Dying for Heroin: the Increasing Opioid-Related Mortality in The Republic of Ireland, 1980-1999.

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ABSTRACT

Background: Over the past 20 years there has been a steady rise in mortality associated with opioid misuse in several western countries. We aimed to examine trends in opioid-related mortality over a 20-year period in the Republic of Ireland.

Methods: Retrospective analysis of deaths attributed to ICD-9 codes 304.0 (morphine type dependence) and E850.0 (accidental poisoning by opiates and related narcotics) in the Republic of Ireland between 1980 and 1999.

Results: The Republic of Ireland has seen a rapid increase in the number of opioid related deaths over the 20 year period studied from 0.01% of total deaths in 1980 to 0.15% in 1999. This is most marked in the younger age groups where, for example, it rose to 23% of 15-19 year old male deaths for 1997. The opioid related mortality rate in the 15-44 range increased by nearly 14 times between 1980-1984 and 1995-1999. Over the whole period 87% of opioid-related deaths were amongst males. Outside Dublin there has been a considerable increase in opioid-related mortality, nearly doubling the percentage of the total from 6% in the 1980s to 11% in the 1990s.

Conclusions: Opioid-related mortality is an increasing problem- as in other western countries. Today young people have a very low mortality rate, and hence this rapid increase may need specific targeted interventions. The spread of opioid-related mortality outside Dublin to rural and other urban areas will have implications for service planning and provision.

Declaration of interest: None

Introduction:

In the past two decades there has been an inexorable increase in the rate of opioid-related deaths in many countries including Australia[1, 2], Spain[3], Italy[4] and the United Kingdom[2]. The main cause of these deaths continues to be accidental fatal opioid overdose[1]. The impact of these deaths is particularly notable among teenagers and young adults[5]. We report trends in opioid-related deaths from a 20 period between 1980 and 1999 for the Republic of Ireland.

Methods:

Data were obtained, with the permission of The Department of Health and Children, from the national register of deaths held at the Central Statistics Office (CSO). Information was coded according to the International Classification of Disease - Ninth Revision (ICD-9)[6]. Deaths attributed to either opioid dependence (ICD-9 code 304.0) or accidental opioid overdose (ICD-9 code E850.0) were identified. These are international codes used by the coroner to classify cause of death. The age of death, gender and whether the person was living outside or inside Dublin City and County (Dublin) was recorded. The numbers of men and women in each 5-year age group who were resident in Ireland between 1980 and 1999 were obtained, as were all causes of mortality by year of death, age, gender and residence inside or outside Dublin.

ICD-9 categories 304.0, and E850.0 were combined (ensuring each death was only counted once) and taken to represent the number of opioid-related

deaths in Ireland during this period. These two categories capture deaths in which opioids have played a contributory role. Age standardised mortality rates were calculated for men and women and the total population for each year between 1980 and 1999, standardised to the 1980 population. Mortality rates were also calculated for the following age groups: 15-24, 25-34, 35-44, 45-54, and 55-64 years.

Due to the small numbers of deaths in the 1980s,when comparing the mortality rates in different years we combined the data for several years. Linear regression analysis was used to investigate changes in the average age of death.

The 1996 population census in Ireland established that there was 1.611 million people aged 15-44 living in Ireland, of whom 31% (0.506 million) lived in Dublin. When calculating the mortality for living inside or outside Dublin, we have applied this figure of 31% to each year between 1980 and 1999.

