Suicide in Scotland 1974 – 2010

Background

The following charts and analysis use data on suicide and intentional self-harm, which are published by the General Register Office of Scotland. The commentary is a discussion of some of the issues, and an attempt to contextualise some of the ‘headline’ conclusions.

The data published by GROS is not corrected for population size, which means that the suicide rate could be dropping if the total number of suicides remains the same but the population of Scotland increases. Scottish population changes in the last 20 years are shown below in Figure 1. Although the increase between 2003 and 2010 looks large, it only represents an increase of approximately 200,000 people (4%).

![Figure 1. Population of Scotland 1981 - 2010.](http://www.gro-scotland.gov.uk/statistics/theme/population/estimates/mid-year/time-series.html)

Although I will refer to ‘suicides’ in the following discussion, the figures include all deaths due to ‘intentional self-harm’ or ‘event of undetermined intent’, which is consistent with recording for most developed countries; the main reason being that a significant number of undetermined deaths are due to suicide.

The following ICD-9 and ICD-10 codes are usually used to categorise a death as ‘suicide’:

<table>
<thead>
<tr>
<th>ICD-9</th>
<th>ICD-10</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>E950-E959</td>
<td>X60-X84</td>
<td>Intentional self-harm</td>
</tr>
<tr>
<td>E980-E989</td>
<td>Y10-Y34</td>
<td>Injury/poisoning of undetermined intent</td>
</tr>
</tbody>
</table>

**Headline Figures**

The number of suicides in Scotland 1974 – 2010 is shown below in Figure 2.

![Figure 2. Numbers of suicides in Scotland 1974 - 2010.](http://www.gro-scotland.gov.uk/statistics/theme/vital-events/deaths/suicides/tables-and-chart.html)

Figure 3 shows the same figures following correction for population (giving a rate), and they have been modified to show a 3-period moving average (which gives a better indication of trend). They have not been corrected for age or sex.

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4 ISD have calculated a suicide rate (age-sex standardised) of 14.7 per 100,000 in 2010. The unadjusted rate (shown below in Figure 3) is 14.96.
Suicides in Scotland peaked in 2001-2002, and have been decreasing ever since. Overall trends over the last century would suggest that suicides rates in the last decade are lower than they have been for over a hundred years (Thomas & Gunnell, 2010).

**Changes in suicides year-to-year**

One of the comments on the ISD website was that the 2010 figure was “an increase on the 2009 figure”.\(^5\) However, whilst politicians might ask why the numbers have gone up it is only a 5% change from 2009 and is well within the range predicted by normal variation (\(i.e.\) due to chance alone).

Figure 4 shows that the 2009-2010 change is almost certainly due to common-cause variation, and is within 2 standard deviations\(^6\) from the mean from 1993 – 2010.

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\(^5\) [http://www.isdscotland.org/Health-Topics/Public-Health/Publications/](http://www.isdscotland.org/Health-Topics/Public-Health/Publications/)

\(^6\) Two standard deviations above and below the mean will encompass approximately 95% of all observations.
Figure 4. Control chart showing natural variation in suicide.
The reason for the large increase between 1991 and 1993 is possibly due to changes in recording of suicide; for example: the introduction of ICD-10 in 1992; and consensus about recording deaths of undetermined intent as suicide.

Male-Female Rates

These are shown below in Figure 5. There has been a slight trend down for females, with the male rate remaining fairly stable. It has come down a little bit in the last 6-7 years.
However, the changes seen in Scottish rates have largely been seen in most European countries (Figure 6). EU members before 2004 are displayed as these countries represent the most-established and most-developed countries in the EU.\footnote{Germany, France, Italy, the Netherlands, Belgium, Luxembourg, Denmark, Ireland, United Kingdom, Greece, Spain, Portugal, Austria, Finland and Sweden.}

If anything, rates in other major European countries have been declining faster than those in Scotland, with most countries dropping below the current Scottish rate in the mid-1990s. However, the trend in the last two decades has been for suicide rates to decline and it is not possible, therefore, to attribute reductions in the Scottish rate to uniquely-Scottish interventions (e.g. Choose Life).
Changes in method over time

Rates (adjusted for population, but not for sex or age) for different methods of suicide are shown below in Figure 7. Since the early 1990s, self-poisoning has become less common whilst hanging has become more common. In 2003, the rate of hanging exceeded the rate of self-poisoning and the total number of suicides by hanging has been greater than self-poisoning for most years since.

