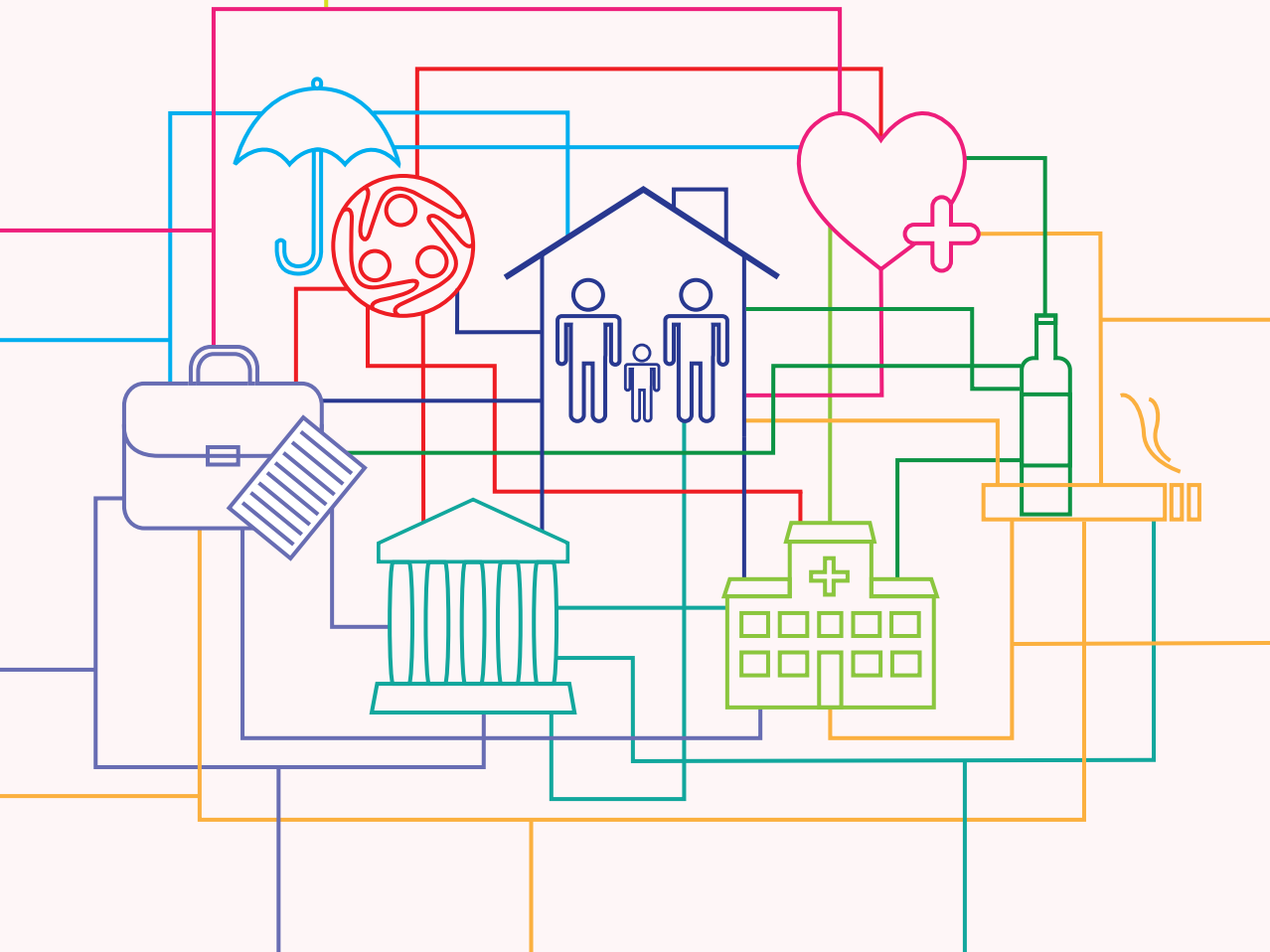


Marina Karanikolos

The Impact of the Financial Crisis on Population Health and Health Systems



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The Impact of the Financial Crisis on Population Health and Health Systems
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The Impact of the Financial Crisis on Population Health and Health Systems

**De impact van de financiële crisis op de
volksgezondheid en op gezondheidssystemen**

Thesis

to obtain the degree of Doctor from the
Erasmus University Rotterdam

by command of the

Rector Magnificus

Prof. Dr. R.C.M.E. Engels

and in accordance with the decision of the Doctorate Board

The public defence shall be held on

21st November 2018 at 13:30 hrs

by

Marina Karanikolos

born in Klaipeda, Lithuania

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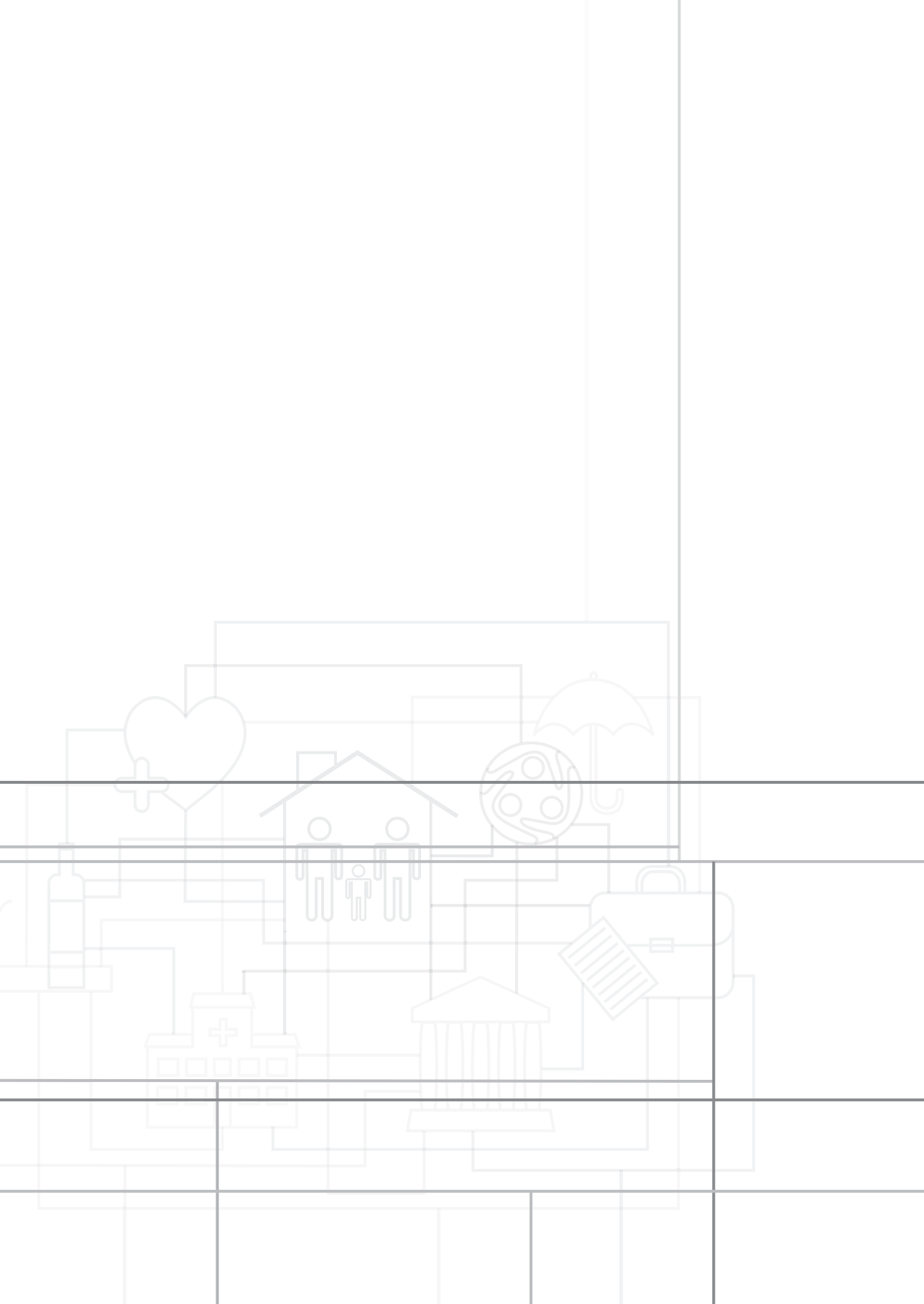
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Chapter 1

General Introduction

BACKGROUND: THE MAKING OF A CRISIS

The Financial Crisis that arose in 2008, spreading to affect almost all parts of the world, was the result of a range of deeply-rooted economic developments, including deregulation of the financial sector, creation of incentives encouraging excessive risk-taking, and accumulation of risky assets by banks.[1] In a context where complex financial products were traded at extremely high volume, often driven by computerised algorithms, any major upset to the international financial system carried risks of global contagion.

Such an upset occurred in the United States of America (USA) in the autumn of 2008. The subsequent Financial Crisis Inquiry Commission Report attributes the initial shock to the collapse of a housing bubble that had been driven by low interest rates, easily available credit, lax regulation, and resulting subprime lending (offering mortgages on properties for more than they were worth). A rise in interest rates rendered these loans unsustainable and the resulting shock was the ultimate trigger of a seismic collapse of the financial system, not just in the USA, but around the globe[2].

The damage to the world economy was enormous, and the total cost is incalculable. The Gross Domestic Product (GDP) of the European Union (EU) fell by 4.3% in 2009, with a second dip of 0.4% in 2012. The only EU Member State to escape recession altogether was Poland, while some countries (e.g. Estonia, Latvia and Lithuania) lost more than 14% of GDP in a single year. Greece remains, by far, the most notable victim of the financial and economic crisis, losing over a quarter of GDP and, even in 2016, still in recession [3].

Under pressure from major international organisations including the International Monetary Fund (IMF), the European Union, and the European Central Bank, many European countries adopted austerity measures, with the stated aim to reduce the current account deficit [4]. This was extremely controversial, with many economists, from the Keynesian school, arguing that the resulting reduced demand in the economy would either delay recovery or even deepen the recession[5]. Those countries in the Eurozone faced particular challenges. Denied the traditional response of competitive devaluation, they were required to meet the European Commission's condition of maintaining public borrowing below the level of 3% of GDP. The argument that public spending should be increased during recession to revive and strengthen the economy was consistently rejected by governments and international organisations[6, 7].

One reason why austerity policies found favour was a study arguing that growth declined when the public-debt-to-GDP-ratio reached a tipping point of 90% [8], a value already exceeded in some European countries such as Italy, while in others the rising level of debt approached it. Yet it was discovered that this was based on a basic calculation error [9], and the existence of a debt threshold associated with dramatically poorer growth has been refuted[10]. By now, Europe was in a double-dip recession that stretched over four years. Eventually the chief economist of the IMF called for expan-

sionary policies, arguing that fiscal consolidation had been associated with lower than expected levels of economic growth [11].

The economic crisis and accompanying austerity drive that lasted almost half a decade, and in a number of countries continues, to some extent, even now, had disastrous effects on the people of the countries most affected. Unemployment increased from 7% to 11% between 2008 and 2013 across the EU. At its peak, in 2013, it reached 27.5% in Greece, 26.1% in Spain, and 16.4% in Portugal. It rose even more sharply in the Baltic countries, with increases to 19.5% in Latvia, 17.8% in Lithuania and 16.7% in Estonia by 2010, while household incomes fell or stagnated[3]. Absence or dismantling of social safety nets in some countries increased poverty levels, widened socio-economic inequalities, and increased exposure of vulnerable groups to important threats to health [12, 13].

Economic shocks on this scale and depth had profound impacts on national budgets. Decisions on where savings could be made were based on both questionable economic grounds (as described above), but also on political ideology. Although countries differed in where they made the deepest cuts, the health sector, as well as the closely related social care sector, were often among those worst affected.

IMPACT OF THE CRISIS ON HEALTH AND HEALTH SYSTEMS

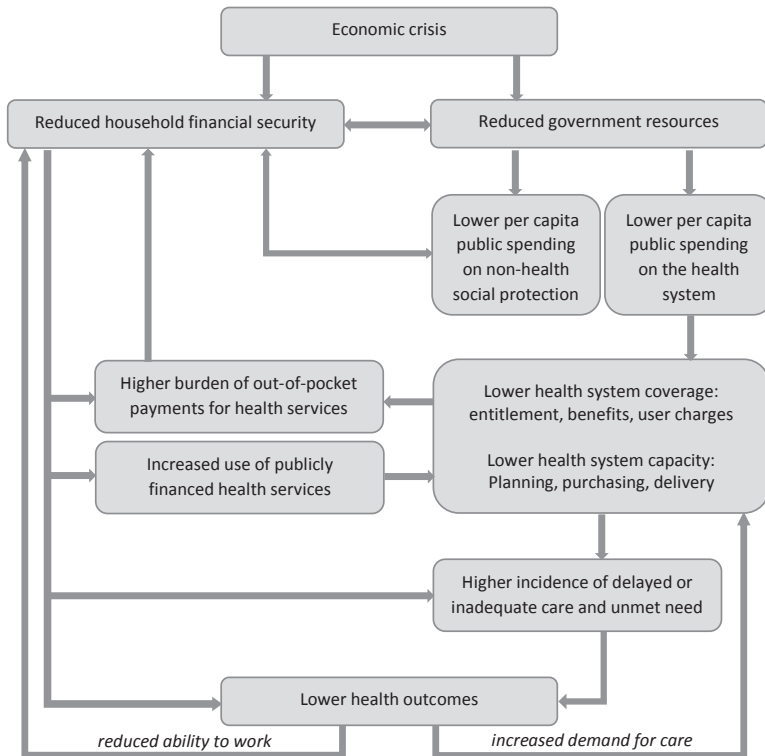
Economic shocks impact on health systems in several ways. Most obviously, they exert pressure on government budgets, reducing the sums available for revenue and capital spending in the health sector. However, their impact on employment and household budgets can increase demand for health care, and in particular mental illness and its physical consequences. Recognising these risks, as early as 2009 there were calls from the public health and health systems communities to take action to mitigate the effects of the economic crisis, such as job loss, reduced income, housing arrears, and generally deteriorating living conditions, and to establish mechanisms to monitor health and implement protective measures in health and social care [14].

However, there were others who argued that recessions can have a positive effect on health. Some of these effects were uncontroversial, such as fewer road injuries consequent on declines in traffic volume or reduced affordability of health-damaging products, such as cigarettes and alcohol. However, some research showing reductions in mortality during recessions in high-income countries [15-17] was contested, with critics arguing that they may not have accounted for lagged effects related to some of the causes of death or for coincidental events, such as the effects of the epidemiological transition during the Great Depression of the 1920s and 1930s[18].

Turning specifically to the relationship between an economic crisis and the health system, Figure 1 describes two possible pathways, as outlined by Thomson et al [19]. The first

pathway involves reduced financial security of households, with consequences for the individuals concerned (e.g. unemployment, falling income). This can either lead to lower health outcomes directly (e.g. through stress, increase in engaging in risky behaviours) or indirectly by reducing the probability that those with health needs will have them met by the health system (e.g. due to burden of out-of-pocket payments). Ill-health, in turn, may reduce an individual's ability to work, which further reduces financial security. The second pathway is through a reduced public health system budget, which may lead to reduced health care coverage or impair the system's capacity to deliver timely and quality care. This can reduce access to health services, damaging health outcomes. Importantly, these pathways can interact, creating multiple pressures. For instance, households with reduced incomes pay less tax and receive greater benefits, reducing the revenues available to the government in general and the health system in particular; and increased use of publicly funded services adds to pressure on health service delivery. These pathways are influenced by diverse policy choices, many of which have their origins outside of the health sector. National fiscal policies shape public spending, including that on social protection, and determine household exposure to financial insecurity.

Figure 1. Pathways to lower health outcomes during an economic crisis



Source: Adapted from Thomson et al (2015) [19]

From an individual level perspective, maintaining work and income is key during recession. Stuckler et al found previously that higher levels of social spending and the maintenance of effective social welfare nets, and especially employment protection mechanisms, can mitigate the adverse health impact of an economic crisis on health, specifically by reducing rates of suicide [14, 20].

From a health system perspective, even when there are severe economic shocks and powerful fiscal pressures, health policy makers are presented with a choice of policy options [21]. These have been summarised by Thomson et al [19] as:

- Attempt to get more out of available resources through efficiency gains;
- Cut spending by restricting budgets, inputs or coverage of health services;
- Mobilise additional revenue.

Maximising efficiency has been one of the key objectives of health systems in high income countries for decades.[22] Consequently, when the crisis hit, the scope for additional efficiency gains was limited in many high income countries. This did not mean that nothing could be done; but further actions required time and, in many cases, investment in new models of delivery, for which it was difficult to raise funds. Given the perceived need for rapid action, cutting spending seemed inevitable.

Finding areas where cuts can be made without adverse impacts on service provision is challenging. Arbitrary cuts are likely to result in inefficiencies in healthcare in the long term. They can result in rationing of services, either implicitly (e.g. creating incentives for informal payments or service dilution) or explicitly (e.g. reducing coverage by excluding people or services, increasing user fees, or prolonging waiting times). Such measures risk undermining financial protection, access to services and overall transparency of the system. Therefore the only option for administering cuts without damaging service provision is to disinvest in non-cost-effective services – a process which requires a strong evidence base, coupled with excellent health technology assessment capacity.

As much of the evidence shows, during the crisis health systems need more, not fewer resources, therefore ability to mobilise revenue is key to maintaining health systems performance levels. A number of mechanisms, including countercyclical spending or creation of reserve funds exist, however they need to be in place before the onset of the crisis.

There were a number of countries in the EU where the crisis had a much more profound impact on the economy. Economies of those in the Baltic region – Estonia, Latvia and Lithuania have managed to recover quickly. Others – Ireland, Greece, and Portugal, had to be bailed out by “the Troika” (the European Commission, International Monetary Fund and the European Central Bank). Each government was required to sign up to a series of “economic adjustment programmes” (EAP) which detailed their obligation to implement specific measures across a range of sectors. In Greece and Portugal, the programmes

(started in 2010 and 2011 respectively) involved specific measures directed at the health sector [23, 24], demanding rapid savings but restricting the number of options available to policy makers (see Chapter 2).

SCOPE, RELEVANCE AND AIMS OF THE THESIS

The impact of the Global Financial Crisis on European economies was monitored and reported in almost real-time, but largely from the financial perspective. The impact on European health systems, in contrast, gained little prominence, even among those responsible for health policy making. Although the onset of the crisis was in the United States, it was European countries, which faced the deepest and longest recessions.

European countries offer a unique opportunity to study the effects of the financial crisis. They are united by similar values and cultures; prior to the crisis they were in similar economic situations, and as members of the European Union, they are subject to the same supra-national legal and regulatory systems. Yet their health policies remain largely a matter of national responsibility, as governments retain competence for organisational structures, governance arrangements and levels and modes of funding and coverage. These differences mean that they vary in their ability to withstand shocks, such as an economic crisis.

For these reasons, in this dissertation I ask how population health and health systems of Europe have been impacted by the crisis and how they responded, and I describe the short- to mid-term consequences for health. I pay particular attention to those countries, such as Greece, Portugal, and the Baltic States, which had the deepest recessions, as these offer especially illuminating country case studies.

The specific aims of the thesis are as follows:

- ***Assess the consequences of the economic crisis of 2008 for population health;***
- ***Assess the impact of the crisis on health systems and identify responses that help countries to maintain stability and promote resilience.***

In the discussion, I will also highlight the implications of the findings of this thesis for health policy and future global health.

The terms “Global Financial Crisis”, “economic crisis” and “recession” are used in this dissertation interchangeably, referring to the aftermath of the event that shook global economies in late 2008 and, for some countries, have not yet concluded.

This thesis not only enriches the scientific body of knowledge on the topic, but identifies a broad set of options available to health policy makers at times of severe financial constraints. It also uses country case studies to identify lessons, which can be learned from the experience of undergoing a severe recession. The set of studies included in

this thesis has already been used widely, not only to stimulate further research on the impact of the crisis, but also to inform policy making at the national [25, 26] as well as international level [19, 27].

STRUCTURE OF THE THESIS

This thesis is a compilation of scientific reports united by the common theme of the impact of the financial crisis, recession, and austerity policies on population health and health systems. It provides an overview of existing literature as well as original analyses of health sector policies, population surveys and mortality data in selected European countries.

The core of this dissertation consists of two parts. The first part consists of four chapters, focussing on the general impact of the crisis across Europe. Chapter 2 provides the background to the financial crisis, a review of literature on the association between recessions and health, presents initial responses of countries within the WHO European Region, and outlines the content of the Economic Adjustment Programmes in Greece and Portugal. Chapter 3 is an analysis of longitudinal data, asking whether employment protection policies played a mitigating role, allowing people in ill health to remain employed during the recession. Chapter 4 is a narrative literature review on the effects of the crisis on health in selected countries up to 2015. Chapter 5 is a time series analysis of amenable mortality data across Europe asking whether trends have changed with the onset of the crisis.

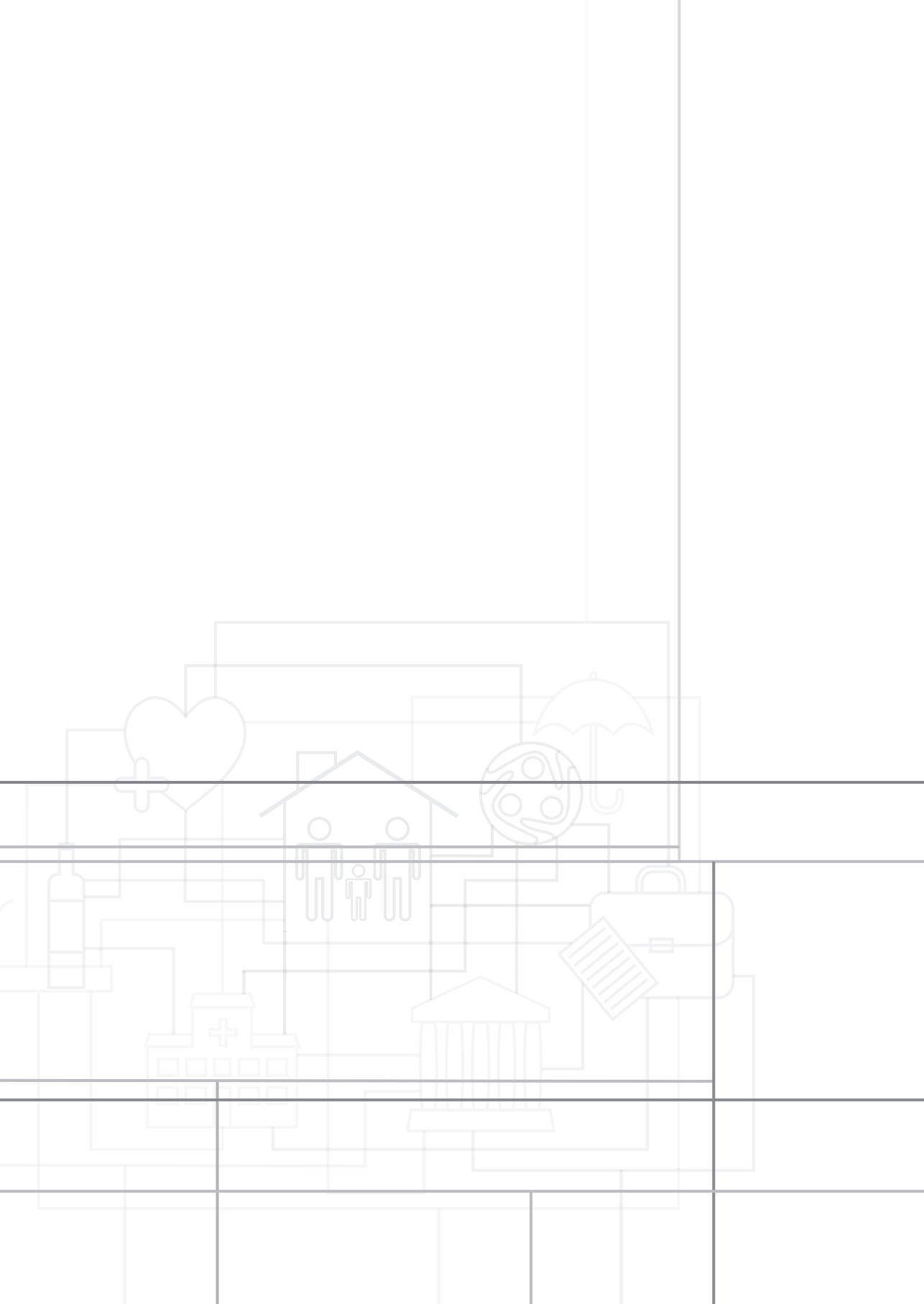
The second part contains country-specific studies, from Greece, Portugal and the Baltic States (Lithuania, Latvia and Estonia). This part highlights their differing circumstances, while analysing the impact of specific policies on population health and health systems. Greece and Portugal were chosen as countries required to accept a bailout, with their policy options being restricted by the conditionalities of the Memorandum of Understanding (MOU) within Economic Adjustment Programmes imposed by the international lenders. The Baltic States suffered deep but short-lived economic shocks and responded in different ways, with differing impacts on access to care.

Finally, a general discussion of the findings from papers presented in this volume will summarise the lessons learned and will present policy options. The dissertation is concluded with a summary, list of references and appendices.

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Chapter 2

Financial crisis, austerity,
and health in Europe

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Sanjay Basu, David Stuckler, Johan P Mackenbach, Martin McKee

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SUMMARY

The financial crisis in Europe has posed major threats and opportunities to health. We trace the origins of the economic crisis in Europe and the responses of governments, examine the effect on health systems, and review the effects of previous economic downturns on health to predict the likely consequences for the present. We then compare our predictions with available evidence for the effects of the crisis on health. Whereas immediate rises in suicides and falls in road traffic deaths were anticipated, other consequences, such as HIV outbreaks, were not, and are better understood as products of state retrenchment. Greece, Spain, and Portugal adopted strict fiscal austerity; their economies continue to recede and strain on their health-care systems is growing. Suicides and outbreaks of infectious diseases are becoming more common in these countries, and budget cuts have restricted access to health care. By contrast, Iceland rejected austerity through a popular vote, and the financial crisis seems to have had few or no discernible effects on health. Although there are many potentially confounding differences between countries, our analysis suggests that, although recessions pose risks to health, the interaction of fiscal austerity with economic shocks and weak social protection is what ultimately seems to escalate health and social crises in Europe. Policy decisions about how to respond to economic crises have pronounced and unintended effects on public health, yet public health voices have remained largely silent during the economic crisis.

KEY MESSAGES

- The public health effects of the economic crisis are already visible, particularly in the countries most affected by recession; however, Iceland has so far avoided negative health effects
- Strong social protection mechanisms (both formal and informal) can mitigate some negative effects of recession on health, such as increasing suicides
- Austerity measures can exacerbate the short-term public health effect of economic crises—eg, through cost-cutting or increased cost-sharing in health care, which reduce access and shift the financial burden to households
- Policy responses to a similar set of economic shocks varied between countries and have led to differing health outcomes, creating potential for future research about how economic changes affect health, policy responses that can mitigate risks, and why some societies are more resilient than others
- Economic crises and their countermeasures have pronounced and unintended effects on public health, yet public health experts have remained largely silent during this crisis.

INTRODUCTION

The economic crisis that has engulfed Europe since 2008 has raised concerns about the health of ordinary people. Despite more than 100 years of research about the effects of economic turbulence on health, the relation between the two is not yet fully understood. We briefly review the origins of the financial crisis and examine what European countries have done in terms of health policy to respond, with a focus on changes to health systems. In the absence of comprehensive data for health during this crisis, we postulate what might be expected to occur on the basis of previous experiences, and review what has actually happened (as far as can be ascertained). We conclude with recommendations for the development of epidemiology of resilience[1] —i.e., understanding how people, households, communities, and entire societies cope with difficult economic circumstances and shocks, and how public health policy can improve health outcomes in this context.

CAUSES OF THE FINANCIAL CRISIS

The financial crisis was avoidable. The US Government's Financial Crisis Inquiry Commission[2] is the most exhaustive analysis of the economic downturn. It focused on events in the USA, but these events are widely agreed to have triggered the crisis in Europe; however, specific problems in European countries exacerbated the situation. The Financial Crisis Inquiry Commission concluded that the crisis was caused by an overabundance of investments in mortgage-backed securities based on valuations of high-risk mortgages that were poorly (sometimes fraudulently) administered. In a chain reaction, a rise in interest rates led to borrower defaults, which led to bank defaults and a crash in the housing and stock markets (Panel 1). By the beginning of 2008, nearly 9 million US home owners owed more than the value of their property[3]. More and more home owners defaulted on their loans, and the value of mortgage-backed securities plummeted[4]. Because many mortgage-backed securities were sold in Europe, the turmoil in the US housing sector quickly spread to European banks. Countries such as Ireland, Spain, and Italy, which had developed so-called property bubbles that were similarly fuelled by artificially low interest rates (partly because of Eurozone membership), were among the worst affected, as demand for housing contemporaneously fell and banks subsequently collapsed.

Panel 1 Causes of the financial crisis—verdict in the USA

- Widespread failures in financial regulation and supervision proved devastating to the stability of financial markets
- Substantial failures of corporate governance and risk management at many systemically important financial institutions
- A combination of excessive borrowing, risky investments, and little transparency
- The US Government was ill prepared, and its inconsistent response added to uncertainty and panic in the financial markets
- A systemic breakdown in accountability and ethics
- Collapse of the mortgage-lending standards and the mortgage securitisation pipeline
- Over-the-counter derivatives contributed substantially
- Failures of credit rating agencies

Source: US Financial Crisis Inquiry Commission [2].

These financial crises soon led to economic crises. In 2009, gross domestic product (GDP) fell in real terms in all countries of the European Union (EU) except Poland; the mean decrease was 4.3%, but losses ranged from 1.9% in Cyprus to 17.7% in Latvia[5]. Between 2007 and 2010, unemployment increased substantially and rapidly—eg, by 3% in Portugal, Slovakia, and Bulgaria, 4% in Denmark, Hungary, and Greece, 5% in Iceland, 9% in Ireland, 12% in Spain and Estonia, 13% in Latvia, and 14% in Lithuania[5].

Panel 2 Approaches taken by the troika in Greece

In Greece, the troika's main target is to achieve a surplus of 4.5% of gross domestic product (GDP) in the next 3 years. Specifically, in 2012, Greece has to implement spending cuts of 1.5% of GDP, equivalent to €3.3 billion. Additional savings of 5.5% of GDP need to be made in 2013–14 [6].

The austerity plan includes major reforms in the public sector workforce, with a reduction of 150 000 jobs between 2011 and 2015, 15 000 job losses in 2012, and employment freezes. Minimum wages have been cut by more than 20%. Greece's social sector accounts for a large share of government spending, and thus a bulk of austerity measures will be implemented in this sector. Reductions in social transfers are hoped to save around 4% of GDP, and will mainly be achieved through cuts to pensions and social benefits and elimination of social support programmes.

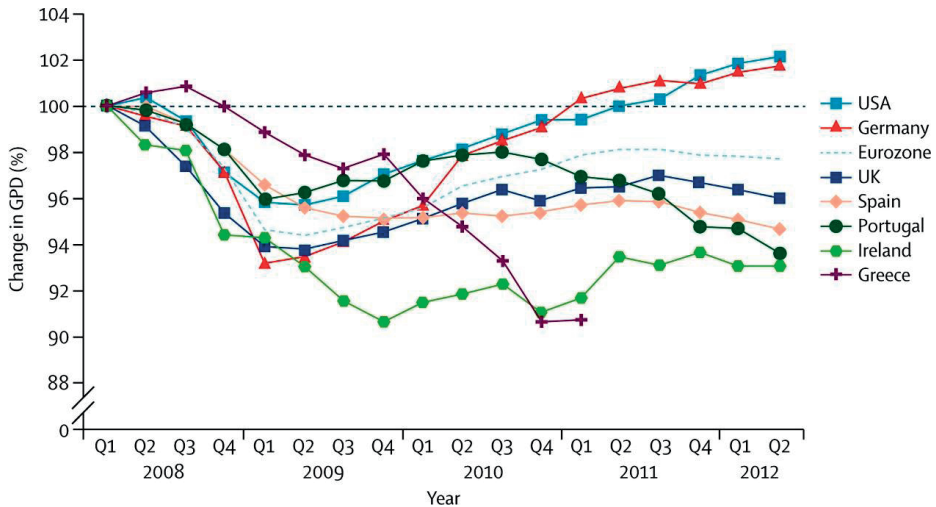
Despite health being deemed a matter of internal governance, the troika has demanded that public spending on health should not exceed 6% of GDP, setting a precedent for the European Union on acquisition of control over national health systems in individual countries[7]. The savings will mainly come from reduced public spending on drugs, decreases in workforce, and changes to purchasing of health services. The aim was to achieve substantial cost savings compared with 2010 by the end of 2012, including a 25% reduction in spending on medical services and goods through price-volume agreements, 50% reduction in administrative personnel at the central social security fund and 25% reduction in doctors contracted by the fund, 30% reduction in costs of services outsourced to private providers, 15% reduction in hospital costs, and 25% reduction in physicians' wages and fees[8].

The restructuring of the public hospital sector in 2011 to generate further savings and efficiency gains included elimination or merging of 370 specialist units, reduction in public hospital beds from 35 000 to 33 000 (and a further 500 beds were designated for priority use by private patients), a freeze on hiring new physicians, and permission for private doctors contracted with the insurance fund to work in public hospitals once weekly[8].

Falling tax revenues and increased spending (especially on bank bailouts but to some extent on the costs of unemployment) in affected countries increased government deficits. Some countries adopted austerity policies, and made large cuts to public expenditure. Austerity policies, including large-scale cuts and public sector reforms, were imposed as a pre-condition by the so-called troika (ie, the International Monetary Fund, European Commission, and European Central Bank) for financial rescue packages, in countries that needed such bailouts—ie, Greece, Ireland, and Portugal.

The austerity policies pursued have been extremely controversial (Panel 2), and the International Monetary Fund's most recent World Economic Outlook report[9] showed that austerity has affected economic growth much more adversely than previously believed, leading to calls for relaxation of these policies. Notably, countries that opted for fiscal stimulus (eg, Germany) have recovered more quickly—a finding interpreted by many commentators as evidence for an alternative to austerity (Figure 1)[10].

Figure 1. Changes to GDPs in selected countries, 2008–12



GDP in Q1, 2008=100%; GDP=gross domestic product. Q=quarter.

Source: Organisation for Economic Co-operation and Development database[11]

EFFECTS ON HEALTH SYSTEMS

Much work has been done to establish how health outcomes might be affected by economic crises, but little previous research has assessed what might happen to health systems[12]. Thus, theory-based testable hypotheses should be developed for comparison with empirical data. When confronted by a fiscal crisis, policy makers might face pressure to maintain, decrease, or increase public expenditure on health (and could also reallocate funds within the health system)[13]. Changes to public expenditure on health can implicate several policy instruments (or combinations thereof) aimed at affecting the provision of publicly financed care.

In a study[13] of responses of health systems to the global financial crisis (as of March or April, 2011), a questionnaire was sent to health policy experts (most of whom were based in universities, WHO country offices, and other non-governmental organisations) in all WHO member states in the European region to gather information about policy

responses—ie, those introduced directly, partially, or possibly in response to the crisis. These data were analysed and verified, and showed that countries in Europe had responded to the financial crisis in various ways. Within the EU, some countries (eg, the Czech Republic, Estonia, Italy, Lithuania, Slovakia) were better prepared than others because of fiscal measures adopted before the crisis. These countries were able to draw on countercyclical policies, such as holding of financial reserves earmarked for health or linking of government contributions for economically inactive groups to earnings in previous years[14]. In other countries, health budgets were protected (Belgium, Denmark) or frozen (the UK, although actual expenditure did decrease, contrary to government assertions), whereas other sectors experienced cuts[13].

Some countries used the crisis to cut costs, particularly in the hospital and pharmaceutical sectors. For example, the governments of Austria, Latvia, Poland, and Slovenia strengthened their position in price negotiations with pharmaceutical companies, and those of Denmark, Greece, Latvia, Portugal, and Slovenia sped up the restructuring of their hospital sectors[13]. Some countries reduced (eg, Cyprus, Greece, Ireland, Lithuania, Portugal, Romania) or froze (eg, England, Slovenia) the salaries of health professionals, or reduced the rate of salary increase (eg, Denmark)[13]. These policies could exacerbate wage imbalances between (depending on the relative change in wages in net immigration countries compared with that in net emigration countries) or within (if health-sector wages fall at a different rate from private-sector wages) countries, which could increase health-worker brain drain.

Initially no major changes were made to the scope (ie, statutory benefits package and services provided to the population that are covered by the state) or the breadth (ie, the population covered by the state) of health coverage, although some reductions were made (usually minor). Thus, in a few countries, some services were removed from the benefits package (eg, in-vitro fertilisation and physiotherapy in the Netherlands)[13]. In some countries, benefits for low-income groups were expanded (eg, Moldova)[13]. However, some countries—specifically, the Czech Republic, Denmark, Estonia, Finland, France, Greece, Ireland, Italy, Latvia, the Netherlands, Portugal, Romania, and Slovenia—decreased the extent of coverage by instituting or increasing user charges for some health services in response to the crisis. In most countries, the scarcity of data and potential lagged effects mean that assessment of the effects of these reforms on access to care and health outcomes is not yet possible. However, evidence from the wider medical literature suggests probable consequences. Rises in user charges are a particular cause of concern, because they increase the financial burden on households[15] and probably reduce the use of high-value and low-value care equally, especially by people with low incomes and high users of health care, even when user charges are low[16, 17]. Introduction or increases of user charges in primary or ambulatory specialist care might worsen

health outcomes and lead to increased use of free but resource-intensive services—eg emergency care. Thus, cost savings and enhanced efficiency are scarce.

Some countries have increased taxes on alcohol or tobacco, or both. A combination of motives—such as raising of revenue and promotion of health—is often behind such measures. For example, in 2012, alcohol taxes increased in both Finland and the UK, where alcohol-related mortality has risen in the 2000s[18, 19]. Cigarettes and alcohol have price elasticities of less than one; tax rises both generate additional revenue and decrease consumption and thus offer dual benefits for governments facing falling revenues and increasing alcohol-related problems because of the financial crisis[20]. Some countries (eg, Finland, France, Hungary) have introduced taxes on soft drinks, but these taxes are small, and, in France, the tax is explicitly a revenue-raising rather than health-promoting measure (it applies equally to drinks with artificial sweeteners).

PREVIOUS ECONOMIC CRISES AND EXPECTATIONS OF HEALTH CONSEQUENCES

Research about the health effects of previous recessions has produced findings that might seem conflicting. Some aggregate data have shown that economic downturns might have few adverse effects on health overall in high-income countries and even that mortality might fall when the economy slows down and rise when the economy speeds up[21-24]. These effects on health have been noted, at least in the short term, in several settings; the extent of the effects varies by age group[25], sex[26], and disease[27], and depends on the indicators used to measure economic change[28-31]. Although these findings have been deemed counterintuitive by some researchers[32], a possible explanation is that recessions improve health behaviours by providing increased sleep and leisure time that can be used for health-improving activities (eg, exercise), and cause people to reduce consumption of unhealthy foods and alcohol (because they have less money) and drive less (resulting in fewer deaths from road traffic accidents).

Other research about economic fluctuations in Europe, which was also based on aggregate data[33], showed that worsening employment and other economic indicators (GDP per person, hours worked, and alternative measures of unemployment) affected mortality from specific causes in different ways. A rise in unemployment of 1% was associated with increases in suicides and murders but decreases in road traffic deaths, whereas a rise of 3% or more was associated with an increase in alcohol-related deaths. The effects of rising unemployment were not uniform and could have been mitigated substantially by social protection[33]. Two countries—Finland and Sweden—clearly stood out because they dissociated rapid increases in unemployment in the early 1990s, from suicide rates (which continued to decrease)[32, 34]. Both countries showed com-

mitment to strong social support during times of crises—eg, through the use of active-labour-market programmes—which could have had protective effects on population health[35, 36].

Further insights can be gained from individual-level research, which shows that unemployment adversely affects health. For example, the prevalence of psychological problems in unemployed people (34%) is more than twice that in employed people (16%)[37], and the negative effects of unemployment on mental health were less in countries with strong employment protection systems than in those with poor employment protection. Poor health in unemployed groups is partly a result of reduced financial resources[38, 39], because loss of income can lead to poor nutrition and potentially to barriers in accessing health care. Martikainen and Valkonen[40] showed that, when demographic and socioeconomic factors are controlled for, unemployed people have higher mortality than do employed counterparts. Morris and colleagues[41] reported that duration of unemployment correlates with increased risk of mortality. Unemployment is associated with increased unhealthy behaviours[41-43] and affects mental health[44], leading to increased psychological and behavioural disorders[41, 45] and increased risk of psychosomatic diseases and suicides[39, 46, 47].

Contrasting findings between individual-level and some aggregate studies generate controversy, not least because some of the health improvements noted in analyses of economic downturns have no obvious biological mechanisms—eg, reductions in cancer deaths. Adverse effects on the most vulnerable groups in the population might be masked by improvements in other groups[48].

Caution is needed in extrapolation from the usual variations in economic cycle to large-scale economic crises. Analysis of previous major crises in the 20th century might help with the anticipation of the health effects of major economic downturns. Research about the health of Americans during the Great Depression showed that, although suicides became more common, overall mortality fell (driven by decreases in infectious diseases and road traffic accidents)[49]. Analysis at state level showed that suicides and road traffic deaths were associated with local bank failures; however, previous research looked at nation-wide deaths, which masked the rise in suicides because infectious and non-communicable diseases were falling at the same time as a result of epidemiological transition that was unrelated to the financial crisis[50].

The break-up of the Soviet Union was followed by economic collapse in successor republics[51, 52], which had devastating consequences on population health across the region. Mortality increased by as much as 20% in some countries. The falls in life expectancy were greatest in countries where socioeconomic transitions were most rapid[53], and were caused by radical privatisation policies—a finding similar to those in different regions of Russia and across the former Soviet Union[54]. To some extent, the adverse consequences were mitigated in countries with high levels of membership of

trade unions, religious groups, or sports clubs, all of which are widely used as markers of social capital.

The effect of economic change on health outcomes depends on the extent to which people are protected from self-harm. The Great Depression coincided with prohibition in the USA, which made alcohol difficult to obtain. By contrast, after the break-up of the Soviet Union, the wide availability of cheap alcohol in various forms boosted the culture of heavy drinking at a time of rapid economic and social changes[55].

Anticipation of any effect on the incidence of infectious diseases is difficult because of the complex interactions between people and pathogens and the many ways in which pathogens can be affected by economic changes. Nonetheless, a systematic review[56] showed deteriorating infectious disease outcomes during economic recession, often as a result of worsening living conditions, restricted access to care, or poor retention in treatment. Infants and people older than 65 years were the most susceptible to infections, and some high-risk groups (eg, migrants, homeless people, prisoners) were particularly vulnerable conduits of epidemics.

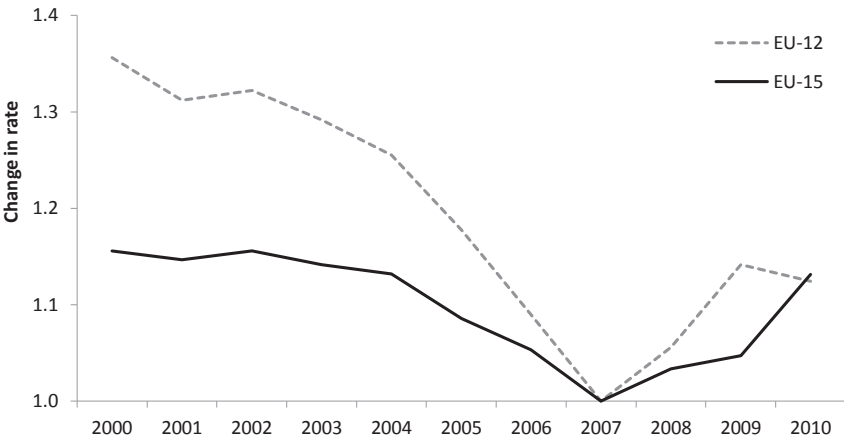
Maintenance of spending in other sectors might be as important as is safeguarding of health budgets in the protection of population health. A historical study[57] during 25 years of selected countries in the Organisation for Economic Co-operation and Development showed that each US\$100 increase per person per year in social-welfare spending was associated with a 1.19% decrease in all-cause mortality. In countries spending less than \$70 per person—eg, Spain and countries that joined the EU since 2004 (mostly eastern European)—a deteriorating economy correlated with a rise in suicide. But in Finland and Sweden, where at least \$300 was spent per person, economic change had no discernible short-term effects on overall population health[33]. Crucially, these findings related specifically to social-welfare spending rather than general government spending. Increased social-welfare spending significantly reduced mortality from diseases related to social circumstances (such as alcohol-related deaths), whereas health-care spending did not. Thus, the reduction was due to spending on areas other than health, suggesting that some aspects of population health (eg, mental health) are more sensitive in the short term to spending on social support than to spending on health care. A study[58] about social welfare and suicides in Europe showed that high social expenditure decreased suicide mortality and that population confidence in welfare provision had a preventive effect in relation to suicide. Economic change results in additional threats to mental health, including unemployment, loss of income, and growing household debt. Apart from ensuring accessible and responsive mental health services, these risks can be mitigated by social welfare and family support programmes[59].

CHANGES TO HEALTH

By contrast with the rapidity with which economic data are published, often several years pass before information about the health of populations becomes available. The most complete and accurate data are mortality estimates. Detailed data for causes, age groups, and different population groups can help to detect changes in mortality. Data for disease prevalence and incidence are less accurate and more difficult to compare between countries than are mortality data, and, on many occasions, are simply not available. The lag of about 2 years in the publication of mortality and other health data means that only the very early effects of the crisis are apparent so far. Many countries in Europe have had prolonged recessions, and cuts to health expenditure will probably affect services and the economic wellbeing of the population well into the future. Thus the full scale of consequences in severely affected countries will become apparent only in several years.

Some effects, however, are already clear. The incidence of mental disorders has increased in Greece and Spain[60, 61], and self-reported general health and access to health-care services have worsened in Greece[61]. The number of suicides in people younger than 65 years has grown in the EU since 2007, reversing a steady decrease in many countries (Figure 2)[62]. In the member states that joined the EU in or after 2004, suicides peaked in 2009 and remained high in 2010, whereas a further increase was noted in 2010 in the 15 pre-2004 countries of the EU. In England, the increase in suicides in 2008–10 was significantly associated with increased unemployment, and resulted in an estimated 1000 excess deaths[63].

Figure 2. Suicide rates before and after 2007 in the 12 post-2004 (EU12) and 15 pre-2004 (EU15) countries of the European Union



No data were available for Italy and Denmark for 2010. Rate of suicide in 2007=1. Data were adjusted relative to countries' populations.

Sources: WHO Mortality Database[66] and Eurostat (for France, Greece, and Luxembourg for 2010)[5].

Panel 3 Greece

Evidence is accruing of worsening mental health in Greece in the past 2 years. The Greek Ministry of Health reported a 40% rise in suicides between January and May, 2011, compared with the same period in 2010 (albeit from a low initial rate)[67]. The results[68] of two nationwide cross-sectional surveys, done in 2008 and 2009, respectively, showed that 1 month prevalence of major depressive disorders doubled during this period and that people facing serious economic hardship were most at risk.

An analysis by Kentikelenis and colleagues[61] showed that self-reported general health has deteriorated—more people reported their health status as “bad” or “very bad” in 2009 than did in 2007. Deterioration in self-reported health was also reported in a study[69] comparing a cross-national survey from 2006 with another from 2011. The proportion of people who felt that they needed but did not access medical care rose significantly; long waiting times, travel distance, and waiting to get better were the main reasons given for not seeking care. Such responses are substantiated by reports of 40% cuts to hospital budgets, shortages of staff and medical supplies, and corruption in health care[61]. Data for use of health services in 2009–11 showed increases in admissions to public hospitals and falls in those to private hospitals, because patients could no longer afford private health insurance.[70, 71] Although Greece has secured cheaper prices for many generic drugs through negotiations with pharmaceutical companies, widespread drug shortages have been reported in pharmacies as wholesalers turn to markets with higher profits. Meanwhile, health insurance funds have delayed reimbursement to pharmacies, resulting in accumulation of debts, which led pharmacies to ask patients to pay for drugs in cash and subsequently be reimbursed by the funds. This process continued until the Ministry of Health agreed to pay some of the pharmacists’ debts[72].

An HIV outbreak in injecting drug users that started in 2011 worsened in 2012. Between 2007 and 2010, between ten and 15 HIV infections were reported yearly in injecting drug users in Greece; the number of infections increased to 256 in 2011, and to 314 in the first 8 months of 2012[73]. Low provision of preventive services has been an important contributor to increased HIV transmission, and non-governmental organisations reported disruption of needle exchange programmes and other preventive initiatives since 2008. User fees for visiting outpatient clinics have increased from €3 to €5[74], and many health-care facilities have closed[75]. Press reports of adverse social consequences, including homelessness[76], surging crime[77], and children being taken into care have become more common[78].

The rescue package prescribed by the troika came with conditions of stringent austerity, including cuts to social welfare, education, and health during the next five years, leaving Greece with very few options to counteract the escalating social crisis.

The most vulnerable people are those in countries facing the largest cuts to public budgets and increasing unemployment. Both job loss and fear of job loss have adverse effects on mental health[64], and income reduction, growing health-care costs, and cuts in services prevent patients from accessing care in time. Such effects have been noted in Greece, Spain, and Portugal (Panels 3–5). In Ireland, which was also bailed out by the troika, the health effects are unclear so far, but health coverage for patients older than 70 years has been reduced (entitlement to medical cards, which allow holders to access some services for free, has been removed for those with high incomes), prescription charges have been introduced for low-income households, and dentistry benefits have been reduced, all of which will probably affect access to care[65]. Such effects are not, however, inevitable. Iceland was one of the first European countries to be hit by the financial crisis; the debt-to-GDP ratio increased from 28% in 2007, to 130% in 2011, and the value of the currency fell by 35% before trading was suspended. Yet at all stages in its response, Iceland rejected the economic orthodoxy that advocated austerity, refused to be accountable for the irresponsibility of a few bankers, and invested in its people who,

evidence suggests, have had very few adverse health consequences (Panel 6). Iceland's choice of policies might have been influenced by widespread protests, in which roughly 10% of the population took part, suggesting high social cohesion. However, the health and economic effects of the policy choices can be assessed independently of the underlying determinants. Continuing study of the European countries most severely hit by the crisis is warranted, because each has encountered unique circumstances; Greece had, for many years, submitted falsified data for the state of its public finances[90], Ireland had a major banking issue, and Portugal's economic growth had stagnated for a decade.

Panel 4 Spain

Between 2006 and 2010[60], the prevalences of mental health disorders in people attending primary care increased significantly, especially those of mood, anxiety, somatoform, and alcohol-related disorders; the rise in the prevalence of major depression was the biggest. Gili[60] and colleagues[60] estimated that at least half the rise in attendance with mental health disorders could be attributed to the combined risks of individual or family unemployment and difficulties with mortgage payments. Loss of family income particularly affects the weakest and most vulnerable members of society. In Catalonia between 2005 and 2010, the proportion of children at risk of poverty increased from 20.6% to 23.7%, and that living in unemployed families from 3.7% to 11.2%[79]. Families are increasingly turning to non-governmental organisations for food, housing, employment, legal advice, and psychological support[79]. Closure of health-care services and reductions in the number of hospital beds and working hours have been reported in Catalonia[80]. Co-payments for drugs for pensioners and increases in cost-sharing for drugs for people with higher incomes have been introduced[81]. A new law shifting health coverage from universal to employment based was introduced in April, 2012, by a royal decree (the parliament was bypassed). An implication of this law is that hundreds of thousands of illegal immigrants will have access only to emergency, maternity and paediatric care[82].

Panel 5 Portugal

In total, savings of €670 million were demanded in Portuguese health care as a condition of the memorandum of understanding between the troika and the Portuguese Government[83]. Drug expenditure, prescriptions, workforce, and user charges were targeted. A target for public expenditure on drugs of 1.25% of gross domestic product was aimed for by the end of 2012 (down from 1.55% in 2010) and 1% by the end of 2013. The main savings have been made in public retail pharmaceutical expenditure through measures including reductions in pricing, promotion of competition, electronic prescribing, and prescription monitoring[84]. In addition to initial salary freezes in 2010, public sector employees' incomes were cut in 2011 and 2012. Since January, 2012, the Portuguese Government has increased citizens' co-payments for primary care appointments from €2.25 to €5.00, while the cost of emergency visits rose from €3.80 to €10.00 in primary care and from €9.60 to €20.00 in secondary care[85]. Although these increases have ostensibly been introduced to reduce non-urgent and inappropriate visits, about 15% of the Portuguese population are not registered with a general practitioner, and rely on emergency services[85]. User charges are capped at €50 per visit, but exceptions include people with low income, those with disabilities and those with chronic illnesses (if the visit is related to their illness), who are exempt from fees[83]. Children are exempt from user charges in health care. However, their welfare has been placed at risk because expenditure on family support was reduced by 30% in 2011, and in January, 2012, 67 000 families lost eligibility for child-care benefits[86]. Winter deaths in people older than 75 years increased by 10% in 2012 compared with 2011, which caused substantial alarm; subsequently, however, the rise was attributed to increased influenza activity and unusually cold weather[87]. However, concerns remain, because more than 40% of Portuguese people older than 65 years who live alone are unable to keep their homes adequately heated[88]. Some health-care professionals have suggested that reduced access to health services and poor diet might have contributed to the increase in deaths, but this view is contested[89].

