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BRIEF REPORT

"Suicide shall cease to be a crime": suicide and undetermined death trends 1970–2000 before and after the decriminalization of suicide in Ireland 1993

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Abstract

Introduction Suicide is criminalized in more than 100 countries around the world. A dearth of research exists into the effect of suicide legislation on suicide rates and available statistics are mixed.

Materials and methods This study investigates 10,353 suicide deaths in Ireland that took place between 1970 and 2000. Irish 1970–2000 annual suicide data were obtained from the Central Statistics Office and modelled via a negative binomial regression approach. We examined the effect of suicide legislation on different age groups and on both sexes. We used Bonferroni correction for multiple modelling. Statistical analysis was performed using the R statistical package version 3.1.2. The coefficient for the effect of suicide act on overall suicide deaths was −9.094 (95 % confidence interval (CI) −34.086 to 15.899), statistically non-significant ($p = 0.476$). The coefficient for the effect suicide act on undetermined deaths was statistically significant ($p < 0.001$) and was estimated to be −644.4 (95 % CI −818.6 to −469.9).

Conclusion The results of our study indicate that legalization of suicide is not associated with a significant increase in subsequent suicide deaths. However, undetermined death verdict rates have significantly dropped following legalization of suicide.

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Introduction

In June 1993, suicide was decriminalized in Ireland [1]; as in other 58 countries around the world, most recently by India [2]. Suicide attempters are prosecuted in 45 countries [3] whose legislators argue that criminalization can prevent suicidal behaviour [4]. Nevertheless, legalization of suicide is thought to eliminate the social stigma associated with suicide, and therefore, ease the burden from family members [5]. A dearth of research exists into the effect of suicide legislation and available statistics are too mixed to support either viewpoint [6]. The effect of suicide decriminalization in seven countries was investigated by Lester some 12 years ago [7]. His pioneering work spanned 10 year suicide data and concluded that decriminalization was associated with an increase in "official" suicide rates. He conducted a 20 year linear time-series investigation and found no affect for suicide decriminalization act 1961 in New Zealand [8]. In a similar 20 year investigation legalization of suicide 1972 in Canada led to no increase in suicide rates [9]. A reduction in Suicide deaths was reported in Sri Lanka following decriminalization of suicide in 1998 by the parliament [10]. In this study, we built on the previous important work by modelling a 30 year long time-series of combined suicide deaths with undetermined deaths, using principled negative binomial model of the counts of suicide deaths. We aimed to take account of trends present before legalization of suicide, an issue that many previous studies addressed inadequately.

Method

Irish 1970–2000 annual suicide data were obtained from the Central Statistics Office [11] and modelled via a negative binomial regression approach [12] including an offset term representing the yearly population [13]. We then quantified the effect of suicide decriminalization by including an indicator variable set to be non-zero only from the year 1993 onward, and included an interaction term between the year and the suicide legislation. We examined the effect of suicide legislation on different age groups and on both sexes. Bonferroni correction for multiple modelling implied that for a 5 % significance level we require $P < 0.00139$ [14]. We combined reported suicide deaths with undetermined deaths to give a better estimate of the total annual suicide deaths [15]. Furthermore, we conducted a sensitivity analysis using only the reported suicide deaths. Statistical analysis was performed using the R statistical package version 3.1.2 [16].

Results

Annual suicide deaths in Ireland were rising during the 1970–2000 period (see Fig. 1). A total of 10,353 deaths were attributed to suicide. The highest overall suicide deaths was 517, and was recorded in 1998. The total mean number of suicides prior to decriminalization act was 216.5 deaths a year. This increased to 448.7 suicide deaths a year after 1993.

The ratio between male and female suicide deaths fluctuated between 1.85 in the year 1977 and 5.50 in the year 1970, the mean was 3.33 (Standard Deviation $SD = 1.05$). The mean for the male-to-female suicide ratio jumped significantly from 3.05 prior to suicide decriminalization to 4.32 afterwards ($t = 3.60$, $p = 0.004$).

Breaking suicide deaths by age group, prior to 1993, the mean for deaths in children below the age of 15 was 1.25 suicides per year and increased to 3.14 suicides per year after 1993. The corresponding figures for the 15–34 years age groups were 81.04 (prior to 1993) and 205.4 (after 1993); whereas for the 35–65 years age group, the average annual suicide deaths (prior to 1993) was 104.6 and (after 1993) was 198.3 deaths a year. For those above 65-years-old, the mean yearly suicide deaths before suicide was legalized was 29.62 and increased afterwards to 41.86 suicide deaths per annum.

