Suicide in Children over Two Decades: 1993-2008

Abstract
Suicide rates have increased in Ireland's youth over the past two decades. However, no research report has focussed on suicide rates that aged under 18. The children of Ireland. We retrieved national disaggregated age and sex-specific suicide mortality data from 1993-1998 and compared it with similar suicide mortality data from 2003-2008. Suicide rates in under 18s were reported in other countries. Between 1980 and 1997 in the US, the rate of completed suicide among children aged 10-14 years increased by 109%. The rate of completed childhood suicides (under 14) in the 1990’s for the UK, New Zealand, Canada, Australia and the USA was estimated as being under 2 per 100,000. In fact, suicide was the third leading cause of death, after accidents and homicides, among 10-19 year-olds in the United States in 2000. An examination of WHO suicide mortality data for 2009 in Ireland vs. UK indicates that suicide rates in children under aged 15 are very rare in both jurisdictions, but that the rates are higher in Ireland than UK (0.7 vs. 0.1/100,000). Suicide occurs significantly more often in boys and more commonly between ages 15-17 in both sexes. Regression analysis (Poisson) identified significant age and sex effects for both number of suicide deaths (Table 2) and also for suicide rates per 100,000 (Table 3), but a decade effect was not significant. The results of raw number of suicide deaths and suicide rates per 100,000 for 1993-1998 and 2003-2008 by age and sex in under 18s are presented in Table 1. Suicide in under 15-year-olds is extremely rare in both decades, with average overall rates of 1.6/100,000. Suicide occurs significantly more often in boys and more commonly between ages 15-17 in both sexes. Regression analysis (Poisson) identified significant age and sex effects for both number of suicide deaths (Table 2) and also for suicide rates per 100,000 (Table 3), but a decade effect was not significant.

Introduction
Rates of youth suicide have increased globally in the past 50 years. Unfortunately, youth suicide rates in Ireland are now the fourth highest in the expanded EU (Figure 1) and the leading cause of death on young males aged 15-24. As a consequence, this has been in young adults aged 19-24, where peak rates have been identified. More specifically, as young male suicide rates are typically 5 times that of young females, most of the research has been with young adult males, who are outside the net of healthcare support. No research study in Ireland has given particular focus to suicide in under 18s the children of Ireland. Indeed, there are relatively few epidemiological studies internationally that have focussed on suicide rates in children in different countries. This is primarily because suicide rates are traditionally reported in each country in 5-year age bands, which typically include ages 5-9, 10-14, 15-19, 20-24, and most commonly 15-24, which blurs the child data from those of young adults. These data are then submitted to WHO, where rates across countries are reported and compared. As such, there is no scope in the current strategy of reporting suicide internationally, to tease out rates of suicide in those who are classified as children (under 18 in Ireland, under 16 in other jurisdictions).

An examination of the data from the Irish Central Statistics Office (CSO) requested to provide the most disaggregated data permissible under the Data Protection Act for raw year on year age and sex mortality numbers of under 18 year olds who died by suicide and open verdict for 1993-1998, and 2003-2008. Population level age and sex data were retrieved from the National Census 1996 and 2006. The age estimates per 100,000 in each age group and time period were based on official recorded deaths and the Data Protection Act in relation to the granularity of sensitive data they can release to the public, and to those involved in research. Specifically, they are not permitted to provide data below a level where less than 5 cases are included in any data cell. For this reason, in order to include all year on year under 18s deaths recorded as suicide or open verdict, we sought grouped data for each age group for each 6 year time period being examined. We then divided this number by 6 to calculate both the average raw and per 100,000 population rate for each time period. As suicide rates can vary from year to year, international researchers often employ 3 year moving averages to control for this variability. In our examination, we averaged 6 years of data to calculate an average yearly count and rate for each time period.

Methods
The Irish Central Statistics Office (CSO) were requested to provide the most disaggregated data permissible under the Data Protection Act for raw year on year age and sex mortality numbers of under 18 year olds who died by suicide and open verdict for 1993-1998, and 2003-2008. Population level age and sex data were retrieved from the National Census 1996 and 2006. The age estimates per 100,000 in each age group and time period were based on official recorded deaths and the Data Protection Act in relation to the granularity of sensitive data they can release to the public, and to those involved in research. Specifically, they are not permitted to provide data below a level where less than 5 cases are included in any data cell. For this reason, in order to include all year on year under 18s deaths recorded as suicide or open verdict, we sought grouped data for each age group for each 6 year time period being examined. We then divided this number by 6 to calculate both the average raw and per 100,000 population rate for each time period. As suicide rates can vary from year to year, international researchers often employ 3 year moving averages to control for this variability. In our examination, we averaged 6 years of data to calculate an average yearly count and rate for each time period.

Results
The results of raw number of suicide deaths and suicide rates per 100,000 for 1993-1998 and 2003-2008 by age and sex in under 18s are presented in Table 1. Suicide in under 15-year-olds is extremely rare in both decades, with average overall rates of 1.6/100,000. Suicide occurs significantly more often in boys and more commonly between ages 15-17 in both sexes. Regression analysis (Poisson) identified significant age and sex effects for both number of suicide deaths (Table 2) and also for suicide rates per 100,000 (Table 3), but a decade effect was not significant.