Panel 6 Iceland

What would have happened if European governments had refused to rescue failing banks? Every country is different, but Iceland's experience is instructive. In the mid 1990s, a few Icelandic bankers and politicians decided that their country's future prosperity depended on becoming a global financial centre. The previously strict banking regulations were overturned and the banks enticed investors in many countries with interest rates that seemed too good to be true. A few experts, such as the UK economist Robert Wade[91], predicted problems, but these warnings were dismissed by the global financial establishment. When the US subprime mortgage market collapsed, Icelandic banks faced massive losses. The International Monetary Fund (IMF) was called in and prescribed a rescue package whereby the Icelandic Government would assume liability for the banks' losses, which would have resulted in 50% of the national income between 2016 and 2023 being paid to the UK and Dutch Governments. The Icelandic Government agreed but the president refused to approve the deal. A referendum was held, and 93% of the population rejected the rescue package. The Icelandic banks' creditors were incandescent; the UK Government invoked antiterrorist legislation to freeze Icelandic assets. Iceland let the value of its króna collapse, so that the price of imports rocketed, and many Icelanders faced major reductions in income. Yet the effects on health were almost imperceptible. Suicides did not increase. When the crisis broke, the frequency of cardiac emergencies increased slightly, but this peak subsided within a week[92]. A national survey of health and wellbeing showed that the crisis had few effects on the nation's happiness[93].

How can the absence of adverse effects be explained? First, Iceland ignored the advice of the IMF, and instead invested in social protection. This investment was coupled with active measures to get people back into work. Second, diet improved. McDonald's pulled out of the country because of the rising costs of importation of onions and tomatoes (the most expensive ingredients in its burgers). Icelanders began cooking at home more (especially fish, boosting the income of the country's fishing fleet). Third, Iceland retained its restrictive policies on alcohol, again contrary to the advice of the IMF. Finally, the Icelandic people drew on strong reserves of social capital, and everyone really felt that they were united in the crisis. Although extrapolation to other countries should be undertaken with care, Iceland, by challenging the economic orthodoxy at every step of its response, has shown that an alternative to austerity exists.

A financial crisis could lead to increases in healthy behaviours (eg, walking, cycling) and reductions in risky behaviours (eg, consumption of less alcohol or tobacco). Increased taxes on alcohol and tobacco can prompt reductions in hazardous drinking[94] and smoking[95, 96]. An analysis[97] of the effects of alcohol policy and economic downturn in Estonia suggested that the reduction in alcohol consumption since 2008 was a result of the combined effects of economic crisis and strengthening of alcohol policies since 2005. However, a more complex situation was noted in a study[98] of the economic crisis in the USA, in which the number of people drinking any alcohol had fallen but binge drinking had increased.

Consistent with previous experience[33, 49], deaths from road traffic accidents are falling in many countries[62], with drivers switching to cheaper transport or reducing their travel. The decrease in accidents is further shown by shortages of organ donations and transplants in Spain—normally a leading country in terms of both[99]. Organ donation has also fallen substantially in Ireland[100]. The exception is the UK, where a long-term decrease in road traffic deaths has been reversed, although this reversal coincides with the removal of road safety targets by the government[101].

LOOKING TO THE FUTURE

The first signs of recovery in the global financial sector were noted in 2009[102]. However, the economy in many countries has not yet recovered, and 2012 growth is projected to be minimum in countries including France, Germany, and the UK, and negative in Iceland, Ireland, Italy, the Netherlands, Portugal, and Spain, among others. Greece is not expected to begin to recover before 2014. An absence of economic growth means loss of income and employment, and reductions in social assistance for ordinary people, which have consequences that are likely to last for many months, during which time protection of health and access to health and social care services for the most vulnerable members of society are particularly important.

Several lessons can be learnt. First, by stark contrast with the availability of information on the economy, the absence of up-to-date morbidity and mortality data have clearly made the immediate effects of the crisis on health impossible to analyse, leaving policy attention focused on economic aspects. Second, remarkably little research has been done about the health consequences of the crisis and much of that done has been undertaken by individual researchers without additional funding. The major funders of health research have been largely absent. A potentially substantial research agenda exists, and would include investigations of why some populations seem to cope with and recover from economic crises better than others. The financial crisis created a set of economic shocks that resulted in widely varying policy responses and differing health outcomes, and thus has presented a so-called quasi-natural experiment for future research about the effects of economic changes on health and which policy responses can mitigate risks. Multilevel notions of resilience—ie, how individuals, communities, and entire societies positively adapt to shocks—can be expanded to cover wider social and economic determinants of public health[103]. Such an inclusive notion of resilience provides an explanatory framework that implicates the physical, psychosocial, and economic factors that help populations to resist and adapt to public health threats, such as the economic crisis.

Finally, public health voices have been largely absent from the debate about how to respond. Many health ministries have been silent. The Directorate-General for Health and Consumer Protection of the European Commission, despite its legal obligation to assess the health effects of EU policies, has not assessed the effects of the troika's drive for austerity, and has instead limited EU commentary to advice about how health ministries can cut their budgets. A small source of optimism is that European civil society organisations, including professional bodies, have spoken out about the adverse health effects of cuts to health and social spending[104]. The question is whether anyone will listen.

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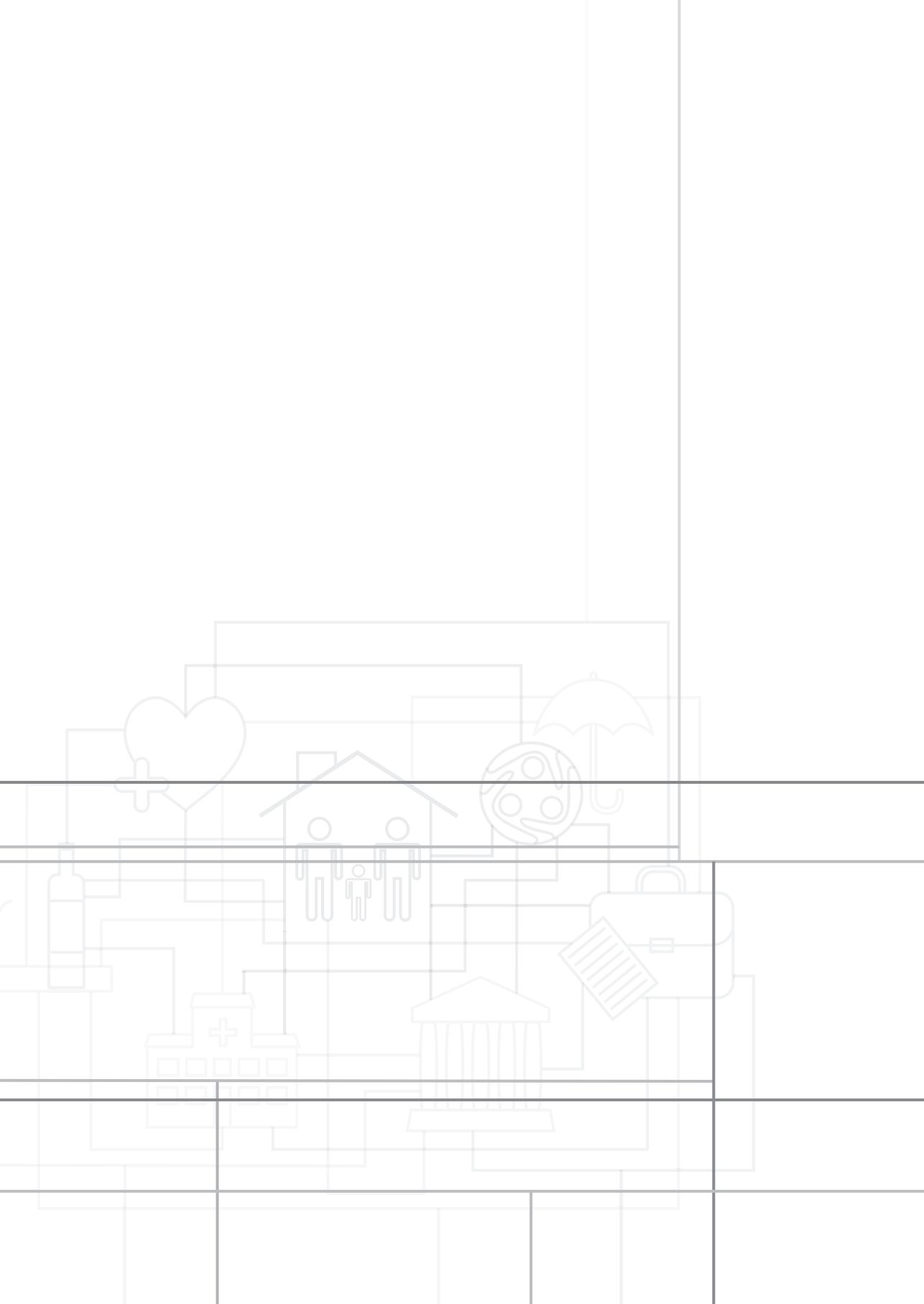
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Chapter 3

Do employment protection policies reduce the relative disadvantage in the labour market experienced by unhealthy people? A natural experiment created by the Great Recession in Europe

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ABSTRACT

Unhealthy persons are more likely to lose their jobs than those who are healthy but whether this is affected by recession is unclear. We asked how healthy and unhealthy persons fared in labour markets during Europe's 2008–2010 recessions and whether national differences in employment protection helped mitigate any relative disadvantage experienced by those in poor health. Two retrospective cohorts of persons employed at baseline were constructed from the European Statistics of Income and Living Conditions in 26 EU countries. The first comprised individuals followed between 2006 and 2008, $n = 46,085$ (pre-recession) and the second between 2008 and 2010, $n = 85,786$ (during recession). We used multi-level (individual- and country-fixed effects) logistic regression models to assess the relationship (overall and disaggregated by gender) between recessions, unemployment, and health status, as well as any modifying effect of OECD employment protection indices measuring the strength of policies against dismissal and redundancy. Those with chronic illnesses and health limitations were disproportionately affected by the recession, respectively with a 1.5- and 2.5-fold greater risk of unemployment than healthy people during 2008–2010. During severe recessions (>7% fall in GDP), employment protections did not mitigate the risk of job loss (OR = 1.06, 95% CI: 0.94–1.21). However, in countries experiencing milder recessions (<7% fall in GDP), each additional unit of employment protection reduced job loss risk (OR = 0.72, 95% CI: 0.58–0.90). Before the recession, women with severe health limitations especially benefited, with additional reductions of 22% for each unit of employment protection (AOR_{female} = 0.78, 95% CI: 0.62–0.97), such that at high levels the difference in the risk of job loss between healthy and unhealthy women disappeared. Employment protection policies may counteract labour market inequalities between healthy and unhealthy people, but additional programmes are likely needed to protect vulnerable groups during severe recessions.

HIGHLIGHTS

- Employment protection reduced job loss risk before the recession and in mild recession.
- The difference in the risk of job loss between healthy and unhealthy women disappeared before the recession.
- In severe recessions employment protections did not mitigate the risk of job loss.
- Employment protection may counteract labour market inequalities.

INTRODUCTION

There has been widespread concern that the Great Recession that began in 2008 has disproportionately impacted vulnerable groups, particularly those with chronic illnesses or disabilities[1]. Historically, persons with chronic illnesses have been twice as likely to lose jobs than those in good health[2]. During previous recessions in Europe, men with chronic illness, particularly from lower socio-economic groups, were more likely to lose their jobs than men without chronic illness, leading many to exit the labour force entirely[3, 4]. Very few longitudinal analyses have examined this issue, but those that have consistently find that people who initially report poorer health were more likely to lose their jobs[5-8] – especially if they are older[9] – and then, when job loss occurs, to have more difficulty regaining work than those in better health[10]. Yet is it inevitable that economic downturns will heavily penalise those already disadvantaged on the grounds of health?

Cross-national variation in the extent to which chronically ill people are penalised in the labour market suggests that political and structural features of the labour market may protect them from any worsening of their existing disadvantage[11]. This political economy approach to health seeks to understand how politics, policies, and economics can influence the health and life chances of vulnerable groups, with potential implications for health inequalities[12-14]. It further draws attention to how recessions and employment protection legislation, two under-researched economic and political determinants of health, influence the relative disadvantage in the labour market experienced by those with chronic illnesses.

Employment protection legislation is intended to help protect jobs during hard times. Such legislation includes safeguards for permanent contracts as well as measures that make redundancy more expensive or difficult for employers. For example, requiring redundancies be approved by third party organisations makes lay-offs more difficult. Dismissal can also be made more costly if longstanding employees are entitled to greater severance pay. In such circumstances, employers may seek alternative ways to achieve savings rather than by shedding workers who may be perceived as less productive, particularly those in ill health, during economic contractions.

Although it is plausible that employment protection may reduce the short-term risk of job loss, the OECD and IMF claim that these policies lead to labour market rigidity, worsening overall employment rates[15, 16]. It is argued that firms may be reluctant to hire employees if it is difficult to dismiss them. U.S. studies that examined the short-term impact of the 1991 Americans with Disabilities Act, which prohibited workplace discrimination against disabled people, suggested that it exacerbated already high unemployment rates in this group[17, 18], with similar results observed in the UK[19]. Yet, others have suggested that these results were artefactual, since the Americans with

Disabilities Act increased the numbers of persons designated as disabled[20, 21]. Further studies that have investigated the longer-term effects find that anti-discrimination policies improved employment rates among disabled people although, in the UK, there is suggestive evidence that they have benefited men more than women[21-23]. These observations are thought to be a product of women's overrepresentation in precarious employment, including part-time work and the service sector. This debate reflects a growing concern with how politics and policies intersect with economic fluctuations in shaping population health[13].

In this study, drawing on the natural experiment created by the economic downturns in Europe that began to emerge in late-2007 following the collapse of the US housing bubble, we examine two questions concerned with the political economy of labour market inequalities:

1. Are unhealthy persons at greater risk of losing jobs than healthy persons during economic recessions?
2. Do employment protection policies mitigate their relative disadvantage during periods of (a) no recession, (b) mild recession, and (c) severe economic recession?

METHODS

Retrospective cohort data

Individual-level data were taken from the European Statistics of Income and Living Conditions (EU-SILC). We included data from individual surveys from 26 EU/EEA countries, apart from Germany in the years 2006–2010, Ireland in 2008–2010, Romania in 2006–2008 and Switzerland in 2006–2010 for which data were unavailable. Household response rates vary by country from 53.7% in Luxembourg to over 90% in Slovakia and Romania, with an overall mean response rate of over 80%.

The SILC survey includes both cross-sectional and longitudinal components. A rotational design is used for the longitudinal component, replacing 25% of the sample each year with a maximum coverage of four years. Thus, to assess the consequences for job loss, we constructed two cohorts of the longitudinal EU-SILC, covering the years 2006–2008 and 2008–2010. These cohorts were selected because they coincide with rising European unemployment associated with the Great Recession. Officially, recessions, defined in terms of declines in GDP, began in late 2007 and early 2008, but the subsequent increase in unemployment, which affected nearly all countries, began in 2009.

Persons in the first cohort (prior to large rises in unemployment associated with the Great Recession) were employed in 2006 and were interviewed annually until 2008. Members of the second cohort (during the rise in unemployment) were employed in

2008 and interviewed annually until 2010. Members of both cohorts were included in the EU longitudinal sample if they were present throughout the three-year study phases (covering 2006–2008 and 2008–2010) and did not exit the workforce (i.e. retired, were unable to work due to disability, were in full-time education or otherwise inactive). This yielded a final analytic sample of 46,085 respondents in 2006–2008 (138,255 person-years) and 85,786 respondents in 2008–2010 (257,358 person-years).

Multi-level statistical models

Becoming unemployed is our outcome of interest. To measure the incidence of unemployment, a dummy variable was created for respondents who self-reported unemployment in any or both of the 2 years from baseline. We define job loss as becoming unemployed and remaining economically active. Unemployment is defined as 'current' economic activity and so the SILC data may fail to capture those who were employed during the data collection period in 2006 and in 2007 but who were briefly unemployed between these two periods.

Chronic illness and health limitation are both key explanatory variables. Chronic illness was defined as the presence of self-reported long-term conditions (No = 0, Yes = 1). We also evaluated the presence of health conditions severely limiting daily activities (henceforth health limitations) (No limitation = 1, Some limitation = 2, Severe limitation = 3), although small numbers did not allow for within-country comparisons. Item non-respondents were removed from our sample for chronic illness (2008 $n = 6022$; 2010 $n = 11,618$) and for limiting health conditions (2008: $n = 6032$; 2010: $n = 11,635$).

Our models also include individual- and country-level covariates. Because chronic illnesses and health limitations are highly correlated with age, we include both measures of age and age-squared to adjust for any non-linear associations with the probability of job loss. We also adjust for marital status (married or not) and educational status (measured as the number of years of educational attainment) as both may moderate the association between economic activity and health status. We also adjust for a series of macroeconomic variables that might explain variation in the pressures in the labour market to which both healthy and unhealthy employees are exposed. These country-level variables include Gross Domestic Product (GDP) as a measure of the wealth of a country while the change in GDP captures the depth of the recession. Both of these are adjusted for inflation and purchasing-power. Unemployment rates measure pre-existing pressure in the labour market while the change in unemployment captures the population wide change in employment rates due to the crisis.

To assess whether persons in ill-health were at greater risk of job loss before and during the Great Recession, we fit a logistic regression model with standard errors adjusted for within-country clustering, as follows:

$$1) \text{ Job loss}_{i,j,k,t} = \beta_0 + \beta_1 \text{Ill}_{i,j,k} \text{ baseline} + \beta_2 \text{Age}_{i,j,k,t} + \beta_3 \text{Age}_{i,j,k,t}^2 + \beta_4 \text{Marital}_{i,j,k,t} + \beta_5 \text{Educ}_{i,j,k,t} + \beta_6 \text{GDP}_{k,t} + \beta_7 \Delta \text{GDP}_{k,t} + \beta_8 \text{UE}_{k,t} + \beta_9 \Delta \text{UE}_{k,t} + \alpha_i + \varepsilon_{i,j,k,t}$$

Here i is individual, j is sex, k is country, and t is year. Job loss is 1 if person i became unemployed since being employed at baseline; Ill is either the measure of self-reported chronic illness or the measure of health limitations at the base year. α_i is the person-specific fixed-effect, which adjusts for time-invariant covariates. Marital is a person's marital status, and Educ is the person's number of years of educational attainment; GDP is gross domestic product and UE measures the unemployment rate while Δ GDP and Δ UE represent the annual change in both of these same measures; ε is the error term. We estimated the models across all individuals and for men and women separately.

Given eq. (1), we then assessed two potential exacerbating or mitigating factors. First we asked whether the risk of job loss was greater during more severe recessions. We compared the risk of job loss in countries experiencing severe recession with those experiencing either a mild recession or no recession at all. Countries with a recession greater than the median downturn (cumulative GDP decline $\geq 7\%$) were defined as 'severe' and 'mild' recessions were those countries below the median ($< 7\%$ of GDP). Data from 2006 to 2008 are coded as 'no recession', since all countries in the sample experienced GDP growth over this period.

Second, we asked whether stronger employment protection could reduce the risks of job loss. To do so we included the OECD measures of the strength of legislation protecting employees from both collective and individual dismissal in the statistical models. Box 1 provides a detailed description of the OECD employment protection indicators[16]. Our combined measure of employment protection is on a continuous scale from 0 (lowest protection) to 2.5 (highest protection). At the lowest levels were countries such as the UK and Denmark, and at the highest were Italy, Luxembourg and Sweden. Data on employment protection were missing from Bulgaria, Cyprus, Latvia, Lithuania, and Malta. Potential protective effects were tested using both a direct effect of each additional unit of employment protection and a modifying effect using an interaction term for health status and each additional unit of employment protection.

$$2) \text{ Job loss}_{i,j,k,t} = \beta_0 + \beta_1 \text{Ill}_{i,j,k} \text{ baseline} + \beta_2 \text{Protect}_{k,t} + \beta_3 \text{Protect} \times \text{Ill}_{i,j,k,t} + \beta_\alpha X_{i,j,k,t} + \beta_\beta Z_{k,t} + \alpha_i + \varepsilon_{i,j,k,t}$$

Again i is individual, j is sex, k is country, and t is year. Job loss is 1 if person i became unemployed since being employed at baseline; $\beta_\alpha X$ is a vector of individual-level covariates described in eq. (1) and $\beta_\beta Z$ is a vector of country-level covariates also described in eq. (1). Protect is a measure of employment protect legislation and Protect \times Ill is an interaction term between an individual-level measure of health status and a country-

level measure of employment protection. This interaction term tests whether unhealthy or healthy employees are the greatest beneficiaries of this type of national legislation. Tables 1 and 2 provide descriptive statistics for all variables used in the analysis.

All statistical models were weighted to account for the clustered, multi-stage sampling design. Models were also weighted by country population size, to be representative of the EU, although the results were not sensitive to this coding decision. Analyses were performed using Stata/IC 12.1.

Box 1. OECD Employment Protection Indices

Employment protection against dismissal includes two components: legislation protecting permanent workers against individual dismissal and specific requirements for collective dismissal.

Individual dismissal

The measure of strictness captures three aspects of the procedure of individual dismissal:

1. Procedural inconveniences,
2. Notice periods and severance pay, and
3. Difficulty of dismissal (including repercussions for unfair dismissal).

Collective dismissal

Most countries impose additional requirements when an employer dismisses a large number of workers. These measures incorporate 4 components:

1. The definition of 'collective dismissals', e.g., more than 50 dismissals,
2. How many actors (e.g., employee representatives or government authorities) need to be notified,
3. Additional delays over and above the delays required for individual dismissal, and Additional severance pay requirements over and above those required by individual dismissals[16].

RESULTS

Those who have health limitations or a chronic illness are more likely to be unemployed than those without poor health (Difference in means = 2.86 percentage points, t (df = 88603) = 10.58, $p < 0.001$) (Figure 1). Between 2005 and 2011, unemployment rates were on average 25.3% in persons with severe health limitations, 13.7% in persons with chronic illnesses, and 9.29% in persons who were healthy (i.e. no chronic illnesses or health limitations). During the post-recession years 2009 and 2011, unemployment rates among those with health limitations rose by 4.08 percentage points ($p < 0.001$) and only 2.14 percentage points ($p < 0.001$) points among those with no health limitations, widening the gap between healthy and unhealthy persons.

To address the possibility that people were ill because they were unemployed (a selection bias), we then evaluated a baseline of persons who were employed in 2006 and 2008. This sub-sample also showed that 4.16% of persons with health limitations lost jobs, 3.39% of persons with chronic illnesses lost jobs, but only 2.82% of healthy persons lost their jobs. We now look in detail at the association between different health states and job loss, adjusting for potential confounding factors.

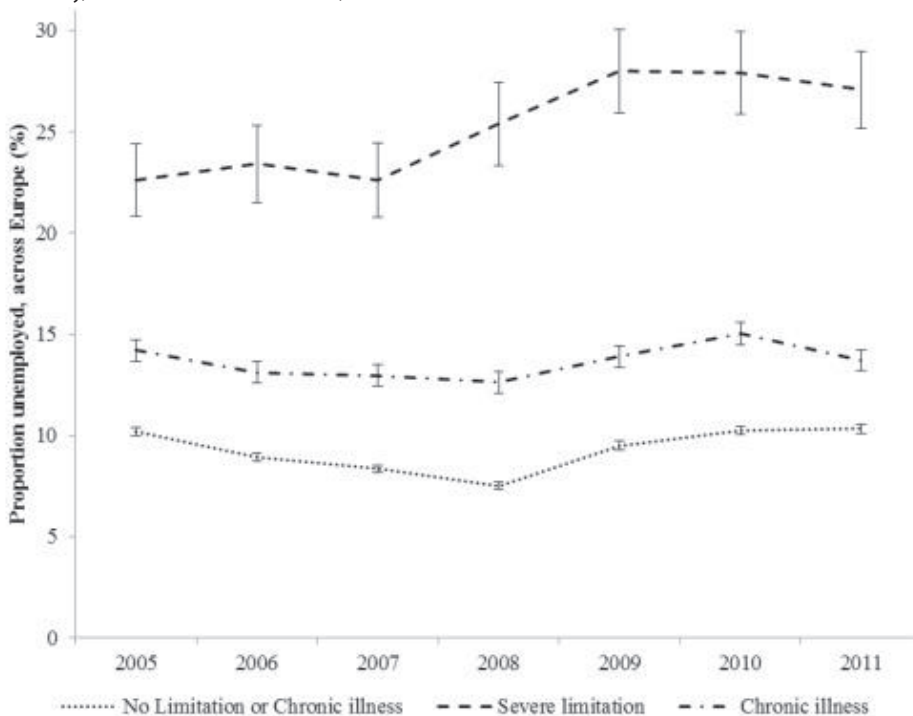
Table 1. Descriptive statistics for individual level variables, 2006–2010

Individual level	Pre-recession cohort			Recession cohort		
	2006 (Baseline)	2007	2008	2008 (Baseline)	2009	2010
Lost work						
Employed	46,085 (100%)	45,090 (97.8%)	44,830 (97.3%)	85,786 (100%)	82,424 (96.1%)	81,242 (94.7%)
Unemployed	0 (0%)	995 (2.16%)	1,255 (2.72%)	0 (0%)	3,362 (3.92%)	4,544 (5.30%)
Age	40.9	41.9	42.9	40.9	41.9	42.9
Sex						
Male	25,537 (55.4%)	25,537 (55.4%)	25,537 (55.4%)	47,120 (54.9%)	47,120 (54.9%)	47,120 (54.9%)
Female	20,548 (44.6%)	20,548 (44.6%)	20,548 (44.6%)	38,663 (45.1%)	38,663 (45.1%)	38,663 (45.1%)
Marital status						
Married	29,477 (64.1%)	29,906 (64.9%)	30,205 (65.6%)	54,665 (63.8%)	55,224 (64.5%)	55,747 (65.1%)
Not married	16,491 (35.9%)	16,150 (35.1%)	15,855 (34.4%)	31,049 (36.2%)	30,457 (35.6%)	29,938 (34.9%)
Education						
Pre-primary	104 (0.23%)	97 (0.21%)	112 (0.24%)	180 (0.21%)	184 (0.22%)	197 (0.23%)
Primary	32,49 (7.1%)	32,94 (7.21%)	32,31 (7.05%)	5,080 (5.95%)	4,966 (5.82%)	4,905 (5.75%)
Lower secondary	6,331 (13.8%)	5,962 (13.1%)	6,128 (13.4%)	12,084 (14.2%)	12,055 (14.1%)	12,073 (14.2%)
Upper secondary	21,419 (46.8%)	21,464 (47.0%)	21,372 (46.6%)	40,418 (47.4%)	40,088 (47.0%)	39,929 (46.8%)
Post-secondary non-tertiary	1879 (4.11%)	1,955 (4.28%)	1,859 (4.05%)	3,296 (3.86%)	3,456 (4.05%)	3,291 (3.86%)
Tertiary education	12,759 (27.9%)	12,924 (28.3%)	13,152 (28.7%)	24,272 (28.4%)	24,574 (28.8%)	24,928 (29.2%)
Chronic illness						
No chronic illness	32,844 (82.0%)			60,995 (82.2%)		
Chronic illness	7,219 (18.0%)			13,173 (17.8%)		
Limiting health condition						
Not limited	35,278 (88.1%)			65,623 (88.5%)		
Limited	3,957 (9.88%)			7,250 (9.78%)		
Strongly limited	818 (2.04%)			1,278 (1.72%)		

Notes: Source: EU-SILC

Table 2. Descriptive statistics for population-level variables, 2006–2010

Variable	Description	2006–2008		2008–2010		Source
		N countries	Mean (Std. Dev)	N countries	Mean (Std. Dev)	
OECD Employment protection index	Combined measure of protection against dismissal and around permanent employment	21	1.42 (0.72)	19	1.42 (0.72)	OECD Employment database
GDP	Per capita, adjusted for inflation and purchasing-power	27	24661.4 (12333.8)	27	24218.2 (12028.3)	EuroStat
Annual change in GDP	Per capita, adjusted for inflation and purchasing-power	27	715.8 (881.9)	27	-327.3 (1111.5)	EuroStat
Unemployment rate	% of the labour force	26	6.43 (2.25)	26	8.28 (3.97)	EuroStat
Annual change in the unemployment rate	Percentage point change in the unemployment rate	26	-0.62 (1.10)	26	1.28 (2.12)	EuroStat

Figure 1. Proportion unemployed by whether respondent has a severely limiting illness, chronic illness, or is healthy, EU-SILC cross-sectional data, 2005–2011

Notes: Source: EU-SILC Cross-sectional data, 2005-2011. Weighted estimates across Europe calculated by year. Vertical bars represent 95% confidence intervals.

Effect of recessions on job loss in persons with different health states

First we look at the pooled associations between health limitations, chronic illness and job loss during the recent economic recessions in Europe.

Table 3 compares the risks of job loss in persons with either a limiting health status or a chronic illness to those without, adjusting for age, education, marital status, and other possible confounding socio-economic factors. In 2008–2010, men and women with severe health limitations were significantly more likely to experience job loss than those without limitations (AOR_{men} = 1.70, 95% CI: 1.09 to 2.64 and AOR_{women} = 1.74, 95% CI: 1.21–2.51). Similarly, prior to the recessionary period, in 2006–8, women with severe health limitations were more likely to lose their jobs than those without (AOR_{women} = 3.42, 95% CI: 2.27–5.15) but not men (AOR_{men} = 0.65, 95% CI: 0.25–1.69). Similar patterns were observed for those with chronic illness (see Table 3). As the results for job loss are similar for those with health limitations and chronic illness, in the remainder of the paper we focus on the latter, as the sample sizes are larger.

Table 3. Job loss risks in persons with and without a limiting illness among persons employed at baseline, before the Great Recession 2006–2008 and during it 2008–2010

Health limitation	Odds of job loss					
	2006–2008 (Prior to recession)			2008–2010 (During the recession)		
	Total	Male	Female	Total	Male	Female
No limitation	Reference	Reference	Reference	Reference	Reference	Reference
Some limitation	1.16 (0.88–1.52)	0.69 (0.35–1.37)	1.54** (1.26–1.88)	1.34** (1.17–1.53)	1.55** (1.42–1.70)	1.14 (0.89–1.46)
Severe health limitations	1.87** (1.63–2.15)	0.65 (0.25–1.69)	3.42** (2.27–5.15)	1.71** (1.51–1.94)	1.70* (1.094–2.64)	1.74** (1.21–2.51)
Number of persons employed at baseline	38,620	21,409	17,211	70,603	38,555	32,047
Number of countries	26	26	26	25	25	25
Chronic illness	2006–2008			2008–2010		
	Total	Male	Female	Total	Male	Female
	Reference	Reference	Reference	Reference	Reference	Reference
Chronic illness	1.15** (1.07–1.24)	0.79 (0.58–1.08)	1.53** (1.37–1.70)	1.29** (1.09–1.52)	1.30* (1.04–1.64)	1.28** (1.16–1.41)
Number of persons employed at baseline	38,629	21,415	17,214	70,604	38,568	32,035
Number of countries	26	26	26	25	25	25

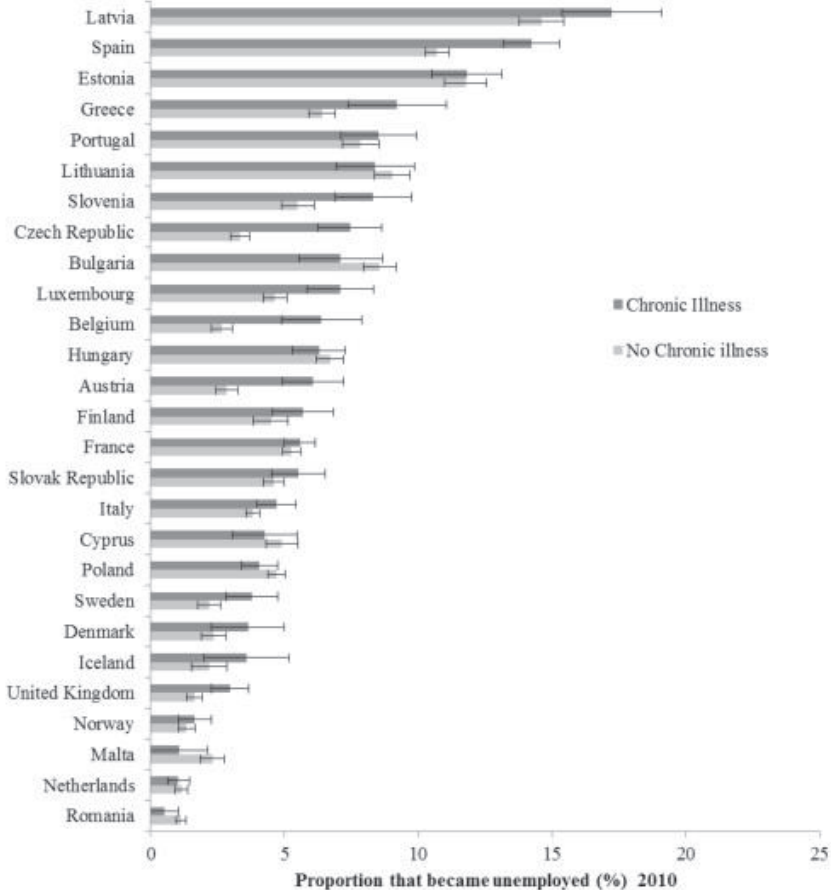
Notes: Data on limitation in activities due to health problems refer to self-reported evaluations of the extent to which they are limited in activities people usually do because of health problems for at least the last 6 months. Data on chronic (longstanding) illnesses or conditions refer to the self-declaration by the respondents of whether they have or have not a chronic (longstanding) illness or condition. All models control for age, age², marital status, education attainment, level of GDP per capita, change in GDP per capita (both measures of GDP are adjusted for inflation and purchasing power), unemployment rate (% of the labour force), change in unemployment rate (% of the labour force). All individuals are employed in the base year of either 2006 or 2008. Standard errors are clustered at the country-level.

* $p < 0.05$, ** $p < 0.01$.

Comparing effects during severe, mild, and no recession

Were these risks of job loss for persons with chronic illness inevitable during periods of recession? As shown in Figure 2, there were marked cross-national variations in the disparities in unemployment rates across European nations between healthy and unhealthy persons for the year 2010. In Norway, there was virtually no employment gap: rates were 2.00% in healthy persons and only slightly higher, at 2.24%, in persons with chronic illness. In contrast, in Latvia, there was a substantial absolute disparity, with rates of 19.7% and 23.6% for these groups, respectively. Austria was an intermediate case, where although unemployment rates were lower, there was also a substantial gap, with unemployment rates about 5% in healthy persons but over 10% in persons with a chronic illness.

Figure 2. Onset of unemployment for people with and without a chronic illness, EU-SILC, 2008–2010



Notes: Source: EU-SILC, longitudinal panel. Unemployment rate among those who self-report a chronic illness or not. Error bars represent 95% confidence intervals.

One factor possibly accounting for these stark differences is the severity of the economic recession. In a more severe recession, employers may need to make large-scale redundancies, disproportionately concentrated among persons with health limitations. To test this possibility, we stratified the association of job loss and chronic illness by the magnitude of each EU country's recession (as measured by cumulative declines in GDP between 2007 and 2010). We coded large recessions as greater than the median downturn (cumulative GDP decline $\geq 7\%$) and small recessions as below the median ($< 7\%$ of GDP).

Tables 4 and 5 show the results of the multi-level statistical models, stratified by the severity of recessions. In countries experiencing large recessions, those with chronic illnesses were considerably more likely to lose their jobs than healthy persons (AOR = 1.66, 95% CI: 1.57–1.76). These effect sizes were significant, but attenuated in countries with milder recessions (AOR = 1.13, 95% CI: 1.07 to 1.19; test of effect homogeneity: $\chi^2(1) = 82.31, p \leq 0.001$) and were similar in magnitude to those found during the pre-recession period (AOR = 1.14, 95% CI: 1.06–1.23) (Table 4). Similar results were observed for those with severe health limitations (Table 5).

Mitigating role of employment protections during severe, mild, and no recession

It is possible that stronger employment protection can mitigate the risk of job loss faced by unhealthy persons during recessions. To test this hypothesis, we include the OECD index of employment protections into the statistical models.

Table 4 shows the results of the multi-level statistical models. In severe recessions, each additional unit of the OECD employment protection index was not associated with the risk of job loss (Pooled AOR = 1.06, 95% CI: 0.94–1.21). However, in milder recessions, we found that each additional unit of employment protection was associated with a 28% lower likelihood of job loss for all persons (Pooled AOR = 0.72, 95% CI: 0.58–0.90), as shown in Table 4. When there was no recession, as in the pre-recession years, each additional unit of employment protection was also found to lower significantly the risk of job loss (Pooled AOR = 0.77, 95% CI: 0.64–0.94) (Table 4).

Next we examine whether there is an additional protective effect of these employment policies for persons in poor health compared to health employees. Employment protection legislation appeared to bring the greatest benefit to women with chronic illness (rather than men), resulting in an additional 22% reduction in job loss risk (AOR = 0.78, 95% CI: 0.62 to 0.97, $p = 0.024$; Table 6). Yet, this additional protective effect for unhealthy women is only observable prior to the onset of the recession. For men, there is no clear difference between the healthy and unhealthy in terms of their risk of job loss both before and during the economic crisis. Using Seemingly Unrelated Estimation we formally test for potential effect heterogeneity by sex (i.e. whether coefficients significantly differed

Table 4. Job loss risks in persons with and without a chronic illness in severe, mild, and no recession

	Odds ratio of job loss		
	2008–2010		
	Total	Male	Female
<i>Severe recession</i>			
Person has a chronic illness	1.66** (1.57–1.76)	1.76** (1.58–1.96)	1.48** (1.26–1.75)
Each unit of OECD employment protection	1.06 (0.94–1.21)	0.95 (0.89–1.01)	1.24 (0.98–1.58)
Number of persons employed at baseline	27,865	15,516	12,348
Number of countries	9	9	9
	Total	Male	Female
<i>Mild recession</i>			
Person has a chronic illness	1.13** (1.07–1.19)	1.07 (0.99–1.15)	1.22** (1.15–1.30)
Each unit of OECD employment protection	0.72** (0.58–0.90)	0.63** (0.46–0.89)	0.89 (0.72–1.09)
Number of persons employed at baseline	29,875	16,043	13,834
Number of countries	10	10	10
	Total	Male	Female
<i>No recession</i>			
Person has a chronic illness	1.14** (1.06–1.23)	0.78 (0.57–1.06)	1.53** (1.36–1.71)
Each unit of OECD employment protection	0.77** (0.664–0.94)	0.73* (0.57–0.93)	0.84* (0.71–0.99)
Number of persons employed at baseline	34,263	19,078	15,185
Number of countries	21	21	21

Notes: Data on chronic (longstanding) illnesses or conditions refer to the self-declaration by the respondents of whether they have or have not a chronic (longstanding) illness or condition. All models control for age, age-squared, marital status, education attainment, level of GDP per capita, change in GDP per capita (both measures of GDP are adjusted for inflation and purchasing power), unemployment rate (% of the labour force), percentage point change in unemployment rate. All individuals are employed in the base year of 2008. Countries are described as 'high recession' if, between 2007 and 2010, the cumulative decline in GDP was greater than the median decline (~7%). All other countries are described as low recession. High recession countries include: Croatia, Czech Republic, Estonia, Finland, France, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Netherlands, Slovenia, Spain, Sweden, and United Kingdom. Standard errors are clustered at the country-level.

* $p < 0.05$, ** $p < 0.01$.

across models). Our tests indicated that chronically ill women benefited from employment protection to a significantly greater extent than did men (χ^2 (1): 5.57, $p = 0.02$). This interaction effect indicates that labour market inequalities between unhealthy and healthy persons are reduced when employment protection policies are present.

To put these findings into perspective (Table 6), Figure 3a and b illustrate the overall impact of employment protection on women with ill health. Figure 3a shows that a higher level of employment protection reduced the risk of job loss for women with and without chronic illness but to a much greater extent for those with chronic illness. In countries with the lowest degree of employment protection, women with chronic illness have a 6.50% risk of job loss (95% CI: 5.24%–7.76%) compared with 3.54% in those

Table 5. Job loss risks in persons with and without a health limitation in severe, mild, and no recession

	Odds ratio of job loss		
	2008–2010		
	Total	Male	Female
<i>Severe recession</i>			
Person has a severe health limitation	1.33 (0.99–1.78)	0.75 (0.44–1.29)	2.70** (1.50–4.85)
Each unit of OECD employment protection	1.03 (0.92–1.16)	0.91** (0.87–0.97)	1.22 (0.96–1.55)
Number of persons employed at baseline	27,853	15,501	12,351
Number of countries	9	9	9
	Total	Male	Female
<i>Mild recession</i>			
Person has a severe health limitation	1.81** (1.69–1.95)	2.13** (1.80–2.51)	1.45** (1.22–1.73)
Each unit of OECD employment protection	0.73** (0.59–0.89)	0.64** (0.47–0.89)	0.88 (0.70–1.09)
Number of persons employed at baseline	29,886	16,042	13,844
Number of countries	10	10	10
	Total	Male	Female
2006–2008			
	Total	Male	Female
<i>No recession</i>			
Person has a severe health limitation	1.89** (1.65–2.18)	0.65 (0.25–1.72)	3.51** (2.37–5.19)
Each unit of OECD employment protection	0.77** (0.63–0.93)	0.73* (0.57–0.94)	0.83* (0.70–0.97)
Number of persons employed at baseline	34,254	19,074	15,180
Number of countries	21	21	21

Notes: Data on severely limiting illnesses or conditions refer to the self-declaration by the respondents of whether they have or have not a severely limiting illness or condition. All models control for age, age-squared, marital status, education attainment, level of GDP per capita, change in GDP per capita (both measures of GDP are adjusted for inflation and purchasing power), unemployment rate (% of the labour force), percentage point change in unemployment rate. All individuals are employed in the base year of 2008. Countries are described as 'high recession' if, between 2007 and 2010, the cumulative decline in GDP was greater than the median decline (~7%). All other countries are described as mild recession. Severe recession countries include: Croatia, Czech Republic, Estonia, Finland, France, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Netherlands, Slovenia, Spain, Sweden, and United Kingdom. No recession observations are from the pre-recession period. Standard errors are clustered at the country-level.

* $p < 0.05$, ** $p < 0.01$.

without chronic illnesses (95% CI: 2.96%–4.11%) ($p < 0.001$). As employment protection increases, not only does the probability of losing work go down, but it declines fastest for women with chronic illness until the differences between persons with and without these conditions become statistically indistinguishable ($p = 0.94$). Similar patterns were observed when evaluating the risks associated with health limitations (Figure 3b).

Robustness checks

Models were adjusted for individual fixed-effects; however, in a robustness check we also adjusted for country-specific differences. None of the results qualitatively changed (see Appendix A, Text S2). Since the likelihood of chronic illness increases non-linearly

Table 6. Effect modification of employment protection policies on persons with and without chronic illness

	Odds ratio of job loss		
	2006–2008		
	Total	Male	Female
<i>Chronic illness</i>			
Direct effect of employment protection for persons without a chronic illness	0.78** (0.64–0.93)	0.69** (0.53–0.89)	0.89 (0.75–1.06)
Modifying effect of employment protection for persons with a chronic illness	1.04 (0.84–1.29)	1.50 (0.94–2.39)	0.78* (0.62–0.97)
Number of individuals	34,263	19,078	15,185
Number of countries	21	21	21
	Total	Male	Female
<i>Health limitation</i>			
Direct effect of employment protection for persons without a severe health limitation	0.76** (0.62–0.92)	0.69** (0.54–0.90)	0.84 (0.70–1.01)
Modifying effect of employment protection for persons with a severe health limitation	0.79 (0.53–1.18)	1.89 (0.66–5.44)	0.53* (0.30–0.93)
Number of persons employed at baseline	34,254	19,074	15,180
Number of countries	21	21	21

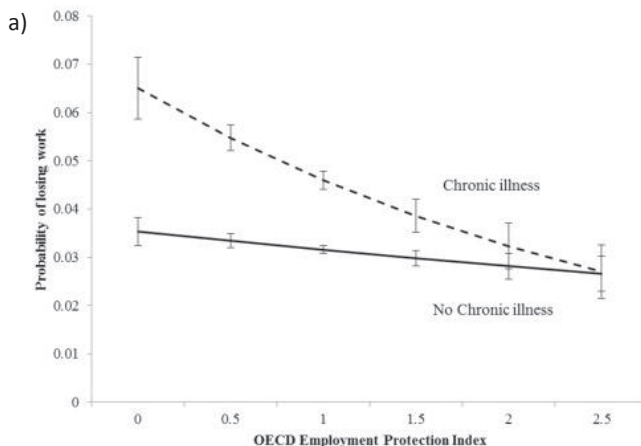
Notes: Data on chronic (longstanding) illnesses or conditions refer to the self-declaration by the respondents of whether they have or have not a chronic (longstanding) illness or condition. All models control for age, age-squared, marital status, education attainment, level of GDP per capita, change in GDP per capita (both measures of GDP are adjusted for inflation and purchasing power), unemployment rate (% of the labour force), percentage point change in unemployment rate, and whether respondent has a chronic illness. All individuals are employed in the base year of 2008. Employment protection is an average of the employment protection scores for dismissal and permanent work. Effect sizes are based on modeling the interaction between whether respondents have a chronic illness or not (Chronic illness = 1) and the level of employment protection: $\beta_1 \times \text{Chronic Illness} + \beta_2 \text{Chronic Illness} \times \text{Employment Protection} + \beta_3 \text{Employment Protection}$. Standard errors are clustered at the country-level.

* $p < 0.05$, ** $p < 0.01$.

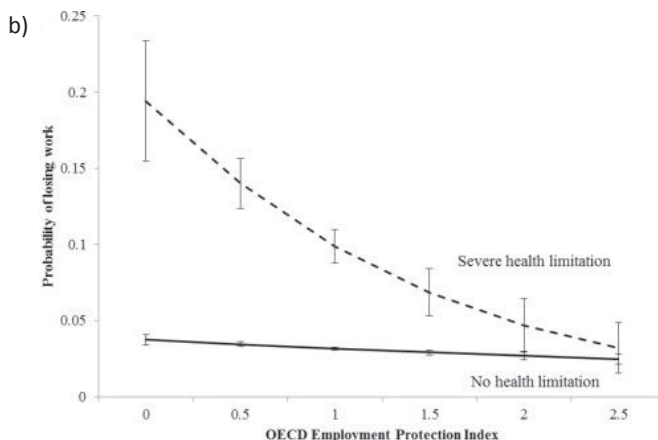
with age, we further disaggregated our models into persons below and above age 40. Consistent with our previous models, we find that women with chronic illnesses in both age cohorts were more likely to become unemployed in the pre-recession period than those without (see Appendix A, Text S3). Because women with chronic illness may occupy more vulnerable positions in the labour market, especially in countries where female labour market participation is low, we added an adjustment for each country's degree of gender labour-market equality, which includes female labour force participation rates, from the World Economic Forum. Again, our results were not significantly altered, as shown in see Appendix A, Text S4. We also re-ran the models using educational attainment as a categorical variable, without substantive changes to the results (see Appendix A, Text S5). Nor did weighting by each country's population size qualitatively affect our findings (see Appendix A, Text S6).

By selecting only those who are employed in the first wave, the analytic sample may exclude those most likely to lose their jobs in subsequent periods. For example, men

Figure 3. a) Job loss risk and employment protection policy for women with and without a chronic illness, before the Great Recession in 2006–2008. b) Job loss risk and employment protection policy for women with and without health limitation, before the Great Recession in 2006–2008



Notes: All models control for age, age², marital status, education attainment, level of GDP per capita, change in GDP per capita (both measures of GDP are adjusted for inflation and purchasing power), unemployment rate (% of the labour force), change in unemployment rate (% of the labour force). Data on chronic (longstanding) illnesses or conditions refer to the self-declaration by the respondents of whether they have or have not a chronic (longstanding) illness or condition. Vertical bars represent 95% confidence intervals. Standard errors are clustered at the country-level. OECD employment index is taken from the Employment database, 2013 edition.



Notes: Data on limitation in activities due to health problems refer to self-reported evaluations of the extent to which they are limited in the activities people usually do because of health problems for at least the last 6 months. All models control for age, age², marital status, education attainment, level of GDP per capita, change in GDP per capita (both measures of GDP are adjusted for inflation and purchasing power), unemployment rate (% of the labour force), change in unemployment rate (% of the labour force). Vertical bars represent 95% confidence intervals. Standard errors are clustered at the country-level. OECD employment index is taken from the Employment database, 2013 edition.

with chronic illness may be less likely to 'become unemployed' because they were economically inactive in the first place (especially older men). Descriptive statistics suggest that women are more likely to report a chronic illness and they are less likely to be involved in the labour market than men, even among men and women over 50. For example, 32.1% of women self-report a chronic illness compared with 28.0% of men. To formally test whether there is a selection effect we use a probit Heckman selection model, which estimates the likelihood of being in employment in 2006 given the presence of poor health (first-stage) and then uses the outcome of this model to adjust the influence of poor health on becoming unemployed given they were employed in 2006. As anticipated, these models suggest that adjusting for selection into employment does not substantially influence our results, for men or women (see Appendix A, Text S7). Finally, job loss may involve other states of economic inactivity rather than becoming unemployed. To ensure our results are consistent for those who become unemployed and those who exit the labour market, we re-estimated our models using both unemployment and economic inactivity as our measure of job loss. Results are slightly attenuated but broadly consistent; for example, Fig. S1 in Appendix A, shows that chronically ill women are less likely to experience job loss (either unemployment or exiting the labour market) in countries with high levels of employment protection.

DISCUSSION

Our study finds that, during Europe's Great Recessions, unhealthy persons have been at greater risk of extended periods of unemployment, albeit the extent to which they have experienced this risk varied depending on the economic (i.e., severity of recession) and political (e.g., level of employment protection) context.

In nations experiencing severe recessions, the consequences have been worst where employment protection policies offer little or no protection in situations where firms shed large numbers of jobs. However, employment protection policies were able to mitigate, and at high levels of protection, to eliminate, the disadvantages experienced by those in ill health in countries facing less severe economic contractions or no recession at all[24]. In short, employment protection policies mitigate labour market inequalities during periods of (a) no recession and (b) mild recession but not during (c) severe recessions. The question arises as to whether these associations are causal. They do meet many of Bradford Hill's criteria of causality, such as specificity and the presence of a clear gradient indicative of a dose-response relationship (especially with respect to women). Taken together, these findings reinforce the importance of the social determinants and, in particular, the political economy of health.

Yet, why are employment protection legislations less protective during severe economic recessions? First, if workers in the second cohort are healthier than the first cohort then firms may be forced to lay off healthy workers irrespective of employment protection legislation. Yet, 18.0% and 17.8% of those employed in 2006 and 2008, respectively, had a chronic illness suggesting that the 2008 cohort were not 'healthier', on average, than the 2006 cohort. Further, rises in unemployment associated with the Great Recession did not occur across Europe until 2009, suggesting that a 'healthy worker effect' is unlikely to explain these results. Second, mass layoffs, which tend to be less health selective, are more common during severe recessions[25]. While employment protection may constrain mass layoffs they would not protect unhealthy employees in the event of a closure of a firm. Hence, in periods of higher levels of mass layoffs, employment protections may fail to offer additional protection to the already disadvantaged[26]. Firm closure has risen during the Great Recession and this rise is likely to have been largest in the countries with the deepest recessions, where the role of employment protection is therefore diminished[25, 27].

Third, although all EU Member States have adopted some form of anti-discriminatory legislation, designed to protect people with disabilities in compliance with the relevant EU Directive, in practice Member States have implemented the Directive's provisions to varying degrees[28]. Evidence suggests that these policies have sometimes had limited ability to protect those with poor health from labour market penalties[29] and this may reflect a low degree of compliance. At the beginning of the crisis, in 2008, only 14% of Spanish firms with more than 50 workers met quotas for employing disabled persons[30]. Similarly, in France, 90% of eligible employers failed to meet the legal quota, and about one-third had no disabled employees at all[24]. Further, should employers view compliance as optional during stable economic periods[24], then it is more likely that such regulations will be flouted when consumer demand declines in recessions [31]. In France, for example, the number of claims of potential labour market discrimination based on disability doubled between 2007 and 2008[24]. Given previous studies that imply that there may be less selection on health during periods when job loss is high, further research is needed to understand the reasons why employment protections have failed to protect employment status of vulnerable groups during the recent economic crisis[32]. Both the rise in mass layoffs and limited (and potentially declining compliance) may explain why employment protections failed to protect vulnerable groups in severe recessions.

