

## The social patterning of deaths due to assault in Scotland, 1980-2005: population-based study

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The homicide rate in Scotland has been increasing since 1980. This increase has accompanied increasing mortality rates due to suicide (among men), chronic liver disease, and mental and behavioural disorders due to the use of drugs and alcohol. The changes in mortality from these causes have been most noticeable among younger adults, particularly young men, for whom the effect has been so strong that the all-cause mortality rates at these ages have begun to rise.

Previous work has shown that Scotland has a high death rate due to assault compared to other countries. Mortality from assault is known to be higher among more disadvantaged populations. The objectives of this paper were to explore the extent of the social gradient for deaths due to assault and its impact on overall inequalities in mortality. The study also investigated the contribution to mortality from assault using knives and other sharp weapons.

Death records covering three year periods around 1981, 1991, 2001 and 2004 and corresponding population estimates were used. Inequalities were assessed according to individual occupational socioeconomic status (NS-SEC) for the years 2000-02 (for men of working age) and by the deprivation of the area of residence using Carstairs scores (based on postcode sectors) and the Scottish Index of Multiple Deprivation (SIMD; based on data zones). Mortality rates were standardised to the European standard population. Inequalities were assessed using rate ratios and the slope index of inequality.

The all-age death rates from assault increased from 20 per 1,000,000 in 1981 to 35 per 1,000,000 in 2004. The mortality increase was most pronounced at ages 15-44; the standardised rate rose from 27 to 57 per 1,000,000 between 1981 and 2004. This increase for ages 15-44 was steeper still for assaults involving knives and other sharp weapons; the standardised rate rose from 16 to 40 per 1,000,000 over these years.

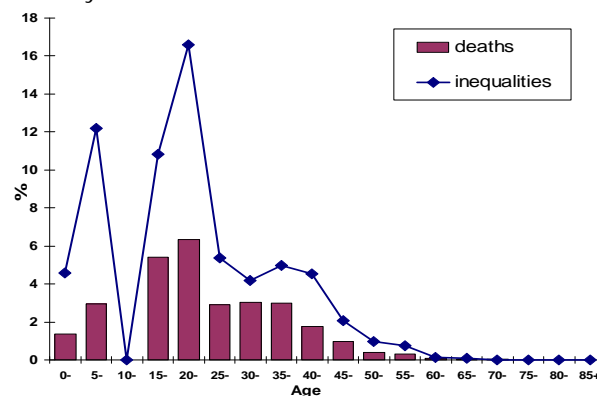
When using individual occupational status to assess inequalities, steep social gradients were evident, with the rate among those in routine occupations (127 per 1,000,000) being nearly 12 times that of those in higher managerial and professional occupations (11 per 1,000,000). The gradient was steeper for those aged 20-39 than at ages 40-59 and was also steeper for assaults involving sharp objects. It should be noted that men in routine occupations form a particularly vulnerable group, with rates being more than double those for those in semiroutine occupations (the next NS-SEC group).

Inequalities in deaths for men and women were also assessed using area-based deprivation. Rate ratios were used to compare the rates in both the most and least deprived quintiles with the rates in the middle three quintiles. Changes in the rate ratios for all assaults between 1981 and 2001, based on the Carstairs score, showed that the relative experience of those living in the most deprived quintile did not change with male rates typically 3-4 times those in the middle three quintiles and female rates 2-2.5 times. In contrast, the rate ratio for men of all ages in the least deprived quintile fell from 0.86 in 1980-1982 to 0.28 in 2001 ( $p=0.022$ ). Relative to the middle three quintiles, the rate ratio in the most deprived quintile for assaults involving sharp objects decreased over time ( $p=0.035$ ), although in 2000-2002, the rate ratio was still 3.38 (95% CI 2.27 to 5.03).

In 2001 men under 65 living in the most deprived quintile of areas had a mortality rate due to assault 31.9 times (95% C.I. 13.1-77.9) that of those

living in the least deprived quintile; for women this ratio was 35.0 (4.8-256.2). The equivalent rate ratios for all-cause mortality were 3.5 (3.3 to 3.6) for men and 2.6 (2.5 to 2.8) for women. Not only do these inequalities for assault exceed those for other causes of death in Scotland, they also exceed the ratio previously reported for homicide in Great Britain by some margin.

Figure 1 shows how deaths that are due to assault vary as a proportion of all deaths by age for men in 2001 (bars). Although representing just 0.3% of male deaths at all ages, assault accounts for 1.0% of deaths under the age of 65 and 3.2% between the ages 15 and 44. Also shown in figure 1 is the percentage of inequalities in mortality at each age that is due to assault (line). Assault accounts for 1.1% of inequalities in male mortality at all ages, rising to 2.4% under 65. The discrepancy between the proportion of total deaths (6%) and the proportion of inequalities (17%) is highest at ages 20-24. The fact that the contribution to inequalities is greater than the proportion of deaths at all ages reflects the steeper social gradient that is seen for deaths due to assault than for other causes. Despite comprising just 3.2% of all male deaths between 15-44 years, assault accounted for 6.4% of the inequalities in mortality.



The extent of the social inequalities in mortality due to assault in Scotland exceeds that seen in other countries and is greater than for other causes of death in Scotland. The scale of these inequalities means that the success of any attempt to reduce the mortality rate, particularly among young men, will depend on protecting those living in the greatest deprivation as well as targeting known contributors such as alcohol use, the carrying of knives and gang culture. These remarkable inequalities seen for assault in Scotland, coupled with high mortality rates for causes associated with alcohol and drug use and mental wellbeing among the most disadvantaged groups, emphasise the need to understand and address the multiplicity of problems associated with deprivation and poverty.

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