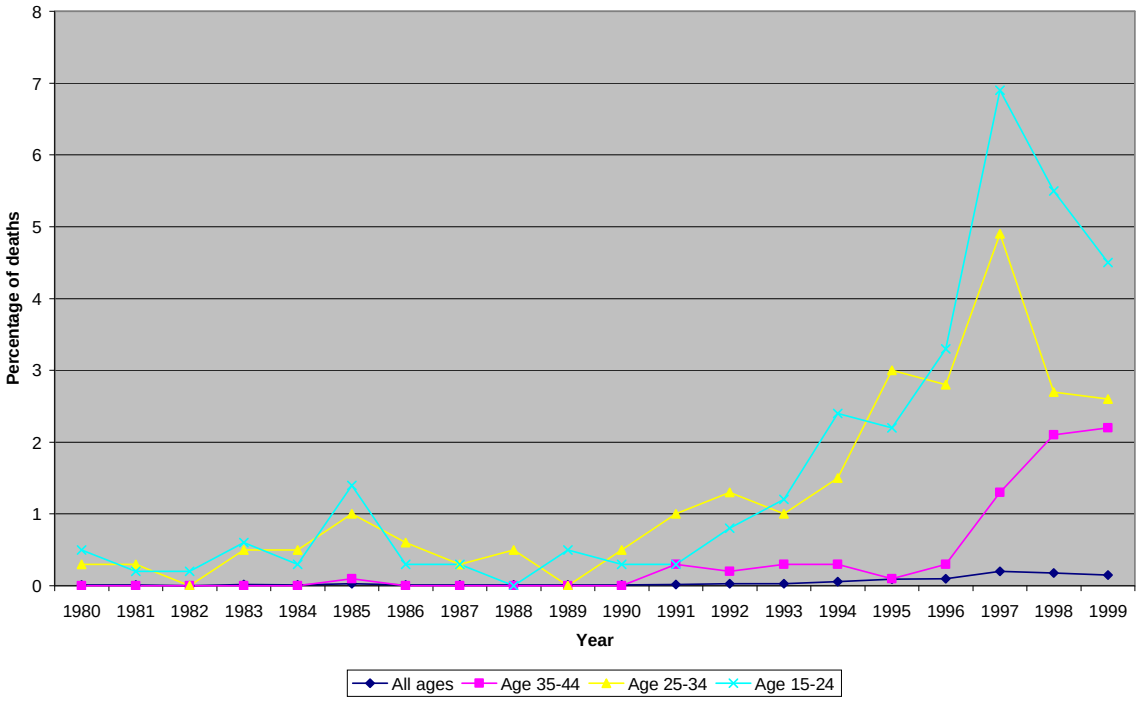
Results:

Between 1980 and 1999 there were 652,777 deaths in Ireland of which 307 (0.05%) were attributable to opioids. However, the rate was substantially higher amongst younger age groups: opioids accounted for 134 of 7,790 deaths amongst those aged 15 - 24 years (1.72%); 104 of 7,686 deaths amongst those aged 25 - 34 years (1.35%); and 56 of 12,717 deaths amongst those aged 35-44 years (0.44%).

The numbers of deaths in each category were; 304.0, N=98; E850.0, N=69; combined 304.0 & E850.0, N=140.

There was a marked increase in the number of opioid-related deaths during the mid and late 1990s – an increase in the percentage of all deaths from 0.01% in 1980 to 0.15% in 1999. Figure 1 shows the increase in the opioid deaths in the late 1990s and the concentration of these deaths amongst young adults. 1997 was the year with the most opioid related deaths, accounting for 0.2% of all deaths and nearly 7% of deaths in those age 15-24 years. Figure 1 also shows that the rise in the number of deaths amongst those aged 35 and over occurred after the rise amongst those aged 15-34.

Figure 1. Percentage of the total number of deaths that were attributable to opioids in Ireland



The majority of these 307 deaths were amongst men (male= 268, female=38, missing data 1).

Geographic location

The majority of opioid deaths (89%) occurred in Dublin. However the increase in opioid mortality was seen throughout Ireland, with the outside-Dublin proportion increasing over the study period. In the 1980s 6% of opioid deaths occurred outside Dublin, in the 1990s 11% of deaths occurred out side Dublin. See Table 1

Table 1

Time Period	Number of deaths outside Dublin (%)	Number of deaths inside Dublin (%)	Total number of deaths (%)
1980 -1984	1 (7%)	13 (93%)	14 (100%)
1985-1989	1 (5%)	18 (95%)	19 (100%)
1990-1994	3 (7%)	41 (93%)	44 (100%)
1995-1999	28 (12%)	201 (88%)	229 (100%)
1980-1999	33 (11%)	273 (89%)	306* (100%)

* Data missing on one death as to whether it was inside or outside Dublin

Age

The average age of these deaths was 28 years (Std.Dev 9.6, Range 15-64). The average age of death rose during this 20-year period from 24 years in 1980-1984, up to 29 years in 1995-1999. Linear regression reveals that there was an increase of 4.3 months each year. The percentage of deaths in each age group was: age 15-24, 44% of deaths; age 25-34, 34% of deaths; age 35-44, 18% of deaths; Age 45+, 4% of deaths.

Birth cohort and mortality

Birth cohort mortality analysis shows that 39% of deaths occurred amongst those who were born between 1970 and 1979, and 36% of deaths occurred amongst those who were born between 1960 and 1969. Those born between 1950 and 1959 accounted for 17% of the deaths and only 3% of the deaths occurred in those born before 1950. Deaths amongst those born since 1980 accounted for 4% of the total number.

