Suicide in Ireland: a cross-national view

David Lester

Ir J Psych Med 2010; 27(4): 198-204

Abstract

Recent epidemiological trends in Irish suicide rates were examined and found to be consistent with world-wide trends. However, the time-series Irish suicide rate was not consistent with predictions made from Durkheim's classic theory of suicide. Finally, current theories of the etiology of suicide were used to derive a linear regression equation to predict the Irish suicide rate which turned out to be quite inaccurate.

The task addressed in this article is a review of the epidemiology of suicide in Ireland and, in doing so, the suicide rate in Ireland will be compared with the suicide rates of other nations of the world. *Table 1* reports the suicide rate in Ireland from 1901 to 1949, *Table 2* for the period 1950-2001, overall and for men and women (and parallel data for Northern Ireland are shown in *Table 3*). These data were compiled from Lester and Yang and from World Health Organisation publications and online (www.who.int).[1] It should be noted that suicide was decriminalised in Ireland in 1993.

The basic trend over time

Walsh documented the trend in Irish suicide rates from 1864 to 1976.[2,3] The Irish suicide rate rose from 1864 on, peaking in the period of 1914-1938. During and after World War II, the suicide rate dropped up to 1968, but rose thereafter. Suicide rates were consistently higher in rural regions than in urban regions. The method for suicide changed over the time period, with an increase in the percentage of suicides using poisons and carbon monoxide.

More recent data confirms a steady increase in the Irish suicide rate up to the present time (*Tables 1 and 2*), trends confirmed by Levi et al, Smyth et al, Corcoran et al and Aoki et al, although this rise is noticeable only in men.[4,5,6,7]

Suicide rates by sex, age and method

Corcoran et al noted that men have higher suicide rates than women in Ireland, a difference found throughout the world with the exception of China, and the male/female ratio is highest in Ireland for the younger age groups.[6] The suicide rate in the 1990s peaked in men aged 20-24 and in women aged 50-54. For those under the age of 30, hanging was the most common method for suicide for men and women. Hanging remained the most common method for men older than 30, but for women drowning became the most common method.

Covering up suicides: studies of Ireland

One explanation for the rising suicide in Ireland since the 1980s is that suicidal deaths are being classified more accurately in recent years and that the earlier low suicide rates were a product of covering-up (misclassifying) the suicides. Farmer and Rohde noted that open verdicts were more common in Ireland than in England and Wales for most methods of suicide.[8]

Clarke-Finnegan and Fahy examined 410 post-mortems in Co Galway in 1978.[9] The estimated suicide rate was 13.1, greater than the official suicide rate for the county of 4.6. McCarthy and Walsh studied deaths in Dublin for the period 1964-1968 and calculated a suicide rate of 5.3 as compared with the official rate of 1.4.[10] For 1954-1863, McCarthy and Walsh found that 52% of the suicides in Dublin were not officially recorded as suicides.[11] Walsh, Walsh and Whelan found that coroners were more likely to return a suicide verdict (versus accidental or open verdicts) if the suicides were under the age of 40, if they communicated suicidal intent, and if they used cutting, hanging, drugs or gas (rather than drowning, jumping, shooting or poisoning).[12]

Connolly and Cullen studied deaths in Co Mayo for 1978-1992 that were coded as suicide, undetermined and accidental deaths.[13] The researchers found that 220 deaths were clearly suicides. Of these, 143 were officially classified as suicides, 41 as undetermined, 15 as accidental deaths and 21 were unregistered or missing; this gives a 35% undercount of the suicides. The misclassification of suicides was especially common for deaths due to drowning (50% were misclassified) and least for hanging (only 5% were misclassified). For all other methods 18% were misclassified. The three groups of deaths did not differ in sex, marital status, employment status, or age. Connolly et al studied suicides in counties Kildare and Mayo for the period 1988-1994 and found an underestimate of official suicide mortality in both counties.[14] (Incidentally, Connolly et al also found differences in the social and other characteristics between the suicides in the two counties, and they suggested that effective suicide prevention tactics might have to be tailored to each county.) Cullen and Connolly examined 260 suicides in Co Mayo in the period 1978-1994, and found that only 163 were classified officially as suicides.[15] Forty-three were classified as undetermined and 26 as accidents, while 7.3% of the suicides were never officially registered. Misclassification of suicides was especially common for suicides by drowning.

Connolly et al looked at 134 single road traffic accidents in Co Mayo during the same period (for those over the age

David Lester, PhD, Professor of Psychology, The Richard Stockton College of New Jersey, Pomona, NJ 08240-0195, United States. Email: David.Lester@stockton.edu

*Correspondence

SUBMITTED: JANUARY 18, 2008. ACCEPTED: FEBRUARY 4, 2009.

of 15) and found only six deaths where there was the suspicion of suicide.[16] Thus, there was no evidence to support that hypothesis that some of these accidental traffic deaths may have been disguised suicides.

