

# Changes in male suicides in Scottish prisons: 10-year study

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## Background

In 1999 I estimated the expected number of UK prison suicides, taking into account that opioid users' deaths from suicide were 10 times the number expected for their age and gender. Changes have since taken place in Scottish prisons.

## Aims

To estimate the expected number of male suicides in Scottish prisons in 1994–2003, having taken age and opioid dependency into account; and to consider the extremes of prisoner age.

## Method

The effective number that prisons safeguard in terms of suicide risk was approximated as 10 times the number of opioid-dependent inmates plus other inmates. By applying age-appropriate suicide rates for Scottish males to these effective numbers, expectations for male suicides in Scottish prisons were calculated.

## Results

In 1994–98, there were at least 57 male suicides, significantly exceeding the age- and opioid-adjusted expectation of 41. In 1999–2003, the 51 male suicides in prison were consistent with expectation (upper 95% limit: at least 54). During the decade 1994–2003, observed and expected suicides were mismatched at both extremes of age: 40 males aged 15–24 years died by suicide v. 24 expected, and 13 males aged 45+ v. 2 expected. Against 4.5 prison suicides expected for males aged 15–24 years during a 2-year period, actual suicides were 3 in 2002 + 2003 and 4 in 2004 + 2005.

## Conclusions

Scotland has redressed an excess of male suicides, especially by its youngest prisoners.

## Declaration of interest

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Harris & Barraclough<sup>1</sup> showed that opioid users' deaths from suicide were 10 times the number expected for their age and gender (95% CI for standardised mortality ratio 7.8–12.6). I subsequently proposed<sup>2</sup> that estimating the expected number of suicides in prison should at least take account of inmates' high prevalence of opioid dependency, and I derived suicide alert thresholds for UK prison services accordingly. I suggested that investigation was warranted if the observed number of prison suicides in any year exceeded the alert threshold. Liebling,<sup>3</sup> on the other hand, has questioned whether statistical science has much to offer in the understanding, monitoring and reducing of prison suicides.

Self-inflicted male deaths in Scottish prisons in each year from 1994 to 1998 numbered 12, 8, 12, 13, and 12 (with 7 deaths not classified as to suicide status). My original alert threshold of 12 suicides per year for male prisoners in Scotland<sup>2</sup> was approached in every calendar year in 1994–98 except 1995, and breached in 1997.

In Scotland as a whole, average male death rates from self-harm at younger ages (15–24, 25–34 and 35–44 years) increased markedly between 1989–93 and 1999–2003 (15–24 years, up from 17.9 to 21.7; 25–34 years, up from 25.2 to 33.4; 35–44 years, up from 23.9 to 31.3 years),<sup>4</sup> but with most of the increase having occurred by 1994–98.

For England and Wales, Fazel *et al.*<sup>5</sup> documented both increased numbers of suicides in male prisoners during 1978–2003 and an overall standardised mortality ratio for suicide of 5, although for boys aged 15–17 years the ratio was much higher, at 18 (95% CI 13–26). Fazel *et al.* did not adjust for opioid dependency but they did highlight the high prevalence of other serious mental disorders in surveys of prisoners. The excess suicide risk of those for whom prisons have a duty of care was clearly evidenced by Pratt *et al.*<sup>6</sup> Suicide rate ratios (95% CI 12–15) for recently released adult prisoners in England and Wales

in 2000–02 were double the rate ratio during other times at liberty, or while incarcerated.<sup>5</sup>

Prison populations have not only increased since 1994–98, but they have also aged. Longer sentences by courts and late detection of sexual offences have contributed to a marked increase in the number of male inmates aged 55+ years in UK prisons.<sup>7</sup> Males aged 45–54 in Scottish prison custody on 30 June 1997 numbered 371 (v. 433 on 30 June 2003, a 17% increase) and those aged 55+ numbered 170 (v. 249 on 30 June 2003, a 46% increase).

By the mid-1990s,<sup>3,9–14</sup> there was recognition that remand prisoners were over-represented among those who die by suicide and that the immediate post-reception period was high risk. Suicide risk was particularly high for Scottish prisoners with a past history of addictions, and there was concern about prisons' detoxification regime.<sup>14,15</sup> Inspectorial reports intensified up to 2000.<sup>16–19</sup> Other recognised risk factors were history of psychiatric treatment and self-injury,<sup>20</sup> and being remanded or convicted for serious, violent or sexual crimes which attract long sentences. Some such suicides occur many years after reception into prison and at older ages, as for Dr Harold Shipman,<sup>21</sup> who took his own life in the fourth year of his sentence and on the day before his 58th birthday. Thus, drivers for prison suicides are known to differ at the extremes of prisoner age, and may be differentially responsive to prisons' several interventions to reduce suicides in prison. In this paper, I have investigated male suicides in Scottish prisons during the period 1994 to 2003.