As with all analyses using survey data, our study has several limitations. First, our analysis cannot ascertain the conscious or sub-conscious motivations of employers that lie behind the increasing tendency to dismiss workers suffering ill health. However, our results do indicate that they are much more prone to do so during recessions. Second, while the longitudinal data document clearly that women were more likely to lose jobs

during non-recessionary periods, consistent with other evidence from Europe[21-23], we were unable to disaggregate different economic sectors that may account for these gendered patterns, such as the traditionally female service industries. Similarly, we are unable to ascertain why men with poor health have become more likely to lose work during the crisis but the most likely explanation is the differential impact of the crisis on sectors dominated by men, for example construction and manufacturing sectors. Third, item non-response could potentially influence our results. Non-respondents were younger than respondents but had similar levels of education (see Appendix A, Text S7). As such, non-respondents were less likely to have long-standing limiting health conditions and chronic illnesses. However, the proportion of non-respondents is so small (e.g., 0.6% of the available sample with a chronic illness) that the impact of non-response in this instance would likely be minimal.

Fourth, our measure of economic status fails to capture all spells of unemployment between data collection periods and is therefore unable to observe short-term fluctuations in economic activity. Without these data it is difficult to assess whether unhealthy persons have struggled to re-enter the labour market more than healthy individuals. Fifth, not all forms of chronic illness may limit working ability, such as type 1 or 2 diabetes or high blood pressure. This measurement error in the association between chronic illness and job loss will likely lead to conservative estimates and may also explain why the results were stronger for those persons reporting severe health limitations. Exploring this more fully with appropriate data would be an important avenue for future research. Finally, our measure of worker protection from dismissal focused on the entirety of the labour force, rather than specifically on persons in ill health. This limitation would have likely attenuated the observed protective associations of worker protections, making it more difficult to identify an effect should one exist.

The novel contributions of this study are its ability to highlight how macro-social factors, such as policy and economics, shape individual life chances, which in turn influence health inequalities. Specifically, we differentiate the employment trajectories of people with poor health in times of financial stability and in recessions, and we assess the impact of labour market policies on those trajectories. This political economy approach also demonstrates that employment protection policies, by reducing the extent to which chronically ill persons experience disadvantage in the labour market, increase the resilience of this group to economic shocks. For these groups, navigating a financial crisis without experiencing poorer health is, in part, contingent on whether there are strong employment protection policies in place[13, 33].

Our results have immediate implications for policy, pointing to an urgent need to either strengthen anti-discrimination policies so that they work effectively or identify alternative protective policies for persons in ill health who occupy vulnerable positions in the labour market during times of economic hardship. This is particularly important

in those countries implementing further deep austerity measures to reduce public sector employment, such as Greece and Spain, where these redundancies may further exacerbate already high risks of job loss for both men and women living with chronic illnesses and disabilities.

In 2013 the IMF and OECD recommended that Greece, Spain, and other crisis-stricken nations implement 'supply-side' reforms, making it easier to fire people, reflecting their belief that this would increase employment and boost future economic growth[34]. Our results suggest that such a policy to withdraw employment protections in pursuit of flexible labour markets is likely to increase the risk of job loss in persons with health limitations and chronic illnesses disproportionately and thus be indirectly discriminatory. Further work would be needed to assess how such programmes affect the likelihood of reintegration into the labour market of persons who have already lost jobs. Because job loss also worsens mental health[35-37], persons with chronic illnesses and health limitations are in danger of becoming ensnared in a vicious cycle of poor health and unemployment.

CONCLUSION

Unhealthy persons are at greater risk of job loss than healthy persons during economic recession; yet, the disadvantages of unhealthy persons in the labour market vary among countries. We find that where employment protection legislation is strong, i.e., where the costs of both collective and individual dismissal are high, the gap in the probability of job loss between unhealthy and healthy persons is diminished; and, before the recession, it is entirely removed for women. However, this protective effect of employment policies is observed primarily during periods of no recession or moderate recessions and not during severe economic downturns (decline in GDP > 7%). In contrast to recent recommendations from the OECD and the IMF to relax employment protection, these findings suggest that strengthening such legislation and ensuring compliance may make these vulnerable groups more resilient to future economic shocks.

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CHAPTER 3. SUPPLEMENTARY DATA

Text S1. Job loss risks in persons with a chronic illness among persons adjusting for country 'fixed-effects', before the Great Recession 2006-2008 and during it 2008-2010

	Odds ratio of Job Loss					
	2006-2008			2008-2010		
	Total	Male	Female	Total	Male	Female
Person has a chronic illness	1.14** (1.06 to 1.22)	0.77 (0.58 to 1.04)	1.53** (1.37 to 1.70)	1.26** (1.07 to 1.48)	1.26* (1.01 to 1.56)	1.27** (1.15 to 1.39)
Number of individuals	38,629	21,415	17,214	70,604	38,568	32,035
Number of countries	26	26	26	25	25	25

Notes: Data on chronic (longstanding) illnesses or conditions refer to the self-declaration by the respondents of whether they have or have not a chronic (longstanding) illness or condition. All models control for age, age-squared, marital status, educational attainment, level of GDP per capita, change in GDP per capita (both measures of GDP are adjusted for inflation and purchasing power), unemployment rate (% of the labour force), percentage point change in unemployment rate. All individuals are employed in the base year of either 2006 or 2008. Models also control for country-specific differences, so called country 'fixed-effects'. Standard errors are clustered at the country-level. * $p < 0.05$, ** $p < 0.01$

Text S2. Job loss risks in persons with a chronic illness among persons disaggregating by age, before the Great Recession 2006-2008 and during it 2008-2010

	Odds ratio of Job Loss					
	2006-2008			2008-2010		
	Total	Male	Female	Total	Male	Female
Age <= 40						
Person has a chronic illness	0.92 (0.74 to 1.16)	0.53 (0.21 to 1.32)	1.51** (1.11 to 2.04)	1.18 (0.91 to 1.51)	1.30* (1.12 to 1.50)	1.01 (1.65 to 1.58)
Number of individuals	15,999	9,099	6,900	27,946	15,624	12,322
Number of countries	26	26	26	25	25	25
Age > 40						
Person has a chronic illness	1.31** (1.23 to 1.40)	1.00 (0.87 to 1.15)	1.57** (1.44 to 1.70)	1.36** (1.21 to 1.53)	1.31 (0.98 to 1.76)	1.44** (1.29 to 1.60)
Number of individuals	22,630	12,316	10,314	42,658	22,944	19,713
Number of countries	26	26	26	25	25	25

Notes: Data on chronic (longstanding) illnesses or conditions refer to the self-declaration by the respondents of whether they have or have not a chronic (longstanding) illness or condition. All models control for age, age-squared, marital status, educational attainment, level of GDP per capita, change in GDP per capita (both measures of GDP are adjusted for inflation and purchasing power), unemployment rate (% of the labour force), percentage point change in unemployment rate. All individuals are employed in the base year of either 2006 or 2008. Standard errors are clustered at the country-level. * $p < 0.05$, ** $p < 0.01$

Text S3. Job loss risks in persons with a chronic illness among persons adjusting for gender equality, before the Great Recession 2006-2008 and during it 2008-2010

	Odds ratio of Job Loss					
	2006-2008			2008-2010		
	Total	Male	Female	Total	Male	Female
Person has a chronic illness	1.15** (1.07 to 1.24)	0.79 (0.58 to 1.08)	1.53** (1.37 to 1.70)	1.28** (1.07 to 1.52)	1.29* (1.02 to 1.64)	1.27** (1.15 to 1.40)
Number of individuals	37,426	20,825	16,601	68,393	37,505	30,887
Number of countries	25	25	25	24	24	24

Notes: Data on chronic (longstanding) illnesses or conditions refer to the self-declaration by the respondents of whether they have or have not a chronic (longstanding) illness or condition. All models control for age, age-squared, marital status, education attainment, level of GDP per capita, change in GDP per capita (both measures of GDP are adjusted for inflation and purchasing power), unemployment rate (% of the labour force), percentage point change in unemployment rate. All individuals are employed in the base year of either 2006 or 2008. Models also control for country-specific differences, so called country 'fixed-effects'. Gender equality index: this measure of gender equality has been produced by the World Economic Forum and consists of measures with respect to four key indicators. We only use two of those here. Each measure indicator is measured on a scale of 0 to 1. First, this measures economic participation and opportunity, including the rates of participation, gendered pay gaps, and the number of women in key professional positions. Second, political empowerment is measured through the ratio of women to men in ministerial or parliamentary positions. This collection of measures is intended to be independent of the level of wealth in a particular country. Standard errors are clustered at the country-level. * $p < 0.05$, ** $p < 0.01$

Text S4. Job loss risks in persons with a chronic illness among persons adjusting for education as a categorical variable, before the Great Recession 2006-2008 and during it 2008-2010

	Odds Ratio of Job Loss					
	2006-2008			2008-2010		
	Total	Male	Female	Total	Male	Female
Person has a chronic illness	1.12** (1.06 to 1.18)	0.79 (0.57 to 1.08)	1.48** (1.34 to 1.64)	1.29** (1.09 to 1.53)	1.31* (1.04 to 1.64)	1.28** (1.16 to 1.42)
Number of individuals	39,574	21,415	17,214	70,604	38,568	32,035
Number of countries	26	26	26	25	25	25

Notes: Data on chronic (longstanding) illnesses or conditions refer to the self-declaration by the respondents of whether they have or have not a chronic (longstanding) illness or condition. All models control for age, age-squared, marital status, education attainment, level of GDP per capita, change in GDP per capita (both measures of GDP are adjusted for inflation and purchasing power), unemployment rate (% of the labour force), percentage point change in unemployment rate. All individuals are employed in the base year of either 2006 or 2008. Standard errors are clustered at the country-level. * $p < 0.05$, ** $p < 0.01$

Text S5. Job loss risks in persons with a chronic illness among persons and weighting by population, before the Great Recession 2006-2008 and during it 2008-2010

	Odds Ratio of Job Loss					
	2006-2008			2008-2010		
	Total	Male	Female	Total	Male	Female
Person has a chronic illness	1.12** (1.06 to 1.18)	0.86 (0.64 to 1.14)	1.35** (1.11 to 1.63)	1.35** (1.14 to 1.61)	1.45* (1.14 to 1.85)	1.25** (1.14 to 1.39)
Number of individuals	39,574	21,918	17,656	73,133	40,008	33,124
Number of countries	26	26	26	25	25	25

Notes: Data on chronic (longstanding) illnesses or conditions refer to the self-declaration by the respondents of whether they have or have not a chronic (longstanding) illness or condition. All models control for age, age-squared, marital status, education attainment, level of GDP per capita, change in GDP per capita (both measures of GDP are adjusted for inflation and purchasing power), unemployment rate (% of the labour force), percentage point change in unemployment rate. All individuals are employed in the base year of either 2006 or 2008. Standard errors are clustered at the country-level. * $p < 0.05$, ** $p < 0.01$

Text S6. Non-response on the unemployment variable

	Non-response on economic activity		Response on economic activity			p-value
	N	Mean (Std. Dev.)	N	Mean (Std. Dev.)	Non-response - Response (Std. Error)	
Socio-demographic						
Age	3,937	38.64 (17.14)	99,898	49.01 (17.55)	-10.37 (0.28)	<0.001
Marital status	2,206	0.41 (0.01)	99,849	0.59 (0.002)	-0.18 (0.01)	<0.001
Education	484	2.99 (0.05)	98,342	2.93 (0.004)	0.054 (0.059)	0.36
Limiting health condition	584	1.17 (0.02)	87,960	1.32 (0.002)	-0.15 (0.03)	<0.001
Chronic illness	498	0.25 (0.019)	87,884	0.30 (0.002)	-0.054 (0.021)	0.009

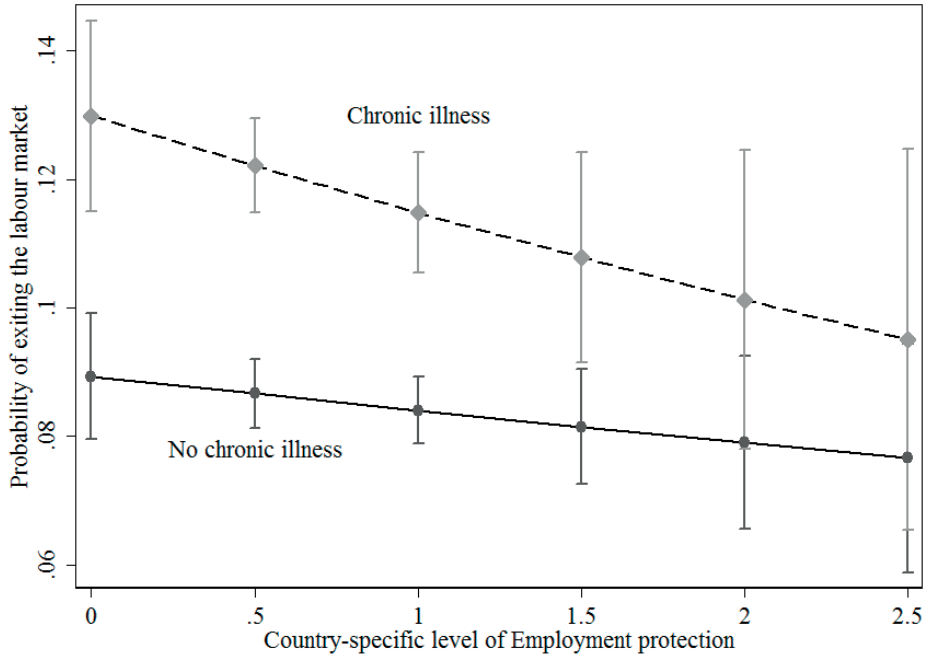
Notes: Two-tailed t-test reported for difference between mean differences.

Text S7. Effect modification of employment protection policies on persons with and without chronic illness, adjusting for selection into employment in 2006

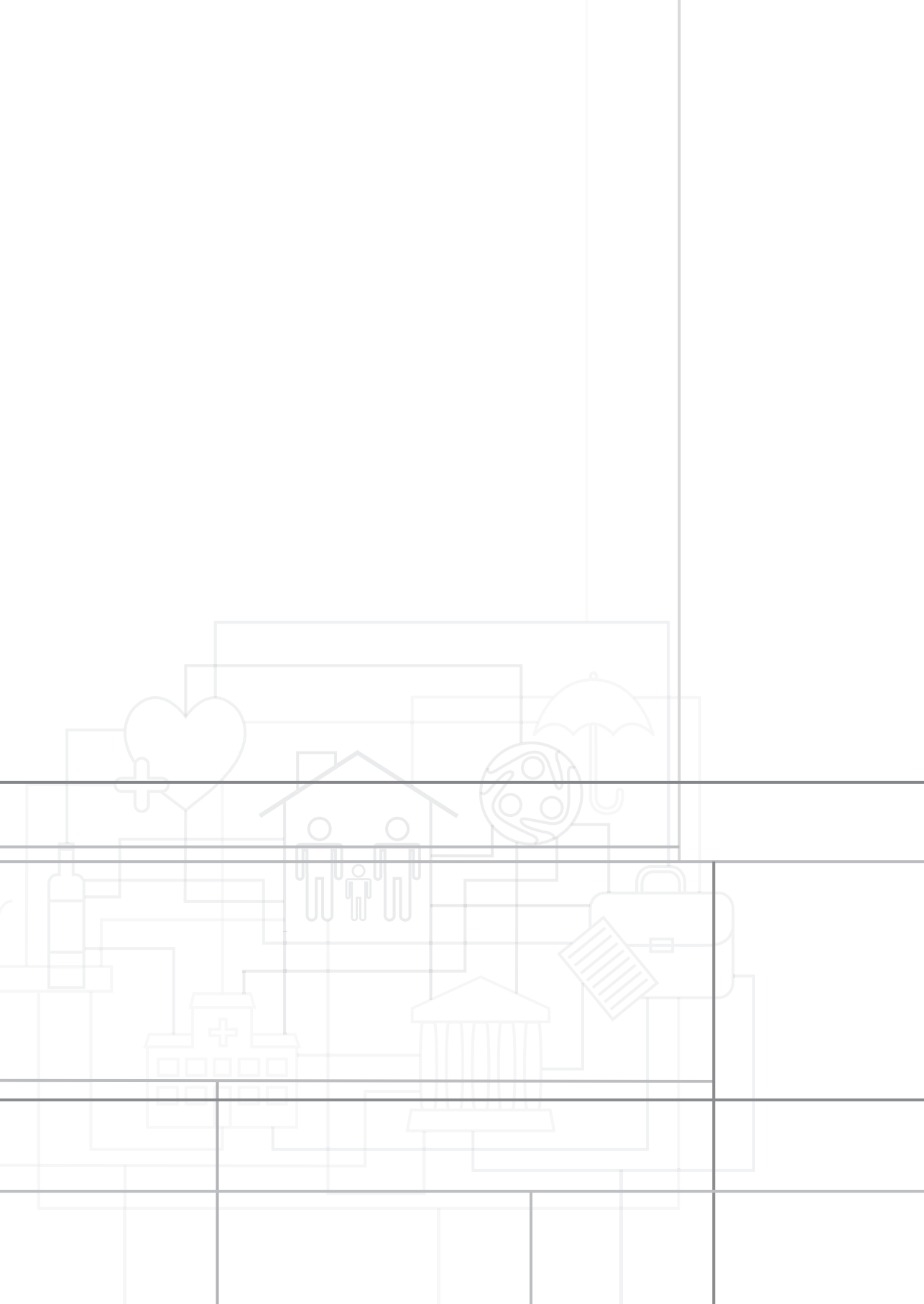
	Odds Ratio of Job Loss		
	2006-2008		
	Total	Male	Female
<i>Chronic illness – without adjustment for selection bias</i>			
Direct effect of employment protection for persons without a chronic illness	-0.11** (-0.03 to -0.19)	-0.16** (-0.05 to -0.26)	-0.05 (-0.13 to 0.03)
Modifying effect of employment protection for persons with a chronic illness	0.02 (-0.07 to 0.11)	0.18 (-0.02 to 0.38)	-0.10* (-0.01 to -0.20)
Number of individuals	34,263	19,078	15,185
Number of countries	21	21	21
<i>Chronic illness – with adjustment for selection bias</i>			
Direct effect of employment protection for persons without a severe health limitation	-0.11** (-0.03 to -0.19)	-0.16** (-0.05 to -0.26)	-0.05 (-0.12 to 0.03)
Modifying effect of employment protection for persons with a severe health limitation	0.01 (-0.07 to 0.10)	0.18 (-0.02 to 0.39)	-0.12** (-0.03 to -0.20)
Number of persons employed at baseline	75,983	35,725	40,258
Number of countries	22	22	22

Notes: Data on chronic (longstanding) illnesses or conditions refer to the self-declaration by the respondents of whether they have or have not a chronic (longstanding) illness or condition. All models control for age, age-squared, marital status, education attainment, level of GDP per capita, change in GDP per capita (both measures of GDP are adjusted for inflation and purchasing power), unemployment rate (% of the labour force), percentage point change in unemployment rate, and whether respondent has a chronic illness. All individuals are employed in the base year of 2008. Employment protection is an average of the employment protection scores for dismissal and permanent work. Effect sizes are based on modelling the interaction between whether respondents have a chronic illness or not (Chronic illness =1) and the level of employment protection: $\beta_1 \times \text{Chronic Illness} + \beta_2 \text{Chronic Illness} \times \text{Employment Protection} + \beta_3 \text{Employment Protection}$. Standard errors are clustered at the country-level. Adjustment for selection uses a probit heckman selection model. * $p < 0.05$, ** $p < 0.01$

Figure S1. Probability of exiting the labour market (unemployment and economic inactivity) by health status and the level of employment protection, women, 2008.



Notes: All models control for age, age², marital status, education attainment, level of GDP per capita, change in GDP per capita (both measures of GDP are adjusted for inflation and purchasing power), unemployment rate (% of the labour force), change in unemployment rate (% of the labour force). Data on chronic (longstanding) illnesses or conditions refer to the self-declaration by the respondents of whether they have or have not a chronic (longstanding) illness or condition. Vertical bars represent 95% confidence intervals. Standard errors are clustered at the country-level. OECD employment protection index is taken from the Employment database, 2013 edition.



Chapter 4

Effects of the Global Financial Crisis on Health in
High-Income OECD Countries. A Narrative Review

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ABSTRACT

A growing body of evidence documents how economic crises impact aspects of health across countries and over time. We performed a systematic narrative review of the health effects of the latest economic crisis based on studies of high-income countries. Papers published between January 2009 and July 2015 were selected based on review of titles and abstracts, followed by a full text review conducted by two independent reviewers. Ultimately, 122 studies were selected and their findings summarized. The review finds that the 2008 financial crisis had negative effects on mental health, including suicide, and to a varying extent on some non-communicable and communicable diseases and access to care. Although unhealthy behaviours such as hazardous drinking and tobacco use appeared to decline during the crisis, there have been increases in some groups, typically those already at greatest risk. The health impact was greatest in countries that suffered the largest economic impact of the crisis or prolonged austerity. The Great Recessions in high-income countries have had mixed impacts on health. They tend to be worse when economic impacts are more severe, prolonged austerity measures are implemented, and there are pre-existing problems of substance use among vulnerable groups.

INTRODUCTION

The onset of the current global financial crisis is often dated to the collapse of Lehman Brothers, a major global investment bank, in September 2008. Its bankruptcy triggered a significant loss in confidence among investors and, eventually, collapse of stock markets around the world. It resulted in significant declines in global trade, slowing or even reversing economic growth worldwide, increases in public sector debt and, in Greece, Ireland, and Portugal, bailouts by international lenders (the International Monetary Fund, European Central Bank, and European Commission, collectively known as “the Troika”)[1]. However, the magnitude of the economic crisis, degree of preparedness, and subsequent policy responses varied among countries. Countries made different political choices in what to cut but, in many, health, education, and social protection suffered most.[2]

There was little, if any, formal attempt at the time to assess the impact of the crisis and associated budget cuts on population health by the institutions involved[3], although some independent research teams sought to investigate using existing secondary data. In part this was because, when the financial crisis arose, recent data on health outcomes were lacking. Thus, the first studies could only anticipate what might happen by studying earlier crises, going as far back as the Great Depression. However, researchers drew different conclusions. A major study on associations between mortality and economic fluctuations throughout the European Union during the period 1970–2007 showed that a one percentage point rise in unemployment leads to increase in suicides and decrease in road traffic deaths among working population, but no significant change in overall mortality[4]. However, other studies suggested a pro-cyclical relationship between economic growth and total mortality[5, 6].

These early studies of previous crises found a great deal of heterogeneity, emphasizing the importance of context. Thus, the rapid increase in mortality seen around 1990 in the former Soviet Union took place in a society where the background mortality attributable to alcohol was extremely high[7]. In contrast, the Great Depression occurred in the midst of an epidemiological transition, with declining deaths from infectious disease and increasing deaths from non-communicable disease, coupled with the effects of imposing and then repealing prohibition[8, 9]. Subsequent research has examined the influence of not only shocks but also resilience[10], showing that the adverse effects of unemployment on suicides can be mitigated by strong social welfare systems, especially those with active labour market policies[4].

It is important to distinguish between physical and mental health. Much attention has been devoted to the link between recession and mental health, particularly depression and suicide risks[11]. Infectious diseases are much more complex, depending on back-

ground risks, such as the pool of injecting drug users, or the presence of disease vectors, such as mosquitos and the effectiveness of control measures in place[12].

Generally, there has tended to be an emphasis on short-term associations, with less attention to long-term effects. Yet it can be expected that these may occur, based on what is known about life-course epidemiology, as well as research on survivors of previous severe shocks such as the Dutch hunger winter in 1944 or the siege of Leningrad[13, 14]. Although these will be more difficult to identify, given smaller effect sizes and greater variability, some evidence of these long-term (sometimes called “scarring”) effects can be inferred from studies showing that unemployment is a major risk factor for many chronic conditions, including cardio-vascular diseases, cancers, respiratory disease, and diabetes[15-21].

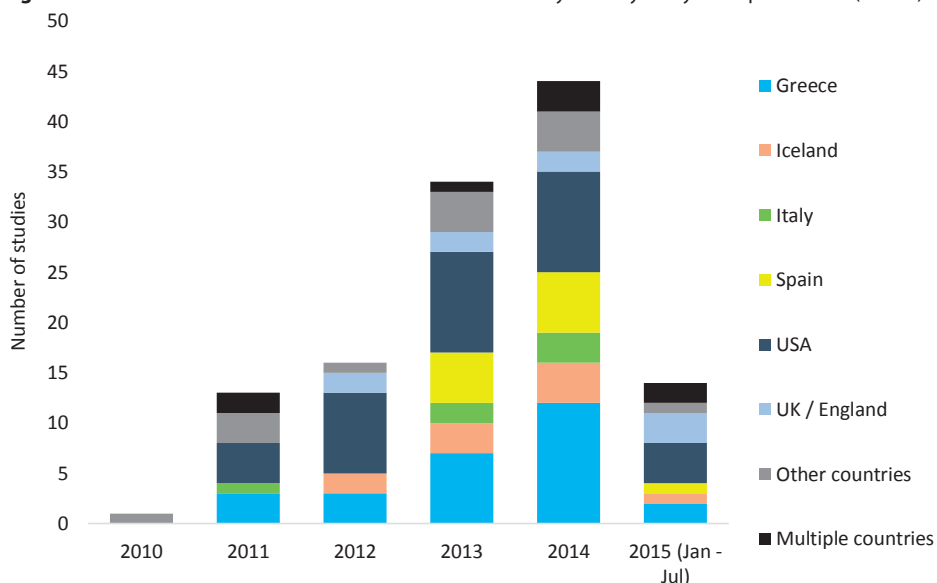
In contrast, recessions tend to reduce exposures to certain risk factors, as people have less disposable income to spend on alcohol and tobacco, and lower affordability of transport may increase cycling or walking[22]. However, much depends on the policy context; for example, when mass unemployment is coupled with easy access to cheap alcohol, there may be large increases in hazardous drinking, as happened during the collapse of the Soviet Union[7], whereas prohibition restricted access to alcohol during the Great Depression, although deaths from cirrhosis rose rapidly when it was repealed, coinciding with economic recovery[8].

Finally, in recent years, concerns have been voiced about the impact of cuts to health budgets, now implemented in several countries, such as the United Kingdom (albeit partially concealed by changing definitions and transfers to the related social care, which has been cut very heavily)[2], Spain[23], and Greece, where a cap on public expenditure on health has been imposed by the Troika[1]. A recent review identified a wide range of responses by European countries to the crisis. While some countries may have managed to improve efficiency without impairing access to services, many experienced a deterioration in access to care[24]. Cuts to services often shifted the financial burden to households, increasing the cost of care, such as for drugs or via co-payments, and reduced provision, such as by closing or reducing operating hours of facilities or by staff lay-offs[23, 25]. Policy makers in countries that implemented the deepest cuts to health or social care, such as the United Kingdom[2], Greece, or Spain, argued that there was no alternative, but largely dismissed evidence of a negative impact on health[23, 26-29].

Researchers had called for active and timely monitoring of the health situation following the financial crisis[3, 4, 30], noting the contrast with the ease of access to timely economic data. In particular, they noted the virtual absence of systems for monitoring the consequences of recession and austerity on vulnerable groups (such as the unemployed, low-income households, children, undocumented migrants, etc.). Yet, despite seeming political indifference, a considerable body of research has now accumulated on the immediate consequences of the economic crisis on health.

Only a few reviews cover the current recession, but they focus on much narrower topics (e.g., child health)[28] or a specific country (e.g., Greece[29], United States[8]). In view of the proliferation of research since the onset of economic crisis, at least in high-income countries (see Figure 1), here we perform a narrative review. A more profound understanding of the effects of the crisis is thus needed, to help countries support those most affected and to be prepared for future recessions, as recommended by the World Health Organization[31, 32]. A review of peer-reviewed literature across a range of health indicators would enable an assessment of the true scale of the crisis's effect on population health, encourage scrutiny of the impact of austerity policies, and provide valuable information for policy makers on the health consequences of budget decisions.

Figure 1. Number of studies included in the narrative review by country and year of publication (n=122)



Note: Other countries: Canada (5), Ireland (3), Australia, Belgium, Japan, Slovenia, South Korea, Sweden (1 each)

METHODS

A narrative review of the literature was carried out to assess and synthesize the evidence from current scientific literature on the impact of the financial crisis on population health in high-income Organisation for Economic Co-operation and Development (OECD) countries (countries listed in Appendix 1). Publications that correspond to predetermined selection criteria were identified and their findings were extracted for analysis, according to the area of impact on health.

Search Strategy

An electronic search of the following electronic databases was undertaken: MEDLINE, EMBASE, and EconLit. The search strategy (Appendix 2) combined three groups of search terms, focusing around the following conceptual areas: (a) financial crisis, (b) health and health care, and (c) high-income OECD countries. Relevant search terms for the financial crisis were identified from a previously published systematic review on economic crisis[12], and these key words (MeSH terms) and free text terms were applied in the current study. The terms were as follows: "austerity," "economic crisis," "fiscal crisis," "financial crisis," "economic recession," "economic depression," "economic insecurity," "debt," "macroeconomic conditions," "unemployment," "GDP," "personnel downsizing," "job loss," "recession," "banking crisis," and "business cycle." For the second concept, the search terms "health" and "health care" were broadly defined to capture all potentially relevant outcomes; however, only papers that examined impact on health alone or together with health care were assessed (papers looking exclusively at impact on health care were excluded). We have included papers that examine access to care through survey data on unmet need, while service utilization indicators were left out of the survey as they were attributed to impact on health care rather than health directly. High-income OECD countries, as defined by the World Bank, were entered as individual search terms. To avoid excluding relevant studies, searches for MEDLINE and EMBASE were performed both using Medical Subject Headings (MeSH) and free text searches. Because of the time lag between the onset of the crisis and collection of health data and the fact that the crisis had only spread to most European countries in 2009, only studies published from January 2009 to July 2015 were included. Only original research papers or correspondence published in peer-reviewed journals in English, which explicitly assess impact of the current crisis on health, were selected. Reference lists of the selected studies were scanned to identify other relevant studies.

Data Extraction and Synthesis

The following information was extracted from the included studies: publication year, authors, title, and journal; study design and setting; country or countries of interest, data time span, health outcome, and main exposure variables; and population characteristics.

For the evidence synthesis, the studies were grouped according to two major categories: (a) consequences for health and (b) consequences for health behaviour. Data from studies with similar outcomes were further grouped into subcategories (by specific health outcome or risk behaviour) and analysed according to these themes.

Similar to other reviews on this topic,[10, 12, 33] we found that definition of the economic crisis, as well as outcome measures, varied widely. In addition, studies included had substantial differences in design, methods, types of data, and setting, so direct comparison of results and effect size between most studies, even within the same thematic

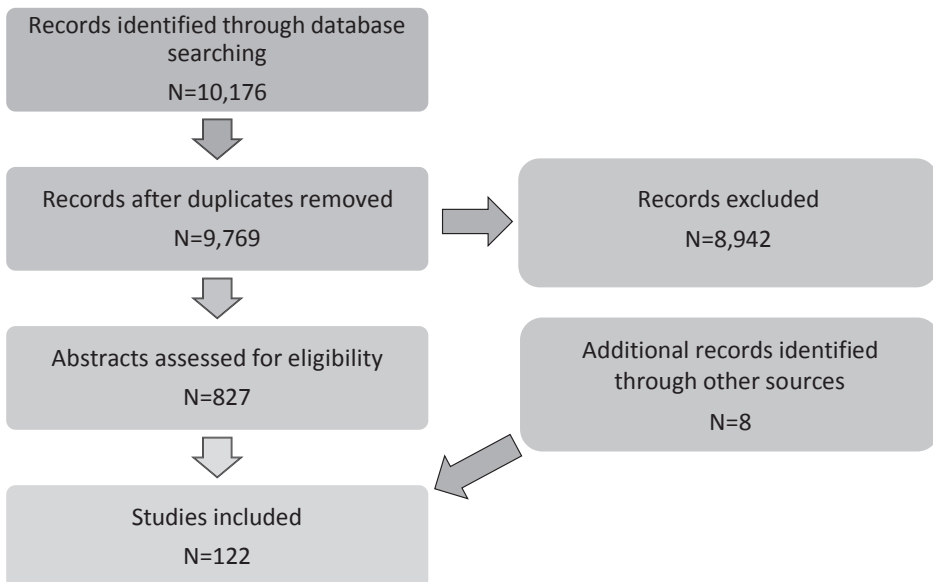
group, is not possible. We therefore report results as overall positive, negative, or an absence of change associated with the economic crisis and report the effect size from individual studies where possible, although we recognize that this cannot be interpreted as an estimate of the actual impact of the crisis.

RESULTS

Figure 2 depicts a flow chart of the review. Of 827 studies initially screened, a total of 122 articles met the inclusion criteria. The data from these articles were extracted and the characteristics evaluated.

The themes of papers were grouped into the categories listed below, based on the main areas of health impact. Some studies found in this review used individual-level data on the economic crisis, such as job loss, financial strain, or deterioration in housing conditions as a proxy for economic crisis. The majority of the studies used ecological, repeated cross-sectional, or aggregate data gathered before and after the crisis, often with an implicit or explicit assumption that a change over this period was associated with the recession or subsequent austerity measures.

Figure 2. Flow diagram of literature review process



Mental Health

Morbidity. Twenty-eight studies focused on mental health, from Australia, Canada, France, Greece, Hungary, Iceland, Ireland, Italy, Slovenia, Spain, Sweden, the United Kingdom, and the United States as well as some multi-country studies. All 28 studies reported worsening in at least one mental health indicator in association with the crisis.

A time series analysis in Italy found an increase in deaths from mental and behavioural disorders, with an additional 0.3 per 100,000 deaths per year attributed to the crisis, amounting to 548 excess deaths (95% CI 347–865) between 2008 and 2010[34]. The collapse of Lehman Brothers in 2008 coincided with an increase in the volume of Internet searches related to psychological distress, identified in Google Trends data (one percentage point in mortgage arrears and foreclosures was associated with a 16% [95% CI 9%–24%] increase in psychological distress queries)[35]. This levelled off after economic stabilization but remained 20% higher than before the Great Recession. Other types of housing insecurity, including moving for cost reasons or rent arrears, were associated with a higher likelihood of anxiety attacks and depressive symptoms, respectively[36]. In the United States, a one percentage point increase in foreclosure rates led to an increase of 0.7 days of poor mental health in the past month[37], while a 10% decrease in housing and non-housing wealth was associated with a small but significant increase in the levels of psychological distress[38]. Another U.S. study showed that loss of wealth led to worsening self-reported mental health but no increase in clinically diagnosed depressive symptoms[39]. A Canadian study found that high social capital moderated the impact of the crisis on mental health: while financial strain led to deterioration in mental health overall, in communities with high compared to low social capital, the effect was milder by a factor of around two for stress ($B=.09$, $p<.001$ and $B=.17$, $p<.001$, respectively) and depression ($B=.03$, $p=.28$ and $B=.11$, $p<.001$, respectively)[40]. In England, prevalence of poor mental health increased from 13.7% (95% CI 12.9%–14.5%) in 2008 to 16.4% (95% CI 14.9%–17.9%) in 2009, subsiding again in 2010; although the increases were marked in men, they were not statistically significant in women[41]. However, data from the Iceland Health and Wellbeing Population Survey showed that prevalence of high stress levels increased after economic collapse in women (OR 1.37, 95% CI 1.16–1.61) rather than in men (OR 1.13, 95% CI 0.92–1.39)[42]. Similarly, a study from the United States found that females were more likely to be diagnosed with anxiety after the recession than before (12% and 10% respectively), while the prevalence of depression among women fell after the crisis; for men, outcomes did not change significantly[43]. A study of mental distress among women in Stockholm found an increase between 2006 and 2010, particularly among economically inactive women, a group that experienced tightening of benefit eligibility criteria[44].

A number of studies focused on specific mental health conditions such as mood disorders (e.g., depression, anxiety). A multi-country study using longitudinal data from

health and retirement surveys in the United States and 13 EU countries found that job loss among 50- to 64-year-olds, particularly when due to firm closure, was associated with an increase in a depressive symptoms score by 28% (95% CI 8.6%–47.8%) in the United States and by 7.5% (95% CI 1.3%–13.7%) in Europe[45]. One-month prevalence of major depressive episode increased from 3.3% in 2008 to 8.2% in 2011 in Greece ($p < 0.0001$),[46] with subsequent studies in Greece reaching broadly similar conclusions[47, 48], as was also the case in Australia[49], England[50], Spain[51], and the United States[52]. A study from Ireland followed up the cohort of “Celtic Tiger” patients (admitted with first-episode depression in the context of: (a) job loss or job insecurity plus (b) personal debt exceeding annual net income as a consequence of economic recession and non-Celtic Tiger controls (first-episode depressed patients not meeting criteria above) over 2 years, and found that patients with severe depression attributed to the economic recession had higher suicide risks but otherwise more favorable outcomes than the control group[53]. Protective factors against depression included interpersonal and institutional trust[54].

In most studies that stratified subjects by economic status, unemployed people or those experiencing job loss displayed higher risks of worsening mental health than those in employment. However, some studies looked at those employed in particular sectors. Worsening mental health was found in bank employees in Iceland, there was a reduction in sleep duration among railway workers in Greece[55], and increased inpatient and outpatient visits and consumption psychotropic medication were found among manufacturing workers in the United States[56]. A multi-country study examining depressive symptoms among workers affected by organizational downsizing in France, Hungary, Sweden, and the United Kingdom found that, after adjusting for country-specific effects, chaotic layoff processes increased the likelihood of depressive symptoms 2.5 times ($p < 0.001$), while fair and unbiased downsizing processes were strongly associated with lower likelihood of depression[57]. A study from Alberta, Canada, showed an increase of 49% ($p = 0.03$) in major depressive disorders (but no change in social phobia, panic, or generalized anxiety disorder) among the employed population[58], while an increase in depressive symptoms of a similar level (47%) was reported among employees in Slovenia[59].

The financial crisis has been linked to worsening of mental health in several vulnerable groups, such as migrants. In Spain, the prevalence of poor mental health increased among male migrants who lost their job (OR 3.6, 95% CI 1.6–8.0) or experienced declines in income (OR 2.8, 95% CI 1.1–7.0)[60], findings confirmed by another study[61].

Suicides. A rise in suicides was among the most immediate concerns identified by those researching the health effects of the recession[62]. We identified 27 papers on suicide or suicidal ideation, from Greece, Italy, South Korea, Spain, and the United Kingdom. Some quantify the impact of the crisis in absolute numbers of excess deaths associated

with the recession or subsequent austerity, based on pre-crisis trends. Thus, Reeves and colleagues estimate that between 2007 and 2011, there have been at least 10,000 economic suicides—those in excess of the expected number—in the United States, Canada, and European Union[63]. Studies from individual countries support these findings: 1,001 excess deaths from suicide were in the United Kingdom[64], 680 in Spain[65], and 4,750 in the United States[66] between 2008 and 2010. Another study estimated that eviction or foreclosure accounted for an annual average of 1,079 suicides in the United States between 2005 and 2010[67]. Moreover, broader analyses that included suicide attempts estimated that there were 4,989 excess suicide attempts in Spain[68] and 290 excess suicides and attempted suicides in Italy[34] over the same period, as well as reversal in declining trend in suicide-related behaviour among 12- to 17-year-olds in Canada[69] and a significant increase in suicide planning over the past 12 months in Spain in 2011–2012 compared to 2001–2002[70].

The longstanding downward trend in suicide trends in EU member states reversed after 2007[1]. The suicide rate in Greece increased by 56% between 2007 and 2011[71, 72] and by 35% between 2010 and 2012 from 3.4 to 4.6 per 100,000 population, affecting both males and females of working age ($p < 0.01$)[72]; both studies link the increase to the rise in unemployment. The rise in suicides[73-77] and suicide attempts[78, 79] in Greece after 2010 was also confirmed in a number of other studies. A monthly trend analysis of suicide mortality in Greece over 30 years attributes abrupt increase in monthly suicides in June 2011 to adoption by the government of series of austerity measures[80]. In Italy, a 1% rise in regional unemployment levels between 2000 and 2010 was associated with an increase in the suicide rate by 0.1 per 100,000 population ($p = 0.05$)[81]. A study from Ireland reports successive annual 10% increases in suicides among men in 2008 and 2009.[82] In Belgium, patients attending primary care physicians who had lost their jobs during the crisis reported higher levels of suicidal thoughts compared to those still employed (OR 8.8, 95% CI 2.0–39.3)[83].

One study from England used coroners' records to examine socioeconomic characteristics of victims of suicide in 2010–2011, finding 38 out of 286 (13%) were partially and 11 (4%) entirely related to financial or employment difficulties[84]. The key features of those suicides linked to the recession were that most people were employed and few ever had a contact with psychiatric services.

However, a study from South Korea found that increases in the rate of suicides during the recession were higher among unemployed rather than employed groups, although the contribution of those in employment, in absolute numbers, was larger[85].

Most studies linked increases in suicides to higher unemployment levels, although mortgage foreclosure/eviction, falls in gross domestic product, and introduction of austerity measures were also used in some as explanatory variables. One study from England argued that associations between suicide rates and unemployment were spuri-

ous[86] but another study found a clear association among men[64], estimating that a 10% increase in the number of unemployed men was associated with a 1.4% (0.5% to 2.3%) increase in male suicides and that about 40% of the increase in suicides among men during the 2008–2010 recession could be attributed to rising unemployment.

Mortality Trends

Overall mortality rates have declined continuously in European countries, showing no deviations from long-term trends in the first years of the crisis[87]. Data from Greece, the worst affected country, also show no overall change in mortality, except for an increase in infant deaths[88, 89]. Nor was there an overall change in Spain[90] or Italy[91]. This was because the increases in suicides (discussed above) were compensated for by decreases in deaths from road traffic accidents, particularly in countries where the initial rate was relatively high[62].

Self-Reported Health

The impact on self-rated health varied across different settings and/or population groups. In Iceland, where the government rejected bank bailouts and austerity measures, self-rated health did not change significantly between 2007 and 2009, although income inequalities in health have widened among males after the crisis[92]. In contrast, in Greece, where the government was required to adopt deep austerity measures, the prevalence of good self-rated health declined from 71.0% in 2006 to 68.8% in 2011 ($p < 0.05$)[93], while the prevalence of poor self-rated health increased correspondingly[26, 94]. In Poland (least affected among EU countries by the crisis) and Ireland, the prevalence of poor self-rated health continued to decline after the crisis[93], and in Spain there was no statistical association between respondents reporting being affected by the economic crisis or job loss in the past 6 months and health-related quality of life[95]. An American survey conducted during the recession found that workers with insecure employment were more likely to report poor self-rated health than those with secure jobs[96]. A study using Google Trends found a significant increase in certain health queries during the recession, amounting to more than 200 million excess searches, including stomach ulcer and headache symptoms, hernia, chest pain, and arrhythmia[97].

Non-Communicable Disease

Three of the five papers examining non-communicable diseases focused on the incidence of cardiovascular disorders. A spike in emergency room visits with cardiac problems was seen in a week at the peak of economic meltdown in 2008 in Iceland (RR 1.26, 95% CI 1.07–1.49)[98] and an increase in the prevalence of hypertension in males between 2007 and 2009[99] was noted in Iceland. In Greece, incident acute myocardial infarction was higher during the crisis (RR 1.40, 95% CI 1.29–1.51)[100]. In the United

States, workers employed in plants with high levels of layoffs were at higher risk of developing hypertension and diabetes compared to their counterparts in more stable employment situations[101]. An increase in cardiovascular and respiratory problems was seen in the United Kingdom when unemployment rose by 3 percentage points in 2008–2009[102]. Other studies from Greece found an increase in the incidence of central serous chorioretinopathy, a rare eye condition thought to be exacerbated by stress,[103] and ear, nose, and throat conditions such as vertigo and tinnitus,[104] which the authors suggested may be linked to stress.

Communicable Disease

The impact of economic recession on infectious disease control varied depending on the context. For instance, tuberculosis case detection in Ireland fell while remaining stable in Portugal[105]; these differences have been attributed to patterns of public health spending, which was reduced in Ireland but was protected initially in Portugal. In the United States, reported tuberculosis incidence declined sharply during the recession, with nearly 1,000 fewer cases than expected in 2009 ($p < 0.001$). This was attributed to decreased immigration and delayed access to diagnosis[106].¹⁰⁴ In Osaka City, Japan, the incidence of tuberculosis among the non-homeless population was higher in 2009 than 2008, but fewer cases were found among homeless persons[107]. Greece has experienced several problems, including an increase in HIV infections (from 10 cases in 2008 to 400 cases in 2012), reappearance of malaria for the first time in 40 years[27, 108], and a resurgence in tuberculosis[27]. These developments have been linked to austerity measures, including cuts to prevention and control programs, such as needle exchange and mosquito spraying. Other outbreaks of communicable diseases, such as tick-borne encephalitis[109], candida infection[110], and West Nile virus[108], have been linked to deterioration in the economic situation in parts of Europe.

Occupational Health

In Iceland, sickness absence increased between 2010 and 2013; at the same time, the proportion of workers reporting going to work while sick increased and was higher in workplaces that experienced downsizing[111]. The number of occupational injuries fell in Spain, reversing an earlier increasing trend, by 12% in 2008 and further 18% in 2009, with the reduction being particularly sharp in the construction and industrial manufacturing sectors[112]. These changes were associated with reductions in industrial activity. A study from Ireland found that the construction sector accounted for only 3% of patients seeking treatment for trauma in 2009 compared to 27% in 2006[113]. Reported incidence rates of non-traumatic musculoskeletal disorders reduced in Canada by 16% in 2008–2009.[114]

Child Health

Only six papers focused on the impact of the crisis on children as a distinct population group. The number of births has fallen dramatically during the recession in Greece[115] and Italy[116] (15% and 7.4% between 2008 and 2012, respectively), while Greece has seen an increase in infant deaths in 2011 and 2012[27]. A survey from Catalonia, Spain, reported a reduction in junk food consumption between 2010 and 2012 compared to 2006, but at the same time there was an increase in obesity from 18.4% (95% CI 16.5%–20.4%) to 26.9% (24.6%–29.2%); health-related quality of life in children under 15 years old has improved, with the exception of children whose mothers had only completed primary education, who achieved lower scores than in 2006[28]. A study from the United States found that children who had gap in health insurance coverage during the recession were at higher risk of having poorly controlled asthma (80.6%, 95% CI 73.7%–87.8% compared to 68.0%, 95% CI 65.5%–70.5% in a no-gap group).[117] A multi-centre analysis in Seattle found an increase in the rate of abusive head trauma among children under 5 during the recession compared with the 4-year period before it.[118]

Unmet Need/Access to Care

Unmet need has progressively increased in Greece between 2008 and 2012[26, 27]. A survey of patients with chronic conditions at primary care facilities showed that 63% experienced economic barriers in accessing care in 2013[119]. A study from the United States found that job loss during the recession increased the probability of unmet need by 4% in families with higher income, and by more than 6% for families with lower income ($p < 0.001$)[120]. Another American study found that levels of foregone medical, dental, mental health care, and prescribed medications increased in working-age adults with all levels of education and all ethnic backgrounds during the recession[121]. Moreover, half of the respondents from a nationally representative survey of more than 70,000 patients with chronic illness in the United States reported that problems for paying for necessary medication became worse in 2008 than before the economic recession[122], while 13% of patients with prescriptions reported skipping doses or cutting pills for cost reasons[123]. However, one study from the United States found a decline in unmet medical need in both insured (from 6.2% to 4.5%) and uninsured (from 17.5% to 16.6%) between 2007 and 2010, although the smaller decrease among the uninsured indicates that the gap between the two groups widened during the recession[124]. A study in Spain found reduced rates of unmet need in migrants and existing residents between in 2006 and 2012, with significant differences between the groups[125].

Health Behaviours and Lifestyle

A total of 22 studies were devoted to health-related behaviours and lifestyle, including alcohol and tobacco consumption, diet and exercise, or a combination. Unemployment and financial strain showed associations with several unhealthy behaviours, such as alcohol consumption, smoking, and drug use[126, 127].

Alcohol. Most studies on alcohol consumption were from the United States, where self-reported consumption decreased from 52.0% in 2006–2007 to 51.6% in 2008–2009, corresponding to 880,000 fewer drinkers across the United States; however, there was an increase in binge drinking from 4.8% to 5.1% ($p < 0.01$) corresponding to 770,000 more bingers[128]. Two other American studies found a negative association between unemployment and alcohol consumption[129, 130]. However, a study focusing on heavy drinkers in the United States confirmed an increase in their number during the recession, while finding that the quantity of alcohol they consumed decreased by 5%[131]. Rent and mortgage arrears or eviction were associated with more negative drinking consequences, including alcohol dependence[132], while health problems experienced during the recession were associated with greater frequency of drinking, drinking to intoxication, binge drinking, and problem-related drinking[133]. Problematic drinking during the recession was more pronounced in males than in females[134] and among Black rather than White ethnic groups[135]. In addition, a 5% rise in unemployment was associated with a 15% increase in the number of Internet searches related to the topic[136]. A study from England showed a significant decrease in frequent drinking in 2008–2009 compared to 2006–2009, but the overall decrease masks adverse changes in high-risk groups (current drinkers, the unemployed, etc.), among whom binge drinking increased in 2009–2010 compared to 2004–2008 (OR 1.64, 95% CI 1.22–2.19)[137]. Reductions in alcohol consumption were also noted in another population survey in Iceland[138].

Smoking/Tobacco Use. Evidence of decreases in tobacco use during the economic crisis was reported in Iceland (from 17.4% to 14.8% in males and from 20.0% to 17.5% in females between 2007 and 2009 respectively, $p < 0.01$)[138, 139] and in Greece (from 43.1% in 2006 to 38.1% in 2011, $p < 0.05$, for both sexes)[140], but smoking increased in Italy (from 22.0% in 2008 to 25.4% in 2009, $p < 0.01$)[141]. An American study showed that being unemployed was a significant predictor of smoking in the recession (AOR 1.80, 95% CI 1.24–1.61 in 2010), whereas this was not a significant risk factor before the recession (AOR 1.26, 95% CI 0.82–1.95 in 2008)[142].

Diet and Body Mass Index. A study from Iceland found mixed effects; while consumption of soft drinks and fast food decreased, so did consumption of fruit and vegetables[138]. Job loss was associated with less weight gain compared to maintaining employment in Iceland, particularly in females[143], during the recession. In the United States, one study found no substantial change in diet or food-related behaviour[144], while another

suggested that changes in food intake and purchasing behaviour preceded the recession[145]. England saw a substantial increase in the number of food banks, across the country, with the rate of food parcels being distributed more than tripling from 0.6 in 2010 to 2.2 in 2013 per 100 population[146].

Exercise. An American study found that every percentage point decrease in employment was associated with 5–6 minutes less physical activity at a population level[147]; comparisons of surveys in 2005 and 2011 found that financial strain was associated with lower frequency of vigorous exercise or participation in active sports at both time points, but the magnitude of the effect increased after recession in those whose exercise levels before the recession were high[127].

DISCUSSION

This narrative review examined the available evidence of the effects of the 2008 global financial crisis on health and health behaviours in high-income OECD countries. The most widely studied and consistent adverse impacts of the crisis were in mental health (including a rise in depression and suicides) and access to care. The impact on other health indicators varied according to the national context, including the depth of the economic crisis, policy responses, and which population groups were studied. Some positive effects were noted in relation to health behaviours, including lower overall alcohol consumption and improved diet. Overall mortality was largely unaffected as the increase in suicides was compensated for by a decline in injuries, especially those that were traffic-related. These findings are consistent with previous systematic reviews.[12, 28, 29]

The majority of the studies located in this narrative review studied the effects of the economic crisis in the United States, Greece, Spain, Iceland, the United Kingdom, Italy, Canada, Ireland, or a combination of countries. Studies confined to individual countries were undertaken in 14 of the 31 high-income OECD countries. Beyond data availability, this reflects the political attention that the crisis has attracted domestically or internationally. Thus, there are many studies from Greece, but none exclusively of Portugal, even though the crisis had a large impact on economies in both countries[1]. In addition, and following from what Stuckler and colleagues have recently confirmed[148], the literature reviewed in this article is mostly conducted in disciplinary silos, with few studies drawing on multiple disciplines.

The narrative review identified many studies relating to the impact of the crisis on mental health. In the early stages of the crisis, a number of mental health experts, including those in the World Health Organization, warned about the need for measures to

protect mental health. However, in Greece, mental health provision experienced some of the largest cuts, of more than 50%[149].