Risk factors amongst the population aged 15-44 years of age

96% of opiate deaths occurred in 15-44 year olds. The opioid mortality rate in this age range increased by nearly 14 times between 1980-1984 and 1995-1999. Male gender was associated with eight fold greater odds of dying from opioids; living in Dublin was associated with twenty fold greater odds. See table 2.

Table 2.
Age-standardised mortality rate from opioids and odds ratios amongst population aged 15-44, between 1980 and 1999. (per 1,000,000 1980 population)

Factor		Age-standardised mortality rate	**Odds Ratio** (95% CI)
Time Period	1980-1984	1.9	**13.6** (7.9, 23.1)
	1995-1999	25.9	
Gender	Female	1.9	**8.4** **(**5.6, 12.6)
	Male	16.1	
Residence	Outside Dublin	1.3	**20.0** (13.6, 29.3)
	Inside Dublin	27.0	

Overall mortality in 1997

1997 was the year with the highest rate of mortality from opioids. Table 3 shows how the opiate deaths were distributed among all deaths in the Republic of Ireland that year for ages 15-44. It can be seen that opioid deaths had the biggest impact amongst men who were living in Dublin. This impact was even more marked amongst men aged 15-19: in 1997 there were 47 deaths in this group and 11 (23%) were due to opioids.

Table 3
Opioid deaths and deaths from all causes in Republic of Ireland during 1997. Age group 15-44 years of age. The effect of gender and residence inside or outside Dublin is shown.

Residence	Opioid deaths/ all deaths (%) amongst those aged 15-44 years		
	Male	Female	All
Inside Dublin	49/346 (14.2%)	5/168 (3.0%)	54/514 (10.5%)
Outside Dublin	7/743 (0.9%)	2/333 (0.6%)	9/1076 (0.8%)
All of Ireland	56/1089 (5.1%)	7/501 (1.4%)	63/1590 (4.0%)

Discussion

Mortality associated with opioids is an increasingly significant cause of death in the Republic of Ireland. By 1997, nearly a quarter of male deaths in the 15-19 year old age group were associated with opioids. In the population as a whole, there has been a dramatic increase in the number of deaths associated with opioids over the time period of this study. This change mirrors, but is much greater than, changes seen elsewhere in the western world. Hall and Darke reported a 6-fold increase over a similar time period in Australia[1, 2], and the United Kingdom[2]. The proportion of 0.05% of all mortality being attributable to opioids is almost identical to the proportion for the U.K. in

the same time period (0.053%), but considerably less that that of Australia (0.276%)[2]. These figures undoubtedly reflect growing opioid use in the Republic of Ireland[7] and the consequent risk of overdose, but it is important to be aware of other contributory factors such as high rates of HIV infection among opioid dependent individuals[8].

Living in Dublin is associated with 20 times greater odds of dying from an opioid overdose. However increasing numbers of fatal opioid overdoses occurred outside Dublin towards the end of the 1990s. This may reflect the trend in other countries such as the United States and United Kingdom for drug use to spread out over time from urban areas into smaller and rural communities[9].

The increasing age of mortality over the time period of this study, probably reflects risks associated with length of drug use[10]. An alternative explanation is that the cohort of young adults who initiated drug use in the late 1970s and 1980s, have now grown older but continue to use drugs. The highest mortality rates are in those born after 1960, who would not have initiated their use until the opioid epidemic of the late 1970s and early 1980s[11]. It is also notable that in the older age groups of drug users in treatment, there is a greater tendency to inject with all its associated risks[7].

Similarly to the international literature[12], males had greater odds of opioid-related mortality. It is though important to note that 72% of opioid dependent individuals in treatment in Dublin were males in 1996[7]. A study of coroners'

inquest files in 1999 revealed that nearly 93% of all opioid-related deaths in Dublin were amongst males[13].

Limitations

There are difficulties with certification and classification on death certificates that may lead to deaths associated with opioid dependence being missed[2 14]. There may be cultural reasons for this, relating to the stigma associated with drug dependence[15], this is recognised in the Irish context especially around suicide[16]. We did not include deaths by suicide attributed to opioids unless opioid dependence was recorded as a cause of death. It is also possible that some accidental opioid overdoses may have been suicide, without associated opioid dependence or misuse, and not recorded as such. We think, however, that overall these factors will lead to an underestimate of the total number of opioid-related deaths rather than an over estimate. Indeed when Ward and Barry examined all Coroners' inquest files for accidental deaths in Dublin for the year 1999, almost double the number of opioid-related deaths were identified[13] compared with those we identified by ICD-9 code.

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