Walsh et al studied the suicides in Co Kildare for 1978-1987.[17] They found 58 suicides whereas the official tally was 55 suicides. However, nine cases on Walsh's list were not suicides on the official list, whereas six cases on the official list were not on Walsh's list. They estimated that official suicide rate for the county of 5.6 should be revised up to 5.9, a minimal change.

Brugha and Walsh examined the certification of deaths in Dublin in 1900-1904 and found that the under-reporting of suicides then was similar to that found in their study for the period 1964-1968 (about 50% of undetermined deaths are excluded as possible suicides).[18] They suggested, therefore, that changes in the suicide rate over the 20th century may possibly be valid and not a result of changes in coroner behaviour.

Naughton et al studied cases of suicide in Co Kerry in 1988 from post-mortem records and identified 16 suicides.[19] The official count was 19, and Naughton et al missed six of these while the official count missed four of those identified by Naughton et al. Combining both sources, there were 23 suicides and so Naughton et al concluded that there were deficiencies in suicide recording practices.

Kelleher and Daly did note that, although Irish coroners may have been "misclassifying" suicides, there is good evidence that the same was happening in England and Wales as well as in other countries.[20]

Date of death versus date of registration

Corcoran et al compared the suicide rate in Ireland depending on whether it is based on the date of the death or the date on which the death is registered.[21] They noted that in 1987 and 1993, fewer suicides occurred than were registered – for example, 327 versus 357 in 1993. In other years, the number of suicides that occurred exceeded the number registered. The two sets of figures seemed to be diverging over the period studied (1987-2003). It is important for meaningful research to base suicide rates on the date of death rather than the date of registration.

Covering up suicides: comparative data

Cantor et al explored this issue by examining the epidemiology of suicide in eight predominantly English-speaking countries (Canada, the US, Australia, New Zealand, England and Wales, Northern Ireland, Scotland and Ireland).[22,23] Looking at all eight nations, the "old-world" nations had similar trends for the period 1960-1989 that were very different from the "new world" nations. However, looking at the old-world nations alone, trends in the Irish suicide rate were very different from those for the three regions of the UK. Cantor et al concluded that the Irish suicide differed probably because of official under-counting suicides, but they felt that Irish suicide rates after 1978 were more valid than earlier rates.[23]

Rockett and McKinley looked at the suicide rate divided by the suicide plus accidental death rate from selected causes in 20 countries in order to examine how what proportion of suicides might be "covered-up" as accidental deaths.[24] They concluded that the Irish data (as well as data from Finland, Greece, Israel and the UK) indicated the possibility of gross misclassification of suicides especially for those aged 15-24 and over the age of 75.

Neeleman and Wessely examined the ratio of open verdicts to suicide verdicts in 16 countries.[25] From 1968 to 1990, this ratio rose in England and Wales from 0.27 to 0.55 (and in Belgium and New Zealand too) but dropped in all other countries including Ireland (where it dropped from 1.25 to 0.22). Thus, the apparent accuracy in official suicide statistics improved in Ireland in contrast to England where it became less accurate.

Suicide rates in immigrants

When people emigrate from other nations to a nation such as Australia or the United States, their deaths are classified by the same set of coroners (or medical examiners). Thus, covering up suicides should not vary by ethnicity. Several studies have found a strong association between suicide rates in (mainly) European nations and immigrants from those nations: in the United States,[26,27,28] Canada,[29,30] Australia,[31,32,27,33,34] and Sweden.[35]

For example, Dublin reported suicide rates for 12 ethnic groups in the United States in 1959.[36] Immigrants from Mexico had the lowest suicide rate (7.9 per 100,000 per year) with the Irish next lowest (9.8). Swedish immigrants had the highest suicide rate (34.2) followed by Austria, Czechoslovakia and the USSR. Thus, the Irish in Ireland had low suicide rates, and the Irish immigrants in the United States also had low suicide rates.

Burvill et al looked at suicide rates of English, Scots and Irish immigrants to Australia as compared to the suicide rates in their countries of origin.[37] They found that the suicide rates of all three immigrant groups were higher than in their home countries, but the greatest increase was found for the Irish immigrants. All three immigrant groups had similar suicide rates in Australia, suggesting that the Irish suicide rate is an undercount. Burvill et al also found that the methods for suicide, which differed in the countries of origin, became more similar in Australia and resembled the methods used by Australian-born suicides. The Irish immigrants used passive methods for suicide more often than the Irish in Ireland and active methods less often.

The rising Irish suicide rate

Daly and Kelleher noted that the Irish suicide rate had risen from 1970 to 1983, from 1.75 to 7.87.[38] For men, the largest increase was among young men and for women those aged 44-64. There was an increased use of violent methods for suicide and a reduced use of poisons. Since the rates of undetermined and accidental deaths remained unchanged during this period, Daly and Kelleher concluded that the increased suicide rate was a real phenomenon and not due to changes in classifying deaths.