The effects of the financial crisis and subsequent austerity on infectious diseases varied. While rates of HIV and tuberculosis incidence increased in Greece, particularly among injecting drug users, in Spain rates have remained stable, while in the United States and Japan the reported incidence of tuberculosis has decreased since the onset of the financial crisis[106, 107]. However, there are concerns that these decreases may represent ascertainment bias, as fewer people access diagnostic services. Thus, in the United States and in Greece[27], the recession was associated with an increase in the number of uninsured, mostly through loss of employment[150-152].

Although unhealthy behaviours such as smoking and alcohol use seem to have decreased in the population as a whole during the recession, people in lower socio-economic groups may have engaged more in unhealthy behaviours[139]. These findings suggest that the recession may have disproportionately affected the poor and vulnerable. In addition, this narrative review concluded that pre-crisis behaviours are strong predictors of behaviour after the crisis[127, 143, 144]. This emphasizes the need for effective public health measures behaviour during both good and bad economic times, especially regulatory and fiscal measures[130]. It is also important to direct public health efforts toward mitigating the negative effects on health behaviour by targeting the most vulnerable populations, such as the unemployed and those in lower socioeconomic groups[139, 153].

Heterogeneity of studies is an inevitable limitation of a study as broad as this. We present the results according to coherent unifying themes, allowing us to cover this large volume of studies.

The majority of the studies included in this review were published in 2013 and 2014, although we only have seven months of publications from 2015. The gradual increase in the number of publications on the topic reflects the time lag between the onset of the crisis and the implementation of austerity measures, and the availability of data on health.

Observational studies such as those reviewed are subject to potential confounding and bias. Most studies of individuals used self-reported outcome data, subject to recall and reporting biases. Despite these limitations, it is important to note that the available evidence is largely consistent in showing that the 2008 global financial crisis has had an adverse impact on certain aspects of population health in many high-income OECD countries. This has been particularly great in countries that suffered the largest economic crises (e.g., Greece, Spain) or prolonged austerity (United Kingdom). Health policies aimed at ensuring access to health care, as well as employment protection policies, can help to mitigate the impact of economic crisis on health and should play a key role in creating resilience to economic shocks.

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CHAPTER 4. SUPPLEMENTARY DATA

Appendix 1. List of OECD Countries Included in the Narrative Review

Australia
Austria
Belgium
Canada
Chile
Czech Republic
Denmark
Estonia
Finland
France
Germany
Greece
Iceland
Ireland
Israel
Italy
Japan
South Korea
Luxembourg
Netherlands
New Zealand
Norway
Poland
Portugal
Slovakia
Slovenia
Spain
Sweden
Switzerland
United Kingdom
United States

Appendix 2: Search strategies

Database: Embase Classic+Embase

Search Strategy:

1 (((economic or financ* or macroeconomic or fiscal or banking) adj4 (cris#s or recession or depression or condition* or insecurity)) or GDP or unemployment or recession or business cycle or debt or job loss or personnel downsizing or austerity).mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]

2 exp economic recession/

3 1 or 2

4 (health or health?care).mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]

5 exp health care/

6 exp health/ or exp health care disparity/ or exp "health care cost"/ or exp health care delivery/ or exp public health/ or exp health care access/ or exp health care availability/ or exp health status/

7 4 or 5 or 6

8 (Australia or Australian or Austria or Austrian or Belgium or Belgian or Canada or Canadian or Chile or Chilean or Czech Republic or Czech or Denmark or Danish or Estonia or Estonian or Finland or Finnish or France or French or Germany or German or Greece or Greek or Iceland or Icelandic or Ireland or Irish or Israel or Israeli or Italy or Italian or Japan or Japanese or Korea or Korean or Luxembourg or Luxembourgian or Netherlands or Dutch or New Zealand or New Zealandian or Norway or Norwegian or Poland or Polish or Portugal or Portuguese or Slovakia or Slovak or Slovenia or Slovenian or Spain or Spanish or Sweden or Swedish or Switzerland or Swiss or United Kingdom or Britain or English or British or United States or American).mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]

9 Australia/

10 Austria/

11 Belgium/

12 Canada/

13 Chile/

14 Czech Republic/

15 Denmark/

16 Estonia/
17 Finland/
18 France/
19 Germany/
20 Greece/
21 Iceland/
22 Ireland/
23 Israel/
24 Italy/
25 Japan/
26 Korea/ or South Korea/
27 Luxembourg/
28 Netherlands/
29 New Zealand/
30 Norway/
31 Poland/
32 Portugal/
33 Slovakia/
34 Slovenia/
35 Spain/
36 Sweden/
37 Switzerland/
38 United Kingdom/
39 United States/
40 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15 or 16 or 17 or 18 or 19 or 20 or 21
or 22 or 23 or 24 or 25 or 26 or 27 or 28 or 29 or 30 or 31 or 32 or 33 or 34 or 35
or 36 or 37 or 38 or 39
41 OECD.mp.
42 high income countr*.mp. [mp=title, abstract, subject headings, heading
word, drug trade name, original title, device manufacturer, drug manufacturer,
device trade name, keyword]
43 41 or 42
44 40 or 43
45 3 and 7 and 44
46 limit 45 to (english language and yr="2009 -Current")

Database: Ovid MEDLINE(R)

Search Strategy:

1 (((economic or financ* or macroeconomic or fiscal or banking) adj4 (cris#s or recession or depression or condition* or insecurity)) or GDP or unemployment or recession or business cycle or debt or job loss or personnel downsizing or austerity).mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier]

2 exp Economic Recession/

3 1 or 2

4 (health or health?care).mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier]

5 exp "Delivery of Health Care"/

6 exp Health/ or exp Health Status/ or exp Public Health/ or exp "Quality of Health Care"/ or exp Quality Indicators, Health Care/ or exp Health Services Accessibility/ or exp Health Resources/ or exp Health Services/

7 4 or 5 or 6

8 (Australia or Australian or Austria or Austrian or Belgium or Belgian or Canada or Canadian or Chile or Chilean or Czech Republic or Czech or Denmark or Danish or Estonia or Estonian or Finland or Finnish or France or French or Germany or German or Greece or Greek or Iceland or Icelandic or Ireland or Irish or Israel or Israeli or Italy or Italian or Japan or Japanese or Korea or Korean or Luxembourg or Luxembourgian or Netherlands or Dutch or New Zealand or New Zealandian or Norway or Norwegian or Poland or Polish or Portugal or Portuguese or Slovakia or Slovak or Slovenia or Slovenian or Spain or Spanish or Sweden or Swedish or Switzerland or Swiss or United Kingdom or Britain or English or British or United States or American).mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier]

9 Australia/

10 Austria/

11 Belgium/

12 Canada/

13 Chile/

14 Czech Republic/

15 Denmark/

16 Estonia/
17 Finland/
18 France/
19 Germany/
20 Greece/
21 Iceland/
22 Ireland/
23 Israel/
24 Italy/
25 Japan/
26 Korea/ or "Republic of Korea"/
27 Luxembourg/
28 Netherlands/
29 New Zealand/
30 Norway/
31 Poland/
32 Portugal/
33 Slovakia/
34 Slovenia/
35 Spain/
36 Sweden/
37 Switzerland/
38 Great Britain/
39 United States/
40 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15 or 16 or 17 or 18 or 19 or 20 or 21
or 22 or 23 or 24 or 25 or 26 or 27 or 28 or 29 or 30 or 31 or 32 or 33 or 34 or 35
or 36 or 37 or 38 or 39
41 OECD.mp. [mp=title, abstract, original title, name of substance word,
subject heading word, keyword heading word, protocol supplementary concept
word, rare disease supplementary concept word, unique identifier]
42 high income countr*.mp. [mp=title, abstract, original title, name of substance
word, subject heading word, keyword heading word, protocol supplementary
concept word, rare disease supplementary concept word, unique identifier]
43 41 or 42
44 40 or 43
45 3 and 7 and 44
46 limit 45 to (english language and yr="2009 -Current")

Database: Econlit

Search Strategy:

1 (((economic or financ* or macroeconomic or fiscal or banking) adj4 (cris#s or recession or depression or condition* or insecurity)) or GDP or unemployment or recession or business cycle or debt or job loss or personnel downsizing or austerity).mp. [mp=heading words, abstract, title, country as subject]

2 [economic recession/]

3 1 or 2

4 (health or health?care).mp. [mp=heading words, abstract, title, country as subject]

5 [health/]

6 [health care/]

7 4 or 5 or 6

8 (Australia or Australian or Austria or Austrian or Belgium or Belgian or Canada or Canadian or Chile or Chilean or Czech Republic or Czech or Denmark or Danish or Estonia or Estonian or Finland or Finnish or France or French or Germany or German or Greece or Greek or Iceland or Icelandic or Ireland or Irish or Israel or Israeli or Italy or Italian or Japan or Japanese or Korea or Korean or Luxembourg or Luxembourgian or Netherlands or Dutch or New Zealand or New Zealandian or Norway or Norwegian or Poland or Polish or Portugal or Portuguese or Slovakia or Slovak or Slovenia or Slovenian or Spain or Spanish or Sweden or Swedish or Switzerland or Swiss or United Kingdom or Britain or English or British or United States or American).mp.

[mp=heading words, abstract, title, country as subject]

9 [Australia/]

10 [Austria/]

11 [Belgium/]

12 [Canada/]

13 [Chile/]

14 [Czech Republic/]

15 [Denmark/]

16 [Estonia/]

17 [Finland/]

18 [France/]

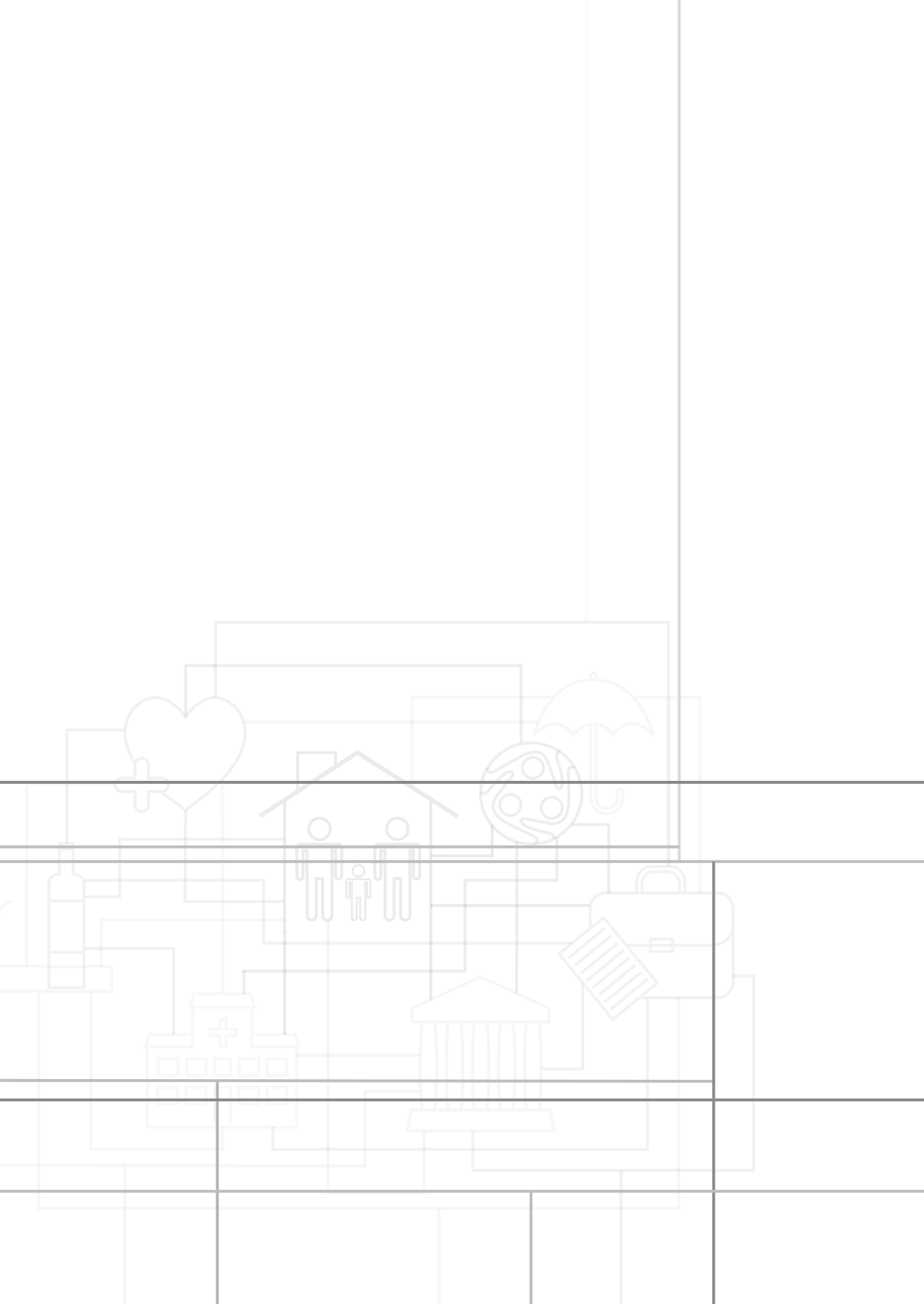
19 [Germany/]

20 [Greece/]

21 [Iceland/]

22 [Ireland/]

23 [Israel/]
24 [Italy/]
25 [Japan/]
26 [Korea/ or South Korea/]
27 [Netherlands/]
28 [New Zealand/]
29 [Norway/]
30 [Poland/]
31 [Portugal/]
32 [Slovakia/]
33 [Slovenia/]
34 [Spain/]
35 [Sweden/]
36 [Switzerland/]
37 [United Kingdom/]
38 [United States/]
39 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15 or 16 or 17 or 18 or 19 or 20 or 21
or 22 or 23 or 24 or 25 or 26 or 27 or 28 or 29 or 30 or 31 or 32 or 33 or 34 or 35
or 36 or 37 or 38
40 OECD.mp.
41 high income countr*.mp.
42 40 or 41
43 39 or 42
44 3 and 7 and 43
45 limit 44 to (english language and yr="2009-Current") [Limit not valid;
records were retained]



Chapter 5

Amenable mortality in the EU –
has crisis changed its course?

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ABSTRACT

Background: Did the global financial crisis and its aftermath impact upon the performance of health systems in Europe? We investigated trends in amenable and other mortality in the EU since 2000 across 28 EU countries.

Methods: We use WHO detailed mortality files from 28 EU countries to calculate age-standardized deaths rates from amenable and other causes. We then use joinpoint regression to analyse trends in mortality before and after the onset of the economic crisis in Europe in 2008.

Results: Amenable and other mortality have declined in the EU since 2000, albeit faster for amenable mortality. We observed increases in amenable mortality following the global financial crisis for females in Estonia [from -4.53 annual percentage change (APC) in 2005–12 to 0.03 APC in 2012–14] and Slovenia (from -4.22 APC in 2000–13 to 0.73 in 2013–15) as well as males and females in Greece (males: from -2.93 APC in 2000–10 to 0.01 APC in 2010–13; females: from -3.48 APC in 2000–10 to 0.06 APC in 2010–13). Other mortality continued to decline for these populations. Increases in deaths from infectious diseases before and after the crisis played a substantial part in reversals in Estonia, Slovenia and Greece.

Conclusion: There is evidence that amenable mortality rose in Greece and, among females in Estonia and Slovenia. However, in most countries, trends in amenable mortality rates appeared to be unaffected by the crisis.

KEY POINTS:

- Amenable mortality has declined in all EU countries between 2000 and 2015; however Estonia, Greece and Slovenia have seen a reversal in previously favourable trends in recent years.
- Individual causes of death contributing to the reversal in amenable mortality suggest a complex picture but the rise in mortality from infectious diseases in at least three countries calls for further investigation.
- Mortality trends in Greece show a sustained rise in deaths from a number of amenable causes, which predated the crisis, while progress stalled in reducing deaths from stroke corresponding to the onset of health expenditure cuts.
- The use of amenable mortality to detect the impact of economic fluctuations on health system performance is limited, due to delayed data availability, ever-reducing scope for improvement, and the focus on death rather than other less adverse health outcomes.

INTRODUCTION

The global financial crisis of 2007–08 and its consequences have had a severe long-term impact on many European economies. National economies, as measured by gross domestic product (GDP), were most negatively affected in 2009, however some European Union (EU) member states, especially Greece, are yet to recover fully.[1] Challenges arising from low or no economic growth, coupled with rising deficits and borrowing costs, impacted on the availability of resources for public spending, including for health, across Europe.[2] Thus, per capita public spending on health fell in several countries, with a small number experiencing sustained reductions during 2009–12, in particular Greece, Ireland and Slovenia, but also Italy, Portugal, Spain and the UK. [3] The slowdown in health spending impacted upon the provision of health services[4] and access to care,[5] with large increases in unmet medical need observed in Greece, Estonia and Latvia during and following the crisis.[1] Other evidence points to an increase in the proportion of European citizens aged 50 years and older who incurred a rise in out-of-pocket expenditures during the same period, with significant increases in the proportion of those experiencing catastrophic expenditures in the Czech Republic, Italy and Spain.[6] It is plausible that these barriers to accessing care impact health outcomes, while reduced public health spending may result in deterioration of quality of care. At the same time, a well-functioning and resilient health system should be capable of maintaining adequate levels of services, unless gaps in financing, coverage or service delivery are unsurmountable.

As was demonstrated previously,[7-10] European health systems have continued to contribute to improving population health by reducing deaths that can be avoided with timely and effective care (amenable mortality), a concept that is now used by several governments and international organizations as an indicator of health system performance. [11-15] The pace of improvement varied across countries, reflecting differences in the availability of and access to technologies and treatment, the effectiveness of service delivery and wider healthcare policies. In this study, we analyse amenable mortality trends from 2000 onwards in the countries of the EU in order to understand the possible impacts of the global financial crisis by means of Joinpoint regression analysis. We contrast amenable deaths with those where healthcare may have a less obvious impact (other mortality).

METHODS

Definition

We used the list of conditions included in amenable mortality proposed by Nolte and McKee in 2004 (Supplementary appendix S1).[7] For consistency with previous work, we applied an upper age limit of 75 years and include 50% of ischaemic heart disease deaths as potentially amenable. We also measured 'other' mortality (all remaining causes) under the age of 75 years as a comparator to help interpret changes in amenable mortality.

Data and availability

We used the WHO detailed mortality files[16] to obtain data on the number of deaths in the 28 EU member states by country, year, sex and cause by 5-year age-group and the corresponding population denominators, for the years 2000–15. We calculated age-standardised mortality rates using the European Standard Population 2013. Mortality data for Italy (2004, 2005) and Portugal (2004–06) were not available and we only calculated trends from 2006 and 2007, respectively. Data for Greece included a change in ICD-coding of cause of death in 2014 (from ICD-9 to ICD-10). This resulted in marked changes in certain causes of amenable deaths, so we only used data for 2000–13 to examine trends over time.

Joinpoint regression

We used Joinpoint regression analysis to identify significant changes in mortality trends for amenable and other causes in each EU country, starting in 2000. We then identified countries which experienced significant reversal (flat-lining or increase) in amenable mortality in either males or females in or after 2009, while mortality from other causes continued falling. Although we recognize that economic crisis can also potentially affect mortality beyond amenable causes, trends in other causes provide a comparator between these two mortality groups, one of which is a widely recognized marker of health care sector performance. We performed further Joinpoint analysis on specific amenable causes of death in those countries where we found reversals in trends. The overall change in trend was measured in terms of annual percentage change (APC). We used Joinpoint Trend Analysis Software v4.5.0.1.[17]

Pre- and post- crisis period

The global financial crisis affected the economies of EU member states in or after 2008, with the earliest plausible impact on health service effectiveness and mortality expected in or after 2009. We therefore defined the years 2009 onwards as the post-crisis period, consistent with established usage. However, we recognize that the timing of the crisis differed across countries. [2]

RESULTS

Overall, amenable and other mortality declined in all EU countries between 2000 and 2015. For amenable mortality, the average pace of decline varied between and APC of 0.4 in Lithuania to 5.6 in Ireland for males and between 1.8 in Lithuania and Italy to 5.0 in Ireland for females. The pace of decline of other mortality ranged from APC 1.2 in Bulgaria, Greece and Lithuania to 3.6 in Croatia and Slovenia for males and from 0.5 in Portugal to 4.6 in Cyprus for females. With the exception of Cyprus (females) and Lithuania (males), amenable mortality declined faster, on average, than other mortality (table 1).

Table 1. Overall change in amenable and other mortality (APC) since 2000

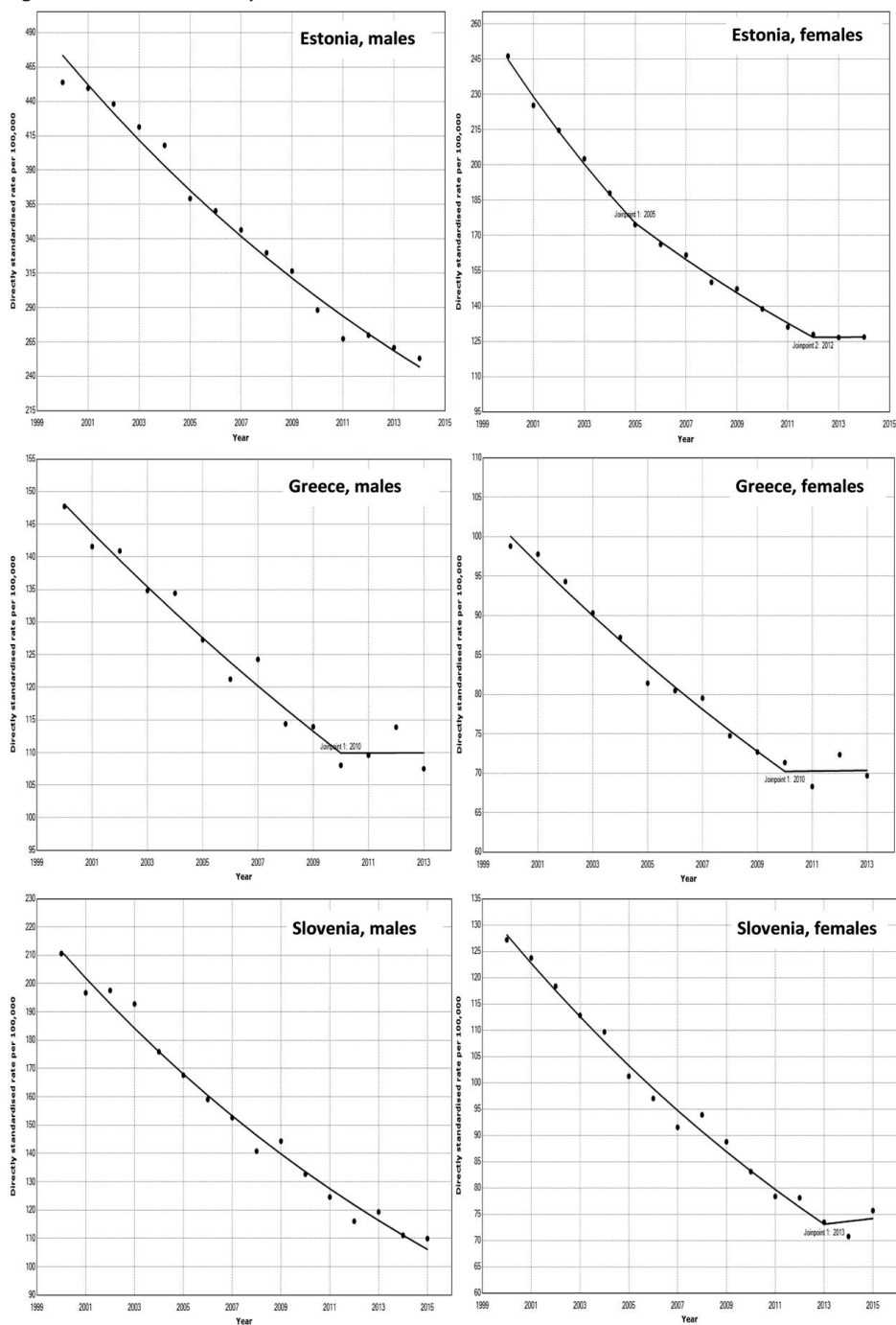
	Amenable mortality		Other mortality	
	Males	Females	Males	Females
Austria	-4.4	-3.5	-1.7	-0.9
Belgium	-3.9	-3.0	-2.0	-0.9
Bulgaria	-2.0	-2.8	-1.2	-2.2
Croatia	-3.7	-4.5	-3.6	-3.2
Cyprus	-4.0	-4.3	-2.9	-4.6
Czech Republic	-3.4	-4.0	-2.0	-1.6
Denmark	-4.3	-4.5	-2.5	-2.7
Estonia	-4.5	-4.6	-2.9	-3.1
Finland	-4.3	-3.6	-1.8	-1.0
France	-3.6	-2.6	-2.2	-1.3
Germany	-3.6	-2.9	-1.9	-1.1
Greece	-2.3	-2.7	-1.2	-1.5
Hungary	-2.8	-2.9	-2.3	-1.4
Ireland	-5.6	-5.0	-3.0	-2.4
Italy	-2.1	-1.8	-2.0	-0.9
Latvia	-2.7	-2.8	-1.9	-1.8
Lithuania	-0.4	-1.8	-1.2	-1.0
Luxembourg	-4.4	-3.8	-3.2	-2.2
Malta	-4.8	-4.4	-2.7	-2.6
Netherlands	-4.6	-3.3	-2.7	-1.2
Poland	-3.5	-3.7	-1.7	-1.4
Portugal	-4.5	-2.5	-3.3	-0.5
Romania	-2.4	-3.2	-1.5	-2.1
Slovakia	-3.4	-3.4	-2.1	-1.7
Slovenia	-4.5	-3.6	-3.6	-2.9
Spain	-3.3	-3.2	-2.6	-1.9
Sweden	-3.5	-2.9	-1.7	-1.2
United Kingdom	-4.9	-4.2	-2.2	-1.6

Since 2000, 30 Joinpoints in 18 countries were identified across both genders in amenable mortality trends. Most of these were related to amenable mortality displaying either more favourable, or a similar direction of change compared to other mortality (Supplementary appendix S2). There were only four instances of reversals in amenable mortality coinciding with the onset of the economic crisis (from decreases to 0 APC change or increases), against a background of a continued fall in other mortality. These were observed for females in Estonia (from -4.5 APC in 2005–12 to 0 APC in 2012–14) and Slovenia (from -4.2 in 2000–13 to 0.7 in 2013–15), as well as males and females in Greece (males: from -2.9 APC in 2000–10 to 0 APC in 2010–13; females; from -3.5 APC in 2000–10 to 0.1 APC in 2010–13) (figure 1).

To better understand drivers of amenable deaths behind the post-crisis reversals, we performed Joinpoint analysis by cause of death for Estonia, Greece and Slovenia, for males and females (table 2). An observed reversal in female amenable mortality in Estonia was attributable, mainly, to a large relative increase in deaths from infectious diseases after 2012, on top of an underlying increasing trend in amenable deaths from respiratory conditions and treatable cancers since 2007. Among males, there was a small increase in amenable respiratory deaths, from 2011. A similar picture is seen in Slovenia, where a reversal in amenable mortality in females can be attributed to an increase in deaths from infectious diseases after 2010, accompanied by underlying slowing in the rate of decrease of amenable deaths from ischaemic heart disease after 2007, while the rate of reduction in other amenable causes remained consistent. Unlike in Estonia, there was a similar pattern among males in Slovenia, with a reversal in amenable deaths from infectious diseases after 2012, but also an underlying reduction in the pace of decline in deaths from ischaemic heart disease and respiratory conditions. Further examination of trends of infectious diseases found substantial recent rises in deaths from sepsis in both countries, although absolute numbers remain small (data not shown).

In Greece, amenable mortality reversed for males and females in 2010. This was driven by a complex set of changes, which also differed between males and females. Thus, the observed changes occurred against the background of small, but sustained increases in selected amenable causes of death since 2000. These included mortality from amenable infectious diseases, and from digestive and respiratory conditions among males and females, which rose at a pace of between 1 and 3% per year between 2000 and 2013. In addition, males experienced sustained increases in mortality from amenable cancers (APC 0.6) and diabetes (APC 1.1) from 2000 onwards. Mortality from stroke fell throughout the entire observation period but we observed a significant deceleration of the pace of decline that coincided with the crisis (from -7 APC in 2000–10 to -0.8 APC in 2010–13 in females and from -6.6 APC in 2005–10 to -0.2 APC in 2010–13 in males). Reversals in mortality were observed for males for amenable perinatal and congenital conditions,

Figure 1. Amenable mortality trends in Estonia, Greece and Slovenia, 2000-15



Axis x – year; axis y – directly standardised rate per 100,000

Table 2. Changes in amenable mortality by cause in Estonia, Greece and Slovenia

Cause	Estonia						Greece						Slovenia							
	Males		Females		Males		Females		Males		Females		Males		Females		Males		Females	
	Segments	APC	Segments	APC	Segments	APC	Segments	APC	Segments	APC	Segments	APC	Segments	APC	Segments	APC	Segments	APC	Segments	APC
Infectious diseases	2000-2014	-10.6*	2000-2012	-15.7*	2000-2013	2.9*	2000-2013	2.5	2000-2006	2.7	2000-2006	2.7	2000-2006	2.7	2000-2006	7.7	2006-2012	-26.0*	2006-2010	-32.6
			2012-2014	91.4					2012-2015	20.4	2010-2015	15.9								
Treatable cancers	2000-2014	-0.9*	2000-2007	-3.6*	2000-2013	0.6	2000-2013	-0.6*	2000-2015	-1.4*	2000-2015	-2.3*								
			2007-2014	0.0																
Diabetes	2000-2014	-0.2	2000-2014	-5.9	2000-2013	1.1	2000-2013	-1.7	-	-	-	-								
IHD (50% amenable)	2000-2002	0.1	2000-2014	-9.6*	2000-2013	-2.7*	2000-2013	-3.9*	2000-2006	-6.2*	2000-2007	-9.0*								
	2002-2014	-7.0*							2006-2015	-2.2*	2007-2015	-0.7								
Stroke	2000-2005	-5.8*	2000-2014	-11.2*	2000-2005	-3.5*	2000-2010	-7.0*	2000-2015	-5.7*	2000-2015	-5.2*								
	2005-2014	-11.9*			2005-2010	-6.6*	2010-2013	-0.8												
Respiratory disorders	2000-2011	-10.6*	2000-2007	-14.7*	2000-2013	1.3	2000-2013	1.9	2000-2004	2.8	2000-2015	-8.2*								
	2011-2014	23.4	2007-2014	4.6					2004-2007	-22.0										
Digestive disorders	2000-2014	-4.2*	2000-2014	-3.3*	2000-2013	1.1	2000-2013	1.8	2000-2015	-9.2*	2000-2015	-8.0*								
Perinatal and congenital	2000-2014	-7.4*	2000-2014	-8.0*	2000-2007	-8.0*	2000-2013	-5.2*	2000-2015	-4.8*	2000-2015	-5.9*								
					2007-2013	0.3														
Other amenable causes	2000-2009	10.3*	2000-2014	5.3*	2000-2004	-7.2	2000-2013	-2.1*	2000-2015	-4.2*	2000-2015	-4.0*								
	2009-2014	0.0			2004-2013	2.4*														

*Significant at P < 0.05; Note: in Slovenia, the number of deaths from diabetes is 0 for some years; therefore, the cause has been excluded from joinpoint regression analysis.

which had been declining until 2007 (–8 APC in 2000–07 to 0.3 APC in 2007–13) and the remaining amenable causes of death (–7.2 APC in 2000–04 to 2.4 APC in 2004–13).

DISCUSSION

This study found wide variations in both levels and pace of change in amenable mortality over time across EU member states. Although rates have, overall, declined, some countries experienced reversals in recent years, at least in the short-term. These are still fairly small in Estonia, Greece and Slovenia, but these countries have seen no increase in other mortality, suggesting that while overall population health is improving, health services may have experienced some challenges. However, observed trends have to be interpreted with caution as they affected males and females differently. In any case, a significant reversal in what has been a very long-term decline in mortality in any country should be a cause of concern, requiring further investigation.

Amenable mortality, as used in this study, plays a dual role. First, it is one of the few existing indicators, which provides an initial assessment of the potential contribution of health services to population health. Second, as the outcome is deaths, it can help understand the impact of health system change. Although it is not possible, with aggregate data, to trace specific policies and actions affecting service delivery that lead to amenable deaths, it is known that the global financial crisis was associated with reduced access to care in multiple countries across the EU, particularly among more vulnerable groups.[18]

Trends in amenable mortality in Estonia, Greece and Slovenia present a complex picture. First, while total amenable mortality in Estonia and Slovenia has reversed only in women after the crisis, cause-specific data show that men have also been affected, although to a lesser extent. In Estonia, the rise in amenable mortality in females was driven partially by an increase in mortality from infectious diseases, but this was not replicated in males. At the same time, rise in deaths from respiratory conditions seen across both genders was more pronounced in males, while both sexes experienced rise in mortality from other amenable conditions throughout the period. In Slovenia, the rise in deaths from infectious diseases was sharp in both genders in recent years, but only in females did it result in a pronounced change of direction in overall amenable mortality. It is important to note that deaths from infectious disease present a very small proportion of total amenable mortality, and absolute numbers are particularly low when disaggregated by gender in countries with small populations, such as Estonia and Slovenia. The increase in mortality from infectious diseases in both countries was driven by a rise in deaths from septicaemia, a trend seen in other European countries, such as the Czech Republic [19] and Serbia [20]. Explanations of these trends are complex, including popu-

lation ageing and rising prevalence of complications of chronic diseases, while in Serbia the increase corresponded with the onset of the economic crisis. Suhrcke et al.[21] suggested various mechanisms by which economic crises can affect communicable disease control, such as through compromising the health of vulnerable population groups and placing additional pressures on health systems facing budgetary problems. However, the precise manifestations depended on the underlying epidemiological situation.

The effects of the measures imposed on Greece following the global financial crisis, including sustained reductions in public spending on health services, together with the broader impact of the crisis on population health, have been detailed elsewhere. [22-25] This body of research has shown that while crisis in itself can pose real threats to health, particularly of vulnerable people, through unemployment and loss of income, the austerity measures to health system exacerbate the issue and further limit access to and quality of health care services. In terms of mortality outcomes, there is some limited research on selected causes of death, such as suicides,[26] cardiovascular diseases and cancers, all of which show unfavourable trends since the start of the crisis. Our analysis of amenable mortality points to more long-standing challenges that people in Greece might have experienced regarding access to and effectiveness of health care which were present even before the economic crisis. Thus, we found small but steady increases in a number of deaths from amenable conditions from 2000 onwards, suggesting that the crisis might have exposed systemic problems in the Greek health system which eventually led to an overall reversal in amenable mortality in Greece. Available evidence has documented fragmentation of coverage, a poorly developed primary care system, and lack of referral systems, along with poorly coordinated care across the care pathway. [27] These underlying challenges have been exacerbated by the changes imposed by the economic crisis, including a cut of 40% of overall public spending on health between 2009 and 2013[1], coupled with exclusion of a large proportion of population from health coverage due to rising unemployment, as well as the sharply rising unmet medical need[28] observed since the start of the crisis. Others have suggested that an increase in mortality at older ages in Greece in 2011-12 may be linked to problems accessing care,[29] while one study reported an increase in deaths due to adverse events associated with medical treatment.[30] Consequently, deterioration in amenable mortality, along with other health outcomes, is not unexpected.

From a broader perspective, our findings suggest that amenable mortality may be a relatively insensitive indicator of the impact of the economic crisis on the quality of healthcare. This is partly due to the inherent limitations of amenable mortality indicator overall: setting the widely accepted age limit at 75 years to minimize issues with coding of multi-morbidity excludes large number of potentially amenable deaths in older people, reduces the potential of detecting significant change when low levels have been achieved, and increases chances of random year-on-year fluctuations in specific

amenable causes due to small numbers. In addition, amenable mortality captures only deaths thus missing the impact on morbidity. Moreover, given recent advances in health care, there is a need to keep the list of amenable causes under continuing review to accurately reflect the current capability of healthcare to prevent deaths. Concerning studying the impacts of the economic crisis, another set of limitations arises from the problem of defining the 'crisis', given how the range of possible economic indicators (GDP, employment, housing repossessions etc.) varied across countries, as did the extent to which cuts were directed at healthcare specifically, and differences in the ability of health system to withstand economic fluctuations. Finally, data availability and timeliness remains problematic, with many years of detailed mortality data missing even for high-income countries, leading to shorter or even interrupted timelines.

In summary, this study adds to the growing body of evidence showing that amenable mortality continues to decline across Europe. At the same time, it highlights increases of deaths from infectious diseases which should either be treatable or preventable in a small number of countries, and calls for investigation of the factors underlying these developments. Other causes for concern include respiratory conditions, as well as the sudden slowdown in the decline in mortality from stroke in Greece. Amenable mortality is a useful tool to highlight the presence of potential concerns about health systems performance, but its ability to detect the impact of changes in public spending on health care on the outcomes achieved by an individual health system is limited.

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CHAPTER 5. SUPPLEMENTARY DATA

Appendix 1. List of amenable causes of deaths

Amenable causes of death	Age	ICD-10 code
Infectious diseases		
Intestinal infections	0-14	A00-09
Tuberculosis	0-74	A15-19, B90
Other infections (tetanus, diphtheria septicaemia, poliomyelitis)	0-74	A36, A35, A80
Whooping cough	0-14	A37
Measles	1-14	B05
Treatable cancers		
Colon and rectum	0-74	C18-21
Skin	0-74	C44
Breast	0-74	C50
Cervical and uterus	0-44	C53-55
Testis	0-74	C62
Hodgkin's disease	0-74	C81
Leukaemia	0-44	C91-95
Diabetes	0-49	E10-14
Ischaemic heart disease (50% of deaths)	0-74	I20-25
Cerebrovascular disease	0-74	I60-69
Respiratory diseases		
Influenza	0-74	J10-11
Pneumonia	0-74	J12-18
Other respiratory conditions	1-14	J00-09, J20-99
Digestive diseases		
Peptic ulcer	0-74	K25-27
Appendicitic	0-74	K35-38
Abdominal hernia	0-74	K40-46
Cholelithiasis and cholecystitis	0-74	K80-81
Perinatal deaths	0-74	P00-96, A33
Other amenable conditions		
Diseases of thyroid	0-74	E00-07
Epilepsy	0-74	G40-41
Chronic rheumatic heart disease	0-74	I05-09
Hypertensive disease	0-74	I10-13, I15
Nephritis and nephrosis	0-74	N00-07, N17-19, N25-27
Benign prostatic hyperplasia	0-74	Y60-69, Y83-84
Misadventures to patients	0-74	O00-99
Maternal deaths	0-74	Q20-28
Congenital cardiovascular anomalies	0-74	

Source: Adapted from Nolte and McKee[7]

Appendix 2. Joinpoint regression results for 28 EU member states, 2000-15 (or latest available)

Country	Cause	Males			Females				
		No of joinpoints	Segments	APC	No of joinpoints	Segments	APC		
Austria	amenable	1	2000-2005	-6.8*	1	2000-2008	-4.7*		
			2005-2014	-3*		2008-2014	-1.9*		
	other	0	2000-2014	-1.7*	1	2000-2007	-1.7*		
						2007-2014	-0.1		
Belgium	amenable	0	2000-2014	-3.9*	0	2000-2014	-3*		
			other	2		2000-2006	-2.9*	2000-2006	-1.9*
						2006-2012	-0.7	2006-2012	0.6
			2012-2014	-3.3	2012-2014	-2.6			
Bulgaria	amenable	0	2000-2013	-2*	0	2000-2013	-2.8*		
			other	1		2000-2011	-0.8*	2000-2007	-2.4*
						2011-2013	-3.4*	2007-2011	-0.6
					2011-2013	-4.8*			
Croatia	amenable	0	2000-2015	-3.7*	1	2000-2002	-13.8*		
						2002-2015	-2.9*		
			other	1		2000-2002	-12.7*	2000-2002	-11.5*
		2002-2015			-2.1*	2002-2015	-1.8*		
Cyprus	amenable	0	2004-2014	-4*	0	2004-2014	-4.3*		
			other	0		2004-2014	-2.9*	2004-2014	-4.6*
Czech Republic	amenable	1	2000-2011	-3.8*	0	2000-2015	-4*		
						2011-2015	-2.1*		
	other	0	2000-2015	-2*	0	2000-2015	-1.6*		
Denmark	amenable	1	2000-2003	-0.4	2	2000-2002	-1.3		
						2003-2014	-5.3*	2002-2010	-4.5*
								2010-2014	-6*
	other	0	2000-2014	-2.5*	0	2000-2014	-2.7*		
Estonia	amenable	0	2000-2014	-4.5*	2	2000-2005	-6.5*		
								2005-2012	-4.5*
								2012-2014	0
			other	2		2000-2007	-1.2*	2000-2007	-2.2*
		2007-2010			-7.9*	2007-2010	-6.6		
			2010-2014	-2.2	2010-2014	-2.1			
Finland	amenable	1	2000-2006	-5.1*	0	2000-2014	-3.6*		
						2006-2014	-3.7*		
			other	1		2000-2008	-1.1*	0	2000-2014
		2008-2014			-2.7*				

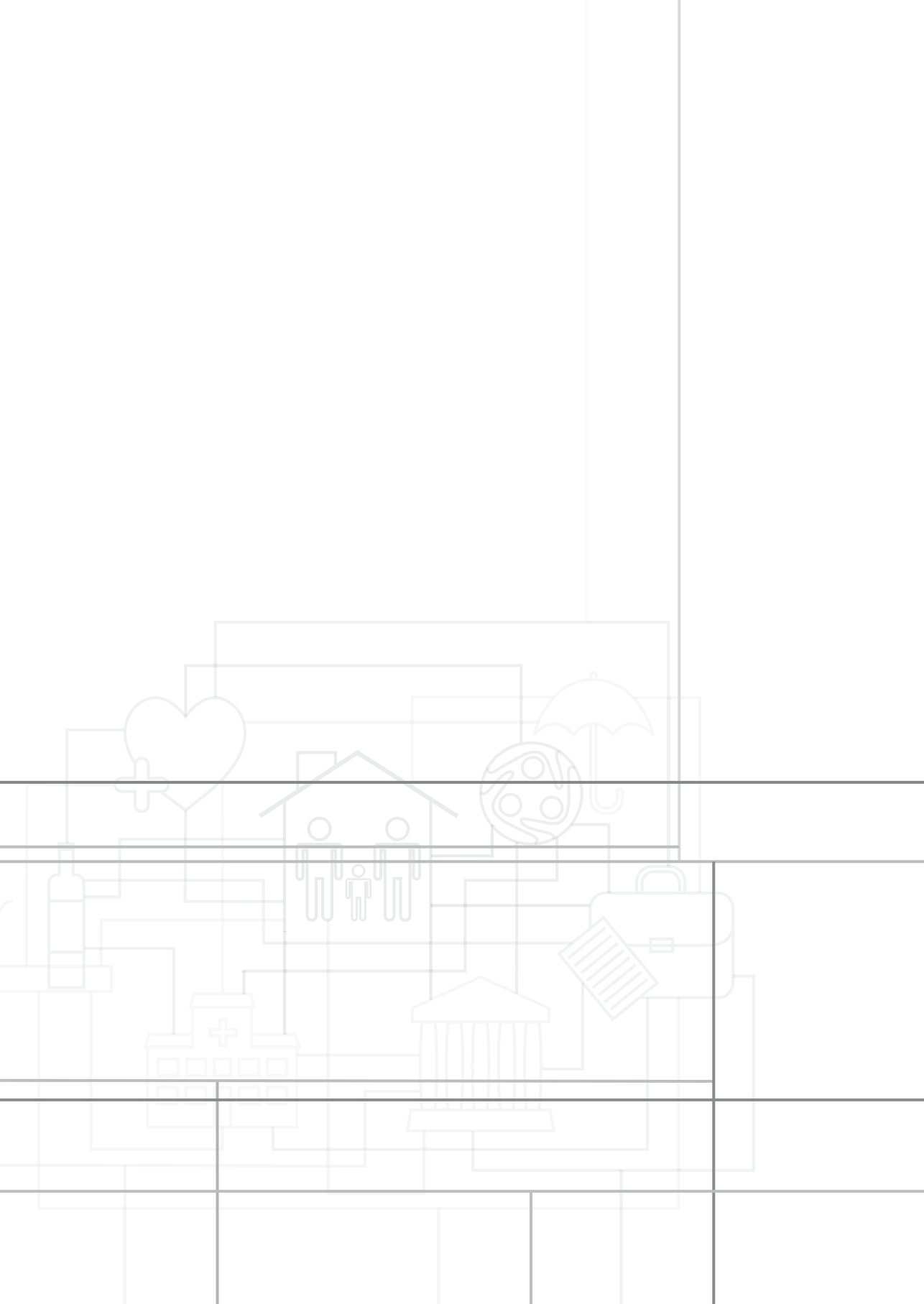
Appendix 2. Joinpoint regression results for 28 EU member states, 2000-15 (or latest available) (*continued*)

Country	Cause	Males			Females		
		No of joinpoints	Segments	APC	No of joinpoints	Segments	APC
France	amenable	0	2000-2013	-3.6*	0	2000-2013	-2.6*
	other	1	2000-2007	-2.7*	2	2000-2003	-0.7
			2007-2013	-1.6*		2003-2006	-3.1*
						2006-2013	-0.8*
Germany	amenable	1	2000-2011	-4*	1	2000-2010	-3.4*
			2011-2014	-1.8		2010-2014	-1.7*
			2000-2007	-2.8*		2000-2007	-2.1*
	other	1	2007-2014	-1*		2007-2014	0
Greece	amenable	1	2000-2010	-2.9*	1	2000-2010	-3.5*
			2010-2013	0		2010-2013	0.1
			2000-2013	-1.2*		2000-2006	-3.1*
	other	0				2006-2013	-0.2
Hungary	amenable	0	2000-2015	-2.8*	1	2000-2007	-3.7*
						2007-2015	-2.2*
			2000-2008	-1.3*		2000-2015	-1.4*
	other	1	2008-2015	-3.3*			
Ireland	amenable	0	2000-2013	-5.6*	1	2000-2002	-9.5*
						2002-2013	-4.1*
			2000-2013	-3*		2000-2006	-3.3*
	other	0				2006-2013	-1.6*
Italy	amenable	0	2006-2012	-2.1*	0	2006-2012	-1.8*
	other	1	2006-2010	-2.7*	0	2006-2012	-0.9*
			2010-2012	-0.7			
Latvia	amenable	1	2000-2006	-0.7	1	2000-2005	-1.1
			2006-2014	-4.2*		2005-2014	-3.8*
			2000-2006	0.3		2000-2006	0.4
	other	1	2006-2014	-3.5*		2006-2014	-3.4*
Lithuania	amenable	2	2000-2007	2.4*	1	2000-2007	0
			2007-2010	-5.4		2007-2015	-3.3*
			2010-2015	-1.1			
			2000-2007	1.6*		2000-2007	1.4*
	other	1	2007-2015	-3.5*		2007-2010	-5.6
				2010-2015		-1.5*	
Luxembourg	amenable	0	2000-2014	-4.4*	0	2000-2014	-3.8*
	other	0	2000-2014	-3.2*	0	2000-2014	-2.2*
Malta	amenable	0	2000-2014	-4.8*	0	2000-2014	-4.4*
	other	0	2000-2014	-2.7*	0	2000-2014	-2.6*

Appendix 2. Joinpoint regression results for 28 EU member states, 2000-15 (or latest available) (*continued*)

Country	Cause	Males			Females		
		No of joinpoints	Segments	APC	No of joinpoints	Segments	APC
Netherlands	amenable	1	2000-2008	-5.4*	0	2000-2015	-3.3*
			2008-2015	-3.6*			
	other	2	2000-2002	-2.1	2	2000-2003	-0.2
			2002-2008	-3.9*		2003-2007	-3.5*
			2008-2015	-1.8*		2007-2015	-0.4*
Poland	amenable	1	2000-2012	-2.9*	2	2000-2002	-5.2*
			2012-2014	-7.1*		2002-2012	-3.1*
						2012-2014	-5.1*
	other	2	2000-2002	-2.6	1	2000-2002	-3.7
			2002-2007	-0.4		2002-2014	-1*
			2007-2014	-2.3*			
Portugal	amenable	0	2007-2014	-4.5*	0	2007-2014	-2.5*
	other	1	2007-2014	-3.3*	1	2007-2012	-2.8*
						2012-2014	5.6*
Romania	amenable	1	2000-2002	3.5	1	2000-2002	2.2
			2002-2015	-3.2*		2002-2015	-4*
	other	0	2000-2015	-1.5*	0	2000-2015	-2.1*
Slovakia	amenable	1	2000-2009	-2.8*	0	2000-2014	-3.4*
			2009-2014	-4.5*			
	other	2	2000-2003	-2.5*	1	2000-2007	-0.7*
			2003-2006	0.2		2007-2014	-2.7*
			2006-2014	-2.8*			
Slovenia	amenable	0	2000-2015	-4.5*	1	2000-2013	-4.2*
						2013-2015	0.7
	other	0	2000-2015	-3.6*	0	2000-2015	-2.9*
Spain	amenable	0	2000-2014	-3.3*	0	2000-2014	-3.2*
	other	1	2000-2003	-1.7*	0	2000-2014	-1.9*
			2003-2014	-2.8*			
Sweden	amenable	1	2000-2011	-4.1*	0	2000-2015	-2.9*
			2011-2015	-1.8*			
	other	2	2000-2004	-1.3*	0	2000-2015	-1.2*
			2004-2013	-2.3*			
			2013-2015	0.4			
United Kingdom	amenable	0	2001-2013	-4.9*	0	2001-2013	-4.2*
	other	0	2001-2013	-2.2*	0	2001-2013	-1.6*

* Significant at $p < 0.05$



Chapter 6.1

Greece's health crisis: from austerity to denialism

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SUMMARY

Greece's economic crisis has deepened since it was bailed out by the international community in 2010. The country underwent the sixth consecutive year of economic contraction in 2013, with its economy shrinking by 20% between 2008 and 2012, and anaemic or no growth projected for 2014. Unemployment has more than tripled, from 7.7% in 2008 to 24.3% in 2012, and long-term unemployment reached 14.4%. We review the background to the crisis, assess how austerity measures have affected the health of the Greek population and their access to public health services, and examine the political response to the mounting evidence of a Greek public health tragedy.

THE GREEK CRISIS

The Greek economy accumulated severe structural troubles before the crisis. Between entry to the Eurozone and the onset of the crisis, annual economic growth averaged 4.2%[1], spurred by capital inflows[2]. However, overspending was concealed from public gaze with the help of investment banks[3] and by reporting of inaccurate data[4].

When the financial crisis hit US banks in 2008, the Greek Prime Minister Kostas Karamanlis pronounced the economy to be “armoured” against the risk of contagion[5]. However, subsequent events moved the country to the epicentre of a financial storm. A new government, elected in 2009, revised the deficit from a projected 3.7% to 15.8% of gross domestic product (GDP)[6]. As the scale of economic mismanagement became apparent, borrowing costs shot up to unaffordable levels. Much of the country's debt was held by banks and pension funds in other European countries that were already fragile[7], and the international community feared that Greece might be forced to default on its debt, with profound implications for the global economy.

By early 2010, the Greek Government was in talks with the international community about a possible bailout. In May, the first package was agreed; in exchange for a €110 billion loan, the government would implement far-ranging austerity measures and structural reforms overseen by the European Commission, the European Central Bank, and the International Monetary Fund (collectively known as the Troika). A second bailout was agreed in October, 2011, demanding further cuts and reforms but providing another €130 billion in funds, and was voted in by an interim government in February, 2012.

DIRECT HEALTH EFFECTS OF AUSTERITY

Background

Two main strategies can reduce deficits in the short term: cutting of spending and raising of revenue. The Greek Government used both at the behest of the Troika, albeit with an emphasis on reduction of public expenditure. 3 years ago, we drew attention to the effects of the austerity measures on the health of the Greek people[8].

