

Suicide and employment status during Ireland's Celtic Tiger economy

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Background: Studies have identified employment as a protective factor against suicide. We examined employment status and risk of suicide in Ireland during the 11-year period 1996–2006, a period of economic boom commonly known as the Celtic Tiger. **Methods:** Data relating to the 5270 suicides and 789 deaths of undetermined intent registered as occurring in Ireland in 1996–2006 and relevant population data were obtained from the Irish Central Statistics Office and analysed using Poisson regression. **Results:** Unemployment fell from 12% in 1996 to 4% in 2000, a level at which it remained until 2006. Male and female rates of suicide and undetermined death were stable during 1996–2006 though suicide among unemployed men increased. Relative to employment, unemployment was associated with a 2–3-fold increased risk of male suicide and undetermined death but generally a 4–6-fold increased risk in women. Unemployment was associated with greater increased risk of suicide and undetermined death when its level was low (2001–06) than in the period of decreasing unemployment (1996–2000). Unemployment was a stronger risk factor in men aged 35–54 years and with increasing age in women. Retired persons aged >55 years had a similar risk to their employed counterparts. Being a homemaker was associated with increased risk in women aged >35 years. **Conclusion:** The current Irish context of rapidly increasing unemployment suggests that rates may rise again as in previous recessions. Appropriate social policy responses are required to mitigate the potential impact of unemployment on suicides.

Keywords: economic recession, employment status, suicide, undetermined death, unemployment

Introduction

Studies examining the association between suicide and employment status at the individual level have generally shown unemployment to be a risk factor.^{1–3} Its effect has been shown to remain after adjustment for other socio-economic factors^{4,5} and factors related to mental health.^{6–8} Whether the extent to which the unemployed are at increased risk of adverse health outcomes including suicide is related to the general level of unemployment in the population has been investigated in a number of studies. Research in Finland⁹ and Sweden¹⁰ revealed that the association between unemployment and all-cause mortality was stronger in times of low unemployment. The opposite was found in a study of suicide in Italy over a 13-year period of increasing unemployment.¹¹ Suicide increased in the employed and unemployed of each gender but the increase was more pronounced in the unemployed.

A study of the Irish system of recording suicide deaths in 2002 estimated that unemployed men and women had four times and five times the suicide rate of their employed counterparts, respectively.¹² In Northern Ireland, a case-control psychological autopsy study found unemployment to be a risk factor for suicide independent of current DSM-III-R Axis I (clinical syndrome) disorder(s).⁶ A second Northern Irish study involving record linkage between census and mortality data for the entire adult population showed significant variation in suicide risk by employment status. However, it was not the unemployed but the homemakers, permanently ill and a residual economically inactive group (i.e. excluding

students and the retired) who were at increased risk of suicide after adjustment for self-rated general health, deprivation and other socio-demographic factors.¹³

In Ireland, the mid-1990s signalled the beginning of an economic boom, known as the Celtic Tiger. It was a period of unprecedented economic growth during which Ireland outpaced its European neighbours in job and wealth creation with an associated property boom and greatly increased cost of living. The aim of this study was to examine Irish suicide by employment status during the Celtic Tiger economy years, 1996–2006. In particular, we examined the association between unemployment and suicide during the initial period of decreasing unemployment and the later period of consistently low unemployment as well as interaction by age, gender and time period.

Methods

The Irish Central Statistics Office (CSO) provided data electronically relating to all deaths by suicide and deaths of undetermined intent (respectively, codes E950–959 and E980–989 of the Ninth Revision of the International Classification of Diseases, Injuries and Causes of Death) registered as occurring in 1996–2006, inclusively (2006 being the most recent year for which complete data were available). Annual population estimates (disaggregated by sex and 5-year age group) and population data from the 1996, 2002 and 2006 national censuses (disaggregated by sex, age group and employment status) were obtained from the CSO website (<http://www.cso.ie/>). For each age–sex–employment status

subgroup, population estimates were interpolated for the intercensal years by assuming that the population change from one census to the next involved constant year-to-year changes. The employment status categories used in Irish censuses differ slightly from those used in Irish mortality data (Supplementary table). Consequently, suicide rates could not be calculated separately for students, persons unable to work due to sickness or disability and male homemakers. Furthermore, the number of suicides of retired persons aged <55 years was too small to estimate their associated suicide risk. The annual unemployment rate, measured as the percentage of the labour force (the employed and the unemployed whether looking for first job or having lost a job) who were unemployed, was obtained from the website of LABORSTA, a database of the International Labour Office Bureau of Statistics (<http://laborsta.ilo.org/>).

