The health effects of a financial crisis: epidemiology on a large scale

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What happened?

GDP per capita (2007=1)

What happened to health?
### Suicides in old and new EU Member States: 2007=1

- EU members before May 2004
- EU members since May 2004

### Deaths on the roads

- Hungary
- Lithuania
- Netherlands

### Reversal in long term decline in unmet need

### Suicides in England

- Each 10% increase in the number of unemployed men was significantly associated with a 1.4% (0.5% to 2.3%) increase in male suicides.
- About two fifths of the recent increase in suicides among men (increase of 529 suicides, 126 to 532) during the 2008-10 recession can be attributed to rising unemployment.

### Increase in unmet medical need in Portugal, by economic status, 2010 to 2012

### Economic suicides in the Great Recession in Europe and North America

“...we estimate that the Great Recession is associated with at least 10,000 additional economic suicides between 2008 and 2010.”


Reversal in long term decline in unmet need
Austerity, precariousness, and the health status of Greek labour market participants: Retrospective cohort analysis of employed and unemployed persons in 2008-2009 and 2010-2011

• Health of all Greeks worsened during austerity after 2010
• However, impact of job loss on chance of reporting worse health much greater during austerity

Epidemiological issues

• Data availability & accuracy
• Defining exposure
  – What is a financial crisis or a recession?
• Understanding causality in complex situations
  – Causal pathways
  – Time lags
• Understanding effect modifiers
  – What makes things worse
  – What makes things better
• Natural experiments
• Multi-disciplinarity
• What is the treatment?

Another source?

• Cyclical trends in search activity for suicide and depression-related terms, with peaks in autumn and winter months, and a trough in summer months
• Significant association with suicides among:
  – 25-24 age group
  – 45-54 year old women (older women tend to overdose so search for details, men tend to hang themselves)

A question of priorities

Country | Last year of mortality data (June 2016)
---|---
Iceland | 2006
Ireland | 2010
Spain | 2011
Estonia | 2011
Belgium | 2012

Data availability & accuracy

Beware incentives to distort data

Benford’s Law on the distribution of the first significant digit in a collection of numerical data

\[ P(d) = \log_{10}(d + 1)/d \]
Benford’s Law applied to EU 27 and Greek financial statistics

(average 133 observations/ country/year)

Source: Rauch, Göttsche, Brähler, & Engel, 2011

NBER definition

“a significant decline in [the] economic activity spread across the country, lasting more than a few months, normally visible in real GDP growth, real personal income, employment, industrial production, and wholesale-retail sales”

Defining and interpreting exposure

Recession: a definition

• A rule of thumb....
• “a decline in the seasonally and calendar adjusted real gross domestic product (GDP) in at least two successive quarters”

Julius Shiskin, NY Times 1974

The need for a multidisciplinary approach

Who is publishing?

Different disciplines

• Systematic search of Web of Science for literature on recessions and health
• 461 articles & 14,401 cited documents
• Network analysis of co-citation pattern by disciplines, journals and backgrounds of the authors

Few reading each other’s work

Koch’s Postulates
- The microorganism must be isolated from a diseased organism and grown in pure culture.
- The cultured microorganism should cause disease when introduced into a healthy organism.
- The microorganism must be reisolated from the inoculated, diseased experimental host and identified as being identical to the original specific causative agent.

Cause and effect

Bradford Hill’s criteria of causality
- Strength of association
- Consistency
- Specificity
- Temporal relationship
- Biological gradient
- Experiment
- Analogy
- Biological plausibility
- Coherence

A fair experiment

Timing
When might we expect to see an effect?
Some effects occur almost instantly:
- Injuries, poisoning and violence mortality (excluding acute alcohol poisoning)

Russia: Men aged 30-59

Mechanisms

Smoking and lung cancer in British men
A lagged effect

Time
- Some things we can predict ...
  - A change in drinking pattern can have an impact almost at once
- Some things are more difficult
  - Smoking rates today predict lung cancer mortality years in the future
  - We can only expect to detect effects with short lags
  - Many other effects will be lost in the noise

Why have rates of homelessness claims in England risen since 2010?
- We used variations in rates across local authorities to test the impact of economic downturns and budget cuts.
- Using cross-area fixed effects models of data from 323 UK local authorities between 2004 and 2012, we evaluated associations of changes in statutory homelessness rates with economic activity, unemployment, and local and central government expenditure.
- Each 10% fall in economic activity was associated with an increase of 0.4% homelessness rates per local authority.