Kelleher et al examined whether the increasing prescribing of antidepressants in the 1970s could have caused the increasing Irish suicide rate since antidepressants can be used to commit suicide.[39] They observed that, during the period 1971-1988, antidepressants accounted for only 4% of all suicides and that 85% of deaths from antidepressants were classified as suicides (rather than accidental deaths or undetermined). They, therefore, dismissed this possibility.

https://doi.org/10.1017/S0790966700001531 Published online by Cambridge University Press

Table 1: Suicide Rates for Ireland, 1901-1949

1901	2.9	1924	3.2
1902	3.3	1925	3.3
1903	3.3	1927	3.2
1904	3.4	1928	3.3
1905	3.6	1929	3.8
1906	3.3	1930	2.8
1907	3.4	1931	3.7
1908	3.4	1932	3.7
1909	3.3	1933	3.5
1910	3.6	1934	3.5
1911	3.4	1935	3.1
1912	3.8	1936	3.3
1913	3.5	1937	2.9
1914	2.7	1938	3.3
1915	3.1	1939	2.7
1916	2.5	1942	2.8
1917	2.2	1943	2.6
1918	2.5	1944	2.6
1919	2.9	1945	2.4
1920	2.1	1946	2.7
1921	3.1	1947	2.4
1922	2.2	1948	2.3
1923	2.5	1949	2.6

Kelleher and Daly concluded that the rising suicide rate in Ireland in 1970-1985 reflected a real increase in suicide and not a change in the classification of death.[20,40,41] First they noted that the rates of death from open verdicts, accidental drownings and accidental poisonings did not increase during this period (and in fact declined in the 1980s). The increase in suicide rates during the period was found in both men and women, for those of all ages and for those using each method for suicide (but especially so for hanging and drowning). The rural suicide rate was higher than the urban suicide rate in this period and rose more sharply.

During the same period, the illegitimacy rate, admissions to hospitals for alcoholism, and indictable crimes all rose; the marriage rate dropped during the period, as did the proportion of the population under the age of 15, while the married-but-separated rate increased. (Ireland did not permit divorce during this period.)

For youths, drugs became increasingly available and used, and there was increased competition for higher education. Kelleher and Daly concluded that the rise in the Irish suicide rate was genuine and was a result of increasing anomie in the population. Swanwick and Clare agreed, noting also the falling marriage rate, changing spiritual values, increased drug addiction, and rising rates for illegitimacy in recent years. However, these changes in the suicide rate may have been a result of other factors, such as cohort effects.[42]

Kelleher et al and Kelleher and Chambers noted that religious practices had declined in Ireland in recent years, along with the increase in the suicide rate. Their study found that the increase in suicide was found only in men whereas both sexes have experienced a fall-off in religious practice. Furthermore, regions that had the least fall-off in religious practices had the greatest increase in suicide. They concluded that changes in religiosity were not related to changes in the Irish suicide rate.[43,41]

Kelleher et al noted that the increase in the Irish suicide rate in the 1980s was found only in males and primarily in rural males, especially in the young and the elderly rural males.[44,41] They speculated that the social problem for elderly rural males might be the increasing proportion of them who are unmarried, but they found no evidence that changes in the incidence of alcohol abuse played a role.

Suicide in Ireland compared to rest of the world

Lester and Yang looked at the association of suicide rates with time for the period 1901-1988 for 12 nations, eight of which showed a linear trend of increasing and four a linear trend of decreasing.[1] Ireland's trend was an increasing suicide rate during the period, in line with the majority of nations.

From 1970 to 1984, Ireland experienced an increase in the suicide rate of men (from 3.0 per 100,000 per year to 6.6) as did 21 of 23 nations studied by Lester, and an increase in the suicide rate of women (from 0.5 to 3.9) as did 14 of the 23 nations.[45]

Lester, Cantor and Leenaars noted that, whereas suicide rates in Ireland and Northern Ireland rose from 1960 to 1990, suicide rates in England and Wales and in Scotland declined at first and then held steady during this period.[46] In Ireland, both male and female suicide rates rose, whereas only male rates occasionally showed an increase in the rest of the United Kingdom. It appears, therefore, that the epidemiology of suicide rates in Ireland differed from that in the United Kingdom.

Rising youth suicide rates

The 1970s witnessed rising suicide rates among youth in many nations. From 1970 to 1980, Lester found that 23 of 29 nations studied experienced a rise in youth suicide rates.[47] In line with this, the suicide rate of Irish male youths aged 15-24 increased by 64.7% during this period and of Irish female youths 750.0%. (The overall Irish suicide rate also rose 250.0% during this period.) The trends in Ireland were, therefore, similar to the trends in the majority of other nations.

The rise in youth suicide rates in Ireland was noted by Madge for the period 1980-1994 and by Rutz and Wasserman for the period 1979-1996, consistent with trends in the majority of countries studied.[48,49] However, the trend in Ireland differed in that the increase was found in both males and females and in those of most age groups, suggesting to Rutz and Wasserman that the rise was probably due to improved suicide statistics (as was the case also for Greece and Sweden).