Statistical analysis

Rates of suicide and suicide plus undetermined death (UD) were calculated using the Irish mortality data and the census-derived population data as the numerator and denominator, respectively. Annual rates of male and female (all ages) suicide and suicide plus UDs were age-standardized using the European standard population.¹⁴ Annual age-specific rates were calculated for 15–34, 35–54 and >55 year age groups. Annual age-standardized rates of suicide (>15 years) were also calculated for employed and unemployed men and women and for female homemakers. Poisson regression analysis was used to estimate time period, age, sex and employment status effects on the incidence of suicide and suicide plus UD in Ireland. For reasons explained above, the Poisson regression analysis was confined to men and women aged >15 years who were classified as employed or unemployed, men and women aged >55 years classified as retired and women aged >15 years classified as homemakers. Evidence of interaction between pairs of factors was assessed by fitting Poisson regression models with and then without the relevant interaction term and performing a likelihood ratio test (LRT). Main effects, interaction effects and their combined effects are reported as incidence rate ratios (IRRs)

with their 95% confidence intervals (CIs) and *P*-values. Poisson regression models including age and employment status were derived separately for male and female suicide and male and female suicide plus UD in 1996–2000 and 2001–06. The independent main effects of age relative to the reference age group 15–34 years are reported. The main effects of employment status relative to the reference group, the employed, were combined with the interaction effects of employment status and age. These combined effects are reported and represent the effect of the employment status relative to the employed of the same age. The Poisson regression analyses were carried out using Stata version 6.0.¹⁵ While all analyses were carried out for suicide deaths only and for suicide plus UDs, results from the latter are presented. The trend in male and female suicide and unemployment is first presented, the trend in male and female unemployment being based on the LABORSTA data. Male and female suicide trends are then presented by age group and by employment status. Gender differences are detailed and then the effects of age and employment status are detailed separately for male and female suicide plus UD.

Results

Unemployment and suicide trends

Between 1996 and 2000, the rate of unemployment in Ireland fell from 12 to 4%, a level at which it remained from 2001 to 2006. A similar trend was observed in male and female unemployment although female unemployment was somewhat lower in 2002–06 (figure 1). During the 11 years 1996–2006, there were 5270 suicides [male: 4286 (81%); female: 984 (19%)] and 789 deaths of undetermined intent [male: 572 (72%); female: 217 (28%)] in Ireland. Male and female rates of suicide and suicide plus UD followed a similar trend and were fairly stable over the study period. The average male suicide rate was 20.0 per 100 000, approximately four times the female rate (4.7 per 100 000; ratio = 4.3). The 4-fold difference remained when UDs were added (male rate: 22.6 per 100 000; female rate: 5.7 per 100 000; ratio = 4.0).