## Method

I made two methodological improvements on my previous work.<sup>2</sup> First, I introduced separate age distributions for prisoners with and without opioid dependency. Second, for specific age groups (15–24, 25–34, 35–44, 45–54, 55–64, 65–74 years), I applied the

more robust *average* death rate from self-harm (per 100 000 males in the general population) for the quinquennium of interest, as supplied by the Registrar General's Office for Scotland.

The Seventh Prison Survey, in 2004 (overall response rate: 77%),<sup>22</sup> was the sole contemporary source of information on Scottish prisoners' opioid dependency in 1999–2003. It asked about respondents' use of specific drugs in the 12 months before incarceration. I requested *ad hoc* cross-tabulations from the Seventh Prison Survey, which gave the age distribution in 2004 of male respondents according to their reported use (or not) of heroin/other opiates/methadone in the 12 months before incarceration. The data are shown as the final column of online Table DS1. Because only 60% of eligible prisoners responded to questions about specific drug use, the final column of online Table DS2 allows for the possibility of under-reporting, whereby 90% only of those who were opioid dependent had reported this in Table DS1. A third option was to assume that opioid dependency by age group for prisoners in 1999–2003 followed the same pattern as in 1994–98.

From 1992–96 Willing Anonymous Salivary HIV (WASH) surveillance studies<sup>23,24</sup> in Scottish Prison Service establishments, I deduced an approximate age distribution for adult male injectors in 1994–98 (Table DS1, col. 4), which was assumed to apply for opioid dependency. In Table DS2, opioid dependency was taken to be 1.5 times the corresponding injector prevalence, and therefore 27% among male young offenders and overall 50% for male adult prisoners – a multiplier which aligned well with results from random mandatory drugs testing of Scottish prisoners.<sup>25</sup> (And likewise in England and Wales in 2001: of 2266 surveyed prisoners, 29% reported using heroin and 18% reported injecting it in the month before incarceration).<sup>26</sup> Proportionate redistribution of injectors from the original WASH age groups to Registrar General's Office for Scotland age groups had to be carried out, as shown in Table DS1.

According to Scottish Prison Service Annual Reports (follow link from Library to Keydocs at [www.sps.gov.uk](http://www.sps.gov.uk)), the average numbers of male prisoners held by the Scottish Prison Service in the financial years 1999/2000 to 2003/04 were 5764, 5676, 5929, 6193, 6306 (mean for males=5974). In Table DS2, the age

distribution for male prisoners in custody on 30 June 2001 (as given in Prison Statistics Scotland, 2001)<sup>27</sup> was applied to the quinquennial mean prison population of 5974 male inmates. The corresponding analysis for 1994–98 had to adopt the age distribution for male prisoners in custody on 30 June 1997 (because age distribution was not available for 30 June 1996). The average numbers of prisoners held by the Scottish Prison Service in the financial years 1995/96 to 1998/99 (not available for 1994/95) were 5632, 5992, 6059, 6029 and so the mean for both genders was 5928. Gender breakdown was not available but, at 30 June 1997, 5936/6121 inmates were male, and so the 1994–98 mean male prison population was taken as  $5936/6121 \times 5928 = 5749$  male inmates. Having approximated, for each age group, its average number of opioid-dependent and other (that is: non-opioid dependent) male prisoners by quinquennium, the former were given a weight of 10,<sup>1</sup> as in my previous study,<sup>2</sup> when computing the expected quinquennial number of male suicides in prison (Table 1).

The Scottish Prison Service maintains separate databases on fatal accident inquiries into prisoner deaths and on prisoner suicides. There is a small risk that suicides in prison in 2004+2005 are undercounted owing to late-reporting fatal accident inquiries. However, since the majority of suicides in prison are by hanging, they are starkly evident.

## Results

In 1994–98, the Scottish Prison Service recorded 100 male deaths in legal custody, for eight of whom cause of death was not detailed on its databases: six deaths at ages 23, 39, 51, 43 (remand), 20 and 34 years in 1994; one death at 53 years in 1995; one death in hospital from 'natural causes' at 30 years in 1998. Fifty-seven deaths were known suicides (33 on remand; and 12, 8, 12, 13 and 12 by calendar year; Tables 1 and 2). Three of the 100 deaths in 1994–98 were of prisoners aged 65 years or older.