Increasing rates of homelessness also strongly linked with government reductions in welfare spending.
- Disaggregating types of welfare expenditure, we found that strongest associations with reduced homelessness claims were spending on social care, housing services, discretionary housing payments and income support for older persons.
Effect modifiers

- Are there things that might protect people from economic crises?
  - Social support, friends, marriage
  - Welfare systems

- Are there things that might worsen the effects of economic crises?
  - Easy access to harmful substances
  - Lack of protection (e.g. Breakdown of law and order)

The impact of a 1% increase in unemployment on mortality

Something can be done...
Active Labour Market Programmes

Below Median Spending
<€100 per capita

Above Median Spending
>€100 per capita

Association (Spain) or lack (Sweden) of unemployment and suicides

Economic shocks, resilience, and male suicides in the Great Recession: cross-national analysis of 20 EU countries

- Multivariate statistical models used to evaluate changes in suicide rates in 20 EU countries from 1981–2011
- Male suicide increases were significantly associated with each percentage point rise in male unemployment, by 0.54%, and indebtedness, by 0.34%. Spending on active labour market programmes (0.26%) and high levels of social capital (0.048%) moderated the unemployment-suicide association.
- There was no interaction of the volume of anti-depressant prescriptions, monetary benefits to unemployed persons or total social protection spending per capita.
- Active labour market programmes and social capital were estimated to have prevented 540 and 210 male suicides, respectively, arising from unemployment in the countries studied.
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.

- Cross-national first difference models used to evaluate how rising unemployment and declining wages related to changes in prevalence of food insecurity and role of social protection expenditure in modifying observed effects.
- Economic hardship strongly associated with greater food insecurity, with each 1 percentage point rise in unemployment associated with estimated 0.29 percentage point rise in food insecurity
- Each $1000 decrease in annual average wages associated with 0.62 percentage point increase in food insecurity

Housing benefit and mental health

- In April 2011 the UK government reduced financial support for low-income persons renting private-sector housing (mean reduction ~ £1,220 per year)
- Data from UK Annual Population Survey (repeated quarterly cross-sectional survey)
- Analysis of renters in private sector
  - intervention group receiving housing benefit (n = 36,859)
  - control group not receiving housing benefit (n = 142,205).
- Main outcome binary measure of self-reported mental health problems

Rising unemployment and falling wages are strong statistical determinants of increasing food insecurity, but at high levels of social protection, these associations could be prevented


Extrapolating these findings, ~26,000 (95% CI: 14,000 to 38,000) people newly experienced depressive symptoms in association with cuts to housing benefit

National minimum wage and mental health

- UK government implemented minimum wage legislation in 1999, increasing hourly wages to £3.60
- We used longitudinal data from the British Household Panel Survey to compare otherwise similar persons:
  - Intervention: who moved up to the minimum wage
  - Controls: who were likely unaffected because
    - their wages were between 100% and 110% of the eligibility threshold
    - their firms did not increase wages to meet the threshold
- Assessed the probability of mental ill-health using 12 item General Health Questionnaire (GHQ-12)
- The intervention group, whose wages rose above the minimum wage, experienced lower probability of mental ill-health compared with both controls
- Improvement represented 0.37 of a standard deviation, comparable to the effect of anti-depressants (0.39 of a standard deviation) on depressive symptoms.