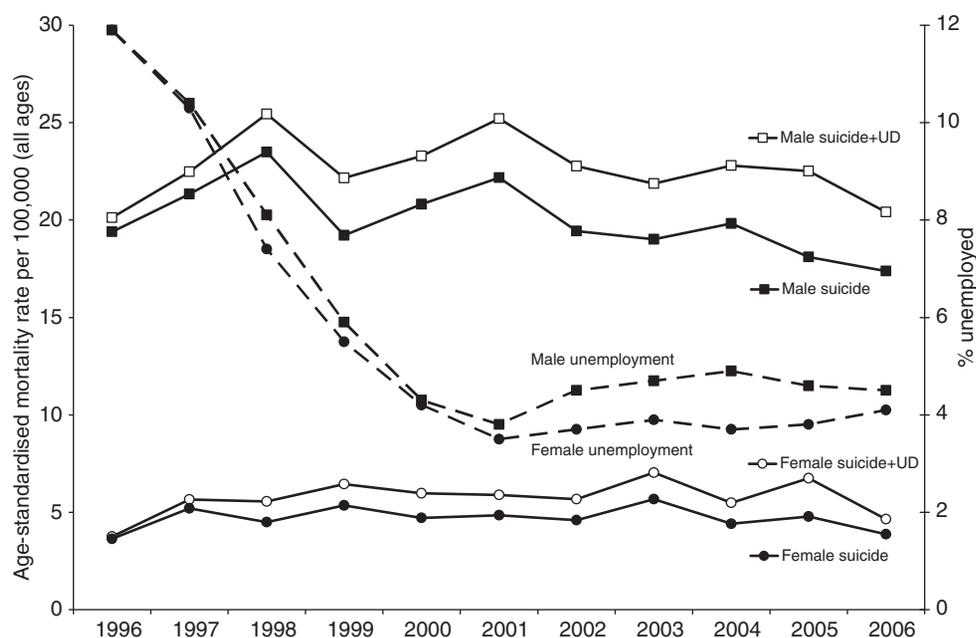


Figure 1 Rates of male and female unemployment and mortality due to suicide and suicide plus UD in Ireland, 1996–2006

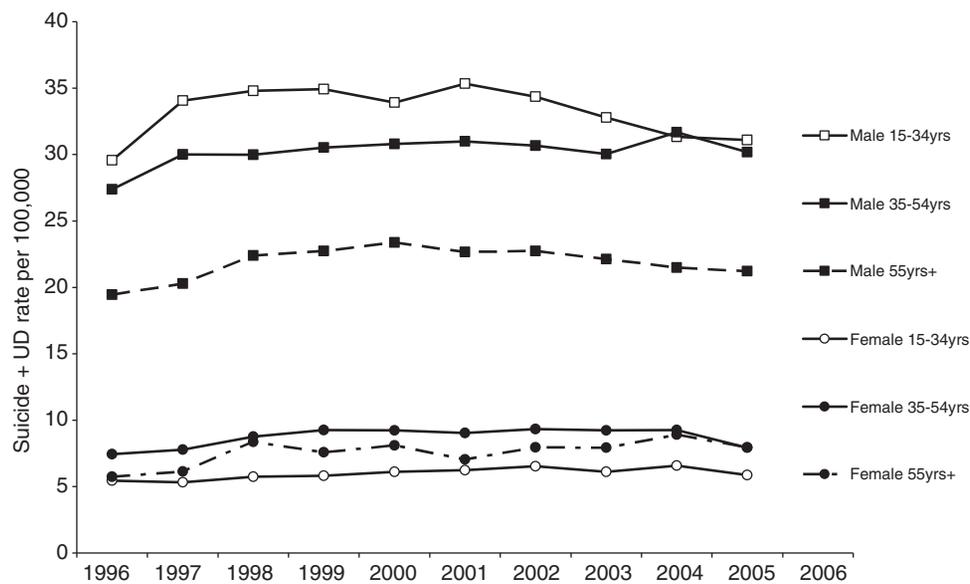


Figure 2 Age-sex-specific rate of suicide plus UD in Ireland, 1996–2006. Three year moving averages of the annual rates are shown. Data for 1995–97 were used in the calculation of the moving average displayed for 1996

Suicide trend by age

Trends in male and female suicide plus UD were also relatively stable when examined by age group (figure 2). The highest male suicide rate was in 15–34-year-olds but in 2005 their rate converged with that of men aged 35–54 years. Older men had a far lower suicide rate. Differences between the age-specific female rates were smaller though women aged 35–54 years had the highest rate, younger women had the lowest rate and the rate in women aged >55 years fluctuated between the two.

Suicide trend by employment status

For men and women, the suicide plus UD rate was highest among the unemployed (figure 3). The rate among unemployed men increased markedly from 50.0 to 72.9 per 100 000 during the study period. Unemployed women had a similar rate to employed men. Women who were homemakers had an identical suicide plus UD rate to the employed until 2002 after which their rate was twice that of the employed.