Upon investigating the effect of legalization of suicide on the overall suicide deaths (see Table 1), the coefficient for the suicide act was −9.094 (95 % CI −34.086 to 15.899), statistically non-significant ($p = 0.476$). Similarly, the coefficient for the interaction term in the model was 0.002 (95 % CI −0.004 to 0.009) which was also statistically not significant ($p = 0.476$). This suggests that there was no change in the rate of suicide occurrence after 1993. The odds for the rate of death by suicide for the total Irish population following legislation of suicide were calculated as 1.002 (95 % CI 0.996–1.009). This translates to an increase in the rate of suicide deaths by 0.2 % (95 % CI −0.4 to 0.9 %). Across the age groups the rate of suicide
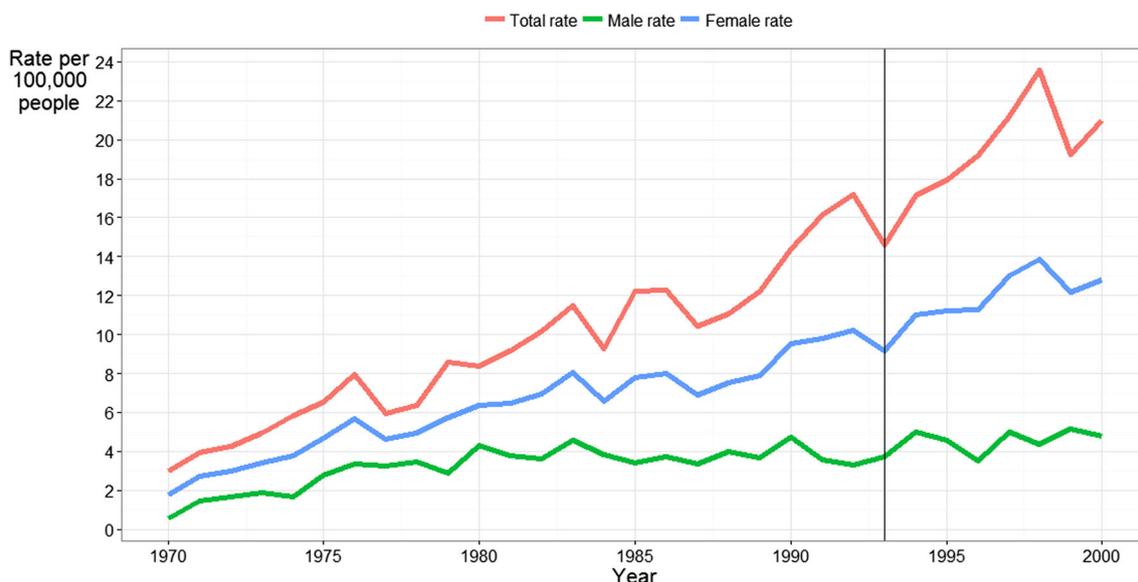
Fig. 1 The 1970–2000 annual suicide rates per 100,000 of the population in Ireland

Table 1 Effect of the suicide decriminalization on combined undetermined and reported suicide deaths

Age category	Suicide act	SE	*p* value	Time × act interaction	SE	*p* value
Overall						
0–14	−29.394	180.26	0.87	0.008	0.045	0.867
15–24	−50.002	18.078	0.153	0.013	0.005	0.152
25–34	−31.544	17.275	0.068	0.008	0.004	0.068
35–44	−35.086	22.964	0.127	0.009	0.006	0.126
45–54	6.03	31.036	0.846	−0.002	0.008	0.839
55–64	−32.56	39.507	0.41	0.008	0.01	0.412
65–74	−105.297	143.286	0.462	0.053	0.072	0.464
75-	−0.607	39.23	0.988	0	0.01	0.989
Total	−9.094	12.751	0.476	0.002	0.003	0.476
Gender						
Men	−29.394	180.26	0.87	0.008	0.045	0.867
Women	−50.002	18.078	0.153	0.013	0.005	0.152
Total	−9.094	12.751	0.476	0.002	0.003	0.476
Undetermined						
Men	−648.7	90.69	<0.001	0.325	0.045	<0.001
Women	−706.8	125.8	<0.001	0.354	0.063	<0.001
Total	−644.4	89.01	<0.001	0.161	0.022	<0.001
Reported suicides						
Men	80.786	33.446	0.0157	−0.041	0.017	0.0156
Women	80.961	70.677	0.252	−0.041	0.035	0.251
Total	76.83	39.126	0.0496	−0.019	0.01	0.0492

has showed no statistically significant change following decriminalization of suicide.