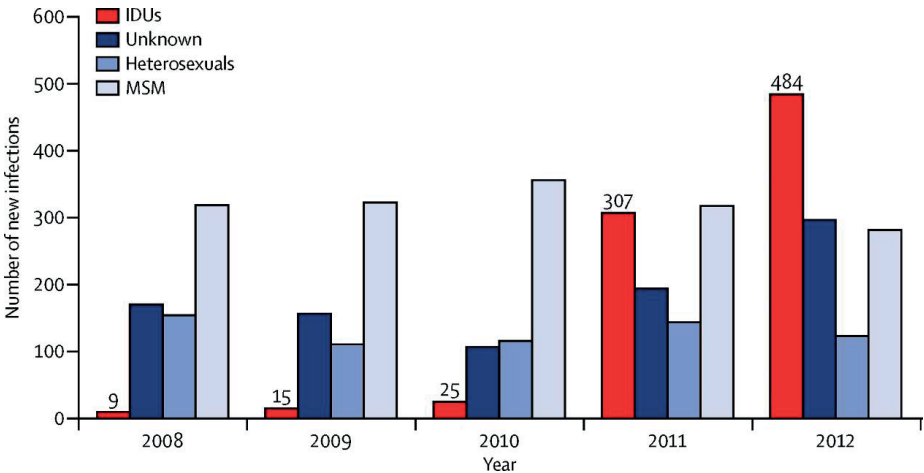
Cuts to public health spending

Greece has been an outlier in the scale of cutbacks to the health sector across Europe[9]. In health, the key objective of the reforms was to reduce, rapidly and drastically, public expenditure by capping it at 6% of GDP. To meet this threshold, stipulated in Greece's bailout agreement, public spending for health is now less than any of the other pre-2004 European Union members[2]. In 2012, in an effort to achieve specific targets, the Greek Government surpassed the Troika's demands for cuts in hospital operating costs

and pharmaceutical spending[10, 11]. The former Minister of Health, Andreas Loverdos, admitted that “the Greek public administration...uses butcher’s knives [to achieve the cuts]”[12]. The negative effects of these cuts are already beginning to manifest.

Prevention and treatment programmes for illicit drug use faced large cuts, at a time of increasing need associated with economic hardship. In 2009–10, the first year of austerity, a third of the street work programmes were cut because of scarcity of funding, despite a documented rise in the prevalence of heroin use[13]. At the same time, the number of syringes and condoms distributed to drug users fell by 10% and 24%, respectively[14]. These events had the expected effects on the health of this vulnerable population; the number of new HIV infections among injecting drug users rose from 15 in 2009 to 484 in 2012 (figure 1)[15], and preliminary data for 2013 suggest that the incidence of tuberculosis among this population has more than doubled compared with 2012[16]. Although needle and syringe distribution has since increased[17], partly in response to media reports and popular pressure, distribution is still well below the minimum target of 200 per drug user per year recommended by the European Centre for Disease Control[14]. In his first act at the end of June, 2013, Adonis Georgiadis, the new Minister of Health (the fourth in a little more than a year), re-introduced a controversial law stipulating forced testing for infectious diseases under police supervision for drug users, prostitutes, and immigrants—a move that is not only unethical but also counterproductive, because it deters marginalised groups from seeking testing during HIV outbreaks[18]. The Joint United Nations Programme on HIV/AIDS has called for the repeal of the law, because it “could serve to justify actions that violate human rights”[19].

Figure 1. Instances of HIV infections by transmission category



Note: IDUs=intravenous drug users. MSM=men who have sex with men. Figure based on data from the European Centre for Disease Prevention and Control and the WHO Regional Office for Europe[15].

Additionally, drastic reductions to municipality budgets have led to a scaling back of several activities (eg, mosquito-spraying programmes[20]), which, in combination with other factors, has allowed the re-emergence of locally transmitted malaria for the first time in 40 years[21, 22].

Through a series of austerity measures, the public hospital budget was reduced by 26% between 2009 and 2011[23], a substantial drop in view of the fact that expenditure should have increased through automatic stabilisers[24]. Evidence of the health effects of these cuts, at a time of increasing demand, is scarce, but staff workloads have increased and waiting lists have grown according to some accounts[8, 25, 26]. Rural areas have particular difficulties, with shortages of medicines and medical equipment[27].

Another key cost targeted by the Troika was publicly funded pharmaceutical expenditure, for which reform was necessary because of very high rates of prescription of branded drugs[28]. The stated aim was to reduce spending from €4.37 billion in 2010 to €2.88 billion in 2012 (this target was met), and to €2 billion by 2014[29]. However, there have been many unintended results and some medicines have become unobtainable because of delays in reimbursement for pharmacies, which are building up unsustainable debts[30]. Many patients must now pay up front and wait for subsequent reimbursement by the insurance fund[31]. Findings from a study in Achaia province showed that 70% of respondents said they had insufficient income to purchase the drugs prescribed by their doctors[32]. Pharmaceutical companies have reduced supplies because of unpaid bills and low profits[33].

Cost shifting to patients

Despite the rhetoric of “maintaining universal access and improving the quality of care delivery”[29] in Greece's bailout agreement, several policies shifted costs to patients, leading to reductions in health-care access.

In 2011, user fees were increased from €3 to €5 for outpatient visits (with some exemptions for vulnerable groups), and co-payments for certain medicines have increased by 10% or more dependent on the disease[24]. New fees for prescriptions (€1 per prescription) came into effect in 2014[24]. An additional fee of €25 for inpatient admission was introduced in January 2014, but was rolled back within a week after mounting public and parliamentary pressure. Additional hidden costs—eg, increases in the price of telephone calls to schedule appointments with doctors—have also created barriers to access[26].

Another concern is the erosion of health coverage. Social health-insurance coverage is linked to employment status, with newly unemployed people aged 29–55 years covered for a maximum of 2 years. Rapidly increasing unemployment since 2009 is increasing the number of uninsured people. Those without insurance are eligible for some health coverage after means testing, but the criteria for means testing have not been updated

to take into account the new social reality[34]. An estimated 800 000 potential beneficiaries are left without unemployment benefits and health coverage[35]. To respond to unmet need, several social clinics (primary care practices staffed by volunteer doctors) have sprung up in urban centres[36]. Médecin3s du Monde has scaled up operations in Greece, and reports increasing numbers of Greek citizens receiving health services and drugs from their clinics as the economic crisis deepens[37]; before the crisis, such services mostly targeted immigrant populations.

To examine whether these policies have affected access to health services, we analysed the most recent data from the European Union Statistics on Income and Living Conditions, a nationally representative survey[38]. Compared with 2007 (a pre-crisis benchmark), a significantly increased number of people reported unmet medical need in 2011 (table 1). Inability to obtain care increased most for older people. These changes mostly result from increases in respondents reporting an inability to afford care, or to reach services because of distance or scarcity of transportation (table 2). Difficulty in transportation overlaps with financial reasons, because hikes in the cost of transport affect mobility, especially for the poorest people, and patients who might have afforded private clinics before the crisis now need to travel to access publicly provided services.

Table 1. Weighted relative ORs for changes in reporting unmet medical need between 2007 and 2011, adjusted for sociodemographic and other factors

	All respondents (n=24177)		Age <65 years (n=17824)		Age ≥65 years (n=6353)	
	OR (95% CI)	p value	OR (95% CI)	p value	OR (95% CI)	p value
OR for unmet medical need 2011 relative to 2007	1.47 [1.30-1.66]	<0.0001	1.40 [1.20-1.63]	<0.0001	1.63 [1.32-2.00]	<0.0001
Age 16–81 years*	1.03 [1.03-1.04]	<0.0001	1.03 [1.03-1.04]	<0.0001	1.03 [1.01-1.06]	0.001
Age ≥65 years relative to age <65 years	0.72 [0.58-0.89]	0.003
Sex male relative to female	0.83 [0.72-0.94]	0.003	0.80 [0.69-0.94]	0.007	0.89 [0.72-1.10]	0.295
Family status married relative to unmarried	0.90 [0.78-1.04]	0.16	0.87 [0.71-1.07]	0.187	0.95 [0.75-1.21]	0.667
Urbanisation rural relative to urban	0.65 [0.58-0.73]	<0.0001	0.66 [0.57-0.76]	<0.0001	0.63 [0.52-0.77]	<0.0001
Education post-secondary relative to secondary and below	0.76 [0.64-0.91]	0.03	0.84 [0.69-1.01]	0.068	0.39 [0.24-0.65]	<0.0001
Pseudo R-squared	0.04	...	0.03	...	0.03	...

Note: Analysis based on the European Union Statistics on Income and Living Conditions survey[38], cross-sectional datasets from 2007 (n=12 346) and 2011 (n=12 641). 24 177 respondents in total provided complete sociodemographic data. We used a dummy variable for the crisis year 2011, age ≥65 years, sex (male), family status (married), level of urbanisation (rural), and education (post-secondary), and weighted ORs for sampling. Descriptive statistics are provided in the Appendix 1. OR=odds ratio.

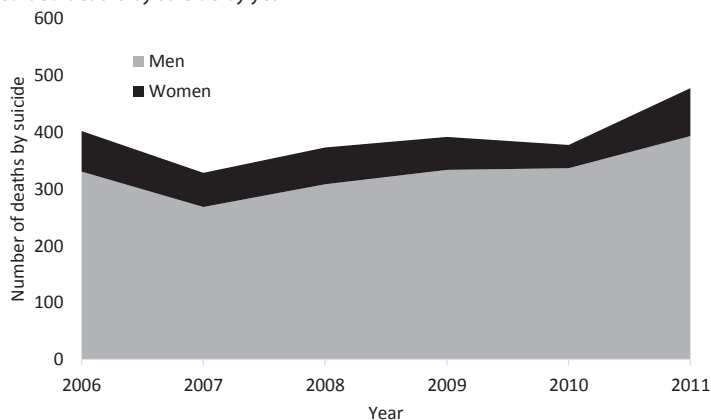
*The OR for the age variable is the change in odds of unmet need when age increases by 1 year.

INDIRECT HEALTH EFFECTS OF AUSTERITY

If the policies adopted had actually improved the economy, then the consequences for health might be a price worth paying. However, the deep cuts have actually had negative economic effects, as acknowledged by the International Monetary Fund[39]. GDP fell sharply and unemployment skyrocketed as a result of the economic austerity measures, which posed additional health risks to the population through deterioration of socioeconomic factors.

Mental health services have been seriously affected. Rapid socioeconomic change can harm mental health[40], unless it is ameliorated by appropriate social policies[41]. However, in Greece public and non-profit mental health service providers have scaled back operations, shut down, or reduced staff; plans for development of child psychiatric services have been abandoned; and state funding for mental health decreased by 20% between 2010 and 2011, and by a further 55% between 2011 and 2012[42]. Austerity measures have constrained the capacity of mental health services to cope with the 120% increase in use in the past 3 years[42]. The available evidence points to a substantial deterioration in mental health status. Findings from population surveys suggest a 2.5 times increased prevalence of major depression, from 3.3% in 2008 to 8.2% in 2011, with economic hardship being a major risk factor[43]. Investigators of another study[44] reported a 36% increase between 2009 and 2011 in the number of people attempting suicide in the month before the survey, with a higher likelihood for those experiencing substantial economic distress. Deaths by suicide have increased by 45% between 2007 and 2011, albeit from a low initial amount. This increase was initially most pronounced for men, but 2011 data from the Hellenic Statistical Authority also suggest a large increase for women (figure 2).

Figure 2. Recorded deaths by suicide by year



Note: Figure based on data provided by the Hellenic Statistical Authority.

Table 2. Weighted relative ORs for changes in reason for unmet medical need during the past 12 months between 2007 and 2011

	Could not afford		Waiting list		Could not take time		Too far to travel		Wanted to wait		Other	
	OR (95% CI)	p value	OR (95% CI)	p value	OR (95% CI)	p value	OR (95% CI)	p value	OR (95% CI)	p value	OR (95% CI)	p value
OR for unmet medical need 2011 relative to 2007	1.39 (1.19–1.61)	<0.0001	1.24 (0.83–1.85)	0.297	0.89 (0.58–1.37)	0.595	2.78 (1.64–4.70)	<0.0001	1.32 (0.82–2.10)	0.250	2.36 (1.58–3.51)	<0.0001
Age 16–81 years*	1.03 (1.02–1.03)	<0.0001	1.04 (1.02–1.07)	<0.0001	1.02 (0.99–1.04)	0.176	1.11 (1.07–1.15)	<0.0001	1.04 (1.02–1.06)	0.001	1.05 (1.03–1.08)	<0.0001
Age ≥65 years relative to age <65 years	0.76 (0.58–0.99)	0.043	0.80 (0.37–1.70)	0.555	0.21 (0.08–0.56)	0.002	0.63 (0.26–1.55)	0.319	1.33 (0.61–2.90)	0.480	0.28 (0.14–0.59)	0.001
Sex male relative to female	0.75 (0.65–0.88)	<0.0001	1.08 (0.71–1.64)	0.716	0.98 (0.62–1.53)	0.925	0.73 (0.45–1.19)	0.209	1.21 (0.75–1.95)	0.426	1.07 (0.69–1.67)	0.749
Family status married relative to unmarried	0.85 (0.72–1.02)	0.083	1.21 (0.72–2.02)	0.474	1.90 (1.05–3.44)	0.033	1.20 (0.70–2.06)	0.511	0.86 (0.53–1.39)	0.533	0.74 (0.46–1.17)	0.197
Urbanisation rural relative to urban	0.65 (0.56–0.75)	<0.0001	0.32 (0.21–0.48)	<0.0001	0.67 (0.43–1.04)	0.074	2.98 (1.57–5.63)	0.001	0.84 (0.53–1.35)	0.478	0.63 (0.43–0.93)	0.020
Education post-secondary relative to secondary and below	0.61 (0.49–0.77)	<0.0001	0.67 (0.38–1.17)	0.161	2.60 (1.66–4.07)	<0.0001	0.49 (0.16–1.46)	0.201	0.32 (0.12–0.83)	0.020	1.43 (0.84–2.46)	0.190
Pseudo R-squared	0.034	...	0.062	...	0.046	...	0.18	...	0.064	...	0.047	...

Note: Analysis based on the European Union Statistics on Income and Living Conditions survey[38]. Descriptive statistics are provided in the Appendix 1. OR=odds ratio.

* The OR for the age variable is the change in odds of unmet need when age increases by 1 year.

Greece's austerity measures have also affected child health, because of reduced family incomes and unemployment of parents. The proportion of children at risk of poverty has increased from 28.2% in 2007 to 30.4% in 2011[45], and a growing number receive inadequate nutrition[46]. A 2012 UN report emphasised that "the right to health and access to health services is not respected for all children [in Greece]"[47]. The latest available data suggest a 19% increase in the number of low-birthweight babies between 2008 and 2010[23]. Researchers from the Greek National School of Public Health reported a 21% rise in stillbirths between 2008 and 2011, which they attributed to reduced access to prenatal health services for pregnant women[48]. The long-term fall in infant mortality has reversed, rising by 43% between 2008 and 2010[49], with increases in both neonatal and post-neonatal deaths. Neonatal deaths suggest barriers in access to timely and effective care in pregnancy and early life, whereas postneonatal deaths point to worsening of socioeconomic circumstances[50, 51].

In summary, although the adverse economic effects of austerity were miscalculated, the social costs were ignored, with harmful effects on the people of Greece[36, 52, 53].

DENIALISM

The cost of adjustment is being borne mainly by ordinary Greek citizens. They are subject to one of the most radical programmes of welfare-state retrenchment in recent times, which in turn affects population health. Yet despite this clear evidence, there has been little agreement about the causal role of austerity. There is a broad consensus that the social sector in Greece was in grave need of reform, with widespread corruption, misuse of patronage, and inefficiencies[24, 54-58], and many commentators have noted that the crisis presented an opportunity to introduce long-overdue changes. Greek Government officials, and several sympathetic commentators, have argued that the introduction of the wide-ranging changes and deep public-spending cuts have not damaged health[59, 60] and, indeed, might lead to long-term improvements. Officials have denied that vulnerable groups (eg, homeless or uninsured people) have been denied access to health care, and claim that those who are unable to afford public insurance contributions still receive free care[36, 61, 62].

However, the scientific literature presents a different picture. In view of this detailed body of evidence for the harmful effects of austerity on health, the failure of public recognition of the issue by successive Greek Governments and international agencies is remarkable. Indeed, the predominant response has been denial that any serious difficulties exist, although this response is not unique to Greece; the Spanish Government has been equally reluctant to concede the harm caused by its policies[63]. This dismissal

meets the criteria for denialism, which refuses to acknowledge, and indeed attempts to discredit, scientific research[64].

During the first years of the crisis the international community was largely silent about this issue, giving its tacit support to the austerity pursued by successive Greek Governments. One exception has been the European Centre for Disease Control, which has long been concerned about the health hazards of austerity.

The experience of other countries in dealing with crises could have helped to guide policy makers. For example, after Iceland's acute crisis in 2008, the country rejected advice from the International Monetary Fund to slash its health-care and social services budget and instead opted to maintain welfare policies crucial to support its citizens, with no discernible effects on health[2].

ENDING THE GREEK HEALTH CRISIS

Recently, the European Commission has begun to meet its Treaty obligation to assess the health effect of all policies, including those of the Troika; it has the necessary skills to do so in its Directorate General for Health, but needs wholehearted support from the entire Commission, especially its president[65]. Two developments hold promise. In July, 2013, the Greek Government signed an agreement with WHO for support in the planning of health sector reforms[66]; the government needs to use the skills of WHO with the urgency demanded by the present health situation. In September, 2013, the government launched a new health voucher programme financed from European Union structural funds to cover 230 000 beneficiaries for 2013–14[67]. The programme was designed to address some health needs of very poor patients losing access to care, especially the growing number of people unemployed for 2 years or more. Uninsured individuals can apply for a voucher that can be used for up to three visits for a predetermined set of primary care services in a 4-month period, and includes prenatal examinations for pregnant women.

Alternative responses to the crisis would have allowed Greece to pursue difficult structural reforms, while preventing devastating social consequences. Experiences from other countries that have survived financial crises (eg, Iceland and Finland) suggest that by ring-fencing health and social budgets, and concentrating cuts elsewhere, governments can offset the harmful effects of crises on the health of their populations. At the time of writing, the Troika was in Athens to assess the implementation of the bailout conditions, and €2.66 billion in cuts were announced to the health and social security budget for the following year[68]. Although the Greek health-care system had serious inefficiencies before the crisis, the scale and speed of imposed change have constrained the capacity of the public health system to respond to the needs of the population at a time of

heightened demand. The foundations for a well functioning health-care system need structures for comprehensive accountability, effective coordination and performance management, and use of the skills of health-care professionals and academics—not denialism. The people of Greece deserve better.

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CHAPTER 6.1 SUPPLEMENTARY DATA

Appendix Table 1. Descriptive statistics – unmet medical need

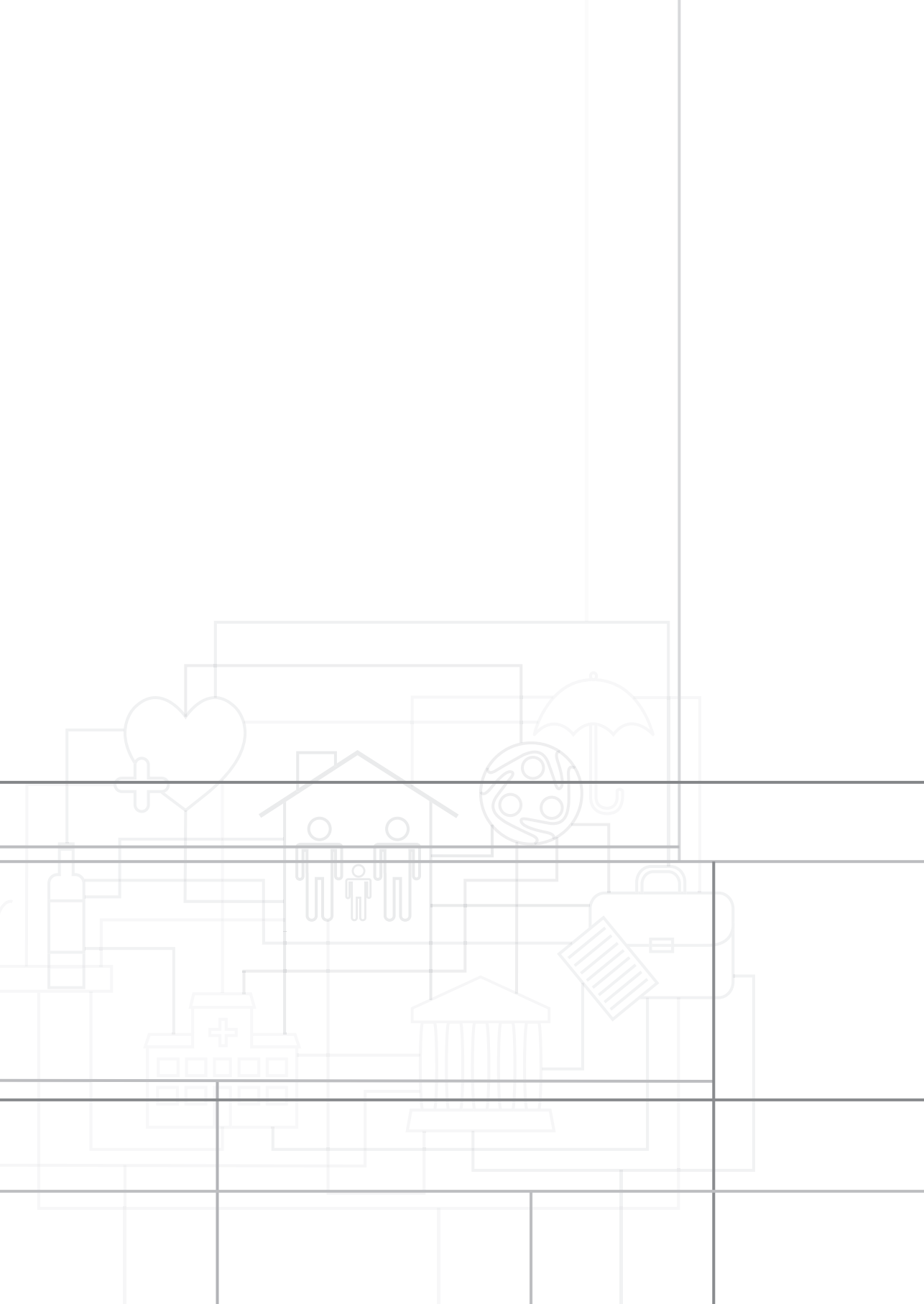
	2007		2011	
	n	%	n	%
Age	12346	49.3*	12641	51.9*
Age 65				
over 65	3241	26.25%	3813	30.16%
65 and under	9105	73.75%	8828	69.84%
Sex				
male	5932	48.05%	6063	47.96%
female	6414	51.95%	6578	52.04%
Family status				
married	7730	62.61%	7981	63.14%
unmarried	4616	37.39%	4660	36.86%
Urbanisation				
rural	6467	52.38%	7412	58.63%
urban	5879	47.62%	5229	41.37%
Education				
post-secondary	2370	19.92%	2739	22.31%
secondary	9529	80.08%	9539	77.69%
Unmet medical need				
yes	807	6.54%	1097	8.68%
no	11539	93.46%	11544	91.32%

* Mean age

Appendix Table 2. Descriptive statistics – reason for unmet medical need

	2007		2011	
	n	% (of total sample)	n	% (of total sample)
Could not afford	543	4.40%	702	5.55%
Waiting list	67	0.54%	85	0.67%
Could not take time off	57	0.46%	59	0.47%
Too far to travel	33	0.27%	87	0.69%
Wanted to wait	45	0.36%	68	0.54%
Other reasons	62	0.50%	94	0.74%
Total with unmet need*	807	6.54%	1097	8.68%

* Includes 2 responses for 2011 with reason for unmet medical need not stated.



Chapter 6.2

Health inequalities after austerity in Greece

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ABSTRACT

Since the beginning of economic crisis, Greece has been experiencing unprecedented levels of unemployment and profound cuts to public budgets. Health and welfare sectors were subject to severe austerity measures, which have endangered provision of as well as access to services, potentially widening health inequality gap. European Union Statistics on Income and Living Conditions data show that the proportion of individuals on low incomes reporting unmet medical need due to cost doubled from 7 % in 2008 to 13.9 % in 2013, while the relative gap in access to care between the richest and poorest population groups increased almost ten-fold. In addition, austerity cuts have affected other vulnerable groups, such as undocumented migrants and injecting drug users. Steps have been taken in attempt to mitigate the impact of the austerity, however addressing the growing health inequality gap will require persistent effort of the country's leadership for years to come.

BACKGROUND

Entering in the 9th year of economic crisis in 2016, Greece has witnessed a 29 % drop in its gross domestic product (GDP) between 2008 and 2014, while, as of 2014, the unemployment rate reached 26.5 % and long-term unemployment 19.5 %. The crisis—and the associated policy response designed by Greece's international creditors—resulted in sharp reductions in public expenditures amounting to a 36 % drop between 2009 and 2014 [1].

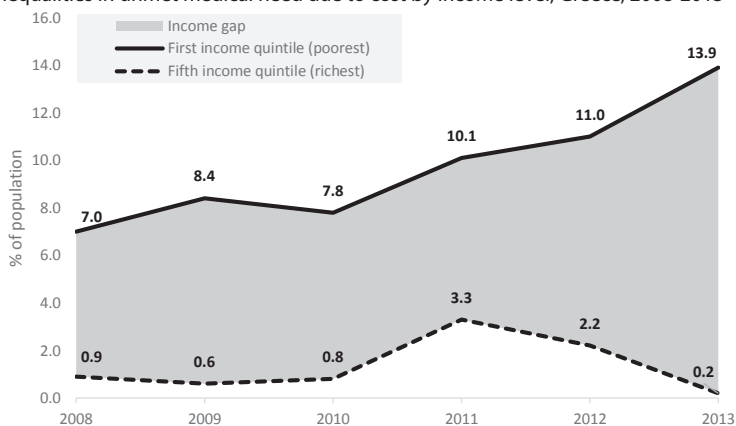
MAIN TEXT

A range of developments in the country have endangered the provision of health and welfare services as well as people's ability to access them, which—in turn—can have adverse impacts on health equity. But have some population groups been affected more than others?

First, as in Greece access to health care is largely determined by employment, people without jobs as well as their family members (estimated to exceed 2 million) have been left without comprehensive health coverage[2]. Second, the health sector itself has been the target of a persistent revenue-raising and cost-cutting drive, with low-income households being disproportionately affected. Recent reforms have included the introduction of user fees to access hospital services, increased co-payments for pharmaceuticals, discontinuation of programmes for vulnerable populations, and long waiting lists for access to health services[3]. Finally, the overall economic climate as a result of the crisis—high unemployment, fear of job loss, and loss of income—can also have an impact on health inequalities, as they are linked to higher general mortality[4, 5], deteriorating mental and physical health[6], and higher exposure to determinants of ill-health[7].

The latest available data from representative population survey European Union Statistics on Income and Living Conditions (EU-SILC) reveals that Greece's worsening economic conditions have undermined access to health care services, particularly for those most vulnerable. The proportion of individuals on low incomes reporting unmet medical need due to cost doubled from 7 % in 2008 to 13.9 % in 2013 (Figure 1). At the same time, self-reported unmet need in the richest population quintile is at the lowest level since the beginning of the crisis, leading to the increase of the relative gap between the richest and poorest population groups to almost ten-fold between 2008 and 2013[1].

Figure 1. Inequalities in unmet medical need due to cost by income level, Greece, 2008-2013



In addition, the most vulnerable groups who frequently are left invisible to official statistics and population surveys are at the forefront of feeling the consequences of the austerity. A study focusing on undocumented migrants demonstrated that 62 % had unmet health need, while 53 % had major difficulty in accessing health services, with key barriers being the cost and long waiting lists[8]. Access to health services, including emergency and inpatient treatment, medical examinations and mental health care deteriorated for homeless people during the recession[9]. Cuts to already modest disease prevention programmes have led to HIV outbreak among the injecting drug users in 2011-13, while incidence of tuberculosis more than doubled in this population in 2013 compared to 2012[3]. Provision of services for these vulnerable groups rely largely on charities, which now also have to cope with increasing demand from impoverished general population, as user charges for healthcare services and pharmaceuticals affect large proportion of households with low income.

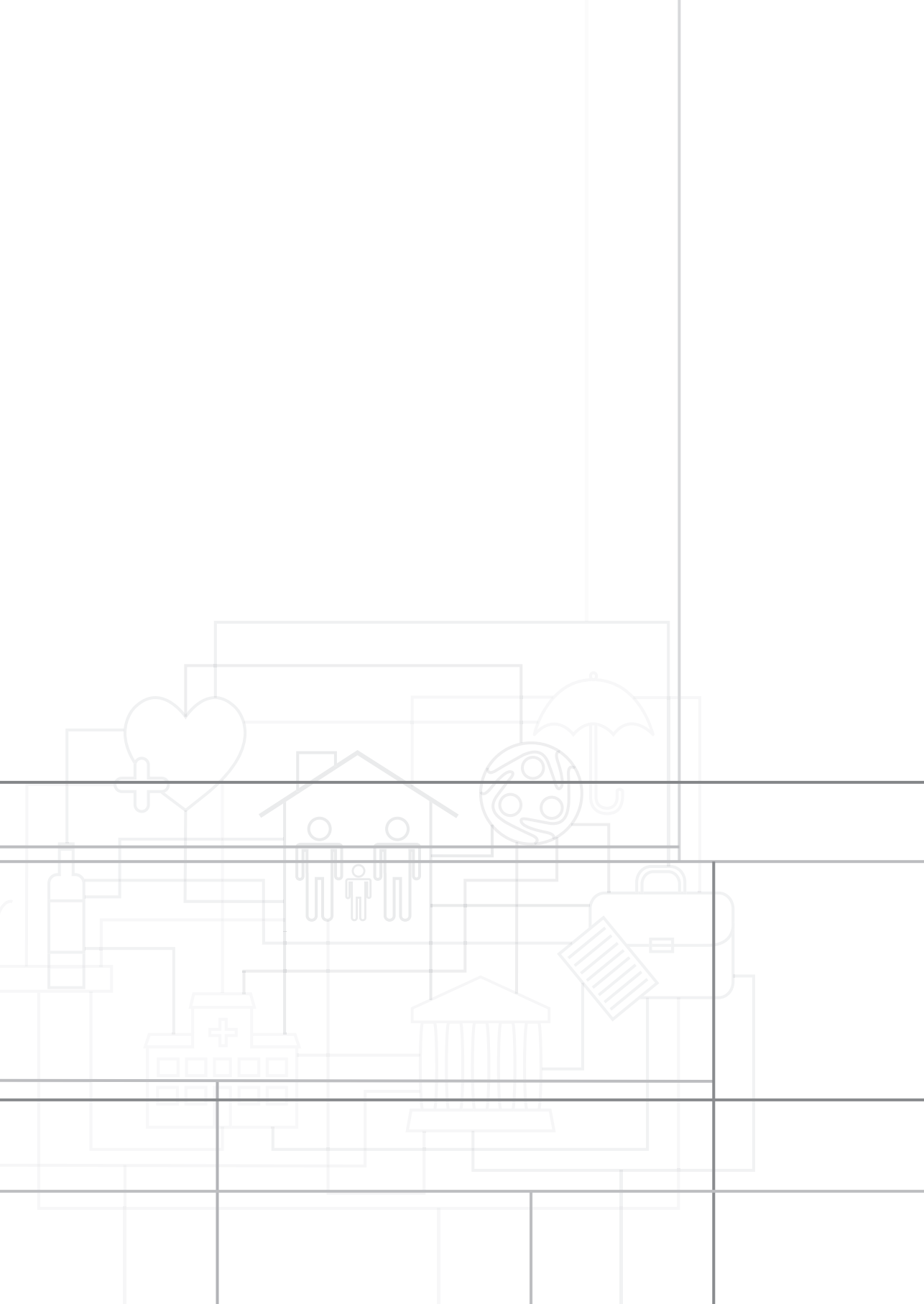
Since the issue of the impact of crisis and austerity on health and access to care in Greece was raised a few years ago[10], a number of actions were taken. For instance, a health voucher scheme intended to cover 230,000 people with basic services only covered 10 % of these in the first 17 months since its introduction in 2013. The legislative initiative from June 2014 which enabled access to primary and inpatient care and to pharmaceuticals for the uninsured in practice was hampered by rigid bureaucratic means-testing procedures for eligible groups and lack of information for healthcare providers[11]. These measures to mitigate the impact of crisis and austerity on the public health in Greece have come too little and too late. The growing health inequality gap suggests that the Greek welfare state—reeling under the pressure of exhaustive austerity—has failed to live up to its promise of universal health coverage.

CONCLUSIONS

Chronic as well as recent ailments of Greece's health system continue to affect its capacity to adequately shelter the social groups most affected by the crisis. Recent political turmoil in 2015—including two national elections, a referendum, a Eurozone membership crisis, and the refugee crisis—have drawn attention away from the pressing challenges for the country's health system. Beginning to address the growing health inequality gap will require the coordinated and persistent effort of the country's leadership over the years to come.

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Chapter 7

Effects of the financial crisis and Troika
austerity measures on health and
health care access in Portugal

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ABSTRACT

Although Portugal has been deeply affected by the global financial crisis, the impact of the recession and subsequent austerity on health and to health care has attracted relatively little attention. We used several sources of data including the European Union Statistics for Income and Living Conditions (EU-SILC) which tracks unmet medical need during the recession and before and after the Troika's austerity package. Our results show that the odds of respondents reporting having an unmet medical need more than doubled between 2010 and 2012 (OR = 2.41, 95% CI 2.01–2.89), with the greatest impact on those in employment, followed by the unemployed, retired, and other economically inactive groups. The reasons for not seeking care involved a combination of factors, with a 68% higher odds of citing financial barriers (OR = 1.68, 95% CI 1.32–2.12), more than twice the odds of citing waiting times and inability to take time off work or family responsibilities (OR 2.18, 95% CI 1.20–3.98), and a large increase of reporting delaying care in the hope that the problem would resolve on its own (OR = 13.98, 95% CI 6.51–30.02). Individual-level studies from Portugal also suggest that co-payments at primary and hospital level are having a negative effect on the most vulnerable living in disadvantaged areas, and that health care professionals have concerns about the impact of recession and subsequent austerity measures on the quality of care provided. The Portuguese government no longer needs external assistance, but these findings suggest that measures are now needed to mitigate the damage incurred by the crisis and austerity.

HIGHLIGHTS

- Austerity measures in Portugal involved substantial reforms, including to health care.
- In 2010–2012, unmet medical need doubled in Portugal.
- Health professionals raised concerns regarding increased co-payments and the quality of care.
- Measures are now needed to ameliorate the damage incurred by the recession and austerity.

INTRODUCTION

Although Portugal is one of the European countries most affected by the global financial crisis, there has been much less attention to the health consequences of the crisis and subsequent austerity measures compared to countries such as Greece, Spain and Ireland. Portugal's recession started in 2008. Despite a brief recovery in 2010, it then lost more than 6% of GDP between 2011 and 2013[1]. The crisis was accompanied by mounting deficits (9.9% of GDP in 2010)[2] and the government debt, mainly from the credit-fuelled expansion of the non-tradable sector such as retail and construction, reached 129% of GDP in 2013[3].

In May 2011, the Portuguese Parliament rejected austerity measures and the government requested an emergency €78 billion bailout package from international lenders – the European Central Bank, the European Commission and the International Monetary Fund – known as the Troika. The Memorandum of Understanding (MoU) with the Troika included agreement to generate substantial savings, including the health care sector[4-6].

Portugal had undergone remarkable change since the 1980s. Social conditions had improved as the creation of a welfare state tackled material deprivation and increased access to healthcare[7]. Portugal's health system is primarily funded through general taxation with a mix of public and private financing. Before the financial crisis, approximately 30% of the total expenditure was private, with nearly 25% representing out-of-pocket payments. Patient co-payments have increased over time, dominated by payments for pharmaceuticals[8]. All residents have access to health care provided by the National Health Service (NHS), and a number of reforms were implemented since the 1990s to improve performance, especially primary care and pharmaceutical care delivery. Portugal had progressively increased expenditure on healthcare, particularly in the public sector. In 2008, when the financial crisis hit Portugal, expenditure for health care represented nearly 10% of GDP[8]. However, progress was reversed during the crisis; health expenditure declined by 5% per year in real terms in 2011 and 2012[9], contrasting with an annual growth of 1.8% in the previous decade[10]. Per capita expenditure stood at 2514 US\$ PPP in 2013, well below the OECD average of 3453 US\$ PPP[11].

Budget cuts were achieved in several ways[6, 12, 13]. First, unit costs were forced down as the government negotiated lower prices for drugs and cut salaries of health workers. Second, more cuts were introduced in prevention, public health and research. Third, measures were implemented to reduce demand for care, mainly by increasing co-payments. Visits to primary care physicians attracted a charge of €5.00 in 2013, up from €2.25 in 2011. The corresponding increases for routine hospital visits were from €4.60 to €7.75 and for emergency visits from €9.40 to €20.60, with additional fees of up to €50 for examination and diagnosis. Increased charges have been maintained at these

values through 2015, even after the termination of the MoU. The impact was, however, softened by broadening exemptions from payments to almost 56% of the population (from 4.3 million people in 2011 to 5.8 million in 2014[14]. Exemptions are based on several criteria (family units earning less than €630 per month, the unemployed, pregnant women and children up to the age of twelve, among other groups) with the main criterion being that of economic hardship. In 2015, the Ministry of Health extended exemption from fees to youth under 18. However, criteria for exemptions for certain conditions such as chronic obstructive pulmonary disease (COPD) and chronic active hepatitis were tightened[15]. Fourth, some subsidies were removed, such as tax relief on private health insurance. Box 1 sets out a more detailed description of the austerity measures sought by the Troika in 2011.

Box 1 Healthcare related austerity measures sought by the Troika.

The Memorandum of Understanding* between the Troika and the Portuguese government demanded cuts in the health care sector in order to achieve savings of €550 million in 2012, and €375 million in 2013. Measures to reform the health system were required, with particular emphasis on the following areas:

1. *Financing:* An increase in overall NHS co-payments (*taxas moderadoras*) was imposed, including (a) higher fees; (b) a substantial revision of existing exemption categories, including stricter means-testing, in cooperation with the Ministry of Labour and Social Affairs; and (c) automatic indexation of co-payment rates with inflation.
2. *Pharmaceuticals and prescriptions:* A reduction in public spending on pharmaceuticals was sought, to 1.25% of the GDP in 2012, and about 1% in 2013. This included: (a) encouraging the prescription of generic medicines and other less costly products; (b) establishing clear prescribing guidelines for physicians according to international practice; and (c) requiring electronic prescriptions for medicines and diagnostic exams covered by public reimbursement.
3. *Primary care services:* Strengthening of primary care services in order to further decrease unnecessary (*sic*) visits to specialists and emergencies, reduce costs and increase effective provision through (a) an augmented number of Family Health Units (*Unidades de Saúde Familiar*), based on a mix of salary and performance-related payments; and (b) a mechanism to guarantee family doctors in needed areas to induce a more even distribution of family doctors across the country.
4. *Hospital services:* Savings in hospital operational costs are demanded, targeting a reduction of €200 million in 2012 (€100 in 2012, and €100 already in 2011), with an emphasis on concentration and rationalisation in state hospitals and health centres, moving some hospital outpatient services to primary care units, stricter control of working hours and activities of staff, and reducing spending on overtime compensation (at least 10% in 2012, and another 10% in 2013).
5. *Other services:* additional demands were made for finalising the development of electronic medical records, and reducing costs of patient transportation by one third.

* Note: Box 1 presents the summary initial requirements of the first adjustment programme. Some of these have continued in the follow up programme, while some were taken off either as completed or due to unexplained reasons.

Source: European Commission[16].

The Portuguese government was required to commit to reducing the deficit to 3% of GDP by 2013, while “minimising impact on vulnerable groups”. Yet there have been concerns that some of these measures may have impacted adversely on access to care and on population health, not least because of awareness of what has happened in Greece[17]. So what has happened in Portugal?

METHODS

We used the European Statistics on Income and Living Conditions (EU-SILC)[18] to analyse changes in self-reported unmet medical need before and after the introduction of the Troika's adjustment package. EU-SILC is an EU-wide representative population survey, the cross-sectional component of which contains data on perceived unmet medical need. The unmet medical need indicator is considered a proxy for barriers experienced in access to care, consistent with other studies[17, 19]. The relevant question asks respondents whether they felt unable to access medical care over the past 12 months, although he/she felt they needed it, with a supplementary question on unmet medical need. We compared data from 2010 and 2012 ($n = 21,474$), covering the introduction of most of the austerity measures. Logistic regression models were analysed, with stratification by economic status (employed, unemployed, retired and other inactive), for socio-demographic characteristics of the sample: age (16–80), sex (male compared to female), marital status (married compared to single) and education (post-secondary compared to secondary or below), with weighting for survey sampling design. Summary statistics presented in Table 1 show that socio-demographic characteristics of 2010 and 2012 survey samples were broadly comparable, although there were more respondents with higher education in 2012.

Table 1. Summary of 2010 and 2012 EU-SILC samples

Variable	2010		2012		t-test	p-value
	n	Mean (SD)	n	Mean (SD)		
age (16-80 years)	11,380	51.40 (18.71)	13,584	51.30 (18.61)	0.4384	0.6611
sex (female=0, male=1)	11,380	0.46 (0.50)	13,584	0.47 (0.50)	-0.2003	0.8413
family status (not married = 0, married = 1)	11,380	0.60 (0.49)	13,584	0.59 (0.49)	0.4402	0.7718
education (secondary = 0, post-secondary = 1)	9,880	0.11 (0.31)	11,625	0.13 (0.33)	-3.9169	<0.001

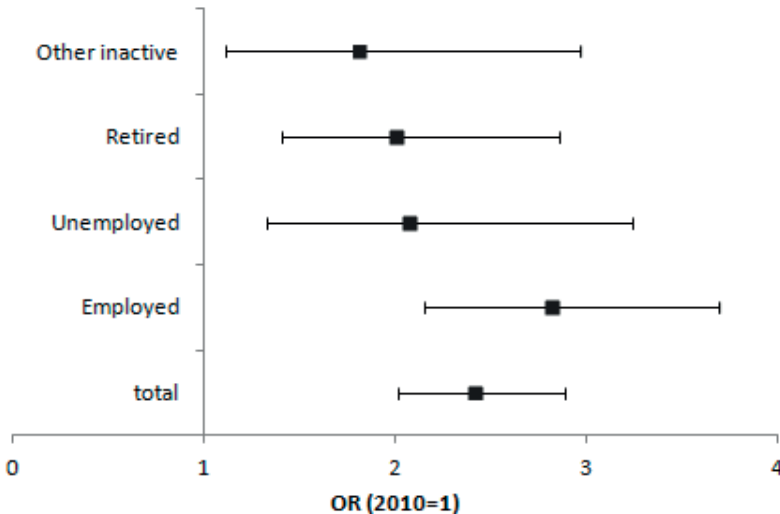
We also accessed and analysed multiple sources of data related to health, health care expenditure and health care utilisation from OECD, Eurostat, and the Portuguese Ministry of Health. We present key findings from available qualitative and quantitative studies, which aim to explore the impact of the recession and subsequent austerity measures on those who are most vulnerable using available survey data.

RESULTS

Effects of health care budget cuts on health system and access to care

As shown in Figure 1 and Table 2, the odds ratio (OR) of reporting unmet medical need (accounting for socio-demographic characteristics of respondents) more than doubled in the crisis year, with the greatest impact on those in employment (OR 2.82, 95% CI 2.15–3.69), followed by the unemployed (OR 2.07, 95% CI 1.32–3.24), and the retired (OR 2.00, 95% CI 1.40–2.85), and other economically inactive groups (OR 1.81, 95% CI 1.11–2.96). EU-SILC also collects the reason for not seeking care and Table 3 shows changes in the frequency of reporting of different perceived barriers. There was an almost 70% increase in odds of citing financial barriers (OR 1.68, 95% CI 1.32–2.12), a more than doubling the odds of citing waiting times (OR 2.18, 95% CI 1.20–3.98) and inability to take time off work or family responsibilities (OR 2.40, 95% CI 1.40–4.12), as well as a large increase in those reporting delaying care in the hope that the problem would resolve on its own (OR 13.98, 95% CI 6.51–30.02). However, caution is needed in interpreting changes in reported reasons for unmet need due to small numbers, which in 2012 varied from 24 responders attributing unmet need due to distance/transportation problems to 384 reporting financial reasons.

Figure 1. Odds of reporting unmet medical need in Portugal in crisis year, by economic status of respondent



Note: Accounting for age, sex, family status and education

Table 2. Odds of reporting unmet medical need in 2010 and 2012 by economic status

	Total	Employed	Unemployed	Retired	Other inactive
Crisis year (2012)	2.4074*** [2.0091,2.8848]	2.8164*** [2.1501,3.6891]	2.0693** [1.3230,3.2365]	2.0013*** [1.4037,2.8533]	1.8089* [1.1062,2.9580]
Age (16-80)	1.0084*** [1.0042,1.0127]	1.0213*** [1.0213,1.0318]	1.0346*** [1.0166,1.0529]	0.9826 [0.9633,1.0023]	1.0278*** [1.0175,1.0383]
Sex (male)	0.8908 [0.7579,1.0470]	0.7486* [0.5898,0.9501]	1.0533 [0.7136,1.5548]	1.0996 [0.7845,1.5412]	1.2882 [0.7553,2.1972]
Family status (married)	0.8733 [0.7307,1.0438]	0.8547 [0.6570,1.1119]	0.883 [0.5674,1.3740]	0.6081** [0.4272,0.8655]	0.5441* [0.3199,0.9253]
Education (post-secondary)	0.4706*** [0.3393,0.6528]	0.4880*** [0.3276,0.7269]	0.4584 [0.1811,1.1603]	0.2713* [0.09215,0.7990]	0.7427 [0.2462,2.2405]
Pseudo R-squared	0.03	0.04	0.04	0.03	0.03
Sample size	21,474	10,328	2,228	5,379	3,539

Note: Odds Ratios; 95% confidence intervals in brackets; * p < 0.05, ** p < 0.01, *** p < 0.001; weighted for sampling

Table 3. Odds of reporting specific reasons for unmet medical need in 2010 and 2012

	could not afford	waiting list	lack of time	travel distance	wait and see	other
Crisis year (2012)	1.6759*** [1.3221,2.1242]	2.1819* [1.1960,3.9805]	2.4037** [1.4038,4.1159]	1.9753 [0.6211,6.2822]	13.981*** [6.5125,30.016]	3.1130*** [1.8612,5.2068]
age (16-80)	1.0062* [1.0003,1.0122]	1.0200** [1.0064,1.0338]	0.9832* [0.9696,0.9970]	1.0539** [1.0194,1.0896]	1.0055 [0.9948,1.0163]	1.0202*** [1.0105,1.0300]
sex (male)	0.6762*** [0.5379,0.8500]	1.143 [0.6809,1.9188]	0.887 [0.5484,1.4346]	0.3573 [0.08732,1.4619]	1.1422 [0.7575,1.7224]	1.8344** [1.1794,2.8532]
family status (married)	0.8971 [0.7000,1.1497]	1.3253 [0.7170,2.4498]	1.6218 [0.8984,2.9277]	0.3248 [0.07436,1.4188]	0.8455 [0.5372,1.3307]	0.5141** [0.3412,0.7746]
education (post-secondary)	0.2342*** [0.1266,0.4334]	0.7037 [0.2404,2.0595]	0.7605 [0.3784,1.5283]	2.0038 [0.3426,11.718]	0.6165 [0.2963,1.2825]	0.8244 [0.4095,1.6597]
Pseudo R-squared	0.02	0.03	0.02	0.09	0.08	0.04
Sample size	21474	21474	21474	21474	21474	21474

Note: Odds ratios; 95% confidence intervals in brackets. *p < 0.05, weighted for sampling, **p < 0.01, weighted for sampling, ***p < 0.001, weighted for sampling.

At the time when perceived barriers to accessing care were rising, as described above, there has been a substantial shift on the sources of health care expenditure. The proportion of public funding decreased from 69% to 64%, and, correspondingly, private expenditure increased from 31% to 36% between 2010 and 2012. This shift was prior to the increase in user charges introduced in 2012[5]. Out of pocket payments (OOPs) constitute around three quarters of private expenditure on healthcare in Portugal, and after a steady rise to €448 per capita prior to the crisis, they declined to €408 per capita in 2013, although public funding declined at a faster pace.

A 2012 patient survey, which included 375 patients sought to provide a snapshot of medication adherence in patients with chronic conditions, found that 22.8% of patients did not purchase prescribed medication, with financial problems cited as one of the main reasons[20]. Another study linked pharmaceutical policy interventions such as harmonizing reimbursement levels and campaigns to promote generics, to utilisation of antipsychotic drugs, found an increase in the use of generic medicines, but also to a decrease in overall sales, consistent with reduced access to medicines[21]. Physicians also estimated that 60% patients are failing to attend follow up treatment due to financial hardship[22].

A recent ecological study analysing the impact of user fees and transport costs increase on emergency services found that the rise in OOPs did not lead to differences in emergency visits between patients exempt and not exempt from payments in three Portuguese hospitals, however longer travel distance because of loss of nearby facilities was a significant factor in reducing emergency visits[23].

In 2013 an assessment of health needs was conducted in two municipalities within the Metropolitan Area of Lisbon, Amadora and Sintra, characterised by economic deprivation and the highest concentration of migrants. Among 253 users of primary health care, 176 of whom were migrants, 45.1% were unable to afford medicines. 25% of the interviewees could not afford health care when needed, and 20.6% reported having serious difficulties paying for diagnostic tests[24]. Problems of accessing primary care were reported, with 34.4% of those interviewed reporting lacking access to a general practitioner, a figure that rose to 43.8% for foreign-born health care users[24].

Between 2011 and 2013, the Portuguese National Health Service (NHS) lost 2.3% of its workforce, including 3.2% of its nursing staff. In 2013 1211 Portuguese nurses registered for work in the UK, compared to 20 in 2006/2007[25]. Although the number of NHS physicians has increased by 3.8% in the same period[26], their salaries, as well as those of other public servants, suffered cuts between 2011 and 2013, and again in the last quarter of 2014, falling by 3.5% for salaries between €1500 and €2000 and up to 10% for salaries above €4165. The ratio of nurses to physicians, which was already low, declined further between 2008 and 2012, from 1.5 to 1.4[27]. In addition, government decree 266-D/2012 increased the working week from 35 to 40 h, which helped to cut overtime

payments by an average of about 6.1% for physicians and nurses. In a survey conducted among 3448 NHS physicians, 65% reported a shortage of medical equipment/products in their facilities and 80% reported that cuts in the NHS budget compromised care quality and access. Furthermore, 2014 and 2015 saw several hospital administration boards resign following disagreement with policy priorities or centrally-imposed cutbacks[22].

Effects of the recession on health

According to EUROSTAT, unemployment has risen rapidly, from 7.6% in 2008 to 14% in 2011, reaching 17.3% in the first quarter of 2013 and decreasing to 12.3% as of the third quarter of 2015[1]. Risk of poverty and social exclusion in the population increased from 24.4% to 27.5% between 2011 and 2013; material deprivation rose from 20.9% to 25.5%; with severe material deprivation rising from 8.3% to 10.9%. The poverty rate among children under 18 years of age also increased, from 28.6% in 2011 to 31.7% in 2013[1].

Suicide rates are a contentious issue in Portugal and there is uncertainty about data prior to 2014, when a new reporting system was introduced. However, calls to Emergency Medical Services by those reporting suicidal thoughts increased by 29.3% from 2011 to 2012[28], but a recent report produced contradictory results[29]. One recent Portuguese study did find an association between suicide and the level of material deprivation in municipalities[30]. The reported incidence of depression also increased in Portugal from 2004 to 2012, partially due to improved identification of cases[31]. A number of studies suggest that mental health-related illness is more prevalent in Portugal than in other European countries[32-34]. Per capita consumption of anti-depressants was highest among 18 EU member states[9]. However, commentators have noted that while recession has probably worsened the situation, including a 30% rise in new consultations among children between 2011 and 2013, and a 41% increase in the number of calls to a suicide helpline between 2011 and 2012, studies of this topic are lacking[32].

Mortality from respiratory diseases has also increased, by 16% between 2011 and 2012, following decades of continuing decreases. 2012 also saw an increase in hospitalizations for respiratory illness, up by 9.9% since 2011[35, 36]. While excess mortality was largely attributed to the seasonal flu outbreak[37], the death rate has been abnormally high[38]. Portugal has one of the highest rates of people unable to keep their house adequately warm (28% in 2013), only superseded by Greece in recent years[1]. The rise in respiratory diseases also coincided with restriction on exemption for co-payments, with only those patients whose disability level was 60% or above being exempt and that only after completing complicated administrative procedures that introduced delays in assessment of the level of disability[15]. Consistent with this, the National Observatory of Respiratory Disease has drawn attention to the reduced use of bronchodilators in 2012, attributed to difficulties affording medicines due to financial constraints[36].

Infectious diseases generally have remained under control. Tuberculosis incidence rates continued to fall in recent years, reaching 22 per 100,000 in 2013[10]. Newly diagnosed HIV cases have decreased overall (from 15 per 100,000 population in 2011 and 2012, to per 10 per 100,000 in 2013 and 11 per 100,000 in 2014) yet vertical transmission reached 0.7 in 2013 and 2014, raising from 0.5 and 0.3 in 2011 and 2012. However, HIV incidence rates are still high relative to the rest of the EU, while there are some concerns for the future as spending on HIV prevention has been reduced, including fewer syringes (mostly distributed through pharmacies) and condoms being distributed, in both cases to less than half of the amount preceding the implementation of austerity, as well as cuts to screening programmes[39, 40]. Especially detrimental for public health has been the reduction of accessibility to migrants, as many new cases relate to this population.