Gender differences

The gender difference in the rate of suicide plus UD varied by age (LRT chi-square = 65.58, $df = 2$, $P < 0.001$). Among 15–34-year-olds, men had six times the rate of women (IRR = 6.28, 95% CI = 5.57–7.10, $P < 0.001$) whereas there was a <4-fold gender difference among 35–54-year-olds (IRR = 3.62, 95% CI = 3.26–4.02, $P < 0.001$) and >55-year-olds (IRR = 3.32, 95% CI = 2.91–3.78, $P < 0.001$). The effect of employment status differed between men and women (LRT chi-square = 28.52, $df = 2$, $P < 0.001$). Relative to being employed, being unemployed was associated with an almost 5-fold increased risk of female suicide plus UD (IRR = 4.76, 95% CI = 3.99–5.67, $P < 0.001$). In contrast, unemployed men had almost three times the risk of the employed (IRR = 2.82, 95% CI = 2.62–3.02, $P < 0.001$).

Age and employment status effects on male suicide and UD

The impact of unemployment on male suicide plus UD differed between 1996–2000 and 2001–06 (LRT chi-square = 14.10, $df = 1$, $P < 0.001$), particularly for men

aged 15–34 years. Those unemployed in 1996–2000 had twice the rate of suicide plus UD of their employed counterparts but there was a 3-fold difference in 2001–06 (table 1).

In 1996–2000, men aged >35 years had a suicide plus UD risk one-third lower than younger men but this difference diminished in 2001–06. In addition, age modified the effect of being unemployed in 1996–2000 (LRT chi-square = 6.69, $df = 2$, $P = 0.035$). Unemployed men aged 15–34 years had twice the risk of employed men of the same age but this risk increase was one-third greater in 35–54-year-olds (Interaction IRR = 1.34, 95% CI = 1.07–1.67, $P = 0.010$). Age also modified the effect of unemployment on risk of male suicide plus UD in 2001–06 (LRT chi-square = 9.31, $df = 2$, $P = 0.010$). Unemployment was associated with at least a 3-fold increased risk among 15–34- and 35–54-year-olds compared with a doubling of risk in >55-year-olds. Among men aged >55 years, those who had retired had a similar rate of suicide plus UD to those in employment.

Age and employment status effects on female suicide and UD

The increased risk of suicide plus UD associated with unemployment was greater in women than in men irrespective of age (Table 1). The associations between female suicide plus UD and employment status in 1996–2000 differed from those in 2001–06 (LRT chi-square = 16.12, $df = 3$, $P = 0.001$). The incidence of suicide plus UD among homemakers, relative to the employed, was higher in 2001–2006 than it was in 1996–2000 whereas the opposite occurred for the retired (>55 years). Among >35-year-olds, the increased risk associated with unemployment appeared greater in 2001–06 than in 1996–2000 but the difference did not reach statistical significance (interaction IRR = 1.26, 95% CI = 0.76–2.10, $P = 0.373$).

The risk of female suicide plus UD associated with being a homemaker varied by age in 1996–2000 (LRT chi-square = 11.04, $df = 2$, $P = 0.004$) and in 2001–06 (LRT chi-square = 10.74, $df = 2$, $P = 0.005$). In 1996–2000, young homemakers had half the risk of young employed women but being a homemaker was not protective for older women. In 2001–2006, young homemakers had the same risk of suicide