In 1999–2003, the Scottish Prison Service recorded 92 male deaths in legal custody. Table 2 shows that 51 were suicides (33 on remand; and 13, 14, 9, 9, and 6 by calendar year). Ten of the

**Table 1** Expected numbers of male suicides in Scottish prisons, 1994–98 and 1999–2003, after allowance for prisoners' opioid dependency by assigning opioid-dependent inmates 10 times the suicide risk for their age group

Age group, years	1994–98 <sup>a</sup> : mean number of male prisoners=5748					1999–2003: mean number of male prisoners=5974				
	Suicide rate per 100 000 general male population	WASH weighted prisoner numbers <sup>b</sup>	Expected suicides for male inmates (WASH age groups), <sup>b</sup> <i>n</i>	Suicide rate per 100 000 general male population	7th Prison Survey weighted prisoner numbers <sup>c</sup>	Expected suicides for male inmates (7th Prison Survey age groups) <sup>c</sup>	WASH weighted prisoner numbers <sup>b</sup>	Expected suicides for male inmates (WASH age groups), <sup>b</sup> <i>n</i>	7th Prison Survey (90% reporting) weighted prisoner numbers <sup>d</sup>	Expected suicides for male inmates (7th Prison Survey age groups, 90% reporting), <sup>d</sup> <i>n</i>
15–24	19.8	11 425	11.31	21.7	8961	9.72	11 481	12.46	9744	10.57
25–34	34.3	14 518	24.90	33.4	13 438	22.44	15 534	25.94	14 680	24.52
35–44	28.4	3086	4.38	31.3	5091	7.97	3498	5.47	5532	8.66
45–54	22.5	359	0.40	22.4	926	1.04	386	0.43	989	1.11
55–64	15.5	119	0.09	18.2	238	0.22	148	0.13	247	0.22
65–74	14.9	46	0.03	13.1	117	0.08	72	0.05	126	0.08
Totals		29 553	41.1 (95% CI 28–54)		28 771	41.5 (95% CI 29–54)	31 119	44.5 (95% CI 31–58)	31 318	45.2 (95% CI 32–58)

a. In 1994–98, eight deaths were described as 'formal findings only' (six in 1994, one in 1995) or from 'natural causes' (one in 1998).

b. Calculated using age distributions for opioid-dependent adult male prisoners, as derived from age distribution for adult injectors in 1992–96 Willing Anonymous Salivary HIV (WASH) surveillance studies (see online Table DS1 for further details).

c. Calculated using age distributions for opioid-dependent adult male prisoners, as derived from age distribution for adult injectors in Seventh Prison Survey, 2004 (see Table DS1 for further details).

d. Calculated using opioid dependency (or not) by age group applied to 1999–2003 if only 90% of dependency was reported in Seventh Prison Survey 2004 (see Table DS2 for further details).

**Table 2** Observed suicides of males in Scottish prisons 1994–98 and 1999–2003 (those on remand/untried and total numbers)

Age group, years	Prison suicides 1994–98, <i>n</i>		Prison suicides 1999–2003, <i>n</i>	
	Prisoner on remand/untried	Total	Prisoner on remand/untried	Total
15–24	15	19	17	21
25–34	12	23	8 <sup>a</sup>	17 <sup>a</sup>
35–44	4	9	2	6
45+	2	6	6	7
Total for all ages	33	57	33	51

a. Status undetermined for one prisoner, eight known to be convicted.

92 deaths in 1999–2003 occurred in prisoners aged 65 years or older. Table 1 gives, by age group, Scotland's *average* death rates from self-inflicted harm per 100 000 males for 1994–98 and 1999–2003. Male suicide rates were highest at 25–34 years and 35–44 years of age.

To take opioid-dependent prisoners' 10 times greater suicide risk<sup>1</sup> into account, in Table 1, I have multiplied by *X*, where  $X = (\text{number of opioid-dependent male prisoners}) \times 10 + \text{number of non-opioid-dependent male prisoners}$ , Scotland's age-specific suicide rates per 100 000 males to work out, for each age group, the expected numbers of male suicides in Scottish prisons in 1999–2003 and in 1994–98. For 1994–98, Table 1 shows an estimated 268 (27%) out of 268+725=993 young offenders as opioid dependent, but 770 out of 1090 inmates aged 21–24 years. Taking their opioid dependency into account, these 2083 male prisoners aged 15–24 years had a weighted suicide risk equivalent to 11 425 males of the same age in the Scottish population.

Table 1 shows summarily that, whereas 57 male suicides (at least) in 1994–98 significantly exceeded the age- and opioid-adjusted expectation of 41.1 for 1994–1998 (upper 95% limit 54), the 51 male suicides in 1999–2003 were in line with the expectation of 41 to 45 (upper 95% limit at least 54).

Even having made allowance for opioid dependency, the actual age distribution of known suicides was at odds with the age distribution expected for suicides in 1994–2003. The total number of suicides by 15- to 24-year-old male prisoners was nearly twice the expected number (21+19=40 *v.* 11.3+12.5=23.8). Also, at the other extreme of prisoner age, there were 13 known suicides by male prisoners aged 45+ years *v.* 2 expected.