Finally, there has been an increase in reported violence against health professionals in the NHS. In 2014 there were 531 notifications of violence, a 160% increase from the previous year, with larger numbers of service users reporting dissatisfaction about, for example, transport, purchase of medicines and payment of user fees[41].

DISCUSSION

This study shows that the recession, followed by the policy of austerity adopted in Portugal has been accompanied by a demonstrable worsening of self-reported access to health care, most marked among those who are not exempt from the increases in co-payments implemented as part of the austerity package. While an ecological study[23] looking at aggregated data did not find differences in emergency admissions between patients that were exempt or not-exempt from payments in 2012 compared to 2011, individual level data shows a contrasting picture. The results of the analysis of EU-SILC data are in line with those of local surveys demonstrating that many Portuguese, particularly from more deprived communities, are experiencing barriers to accessing services, including primary care[24, 38]. This is despite the recent assessment, performed for the Ministry of Health, which showed that there has been substantial expansion of primary care in Portugal[42]. The reasons are complex but they seem to involve a combination of reductions in both demand and supply. The former seems, in part, to reflect increases in co-payments but also the difficulty that the increasing number of people that are exempt face when seeking to establish their eligibility because of the many bureaucratic obstacles involved. The exemptions seemed to have slightly cushioned the impact on access to care among the unemployed, as the largest increase in unmet need was seen among those in employment. Costs constitute a major barrier to accessing care, although long waiting times also seem important. The latter could be explained by reductions in supply, including cuts to provision of services, and the number of nurses

employed[27]. This has placed additional pressure on those providing care, which can be expected to demotivate those who remain.

Although a substantial reduction in pharmaceutical expenditure in Portugal reflects generally successful implementation of policies aimed at introducing clinical guidelines, monitoring systems, compulsory electronic prescriptions and generic substitution in both the public and private sector[27], many patients with chronic conditions seem to have cut down on use of medication for financial reasons. Non-adherence to prescribed medication, including secondary prevention of myocardial infarction, due to inability to afford medicines has already led to documented cases of unplanned readmission of patients in Greece[43] and Spain[44].

Cuts to human resources, achieved mainly through salary reductions and increasing workload have been linked to emigration of health professionals. Coupled with worsening working conditions, including increasing levels of violence, the risk of an understaffed health system and demoralised workforce is clear.

This study has some limitations. First, the data on unmet need is self-reported and is subject to respondent bias. It also does not allow us to quantify the number of times the respondent felt he or she had an unmet need during the specified period. Despite these limitations, this measure is widely used in studies of this type, as this is the only indicator of unmet need available across the EU countries, serving as a proxy for barriers to accessing care and the reasons thereof. Second, in the absence of sufficient peer-reviewed evaluations of service delivery and patient experience, we had to rely on official statistics, grey literature as well as preliminary results of ongoing studies. This has been a problem in several countries most affected by the crisis and severe austerity; investment in data collection and research has been among the first casualties. For example, Greece withdrew from the Survey of Health, Ageing and Retirement in Europe (SHARE) just before the financial crisis, when the data collected would have been of particular value. Third, there are some gaps in information, including change in suicide registrations, which complicate assessment of one of the most sensitive indicators of the consequences of recessions for health. These limitations notwithstanding, the study offers one of the first comprehensive pictures of changes to the Portuguese health system and the health of the population following the introduction of austerity policies as a result of the financial crisis.

The impact of austerity measures in the health sector needs to be viewed in the context of the pre-existing situation in Portugal. Both before and after the imposition of austerity self-reported health status as well as some mental health indicators in Portugal were among the worst in the EU.

Finally, the political and economic situation has been turbulent. Elections held in June 2011 forced the Socialist government from office, ushering in a coalition of the Partido Social-Democrata (centre-right) and Centro Democrático Social – Partido Popular (con-

servative), which oversaw the implementation of the adjustment programme until its termination in May 2014. The latest general election in October 2015 saw a centre-right minority government come into power, only to be overthrown a few weeks later following a no confidence motion headed by the Socialist party with the support of the Communist Party, the Greens and the Left Bloc, which pledged to “turn the page on austerity”.

At last, the Portuguese economy is showing some signs of improvement but it is too early to know whether this will be matched by an improvement in health. Yet, even if it is, Portugal has lost several years of much needed progress in closing the health gap with the rest of Europe.

CONCLUSIONS

The available evidence points to a clear deterioration in access to health care in Portugal since austerity measures imposed by the Troika came into effect in 2011, especially for vulnerable population groups not benefiting from exemptions from charges. This situation is familiar to other countries in Southern Europe, particularly Greece[17] and Spain[45], where the universality of health coverage, population health and existence of the welfare state has been challenged by austerity measures[46].

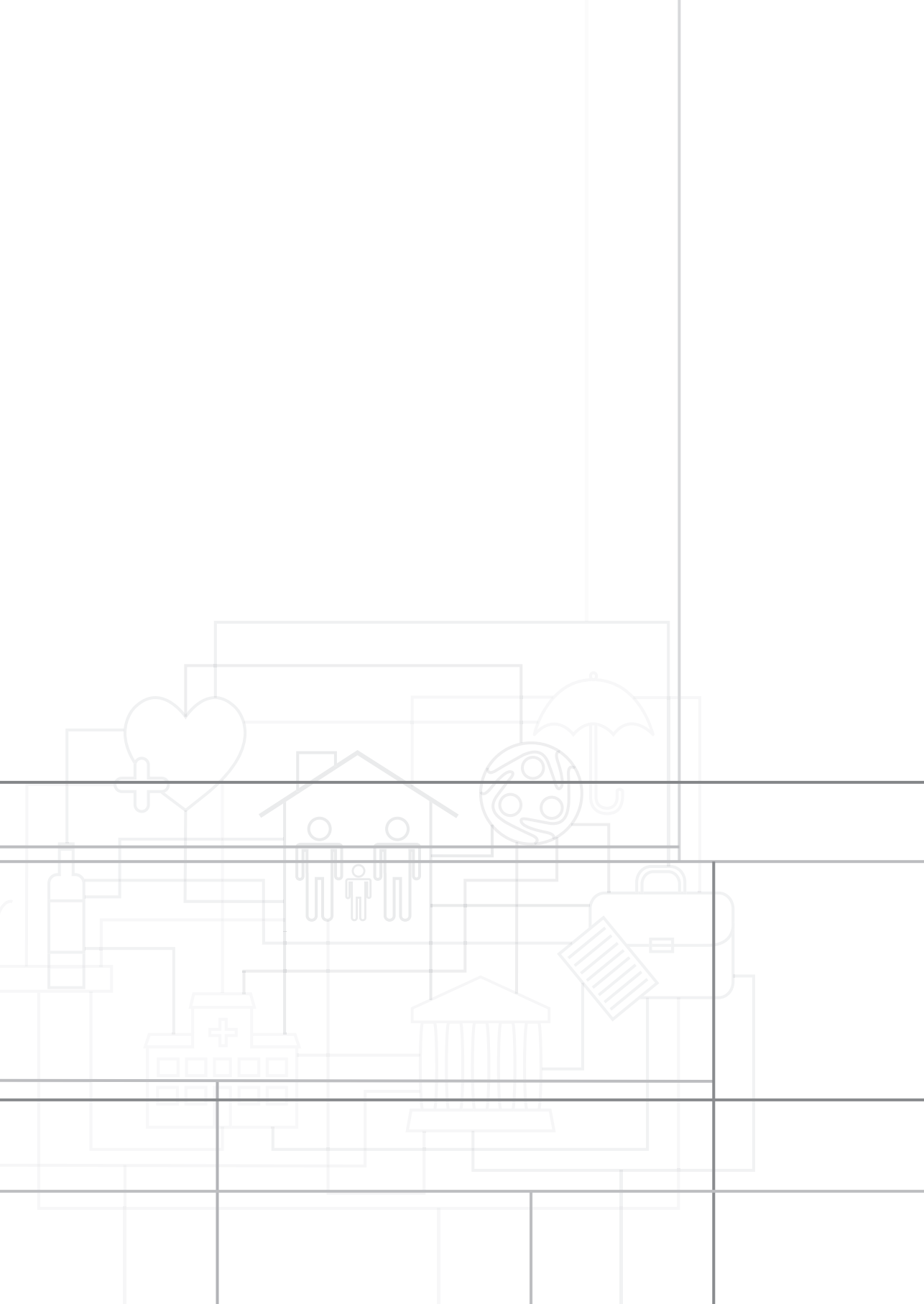
The bailout agreement ended in May 2014. However, the OECD reported that the Portuguese government had imposed cuts double those demanded in the original bailout agreement[47]. The impact of the cuts of this scale on the fairly well functioning Portuguese NHS[48] and population health is not yet fully clear. This paper presents early evidence of the impacts of healthcare cuts and recession on access to services and health outcomes. The Portuguese government no longer needs external assistance but the results presented in this paper suggest that measures are now needed to ensure access to care across many population groups, particularly those overlooked by the exceptions, in order to mitigate the damage of the recession and the austerity.

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Chapter 8.1

Access to care in the Baltic States:
did crisis have an impact?

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ABSTRACT

Background : In 2009, brief but deep economic crisis profoundly affected the three Baltic States: Estonia, Latvia and Lithuania. In response, all three countries adopted severe austerity measures with the shared goal of containing rising deficits, but employing different methods. **Aims :** In this article, we analyse the impact of the economic crisis and post-crisis austerity measures on health systems and access to medical services in the three countries. **Methods :** We use the EU-SILC data to analyse trends in unmet medical need in 2005–2012, and apply log-binomial regression to calculate the risk of unmet medical need in the pre- and post- crisis period. **Results :** Between 2009 and 2012 unmet need has increased significantly in Latvia (OR: 1.24, 95% confidence interval (CI): 1.15–1.34) and Estonia (OR: 1.98, 95% CI: 1.72–2.27), but not Lithuania (OR: 0.84, 95% CI: 0.69–1.04). The main drivers of increased unmet need were inability to afford care in Latvia and long waiting lists in Estonia. **Conclusion :** The impact of the crisis on access to care in the three countries varied, as did the austerity measures affecting their health systems. Estonia and Latvia experienced worsening access to care, largely exacerbating already existing barriers. The example of Lithuania suggests that deterioration in access is not inevitable, once health policies prioritise maintenance and availability of existing services, or if there is room for reducing existing inefficiencies. Moreover, better financial preparedness of health systems in Estonia and Lithuania achieved some protection of the population from increasing unmet need due to the rising cost of medical care.

KEY POINTS

- Economic crisis had a negative impact on population health in Europe, particularly in the hardest-hit countries. The Baltic States (Estonia, Latvia and Lithuania) had one of the deepest recessions among the EU countries, forcing their governments to respond with large cuts to public spending on healthcare.
- This study presents valuable lessons on the impact of the crisis and policy response on access to care. It uses population survey data to quantify changes to the unmet medical need in Estonia, Latvia and Lithuania before and after the economic crisis, and analyses the reasons behind the increase in unmet need in Estonia and Latvia in 2010–2012.
- The study provides context on health policy responses which could have had an impact on access to care in the Baltic States

INTRODUCTION

The three Baltic States, Estonia, Latvia and Lithuania have been profoundly affected by the financial crisis, experiencing sharp reductions in Gross Domestic Product (GDP) (of 14, 18 and 15%, respectively) and rise in unemployment in 2009 (Appendix Table S1). Economic shocks on such a scale and intensity inevitably had a profound effect on public budgets in these countries, including state financing of their health systems. In response, all three countries adopted severe austerity measures with the declared goal of containing rising deficits. The path chosen provoked an international debate, most notably between Estonia's President Toomas Ilves and the Nobel-Prize winning economist Paul Krugman, with the former proclaiming victory over economic adversity as early as 2012[1] and the latter questioning the degree of success that had been achieved[2, 3]. The shocks, although brief, were fairly profound, especially for Latvia which, due to its larger exposure to financial turbulence and weaker preparedness, faced bankruptcy and had to be bailed out with the total of 7.5 billion euro loans from the European Union, the International Monetary Fund and the World Bank over 2008–2011[4]. Estonia and Lithuania were able to mobilise their own resources and coped through adopting major financial retrenchment in the public sector[5, 6]. Economic growth has returned in subsequent years, achieving pre-crisis level by 2013 in Estonia and 2014 in Latvia and Lithuania.

Several years after the onset of the crisis, it is not clear how the years of financial retrenchment across many sectors have impacted on different aspects of health service provision. Some authors point to improvements in overall indicators of population health, such as life expectancy and all-cause mortality during and immediately after the crisis[7], sometimes linking them directly to the effect of recession[8]. But before attributing any changes to the crisis in the Baltic countries, it is important to note that Estonia, Latvia and Lithuania have also undergone a major transition: from former Soviet Republics to independent capitalist economies. These changes have profoundly affected population health, initially negatively, with life expectancy at birth falling by more than 3 years between 1990 and 1994, and subsequently recovering by the late 1990s[9]. The rapid improvement in life expectancy in recent years (after 2007) in all three countries coincided with the crisis. Its onset, which preceded the fall in GDP due to the recession, suggests that the continuing health transition may have played a role, with large reductions in premature mortality, particularly from cardio-vascular diseases and external causes[10], partly due to improved preventive efforts, such as tackling smoking[11] and alcohol consumption[12, 13].

Improvement in these rather broad population health measures does not pick up the impact of the crisis on more 'crisis-sensitive' measures of ill-health, particularly in the longer term. Research available to date shows the crisis has not left population health

in the Baltic countries unscathed—there been a notable increase in suicides[14] and a long-term improvement in self-perceived health has come to halt[15].

If it is to address the threats to population health associated with the financial crisis, a health system must be able to maintain and, where necessary, increase availability of services, particularly for the most vulnerable groups. Failure of the state to do so in the face of austerity measures can lead to devastating consequences even in high income countries, as has already been seen in Greece[16]. In Estonia, Latvia and Lithuania, the health sectors also faced austerity measures, yet the scale and nature varied among these countries (see Appendix Table S1). In Estonia, measures to control health spending mainly involved cutting budgets of public health programmes and looking for efficiency gains. In Latvia, drastic measures were taken in order to counterbalance the cuts, including introduction of new out-of-pocket payments (OOP) and increases in existing ones, as well as major restructuring of secondary care. Lithuania resorted to reducing provider payments and cutting administrative functions.

The aim of this article is to analyse the impact of the economic crisis and post-crisis austerity measures on access to medical service in the three countries, and to determine whether this impact was dependent on the different financing and health policy responses.

METHODS

Data

European Union Statistics on Income and Living Conditions (EU-SILC)[17] is an EU-wide annual representative population survey in which Estonia, Latvia and Lithuania have participated since 2005, with the latest available data for 2012. While mainly focussed on socioeconomic conditions, the survey also contains several health variables: self-reported health, presence of chronic disease; existence of limiting health problems; unmet need for medical examination or treatment and unmet need for dental examination or treatment. In this analysis, we used the 'unmet need for medical examination or treatment during the last 12 months' as well as the main reason why such unmet need was reported, as a proxy measure of access to health care services.

The year 2009 has been chosen a baseline for measuring unmet medical need since the crisis, as the EU-SILC definition relates to the past 12 months and this was the last year predating the impact of the crisis. Subsequent years coincide with the main impact of the economic crisis (2010) and policy responses (2011 and 2012) in the Baltic countries.

We constructed dummy variables for unmet need and the reason for unmet need, as well as for the latest year of survey in relation to 2009 (baseline), and for explanatory sociodemographic variables: sex (male = 1), family status (married = 1), education

(postsecondary = 1). The samples from 2009 to 2012 and their basic sociodemographic characteristics are described in the Appendix Table S2.

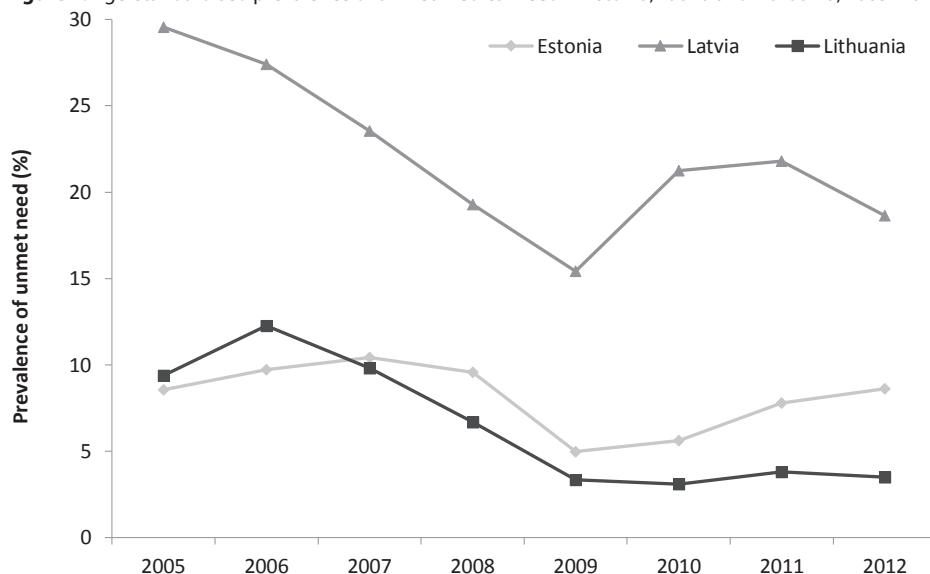
Analysis

First, we used age-adjusted prevalence of unmet medical need to establish trends in the three countries between 2005 and 2012, age-adjusted using the 2013 European Standard Population. We then applied log-binomial regressions to calculate the risk of unmet medical need for the years 2010–2012 relative to the baseline (2009). Log-binomial regressions were also used to analyse the change in risk of reporting unmet need in 2010–2012 due to each specific reason (financial constraint; long waiting list; lack of time due to work/family responsibilities; travel distance; delay to see if problem resolves; and combined ‘other’ category, which included fear of doctor, not knowing appropriate specialist and other reasons). We used EU-SILC standard sampling population weights to account for survey design.

RESULTS

Figure 1 shows age-adjusted prevalence of unmet medical need in Estonia, Latvia and Lithuania. Latvia exhibited the highest rates among the three countries throughout the entire period (2005–2012). Before the crisis it had almost halved, from 29.6% in

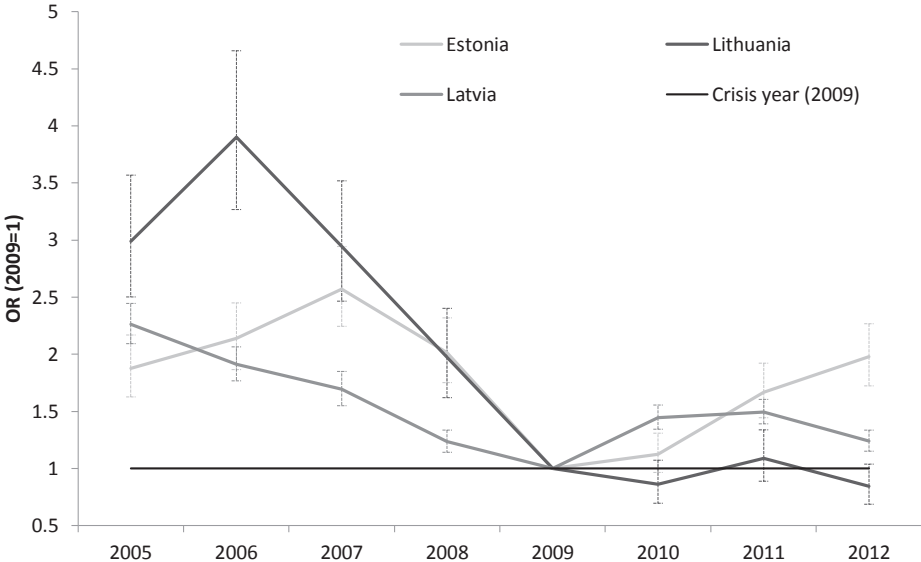
Figure 1. Age-standardised prevalence of unmet medical need in Estonia, Latvia and Lithuania, 2005–2012



2005 to 15.4% in 2009. After the crisis this trend reversed, with unmet medical need peaking at above 21% in 2010–2011 and reducing again to 18.6% in 2012. In Estonia and Lithuania the prevalence of unmet need followed a similar path, starting at 8.5 and 9.4% respectively and, after a small increase 2006–2007 reducing to 5.0% (Estonia) and 3.3% (Lithuania) in 2009. After the crisis, unmet need steadily increased year on year in Estonia, to 8.6% in 2012, but remained fairly stable in Lithuania (at 3.5% in 2012).

Figure 2 and Appendix Table S3 shows the change in access to services in comparison to the baseline year (2009). The weighted odds ratio (OR) for reporting unmet medical need after the crisis is larger than 1.00, indicating an increase as compared to before the crisis, in Latvia (OR: 1.45, 95% confidence interval (CI): 1.34–1.55 in 2010, OR: 1.49, 95% CI: 1.39–1.60 in 2011 and OR: 1.24, 95% CI: 1.15–1.34 in 2012) and Estonia (OR: 1.12, 95% CI: 0.96–1.31 in 2010, OR: 1.67, 95% CI: 1.44–1.92 in 2011 and OR: 1.98, 95% CI: 1.72–2.27 in 2012). In Lithuania, the ORs have fluctuated below and above the baseline at non-significant levels (OR: 0.86, 95% CI: 0.69–1.07 in 2010, OR: 1.09, 95% CI: 0.89–1.34 in 2011 and OR: 0.84, 95% CI: 0.69–1.04 in 2012). Unlike in Estonia and Lithuania, in Latvia unmet medical need is consistently lower for respondents with post-secondary level of education.

Figure 2. Change in unmet medical need (OR) in Estonia, Latvia and Lithuania 2005–2012, indexed to 2009



Note: ORs and their 95% Confidence Intervals adjusted for age, sex, marital status and education, weighted for survey sampling

Table 1 shows the change in reasons for unmet medical need in the three countries in 2010–2012 compared to 2009. In Estonia, there has been a significant and progressive

increase in unmet need attributed to waiting times in 2011 and 2012, an increase in unmet need attributed to distance in 2012 and in other reasons (2010–2012). In Latvia, there has been an increase in unmet need attributed to inability to afford care in 2010–2012, and increase in those delaying care to wait and see if the health problem gets better (2012) and other reasons (2011). In Lithuania, there has been an increase in those who could not take time off work or family responsibilities in 2011 and in those delaying care in 2011 and 2012. However, these changes in unmet need have to be considered in terms of their proportion of the total sample. Figure 3 shows trends in age-standardised prevalence of unmet medical need for the three main reasons and the

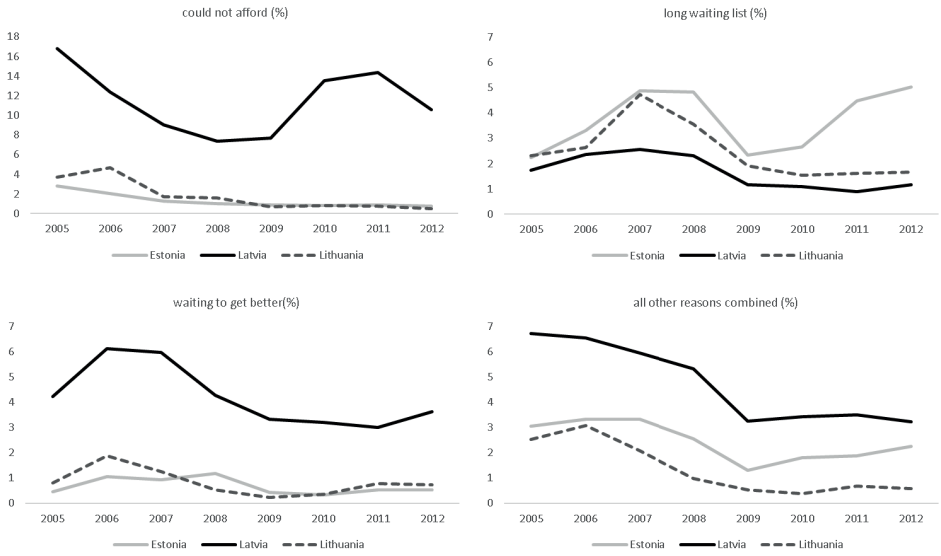
Table 1. Change in reason for unmet medical need (OR) in Estonia, Latvia and Lithuania in 2010 - 2012 compared to 2009 (ORs and 95% confidence intervals)

	could not afford	waiting list	could not take time	too far to travel	wanted to wait	other reasons
Estonia						
2009	1	1	1	1	1	1
2010	0.93 [0.64,1.36]	1.11 [0.89,1.38]	1.05 [0.54,2.05]	1.31 [0.93,1.84]	0.49* [0.27,0.89]	2.08** [1.30,3.32]
2011	1.24 [0.87,1.76]	1.93*** [1.59,2.35]	1.31 [0.68,2.55]	1.34 [0.95,1.90]	0.83 [0.50,1.37]	1.66* [1.01,2.73]
2012	1.16 [0.81,1.65]	2.23*** [1.84,2.69]	1.64 [0.89,3.04]	1.64** [1.19,2.28]	1.1 [0.68,1.77]	2.77*** [1.75,4.40]
Latvia						
2009	1	1	1	1	1	1
2010	1.80*** [1.63,1.98]	0.89 [0.68,1.15]	0.99 [0.79,1.23]	0.86 [0.60,1.22]	1.02 [0.87,1.19]	1.29 [1.00,1.67]
2011	1.96*** [1.79,2.15]	0.69** [0.53,0.91]	0.85 [0.69,1.06]	1.28 [0.93,1.76]	0.94 [0.81,1.09]	1.30* [1.01,1.67]
2012	1.36*** [1.23,1.50]	0.92 [0.71,1.18]	0.79* [0.63,1.00]	1.11 [0.80,1.55]	1.21* [1.04,1.40]	1.29 [0.99,1.66]
Lithuania						
2009	1	1	1	1	1	1
2010	1.18 [0.77,1.79]	0.67** [0.49,0.90]	1.06 [0.42,2.72]	0.96 [0.42,2.19]	1.82 [0.89,3.73]	0.75 [0.33,1.69]
2011	1.26 [0.80,1.96]	0.76 [0.56,1.01]	3.67** [1.58,8.52]	1.1 [0.53,2.27]	2.91*** [1.59,5.32]	0.95 [0.47,1.91]
2012	0.73 [0.47,1.15]	0.64** [0.48,0.86]	1.94 [0.67,5.57]	1.61 [0.84,3.09]	2.31** [1.26,4.23]	0.8 [0.39,1.61]

Note: Odds ratios adjusted for age, sex, marital status and education; weighted for survey sampling. Other reasons include: fear of doctor/hospitals/examination/treatment; did not know any good doctor or specialist; other. * $P < 0.05$ ** $P < 0.01$ *** $P < 0.001$.

combined 'other' category in 2005–2012. The scale of unmet need attributed to inability to afford care in Latvia has been and remains disproportionately high, compared to neighbouring countries and other causes. It has increased during the crisis and remains the single largest barrier to accessing services there, followed by delaying care while waiting to get better. At the same time, Estonia exhibits a sharp increase in unmet need attributed to long waiting lists in 2011 and 2012. Lithuania has shown fairly stable trends in reasons for unmet need post-2009, with long waiting lists remaining as the leading cause but affecting only 2% of respondents.

Figure 3 Changes in reason for unmet medical need (age-standardised), in Estonia, Latvia and Lithuania, 2005–2012



DISCUSSION

Our analysis shows that between 2009 and 2012 unmet need has increased significantly in Latvia (OR: 1.24, 95% CI: 1.15–1.34) and Estonia (OR: 1.98, 95% CI: 1.72–2.27), but not Lithuania (ORs: 0.84, 95% CI: 0.69–1.04). The main drivers of increased unmet need were inability to afford care in Latvia and long waiting lists in Estonia. In Lithuania, waiting lists were also seen as the main barrier, however the increase has been in seen in respondents waiting to get better on their own.

This study has a number of limitations. First, due to the nature of EU-SILC, the data are self-reported, and how unmet need for medical examination or treatment is perceived may vary, both within and among countries and over time, although the extent to which this really is a problem is unclear[18, 19]. Second, the number of respondents reporting

having unmet need in the population is generally low, inevitably reducing the power to detect significant change. Third, there is no reliable and comparable data on utilization of services, which we could include to test if any self-reported increase in unmet need corresponds to factual changes in the levels of health service use in different settings. Finally, in this study we cannot test for a direct causal relationship between the crisis and unmet need although, as we show below, the findings are consistent with what is known about the main policy changes in response to the crisis in each country.

All three the Baltic governments have engaged in substantial budgetary tightening across the public sector, including health. The first shock of the crisis did not seem to have an immediate impact on population health, with the exception of suicides, which increased by more than 10% in 2009–2010[9] and a decrease in road traffic accidents[20]. Immediate large rises in unemployment (by 11.2, 11.8 and 12 percentage points in Estonia, Latvia and Lithuania, respectively[21]), which are frequently associated with certain adverse health outcomes, such as suicide[22], reduced in 2011 and 2012, partially due to improvements in the economic situation, and partially due to migration of the labour force to other EU countries. The similarities between the three countries end at the onset of the crisis, with differences then emerging in their health system preparedness and response.

According to EU-SILC data, Latvia has continuously had one of the highest levels of unmet need among EU countries. Public expenditure on health fell from US\$1380 to 1015 million between 2008 and 2012, whereas the share of private household payments rose from 33.7 to 35.1% over the same period[23]. Deep cuts were implemented across the sector in 2010, including 40% cuts to treatment services, 68% cuts to administration of health care financing, and the virtually complete elimination of existing funding for public health programmes[24]. There has been an emphasis on shifting health expenditure to individuals, with increases of varying scales in a number of pre-existing official co-payments: for outpatient appointments, per diem hospital stay, inpatient surgery, diagnostic services, etc. At the same time, the threshold for exempting those on low incomes had been €170 and below per household member per month but in 2012 this was further reduced to €130. Moreover, in 2009 a cap on the total user charges per person per year was increased from €213 to €570[4]. Given these changes, the finding that the increased need during the crisis and its aftermath was attributed to financial reasons, reversing the previous positive trend, seems intuitive. This change corresponds with these large increases in co-payments. The exemption threshold was already low and even then did not cover the full spectrum of services[4]. In summary, the level of unmet need in Latvia was highest in 2010 and 2011, which corresponds to both the delayed impact of the crisis in terms of reduced household budgets, as well as introduction of austerity measures in form of budget cuts and increases in OOP.

Habicht and Evetovits[5] note that Estonian health system was able to manage even a deep but short-term crisis because it had accumulated reserves in its main financing body, the Estonian Health Insurance Fund (EHIF), as well as benefiting from earlier reforms that eliminated inherited inefficiencies. Cost-saving measures have focussed on reducing hospital costs (by 5–6% in 2010 and 2011) and some restrictions to the benefits package for dental services and temporary sick leave. At the same time, outpatient care has been subject to implicit rationing since 2009 through increases in maximum official waiting times, from 4 to 6 weeks. The financial burden on households did not increase as user charges were maintained at the same level between 2002 and 2012, while the amount of out-of-pocket payments for health by private households as a proportion of total health expenditure decreased from 19.6% in 2008 to 18.2% in 2012[9]. The preparedness of the Estonian health system did not seem to have enabled it to maintain the pre-crisis level of access to care, as unmet need has been rising through 2010–2012, albeit the overall level still remains fairly low. The gradual rise, as well as the predominant reason given by respondents, long waiting lists, indicates the gradual increase in non-price rationing of health services. The above mentioned increase in minimum waiting times, coupled with reduction in fees paid by the EHIF to health providers (table 1), could potentially have led to provider-induced reduction in service supply, resulting in longer waiting lists. While longer waiting times may reduce demand for services without undermining health outcomes[25], reducing timely access may have an impact on clinical quality as well as reducing patient satisfaction[24].

In Lithuania, the existence of a counter-cyclical mechanism and the law requiring gradual year-on-year increase in state contribution for the unemployed and economically inactive population has helped to cushion the impact of the crisis on the budget of the health insurance fund (about 90% of the public health expenditure)[26]. Nevertheless, it was not enough to protect the health system, and, since 2009, there have been large cuts to provider payments, amounting to an average of 19% for secondary care services in 2010, gradually reducing to 11% for 2011 and 2012. For the majority of primary care services, the cuts were between 11 and 3% over the same period[6]. In addition, the crisis took place during the last stage of a prolonged process of reform that sought to improve efficiency in the health sector by shifting care to what was seen as a cheaper primary care setting and reducing reliance on hospital services[27]. However, neither the crisis nor the subsequent measures seemed to have an impact on access, as assessed by EU-SILC data. The level of unmet need remained fairly stable after the crisis, and there even is an indication of a potential improvement. As the cuts fell mainly on providers, it is possible that access to services remained intact for patients if the cuts prompted healthcare providers to reduce inefficiencies (e.g. high reliance on inpatient treatment). At the same time, the results of our analysis by reason for unmet need show an increase in respondents who are delaying care, which could indicate a gradual shift

in a culture of reliance on specialist care bypassing primary level towards more rational service use, or that other barriers are at play from the patients' perspective which delay them from seeking care promptly.

The trends in reasons for unmet need show that the progress achieved before the crisis has been reversed in two of the three countries examined. The main barriers to accessing care before the crisis in Latvia and Estonia (financial cost and waiting times respectively) showed an increase once the countries were hit by financial difficulties. This demonstrates the fragility of progress achieved in health care reform, as governments respond to major economic shocks.

To conclude, this study presents valuable lessons on the impact of the financial crisis and policy response on access to care. Two of the Baltic countries—Estonia and Latvia—experienced worsening access to care, albeit to a different extent and from a different baseline, largely exacerbating already existing barriers. It is concerning that the improvement in access, which was seen in years prior to crisis has reversed, as the Baltic States still tend to lag behind the rest of the EU Member States on many health indicators. The example of Lithuania suggests that that deterioration in access is not inevitable, once health policies prioritise maintenance and availability of existing services at least on pre-crisis levels, or if there is room for reducing existing inefficiencies. In addition, better financial preparedness of health systems in Estonia and Lithuania managed to protect the population from increasing unmet need due to the cost of care, which is an important achievement considering the depth of the crisis.

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CHAPTER 8.1 SUPPLEMENTARY DATA

Appendix Table S1. Economic crisis and health systems response in Estonia, Latvia and Lithuania

	Estonia	Latvia	Lithuania
Health system financing source (% total revenue)	EHIF with 69%, CG with 11%, private with 20% (2011)	CG with 60%; private with 40% (2009)	LHIF with 61%, CG with 10%; private with 29% (2011)
% GDP change	-4.2% (2008), -14.1% (2009), 2.6% (2010), 9.6% (2011), 3.9% (2012)	-2.8% (2008), -17.7% (2009), -1.3% (2010), 5.3% (2011), 5.2% (2012)	2.9% (2008), -14.8% (2009), 1.6% (2010), 6.0% (2011), 3.7% (2012)
Unemployment (%)	5.5% (2008), 13.5% (2009), 16.7% (2010), 12.3% (2011), 10.0% (2012)	7.7% (2008), 17.5% (2009), 19.5% (2010), 16.2% (2011), 15.0% (2012)	5.8% (2008), 13.8% (2009), 17.8% (2010), 15.4% (2011), 13.4% (2012)
Public expenditure on health (PPP\$ per capita) [9]	1042 (2008), 1035 (2009), 1010 (2010), 1041 (2011), 1107 (2012)	741 (2008), 648 (2009), 657 (2010), 651 (2011), 674 (2012)	939 (2008), 935 (2009), 935 (2010), 965 (2011), 1010 (2012)
Areas of response measures	Reduction in CG spending; using reserves to compensate for loss of revenues to health insurance fund, cuts to provider payments, reduction in sick leave entitlements, reduction in dental coverage, increase in maximum outpatient waiting times, reduction of pharmaceutical costs.[5]	Cuts to PHE; increase in OOPs for specialist outpatient and inpatient care; introduction of global budgets for hospitals, prioritising some services and excluding others; service restructuring; pharmaceutical policy reforms. [4]	Reduction in CG spending; NHIF spending maintained due to existing compensatory mechanisms ¹ ; cuts to provider payments for specialist outpatient and inpatient care; reduction in sick leave entitlements, reduction of pharmaceutical costs.[6]

PHE – public expenditure on health; EHIF – Estonian Health Insurance Fund; CG – Central Government; LHIF – Lithuanian Health Insurance Fund; Source: Eurostat [21], unless stated otherwise

1 LHIF spending maintained due to measures implemented before the crisis: (1) counter-cyclical mechanism where social health insurance payments for employed population are calculated based on average salary lagged by 2 years; (2) legislation requiring year-on-year increase in state payments for the unemployed and economically inactive groups.

Appendix Table S2. Survey samples 2009-2012

	2009			2010			2011			2012		
	Obs	Mean	SD	Obs	Mean	SD	Obs	Mean	SD	Obs	Mean	SD
Estonia												
age	11308	45.73	19.21	11219	46.01	19.15	11171	46.76	19.10	11902	47.25	19.12
sex	11308	0.46	0.50	11219	0.46	0.50	11171	0.46	0.50	11902	0.46	0.50
married	11308	0.43	0.49	11219	0.43	0.49	11169	0.43	0.50	11901	0.42	0.49
education	11220	0.24	0.43	11108	0.26	0.44	11072	0.27	0.44	11768	0.28	0.45
unmet need	11220	0.05	0.22	11110	0.05	0.23	11072	0.08	0.27	11770	0.09	0.28
Latvia												
age	12207	48.93	19.26	12999	49.23	19.16	13503	49.67	19.08	12964	50.67	19.02
sex	12207	0.43	0.50	12999	0.43	0.50	13503	0.43	0.49	12964	0.42	0.49
married	12206	0.43	0.50	12999	0.42	0.49	13496	0.41	0.49	12964	0.42	0.49
education	12026	0.25	0.43	12857	0.26	0.44	13354	0.28	0.45	12817	0.30	0.46
unmet need	12065	0.16	0.36	12888	0.21	0.41	13388	0.22	0.42	12843	0.19	0.40
Lithuania												
age	11214	50.47	18.75	11606	49.94	18.65	11028	50.85	18.48	11224	51.73	18.41
sex	11214	0.46	0.50	11606	0.46	0.50	11028	0.46	0.50	11224	0.46	0.50
married	11214	0.60	0.49	11606	0.60	0.49	11028	0.60	0.49	11224	0.59	0.49
education	11138	0.44	0.50	11498	0.45	0.50	10934	0.45	0.50	11161	0.46	0.50
unmet need	10723	0.04	0.19	11425	0.03	0.18	10842	0.04	0.20	11036	0.04	0.20

Appendix Table S3. Change (ORs) in unmet medical need in Estonia, Latvia and Lithuania in 2010-2012 compared to 2009

	2010					
	Odds Ratio	EIM Std. Err.	z	P>z	[95% Conf. Interval]	
Estonia						
survey year	1.1234	0.0874	1.50	0.1340	0.9646	1.3084
age (16-81)	1.0096	0.0021	4.70	0.0000	1.0056	1.0137
sex (male=1, female=0)	0.8729	0.0703	-1.69	0.0910	0.7455	1.0221
family status (married=1)	1.2407	0.0995	2.69	0.0070	1.0604	1.4518
education (post-secondary=1)	0.8476	0.0732	-1.92	0.0550	0.7157	1.0039
_cons	0.0355	0.0047	-24.96	0.0000	0.0273	0.0462
Latvia						
survey year	1.4452	0.0540	9.86	0.0000	1.3432	1.5550
age (16-81)	1.0169	0.0009	18.21	0.0000	1.0151	1.0187
sex (male=1)	0.9511	0.0369	-1.29	0.1970	0.8814	1.0263
family status (married=1)	0.9035	0.0354	-2.59	0.0100	0.8367	0.9756
education (post-secondary=1)	0.7040	0.0318	-7.77	0.0000	0.6443	0.7692
_cons	0.0973	0.0058	-38.97	0.0000	0.0865	0.1094
Lithuania						
survey year	0.8629	0.0954	-1.33	0.1820	0.6949	1.0717
age (16-81)	1.0250	0.0029	8.78	0.0000	1.0193	1.0306
sex (male=1)	0.7271	0.0865	-2.68	0.0070	0.5759	0.9180
family status (married=1)	0.8028	0.0926	-1.91	0.0570	0.6404	1.0063
education (post-secondary=1)	0.9020	0.1004	-0.93	0.3540	0.7252	1.1218
_cons	0.0145	0.0031	-19.99	0.0000	0.0096	0.0220

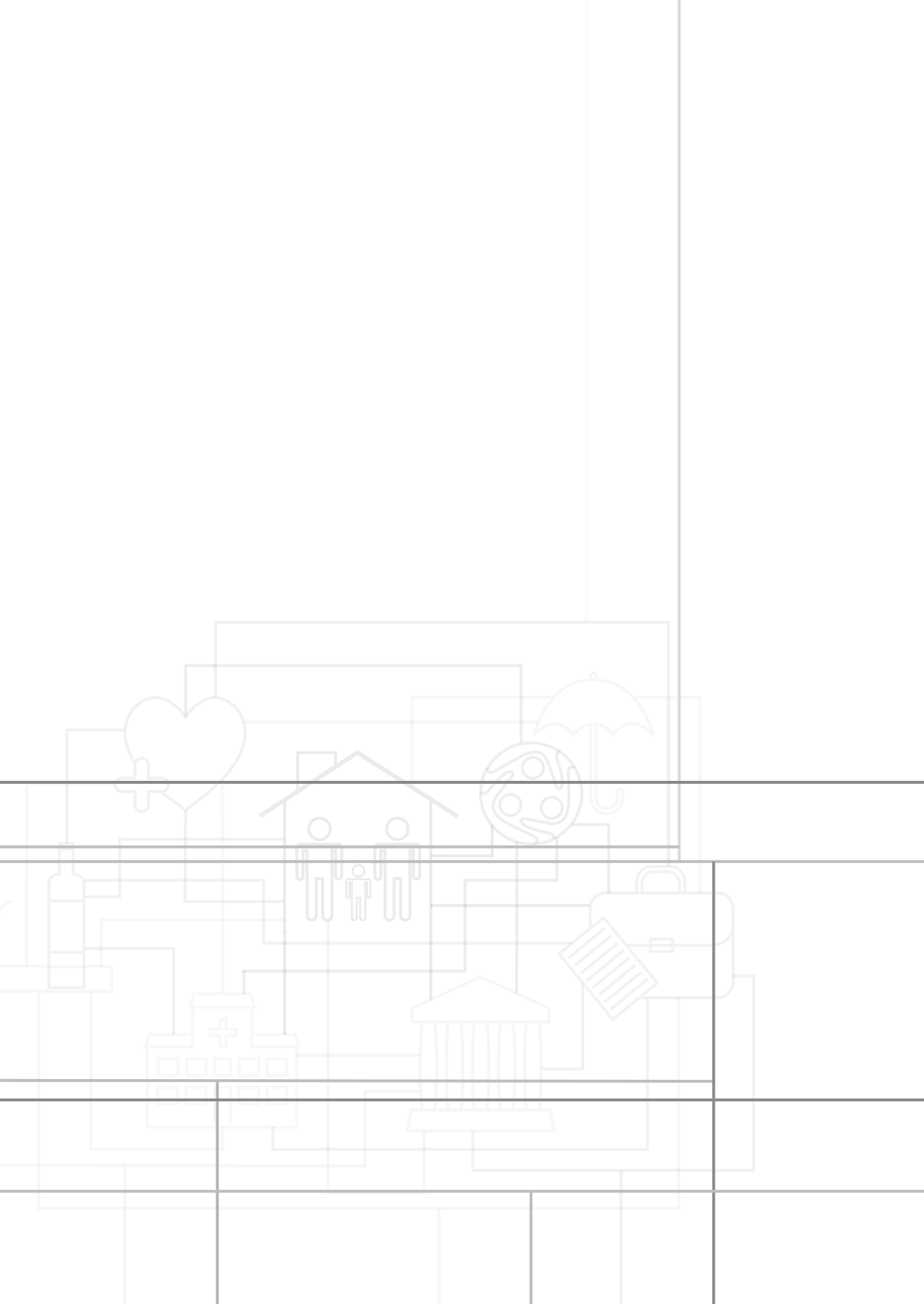
Appendix Table S3 (continued)

	2011					[95% Conf. Interval]	
	Odds Ratio	EIM Std. Err.	z	P>z			
Estonia							
survey year	1.6656	0.1214	7.00	0.0000	1.4438	1.9214	
age (16-81)	1.0121	0.0019	6.38	0.0000	1.0084	1.0158	
sex (male=1, female=0)	0.8082	0.0587	-2.93	0.0030	0.7010	0.9319	
family status (married=1)	1.0322	0.0752	0.43	0.6640	0.8948	1.1906	
education (post-secondary=1)	0.8532	0.0697	-1.94	0.0520	0.7270	1.0013	
_cons	0.0351	0.0045	-26.21	0.0000	0.0273	0.0451	
Latvia							
survey year	1.4935	0.0545	10.99	0.0000	1.3904	1.6043	
age (16-81)	1.0188	0.0009	20.86	0.0000	1.0170	1.0206	
sex (male=1)	0.9376	0.0354	-1.71	0.0880	0.8707	1.0096	
family status (married=1)	0.9507	0.0360	-1.34	0.1810	0.8828	1.0239	
education (post-secondary=1)	0.7205	0.0308	-7.68	0.0000	0.6626	0.7834	
_cons	0.0868	0.0052	-40.93	0.0000	0.0772	0.0975	
Lithuania							
survey year	1.0898	0.1140	0.82	0.4110	0.8879	1.3377	
age (16-81)	1.0213	0.0028	7.70	0.0000	1.0158	1.0268	
sex (male=1)	0.6837	0.0741	-3.51	0.0000	0.5528	0.8455	
family status (married=1)	0.8127	0.0876	-1.92	0.0540	0.6580	1.0038	
education (post-secondary=1)	0.9467	0.1015	-0.51	0.6090	0.7673	1.1680	
_cons	0.0175	0.0035	-19.98	0.0000	0.0118	0.0260	

Appendix Table S3 (continued)

	2012					[95% Conf. Interval]	
	Odds Ratio	EIM Std. Err.	z	P>z			
Estonia							
survey year	1.9763	0.1384	9.73	0.0000	1.7229	2.2670	
age (16-81)	1.0099	0.0018	5.50	0.0000	1.0063	1.0134	
sex (male=1, female=0)	0.8889	0.0621	-1.68	0.0920	0.7751	1.0195	
family status (married=1)	0.9840	0.0684	-0.23	0.8160	0.8587	1.1276	
education (post-secondary=1)	1.0118	0.0757	0.16	0.8750	0.8738	1.1716	
_cons	0.0366	0.0044	-27.36	0.0000	0.0288	0.0463	
Latvia							
survey year	1.2394	0.0470	5.66	0.0000	1.1506	1.3351	
age (16-81)	1.0182	0.0010	19.18	0.0000	1.0163	1.0200	
sex (male=1)	1.0170	0.0403	0.43	0.6700	0.9410	1.0991	
family status (married=1)	0.9306	0.0370	-1.81	0.0710	0.8608	1.0061	
education (post-secondary=1)	0.6796	0.0309	-8.49	0.0000	0.6216	0.7430	
_cons	0.0884	0.0055	-39.15	0.0000	0.0783	0.0998	
Lithuania							
survey year	0.8437	0.0890	-1.61	0.1070	0.6861	1.0375	
age (16-81)	1.0250	0.0030	8.40	0.0000	1.0191	1.0309	
sex (male=1)	0.7456	0.0830	-2.64	0.0080	0.5993	0.9274	
family status (married=1)	0.8549	0.0946	-1.42	0.1560	0.6883	1.0619	
education (post-secondary=1)	0.9461	0.1033	-0.51	0.6120	0.7638	1.1718	
_cons	0.0136	0.0030	-19.59	0.0000	0.0089	0.0209	

Note: Weighted for survey sampling



Chapter 8.2

The impact of the crisis on the health system
and health in Lithuania

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INTRODUCTION

In 2009, Lithuania faced a deep financial crisis. GDP fell by 15% and unemployment more than tripled in one year. In response, the government implemented strict fiscal consolidation measures (see Appendix 1). Public funding for the health system was partially protected from large reductions in SHI revenue thanks to counter-cyclical mechanisms that were in place before the crisis and strengthened in response to the crisis. Cuts to health services were tailored to try and increase provider efficiency in the short run. Over a longer period, however, they could lead to cumulating deficits and, therefore, needed to be supported by a shift in service provision towards prevention, primary care and outpatient settings. Through carefully implemented reforms, the health system was able to lower spending on pharmaceuticals without damaging access, even under crisis conditions.

THE NATURE AND MAGNITUDE OF THE FINANCIAL AND ECONOMIC CRISIS

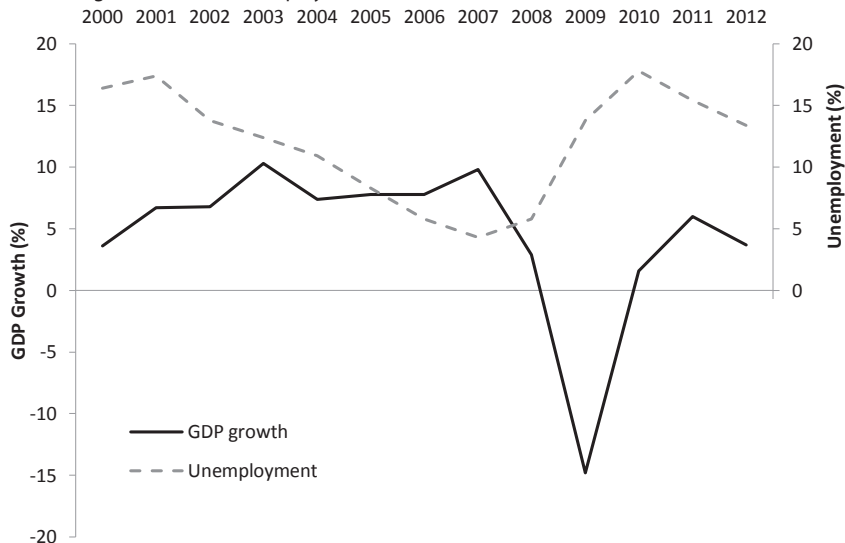
The origins and immediate effects of the crisis

The financial crisis impacted severely on Lithuania's economy in 2009 when GDP fell by nearly 15% in comparison to the previous year, and unemployment increased from 4.4% in 2007 to 18% in 2010 (Figure 1 and Table 1). One of the major reasons that left Lithuania vulnerable to the economic shock was the expansion of banking sector loans, mostly for real estate, which caused a property bubble that subsequently collapsed. The large growth in banks' loan portfolios during the previous five years was unprecedented: between 2003 and 2008 the annual increase in the total Lithuanian commercial banking system's loan portfolio was, on average, more than 40%. This growth was double that of deposits, and six times greater than the real GDP growth rate[1]. Competition among banks in offering low-interest loans also influenced expectations underlying business and residential investment decisions and fuelled high levels of borrowing as well as intense domestic consumption. As a result, Lithuania found itself with significant deficits in its current and foreign trade accounts, while the growth of wages was much higher compared with labour productivity.

Prior to the onset of the crisis and during the first three years (2005–2007) of Lithuania's membership of the EU, the country received significant financial transfers of about €12.8 billion from external sources: €2.7 billion of EU support (mainly from EU structural funds), €1.8 billion in remittances from emigrants (official records) and €8.2 billion of parent banks' funds (mainly from Scandinavia). These transfers amounted to a substantial cash flow, equivalent to about 15–20% of GDP every year. As mentioned above, most of the domestic banks' loans were directed towards the real estate sector, leading to a real

estate bubble. Meanwhile, during this period of growth the country did not accumulate financial reserves. While, the government deficit met Maastricht criterion until 2007, it started increasing in 2008 and peaked at 9.4% in 2009 (Table 1).