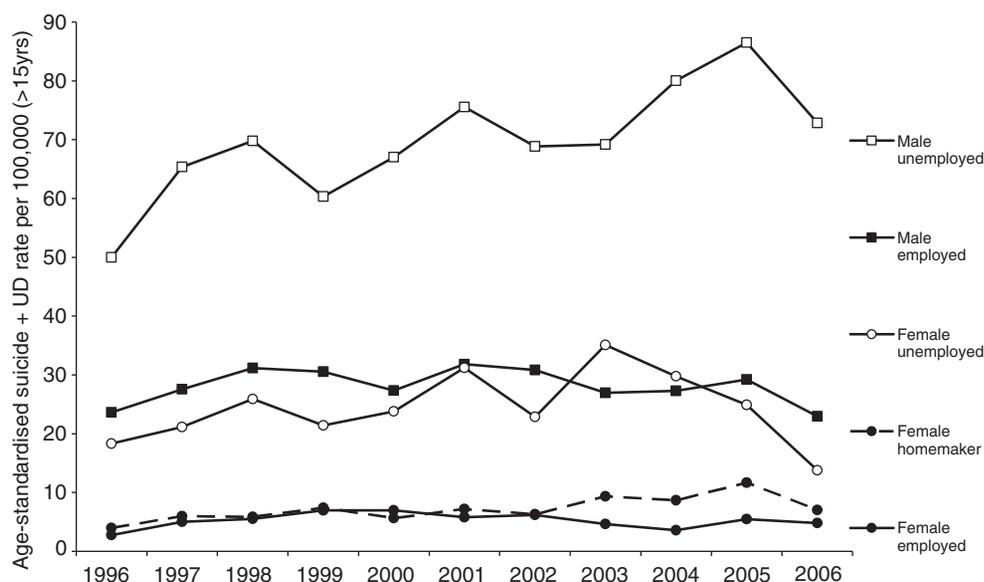


Figure 3 Male and female rate of suicide plus UD in Ireland by employment status, 1996–2006

Table 1 Effects of age and employment status on male and female rates of suicide plus UD during Ireland's years of decreasing unemployment (1996–2000) and low unemployment (2001–06)

Factor	Group	Male				Female			
		1996–2000		2001–06		1996–2000		2001–06	
		IRR	(95% CI)	IRR	(95% CI)	IRR	(95% CI)	IRR	(95% CI)
Age (years)	15–34 (reference group)	1.00	–	1.00	–	1.00	–	1.00	–
	35–54	0.70***	(0.62–0.79)	0.82***	(0.74–0.91)	1.25	(0.90–1.74)	1.12	(0.86–1.46)
	≥55	0.66***	(0.55–0.80)	0.80**	(0.69–0.94)	0.81	(0.41–1.63)	0.88	(0.54–1.43)
Employment status (reference group is the employed of the same age)	Unemployed aged 15–34	2.12***	(1.83–2.46)	3.06***	(2.69–3.50)	4.41***	(3.06–6.37)	3.97***	(2.82–5.58)
	Unemployed aged 35–54	2.84***	(2.41–3.36)	3.63***	(3.12–4.22)	4.99***	(3.23–7.68)	5.91***	(4.18–8.35)
	Unemployed aged >55	2.33***	(1.64–3.31)	2.13***	(1.52–2.97)	5.25**	(1.62–17.03)	8.61***	(4.25–17.42)
	Retired aged >55	0.88	(0.71–1.10)	0.84	(0.70–1.00)	1.52	(0.72–3.19)	0.71	(0.40–1.26)
	Homemaker aged 15–34	–	–	–	–	0.45*	(0.22–0.93)	0.87	(0.52–1.46)
	Homemaker aged 35–54	–	–	–	–	1.38*	(1.01–1.88)	1.84***	(1.41–2.40)
	Homemaker aged >55	–	–	–	–	1.76	(0.88–3.50)	2.52***	(1.55–4.08)

* $P < 0.05$; ** $P < 0.01$; *** $P < 0.001$.

plus UD as the employed but with increasing age being a homemaker was associated with significantly increased risk.

Unemployment was a stronger risk factor with increasing age in women. This effect modification was strongest, but only approached statistical significance, in 2001–2006 (LRT chi-square = 4.84, $df = 2$, $P = 0.089$) when the 4-fold increased risk associated with unemployment among 15–34-year-olds was 50% stronger in 35–54-year-olds (interaction IRR = 1.49, 95% CI = 0.92–2.42, $P = 0.109$) and two times stronger in women aged >55 years (interaction IRR = 2.17, 95% CI = 0.99–4.75, $P = 0.053$).

Discussion

The Celtic Tiger economy in Ireland reduced unemployment from 12% in 1996 to 4% in 2000, a level at which it remained until 2006. Male and female rates of suicide plus UD were relatively stable during 1996–2006. Unemployed men and women had far higher rates than their employed counterparts but unemployment was a stronger risk factor for women.