Suicide in the elderly

There has been concern over rising elderly suicide rates. From 1970 to 1980, Lester found rising elderly suicide rates in 17 of 28 nations for men and in 15 of the 28 nations for women.[50] In Ireland from 1970 to 1980, the suicide rate for those 75 years of age and older rose by 100.0% in men and by 171.4% in women. Thus, Ireland's rising elderly suicide

https://doi.org/10.1017/S0790966700001531 Published online by Cambridge University Press

Table 2: Suicide rates for Ireland by gender 1950-1985

Year	Men	Women	Total
1950	4.2	0.9	2.6
1951	4.0	1.1	2.6
1952	3.5	0.9	2.2
1953	3.3	1.2	2.3
1954	3.2	0.8	2.0
1955	3.7	1.0	2.3
1956	4.4	0.8	2.6
1957	4.0	1.0	2.5
1958	4.2	1.2	2.7
1959	3.8	1.2	2.5
1960	4.1	1.8	3.0
1961	4.9	1.4	3.2
1962	2.9	0.8	1.8
1963	3.7	1.2	2.5
1964	3.4	0.7	2.0
1965	3.0	0.5	1.8
1966	3.6	1.2	2.4
1967	3.7	1.2	2.5
1968	3.8	1.0	2.4
1969	2.6	1.0	1.8
1970	3.0	0.5	1.8
1971	3.9	1.5	2.7
1972	4.3	1.7	3.0
1973	5.0	1.9	3.4
1974	5.9	1.7	3.8
1975	6.6	2.8	4.7
1976	7.9	3.4	5.7
1977	6.0	3.3	4.6
1978	6.4	3.5	4.9
1979	8.6	2.9	5.7
1980	8.3	4.3	6.3
1981	9.1	3.8	6.9
1982	10.2	3.6	7.4
1983	11.5	4.6	7.6
1984	9.2	3.9	6.1
1985	12.2	3.4	8.3

Table 3: Suicide rates for Northern Ireland by gender 1950-1985

Year	Men	Women	Total
1950	5.3	1.7	3.5
1951	5.5	2.7	4.1
1952	4.5	1.6	3.0
1953	4.7	2.0	3.3
1954	5.3	1.7	3.5
1955	5.4	1.3	3.3
1956	4.8	2.9	3.9
1957	4.6	2.6	3.6
1958	4.5	1.7	3.1
1959	5.0	3.3	4.1
1960	5.8	3.0	4.4
1961	6.8	3.4	5.0
1962	5.1	3.4	4.2
1963	8.7	3.5	6.0
1964	6.9	4.0	5.4
1965	5.9	3.7	4.8
1966	6.5	4.6	5.5
1967	8.8	4.5	6.6
1968	7.0	6.2	6.6
1969	7.3	4.9	6.1
1970	4.7	3.2	3.9
1971	4.5	2.4	3.4
1972	4.1	2.0	3.0
1973	4.2	4.9	4.6
1974	5.1	2.9	4.1
1975	4.7	2.6	3.7
1976	5.5	3.3	4.5
1977	5.0	4.1	4.6
1978	5.0	4.1	4.6
1979	7.1	2.8	5.0
1980	7.1	3.4	5.3
1981	9.0	2.8	5.8
1982	7.6	4.6	6.0
1983	11.3	6.8	9.2
1984	9.3	4.6	7.0
1985	11.1	4.0	7.5

rate in the 1970s paralleled the trend for men in the majority of nations during that period.

Suicide and homicide

Lester and Yang correlated suicide and homicide rates for the period 1950-1985 for 19 nations.[1] Thirteen nations had positive associations and six negative associations. Ireland's association was positive, in line with the majority, and this result was replicated by McKenna, Kelleher and Corcoran.[51]

Unemployment and suicide

Lester and Yang examined the association of suicide rates with unemployment rates for the period 1950-1985 for 14 nations, and in 10 the association was positive, including Ireland.[1] Pritchard found a similar result, both for the general population and for youths.[52]

Social integration and suicide

Marriages and births create families, and Durkheim proposed that increasing social integration (up to a point) would result in lower suicide rates.[53] Lester and Yang studied 36 nations for the period 1950 to 1985; 22 had a negative association between suicide rates and marriage rates in line with this hypothesis but not Ireland (Northern Ireland was

https://doi.org/10.1017/S0790966700001531 Published online by Cambridge University Press

consistent with the majority trend); 24 had a negative association between suicide rates and birth rate in line with this hypothesis, including Ireland (but not Northern Ireland). The associations for Ireland (a positive association between the suicide rate and the marriage rate and a negative association between the suicide rate and the birth rate) were also found for the period 1901-1988.[1,54,55]

Lester, Cantor and Leenaars found that unemployment, marriage and birth rates predicted the English suicide rate from 1960 to 1990 quite precisely (and statistically significantly), but less successfully for Ireland (and for Scotland and Northern Ireland).[46]

Lucy et al examined trends in suicide in Ireland by age and sex for the period 1968-2000.[56] They noted that, for the first half of the period, the rate of undetermined deaths was substantial, but this rate declined and would have had little impact on the suicide rate in the latter part of the period. Both male and female suicide rates were associated with the gross domestic product, the unemployment rate, the female labour force participation rate, expenditures on alcohol, the marriage rate, the indictable crime rate and the rate of illegitimate births. In a multiple regression, the significant predictors for both male and female suicide rates were alcohol expenditures, the marriage rate and the crime rate. However, changes in these variables did not predict changes in the suicide rate. Switching to econometric techniques (that is, removing time trends in the data by using year-to-year differences in the variables) eliminated the significant associations except for the association of the crime rate with the female suicide rate.