Figure 1. Changes in GDP and unemployment in Lithuania, 2000–2012



Source: Eurostat[2]

Table 1. Demographic and economic indicators in Lithuania, 2000–2012

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Population level (thousands)	-	-	-	3,462	3,446	3,425	3,403	3,385	3,366	3,350	3,329	3,053	3,008
People aged 65 and over (% of total population)	-	-	-	14.7	15	15.1	15.3	15.6	15.8	16	16.1	17.9	18.1
GDP per capita (€ per inhabitant)	4,100	4,400	4,800	5,300	5,800	6,300	6,900	7,700	8,000	6,900	7,100	7,700	8,100
Real GDP growth (%)	-	-	-	10.3	7.4	7.8	7.8	9.8	2.9	-14.8	1.5	5.9	3.6
Government deficit (% of GDP)	-	-	-1.9	-1.3	-1.5	-0.5	-0.4	-1.0	-3.3	-9.4	-7.2	-5.5	-3.2
Government consolidated gross debt (% of GDP)	-	-	22.2	21.0	19.3	18.3	17.9	16.8	15.5	29.3	37.9	38.5	40.7
Long term interest rates (10 year government rate)	-	-	5.97	5.22	4.43	3.73	4.00	4.58	-	-	-	-	4.54
Unemployment rate (%)	16.3	7.1	13.2	13.0	11.4	8.4	5.7	4.4	5.9	13.9	18.0	15.5	13.3
Long-term unemployment (%)	8.0	9.8	7.4	5.9	5.8	4.2	2.3	1.2	1.1	3.2	7.4	8.0	6.5

Source: Eurostat[2]

According to official statistics, total (declared plus estimated) emigration was between 24 000 and 27 000 people annually in 2006–2008[3]. After the onset of the crisis, it rose to 35,000 in 2009, 83,000 in 2010 and 54,000 in 2011. During this period, over 80% of emigrants were part of the economically active population, with people aged between 20 and 34 constituting, on average, 55% of the total. The unemployment rate increased rapidly from 5.9% (2008) to 13.9% in 2009 and to 18.0% in 2010. With economic recovery and emigration, it decreased to 15.5% in 2011 and 13.3% in 2012.

Government responses to the crisis

In contrast to some other countries that were severely affected by the financial crisis, Lithuania did not apply to the IMF and European Central Bank for financial aid; instead, the strategy of the Government was to cope with the crisis using its own means by implementing strict fiscal policy, cutting public expenditure and borrowing on international markets. The situation was exacerbated by having to rescue one of the country's mid-sized domestic banks at the end of 2011. In addition to using funds accumulated in the bank deposit insurance fund, this required €725 million from the state budget.

During this period of economic contraction, the long-term interest rate in international markets rapidly increased from less than 5% in 2007 to 9% at the end of 2008, peaking at 14.5% in 2009[4]. Later, as GDP returned to growth in 2010 and subsequent years, markets demonstrated increasing confidence in Lithuania's economy, and the interest rate reduced to 5% in 2010 and 2011, and 4% at the end of 2012.

Fiscally, Lithuania was not prepared for an economic downturn. During the years of fast economic growth that preceded the financial crisis, based partly on the disproportional growth of the real estate sector, which was stimulated by cheap loans, the country did not use available opportunities to accumulate financial reserves. Once the crisis deepened, and facing a deep contraction of the economy, the government chose to introduce strict fiscal discipline and public sector retrenchment. The policies introduced included:

- a reduction in public administration expenditure in 2009: through a 13% reduction of public servants' salaries, and an 8% reduction to those of other public sector employees as well as through public sector downsizing, mainly by merging institutions with similar functions; and
- balancing the social insurance budget and reducing social benefits, for example through such measures as a progressive cut in retirement pensions (from 2.1% to 12.3% for full-time pensioners and from 2.5% to 70% for working pensioners) and social benefits for other groups, as well as the gradual extension of the retirement age.

These measures, together with some tax policy changes (see below) and policies directed towards improving the business environment, were included in the National

Agreement (2009) drawn up in response to the crisis and signed by the government and other stakeholders (representatives of trade unions, businesses and employers, and pensioners) in October 2009[5]. Under this Agreement, some of the cuts (e.g. the reduction in retirement pensions) were abolished in 2012.

At the end of 2008, the government (2008–2012), which had just come to power after national elections, initiated a tax reform in an effort to stabilize public finances. The key elements of the reform introduced at the beginning of 2009 were:

- an increase of the rate of VAT rate from 18% to 21%;
- an increase of corporate tax rate from 15% to 20% with some exceptions for small business; the corporate tax rate was restored to 15% in 2010; and
- splitting income tax, which used to incorporate personal income tax and a health insurance contribution amounting to 24% of salary (on average), into two distinct categories of personal income tax (15%) and health insurance contribution (typically 9%) of total income.

The reform of personal income tax was a continuation of previous reforms directed towards the reduction and equalization of labour taxes. Before 2006, the tax rate was 33% for employees and 15% for the self-employed. In 2006, the rate for employees decreased to 27%, and in 2008, to 24%. Finally, as mentioned in 2009, personal income tax was formally separated from health insurance contributions and the rate of personal income tax was set at 15% for all categories of the economically active population.

Changes in the structure of tax revenue during the period 2006–2011 are shown in Table 2. The main shift was in 2010, when the share of revenues from income and corporate tax fell substantially, accounting for 19% of total tax revenues in comparison to almost 30% in 2008. At the same time, the share of support from EU structural funds increased from 13% in 2008 to 23% in 2010 of the national budget.

Broader consequences

Increasing unemployment and loss of income affected household budgets. In 2011, OOP expenditure constituted 27% of total health expenditure. About two-thirds of OOPs were for pharmaceuticals, as patients have to cover the full price of medicine unless they fall into exemption categories (including children, pensioners and people with chronic diseases) for which between 50% and 100% of the price is reimbursed by the state. The Household Expenditure Survey in 2008[8] showed that average household monthly spending on health care was €11, which was about 4% of average household disposable income, with pensioners' households spending on average €23 (10% of disposable income) on health.

Table 2. Changes in the structure of tax revenue in Lithuania, 2006–2011

	2006	2007	2008	2009	2010	2011
Taxes on income and profits, %, including:	32.5	29.5	29.8	22.6	19	18.2
Personal income tax	20.8	19.0	18.6	15.6	14.9	14.8
Corporate profit tax	11.7	10.5	11.2	7.0	4.1	3.4
Taxes on property, %	1.4	1.2	1.1	1.3	1.5	1.3
Domestic taxes on goods and services, %, incl.	45.0	45.9	47.7	43.2	46.2	47.8
VAT	31.5	32.5	33.7	28.0	31.3	33.3
Excises	12.2	11.7	12.2	13.4	13.0	12.4
Taxes on international trade and transactions, %	0.9	0.9	0.9	0.7	0.8	0.8
Non-tax revenue, %	7.9	7.1	7.2	7.4	9.2	8.5
Capital revenue, %	1.2	1.0	0.6	0.4	0.5	0.6
EU support, %	11.1	14.5	12.7	24.4	22.9	22.8
Total, EUR million	5,659.8	6,964.7	7,934.4	7,033.2	6,750.9	7,394.6

Source: Statistics Lithuania[6, 7]

HEALTH SYSTEM PRESSURES PRIOR TO THE CRISIS

In terms of service provision, the health sector was insufficiently prepared to deal with the financial crisis because of its underdeveloped primary care system, excess capacity of the hospital sector and, as a result, overreliance on inpatient care despite the ongoing attempts to expand the reach of primary care and develop alternatives to inpatient services. In addition, total private expenditure, consisting mostly of OOP payments, are high, constituting 28% of total health expenditure in 2011[9], and may lead to growing financial barriers in accessing health services or pharmaceuticals when households' incomes fall.

In Lithuania, primary care has enjoyed organizational autonomy since 1997 and has performed a gatekeeping role since 2002. Around 90% of the population is registered with a GP or a primary care team. Payment for primary health care consists of a capitation component (82%) and a FFS and performance-related component (18%), which is tied to prevention activities and quality indicators (e.g. chronic disease management). However, the role of primary care is still underdeveloped, as many patients only schedule visits to receive a referral to a specialist[10]. This situation is combined with rather slow reform and excess capacity in the hospital sector. Since 2001, supported by financial incentives for hospitals, the range of alternatives to inpatient services has been increasing, including the introduction of day care and day surgery. In the past few years, the average growth of day surgery has been 10% per year, reaching 34% of all surgical

operations² in 2011[11]. Despite this, there is still an overreliance on inpatient care and the hospitalization rate is one of the highest in the EU (see Murauskiene et al, 2013[12] for further details on health financing and provision of services). Selected indicators for acute hospitals in Lithuania and the EU over recent years are given in Table 3.

Table 3. Acute hospital indicators in Lithuania and the EU, 2006–2011

	2006	2007	2008	2009	2010	2011
Hospital beds per 100,000						
Lithuania	511.5	510.7	505.9	503.4	504.2	509.1
EU average	419.0	410.1	402.8	399.2	393.5	n/a
Hospital discharges per 100						
Lithuania	19.8	19.8	20.0	20.3	20.3	20.5
EU average	15.7	15.6	15.6	15.6	n/a	n/a

Note: n/a: Not available.

Sources: Health Information Centre[9], WHO Regional Office for Europe [13].

Notwithstanding these structural deficiencies, the government’s use of a counter-cyclical mechanism, in this case the compulsory health insurance contributions made by the state on behalf of the unemployed and those who are economically inactive, was a major factor which helped to maintain this source of health sector funding despite falling revenues from those employed due to decreasing wages and increasing unemployment. Following existing legislation, the government has been increasing the share of the health insurance contribution per person insured by the state since 2008, and as a result the transfers from the state budget to the National Health Insurance Fund (NHIF), increased substantially during the first years of the crisis. There were reserves amounting to €125 million in the NHIF at the beginning of 2009 (representing 10% of its budget), consisting of savings made from cancelling advance payments (7.5%) and bonuses (2.5%) to providers. This reserve was utilized to soften the impact of the crisis over the course of 2009.

HEALTH SYSTEM RESPONSES TO THE CRISIS

Changes to public funding for the health system

Health budgets. The NHIF is the single agency responsible for health service purchasing. It manages the compulsory health insurance scheme, accounting for 80 to 85% of public health expenditure. NHIF revenues mainly come from two major sources: health insurance contributions and contributions from the state budget for the economically

2 The definition of day care in Lithuania may include overnight stays.

inactive population and the unemployed as well as additional state budget transfers for some targeted programmes delegated to the NHIF for administration.

Before the crisis, total health expenditure in Lithuania was increasing steadily, and more than doubled between 2004 and 2008 to €2.1 billion. It started to decline in 2009, falling by 6% in comparison to 2008, and by a further 4% in 2010. However, by 2011, total health expenditure had increased almost to the 2008 level (Table 4).

Table 4. Health expenditure trends in Lithuania, 2004–2011

	2004	2005	2006	2007	2008	2009	2010	2011(p)
Total health expenditure (THE) (€ million)	1,035.1	1,223.4	1,493.5	1,788.7	2,142.0	2,007.8	1,963.8	2,122.0
Public	699.3	829.0	1,038.1	1,305.4	1,550.7	1,462.1	1,390.5	1,467.4
of which social security funds	610.0	714.3	875.0	1,048.4	1,260.9	1,226.5	1,173.9	1,249.2
Private	335.8	394.1	455.2	483.1	591.2	545.5	538.9	586.8
of which private households OOP	330.6	388.4	447.8	475.0	579.2	531.3	527.1	573.6
THE as % of GDP (%)	5.7%	5.8%	6.2%	6.2%	6.6%	7.5%	7.1%	6.9%
Public expenditure on health as % of total public expenditure (%)	12.5%	14.9%	13.6%	13.3%	13.4%	12.7%	13.3%	14.0%
Public expenditure on health as % of GDP (%)	3.8%	4.0%	4.3%	4.5%	4.8%	5.4%	5.0%	4.8%
Private expenditure on health as a % of THE (%)	32.4%	32.2%	30.5%	27.0%	27.6%	27.2%	27.4%	27.7%
Private expenditure on health as % of GDP (%)	1.8%	1.9%	1.9%	1.7%	1.8%	2.1%	2.0%	1.9%
Public expenditure on health as % of THE	67.6%	67.8%	69.5%	73.0%	72.3%	72.8%	70.8%	69.2%
THE per capita (in €)	301.3	358.3	440.0	529.9	637.9	601.2	597.5	658.6

Notes: (p): Preliminary data; THE: Total health expenditure.

Source: Statistics Lithuania[3]

Despite the economic downturn, the transfers from the state budget to the health sector (including contributions to the compulsory health insurance scheme as part of the NHIF's revenue) increased from €493.5 million in 2008 (100%) to €563.9 million in 2009 (114%), to €664.8 million in 2010 (135%) and €643.2 million in 2011 (131%)[3] due to the counter-cyclical mechanism in place and the increasing share of contributions for the inactive population and the unemployed. In light of the massive cuts in other public sectors, maintaining this increase was definitely a challenge for the Government and for the Ministry of Finance; however, the provisions of the Law on Health Insurance, which stipulate the level of the state budget contribution, were adhered to. Consequently, despite the crisis, the health sector was one of the sectors that received more funding as a proportion of total government expenditure in 2009. Between 2007 and 2009, there

were also expenditure increases in the social sector whereas substantial reductions were implemented in general public services and in the defence budget.

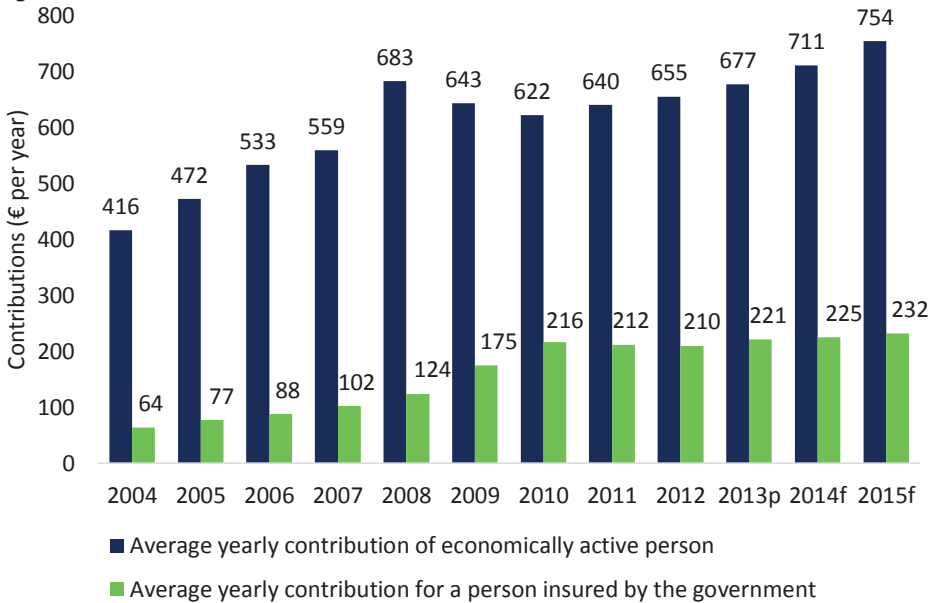
Before the crisis, in absolute terms, private spending on health was growing at a similar rate to public spending, while the share of private expenditure was very gradually decreasing (from 32.4% in 2004 to 27% in 2007). However, already in 2008 there was a rapid increase in private spending in absolute figures and a slight increase in relative terms (Table 4).

External funding increased annually during the crisis, from €10 million in 2007 to €60 million in 2011, as the health system received a total of €225 million from EU structural funds during the period 2007–2013[14].

SHI revenue. Under the Law on Health Insurance there are two main sources of SHI revenue: the contributions of the economically active population, which account for approximately 40% of the total population, and the contribution of the state budget on behalf of the economically inactive population (pensioners, children, students, etc.) and the registered unemployed. For 2011, the contributions of the active workforce constituted approximately 60% of health insurance revenue, and the contribution of the state budget for the economically inactive and the unemployed constituted about 40%. The ratio between these two sources has changed over different stages of the economic cycle, depending mainly on the unemployment rate.

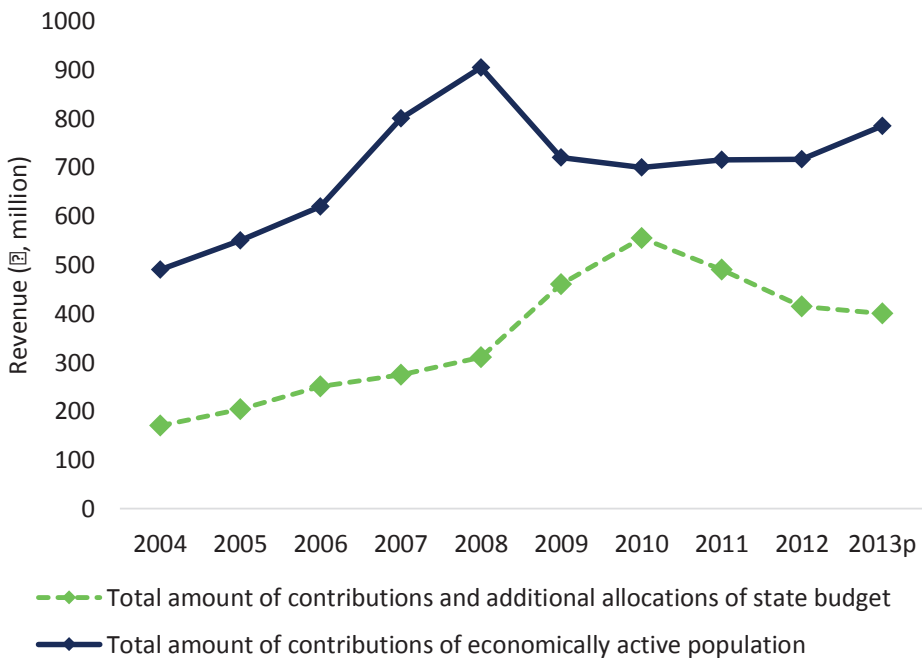
One important aspect, which is also the basis of the counter-cyclical mechanism, is that the state's contribution is tightly and retrospectively bound to that of the economically active population. In 1998, the Law on the Health System stipulated that public spending on health had to be at least 5% of GDP. However, this target was never achieved and eventually the provision was abolished as unconstitutional in 2002. Nevertheless, there was a need to establish a mechanism to ensure a gradual increase of the state budget contribution to health financing in accordance with the development of the general economy as well as to maintain the predictability of this financial flow. As a result, in 2004, the average monthly salary of 2003 was set as the basis for the share of the budget contribution towards SHI for the unemployed and inactive groups for forthcoming years. This was changed in 2007 when the state budget contribution was set as a share of the average gross monthly salary, lagged by two years, and this share has increased over time (Table 5). The effect of this measure on the health insurance fund's revenue is shown in Figures 2 and 3.

Figure 2. Contributions to SHI in Lithuania, 2004–2015



Notes: p: Preliminary data; f: Forecast.
Source: NHIF[11]

Figure 3. Functioning of the counter-cyclical mechanism of SHI revenue in Lithuania, 2004–2013



Source: NHIF[11]

Table 5. Share of the state budget contribution for people insured by the government as a percentage of the official (2-year lagged) average salary in Lithuania

	2007	2008	2009	2010	2011	2012	2013	2014	2015
State budget contribution per person (%)	26	27	32	33	34	35	36	37	37

Source: Parliament of the Republic of Lithuania, Health Insurance Law[15]

In addition, the tax reform adopted at the end of 2008 set clear rules for compulsory health insurance contributions. The original rate of personal income tax (24% of gross salary in 2008) contained compulsory health insurance contributions (30% of the personal income tax). This was separated into a distinct tax on income (15%) and a health insurance contribution (9% in most cases). The result of the reform was that there were almost no unjustified exceptions left to SHI obligations and the collecting agents (mainly the Social Insurance Fund and the State Tax Office for some groups) substantially increased their effectiveness in enforcing payment of contributions through the implementation of government policy against the shadow economy and tax avoidance.

However, as can be seen in Figure 3, due to increasing unemployment and decreasing wages the amount of money collected for SHI from the economically active population declined by 20% in 2009, and by 23.3% in 2010 in comparison to 2008. In 2011, it started to recover slightly, and this trend continued in 2012. In contrast, the amount of state budget contributions for people insured through the state budget rapidly increased and more than doubled between 2007 (€263 million) and 2010 (€554 million). According to legislation, the expenditure of the SHI fund has to be balanced with its revenues. The fund can accumulate reserves not exceeding 10% of revenue in a given year. The reserve is built up using previous years' surplus revenue and should be used to cover temporary deficits in revenue or for covering unpredictable expenditures.

Changes to coverage

Population entitlement. There were no essential changes in population entitlement to health care. SHI coverage has expanded slightly since 2009 through the implementation of clearer and more transparent rules for health insurance contributions as well as better collection. At the beginning of 2012, 91% of the population was covered by health insurance. The remaining 9% of the population (e.g. people who did not declare that they had left the country, those in the shadow economy, the homeless) was entitled to urgent care, which involved acute conditions that may result in serious complications, disability or death.

The benefits package. Lithuania has quite a broad benefits package. There were no changes to service coverage and scope of services as a result of the financial crisis, with the exception of a reduction in temporary sick leave benefits, administered by the Social Insurance Agency. Before the crisis, sick leave benefit amounted to 85% of salary, while

since 2009 those on a sick leave receive 40% of salary between the third and seventh day of their illness, and 80% of their salary subsequently.

User charges. As shown in Table 4, historically, private expenditure makes up approximately 30% of total expenditure on health. Virtually all of private expenditure consists of households' OOP payments. The share of private expenditure on health increased slightly during the crisis, from 27% in 2007 to 27.7% in 2011. While the bulk of OOP (about two-thirds) is attributed to payments for pharmaceuticals, private pharmaceutical expenditure decreased during this period[16] This means that providers charged patients more often or with larger amounts for diagnostic tests and treatment. The extent of these charges is difficult to estimate, as some of them are not clearly defined and regulated, and de facto they exist as quasi-formal direct payments[12]. The increase in these charges, as well as in informal payments, has been reflected in a series of population surveys conducted by the NHIF[17], which indicated that between 2009 and 2011, OOP payments increased among survey respondents by 23% for diagnostic tests and by 9% for treatment.

The role of VHI. The introduction of VHI, planned to cover a substantial part of the population, was included in the government's programme between 2008 and 2012. The main rationale for this introduction was the belief that it had the potential to generate substantial additional funding for health care. However, a feasibility study commissioned by the Ministry of Health in 2010 highlighted the population's apparently negative attitude towards the idea of introducing VHI[18] and, therefore, this initiative was not implemented.

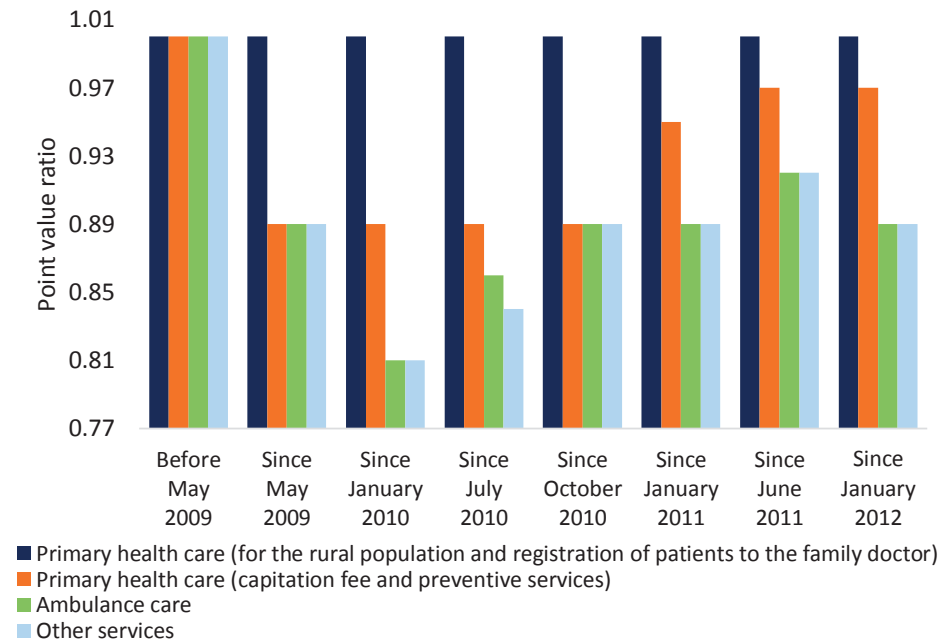
Changes to health service planning, purchasing and delivery

Reducing health service tariffs. An important measure introduced as a response to the crisis was a reduction in the prices of health care services paid to providers by the NHIF. These cuts were made in several rounds, using a mechanism of decreasing point values.

The first round of cuts was made in May 2009, when all prices of health care services were reduced by 11%, with the exception of the bonus payment per capita for the registered rural population and new registrations of patients with a family doctor (versus being registered with a primary health care team), which remained intact throughout the crisis. The next round, in January 2010, involved a further reduction of 8% (reduction of 19% in total) for most services, including ambulance service and specialist inpatient and outpatient care. Only capitation payments and payments for preventive services (accounting for more than 80% of financing for primary care) stayed at the previous level. From July 2010 the lowest point value was gradually restored and remained at 89% until January 2012. There were also three retroactive attempts to partially compensate providers for significant cuts using the reserves. As a result, during the crisis and post-crisis period, prices were never reduced by more than 11% for most services; moreover,

primary care had funding priority and experienced less drastic cuts compared with providers of other health services (Figure 4).

Figure 4. Point value ratios for health care prices in Lithuania, 2009–2012



Source: NHIF[11]

With existing reserves and room to increase efficiency, overall, providers maintained a positive balance in 2009 and 2010. However, by 2011 their reserves were depleted and there was an increasing number of hospitals declaring negative financial results in 2011 and 2012[11].

Planned provider-payment reforms. A long-term strategy of shifting care from inpatient to outpatient, ambulatory and day-care settings started in 2003 and continued during the crisis. The rationale behind this was to reduce existing high rates of inpatient admissions and increase the use of less resource-intensive services (outpatient visits, day care, day surgery and short-term hospitalizations). Thus, the hospital payment mechanism is aimed to incentivize hospitals to provide more of these types of service.

Another important provider-payment reform that was not related to the crisis was the replacement of local case-based payments (in use since 1997) by DRGs (AR-DRGs version 6.0) for payment of acute inpatient care from 2012, after a preparation period in 2009–2011. As a change management measure, the strategy to freeze hospital budgets at the level of 2011 was applied for 2012 and 2013 and did not immediately affect the volumes and prices of services. However, implementation of DRGs triggered a shift in

health services costing. By the end of 2012, a feasibility study was completed to identify alternatives in costing methodology. It is most likely that the pilot project using the selected methodology will take place in 2013–2016 with the aim of compiling comprehensive, detailed and reliable data for the calculation of DRG prices, and benchmarks for the management of the hospital sector at the macro-level, and the management of hospitals at the meso- and micro-levels.

Service restructuring. In 2009, a hospital restructuring master plan was introduced, as part of the broader service reconfiguration strategy being implemented since 2003. The plan consisted of:

- stratification of the hospital network into municipal, regional and national levels;
- the merger of hospitals into larger legal entities, particularly incorporating mono-profile specialized hospitals into multi-profile ones; and
- implementing elements of selective contracting by terminating contracting of surgery, obstetrics and intensive care services with small municipal hospitals that had not met the criteria of a minimal number of major procedures and deliveries.

The plan was implemented until 2012. As a result, some hospitals merged between 2009 and 2012, joining mono-profile hospitals with larger multi-profile institutions and thus reducing the number of legal entities by 25% (from 81 to 61), and some municipal hospitals ceased to provide surgery (eight) and obstetric (three) services. In order to maintain accessibility to a limited scope of services in these hospitals, additional funding was used to assure 24/7 access to a surgeon at an accident and emergency department, who could provide urgent care, conduct minor procedures and refer patients to a larger hospital. In addition, the providers of ambulance care and transfers received some funding to cover the higher number of patients transported to larger hospitals.

Capital investment. During the crisis, the governmental investment in health care projects decreased from €66 million in 2008 to €17 million in 2009, and €14 million in 2010[14]. As the state share of investment dropped sharply, the funding from EU structural funds became the major source of capital investment.

Reductions in health sector salaries and changes to working conditions. The main costs of health care provision are related to the salaries of medical personnel, which account for 50–70% of expenditure in hospitals and 70–80% in outpatient care. Historically, health care sector salaries in Lithuania have been low in comparison with other EU Member States; consequently, a strategy to increase the salaries of medical personnel was implemented between 2005 and 2008, increasing the average monthly salary of health workers from €285 in 2005 to €635 in 2008 and €683 in 2009. However, reductions in the prices of health care services impacted mainly on salaries, which decreased on average by 13% for both doctors and nurses in 2010 and then started to recover gradually. In

2011, the level of salaries was almost back to that of 2009 (€661), and in 2012 exceeded this level (€710)[11].

Pharmaceutical policy reforms. Lithuania belongs to the group of countries (such as the Czech Republic, Poland, Austria, Belgium and Spain) with relatively high consumption rates for pharmaceuticals (with expenditure accounting for 1.7% to 1.9% of GDP and 15% of public health care spending). Public funding covers approximately 35% of total pharmaceutical expenditure. The share of generics accounts for 50% of packages (and 18% of expenditure)[19].

In response to the financial crisis, the Plan for Improving Pharmaceutical Accessibility and Reducing Prices (the “Drug Plan”) was approved in July 2009 and implemented in 2009–2010[20]. The Drug Plan consisted of a set of 28 measures addressed at producers, wholesalers, pharmacists, physicians and patients. The most effective measures of the Drug Plan were the expansion of the list of reference countries for setting reference prices; new requirements for generic pricing and the introduction of cost and volume agreements with producers. A new version of the catalogue of pharmaceuticals reimbursed by the NHIF (positive list) was introduced, and reference prices were set according to the average of eight EU Member States (Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Poland, Romania and Slovakia) minus 5%. The effect of this measure was a substantial decrease in the prices of originators. From 2010, there were also new requirements for generic pricing in order to be reimbursed; for example, the first generic had to be priced 30% below the originator, while the second and third generics must be priced at least 10% less than the first generic. In addition, a reserve list of pharmaceuticals, to be introduced into the catalogue, was established. Moreover, pharmaceuticals started to be prescribed according to the active substance (INN) of the product, while patients were given the possibility to choose the medicine with the smallest co-payment.

The implementation of the plan resulted in a reduction in the reference prices of more than 1000 medicines, and pharmaceutical expenditures by both the NHIF and patient co-payments decreased substantially[16]. It is estimated that in comparison to 2009, €15 million in personal expenditure was saved in 2010, and €19 million in 2011, while the number of prescriptions increased[11], indicating an improvement in access to pharmaceuticals since the introduction of the Drug Plan.

NHIF expenditure on pharmaceuticals and medical devices in the ambulatory care sector decreased from €197.9 million in 2008 to €189.2 million in 2010. These savings created opportunities for the reimbursement of new innovative medicines. In 2011 reimbursement was applied to new drugs for the treatment of lung, breast, stomach and colon cancer as well as for ischaemic heart disease, mental and behavioural disorders, and some other diseases[11].³

3 Some of these new pharmaceuticals include Gefitinibum, Anagrelidum, Pegfilgrastinum, Capecitabinum, Agomelatium, Fulvestrantum, Palonosetronum and Ivabradinum.

Prevention, health promotion and public health. The impact on preventive services provided in primary care varied according to the programme. Some services continued to have funding priorities: funding for prevention of cardiovascular diseases steadily increased annually from €0.28 million in 2006 to €2.76 million in 2011; the new programme for colon cancer screening began in 2009 (€0.38 million) and continued in 2010 (€0.92 million) and 2011 (€0.71 million). At the same time, funding for breast, cervical and prostate cancer screening programmes declined in 2009 and 2010 and partially recovered in 2011[21].

With the exception of the priority services discussed above, the funding for public health was not protected from budget cuts. Before the crisis, the public health budget (both national and municipal) grew from €19.6 million in 2006 to €29.5 million in 2008. Since 2009, there have been substantial cuts: to €22.4 million in 2009 and €18.9 million in 2010 (a 36% reduction compared with 2008) but with a minor recovery to €20.4 million in 2011[14]. According to legislative changes introduced in 2007, public health bureaus, responsible mainly for health promotion, health status monitoring and child health, were established in municipalities. At the state level, following parliamentary decisions in 2011 and 2008–2012 and the government's policy to reduce bureaucracy and related costs, the State Public Health Service was abolished in 2012. Instead, the network of 10 regional public health centres, which are mainly responsible for public health safety and prevention and control of communicable diseases, are now directly supervised by the Ministry of Health.

IMPLICATIONS FOR HEALTH SYSTEM PERFORMANCE AND HEALTH

Equity in financing and financial protection

Changes during the crisis period increased equity in financing health care in terms of revenue collection. The tax reform at the end of 2008 had a positive impact both on vertical and horizontal equity. For example, some self-employed population groups such as artists, sportsmen and other freelancers started to pay contributions on a regular basis according to their income. In addition, the number of population groups paying fixed flat-rate contributions was reduced, and contributions became income based.

Access to services

Health care utilization indicators show that there were no evident changes in access to health care except for a slight temporal decrease of outpatient visits in 2009 and 2010, which then increased in 2011, exceeding the pre-crisis level (Table 6). However, the increase in OOP expenditure and data from patient surveys[17] indicate the presence of

Table 6. Health service utilization per inhabitant in Lithuania, 2006–2011

	2006	2007	2008	2009	2010	2011*
Visits to GPs	4.4	4.6	4.7	4.6	4.5	4.7
Outpatient visits per person	6.6	6.9	7.0	6.9	6.9	7.2
Inpatient admissions per 100, total	21.6	21.6	21.8	22.2	22.2	22.7
Inpatient admissions per 100, acute	19.8	19.8	20.0	20.5	20.4	20.7
Day cases per 100, total	0.9	1.3	1.5	1.6	1.9	2.2

Note: *The increase across all indicators indicates a substantial change in the denominator (total population) as a result of more accurate recording of migration data and the availability of 2011 census data; corrections in population estimates for preceding years have not yet been published.

Source: Health Information Centre[9].

additional financial barriers to access to care. There is no comprehensive data on waiting lists.

According to EU-SILC survey data on self-reported unmet medical need, Lithuania's average unadjusted rate improved from 10.1% in 2005 to 3.6% in 2009; after that, unmet need increased to 4.4% in 2011 mainly for financial reasons and because patients chose to delay treatment[2].

Impact on efficiency

Certain measures, mostly pre-dating the crisis, continued to address inefficiencies within the health system. First, established priorities, such as strengthening primary care, treating patients outside inpatient settings and prevention, were maintained. Second, in line with reform of the hospital network, some services (surgery, obstetrics) were moved from local to larger hospitals.

To some extent, the measures taken during the crisis enabled the health system to manage with less. The most successful example is the implementation of the Drug Plan, which reduced pharmaceutical expenditure and improved patients' access to pharmaceuticals. In addition, reductions in the prices of health care services forced providers to maintain provision of services with lower levels of funding.

There is no comprehensive information related to changes in the quality of care. However, the maintenance of service provision levels by providers facing reduced budgets presumably resulted in cuts to the salaries of medical personnel, which could potentially have had a negative impact on quality of care.

Quality of care

According to the population survey conducted by the NHIF[17], waiting times and large co-payments were named as the main barriers to accessing health care. Between 2009 and 2011, the share of respondents indicating that they had experienced difficulties in accessing care with regard to visits to a specialist increased from 38% to 58%, for

diagnostic tests from 27% to 40%, and for elective surgery from 11% to 19%. According to the same survey, the share of respondents assessing quality of care as low increased from 13% in 2009 to 28% in 2011. However, this was a general judgement not based on any specific aspect of quality.

Transparency and accountability

The tax reform of 2008 brought positive changes to transparency and accountability to tax payers. The separation of the SHI contribution into a separate component and improved collection served as a signal to tax payers, quantifying their input into the public financing of health care as well as emphasizing their duty to make the required contribution. Moreover, under strict fiscal discipline, general transparency and accountability in public finances has improved. For example, the Ministry of Finance initiated the implementation of a system for national budget monitoring while the Cabinet and the Ministry of Finance have tightened the terms of use of the compulsory health insurance fund's reserve.

Impact on health

While the financial crisis has not had an obvious impact on the overall health status of the population in Lithuania, falling incomes and rapid growth in unemployment (peaking at 17.8% in 2010) theoretically increases the number of people at risk of suicides, mental health problems or not being able to access health services. The available evidence on changes to health mainly relates to an increase in suicides, depression and HIV infections, and a decrease in road traffic accidents and alcohol-related morbidity and mortality (Tables 7 and 8).

Table 7. Selected health indicators in Lithuania, 2002–2011

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Depression (incidence per 100,000)	69.5	65.6	64.1	54.7	52.0	45.2	48.0	53.6	64.3	n/a
Addiction disorders (incidence per 100,000)	79.8	72.9	76.6	95.3	89.4	101.2	93.0	72.7	67.6	74.8
Suicides (DSR per 100,000)	44.7	42.1	40.2	38.6	30.9	30.4	33.1	34.1	31.0	31.6
Alcohol-related deaths (DSR per 100,000)	29.0	32.2	32.0	36.4	43.7	51.6	43.9	30.5	29.3	29.3
Transport accidents (DSR per 100,000)	23.9	24.7	25.1	25.9	26.5	26.0	17.9	13.7	11.3	11.2

Note: n/a: Data not available; SDR: standardized death rate.

Sources: Health Information Centre[9]; State Mental Health Centre[26]

Table 8. HIV incidence (absolute numbers) according to transmission mode in Lithuania, 2006–2011

	2006	2007	2008	2009	2010	2011
Heterosexual	15	27	26	34	26	31
MSM	8	4	9	9	5	7
Injecting drug users	62	59	42	117	106	86
Unknown	15	15	18	20	16	41
Perinatal	0	1	0	0	0	1
Total	100	106	95	180	153	166

Source: Centre for Communicable Diseases and AIDS[27]

Historically, Lithuania has the highest recorded rate of suicides in the WHO European Region; however, a steady decline in deaths from suicides and self-inflicted injuries was seen during a number of years prior to the crisis, leading to the rate of 28.4 per 100,000 in 2007. This trend reversed in 2008 and 2009, amounting to an increase in the suicide rate to 31.5 per 100,000, and slightly decreasing since.

In mental health, depression increased during 2008–2010, reversing the previous falling trend. Similar results (on self-reported depression) have been reported in the population health survey, particularly in women (from 17% in 2008 to 25% in 2010), but also in men (from 25% in 2008 to 27% in 2010) [22]. Addiction disorders decreased, driven primarily by a reduction in mental health disorders caused by alcohol abuse, in line with other alcohol-related trends (see below). This was due to anti-alcohol policies introduced in 2007 and 2008, irrespectively of the crisis.

The introduction of anti-alcohol policies, prompted by rising alcohol consumption and worsening of alcohol-related health outcomes in the years leading to the crisis, had a positive impact in reducing alcohol-related mortality. In addition, road traffic deaths halved as a result of a combination of factors, including enforcement of road traffic safety[23], anti-alcohol measures[24] and the effects of the financial crisis[25]. Initially very noticeable, these changes seemed to slow down in 2011 but are still at levels that are higher than the EU average, indicating that the initial impetus has worn off.

According to data from the Lithuanian Centre for Communicable Diseases and AIDS, there was a substantial increase in HIV incidence in the period 2009–2011 in comparison with previous years [27], see also Table 8. Since 2004, HIV incidence had been gradually falling from 3.9 per 100 000 population in 2004 to 2.8 in 2008; however, it nearly doubled to 5.4 in 2009, 4.7 in 2010 and 5.2 in 2011[9]. The increase in absolute numbers was mainly seen among injecting drug users, which has been the main mode of HIV transmission in Lithuania (Table 8). Between 2006 and 2010, there was a reduction in funding available for needle exchange programmes, with distribution amounting to an estimated 45 syringes per user per year[28].

The results from an adult population health survey[22] showed that, overall, the proportion of respondents assessing their health as good remained relatively stable between 2008 and 2010, at 53% for men and 52% for women, with longer-term trends indicating an improvement since 2004. There were some positive trends towards healthier lifestyles in 2010. For men, daily smoking decreased from 39% in 2008 to 34% in 2010, while it increased slightly from 14% to 15% for women during the same period. The proportion of respondents drinking strong alcohol decreased in both sexes between 2008 and 2010, from 29% to 24% in males and from 12% to 9% in females. These trends are mirrored in national statistics, as cigarette sales fell by 33% in 2009 and by 39% in 2010 compared with 2008 sales. However, these figures have to be treated carefully because of the possible increase in illegal tobacco sales. Alcohol consumption showed similar trends. However, the improvements in both indicators were short term, particularly in the case of alcohol, as in 2011 consumption bounced back to exceed pre-crisis levels (Table 9).

The medium- and long-term impact of the financial crisis on health is still unclear. However, evidence from previous recessions shows that sharp rises in unemployment and loss of income have long-term effects on health, particularly that of the most vulnerable.

Table 9. Smoking and alcohol consumption indicators in those aged 15+ in Lithuania, 2007–2011

	2007	2008	2009	2010	2011
Smoking, cigarettes per inhabitant (15+ population) per year	1,457	1,421	947	863	987
Alcohol (100%) consumption, litres per inhabitant, (15+) population) per year	13.4	13.3	12.4	12.9	14.1

Source: Health Information Centre[9]

DISCUSSION

Drivers of change

The most important factors driving crisis-related changes in Lithuania were agents external to the health system – the parliament, the government and the Ministry of Finance. The new conservative-led coalition government that came to power in December 2008 had to take urgent measures to reduce public spending in order to cope with the crisis that had started to unfold. The government and the Ministry of Finance involved representatives of the Ministry of Health and the NHIF in discussions and the preparation of draft legislative amendments in response to the crisis.

The crisis was regarded both as a challenge (bearing in mind the depth of the economic downturn) and as an opportunity to implement unpopular but necessary reforms.

An example of such reforms was the restructuring of the hospital network with some reconfiguration of hospital services. However, the measures taken to rationalize hospital care were not sufficient[29] and showed modest results. Therefore, it could be argued that this opportunity was not used to its full extent. However, it should be recognized that the government at the time was working under huge time pressure, reacting to the consequences of the quickly deteriorating economic situation, and may not have had enough time to prepare and implement more comprehensive strategies.

Content and process of change

In May 2009, the World Bank presented the Social Sector Public Expenditure Review on Lithuania. On the basis of this review and its own analysis, the Ministry of Health prepared a strategy for the period 2009–2012. The main elements of this strategy were to strengthen primary care further; greater expansion of day care; reform of the hospital network, with a reconfiguration of services; and changes to pharmaceutical policy. To various extents, these measures were implemented by 2011 and 2012.

Prioritization of primary care, outpatient care and day care were, in fact, the continuation of pre-crisis policies and, therefore, were easy to pursue. Moreover, since the cuts in health care prices were differentiated, these services (primary care, outpatient care, day care and preventive services) saw less of a price reduction compared with other services. The funding for some public health prevention programmes financed through the NHIF (cancer and cardiovascular screening) also increased. At the same time, the state-funded public health budget was not protected by any counter-cyclical mechanism and so experienced substantial cuts.

The most difficult policies to implement were hospital reform (because of strong resistance from providers) and the Drug Plan (because of its complexity, with 28 measures). From the middle of 2009, substantial cuts in health services prices were introduced, and this measure quickly affected providers by forcing them to maintain services at lower cost, resulting in significant reductions in the salaries of medical personnel. To a certain extent, this helped the Ministry of Health to prepare and introduce more complex and difficult measures, such as the restructuring of the hospital network. The hospital restructuring and reconfiguration plan was partially fulfilled: mergers resulted in a decrease of 25% in the number of acute care providers (as legal entities), joining most of the mono-profile hospitals with larger multi-profile institutions. However, the overcapacity in inpatient care still remained, together with a high hospitalization rate.

Among the changes that were discussed but not implemented were the introduction of formal user charges and VHI. However both were dropped because of negative reactions from the population.

Some intersectoral action, coinciding with the crisis and involving improvements in road safety and alcohol control measures, resulted in a substantial reduction of road traffic deaths in 2008–2010.

Implementation challenges

Overall, there was quite strong motivation and political will to implement reforms at the central political level (parliament, government, Ministry of Health, Ministry of Finance). However, for hospital restructuring, there was resistance from municipal governments, which, as hospital owners, tried to protect local hospitals from the centralization of inpatient care. Therefore, not all planned restructuring was implemented, although this was not directly a result of the crisis. There was also resistance from health professionals anxious about the reductions in the prices of services, as they resulted in a decrease in salaries. However, these measures were pushed through mainly on the strength of the government's prevailing opinion that priority should be given to the health system's financial sustainability as a basis for future recovery.

Resilience in response to the crisis

Fiscally, Lithuania was not prepared for an economic downturn. During the years of fast economic growth (2004–2007), based partly on a real estate bubble, the country did not use all the available opportunities to collect financial reserves. As the economy rapidly contracted, the government introduced strict fiscal discipline and cuts to public sector spending. The health sector's preparedness was also insufficient because of existing inefficiencies and steady growth in input costs. However, in 2008, the reserve of the compulsory health insurance fund, which is responsible for over 85% of public expenditure on health, accounted for 7.5% of the total fund's budget. This reserve was utilized to soften the impact of the crisis at the beginning of 2009 but the reserve could not cover the simultaneous significant decrease in revenue. The two-year, counter-cyclical mechanism underlying SHI revenue collection on behalf of the state and the increasing size of the state contribution as a proportion of official salaries meant that the level of state budget transfers for people insured by the state rapidly increased in the first two years of the crisis. These measures softened the impact of reductions in health insurance revenues and enabled the government to avoid extreme cuts in health spending.

The Lithuanian health care system has learnt a number of lessons from going through the crisis. First, cuts to services, even if tailored to increase the efficiency of providers in the short term, lead to cumulating deficits in the long term and, therefore, should be supported by structural changes related to shifts in responsibilities and resources from inpatient to outpatient care settings, and from specialized to primary care. Second, the success of the Drug Plan indicates that complex measures involving multiple stakeholders that are consistently implemented can decrease expenditure and increase

accessibility of pharmaceuticals. Third, a health care financing model based on a mix of contributions (SHI contributions from the economically active population and transfers from the budget for those insured by the state) in combination with a counter-cyclical mechanism proved its capacity to counteract falling revenues and to ensure that the share of public spending on health remained intact during the crisis.

Because of the time lags involved, it is still too early to assess the medium- to long-term impact of the crisis on the health system and population health in Lithuania.

CONCLUSIONS

Lithuania's health care system experienced substantial financial pressure under the large contraction of the country's economy in 2009 (GDP fell by almost 15%). The health system was not properly prepared for the crisis because of the existing inefficiencies in the inpatient sector and primary health being limited in its role in providing appropriate curative and preventive services in the community. At the same time, Lithuania's health financing model based on a single purchaser, a mix of SHI revenue sources, and a counter-cyclical mechanism, proved its vitality as public financing for health care was affected much less than the economy in general.

The main policy during the crisis period was to maintain access to the health benefits package provided by the publicly funded health care system. In order to do this, providers were forced to increase efficiency through reductions in the prices of services covered by the NHIF, restructuring of the hospital network and introducing incentives to treat more patients in primary care and outpatient settings. As a result, there were no changes in health coverage during the crisis. The main drawbacks of the reform measures undertaken during the crisis period were the reduction to health care workers' salaries and hospitals growing financial deficits. While service utilization data showed no major changes, it is difficult to interpret these data because of changes in population numbers. However, population surveys and the increase in OOP payments indicate that some reductions in access to care have been experienced.

As demonstrated by the Drug Plan, well-designed and properly implemented complex measures can decrease expenditure without impairing accessibility (of medicines) even in conditions of crisis.

The crisis seems to have had a short-term impact on the population's mental health, reflected in the increases in depression, addiction disorders and suicides rates. In addition, there has been an increase in HIV incidence among injecting drug users. At the same time, there has been a decrease in road traffic accidents and alcohol-related morbidity and mortality, as well as temporal reductions in the consumption of tobacco and alcohol. The medium- and long-term impact of the financial and economic crisis on

health is still unclear; however, evidence from previous recessions shows that sharp rises in unemployment and loss of income affect the health of the most vulnerable groups well into the future.

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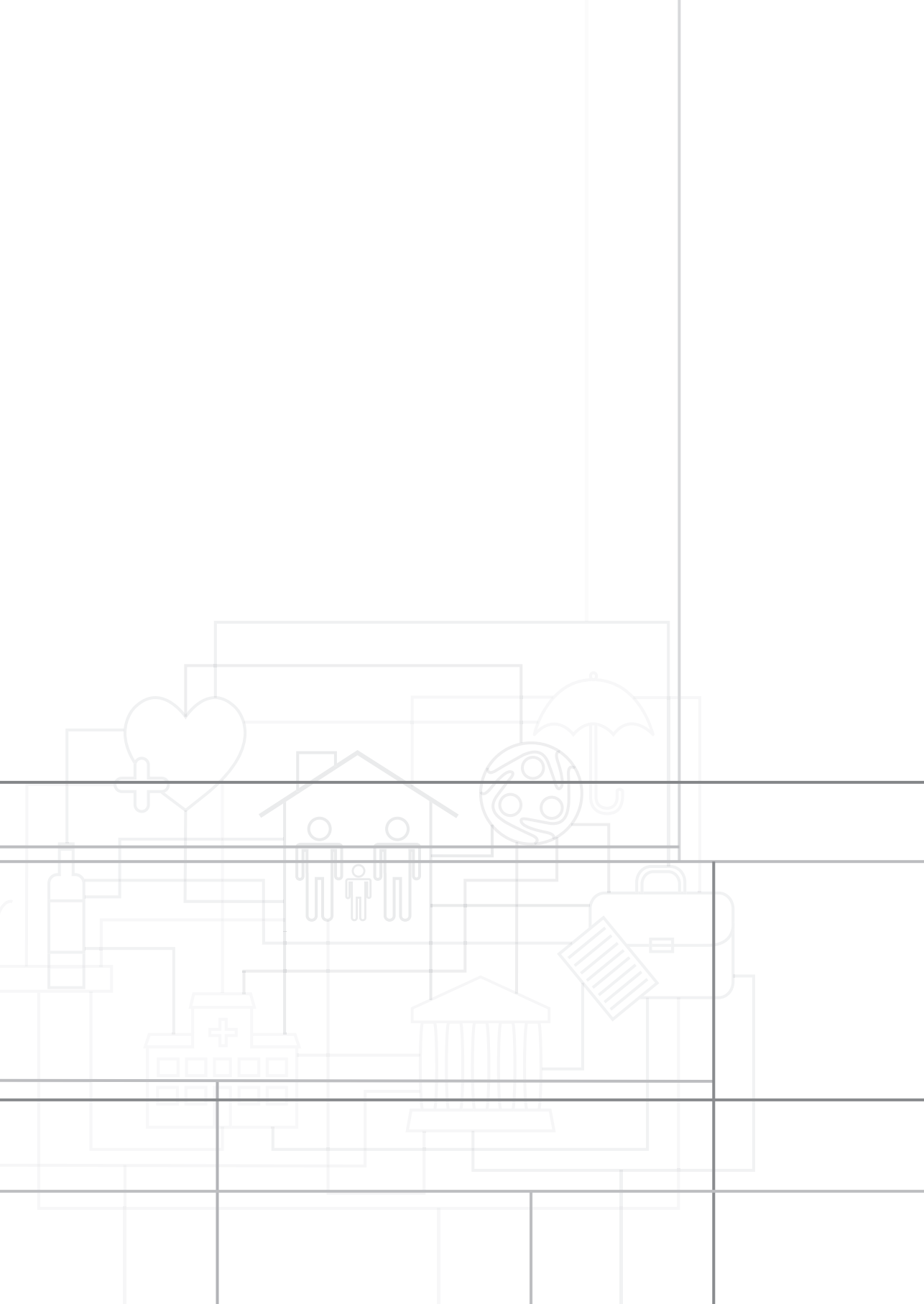
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CHAPTER 8.2 SUPPLEMENTARY DATA

Appendix 1. Major crisis-related events and changes in the health system in Lithuania, 2008–2011

Date	Event/action
2008	Government, with parliament's support, implemented tax reform, separating personal income tax into a personal income tax component and a SHI contribution Unemployment rate reached 5.9%
2009	Ministry of Health and the NHIF implemented a policy to reduce the prices of services paid to health care providers by the NHIF Ministry of Health implemented a plan for improving pharmaceutical accessibility and reducing prices ("The Drug Plan") National Agreement on Crisis Measures is signed between the government and social partners Government begins an ongoing programme for the restructuring of health care institutions, particularly hospitals and services (until 2012)
2010	Unemployment rate peaked at nearly 18% NHIF revenues declined by 23.3% (compared with 2008) due to increasing unemployment and decreasing wages New requirements for generic pricing and prescribing by INN came into force Salaries for doctors and nurses declined by an average of 13% (but recovered to over pre-crisis levels in 2012)
2011	Reimbursement was applied to new drugs for the treatment of lung, breast, stomach and colon cancer as well as for ischemic heart disease, mental health and behavioural disorders, and some other diseases
2012	In conjunction with reductions to some parts of the public health and prevention budget, the State Public Health Service was abolished Unemployment level stabilized at 13.3%



Chapter 9

General discussion

SUMMARY OF MAIN FINDINGS

The financial crisis in Europe has posed major threats to health, but also some opportunities. In Chapter 2, we trace the origins of the economic crisis in Europe and the early responses of governments, we examine the effects on health systems, and review the effects of previous economic downturns on health to predict the likely consequences of the present crisis. We then compare our predictions with available evidence on the effects of the crisis on health. There we find that while immediate rises in suicides and falls in road traffic deaths were anticipated, other consequences, such as HIV outbreaks, were not, and are better understood as products of state retrenchment. Greece, Spain, and Portugal adopted strict fiscal austerity; their economies continued to recede over the following years, and strain on their health-care systems increased. Suicides and outbreaks of infectious diseases became more common, while budget cuts have restricted access to health care. By contrast, Iceland rejected austerity in a popular vote, and there the financial crisis seemed to have had few or no discernible effects on health. Although there are many potential differences between countries that could lead to confounding, our analysis suggests that, although recessions pose risks to health, the interaction of fiscal austerity with economic shocks and weak social protection was what ultimately escalated health and social crises in some European countries. Policy decisions about how to respond to economic crises had pronounced and unintended effects on public health, yet public health voices have remained largely silent during the economic crisis.