The hanging rates levelled a little in 2000, but have increased slightly in the last couple of years. Firearms suicides have been declining for over 20 years.

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Figure 7. Method of suicide - 1983 - 2010. 3-year moving average.

Age distribution of suicides in Scotland

The age distribution of suicides in 2010 (N=781) is shown below in Figure 8. Whilst suicides in younger people make the headlines, the total number of suicides in those under 30 years is 164, which is 21% of the total. However, the number of suicides in those between the ages of 40 and 60 is 343; 43.9% of the total.

This means that whilst much of the attention is focused on particular age groups such as young people, twice as many suicides are occurring in groups that get much less attention. This has implications for prevention strategies in the context of public health initiatives.
Figure 8. Age distribution of suicides in Scotland in 2010.

Rates by NHS Board

These are shown below. Boards are stratified according to whether their yearly rates tended to be: one standard deviation higher than the mean; within one standard deviation of the mean; or one standard deviation lower than the mean. The Board classification is as follows:

Table 2. General relationship of the Board’s rate to the Scottish average.

<table>
<thead>
<tr>
<th>NHS Board</th>
<th>General relationship to the mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ayrshire &amp; Arran</td>
<td>Below</td>
</tr>
<tr>
<td>Borders</td>
<td>Average</td>
</tr>
<tr>
<td>Dumfries &amp; Galloway</td>
<td>Above</td>
</tr>
<tr>
<td>Fife</td>
<td>Below</td>
</tr>
<tr>
<td>Forth Valley</td>
<td>Below</td>
</tr>
<tr>
<td>Grampian</td>
<td>Average</td>
</tr>
<tr>
<td>Greater Glasgow &amp; Clyde</td>
<td>Above</td>
</tr>
<tr>
<td>Highland</td>
<td>Above</td>
</tr>
<tr>
<td>Lanarkshire</td>
<td>Below</td>
</tr>
<tr>
<td>Lothian</td>
<td>Average</td>
</tr>
<tr>
<td>Orkney</td>
<td>Above</td>
</tr>
<tr>
<td>Shetland</td>
<td>Above</td>
</tr>
<tr>
<td>Tayside</td>
<td>Average</td>
</tr>
<tr>
<td>Western Isles</td>
<td>Above</td>
</tr>
</tbody>
</table>
Since the Island Boards have low numbers, small variations can result in large changes in rates. Therefore, the Island Boards are not included in the graphs below.

**Important note:** the categorisation in Table 2 above is largely for convenience and easier presentation of data. For normally-distributed data, 50% of Boards will be above average (the mean) and 50% will be below average. A Board’s position does not necessarily indicate good or bad practice – it is more likely to represent normal variation.

![Figure 9](image_url)

*Figure 9. NHS Boards which tend to have higher-than-average suicide rates (3-period moving average).*
Figure 10. NHS Boards with suicide rates usually within 1 SD of the Scottish average (mean) (3-period moving average).

Figure 11. NHS Boards which tend to have lower-than-average suicide rates (3-period moving average).
Most NHS Boards have suicide rates which generally mirror those of Scotland as a whole. Variation year-to-year is difficult to attribute to specific interventions or events and is likely to represent normal variation over time.

A good example would be Dumfries and Galloway, which shows some big ‘spikes’ in Figure 9 above. However, if a control chart is plotted of the no. of suicides over time (Figure 12), one can see that only two years (1998 and 1999) are higher than two standard deviations from the mean. Since two standard deviations (above and below) cover 95% of the samples, one would expect to see one measurement out of every twenty (i.e. 5%) which is 2 SDs from the mean. In the case of Dumfries and Galloway, over almost 40 years of measurement, there are three years which are further than 2 SDs from the mean; a rate which is largely consistent with chance.

![Figure 12. Control chart of suicides for Dumfries and Galloway 1974 - 2010.](image)

References