Unemployment was a stronger risk factor when it was rare (2001–06) than in the period of decreasing unemployment (1996–2000). Relative to the employed, young female homemakers were protected from suicide in 1996–2000 but not in 2001–06 whereas older homemakers had higher rates. In relation to age, unemployment was a stronger suicide risk factor for men aged 35–54 years and with increasing age for women. The results of the analysis of the suicide data alone were highly consistent with those based on suicide and UD's though it was notable that the strength of the effect of unemployment was marginally greater when UD's were included.

Our finding that unemployment was a stronger risk factor for female suicide than for male suicide is consistent with record linkage/longitudinal studies in the UK and Wales⁵ and the USA⁴ but not with similarly designed studies in Denmark⁷ and New Zealand¹⁶ and an Italian study of national suicide rates.¹¹ The finding has been related to increased female participation in the labour force and increased investment by women in their socio-economic

roles.^{4,17,18} Both would apply to Ireland and these factors may also be relevant to the finding that the protective effect of employment increased with age among women. That unemployment was a stronger risk factor for men aged 35–54 years and older women is also supported by studies that have shown young unemployed people to experience less psychological distress than the middle-aged unemployed^{19,20} for whom the consequences of being out of work may be more serious as they are likely to have greater financial and family commitments and may suffer a greater loss in status and security by being unemployed than a young person.²¹ That young female homemakers were at low risk of suicide may relate to having a young child, a highly protective factor against female suicide.²²

Studies of all-cause mortality in Finland⁹ and Sweden¹⁰ and studies of hospital-treated non-fatal suicidal behaviour in Helsinki²³ and Edinburgh²⁴ have also shown unemployment to be a stronger risk factor when its level was low. In contrast, an Italian study,¹¹ more similar to ours as it involved analysis of national suicide rates by employment status in a period of changing levels of unemployment, found the risk of suicide in the unemployed increased relative to the employed as the general level of unemployment increased.

There are two broad explanations for the association between unemployment and suicide: firstly, health selection, whereby pre-existing vulnerabilities such as mental illness lead to and/or maintain the state of unemployment and it is these vulnerabilities that lead to suicide; secondly, unemployment causes vulnerability to suicide by causing stress and financial worry, loss of self-esteem, social disintegration, threats to healthy routine and sense of purpose all of which increase risk of depression, substance misuse, hopelessness and ultimately suicide.^{4,9,10,16} Both explanations can be evoked in explaining how the effect of unemployment may vary with the general level of unemployment. If unemployment is rare, its effects may be amplified in particular with regard to loss of self-esteem and social integration and increased stigma and isolation. A concentration of risk of suicidal behaviour in persons when the risk factors they are exposed to become rare has previously been demonstrated.^{25,26} The health selection hypothesis may also explain greater risk associated with unemployment when it is rare because it suggests that when there is almost full employment only the most vulnerable fail to be employed thereby maximizing the difference in suicide between the unemployed and employed. As unemployment increases, the proportion of vulnerable people among the unemployed decreases thereby diminishing the difference in suicide between the unemployed and employed. It is likely that for some suicides related to unemployment health selection was the mechanism that applied whereas for other cases unemployment had a direct role in increasing suicide risk.

The study period was confined to 1996–2006 because before this time the coding of employment status in Irish mortality data did not have a specific category for the unemployed. The study period allowed examination of the effect of unemployment during periods of decreasing unemployment and low unemployment but not in periods when the unemployment rate was consistently high or when it increased. The coding of employment status in Irish mortality data also meant that we could not assess suicide risk among students and people unable to work due to illness or disability. The latter would have been of particular interest and have been found to be at elevated risk of suicide in neighbouring Northern Ireland¹³ and in England and Wales.⁵ The census employment status data used in our study originated from the subjective opinion of the individual or family member who completed the census

form, whereas the mortality employment status data were based on the coroners' certificates which would have been sourced from the family of the deceased or another appropriate informant. We therefore consider the probability of numerator–denominator bias (i.e. an individual's employment status being described differently in the census and mortality data) to be low but we cannot discount the possibility of such bias. We had no information regarding the quality or reliability of the recording of employment status in the mortality data. In terms of completeness, an employment status was recorded for 94% of the deaths under study. Unrecorded data were primarily confined to deaths of <35-year-olds and this suggests that some sample bias may have been present.