Discussion
This is the first report to systematically examine suicide rates by age and sex across decades in the children of Ireland. Although significant age and sex effects are apparent. Although the observed number and rate of suicide deaths in childhood has increased across the decades, this trend is not statistically significant. A similar increase has also been reported in other countries. Between 1980 and 1997 in the US, the rate of completed suicide among children aged 10-14 years increased by 109%. The rate of completed childhood suicides (under 14) in the 1990s for the UK, New Zealand, Canada, Australia and the USA was estimated as being under 2 per 100,000. In fact, suicide was the third leading cause of death, after accidents and homicides, among 10- to 19-year-olds in the United States in 2000. An examination of WHO suicide mortality data for 2009 in Ireland vs. UK indicates that suicide rates in children under aged 15 are very rare in both jurisdictions, but that the rates are higher in Ireland than UK (0.7 vs. 0.1/100,000). Suicide occurs significantly more often in boys and more commonly between ages 15-17 in both sexes. Regression analysis (Poisson) identified significant age and sex effects for both number of suicide deaths (Table 2) and also for suicide rates per 100,000 (Table 3), but a decade effect was not significant. The results of raw number of suicide deaths and suicide rates per 100,000 for 1993-1998 and 2003-2008 by age and sex in under 18s are presented in Table 1. Suicide in under 15-year-olds is extremely rare in both decades, with average overall rates of 1.6/100,000. Suicide occurs significantly more often in boys and more commonly between ages 15-17 in both sexes. Regression analysis (Poisson) identified significant age and sex effects for both number of suicide deaths (Table 2) and also for suicide rates per 100,000 (Table 3), but a decade effect was not significant.

The U.N. Convention on the Rights of the Child supports the right of children to protection, provision, participation, dignity and respect. It was ratified by Ireland in 1992. The decline in youth suicide in other countries has been thought to be due to better recognition of high risk youths, earlier interventions and provision of effective treatments and services for youth with mental health disorders. Given the 15-24 years age group are most at risk, coupled with the increase in youth suicide noted over the study period, services for these age groups are a primary concern. However Mental Health services are currently under-developed for the children within this age group (16-18 years old) transitioning from child to adult support in Ireland. Based on our data and in line with children's rights under the Irish Constitution, this age-group is entitled to a comprehensive, and integrated service tailored to their needs.

There is value in including a six-year average, compared with selecting one year compared with the next, when examining suicide rates, particularly when the absolute numbers are small. For example, the recently published State of the Nations Children (2010) compared suicide rates in 15-17 year olds between 2005 and 2009, and reported that female rates had fallen from 0.4/100,000 to 0.2/100,000. If this one-year rate for 2009 is repeated in the subsequent 5 years, this will translate into a 5-fold increase in young female suicide since the nineties. Alcohol is long recognized as a significant risk factor for suicide, being linked with depression and impulsivity, and particularly in males.

When present, it increases the risk eight-fold. Given the known high rates of alcohol misuse among Irish...
adolescents, this, coupled with increase rates of DSH, places both young Irish males and females at continuing increased risk for completed suicide. Our principal limitations relate to (i) Data Protection Act issues which restricted our enquiry, and (ii) dealing with very small absolute numbers of suicide deaths. For example, we were unable to document the youngest age for suicide death in either of these time periods, nor were we permitted to document suicide rates in those children under aged 10, due to the small numbers (less than 5) involved during each time period being studied. Nor were we permitted to report or compare rates in under 18s across counties in Ireland, again because of smaller numbers in smaller counties.

Nonetheless, this is a surveillance report with findings that have implications for the protection of the children of Ireland under the Irish Constitution. It also has particular healthcare and suicide prevention policy implications, as Ireland currently has the youngest demographic in Europe. A wave of young people is currently moving through Irish society where suicide rates amongst their peers have increased substantially from those of their parents. Not only is suicide likely to remain the leading cause of death in these children in the next decade, suicide will also be the leading cause of peer bereavement, with implications for tailored age and sex-specific psycho-education and bereavement support. As this age of risk corresponds with school teen-years, perhaps it is time for a national review of school-based psycho-education and intervention strategies, as it is likely that suicidality emerges in early adolescence, manifesting itself in overtly suicidal acts towards the mid to later teens, suggesting that intensified prevention efforts need to be delivered considerably earlier in Irish life than was conceived heretofore.

Macro-level national data such as these do not permit any detailed examination of relevant clinical factors, or indeed any insights into the phenomenon of clusters which are highly probable in a proportion of these cases. Any new insights and understanding of these factors are likely to emerge from a carefully designed Psychological Autopsy study of the Children of Ireland, in synchrony with a national Coroners Study.

Given the scale of the problem we have described over the past 2 decades, (and the relative magnitude of the problem compared with our closest neighbour (UK), such an initiative is to be strongly recommended, to address the knowledge vacuum in this area of national concern. The findings from such a study would better inform age-specific intervention and prevention policy for the children of Ireland. They deserve, and indeed are entitled, to no less.

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