The role of mass privatisation

- Mass privatisation programmes associated with an increase in short-term adult male mortality rates of 12.6%
- Unemployment rates increased substantially by mass privatisation (56.3%)
- Each 1% increase in the percentage of population who were members of at least one social organisation decreased the association of privatisation with mortality by 0.27%
- When more than 45% of a population was a member of at least one social organisation, privatisation was no longer significantly associated with increased mortality rates

On the effect of mass privatisation in the former USSR

- "polemic that will not withstand epidemiological scrutiny"
- "Don’t they know that the most important reason for poor health in Russia is diet"

Data torture

- Interpreting every result as confirming your hypothesis
- Lack of biological plausibility
- Failure to report number of comparisons made
- Dropping subjects without justification
- Inappropriate classification of exposure and disease
Greek Tragedy
- 40% rise in homelessness
- 50% increase in unmet medical needs
- 40% increase in infant mortality
- 30% rise in stillbirths
- 60% rise in suicides


Austerity, sanctions, and the rise of food banks in the UK
- One percentage point increase in unemployment increased likelihood of food bank opening in subsequent year by 1.08 (95% CI 1.02 to 1.14)
- Each 1% cut in central government spending on welfare benefits in local authority increased odds of a food bank opening within two years by 1.6 (95% CI 1.25 to 2.03)
- Each 1% increase in the rate of benefit sanctions associated with significant increase of 0.29 percentage points (95% CI 0.01 to 0.17)

The growth of food banks

Source: Loopstra et al BMJ 2015

Reasons?
- “not able to manage their finances” (Michael Gove, Education Minister)
- “[food bank use can] become a habit” (Paul Maynard, Conservative MP)
- “food from a food bank is by definition a free good and there’s almost infinite demand” (Lord Freud, Conservative minister)
- “have more money to spend on alcohol, cigarettes” (Councillor Steward (Conservative))
- Trussell Trust is “Scaremongering” (Iain Duncan Smith, Work & Pensions minister)

Denialism is characterized by:
1. Conspiracy - Suggesting opponents have an ulterior motive for their position or are part of a conspiracy.
2. Cherry picking - Selecting an anomalous critical paper supporting their idea, or using outdated, flawed, and discredited papers in order to make their opponents look like they base their ideas on weak research.
3. False Experts - Paying an expert in the field, or another field, to lend supporting evidence or credibility; bypassing the peer review process.
4. Moving the Goalpost - Dismissing evidence presented in response to a specific claim by continually demanding some other (often greater) piece of evidence. Denialists use the absence of complete and absolute knowledge to prevent the implementation of sound policies, or the acceptance of an idea or theory.
5. Other Logical Fallacies - Usually one or more of false analogy, straw man, red herring, or quote mining, and even plain lies and insults.

Real choices

Red = reduced spending
Blue = increased spending

Source: ONS 2014

Protect health, education, and social protection spending

Olivier Blanchard, Chief Economist of the IMF has recalculated the fiscal multiplier – the impact of additional spending on GDP growth
• Larger than previously thought – about 1.6
• So maybe increased government spending would actually make things better?

Natural Experiment: stimulus versus austerity

What can we do?

Have we been here before?
• How to solve a slump: "A solid majority of economists" agree:
  • The government borrows more and invests the cash either in building schools and hospitals or in providing benefits and tax cuts
  • This boosts demand and generates employment
  • This can be paid for by borrowing – wartime UK government ran "astronomical budget deficits", while "the rate of interest has shown no rise since the beginning of 1940"
  • If it becomes too costly to keep on top of the national debt then ministers should raise more funds, not by taxing ordinary pay or spending, which would slow the economy, but with a levy on "idle wealth"
  • A booming economy and healthy profits would be good for the "leaders of industry", but they will never support such government intervention
  • The main sources of resistance are "so-called 'economic experts' closely connected with banking and finance" and "big business".
  Michał Kalecki, 1942

So what should we prioritise to maintain health?
• Active labour market interventions:
  – public employment programmes (welfare to work)
  – training and skills development
  – programmes for youth transitioning from school to work
  – programmes to get the unemployed back to work
  – programmes to provide employment for disabled people
  – support for people with low level mental health
• And don’t forget that health services are major employers – they do good by employing people as well as by treating them

Thank you for your attention