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A Study of Suicide Rates in Northern Ireland 1984-2002

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SUMMARY:

Annual figures collected by the Samaritans from the Registrar Generals' figures for suicides for the years 1984-2002 inclusive were analysed. Trends by gender, age group, marital status and method were examined. Suicide rates were standardised where appropriate. The mean annual rate was calculated for the 10 year period 1984-1993 and compared with the nine year period 1994-2002. The mean annual rate of suicide increased by 4.7%. Female suicide rates decreased by 17%, male suicides increased by 13.2%. The highest percentage increase was seen in males aged 25-34, (34%) followed by the 15-24 age group, (26.5%). There was a significant upward trend in suicide rates at $p < 0.01$ in young males aged 10-34 and a significant fall in total suicide rates in those aged 35+. The greatest increase in the mean annual rate was seen in those of single status in sexes, males 24.2% and females 28.6%. There was a decrease in the mean annual rate for all methods of suicide except hanging with an increase of 99.37% in males and 87.80% in females.

The overall rate of suicide in Northern Ireland appears to be rising. This trend is largely a result of the increase in suicides amongst young males aged 10-34. Violent methods of suicide, namely hanging have increased, suggesting that this more lethal method is contributing to the higher suicide rate.

INTRODUCTION

The issue of suicide in Northern Ireland (NI) has been addressed by a number of initiatives. Suicide prevention was one of the four key areas in the Promoting Mental Health Strategy and Action Plan 2003-2008 which envisaged a 10% reduction in overall suicide rate by 2008¹. The Bamford Review of Mental Health and Learning Disability has recommended that a suicide strategy be developed as a matter of urgency². The Suicide Prevention Strategy for NI was launched in October 2006 as a result of concern about an increase in suicides in the province of particularly among young people³. The aim of this strategy is "to reduce the Northern Ireland suicide rate, particularly among young people and those most at risk" and a target of reduction in suicides by 15% by 2011³.

As part of the suicide prevention strategy an analysis of suicide and self harming in NI was commissioned using data held by the General Register Office⁴. The use of five year moving averages highlighted that the rate of male suicides in NI had increased steadily from 1991-2004⁴.

The World Health Organisation has estimated that in 2004 the total suicide rate was 7.0/100,000 in the UK⁵. Within the UK,

Scotland has the highest suicide rate followed by NI with rates in England and Wales falling in recent years⁶. This rate was less than that in the Republic of Ireland, which was estimated at 9.7/100,000 with Lithuania having the highest suicide rate at 40.2/100,000⁵.

The Samaritans in NI have been at the forefront of highlighting the issue of suicide. They provide a 24-hour confidential help line to those in distress and have been involved in public awareness campaigns and, since 1984, have been collecting suicide figures on a yearly basis. Accurate yearly figures are notoriously difficult to ascertain - official mortality figures underestimate the true mortality, therefore official data should be treated with caution.

All deaths by suicide in NI require an inquest. When a death is suspected to be a suicide it is referred to the coroner and goes through a formal inquest. Upon completion, coroners provide a summary of their finding to the Registrar. Death is then recorded as a suicide by the General Register Office. The Office of National Statistics has drawn attention to the problem they have in obtaining timely information from coroners until an inquest is complete. Based on General Register Office figures 1999-2003, 24.3% of suicides are registered within six months, 93.7% within one year and 96.9% within two years. A time delay occurs between actual death occurring and date of registration of up to several years in some cases, making it difficult to monitor trends. The difficulty in the formal recording of suicide in Northern Ireland was also highlighted in the Promoting Mental Health Strategy and Action Plan¹ as well as the Luce Report investigating the death certification in Britain and NI in 2003⁷.

The suicide statistics collected by the Samaritans in NI were used as the basis of this study. Figures for suicides occurring in a particular year at inquest and adapted for year of death, differ from official figures collected from the Office of National Statistics, and are based on registered deaths. By using the data from the Samaritans we hypothesize that this data may more accurately reflect time trends than official figures as they record suicides in the actual year in which they took place. We undertook to identify if there was a time increase in suicide rates and which particular groups were affected.

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METHODS

Figures collected on a yearly basis by the Samaritans from for suicides in NI from 1984 to 2002 were analysed. These were collected from Registrar General for suicides occurring that particular year at inquest and adapted for year of death. These do not take account of "undetermined deaths". In discussion with the General Register Office and other researchers it has

been established that there are ~20 such deaths in Northern Ireland per year; if all of these deaths were suicide it would increase the Northern Ireland suicide statistics by about 15%.