Eighty per cent of suicides by male prisoners aged 15–24 years in Scotland for the decade 1994–2003 were among young men on remand or who were untried ( $(17+15)/(21+19) = 32/40$ ; 95% CI 68–92%). Those on remand or untried accounted for around half only of the self-inflicted deaths by prisoners aged 25–34 years with known remand/convicted status (20/39; 95% CI 35–67%), or by older men (14/28; 95% CI 31–69%).

## Discussion

Other factors besides age and opioid dependency clearly matter for the mitigation of male suicides in prison. They include mental health comorbidity,<sup>5</sup> remand status,<sup>13,18,19</sup> time since reception and the seriousness or violence of the prisoner's indictment offence. None of these other factors is adequately addressed by an analysis which adjusts solely for age and opioid dependency. However, going further would require ethically approved access to prisoner information systems which hold medical or 'prisoner-in-confidence' data.<sup>6</sup>

Male prisoners' suicides significantly exceeded age- and opioid-dependency adjusted expected suicides in 1994–98 (at least 57 observed *v.* 41 expected) but exceeded the annual alert

threshold of 12 only once.<sup>20,28</sup> Suicides by male prisoners were consistent with expectation in 1999–2003 (51 observed *v.* 41–45 expected), despite worryingly high numbers<sup>2</sup> of 13+14 in 1999+2000.

In the decade 1994–2003, there were nearly twice as many suicides by 15- to 24-year-old male prisoners (40) as expected (24) after accounting for opioid dependency. Also, at the other extreme of prisoner age, there were 13 known suicides at age 45+ years *v.* 2 expected.

Mismatch of the age distributions of observed *v.* opioid-adjusted expected suicides emphasised the vulnerability of male prisoners aged 15–24 years: 80% of suicides in this age group were by young men on remand or who were untried. Their vulnerability was addressed by the Scottish Prison Service's changes in how additions and the identifying of suicide risk<sup>15</sup> are dealt with on reception into prison, and by remedying deficiencies in younger prisoners' induction and their lack of activities or occupation on remand.<sup>16,19</sup>

UK's prison inspectorates were influential in tackling prison suicides.<sup>10,13,16–19</sup> Mental health nurses now conduct the suicide risk assessment on reception into prison, and the number of them in post featured regularly in Scotland's prison inspection reports in 1994–2003. In-cell television to reduce suicides by remand prisoners was first suggested in the 1995–96 report by Her Majesty's Chief Inspector of Prisons for Scotland<sup>13</sup> and again in *Women Offenders – A Safer Way*.<sup>16</sup> Initially, the suggestion received a stony ministerial hearing until in-cell electricity facilitated in-cell television from 2000.

*Punishment First, Verdict Later*<sup>19</sup> reviewed conditions for remand prisoners in Scotland at the end of the 20th century. It highlighted induction deficiencies and poor prisoner–staff relationships, which require an understanding of the particular pressures and problems encountered by remand prisoners so that their needs might be better met and rights safeguarded. 'Because of the numbers' was staff's explanation of why so many remand prisoners had so little time out of their cells, so few programmes were available to them, why there was limited access to telephones, showers and possessions, and why they were sometimes housed with convicted prisoners. In Scotland no operating standards dealt specifically with remand prisoners, whose legal status should have entitled them, in the inspectorate's view, to a continuance of (community-) prescribed medication<sup>14</sup> and equitable delivery of other services. Dependency on others, even for access to money during their period of remand, 'compounded feelings of helplessness and hopelessness, with sometimes tragic consequences'.

Healthcare standards introduced in May 1998 required Scottish prisons to provide detoxification regimes, but not until Health Care Standard 10 in 2001 was continuation, or provision in prison, of substitution therapy<sup>14</sup> given equal prominence. The proportion of (around 7000) prisoners testing positive for methadone in random mandatory drugs tests increased from 1% in the financial year 2002/03 to 9% in 2003/04 and 14% in

2004/05,<sup>29</sup> as the Scottish Prison Service's new methadone policy took hold.

Against the progressive backdrop of the Scottish Prison Service's revised suicide risk and drugs strategies, mental health nurses at reception assessments, in-cell television and improved induction for remand prisoners, male suicides by 15- to 24-year-olds were 3+0 in 2002+2003 and 2+2 in 2004+2005, against a 2-year expectation of 4.5. The exceptional vulnerability to suicide of the youngest age group of prisoners may thus have been redressed in Scotland.

International prison comparators, or intervention studies, would be needed to decipher how much credit to ascribe to the different components of the Scottish Prison Service's successful approach for its youngest prisoners, or to assess their relative cost-effectiveness.

The Scottish Prison Service's attention should now turn to its older male prisoners<sup>7</sup> (aged 45+ years), whose excess suicides have different precursors: there were six such suicides in around 2400 prisoner-years during 2002 to 2005.

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