Methods for suicide

The methods used for suicide vary greatly by nation, as noted above by Burvill et al and Snyder who both included Ireland in their data sets.[37,57] Furthermore, nations experience differences in the timing of the availability of lethal methods for suicide, such as when domestic gas was detoxified (by switching from coal gas to natural gas), when emission controls were required on cars, and the passage of gun control laws.

Suicide and season

Reid et al found no seasonal variation of suicide in Ireland.[58]

Comment

Overall, the trends in the Irish suicide rate were consistent with trends found in the majority of nations of the world during the 20th century.

County suicide rates

Connolly and Lester calculated suicide rates for each Irish county for the period 1978-1984 and looked for socio-economic correlates.[59] The county suicide rates were positively associated with the overall death rate and the percentage of elderly in the counties and negatively associated with the population change, the birth rate and the percentage of the population under the age of 15.

Connolly and Lester then looked at these associations ten years later, for the period 1988-1994.[60] The county suicide rates in the two periods had only a modest correlation (0.31), indicating some instability. The socioeconomic correlates were also somewhat different 10 years later. The suicide rates for this later period were negatively correlated with the female/male population ratio, the percentage of the urban population and the population change and positively correlated with the overall death rate and the percentage of the elderly population

Predicting the Irish suicide rate

A number of studies have appeared in recent years examining social correlates of national suicide rates. It is of interest to inquire, therefore, whether the results of this research could be used to identify a set of social variables which can predict the Irish suicide rate. To do this, we must first briefly review theories of suicide in order to identify possible predictor variables.

Physiological theories

One possible explanation, of course, for differences in the suicide rates of nations could be that different nationalities differ in some relevant manner in their physiology. Perhaps, for example, there are differences in inherited psychiatric disorders, particularly affective disorders, or brain concentrations of serotonin, the neurotransmitter believed to be responsible for depression?

Lester studied the associations between the proportions of people in 17 industrialized nations with the different types of blood (O, A, B and AB) and the nations' suicide rates.[61] He found that, the lower the proportion of Type O people and the higher the proportion of Type AB people, the higher the suicide rate.

Mawson and Jacobs noted that the synthesis of the neurotransmitter serotonin (believed to contribute to people's level of depression) by the body requires the precursor amino acid L-tryptophan.[62] Corn has less L-tryptophan as compared to other cereals, and so nations with a higher corn consumption would get less L-tryptophan, and so might have lower levels of serotonin. Lester, however, in a study of 38 nations, found no association between per capita consumption of corn and suicide rates.[63] Kitahara estimated the levels of tryptophan in the blood relative to other amino acids (such as tyrosine) from dietary intake in residents of nations and found no association with the suicide rate in a large sample of nations (a result replicated by Lester).[64,65,66]

Psychological theories

The major psychological factors found to be associated with and predictive of suicidal behaviour are depression (in particular hopelessness) and psychological disturbance, labelled variously as neuroticism, anxiety, or emotional instability.[67] Psychiatric disorder of any kind appears to increase the risk of suicide, with affective disorders and substance abuse leading the list.

Alcohol abuse and drug abuse are strongly linked with suicidal behaviour. Not only are these behaviors seen as self-destructive in themselves (Menninger called them chronic suicide), but also both attempted and completed suicide occur at high rates in substance abusers.[68,69]

Composition theories

Moksony has noted that one simple explanation of differences in suicide rates between nations is that the national

https://doi.org/10.1017/S0790966700001531 Published online by Cambridge University Press

Table 4: Results of the multiple regression analysis and the prediction of the Irish suicide rate

	b coefficient	Irish raw score*	Contribution to Irish suicide rate
Birth rate	-1.245	218	-271.41
Divorce rate	0.190	000	0.00
Alcohol consumption	0.078	584	45.55
% elderly	0.035	107	3.74
Blood type	-0.840	559	-469.56
Constant	566.658		566.66

Multiple R: 0.71. Predicted Irish suicide rate: -125 per one million per year. Actual Irish suicide rate: 62 per one million per year
**Decimal points were omitted in the analysis*

populations differ in the proportion of those at risk for suicide.[70] For example, typically in developed nations, suicide rates are highest in the elderly. Therefore, nations with a higher proportion of the elderly will have a higher suicide rate.

Social theories

The most popular explanations of social suicide rates focus on social variables. These social variables may be viewed in two ways: (1) as direct causal agents of the suicidal behaviour, or (2) as indices of broader, more abstract, social characteristics which differ between nations.