Suicides for those aged 10 years and above were considered. Trends by gender, age group, method and marital status were examined. Calculation of suicide rates per 100,00 of the population was done using the 1981 census figures for the years 1984-1990, the 1991 census figures for the years 1991-2000 and the 2001 census figures for the years 2001-2002. Suicide rates were standardised when appropriate by gender, age or marital status using the population figures for these groups from the appropriate census. The mean annual rate was calculated for the 10-year period 1984-1993 and compared with the 9-year period 1994-2002. The percentage change between these two groups was then calculated.

When comparing time periods for marital status the period used was 1985-1993 and 1994-2002 as available data from 1984 was incomplete.

Standardised suicide rates by age and sex were further analysed. A correlation matrix was applied enabling touching age bands that showed similar patterns to be combined. In females this resulted in two groups to be analysed, age 10-34 and 35+. In males, four groups, age up to 34, 35-54, 55-74 and 75+. Combining the two sexes resulted in four groups, age 10-24, 25-34, 35-64 and 65+. A linear regression model with year as the key explanatory variable was then fitted to each of these groups. Allowances were made for non-random components, for example in a year with a high suicide rate strategies maybe put in place the following year to address this, by in all cases applying an autoregression of lag size 1 year term only progressing to autoregression of lag size 2 when auto regression 1 was significant. $P < 0.05$ was taken as the significant cut-off value.

RESULTS:**Changes in Recorded Suicide Rates by Gender:**

Table I compares the mean annual suicide rate standardised by gender for the periods 1984-1993 with 1994-2002. There was a 4.7% increase in

TABLE I:

Changes in Recorded Suicide Rates by Sex

	1984 -1993		1994-2002			
	Mean Annual Number	Mean Annual Rate	Mean Annual Number	Mean Annual Rate	Change in Mean Annual Rate	% Change
Male	93.6	15.35	112.3	17.47	2.12	13.20%
Female	32.3	4.94	28.8	4.10	-0.84	-17.0%
Total	125.9	10.00	141.1	10.47	0.47	4.70%

TABLE II:

Changes in Recorded Suicide Rates by Age

	1984-1993		1994-2002				
Age	Sex	Mean Annual Number	Mean Annual Rate	Mean Annual Number	Mean Annual Rate	Change in Mean Annual Rate	% Change
10-14	M	0.7	1.03	0.6	0.82	-0.21	-20.3%
	F	0.3	0.44	0.3	0.52	0.08	18.2%
15-24	M	21.4	16.2	26.2	20.5	4.3	26.5%
	F	3.5	2.76	4.6	3.7	0.94	34.1%
25-34	M	22	20.97	32.9	28.1	7.13	34%
	F	4.4	4.29	6.1	5.01	0.72	16.8%
35-44	M	15.3	17.39	21.3	20.97	3.58	20.6%
	F	6.3	6.96	6.8	6.52	-0.44	-6.3%
45-54	M	12.4	16.64	15.2	17.6	0.96	5.8%
	F	7.0	8.56	5.7	6.48	-2.08	-24.3%
55-64	M	11.7	17.58	7	10.2	-7.38	-42%
	F	5.1	6.75	2.3	3.1	-3.65	-54.1%
65-74	M	6.2	12.55	5.7	10.79	-1.76	-14%
	F	4.2	6.52	2	3.18	-3.34	-51.2%
75+	M	3.9	16.44	3.4	11.82	-4.62	-28.1%
	F	1.5	3.3	0.9	1.57	-1.73	-52.4%

the mean annual rate from 10 to 10.47. There was an increase in the mean annual rate of male suicides from 15.35 to 17.47 (13.2%). Female suicides decreased from a rate of 4.94 to 4.1 (-17%). The male: female suicide ratio increased from 2.9:1 to 3.9:1.

Changes in Recorded Suicide Rates by Age Only:

In the 10-24 group a regression coefficient of $b = 0.05$ suggested a flat series ($b = 0.05 \pm 0.18$, $P = 0.609$). In the 25-34 age group a positive regression coefficient of $b = 0.15$ indicated a non-significant upward trend toward an increase in suicide rates in this group ($b = 0.15 \pm 0.21$, $P = 0.192$). In the 35-64 group a regression coefficient of $b = -0.68$, indicated a significant downward trend in suicide rates in this group ($b = -0.68 \pm 0.49$, $P = 0.015$). In the 65+ group there was a highly significant downward trend in suicide rates, with a regression coefficient of $b = -0.60$ ($b = -0.60 \pm 0.25$, $P < 0.01$). In all cases autoregression of lag size 1 was not significant and therefore not considered.

Changes in Recorded Suicide Rates by Age and Gender:

Table II compares the mean annual suicide rate standardised according to age group for the periods 1984-1993 with 1994-2002. There were few suicides for either gender recorded for the 10-14 age group. Comparing the two groups in table II. The mean annual rate increased for males for those aged 15-55. The highest percentage increase was in the 25-34 group with an increase in the mean annual rate of 34%. This was followed by the 15-24 age group with an increase of 26.5%. There was a decrease in male suicide rates between the two groups for all those aged 55+. The mean annual rate increased for females in the 15-24 and 25-34 age groups. The highest percentage increase was in the 15-24 age group with an increase of 34.1%. The 25-34 age group had a percentage increase of 16.8%. There was a decrease between the mean annual rates of the two groups for all females aged 35+.