Chapter 3 then follows with an analysis on how recession affects employment of people in ill-health. Specifically, it looks at how healthy and unhealthy persons fared in labour markets during Europe's 2008-2010 recessions and whether national differences in employment protection helped mitigate any relative disadvantage experienced by those in poor health. Two retrospective cohorts of persons employed at baseline were constructed from the European Statistics of Income and Living Conditions in 26 EU countries. The first comprised individuals followed between 2006 and 2008, $n=46,085$ (pre-recession) and the second between 2008 and 2010, $n=85,786$ (during recession). We used multi-level (individual- and country-fixed effects) logistic regression models to assess the relationship (overall and disaggregated by gender) between recessions, unemployment, and health status, as well as any modifying effect of OECD employment protection indices measuring the strength of policies against dismissal and redundancy. Those with chronic illnesses and health limitations were disproportionately affected by the recession, respectively with a 1.5- and 2.5-fold greater risk of unemployment than healthy people during 2008-2010. During severe recessions ($>7\%$ fall in GDP), employment protection did not mitigate the risk of job loss (OR=1.06, 95% CI: 0.94-1.21). However, in countries experiencing milder recessions ($<7\%$ fall in GDP), each additional unit of employment protection reduced risk of job loss (OR=0.72, 95% CI: 0.58-0.90).

Before the recession, women with severe health limitations especially benefited, with additional reductions of 22% for each unit of employment protection (AOR female =0.78, 95% CI: 0.62-0.97), such that, at high levels, the difference in the risk of job loss between healthy and unhealthy women disappeared. Employment protection policies may counteract labour market inequalities between healthy and unhealthy people, but additional programmes are likely needed to protect vulnerable groups during severe recessions.

The most comprehensive overview of the early and mid-term effects of the 2008 financial crisis in high income countries was compiled in a systematic narrative literature review in Chapter 4. It includes evidence published between January 2009 and July 2015 and includes 122 studies. The review finds that the 2008 financial crisis had negative effects on mental health, including suicide, and to a varying extent on some non-communicable and communicable diseases and access to care. Although unhealthy behaviours such as hazardous drinking and tobacco use appeared to decline during the crisis, there have been increases in some groups, typically those already at greatest risk. The health impact was greatest in countries that suffered the largest economic impact of the crisis or prolonged austerity. It concludes that the Great Recession in high-income countries has had mixed impacts on health. They were worse when economic impacts had been more severe, prolonged austerity measures had been implemented, and there had been pre-existing problems of substance use among vulnerable groups.

Chapter 5 asks if the global financial crisis and its aftermath impacted upon the performance of health systems in Europe. It investigates trends in amenable and other mortality in the EU since 2000 across 28 EU countries using Joinpoint regression, a package designed to identify regression discontinuities. It finds that amenable and other causes of mortality have declined in the EU since 2000, albeit faster for amenable mortality. There were increases in amenable mortality following the global financial crisis for females in Estonia (-4.53 annual percentage change (APC) in 2005-2012 to 0.03 APC in 2012-2014) and Slovenia (4.22 APC in 2000-2013 to 0.73 in 2013-15) as well as males and females in Greece (males: -2.93 APC in 2000-2010 to 0.01 APC in 2010-2013; females: -3.48 APC in 2000-2010 to 0.06 APC in 2010-2013). Other mortality continued to decline for these populations. Increases in deaths from infectious diseases before and after the crisis played a substantial part in reversals in Estonia, Slovenia and Greece. It concludes that amenable mortality rose in Greece and, among females in Estonia and Slovenia, while in most countries, trends in amenable mortality rates appeared to be unaffected by the crisis.

The second part of this thesis deals with specific countries where the crisis has been more pronounced. Chapters 6.1 and 6.2 focus on Greece. Greece's economic crisis has deepened since it was bailed out by the international community in 2010. The country underwent the sixth consecutive year of economic contraction in 2013, with its

economy shrinking by 20% between 2008 and 2012, and little or no growth thereafter. Unemployment has more than tripled, from 7.7% in 2008 to 24.3% in 2012, and long-term unemployment reached 14.4%. First, the chapters explore the background to the crisis, assess how austerity measures have affected the health of the Greek population and their access to public health services, and examine the political response to the mounting evidence of a Greek public health tragedy. Second, they analyse EU-SILC data to show that the proportion of individuals on low incomes reporting unmet medical need due to cost doubled from 7% in 2008 to 13.9% in 2013, while the relative gap in access to care between the richest and poorest population groups increased almost ten-fold. In addition, austerity cuts have affected other vulnerable groups, such as undocumented migrants and injecting drug users. The study concludes that while steps have been taken to attempt to mitigate the impact of austerity, to adequately address the growing health gap would require persistent efforts by the country's leadership for years to come.

Although Portugal has also been deeply affected by the global financial crisis, the impact of the recession and subsequent austerity on health and health care has attracted relatively little attention in research. Chapter 7 used several sources of data, including the EU-SILC, which tracks unmet medical need during the recession and also before and after the Troika's austerity package. This showed that the odds of respondents reporting having an unmet medical need more than doubled between 2010 and 2012 (OR = 2.41, 95% CI 2.01–2.89) in Portugal, with the greatest impact on those in employment, followed by the unemployed, retired, and other economically inactive groups. The reasons for not seeking care involved a combination of factors, with a 68% higher odds of citing financial barriers (OR = 1.68, 95% CI 1.32–2.12), more than twice the odds of citing waiting times and inability to take time off work or family responsibilities (OR 2.18, 95% CI 1.20–3.98), and a huge increase in reporting delaying care in the hope that the problem would resolve on its own (OR = 13.98, 95% CI 6.51–30.02). Individual-level studies from Portugal also suggest that co-payments at primary and hospital level are having a negative effect on the most vulnerable living in disadvantaged areas, and that health care professionals have concerns about the impact of recession and subsequent austerity measures on the quality of care provided. The Portuguese government no longer needs external assistance, but these findings suggest that measures are now needed to mitigate the damage incurred by the crisis and austerity.

Chapters 8.1 and 8.2 then focus on the Baltic States. In 2009, brief but deep economic crises profoundly affected Estonia, Latvia and Lithuania. In response, all three countries adopted severe austerity measures with the shared goal of containing rising deficits, but employing different methods. In Chapter 8.1 the impact of the economic crisis and post-crisis austerity measures on health systems and access to medical services in the three countries was analysed using the EU-SILC data on unmet medical need in 2005–2012,

applying log-binomial regression to calculate the risk of unmet medical need in the pre- and post- crisis period. Between 2009 and 2012, unmet need has increased significantly in Latvia (OR: 1.24, 95% confidence interval (CI): 1.15–1.34) and Estonia (OR: 1.98, 95% CI: 1.72–2.27), but not Lithuania (OR: 0.84, 95% CI: 0.69–1.04). The main drivers of increased unmet need were inability to afford care in Latvia and long waiting lists in Estonia. The chapter concludes that the impact of the crisis on access to care in the three countries varied, as did the austerity measures affecting their health systems. Estonia and Latvia experienced worsening access to care, largely exacerbating already existing barriers. The example of Lithuania suggested that deterioration in access is not inevitable, once health policies prioritise maintenance and availability of existing services, or if there is room for reducing existing inefficiencies. Moreover, better financial preparedness of health systems in Estonia and Lithuania provided some protection of the population from increasing unmet need due to the rising cost of medical care. Chapter 8.2 also focusses on Lithuania. Its health system was not properly prepared for the crisis because of the pre-existing inefficiencies in the inpatient sector and with primary health being limited in its role in providing appropriate curative and preventive services in the community. At the same time, Lithuania's health financing model, based on a single purchaser, with a mix of statutory health insurance revenue sources, and a counter-cyclical mechanism, offered a degree of protection as public financing for health care was affected much less than the economy in general.

WHAT THIS THESIS ADDS

This thesis presents a large body of evidence on the impact of the financial crisis on population health in Europe. The resulting economic recessions affected health system financing and investment priorities, thereby also having a profound effect on health systems, especially in countries where austerity measures were implemented.

Aim: Assess the consequences of the economic crisis of 2008 for population health

Chapter 2 shows that it could have been predicted that a financial crisis would affect population health even before the start of the Global Financial Crisis. Initially this was limited to work by health economists, such as Ruhm, who found a counter-cyclical relationship between economy and health [1, 2]. But as early as 2009, the evidence that large scale crises affected population health adversely emerged, suggesting that, in contrast, economic shocks present a large risk to population health, but there are measures which could mitigate the negative impact [3].

Five years into the crisis, the evidence of the impact on population health in specific countries was clearly discernible. The literature review (Chapter 4) details the particularly

negative impact of the crisis on mental health, including suicide, across multiple countries. More specifically, all available evidence shows worsening in at least one indicator of mental health during the recession. Housing insecurity, loss of income, including benefits, and unemployment were significant predictors of deterioration in mental health state in general, and more specifically in reporting symptoms of depression and anxiety. At the same time studies revealed some protective factors that mitigated the negative impact on mental health: high social capital, high levels of interpersonal and institutional trust.

The suicide rate has been a particularly sensitive indicator of economic and social changes. Showing substantial rises during the Great Depression in the USA in 1930s[4], and after the collapse of the Soviet Union in 1990s[5], it has also taken its toll in the Global Financial Crisis (see Chapter 2 and 4). The rise during the last of these was predicted early[3] and monitored closely[6-9], with public health academics consistently calling for introduction of measures to protect people from falling into a state of desperation [10]. The measures that mitigate the impact of recession on suicide include rises in social spending in general, and spending on employment protection policies in particular[11]. More recent evidence from the economic crisis in 2008 shows that EU countries that have higher spending (above 135 US dollars per person per year on active labour market measures) have smaller increases in suicide during periods of rising unemployment compared to countries that spend less [12]. However, lack of attention at the governmental level persisted until the international press highlighted the link between suicides and the economic crisis, using personal stories from countries with traditionally low levels of suicide, such as Greece, Spain and Italy[13, 14].

Apart from mortality from suicides, few other causes of death have been directly linked to recession, at least in the short term. Deaths from road traffic injuries have fallen – something that was also predicted using existing evidence[6] and confirmed by the literature review (Chapter 4), as well as by more recent studies [15, 16], which show that the reduction in road traffic deaths is largely due to reduction in high-risk driving (e.g. speeding, young drivers). Other mortality data have shown that in some countries the decline in amenable causes of death has been slow or even reversed since 2008 (see Chapter 5), with Greece being the only country consistently displaying a substantial negative impact of the recession. At the same time, studies show that in Greece the rate of decline in all-cause mortality has slowed [17], while in Spain, on the other hand, it has sped up [18] after the onset of the crisis. These trends, however, have to be interpreted against a background of a complex interaction of multiple factors, including recession itself, its possible lag effects, accompanying austerity in the healthcare system, and any impact on access to care, as well as the stage of epidemiological transition, with population age and morbidity profiles changing faster than health systems can adapt to deliver effective and quality care.

Beyond mortality, there was a negative impact on communicable and non-communicable disease as well as access to care in countries which introduced austerity to the health sector, particularly in Greece (see Chapter 4 and Chapter 6.1). The rise in HIV and TB in Greece, as well as rise in unmet medical need in several other countries, reflected the challenge that recession poses to health systems if they are to respond to the consequences of the crisis effectively.

The crisis has also put child health at risk. While most evidence comes from Greece, a recent analysis based on the Growing Up in Ireland Infant Cohort Study showed that reduction in welfare benefits and in parent's working hours, as well as difficulty affording basics, was associated with adverse and potentially long-lasting child health outcomes. [19]

The impact on risky behaviours, such as smoking and alcohol consumption, has been largely two-fold (Chapter 4). While population surveys in several countries showed an overall reduction in alcohol consumption during recessions, there were groups that assumed a greater risk (heavy- or binge- drinkers, people in ill-health, the unemployed). Similarly, overall smoking rates decreased across many countries, but in some unemployment was a greater predictor of smoking during the recession than before it.

The body of evidence points to a number of groups who are particularly vulnerable to the effects of the crisis on health. Those are people who lose jobs or income, those facing large personal debts or housing insecurity, those relying on social benefits and seeing reduction in their income due to austerity measures, as well as already socially vulnerable groups such as homeless people, drug users, the refugees. At a time of economic crisis, these comprise large and often overlapping population groups, whose health needs stretch beyond the remits of the healthcare systems.

Thus Chapter 3 provides an example of the mitigating role of employment protection policies for people who experience health problems. Disabled people, as well as those suffering from chronic conditions were at substantially greater risk of losing their jobs during recessions compared to healthy people in countries experiencing a severe drop in GDP. In countries where the crisis was less severe, higher levels of employment protection reduced the risk of job loss among unhealthy people. At the same time, evidence shows that health is a sector where government spending boosts the national economy, at least in the short-term.[20] Therefore the argument of investing in health is not only on a humanistic and social basis, but also on economic grounds.

Overall, this thesis shows that, to date, the short-term impact of the recession on health has largely been negative and manifested in worsening mental health, including suicide, as well as in increasing unmet healthcare need. The negative impact of rising suicide rates on overall mortality is partially off-set by falling deaths from road traffic injuries. One major positive effect of the recession – manifesting in reductions in exposure to certain risky behaviours in the general population – takes years to translate into changes

in mortality, and often coincides with other drivers of health, and is, therefore, extremely difficult, if not impossible, to quantify. Of course, we also do not need a recession to reduce smoking and alcohol consumption: behaviour-related ill-health is preventable through effective inter-sectoral policies which aim to protect population health, such as tobacco and alcohol control measures. Therefore, changes in all-cause mortality coinciding with recessions need to be interpreted in the context of wider epidemiological and health systems changes. Changes in amenable mortality, on the other hand, especially those pointing to reversals in longstanding declining trends, are a cause for concern, but further study using disaggregated data is necessary to establish whether deterioration in health could be the result of worsening of access to or quality of care during the crisis.

Aim: Assess the impact of the crisis on health systems, and identify responses that help countries to maintain stability and promote resilience

Reports of the aftermath of the crisis, cited in the introduction to this thesis, have shown that high level policy makers in some countries, and internationally, have been driven by ideological rather than economic arguments. Moreover, they have often failed to protect the health sector, with their efforts to constrain spending sometimes being at a cost to population health. In some countries, such as Greece, Ireland Portugal, Latvia, the pressure came from international organisations. As shown in Chapter 2, the approach to the health sector in Greece and Portugal was particularly influenced by the Troika, which not only did not allow the countries to invest in health, but severely diminished the ability of health systems to respond to the existing needs of the population by placing severe time and budget limitations.

Most countries, however, relied on their health systems being prepared to withstand the increase in demand coupled with fiscal pressures. The study on how health systems responded to the crisis, presented in Chapter 2 and updated in Thomson et al [21] outlines three key areas experiencing changes (health system funding, health coverage and health service delivery) and presents a range of policy responses seen across Europe.

Health systems in virtually all countries of the EU have felt the crisis – but to a varying extent. For example, in France, Germany, Sweden, Austria, Malta, Belgium and Poland, the growth in per capita spending has slowed markedly between 2008 and 2012, compared to 2007-2008, but always exceeded at least 1% year on year growth. In some others (UK, the Netherlands, Finland, Slovakia) growth has almost halted – to below 1%. The rest of the EU countries experienced a decrease in spending at least once over the five-year period, with several of them (notably Ireland, Portugal, Latvia, Greece, Croatia) seeing cuts of more than 10% in at least one year.[21]

The data from the survey presented in Chapter 2 and updated in Maresso et al [22] demonstrate how the approach to fiscal constraint can vary in different national settings. First, where health budgets are derived from social health insurance, which depends on

employment contributions, the existence of countercyclical mechanisms (e.g. Lithuania) and financial reserves (e.g. Estonia, Czech Republic) can provide additional funding to cushion the impact of the fall in social health insurance contributions. Second, the gap in financing can also be covered through deficit financing (e.g. Portugal) as well as increasing government budget transfers (e.g. Germany). Third, a number of measures, such as changes to social health insurance contributions (e.g. increase in rates or ceilings, enforcing revenue collection, earmarking taxes) can provide a degree of protection. However, in order to safeguard health budgets effectively, some of these measures need to be in place by the time of the onset of the crisis, as they require long-term measures.

Health coverage across the EU member states is nearly universal, however the economic crisis has put this achievement under considerable strain in some of the worst-affected countries. While the unintended consequence of a rise in employment resulted in the loss of comprehensive health coverage for over two million people in Greece (see Chapter 6.2), countries like Spain, the Czech Republic, Ireland, Cyprus and Slovenia specifically excluded population groups (based on income or residence status) to find short term savings from reducing entitlement to health services.[21] In Spain, legislation introduced through a royal decree (thus bypassing the Parliament) has shifted the coverage from universal to employment-based, thus revoking access to publicly funded care for hundreds of thousands of undocumented migrants (with limited exemptions, such as emergency, maternity and paediatric care). The decentralised nature of the Spanish administration meant that some regions sought to limit the effects of the decree, while others applied it in full, leading to large differences in access to healthcare among undocumented migrants.[23] At the same time, many European countries took measures to protect access to the most vulnerable groups, e.g. the long-term unemployed in Estonia, children from low-income families in Austria).

In respect to services included in the publicly-financed benefits package, there were few changes directly related to the crisis, mostly relating to pharmaceuticals. However, the crisis was seen as an opportunity to redefine the minimum benefits package in Greece and Portugal, and encouraged progress in making changes to the scope of publicly provided services informed by systematic Health Technology Assessment (HTA) mechanisms.

In contrast to population coverage and scope of services, the area of financial protection experienced wide-spread changes across the EU, including both expansion and reduction of user charges. At the time of the economic crisis, faced with growing demand for services, an increase in user fees was seen by some policy makers as means to compensate for shrinking public budgets while, at the same time, deterring excess use of services. Often the same countries had decreased user charges in other areas and/or strengthened financial protection for specific vulnerable groups. For example, in Greece user charges were increased in primary, outpatient and inpatient care, but low-

ered for some diagnostic tests; in Portugal user charges in primary care were increased, but exemptions from user charges were expanded. However, available evidence on application of user charges highlights the complexity of the right policy design: if user charges are to be implemented, and the evidence in support of them is extremely weak, then they should be applied selectively, using a value-based approach, and avoiding placing unfair burden and penalty on patients. At the same time, such policy needs to incorporate strong measures of financial protection for people on lower incomes and regular service users (e.g. chronic patients).

Changes to health service delivery (including planning and purchasing) in response to the crisis were often related to the pre-existing drive for increasing efficiency in the health system. Complex cost-saving measures, such as changes to provider payments, greater use of HTA to inform service delivery, and re-adjusting skill-mix were often overshadowed by simpler budget cuts (largely administrative and on investment, but also to public health programmes, primary and secondary care services), as well as reduction in spending on workforce (through lowering wages or staff numbers).

The crisis was seen as opportunity for many countries to reduce pharmaceutical costs, particularly in Eastern European countries, where pre-crisis pharmaceutical expenditure growth was faster.[24] The introduction of cost-containment measures with rapid effects was therefore necessary. Responses included price reductions, internal and external reference pricing, price-volume, budget impact and other risk-sharing agreements. Other measures seeking to bring savings in the long-term were related to shift towards evidence-based delivery and involved changes to prescribing (guidelines, monitoring, e-prescribing, prescribing by international non-proprietary name), as well as an emphasis on generic substitution. However, there were cases where reforms either did not achieve the expected effect in terms of the scale of savings (e.g. Ireland), or had a negative impact on access to medicines as a result of product withdrawals from the market (e.g. Greece), increased parallel exports (Greece and Romania), and pharmacy closures (Portugal).

At this stage the evidence on how the impact of the crisis on health systems translates into the impact on population health outcomes is scarce. In Chapter 5 this is analysed using amenable mortality - one of the key measures of health systems performance. Overall amenable mortality trends in Europe continue to decline, although there is evidence that the scope for further improvement in terms of mortality is diminishing, especially in countries with already very low rates.[25] Nevertheless, the analysis in Chapter 5 shows that health systems in high-income countries largely managed to absorb the economic shock and redistribute available resources in a way that the quality and effectiveness of care, as measured by amenable mortality, was not affected. Greece, however, here too stood out as a notable exception, as amenable mortality rates have increased in recent years.

The crisis did not affect European countries equally, nor were their health systems equally well-prepared to withstand its effects. The shock presented by the economic crisis highlighted several areas where health system resilience was lacking.[21, 26] First, the health system needs to be adequately funded, as cuts made to already underfunded systems increase further strain on healthcare resources, jeopardizing access to and quality of services. Second, comprehensive health coverage and low levels of out-of-pocket payments are also a pre-requisite in health systems' ability to absorb shocks, as economic crises tend to exacerbate gaps in coverage, particularly within the most vulnerable groups. Third, countercyclical mechanisms (e.g. built-in formulas to stabilise revenue within health and social welfare budgets accounting for economic fluctuations) and the ability to accumulate reserves provide additional, albeit short-term, capacity to maintain spending. Fourth, information about cost-effectiveness of different healthcare services is crucial in providing the evidence for decision making in relation to defining and financing benefits package and service provision. Fifth, expertise in areas, which need to and can be reformed effectively is important when tackling relevant areas where efficiency can be improved instead of producing savings by adopting cuts across the board. Finally, the role of political factors – the will and ability to tackle areas of inefficiency, and the capacity to mobilise revenues for the health sector – is key in ensuring the implementation of changes.

The first three above mentioned areas build adequate, equitable and stable foundations within a health system. They establish predictability of financial flows, sufficient level of resources, and promote equitable service provision as well as ensuring financial protection for the most vulnerable groups. These are the areas that can and need to be continuously strengthened in times preceding the crisis. The fourth and fifth areas relate to choices and decisions that are made in response to the crisis. For example, saving (or cuts) made in the wrong areas can be counterproductive if they result in cost-increasing substitution or increased access barriers (e.g. patients going to accident and emergency department instead of primary care). In addition, non-selective cuts may lead to reduction in provision (e.g. smaller scope of services or fewer staff), which in turn only increases pressures on the system at a time of rising demand. At the same time, making savings can produce efficiency gains (e.g. through better procurement or cost-reducing substitutions), but this requires knowledge and expertise. However adequate and targeted financing, even during times of fiscal constraints, can deliver long-term efficiency gains through investment in public health and prevention programmes, shifting services out of hospital settings, introducing HTA and eHealth, strengthening planning and procurement mechanisms, and making changes to skill mix.[21]

From a health policy perspective, the differing country responses demonstrated that there are options. Where the right mechanisms are in place, health spending does not need to fall, and where it falls, cuts can be targeted towards services with least cost-effectiveness. However, the availability of these options depends on initial health

systems design, absence of gaps, ability to mobilise resources, expertise, and political will. Box 1 examines in further detail experiences in and responses by governments in Greece, Portugal, Estonia, Latvia and Lithuania.

Box 1. Country cases – learning from successes and failures

Experiences from Greece, Portugal and the Baltic States described in Part II of this thesis offer valuable lessons drawing on the countries' response to the crisis.

The cases of Greece and Portugal examine in detail the pressures on health system, including that of international lenders. Greece and Portugal entered economic adjustment with the view that the bailout process will be painful in the short-term, but soon would lead to economic recovery. Instead, recessions in both countries were much deeper and longer than expected [27], [28]. It is clear now that the economic burden underpinning the EAPs in Portugal and Greece was underestimated, and this has further been confirmed by the IMF correction of its fiscal multipliers.[29] Despite that recognition, the demands to carry out deep and fast reforms in healthcare remained in place. Chapters 6.1, 6.2 and 7 show the unmet need due to cost both in Greece and Portugal has risen markedly, indicating that the ongoing reforms have failed to protect people from facing increasing barriers to accessing care, despite the declarative measures to ensure access for vulnerable groups.

Greece has been a particularly notable case, as a weakened and systemically underfunded health system struggles to meet growing population health needs, exacerbated by prolonged periods of high unemployment and loss of income, as well as the refugee crisis. The arbitrary cuts to health funding immediately highlighted the weakest points – lack of comprehensive health coverage and weaknesses of communicable disease control (Chapter 6.1). A focus on steep reduction of pharmaceutical spending lead to interruptions with drug supplies and the need for patients to pay for medicines out of pocket. More recent evidence documents the decline in patient-reported quality of care [30]. Similarly, in Portugal, the rise in unmet need due to cost is a consequence of the shift of financial burden of care to patients. Despite widening of the population groups exempt from out-of-pocket payments, the rise in user charges across primary and specialist care has a prohibitive effect on patients [31].

It is important to note, however, that both the Greek and Portuguese health systems were facing major challenges even before the crisis. In the former, these included fragmentation, high out-of-pocket payments, large inefficiencies, and extremely weak primary care.[32] The crisis, including through the conditions of the EAPs, have forced Greece to centralise its social health insurance, introduce information and management systems and improve monitoring, transform provider payment mechanism and reduce pharmaceutical spending [33]. In August 2016 key legislation was introduced to provide health coverage for 2.5 million people who lost it through unemployment. While primary care is still lacking, first steps are being made in forming primary care networks under regional authorities. However the key issue – that of adequate funding, remains unresolved [34]. Portugal experienced similar challenges before the crisis, including inefficiencies, particularly due to high reliance of specialist care, high pharmaceutical expenditure as well as imbalances in human resource distribution[35]. The EAPs focus on containing pharmaceutical expenditure was largely successful and enabled Portugal to reduce spending on drugs [36]. Other achievements included addressing long-standing health system debts, commitment to strengthen primary care and implementing modern information systems. [31]

At the opposite end of Europe – in the Baltic States – the impact of the economic crisis in 2008 and 2009 was also devastating – with a sharp drop in GDP of 15-20% over one to two years[37]. Despite many similarities in economic development prior to the crisis, the health systems of Estonia, Latvia and Lithuania were affected differently. In 2008-2010 public expenditure on health per capita fell by 20% in Latvia, but by 7% in Lithuania and by 6% in Estonia.[21] The drop in spending in Estonia and Lithuania have been cushioned by accumulated reserves in the former and counter-cyclical social health insurance funding formulae in the latter, while in Latvia the health sector faced disproportionate cuts[22]. Chapter 8.1 shows the rise in unmet need in Estonia and Latvia during the crisis, but not Lithuania. Notably, of the three countries Lithuania was the only one, which pledged to protect access to healthcare as part of the response (see Chapter 8.2). Latvia, on the contrary, introduced series of measures, including a sharp rise in user fees, to compensate for the loss of public funding. Estonia found a third way, whereby it prioritised specific programmes as well as introduced rationing by extending waiting times. It is not surprising, therefore, that in immediate aftermath population survey shows rise in unmet need due to cost in Latvia, and due to waiting times in Estonia.

STRENGTHS AND WEAKNESSES

In addition to its strengths, such as the coverage of a wide range of European countries, this thesis also has a number of weaknesses. First, as it has been demonstrated in many studies examining the impact of the crisis on mortality, it is hard to establish a causal relationship between the economic cycle and mortality, without factoring in the epidemiological transition, health sector capabilities, and lag effects of behavioural factors. Second, while it has been highlighted that some population groups are more vulnerable to the effects of the crisis, these groups can vary by country, and can often be hidden in the overall statistics used in this thesis. Third, due to lack of data some major effects of the crisis on health are difficult to establish. This is particularly true for morbidity and care seeking. Thus, suicide often becomes a proxy for mental health and self-reported unmet healthcare need becomes a proxy for difficulties in accessing care. Fourth, EU-SILC data, particularly its health component, were used to assess the impact of the crisis on health and access to care. The survey itself is subject to the usual limitations of a population survey, such as self-reporting, representativeness, data quality and completeness, [38] while a proxy of unmet need for medical examination was used to measure barriers to accessing care. The latter is a measure particularly vulnerable to miss-interpretation as it can only capture perceived unmet need. However, the follow-up question allow to distinguish between health system-related barriers (such as cost, waiting time or travel distance) and person-related factors (such as delay in seeking care, lack of time, fear and others).

To counteract many of these challenges, this thesis employs detailed country case studies. This enables one to examine specific country contexts and explore various health indicators which are more relevant for countries most affected by the crisis. In addition, in the interpretation of findings I distinguish the impact of the recession on health from the impact of the recession on health systems, as these two key mechanisms interacting together ultimately determine whether population health has been affected.

CONCLUSIONS AND IMPLICATIONS FOR POLICY AND RESEARCH

This thesis shows that the impact of an economic crisis on health can be substantial, especially if it is exacerbated by severe austerity measures. The implications of recession, such as unemployment and loss of income, on individuals themselves had a largely negative impact on health, particularly mental health, across multiple countries. Depression, anxiety, and suicide have increased, while changes in other indicators of health status vary across countries and depend on the population group studied. Inequalities tend to exacerbate as those who are unemployed, experiencing income or housing insecurity,

or people already in ill-health are more sensitive to effects of recession. Effects on health tend to be worse when economic impacts are more severe, prolonged austerity measures are implemented, and there are pre-existing problems of substance use among vulnerable groups.

On the positive side, smoking and alcohol consumption, as well as deaths from road traffic injuries have reduced among the general population, as predicted. However vulnerable groups (e.g. heavy drinkers, the unemployed) experienced deterioration in risk behaviours.

Responses of health systems in European countries varied, with some demonstrating how health sectors can build resilience to withstand economic shocks. The key factors included adequate financing and coverage, low out of pocket payments, use of knowledge and expertise as well as HTA to make investment choices based on cost-effectiveness, as well as political will.

Access to care has worsened in some countries in Europe. However, in general, health systems managed to withstand the temporary fall in public expenditure on health without major effects on quality and timeliness of services. Many countries adapted by targeting well-known areas in improving efficiency, while some increased the financial burden for patients by raising user fees. Few countries reduced health insurance coverage, but some did so explicitly in response to the crisis (e.g. Spain), whereas in Greece this was due to underlying weakness in the health insurance system. At the same time, several countries attempted to protect the most vulnerable groups by expanding existing exemption groups. In several countries the impact of cuts on health system was cushioned by existing counter-cyclical mechanisms and savings.

Greece became the most notable case, where the economic crisis has brought out major challenges to both population health and the Greek health system. In addition, lack of action on critical aspects of care, such as communicable disease prevention, mental health strengthening, availability of good quality primary care and timely access to specialist services and pharmaceuticals produced major challenges to population health status.

This analysis of effects and responses to the financial crisis demonstrates that policy makers have choices. First, it is important to focus on building right financial mechanisms which enable health systems to withstand recessions. Those involve counter-cyclical funding formulas, accumulating reserves, having ability to mobilise funding. Second, maintaining adequate workforce and infrastructure are crucial to cope with increasing demand. Third, a crisis exacerbates vulnerabilities and inequalities, therefore it is important to ensure access to services for most vulnerable groups. Fourth, before implementing austerity, short-term savings need to be weighed against long-term priorities and informed by evidence.

In many countries the crisis was used as an opportunity to introduce changes that were long-planned but never implemented due to lack of political will or support. While in some cases this was a trigger to address major underlying health system weaknesses (e.g. inefficiency, fragmentation), the process of implementation requires adequate time frames, financial and workforce capacity, information and consistent political support. Moreover, the changes need to be in line with national goals, values and priorities, and communicated in a transparent way. Finally, tackling the impact on population health during the crisis requires a multi-sectoral approach, as much of the underlying factors are beyond the control of a health system.

This thesis presents the short-and mid-term impacts of the economic crisis in the countries most affected. Future research could focus on the effects of the long-term austerity measures on population health, as well as on quality of and access to healthcare.

It is also important to note the wider potential impact of the financial crisis on global health. Political ideologies used the crisis as a pretext to shrink the role of the state and impose austerity. Poverty, inequality, and disfranchisement of large population groups in the crisis aftermath triggered the rise of a far-right ideology across Europe [39]. While there is no certainty on the full extent of the role of the recession in such global events as the Arab spring in the Middle-East [40], Brexit in Europe [41], or electoral losses of the Democratic Party in the United States [42], it is clear that these events keep affecting population health profoundly across the world through Syrian conflict, dismantling of core European values, and loss of financial and political support of the key player – the US – in areas such as climate change, maternal and child health. Therefore now, ten years from the start of the crisis, it is time to look back, learn the lesson and ensure that mechanisms to protect people from the devastating consequences of decisions to implement austerity are in place.

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SUMMARY

The Financial Crisis that arose in 2008, spreading to affect almost all parts of the world, was the result of a range of deeply-rooted economic developments, including deregulation of the financial sector, creation of incentives encouraging excessive risk-taking, and accumulation of risky assets by banks. The damage to the world economy was enormous, and the total cost is incalculable. The Gross Domestic Product (GDP) of the European Union (EU) fell by 4.3% in 2009, with a second dip of 0.4% in 2012. Under pressure from major international organisations including the International Monetary Fund (IMF), the European Union, and the European Central Bank, many European countries adopted austerity measures. Economic shocks on this scale and depth had profound impacts on national, including health systems, budgets. There were a number of countries in the EU where the crisis had a much more profound impact on the economy. Economies of those in the Baltic region – Estonia, Latvia and Lithuania have managed to recover quickly. Others, including Greece and Portugal, had to be bailed out by international lenders under their conditions.

European countries offer a unique opportunity to study the effects of the financial crisis. They are united by similar values and cultures; prior to the crisis they were in similar economic situations, and as members of the European Union, they are subject to the same supra-national legal and regulatory systems. Yet their health policies remain largely a matter of national responsibility, as governments retain competence for organisational structures, governance arrangements and levels and modes of funding and coverage. These differences mean that they vary in their ability to withstand shocks, such as an economic crisis. The specific aims of the thesis are as follows: to assess the consequences of the economic crisis of 2008 for population health; to assess the impact of the crisis on health systems and identify responses that help countries to maintain stability and promote resilience.

This thesis is a compilation of scientific reports united by the common theme of the impact of the financial crisis, recession, and austerity policies on population health and health systems. It provides an overview of existing literature as well as original analyses of health sector policies, population surveys and mortality data in selected European countries. The core of this dissertation consists of two parts. Part I consists of four chapters, focussing on the general impact of the crisis across Europe. Chapter 2 provides the background to the financial crisis, a review of literature on the association between recessions and health, presents initial responses of countries within the WHO European Region, and outlines the content of the Economic Adjustment Programmes in Greece and Portugal. Chapter 3 is an analysis of longitudinal data, asking whether employment protection policies played a mitigating role, allowing people in ill health to remain employed during the recession. Chapter 4 is a narrative literature review on the effects

of the crisis on health in selected countries up to 2015. Chapter 5 is a time series analysis of amenable mortality data across Europe, asking whether trends have changed with the onset of the crisis. Part II contains country-specific studies, from Greece, Portugal and the Baltic States (Lithuania, Latvia and Estonia). This part highlights their differing circumstances, while analysing the impact of specific policies on population health and health systems. Finally, a general discussion of the findings from papers presented in this volume will summarise the lessons learned and will present policy options.

I find that the financial crisis in Europe has posed major threats to health, but also some opportunities. Although recessions pose risks to health, the interaction of fiscal austerity with economic shocks and weak social protection was what ultimately escalated health and social crises in some European countries. Overall, the short-term impact of the recession on health has largely been negative and manifested in worsening mental health, including suicide, as well as in increasing unmet healthcare need. The negative impact of rising suicide rates on overall mortality is partially off-set by falling deaths from road traffic injuries. One major positive effect of the recession – manifesting in reductions in exposure to certain risky behaviours in the general population – takes years to translate into changes in mortality, and often coincides with other drivers of health, and is, therefore, extremely difficult, if not impossible, to quantify. Of course, we also do not need a recession to reduce smoking and alcohol consumption: behaviour-related ill-health is preventable through effective inter-sectoral policies which aim to protect population health, such as tobacco and alcohol control measures. Therefore, changes in all-cause mortality coinciding with recessions need to be interpreted in the context of wider epidemiological and health systems changes. Changes in amenable mortality, on the other hand, especially those pointing to reversals in longstanding declining trends, are a cause for concern, as they may indicate worsening of access to or quality of care during the crisis.

The crisis did not affect European countries equally, nor were their health systems equally well-prepared to withstand its effects. Greece became the most notable case, where the economic crisis has brought out major challenges to both population health and the Greek health system. In addition, lack of action on critical aspects of care, such as communicable disease prevention, mental health strengthening, availability of good quality primary care and timely access to specialist services and pharmaceuticals produced major challenges to population health status.

The shock presented by the economic crisis helped to identify several areas that can help to strengthen health system resilience. These are 1) adequate funding, 2) comprehensive health coverage and low levels of out-of-pocket spending, 3) presence of countercyclical mechanisms or reserves to protect funding in the short-term, 4) ability to invest in cost-effective services, 5) expertise to direct reforms, and 6) political will. From a health policy perspective, the differing country responses demonstrated that

there are options. Where the right mechanisms are in place, health spending does not need to fall, and where it falls, cuts can be targeted towards services with least cost-effectiveness. However, the availability of these options depends on preparedness in the aforementioned six areas.

This thesis presents the short-and mid-term impacts of the economic crisis in the countries most affected. Future research could focus on the effects of the long-term austerity measures on population health, as well as on quality of and access to healthcare.

SAMENVATTING

De financiële crisis die in 2008 ontstond en zich verspreidde naar bijna alle delen van de wereld was het resultaat van een reeks diepgewortelde economische ontwikkelingen, waaronder de deregulering van de financiële sector, het creëren van stimulansen om buitensporige risico's te nemen en de accumulatie van risicovolle activa door banken. De schade aan de wereldeconomie was enorm en de totale kosten zijn niet te overzien. Het bruto binnenlands product (bbp) van de Europese Unie (EU) daalde in 2009 met 4,3%, met een tweede daling van 0,4% in 2012. Onder druk van grote internationale organisaties, waaronder het Internationaal Monetair Fonds (IMF), de Europese Unie en de Europese Centrale Bank stelden veel Europese landen bezuinigingsmaatregelen in. Economische schokken op deze schaal en van deze diepte hadden grote gevolgen voor nationale begrotingen, waaronder de budgetten voor gezondheidssystemen. In sommige landen van de EU had de crisis een groter effect op de economie dan in andere landen. De economieën van landen in de Baltische regio, bijvoorbeeld Estland, Letland en Litouwen, hebben zich snel hersteld. Andere, waaronder die van Griekenland en Portugal, moesten door internationale kredietverstrekkers, en onder hun voorwaarden, worden gered.

Europese landen bieden een unieke gelegenheid om de effecten van de financiële crisis te bestuderen. Zij worden gekenmerkt door soortgelijke waarden en culturen, zij bevonden zich voorafgaand aan de crisis in vergelijkbare economische situaties, en als leden van de Europese Unie zijn zij onderworpen aan dezelfde supranationale wet- en regelgevingen. Toch blijft hun gezondheidsbeleid grotendeels een zaak van nationale verantwoordelijkheid, aangezien overheden de bevoegdheid hebben behouden voor de organisatiestructuur, de regeling van de governance, en de mate en manieren van financiering en kostendekking. Deze verschillen betekenen dat landen variëren in hun vermogen om schokken te weerstaan, zoals die van een economische crisis. De specifieke doelstellingen van dit proefschrift zijn als volgt: het beoordelen van de gevolgen van de economische crisis van 2008 voor de volksgezondheid; het beoordelen van de impact van de crisis op de gezondheidssystemen; en het identificeren van responsen die landen helpen de stabiliteit van hun gezondheidssystemen te handhaven en veerkracht te bevorderen.

Dit proefschrift is een samenbundeling van wetenschappelijke rapporten die als gemeenschappelijk thema hebben de impact van de financiële crisis, de recessie en het bezuinigingsbeleid op de volksgezondheid en gezondheidssystemen. Het geeft een overzicht van de bestaande literatuur en een aantal oorspronkelijke analyses van gezondheidsbeleid, bevolkingsenquêtes en sterftegegevens in geselecteerde Europese landen. De kern van dit proefschrift bestaat uit twee delen. Deel I bestaat uit vier hoofdstukken die zich richten op de algemene impact van de crisis in Europa. Hoofdstuk 2

beschrijft de achtergrond van de financiële crisis, geeft een overzicht van literatuur over het verband tussen recessies en gezondheid, presenteert eerste responsen van landen binnen de Europese regio van de WHO en schetst de inhoud van de economische aanpassingsprogramma's in Griekenland en Portugal. Hoofdstuk 3 is een analyse van longitudinale gegevens en onderzoekt of het beleid voor ontslagbescherming een verzachtende rol speelde door mensen met een slechte gezondheid tijdens de recessie in staat te stellen aan het werk te blijven. Hoofdstuk 4 is een verhalende literatuurstudie over de effecten van de crisis op de gezondheid in geselecteerde landen tot 2015. Hoofdstuk 5 is een tijdreeksanalyse van (door goede zorg) te voorkomen sterfgevallen in Europa en onderzoekt of trends in vermijdbare sterfte zijn veranderd sinds het uitbreken van de crisis. Deel II bevat land-specifieke studies, in het bijzonder uit Griekenland, Portugal en de Baltische staten (Litouwen, Letland en Estland). Dit deel van het proefschrift belicht hun verschillende omstandigheden en analyseert de impact van specifiek beleid op volksgezondheid en gezondheidssystemen. Het proefschrift wordt afgesloten met een algemene beschouwing waarin de geleerde lessen worden samengevat en beleidsopaties worden gepresenteerd.

Ik constateer dat de financiële crisis in Europa grote bedreigingen voor de gezondheid heeft opgeleverd, maar tevens enkele kansen. Hoewel recessies risico's voor de gezondheid inhouden, was uiteindelijk de wisselwerking tussen fiscale bezuinigingen, economische schokken en zwakke sociale zekerheid de oorzaak van crisissituaties in het gezondheids- en sociale domein in sommige Europese landen. Over het algemeen is het effect van de recessie op de volksgezondheid op de korte termijn grotendeels negatief geweest en manifesteerde dit zich in een verslechtering van de geestelijke gezondheid, waaronder zelfmoord, als ook in een toename van onvervulde behoefte aan gezondheidszorg. De negatieve impact van stijgende zelfmoordcijfers op de totale mortaliteit wordt gedeeltelijk gecompenseerd door dalende sterftecijfers door verkeersongevallen. Een belangrijk positief effect van de recessie - een reductie in risicogedrag in de algemene bevolking - leidt pas na jaren tot veranderingen in de mortaliteit en valt vaak samen met andere factoren die de gezondheid bepalen, waardoor het moeilijk is dit positieve effect te kwantificeren. Uiteraard is er geen recessie nodig om roken en alcoholgebruik te verminderen: een slechte gezondheid voortkomend uit ongezond gedrag is te voorkomen door effectief intersectoraal beleid dat gericht is op het beschermen van de volksgezondheid, zoals maatregelen gericht op het beperken van alcohol- en tabaksgebruik. Om bovenstaande redenen moeten veranderingen in totale mortaliteit die samenvallen met recessies worden geïnterpreteerd in de context van bredere epidemiologische veranderingen en veranderingen in gezondheidssystemen. Echter, veranderingen in de (door goede zorg) te voorkomen sterftecijfers, en vooral veranderingen die wijzen op omkeringen in reeds lang dalende trends, zijn zorgwekkend omdat

zij kunnen wijzen op een verslechtering van de toegang tot of de kwaliteit van zorg tijdens de crisis.

De crisis heeft uiteenlopende gevolgen gehad voor verschillende Europese landen en ook hun gezondheidsstelsels waren niet in gelijke mate voorbereid om de gevolgen hiervan te weerstaan. Griekenland was het meest opvallende geval, waar de economische crisis grote consequenties heeft gehad voor zowel de volksgezondheid als het Griekse gezondheidssysteem. Bovendien heeft het gebrek aan actie op cruciale onderdelen van de zorg, zoals de preventie van overdraagbare ziekten, versterking van de geestelijke gezondheidszorg, beschikbaarheid van hoogkwalitatieve eerstelijns zorg en tijdige toegang tot gespecialiseerde diensten en geneesmiddelen, geleid tot een grote problemen voor de volksgezondheid.

De schok van de economische crisis heeft bijgedragen aan het identificeren van factoren die belangrijk zijn voor de veerkracht van een gezondheidssysteem. Dit zijn 1) voldoende financiering, 2) een uitgebreide dekking van de gezondheidszorg en een laag niveau eigen bijdragen, 3) de aanwezigheid van anticyclische mechanismen of reserves om de financiering te beschermen op de korte termijn, 4) het vermogen om te investeren in kosteneffectieve zorg 5) deskundigheid om hervormingen door te voeren, en 6) politieke wil. De uiteenlopende reacties van landen op de financiële crisis toont aan dat er opties zijn op het gebied van gezondheidsbeleid. Waar de juiste mechanismen aanwezig zijn hoeven zorguitgaven niet omlaag te worden gebracht, en waar zij moeten dalen, kunnen bezuinigingen worden gericht op diensten met minimale kosteneffectiviteit. De beschikbaarheid van deze mechanismen hangt echter af van paraatheid op de bovengenoemde zes gebieden.

Dit proefschrift presenteert de korte en middellange termijn effecten van de economische crisis in de meest getroffen landen. Toekomstig onderzoek zou zich kunnen richten op de lange termijn effecten van bezuinigingsmaatregelen op de volksgezondheid en op de kwaliteit van en toegang tot gezondheidszorg.

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ABOUT THE AUTHOR

Marina Karanikolos was born in Klaipeda, Lithuania, in 1982. She grew up there and attended Žaliakalnio and M.Gorkio secondary schools. In 2000 Marina embarked on studying for two undergraduate degrees – Public Health in Klaipeda University and Law in the Baltic Russian Institute (now Baltic International Academy), and graduated successfully from both in 2004. Studying for two degrees simultaneously opened up an exciting multidisciplinary world where fields, subjects, ideas, teaching and research methods were vastly different but often complemented each other.

Marina's career in Public Health began in the NHS in London in 2004 during the time of the London-wide "MMR catch-up campaign", where parents were encouraged to vaccinate children who had missed immunisation. As the campaign co-ordinator for two of the inner London boroughs, Marina became interested in the intricacies of interactions between multiple health system actors, including young patients and parents, doctors and nurses, public health professionals and the wider public. She then researched this topic further in her Master's thesis in Public Health at King's College London, examining the medical, ethical and legal dilemmas of individual rights and freedoms and public good. Marina's further work in the NHS involved providing health intelligence to inform needs assessments, health impacts, population health monitoring and NHS service reconfiguration and planning at local and regional levels.

Since 2010 Marina has been working at the European Observatory on Health Systems and Policies based at the London School of Hygiene and Tropical Medicine. There she has performed research and knowledge-brokering in a range of areas, including assessment and international comparisons of health systems performance, population health monitoring, and the impact of the financial crisis on population health and health systems in Europe. The latter presented such a cause for concern, and stimulus for prompt research, that the international experience of the effects of the crisis became the subject of this thesis.

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- Economou C, Kaitelidou D, **Karanikolos M**, Anna Maresso. Greece: Health System Review. *Health Systems in Transition*, 2017 Sep; 19(5):1-166.
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- Arora V, **Karanikolos M**, Clair A, Reeves A, Stuckler D, McKee M. Data Resource Profile: The European Union Statistics on Income and Living Conditions (EU-SILC) *Int J Epidemiol*. First published online May 6, 2015 doi:10.1093/ije/dyv069

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- Mackenbach J, **Karanikolos M**, McKee M. The unequal health of Europeans: successes and failures of policies. *Lancet* 2013 March 27 doi:10.1016/S0140-6736(12)62082-0
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- Kentikelenis A, **Karanikolos M**, Papanicolas I, Basu S, McKee M, Stuckler D. Effects of Greek economic crisis on health are real. *BMJ*. 2012 Dec 21;345:e8602; author reply e8608. doi: 10.1136/bmj.e8602.
- McKee M, **Karanikolos M**, Belcher P, Stuckler D. Austerity: a failed experiment on the people of Europe. *Clinical Medicine* 2012 12(4) 1-5
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PHD PORTFOLIO

Name: Marina Karanikolos

PhD Period: 2012-2018

Erasmus MC Department: Public Health

Promotor: Prof. Dr. Johan P Mackenbach

Co-promotor: Prof. Dr. Martin McKee

1. PHD TRAINING	Year	Workload (Hours / ECTS)
Courses		
Integrity in Science (Erasmus MC, Rotterdam)	2016	8 hours
Communicating science to public (LSHTM)	2016	8 hours
Media training (LSHTM, London)	2013	8 hours
Dissertation supervision (LSHTM, London)	2012	8 hours
Small groups teaching (LSHTM, London)	2012	8 hours
Advanced use of Stata (LSHTM, London)	2012	40 hours
Seminars and workshops		
Sharing Information and Evidence with Policy Makers (pre-conference workshop, EUPHA, Stockholm)	2017	8 hours
Suicides, mental health and economic crisis (Suicide and Work in the Globalised Economy, Wellcome Trust workshop, London)	2016	8 hours
Policy focus group on health systems performance assessment indicators (quality of care) in the EU (workshop, European Commission, Brussels)	2015	8 hours
Economic crisis, health systems and health in Europe: impact and implications for policy (preconference workshop, EUPHA, Milan)	2015	8 hours
Policy dialogue on reducing avoidable mortality in England (workshop, Department of Health, London)	2014	8 hours
Health Policy in the shadow of financial and economic crisis – Impact on healthcare systems in Greece, Ireland and Portugal (workshop, Bielefeld University)	2013	8 hours
The impact of the crisis on health systems in Europe (authors workshop, WHO Barcelona Office)	2013	16 hours
The impact of the crisis on Greece, Spain, Portugal (workshop, School of Public Health, Lisbon)	2012	16 hours
ECOHOST seminar series (organising seminars, LSHTM, London)	2012-2014	20 hours
Presentations		
The unequal health of Europeans: successes and failures of polices (Innovation in Care Conference, Brussels)	2017	1 ECTS
Amenable mortality in the EU28 (Best Abstract Award prize, abstract presentation, EUPHA, Vienna)	2016	1 ECTS
Health and Health System after austerity in Greece (plenary, Sandwell Health and Other Economic Summit, Birmingham)	2016	1 ECTS

Financial crisis, unmet need and access to care in Estonia, Latvia and Lithuania (HSPR seminar series, LSHTM, London)	2015	1 ECTS
Access to care in the Baltic States: did crisis have an impact? (abstract presentation, EUPHA, Milan)	2015	1 ECTS
Not that different or just not measurable? The contribution of health care to changes in population health outcomes in the four UK countries before and after devolution (poster presentation, The Lancet Public Health Science, in association with EUPHA, Glasgow)	2014	1 ECTS
Improving health worldwide: strengthening research capacity (poster presentation, LSHTM Annual Symposium, London)	2014	1 ECTS
Impact of the financial crisis on health system, efficiency and health in Lithuania (Annual Conference of the Lithuanian National Health Insurance Fund, Vilnius)	2014	1 ECTS
The impact of the financial crisis on health and health systems in Europe (Lithuanian Presidency of the Council of the European Union 2013 Conference "Sustainable Health Systems for Inclusive Growth in Europe", Vilnius)	2013	1 ECTS
Labour market inequalities, employment protections, and health disadvantage in Europe before and after economic recession - multilevel cohort analysis (abstract presentation, EUPHA, Brussels)	2013	1 ECTS
The crisis, austerity and health in Europe (The European Social Observatory and European Trade Union Institute forum, Brussels)	2013	1 ECTS
The effect of economic crisis and austerity on mental health and services in Europe (plenary lecture, Berlin School of Mind and Brain)	2013	1 ECTS
The response of European health systems to the financial crisis, with special reference to Greece (plenary, National Council for Quality and Prioritization in Health Care Services, Oslo)	2013	1 ECTS

International conferences

10 th European Public Health Conference, Stockholm	2017	1 ECTS
European Health Forum, Gastein	2017	1 ECTS
9 th European Public Health Conference, Vienna	2016	1 ECTS
8 th European Public Health Conference, Milan	2015	1 ECTS
Lithuanian Presidency of the Council of the European Union 2013 Conference "Sustainable Health Systems for Inclusive Growth in Europe", Vilnius	2013	1 ECTS
6 th European Public Health Conference, Brussels	2013	1 ECTS
WHO Conference on Health Systems and the Economic Crisis, Oslo	2013	1 ECTS
European Health Forum, Gastein	2012	1 ECTS

2. TEACHING

	Year	Workload (Hours / ECTS)
Thesis supervision for Masters in Public Health (LSHTM)	2013-2016	80 hours
Deputy module organiser, exam marking – Health Systems (DL) (LSHTM)	2013-2014	80 hours
Lectures, seminars, exams marking (LSHTM)	2012 - 2017	60 hours

