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Abstract Background: In England and Wales in the 1960s there were marked declines in suicide rates. These reductions were partly attributable to the detoxification of the domestic gas supplies; however, their extent varied by age and gender, with the most striking effects seen in older men. The objective of this study was to investigate method-specific trends in suicide between 1950 and 1975 to elucidate possible explanations for the patterns seen in different demographic groups. Methods: An analysis of age-standardised method-specific suicide rates for England and Wales between 1950 and 1975 was carried out using routinely available mortality and population statistics. Results: As has previously been shown, there were marked reductions in suicides by gassing in men and women of all ages between 1960 and 1975. In women and younger men, the effects of these reductions on overall suicide rates were partially offset by rises in drug overdose deaths (method substitution), but there were no immediate increases in the use of other suicide methods. In contrast, in older men, reductions in suicide by gassing were accompanied by only a slight increase in overdose suicides as well as reductions in rates of suicide using all other methods. The modest rise in overdose fatalities in older men occurred despite the fact that they were more often prescribed barbiturates and tricyclic antidepressants than younger men. Conclusions: Accessibility to and the lethality of particular methods of suicide may have profound effects on overall suicide rates. Such effects appear to depend upon the popularity of the method and the extent to which alternative methods that are acceptable to the individual are available. Social and psychological interpretations of fluctuations in suicide rates should only be made after assessing the possible contribution to these of changes in method availability and lethality.

Introduction

Suicide rates in England and Wales have fluctuated markedly over the course of this century (Charlton et al. 1993). Similar variations are seen in many industrialised countries (see, for example Bille-Brahe and Jessen 1994; Morrell et al. 1993). Variations are thought to be largely due to changes in the socioeconomic environment (Gunnell et al. 1999a; Morrell et al. 1993), periods of war (Charlton et al. 1993; Morrell et al. 1993) and the availability of particular methods of suicide (Kreitman 1976; Morrell et al. 1993; Gunnell et al. 1999b; Bille-Brahe and Jessen 1994).

Kreitman, in an investigation into the reductions in suicide in the 1960s (see Fig. 1), demonstrated the particular influence on overall suicide rates of the detoxification of domestic gas supplies (Kreitman 1976). In the 1950s and early 1960s, domestic gas poisoning was the most frequently used method of suicide in men and women, accounting for around half of all suicides. In the 1950s, changes in domestic gas supply and manufacture resulted in a reduction in its carbon monoxide content and lethality. This resulted not only in a reduction in method-specific suicide rates but, because there was no immediate compensatory rise (substitution) in the use of other methods, overall suicides also declined. The extent to which overall suicide rates within particular age and sex groups were affected appeared to depend upon the extent to which other methods replaced gassing. The most marked decline occurring in older men.

To date, the exact nature of any ‘method substitution’ has not been investigated. Previous analyses of this issue have either failed to examine trends in method-specific suicide rates, grouping all non-gas suicides into an ‘other methods’ category (Kreitman 1976; Lester 1990) or have not assessed age- and gender-specific effects on method-specific suicide rates of
coal gas detoxification (Malson 1977). Any such specific effects, if present, may have important implications for suicide prevention, as one possible feature of preventive strategies involves restricting the availability of commonly used methods of suicide. To investigate this issue further we have analysed age-, sex- and method-specific suicide rates in England and Wales between 1950 and 1975.

**Subjects and methods**

Suicide data

Suicide rates are based on mortality and population data produced by the Office of National Statistics (ONS) 1950–1975 (Office for National Statistics 1997). Because of instability in rates due to small number variation, we smoothed the annual rates by calculating 3-year moving averages, centred on the last year of each 3-year period. As secular trends in suicide rates were similar in the 55–64, 65–74 and 75+ age groups (Fig. 1), we grouped these ages together and compared their trends with 15- to 34- and 35- to 54-year-olds. We calculated age-standardised suicide rates within each of these three age bands using the European standard population within 5-year age bands.

Table 1 outlines the classification of suicide methods used in our analyses. The figures simplify the methods of suicide included within each category – for example, the category ‘hanging’ includes suicides by strangulation and suffocation. After 1968, the International Classification of Diseases was modified to include a new category of deaths – deaths undetermined whether deliberate or accidental (coded E980–E989). As the availability of this new classification may have influenced the recording of suicides, we assessed the effect on our interpretations of including these deaths in our figures.

Prescribing data

To examine age- and sex-specific prescribing patterns in the period covered by this analysis, we obtained data from IMS Health, an organisation compiling international health data. Data for prescribing of tricyclic anti-depressants and barbiturates, two of the most commonly prescribed and toxic psychoactive drugs used in the 1960s and 1970s, were available from 1971. Data at this time were based on a quarterly survey of 250 panel doctors and 250 sample doctors, stratified by region and years since qualification, so as to be representative of the total general practitioner (GP) population. The GPs supplied details of their prescribing over a 7-day period. The age groups used to summarise the prescribing data do not allow categorisation into the same age bands used in our analysis of suicide rates. The prescribing data were therefore aggregated into the three age bands (12–39, 40–54 and 55+) that most closely matched those used in our suicide mortality analyses.

**Results**

Suicide rates

Age-standardised overall and method-specific suicide rates are presented for the 15–34, 35–54 and 55+ age groups in Figs. 2 and 3. Suicide rates by methods other than gassing and overdose were plotted separately, as rates were considerably lower than those using gassing and overdose, and so trends cannot be distinguished.

Figure 2 shows that, within each age group, trends in overall suicide closely parallel those for overdose and