

Health and Community Care

The epidemiology of suicide in Scotland 1989-2004: an examination of temporal trends and risk factors at national and local levels

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The Scottish Executive's National Programme for Improving Mental Health and Well-Being launched Choose Life, the National Strategy and Action Plan to Prevent Suicide in Scotland in December 2002. The work reported here details findings from an epidemiological analysis of suicide in Scotland during the period 1989-2004, with an emphasis on the years prior to the implementation of Choose Life.

Main findings

- Male suicide rates increased by 22% and female suicide rates by 6% during 1989-2004.
- There was no clear temporal trend in suicide at the local level. Rates tended to fluctuate or exhibit irregular patterns over time.
- Over the whole period of the study, pooled all-person standardised mortality ratios (SMRs) in Glasgow City and five other local authorities were significantly elevated (compared to Scotland as a whole).
- Male suicide rates were approximately three times higher than female suicide rates (four times higher in the 15-34 year age group). Male vulnerability to suicide appeared to be greater in more rural and remote areas.
- Male suicide rates tended to decline with age (from a peak rate in the 25-34 year age group), whereas among women rates were lower in youngest and oldest age groups, with the peak rate in 45-54 age group.
- The most common method of suicide was hanging among males and self-poisoning among females. The local pattern was similar to that found nationally, although drowning as a method of suicide was more prevalent in Highland and the islands.
- Suicide rates in manual groups were significantly higher than rates in non-manual groups. This pattern was found at both national and local levels.
- The higher the level of socio-economic deprivation, the higher the standardised suicide mortality ratio (SMR). The relative gap between SMRs in the most and least deprived quintiles was larger ('widening gap') in 1996-2002 compared to 1989-1995.
- The suicide rate was significantly higher in the lowest social class than in other social classes in all local areas, irrespective of the degree of socio-economic deprivation in the area where people lived.

Background

In December 2002 the Scottish Executive launched *Choose Life, the National Strategy and Action Plan to Prevent Suicide in Scotland*, setting a target of reducing the rate of people dying by suicide in Scotland by 20% by 2013. The strategy is a major strand of the Executive's National Programme for Improving Mental Health and Well-Being.

One of the main objectives of *Choose Life* is to improve the quality, collection, availability and dissemination of information relating to suicide and suicidal behaviour. The work reported here details findings from an epidemiological analysis of suicide in Scotland during the period 1989-2004, with an emphasis on the years prior to the implementation of *Choose Life* (2003). In addition to establishing trends in the incidence of suicide at national and local levels, the study explored variation in suicide rates by gender, age, social class, socio-economic deprivation and method.

Aim, objectives and scope

The broad aim of the project was to support the implementation of *Choose Life* by providing detailed information on the epidemiology of suicide at national and local levels.

The more specific objectives of the project were:

1. To establish the incidence of suicide in Scotland over the period 1989-2004, including time (temporal) trends, at national and local levels
2. To describe variation in suicide rates by sex, age, method, social class and socio-economic deprivation, over the period 1989-2002, at national and local levels
3. To compare individual-level estimates of the relationship between suicide and socio-economic status with area-level estimates of the relationship between suicide and socio-economic deprivation.

The main focus of this report is the 14 year period leading up to and including 2002. In relation to the examination of suicide trends over time (at both local and national levels) (objective 1), the analysis has extended to 2004, in order to provide some indication of stability or change in the suicide rate during the first two years of *Choose Life* implementation.

Methods

An anonymised dataset of intentional self harm and undetermined deaths among adults aged 15+ years during

1989-2004 was provided by the General Registrar Office for Scotland (GROS)¹. There were 13185 deaths recorded over the period 1989-2004, of which 74% were male. On the basis of residential address, each death was assigned to one of five categories (national level analysis) or three categories (local level analysis) of area-level socio-economic deprivation.

Denominators by sex and age for all suicide rates and standardised mortality ratios (SMRs) were derived from mid-year population estimates, while census data provided denominators used to calculate suicide rates by social class.

National suicide rates by social class (at death) were computed for males during two time periods (separately): 1989-1995 and 1996-2002. The Registrar General's Social Class (SC) was used as the measure of socio-economic classification. There are five SC categories, with one divided into two subgroups: professional etc (I), managerial and technical (II), skilled non-manual (IIIN), skilled manual (IIIM), partly-skilled (IV) and unskilled (V).

The expected numbers of deaths were calculated for each local area using the death rates at the national level. The standardised mortality ratio (SMR) was derived by dividing the observed number of deaths by the expected number of deaths. The age-adjusted rate was obtained by multiplying SMR and crude death rate.

For the area deprivation analysis, age and sex specific deaths from 1996-2002 were used as the numerators while the denominator was obtained from the 2001 Census. This standard population was used for the calculation of suicide SMRs for the 1989-1995 and 1996-2002 periods, to enable comparisons of suicide trends over time.²

Findings

Across the country as a whole male suicide rates increased by 22 percent and female suicide rates by 6 percent over the period 1989-2004 (single years).

In Glasgow City and a few other local authorities (West Dunbartonshire, Highland, Eilean Siar, Dundee City and Argyll & Bute) all-person SMRs pooled over the whole period of the study were significantly elevated (compared to Scotland as a whole). In West Lothian, South Lanarkshire, North Lanarkshire, Fife, Falkirk, East Renfrewshire, East Lothian, East Dunbartonshire, Angus and Aberdeenshire all-person SMRs were significantly lower than the national average.