The most important theory for choosing relevant variables is that of Durkheim.[53] Durkheim hypothesised that suicide rates were caused by the society's level of social integration (that is, the degree to which the people are bound together in social networks) and the level of social regulation (that is, the degree to which people's desires and emotions are regulated by societal norms and customs). Durkheim thought that this association was curvilinear, but later sociologists have suggested that the association is linear in modern societies, with suicide increasing as social integration and regulation decrease.[71] Studies of samples of nations have found that suicide rates are associated with such variables as the birth rate, female participation in the labor force, immigration, and the divorce rate.[72,73,74] Some investigators see these associations as suggesting a direct link between divorce or immigration and suicidal behaviour. For example, divorce may be associated with suicide at the aggregate level because divorced people have a higher suicide rate than those with other marital statuses. Other investigators see the associations as suggesting that divorce and immigration are measures of a broader and more basic social characteristic, perhaps social integration, which plays a causal role in suicide. In this latter case, nations with a higher rate of divorce may have a higher rate of suicide for those in all marital statuses.

In a study of 25 nations in 1970, Lester found that suicide rates were associated positively with the percentage of the elderly, the divorce rate and the gross domestic product, and negatively with the percentage of people under the age of 15, the unemployment rate and the birth rate.[75] The association of suicide with birth and divorce rates is consistent with predictions from Durkheim's theory, the association with the percentage of elderly and young is consistent with a composition explanation of the suicide rate, and the association with unemployment and gross domestic product is consistent with previous research findings.[76,74]

Predicting Ireland's suicide rate

This brief review of physiological, psychological, sociological and compositional theories of suicide rates has identified a number of variables which ought theoretically to be associated with suicide rates or which have been found empirically to correlate with suicide rates. As a test of the utility of these variables, a set of these variables was tested for their ability to predict the suicide rates of a sample of developed nations with available data. Then, the regression equation so identified was examined for its ability to predict the Irish suicide rate.

The variables chosen, together with their theoretical source, were: blood type (physiological), alcohol consumption (psychological), percentage of elderly (compositional), and divorce and birth rates (sociological). The sample used consisted of 18 industrialised nations first used by Lynn in a study of national character: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Ireland, Italy, Japan, the Netherlands, New Zealand, Norway, Sweden, the United Kingdom, the United States and West Germany.[77] Data on blood types were not available for Switzerland. Data on blood types were available for 17 of these, and the present analysis restricted the sample to these 17 nations. The multiplier linear regression equation was derived from these 16 nations (excluding Ireland) and then the Irish suicide rate predicted from this regression equation. The results of the multiple regression analysis are shown in Table 8, together with the predicted suicide rate for Ireland when the values for the Irish predictor variables are substituted into the regression equation. It can be seen that the Irish suicide rate was predicted quite inaccurately, 125 per million per year in 1980 as compared to the actual suicide rate of 62 per million per year. Therefore, it appears that the suicide rate in Ireland has different causal factors from the suicide rate in other industrialised nations.

Discussion

Recent epidemiological trends in the Irish suicide rate, such as increasing youth suicide rate, were seen to be consistent with trends in other nations of the world. An examination of the time-series Irish suicide rate indicated, however, that it was not consistent with Durkheim's classic theory of suicide which predicts associations between suicide rates and measures of social integration, such as marriage and birth rates.

Finally, a review of the major perspectives on and predictors of suicide, both at the individual level and at the societal level, identified several possible correlates of national suicide rates. The Irish suicide rate was found to be inaccurately predicted based on a multiple regression equation derived from data from 16 industrialised nations, suggesting that the Irish suicide rate has different determinants from those found for other nations.

https://doi.org/10.1017/S0790966700001531 Published online by Cambridge University Press

Declaration of interest: None.