TABLE III:

Changes in Recorded Suicide Rates by Marital Status

Status	Sex	1985-1993		1994-2002		Change in Mean Annual Rate	% Change
		Mean Annual Number	Mean Annual Rate	Mean Annual Number	Mean Annual Rate		
Single	M	43.5	16.5	57.3	20.5	4.0	24.2%
	F	8.3	3.5	11.3	4.5	1.0	28.6%
Married	M	42.7	13.2	40.8	12.1	-1.1	-8.3%
	F	16.1	4.9	10.9	3.1	-1.8	-36.7%
Widowed	M	4.7	26.7	5.1	27.6	0.9	3.37%
	F	5.0	6.8	3.3	4.8	-2.0	-29.4%
Divorced	M	4.1	75.2	9.1	75.3	0.1	0.1%
	F	3.1	38.9	3.2	17.6	-21.3	-54.8%

Male Suicide Rates:

In the 10-34 age group a positive regression coefficient of $b = 1.26$ indicated a statistically significant upward trend in suicide rates in this group ($b = 1.26 \pm 0.35$, $P < 0.01$). In the 35-54 group a regression coefficient of $b = 0.34$ indicated a non-significant upward trend ($b = 0.34 \pm 0.58$, $P = 0.266$). In the 55-74 a negative regression coefficient of $b = -0.52$ indicated a non-significant downward trend in suicide rates ($b = -0.52 \pm 0.55$, $P = 0.082$). In the 75+ group there was a negative regression coefficient of $b = -1.25$ indicating a significant downward trend in suicide rates in this group ($b = -1.25 \pm 0.89$, $P = 0.014$). In all but one case autoregression of lag size 1 was not significant and therefore not considered. In the 10-34 age group autoregression of lag size 1 was significant at -0.49 ± 0.45 , $P = 0.05$, auto regression of lag size 2 was not significant.

Female Suicide Rates:

In the female 10-34 group there was a positive regression coefficient of $b = 0.20$ indicating a non-significant upward trend in suicide rates ($b = 0.20 \pm 0.28$, $P = 0.185$). In the 35+ group a negative regression coefficient of $b = -1.29$ indicated a highly significant downward trend in suicide rates amongst this group ($b = -1.29 \pm 0.54$, $P < 0.01$).

Changes in Recorded Suicide Rate by Marital Status:

Table III compares the mean annual suicide rate standardised by marital status for the periods 1985-1993 and 1994-2002. The mean annual rate increased for both males and females of single status. The mean annual rate decreased for both males and females of married status with a decrease of 8.3% for females and 36.7% for males. There was a small increase in the mean annual rate for widowers of 3.37% but the rate for widows decreased by 29.4%. There was little change in the rate for male divorcees and a marked decrease for the females of 54.8%. Male divorcees had by far the highest mean annual suicide rate, six times greater than married males.

Changes in Recorded Suicide Rates by Method:

Table IV compares the mean suicide rate by method available classified according to ICD9 for the periods 1984-1993 and 1994-2002. The most common method of suicide in males in both time periods was hanging. In females overdose was the most common method of suicide for both time periods. There was a decrease in the mean annual rate from 1984-1993 to 1994-2002 for all methods of suicide used except for hanging with a percentage increase in males of 99.37% and in females 87.80% an almost doubling of the mean annual rate.

DISCUSSION

The results of this study indicate that the total suicide rate in Northern Ireland appears to be rising. This appears to be largely as a result of the increase in young male suicides aged 10-34, with a statistically significant upward trend at $p < 0.01$. Suicide rates appear to be falling in the older population with a significant decrease in the 35+ age group in total suicide rates. The small number of female suicides make trends difficult to establish, however again they showed a non-significant upward trend in those less than 35 and a highly significant fall in suicide rates for those age 35+, ($p < 0.01$). As the suicide rate in the younger male population rises, that in the older population is falling, cancelling out significant rises if only total trends are examined and not the age break-down.

This is the first study specific to Northern Ireland which has examined the age and breakdown of suicide rates adjusting for non-random components. It was only in the young male population aged 10-34 that autoregression of lag size 1 was significant, indicating that in this population there is a tendency for a higher than average suicide rate followed by a year where the suicide rate drops.