As to the effect of suicide legalization on male suicides (see Table 1), an overall rise in suicide rate by 0.4 % was noted (95 % CI −2.1 to 2.9 %), not significant statistically ($p = 0.775$). On the other hand (see Table 1), females recorded an upsurge in the rate of suicide deaths by 1.7 % (95 % CI −3.4 to 7.2 %), although the effect size was slightly more impressive, it was still statistically insignificant ($p = 0.521$). Breaking down the gender variables by age classes, the odds varied between 0.680 and 1.109 for females and between 0.785 and 1.034 for males, with none of the changes in suicide deaths rates being statistically significant.

Focusing the analysis on the reported suicides alone (see Table 1), the overall effect for the suicide act was a positive rise, the coefficient was 67.83 (95 % CI 0.14–153.52), a wide confidence interval, that is not significant statistically ($p = 0.0492$) with the penalty posed by the Bonferroni correction. Examining men and women separately, the effect of the suicide act on female reported suicide deaths was not statistically significant ($p = 0.251$). For men, the ($p = 0.0156$) was still not significant at the level required following Bonferroni correction.

However, examining the effect of suicide legalization act on the rates of undetermined deaths indicated a statistically significant reduction after 1993. The coefficient for the suicide act was −644.4 (95 % CI −818.6 to −469.9), which was statistically significant ($p < 0.001$). Additionally, the coefficients for the effect of suicide act on undetermined deaths rates for men and women were statistically significant with 95 % CI of (−826.45 to −470.95), and (−953.37 to −460.23), respectively.

Discussion

The results of our study indicate that legalization of suicide is, reassuringly and despite the slight 0.2 % increase (0.4 % for males and 1.7 % for females), not associated with a statistically significant increase in the subsequent rate of suicide deaths. Moreover, slight and insignificant reduction in suicide deaths rates following 1993 legislation act was noted by 0.2 % in the 45–54 years old group, (5.2 % in females between 45 and 54 years of age, 4.2 % in females aged 55–64, 3.8 % in males aged 55–64, 0.8 % in males aged 65–74, and 1.7 % in males above 75-years-old). Our study provides further support to the global/international campaign for decriminalization of suicide. These results may be used as an argument for those lawmakers seeking to destigmatize suicide mortality through decriminalizing suicidal behaviour. This can, undoubtedly, be furthered by other suicide prevention campaigns and programmes.

Our study revealed the significantly negative effect of suicide decriminalization on the rates of undetermined deaths. The many demographic similarities between undetermined and suicide deaths have motivated researchers to expressed concerns regarding the misclassification of suicide deaths as undetermined [17]. Many amalgamate them when studying suicide rates [18]. Arguably, the Suicide act 1993 can be regarded as having removed restrictions on coroners to return a verdict of death by suicide, therefore, increasing the reported deaths by suicide after 1993 [19]. This has significant implication into suicide research specifically research investigating the effect of changes in legislation. Previous studies, notably, attempted to quantify the effect of suicide legalization on the reported suicide deaths alone [7–9]. The conclusions of such studies could have been improved greatly should data on undetermined deaths, if available, were included in the analysis.

To our knowledge, our study is first to explore the effect of decriminalization of suicide on each gender separately. Despite the study strength of taking account of undetermined deaths, an important limitation to this study is the reliance on registered causes of deaths. The Interim report of the National Task Force on Suicide has indicated that a margin of error of just <5 % is present in relation to the accuracy of data on suicide deaths in Ireland [20]. This has to be taken into account when the results of our study are interpreted. Moreover, the effect of suicide legislation on suicidal behaviour, which may not have resulted in death, remains beyond the scope of the current study. Another limitation that should be considered is that we were obliged to examine the 1993–2000 period only because we wanted to focus the analysis on the years that immediately followed suicide decriminalization. We attempted to avoid the additional effect posed by significant economic changes after the year 2000. Perhaps, other contemporary changes, unaccounted for by the present study, in suicide prevention policies may have their own effect on suicide deaths. One important suicide prevention landmark was the establishment of the National Task Force on Suicide in the mid to late 1990s. Some of its recommendations provided in its Interim report in September 1996 may have had an impact on suicide through various intervention strategies, emphasis on training of General Practitioners and all members of Primary Care Teams, improving communication with voluntary organisations, and screening and treatment of mental illness in the community, hospital and prison settings [20].

Conclusion

We found no evidence of rise in suicide deaths in any of the age groups or either gender after suicide was decriminalized in Ireland in 1993. These results may be used as an argument for law-makers seeking to destigmatize suicide mortality through decriminalizing suicidal behaviour. However, significant reduction in undetermined deaths has occurred following suicide decriminalization in 1993 indicating increased tendency for returning a verdict of 'suicide death'. Future research in epidemiological changes in suicide should pay attention to the changes observed in rates of undetermined deaths.

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