References

1. Lester D, Yang B. Suicide and homicide in the 20th Century. Commack, NY: Nova Science 1998.
2. Walsh D. A century of suicide in Ireland. Journal of the Irish Medical Association 1976; 69: 144-151.
3. Walsh D. The recent increase in reported suicide in Ireland. Journal of the Irish Medical Association 1978; 71: 613-616.
4. Levi F, La Vecchia C, Lucchini F, Negri E, Saxema S, Maulik P K, Saraceno B. Trends in mortality from suicide, 1965-99. Acta Psychiatrica Scandinavica 2003; 108: 341-349.
5. Smyth C, MacLachlan M, Clare A. Cultivating suicide? Dublin, Ireland: Liffey Press. 2003.
6. Corcoran P, Burke U, Byrne S et al. Suicidal behaviour in Ireland. In A. Schmidtke, U. Bill-Brahe, D. DeLeo & A. Kerkhof (Eds.) Suicidal behaviour in Europe, pp.97-105. Cambridge, MA: Hogrefe & Huber. 2004.
7. Aoki K, Sun J, Kono A, Misumi J. Suicide and homicide effects of life expectancy and mortality in Ireland. Homeostasis 2005; 43: 128-135.
8. Farmer R, Rohde J. Effect of availability and acceptability of lethal instruments on suicide mortality. Acta Psychiatrica Scandinavica 1980; 62: 436-446.
9. Clarke-Finnegan M, Fahy T J. Suicide rates in Ireland. Psychological Medicine 1983; 13: 385-391.
10. McCarthy P D, Walsh D. Suicide in Dublin. British Journal of Psychiatry 1975;126: 301-308.
11. McCarthy P D, Walsh D. Suicide in Dublin. British Medical Journal 1966; i: 1393-1396.
12. Walsh B, Walsh D, Whelan B. Suicide in Dublin. British Journal of Psychiatry 1975; 126: 309-312.
13. Connolly J F, Cullen A. Under-reporting of suicide in an Irish county. Crisis 1995; 16: 34-38.
14. Connolly J F, Cullen A, Walsh D, McGauran S, Phelan D. A comparison of suicide in two Irish counties. Irish Journal of Psychological Medicine 1999; 16: 136-139.
15. Cullen A, Connolly J J. Aspects of suicide in rural Ireland 1978-1994. Archives of Suicide Research 1997; 3: 43-52.
16. Connolly J F, Cullen A, McTigue O. Single road traffic deaths. Crisis 1955; 16: 85-89.
17. Walsh D, Cullen A, Cullivan R, O'Donnell D. Do statistics lie? Psychological Medicine 1990; 20: 867-871.
18. Brugha T, Walsh D. Suicide past and present. British Journal of Psychiatry 1987; 132: 177-179.
19. Naughton M, Doyle A, Melia P, Barry D. Suicide in Kerry. Irish Journal of Psychological Medicine 1996; 13: 147-148.
20. Kelleher M J, Daly M. Changes in the Irish suicide rate. In S. D. Platt & N. Kreitman (Eds.) Current research on suicide and parasuicide 1989; pp.30-38. Edinburgh: Edinburgh University.
21. Corcoran P, Arensman E, O'Mahony D. Suicide and other external-cause mortality statistics in Ireland. Crisis 2006; 27: 130-134.
22. Cantor C H, Leenaars A A, Lester D, Slater P J, Wolanowski A M, O'Toole B. Suicide trends in eight predominantly English-speaking countries 1960-1989. Social Psychiatry & Psychiatric Epidemiology 1996; 31: 364-373.
23. Cantor C H, Leenaars, A A, Lester D. Under-reporting of suicide in Ireland 1960-1989. Archives of Suicide Research 1997; 3: 5-12.
24. Rockett I R H, McKinley T. Reliability and sensitivity of suicide certification in higher-income countries. Suicide & Life-Threatening Behaviour 1999; 29, 141-149.
25. Neeleman J, Wessely S. Changes in classification of suicide in England and Wales. Psychological Medicine 1997; 27: 467-472.
26. Sainsbury P, Barraclough B M. Differences between suicide rates. Nature 1968; 220: 1252.
27. Lester D. The validity of national suicide rates. British Journal of Psychiatry 1980; 136: 107-108.
28. Lester D. Suicide rates in immigrant groups and their countries of origin. Psychological Reports 1989; 65: 818.
29. Kliewer E V, Ward R H. Convergence of immigrant suicide rate to those in the destination country. American Journal of Epidemiology 1988; 127: 640-653.
30. Lester D. Suicide rates in immigrant groups as a function of their proportion in the country. Perceptual & Motor Skills 1994; 79: 994.
31. Lester D. Migration and suicide. Medical Journal of Australia 1972; 1: 941-942.
32. Sainsbury P. Suicide. Proceedings of the Royal Society of Medicine 1973; 66: 579-587.
33. Burvill P W, Woodings T, Stenhouse N, McCall M. Suicide during 1961-1970 in migrants in Australia. Psychological Medicine 1982; 12: 295-308.
34. Burvill, P M. Suicide in the multiethnic elderly population of Australia, 1979-1990. International Psychogeriatrics 1995; 7: 319-333.
35. Ferrada-Noli N. A cross-cultural breakdown of Swedish suicide. Acta Psychiatrica Scandinavica 1997; 96: 108-116.
36. Dublin L I. Suicide 1963. New York: Ronald.
37. Burvill P W, McCall T, Woodings T, Stenhouse N S. Comparison of suicide rates and methods in English, Scots and Irish migrants in Australia. Social Science & Medicine 1983; 17: 705-708.
38. Daly M, Kelleher M. The increase in the suicide rate in Ireland. Irish Medical Journal 1987; 80: 233-234.