¹ In this document, a **suicide** is defined as comprising both death by intentional self harm **and** undetermined death

² For more information about definitions in relation to reporting suicide, see the 'statistics' section on www.chooselife.net

Male suicide rates were approximately three times higher than female suicide rates over the period. There was some variation in the male: female suicide ratio between local areas, with a suggestion that male vulnerability to suicide was greater in the more rural and remote areas of the country.

Across Scotland as a whole male suicide rates tended to decline with age, whereas among women there was an inverse U-shaped relationship (lower rates in youngest and oldest age groups). The highest suicide rate among men (40.8 per 100,000) occurred in 25-34 year age group. High rates were also evident among men aged 35-54 years. Among women, the highest suicide rate (11.6 per 100,000) was found in the 45-54 year age group, with high rates also in the 25-44 year age groups. The excess of suicide deaths among males was particularly marked in the 15-34 year age group (approximately fourfold).

The most common method of suicide among males in Scotland were hanging (7.9 per 100,000), self-poisoning (6.1), drowning (3.1) and gassing (3.0). Among females the most common method of suicide was self-poisoning (4.4 per 100,000). Hanging suicide rates significantly increased over time for both men and women, while death rates by gassing (mainly carbon monoxide [car exhaust] poisoning) decreased significantly. In most local areas the rank ordering of methods and trends over time were similar to what was found at national level. The main difference was the greater popularity of drowning as a method of suicide in Highland and the islands.

At the national level there was a marked variation in male suicide rates by occupational social class. There were significant differences between rates in the non-manual groups and social class IIIM, between IIIM and IV, and between IV and V. Similar patterns and trends were found in local areas.

Across Scotland there was a strong relationship between suicide and socio-economic deprivation: the higher the level of deprivation, the higher the standardised suicide mortality ratio (SMR). The relative gap between SMRs in the most and least deprived quintiles was larger in 1996-2002 compared to 1989-1995 ('widening gap'). An analysis of suicide and socio-economic deprivation *within* local areas reveals evidence of a relative suicide gap in all but a few local authorities and health boards. A widening suicide gap over time was found in 24 (out of 32) local authorities and 12 (out of 15) health boards.

The suicide rate was significantly higher in class V than in other social classes in all local areas, irrespective of the degree of socio-economic deprivation. In 1989-1995 the

patterning of social class differences did not differ markedly between categories of socioeconomic deprivation. This suggests that the main influence on suicide rates is at the individual, rather than area, level. In 1996-2002, however, there is evidence of a trend towards an increase in the social class gradient with worsening level of socioeconomic deprivation: that is to say, the gap between suicide rates in the highest and lowest social classes increases as socio-economic deprivation worsens.

Implications

Social class and socio-economic deprivation

- There is a need to give greater priority to the effects of social class (at individual level) and socio-economic deprivation (at area level) in suicide prevention strategy and action plans.
- Targeted action is warranted in areas with high suicide rates where there is evidence of impact of socio-economic deprivation (e.g. Glasgow).
- However, targeting suicide prevention activities exclusively on areas of social disadvantage will not be adequate, because the needs of people who are in the lowest social classes but who live outside areas of economic deprivation will not be met.
- Addressing higher suicide risk in lower socio-economic groups would be consistent with Scottish Executive's wider strategies on promoting social justice and social inclusion, reducing social inequality and tackling health inequalities
- The ratio of male to female age-adjusted suicide rates indicates a higher level of vulnerability to suicide among men in the more rural and remote areas in the country.

Supporting the national suicide reduction target

- In Scotland *Choose Life* sits in the broader context of health improvement and social justice (as part of the Executive's National Programme for Improving Mental Health and Well-being). Several initiatives are likely to be contributing to the recent reduction in the suicide rate in Scotland. Work on improving health and social care services may also be impacting on the suicide rate, as well as wider social, economic and public policy factors.
- To support the implementation of *Choose Life*, more detailed and up to date information about the epidemiology of suicide is needed. An in-depth exploration of GROS information on suicide (or possible suicide) deaths in Scotland would help to inform planners and practitioners about the suicide situation in Scotland.

Links with the evaluation of the first phase of *Choose Life*

The evaluation of the first phase of *Choose Life* was published in September 2006 and members of the evaluation team also worked on this project. Findings from this study reinforce several of the recommendations made by the evaluation team. In particular:

- *Enhanced focus on inequalities.* The evaluation highlighted the omission of socio-economic deprivation and low socio-economic status from priority groups in the *Choose Life* strategy.
- *Targets at local levels.* Because the number of suicides and undetermined deaths fluctuates annually, it is not easy

to translate a 10 year national target into meaningful local area targets, particularly in areas where the number of suicide deaths per annum is small. To maximise the engagement and continuing contribution of local areas towards the national 10 year target, it may be worthwhile considering the introduction of local targets.

- *Possible 'proxy' target.* One possible candidate would be non-fatal self harm incidence, operationally defined as admissions to hospital following self-poisoning and/or self-injury, although admissions to hospital and medical or psychosocial 'seriousness' are not perfectly correlated.

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The report, "The epidemiology of suicide in Scotland 1989-2004: an examination of temporal trends and risk factors at national and local levels", which is summarised in this research findings is a web only document and is available on the publications pages of the Scottish Executive website at:
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