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## Recessions and mortality: subtle but informative effects

Research on the health consequences of economic downturns has focused on the unemployed population. Losing one's job is stressful, and undermines a sense of personal worth, besides the effect on earnings [A: edit

?]. The most extreme manifestation of the negative effect of unemployment is its association with suicide, reported in studies at both individual<sup>1</sup> and population<sup>2,3</sup>

[A: We have exceeded the maximum number of references, could we delete one of these two?] levels. Mortality from cardiovascular disease and other conditions is also increased in unemployed people.<sup>1</sup>

Therefore, it appears paradoxical that when unemployment increases in a country, mortality of the population as a whole tends to decline. This is the finding of a study by Enrique Regidor and colleagues,<sup>4</sup> which follows up the entire Spanish population aged 10–74 years in 2001 for 10 years. Mortality was examined in the period before the recent recession (2004–07) and then afterwards (2008–11). The rate of decline in total mortality following the recession was found to be steepest in those who were least socio-economically advantaged.

Overall, this new study confirms much of what has been established in a research field going back almost

a century:<sup>5,6</sup> [A: Could we delete one of these two references?] that total mortality declines in recessions and rises transiently when the economy expands. This effect is described as procyclical.<sup>7</sup> These findings have been interpreted by some as minimising the negative impact of unemployment on individuals. However, this view fails to distinguish between the impact of unemployment on the unemployed people per se, and the association of mortality with macro-economic conditions in whole populations, as proxied by a country's unemployment rate.<sup>8</sup>

There are several reasons why a recession would affect working age mortality in the population as a whole aside from suicide. Particularly for manual workers, lower levels of industrial production and construction can result in reduced exposure to workplace hazards. Although a recession could result in some employers taking shortcuts with health and safety measures, the net effect of the recession is the reduction of industrial injuries and fatalities, as has been seen in Spain.<sup>9</sup>

Declines in mortality during recessions have [A: ?]

been found among people well above retirement age.<sup>10</sup>

This finding points to effects of the recession that touch all age groups regardless of labour market involvement

[A: edit ok?] pollution could be one of these effects: variation in particulates and nitrogen oxides have been associated with fluctuations in mortality from cardiovascular and respiratory disease in old ages as well as working ages.<sup>11</sup> Using satellite data, a study<sup>12</sup> from the USA showed profound effects of the 2008 recession on nitrogen dioxide plumes above cities. As might be expected, Regidor and colleagues replicate the widely observed<sup>2</sup> fall in mortality from road traffic injuries. A detailed analysis of the reduction in this cause during the 2008 economic downturn in the USA suggested that the key factor was changes in the mix of vehicle types on the road.<sup>13</sup> Reductions in air pollution levels and hazardous traffic could be expected to reduce mortality risk most among the least advantaged in society.

It has been suggested that the procyclical, macro-economic effects on mortality have diminished over recent decades.<sup>14</sup> Interventions to reduce air pollution, control smoking, and improve levels of workplace and social protection might have contributed to this decreased effect. However, there could be a more important explanation. Cardiovascular disease has been the principal driver of the associations of total mortality with macro-economic conditions, whereas cancer has been little implicated. Since the 1970s the balance of total deaths due to cardiovascular disease and cancer has changed in high-income countries, driven principally by the steep decline in cardiovascular deaths [A: is this what you meant by "the former"?].<sup>15</sup> Thus pro-cyclical effects might diminish as a result of changes in the cause-specific composition of total mortality.

The most compelling evidence that social and economic changes can have powerful and immediate effects on mortality of nation states comes from the impact of the fall of the Berlin wall and its aftermath on the former communist countries of Europe.<sup>16</sup> These effects were much larger and in the opposite direction to those seen as a result of recessions in western countries, and cannot be explained in purely macro-economic terms. The case of Russia in the 1990s attests to the potentially catastrophic negative effect on mortality of a breakdown in the functioning of the state and in the structures that make

daily life predictable and contained.<sup>17</sup>

With the current outlook for the world economy looking increasingly uncertain, the health effects of macro-economic policies should rightly be kept in the spotlight. But it is important to put things in context. It is remarkable that over the past 60 years life expectancy in all high-income western countries has increased steadily,<sup>16</sup> with any effect of the 2008 or earlier recessions being almost invisible. This is not to be complacent, for these relatively subtle effects of macro-economic circumstances on mortality point to deaths that are clearly preventable if society chose to act.

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declare no competing interests.

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