39. Kelleher M J, Daly M, Kelleher M J A. The influence of antidepressants in overdose on the increased suicide rate in Ireland between 1971 and 1988. British Journal of Psychiatry 1992; 161: 625-629.
40. Kelleher, M J, Daly M. Suicide in Cork and Ireland. British Journal of Psychiatry 1990, 157: 533-538.
41. Kelleher M J, Chambers D. Cross-cultural variation in child and adolescent suicide. In R. A. King & A. Apter (Eds.) Suicide in children and adolescents 2003, pp.170-197. New York: Cambridge University Press.
42. Swanwick G, Clare A W. Suicide in Ireland 1945-1992. Irish Medical Journal 1997; 90: 106-108.
43. Kelleher M J, Chambers D, Corcoran P. Suicide and religion in Ireland. Archives of Suicide Research 1999; 5: 173-180.
44. Kelleher M J, Corcoran P, Keeley H S, Chambers D, Williamson E, McAuliffe C, Burke U, Byrne S. Differences in Irish urban and rural suicide rates, 1976-1994. Archives of Suicide Research 2002; 6: 83-91.
45. Lester D. Changes to suicide rates unique to Canada? Canadian Journal of Public Health 1990; 81: 240-241.
46. Lester D, Cantor C H, Leenaars A A. Suicide in the United Kingdom and Ireland. European Psychiatry 1997; 12: 300-304.
47. Lester D. Youth suicide. Adolescence 1988; 23: 955-958.
48. Madge N. Youth suicide in an international context. European Child & Adolescent Psychiatry 1999; 8: 283-291.
49. Rutz E M, Wasserman D. Trends in adolescent suicide mortality in the WHO European region. European Child & Adolescent Psychiatry 2004; 13: 321-331.
50. Lester D. Attempts to explain changing elderly suicide rates. International Journal of Geriatric Psychiatry 1993; 8: 435-437.
51. McKenna C, Kelleher M J, Corcoran P. Suicide, homicide and crime in Ireland. Archives of Suicide Research 1997; 3: 53-64.
52. Pritchard C. Is there a link between suicide in young men and unemployment? British Journal of Psychiatry 1992; 160: 750-756.
53. Durkheim E. Le suicide. 1897 Paris: Felix Alcan.
54. Lester D. Suicide in Ireland from 1950 to 1985. Irish Medical journal 1993; 86: 172, 210-211.
55. Lester D, Curran P S, Yang B. Time series regression results of suicide rates by social correlates for the USA and Northern Ireland. Irish Journal of Psychological Medicine 1991; 8: 26-28.
56. Lucy S, Corcoran P, Keeley H S, Brophy J, Arensman E, Perry IJ. Socioeconomic change and suicide. Crisis 2005; 26: 90-94
57. Snyder M L. Methods of suicide used by Irish and Japanese samples. Psychological Reports 1994; 74: 127-130.
58. Reid P, Smith H, Greene S. Seasonal variation in Irish suicidal deaths. Psychological Reports 1980; 46: 306.
59. Connolly J F, Lester D. Suicide rates in Irish counties. Irish Journal of Psychological Medicine 2000; 17: 59-61.
60. Connolly J F, Lester D. Suicide rates in Irish counties: 10 years later. Irish Journal of Psychological Medicine 2001; 18: 87-89.
61. Lester D. National distribution of blood groups, personal violence (suicide and homicide), and national character. Personality & Individual Differences 1987; 8: 575-576.
62. Mawson A, Jacobs K. Corn consumption, tryptophan and cross-national homicide rates. Journal of Orthomolecular Psychiatry 1978; 7: 227-230.
63. Lester D. Corn consumption, tryptophan and cross-national homicide and suicide rates. Journal of Orthomolecular Psychiatry 1985; 14: 178-179.
64. Kitahara M. Dietary tryptophan ratio and suicide. International Journal of Biosocial Research, 1986; 8(1): 53-60.
65. Kitahara M. Tryptophan uptake from diet and the incidence of suicide. Biology & Society 1986; 3(2): 74-79.
66. Lester D. Tryptophan uptake and national rates of suicide and homicide. Journal of Orthomolecular Medicine 1989; 4: 159-160.
67. Lester D. Why people kill themselves. Springfield, IL: Charles Thomas 1992.
68. Menninger K. Man against himself. New York: Harcourt, Brace & World. 1938.
69. Lester D. Alcoholism and drug abuse. In R.W. Maris, A. L. Berman, J. T. Maltsberger & R. I. Yufit (Eds.) Assessment and prediction of suicide 1992; pp. 321-336. New York: Guilford.
70. Moksony F. Ecological analysis of suicide. In D. Lester (Ed.) Current concepts of suicide 1990; pp. 121-138. Philadelphia: Charles Press.
71. Johnson BD. Durkheim's one cause of suicide. American Sociological Review 1965; 30: 875-886.
72. Stack S. Domestic integration and the rate of suicide. Journal of Comparative Family Studies 1980; 11: 249-260.
73. Stack S. The effect of immigration on suicide. Basic & Applied Social Psychology 1981; 2: 205-218.
74. Stack S. Suicide and religion. Sociological Focus 1981; 14: 207-220.
75. Lester D. Patterns of suicide and homicide around the world. Commack, NY: Nova Science. 1994.
76. Platt S. Unemployment and suicidal behaviour. Social Science & Medicine 1984; 19: 93-115.
77. Lynn R. National differences in anxiety and extraversion. Progress in Experimental Personality Research 1982; 11: 213-258.