It is difficult to compare this data with that commissioned by the NI Suicide Prevention strategy which examined 5 year moving averages and the comparison of age standardised yearly rates⁴. They showed an increasing suicide rate in Northern Ireland from 1991-2003 with males aged 25-34

having the highest percentage of suicides, a similar trend to this data. This study would appear to mimic a trend seen in England and Wales in the 1980s and early 1990s which showed an increase in suicides in the young male population and a decrease in the elderly⁸ and reflects current trends in Scotland⁹.

Several limitations of this study need to be addressed. The exclusion of undetermined deaths in the data it could be argued may affect results. It has been reported in NI there was a steady reduction in recorded numbers of undetermined and accidental deaths during the period 1975-1986¹⁰. The generally held view that improvements in recording arrangements and greater acceptance of recording of death as a suicide may lead to an increase in the likelihood of the coroner returning a suicide verdict could we acknowledge have led to the increase in suicide rates. In the Republic of Ireland this theory has been examined. Here it was felt that the increase in suicide figures recorded over the last 20 years due to better recording accounts for only 40% of the rise and that it should affect data relating to both men and women of all ages¹¹. We however feel that improvements in recording a death as a suicide is an unlikely explanation for our results as we feel this would have led to a general increase in rates across all age bands and both genders and does not explain the significant fall in suicide rates in the older populations.

The increase in the mean annual rate of suicides amongst the single population with a decrease in the married holds

TABLE IV:

Changes in Recorded Suicide Rates by Method

Method	Sex	1984-1993		1994-2002		Change in Mean Annual Rate	% Change
		Mean Annual Number	Mean Annual Rate	Mean Annual Number	Mean Annual Rate		
E950 Poison	M	14.5	2.37	14.8	2.30	-0.07	-2.95
	F	14.9	2.28	11.7	1.68	-0.60	-26.30
E952 Other Gas	M	12.3	2.03	10.1	1.57	-0.46	-23.00
	F	1.6	0.25	1.0	0.12	-0.13	-52.00
E953 Hanging	M	29.2	4.78	62.5	9.53	4.75	99.37
	F	5.3	0.82	10.8	1.54	0.72	87.80
E954 Submerge	M	11.3	1.87	5.8	0.90	-0.97	-51.87
	F	6.9	1.07	3.0	0.41	-0.66	-61.68
E959 Guns/Explosive	M	19.7	3.23	13.1	2.02	-1.21	-37.46
	F	1.1	0.17	1.1	0.16	-0.01	-5.88
Others =E951 Domestic Gas	M	6.6	1.09	6.0	0.91	-0.18	-16.51
	F	2.5	0.44	1.2	0.16	-0.28	-63.63
E956 Cut/Pierce							
E957 Fall from Height							
E958 Others							

with the general held belief that marriage acts as a protective factor. However as there was no age group breakdown any differential impact could potentially be explained by the age distribution of the group. The small numbers in the widowed and divorced population mean it is not possible to reach firm conclusions. Little attention is given to the method of suicide in the literature on NI¹². This study found that suicide by most methods is falling except for hanging with an almost doubling of the mean annual rate between the two time groups for both sexes. Amongst the female population overdose remained the preferred method for both groups indicating their preference for less violent means.

The increase in hanging as a suicide method is a trend which was also seen in Scotland between 1981-1999 where hanging as a method increased as car exhaust fumes as a method decreased with the advent of catalytic converters¹³. In Australia which had a rising young male suicide rate, restriction of firearms led to a doubling in the rate of hanging, however in both cases this trend commenced even before the advent of these restrictions¹⁴. It has been suggested that as prevention strategies restrict access to other means, males have a tendency to seek out alternatives^{13,14} and that the reduced stigma of hanging with the abolition of judicial hangings has contributed to its increasing use as a method¹⁵.

Gunnell and colleagues have argued in relation to England and Wales that changes in method preference and therefore in case fatality should be considered before concluding that changes must relate to social trends¹⁶. Given the rise in young male suicides found in this study, we hypothesise that hanging as a suicide method could be contributing to this higher suicide rate. This has important implications for any suicide prevention strategy, giving the difficulties in restricting access to this means and hangings case fatality of approximately 70%¹⁷.

The causes of suicide are complex and multifactorial. We have made no examination in this study of the social and health factors behind our results. In addition NI differs from our counterparts in Scotland⁹ and the Republic of Ireland¹⁸ who are also experiencing rising young male suicides in that we have experienced 30 years of civil conflict. One of the key areas in the NI Suicide Prevention strategy is research into the existing gaps in our information both localised and shared with our counterparts above.

CONCLUSION

The overall rate of suicide in Northern Ireland appears to be rising. This trend is largely a result of the increase in suicides in the young male population, with suicides in the older population falling. The greatest rise is observed amongst the single population. Suicide by most methods is falling except for hanging which has increased dramatically in both the male and female population. We hypothesize that this more violent method could be contributing to the higher suicide rate.

Conflict of interest – the authors have no conflict of interest to declare.

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