We were unable to make adjustment for confounding factors important in the association between employment status and suicide. The most important of these would undoubtedly relate to mental health, which would be associated with far greater increased risk of suicide than employment status. However, it has been shown that unemployment still explains significant variation in suicide risk after adjustment for factors related to mental health.^{6–8} Furthermore, adjusting for confounders is more important in longitudinal studies than in ours as we assessed differences in relative risk of suicide in two consecutive time periods. Confounders could be expected to operate similarly in both periods and therefore the changes in relative risk may be unaffected by confounding.

During Ireland's Celtic Tiger economy, unemployment fell and male suicide rates levelled off. Whether the latter is attributable to the Celtic Tiger or to Ireland's suicide prevention efforts cannot be determined given the difficulties inherent in assessing the impact of suicide prevention strategies.^{27,28} However, Ireland is now in economic crisis with rapidly increasing unemployment. Our previous experiences of increasing unemployment in the late 1970s and early 1980s saw increases in suicide, primarily among men. Experience in other countries has been mixed. Rapidly increasing unemployment in the early 1990s was not associated with increases in suicide rates in Sweden²⁹ and Finland³⁰ but was associated with 30–40% increases in male and female suicide in Italy, albeit from low baseline rates.¹¹ The extreme economic crisis in South Korea in 1998 was associated with a 40% increase in the national suicide rate for that year but the South Korean economy recovered quickly and the suicide rate returned to pre-crisis levels.^{31,32} A recent study of the 26 European Union countries reported that an increase in unemployment of at least 3% was associated with a 4.45% increase in suicides among <65-year-olds.³³ Ireland's unemployment rate increased by at least 3% in 2008 and again in 2009. This suggests that the recent period of stable Irish suicide rates may be over and that Irish suicide may increase again as in previous times of recession. However, with increasing unemployment, we believe there will be a weakening of the risk of suicide in the unemployed relative to the employed which may offset some of the anticipated rise in suicides. It has also been shown that higher social spending on active labour market programmes aimed at keeping and reintegrating workers in jobs reduced the effect of unemployment on suicides.³³ It is important that policy makers choose to increase investment in a range of appropriate social policy responses to mitigate the potential impact of unemployment on suicide.³⁴

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Conflicts of interest: None declared.

Key points

- Ireland's economic boom was associated with stable rates of suicide and UD overall but an increasing rate in unemployed men.
- The rate increase in suicide associated with unemployment varied with the general level of unemployment, being greater when the level of unemployment was low than in the period of decreasing unemployment.
- Unemployment was associated with greater increased risk in women than in men.
- Among men, unemployment was a stronger suicide risk factor among 35–54-year-olds whereas its negative effect increased with age among women.

References

- 1 Jin RL, Shah CP, Svoboda TJ. The impact of unemployment on health: a review of the evidence. *Can Med Assoc J* 1995;153:529–40.
- 2 Platt S. Unemployment and suicidal behaviour: a review of the literature. *Soc Sci Med* 1984;19:93–115.
- 3 Platt S, Hawton K. Suicidal behaviour and the labour market. In: Hawton K, Van Heeringen K, editors. *The international handbook of suicide and attempted suicide*. Chichester: Wiley, 2000:309–84.
- 4 Kposowa AJ. Unemployment and suicide: a cohort analysis of social factors predicting suicide in the US National Longitudinal Mortality Study. *Psychol Med* 2001;31:127–38.
- 5 Lewis G, Sloggett A. Suicide, deprivation, and unemployment: record linkage study. *BMJ* 1998;317:1283–6.
- 6 Foster T, Gillespie K, McClelland R, et al. Risk factors for suicide independent of DSM-III-R Axis I disorder. Case-control psychological autopsy study in Northern Ireland. *Br J Psychiatry* 1999;175:175–9.
- 7 Qin P, Agerbo E, Westergaard-Nielsen N, et al. Gender differences in risk factors for suicide in Denmark. *Br J Psychiatry* 2000;177:546–50.
- 8 Wong PW, Chan WS, Chen EY, Chan SS, Law YW, Yip PS. Suicide among adults aged 30–49: a psychological autopsy study in Hong Kong. *BMC Public Health* 2008;8:147.
- 9 Martikainen PT, Valkonen T. Excess mortality of unemployed men and women during a period of rapidly increasing unemployment. *Lancet* 1996;348:909–12.
- 10 Ahs AM, Westerling R. Mortality in relation to employment status during different levels of unemployment. *Scand J Public Health* 2006;34:159–67.
- 11 Preti A, Miotto P. Suicide and unemployment in Italy, 1982–1994. *J Epidemiol Community Health* 1999;53:694–701.
- 12 National Suicide Research Foundation. Inquested deaths in Ireland: a study of routine data and recording practices. Cork: National Suicide Research Foundation, 2007.
- 13 O'Reilly D, Rosato M, Connolly S, Cardwell C. Area factors and suicide: 5-year follow-up of the Northern Ireland population. *Br J Psychiatry* 2008;192:106–11.
- 14 Waterhouse J, Muir C, Correa P, et al. *Cancer incidence in five continents*. Lyon: IARC, 1976.
- 15 StataCorp. *Stata Statistical Software: Release 6.0*. College Station: Stata Corporation, 1999.
- 16 Blakely TA, Collings SC, Atkinson J. Unemployment and suicide. Evidence for a causal association? *J Epidemiol Community Health* 2003;57:594–600.
- 17 de Castro EF, Pimenta F, Martins I. Female independence in Portugal: effect on suicide rates. *Acta Psychiatr Scand* 1988;78:147–55.
- 18 Stack S. Suicide: a 15-year review of the sociological literature. Part I: cultural and economic factors. *Suicide Life Threat Behav* 2000;30:145–62.
- 19 Creed P, Watson T. Age, gender, psychological wellbeing and the impact of losing the latent and the manifest benefits of employment in unemployed people. *Aust J Psychol* 2003;55:95–103.
- 20 Rowley KM, Feather NT. The impact of unemployment in relation to age and length of unemployment. *J Occup Psychol* 1987;60:323–32.
- 21 Warr P. *Work, unemployment and mental health*. Oxford: Clarendon Press, 1987.
- 22 Qin P, Mortensen PB. The impact of parental status on the risk of completed suicide. *Arch Gen Psychiatry* 2003;60:797–802.
- 23 Ostamo A, Lahelma E, Lonnqvist J. Transitions of employment status among suicide attempters during a severe economic recession. *Soc Sci Med* 2001;52:1741–50.
- 24 Platt S, Kreitman N. Long term trends in parasuicide and unemployment in Edinburgh, 1968–87. *Soc Psychiatry Psychiatr Epidemiol* 1990;25:56–61.
- 25 Neeleman J. Beyond risk theory: suicidal behavior in its social and epidemiological context. *Crisis* 2002;23:114–20.
- 26 Neeleman J, Wilson-Jones C, Wessely S. Ethnic density and deliberate self harm; a small area study in south east London. *J Epidemiol Community Health* 2001;55:85–90.
- 27 Bellanger MM, Jourdain A, Batt-Moillo A. Might the decrease in the suicide rates in France be due to regional prevention programmes? *Soc Sci Med* 2007;65:431–41.
- 28 De Leo D, Evans R. *International Suicide Rates and Prevention Strategies*. Göttingen: Hogrefe & Huber, 2004.
- 29 Mäkinen IH. Effect on suicide rate of having reduced unemployment is uncertain. *BMJ* 1999;318:941–2.
- 30 Hintikka J, Saarinen PI, Viinamäki H. Suicide mortality in Finland during an economic cycle, 1985–1995. *Scand J Public Health* 1999;27:85–8.
- 31 Khang YH, Lynch JW. Regarding Changes in mortality after the recent economic crisis in South Korea. *Ann Epidemiol* 2005;15:535–7; author reply 8–9.
- 32 Kim H, Song YJ, Yi JJ, et al. Changes in mortality after the recent economic crisis in South Korea. *Ann Epidemiol* 2004;14:442–6.
- 33 Stuckler D, Basu S, Suhrcke M, et al. The public health effect of economic crises and alternative policy responses in Europe: an empirical analysis. *Lancet* 2009;374:315–23.
- 34 Gunnell D, Platt S, Hawton K. The economic crisis and suicide. *BMJ* 2009;338:b1891.