

## The role of individual and contextual effects in injury mortality: new evidence from small area analysis.

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\*\*\* Changes signalled in yellow (in 1 paragraph of the results section and 1 in the discussion)  
\*\*\* Also Figure 1 has to be changed (values of Y axis)

### Results

#### *Description of the population*

This study included 2,763 injury deaths in men and 1,630 in women (Table 1). In men, the majority of injury deaths involved young people (under 44 years), most often due to traffic injuries and to drug overdose. In women, the majority of deaths were among the elderly population ( $\geq 75$  years old), mostly due to falls. Male unemployment in the neighbourhoods ranged from 8% to 22.9% and the proportion of men in jail ranged from 24.9 to 1,679.9 per 100,000 men older than 21 years.

#### *Mortality rates*

As shown in Figure 1, death rates were higher in males at the extremes of the age distribution (under 44 and over 74 years), and for lower educational levels. For example, in males aged 25-34 death rates were 288.1 per 100,000 inhabitants in the population with no schooling, 143.4 in those with only primary education and 38.7 in the more educated group. For females, the corresponding rates were 69.4, 32.5, and 11.7, respectively. In both sexes, inequalities by educational level decreased in the intermediate age categories.

The distribution for the main causes of injury death in males and females shows an inverse relationship between educational level and injury mortality. This relationship seems to be more important in the younger ages than in the elderly. The distribution by age group changed by cause of death: traffic injuries were more important (under

35) and at older ages, while falls and other injuries increased importantly at older ages; drug overdose mortality was important mainly in the young population, while suicide mortality showed a less characteristic age profile. Men had higher rates of traffic injuries and drug overdose.

Neighbourhood injury mortality increases with increased male unemployment. This relation is maintained for mortality due to falls and drug overdose in both sexes and for suicide in men, although this is not the case for traffic crashes and suicide in women (figures not shown).

### *Multilevel models*

The results of the Poisson multilevel models are presented in table 2. Inequalities in injury mortality by educational level follow a gradient, with higher risks for the population with no schooling, after having adjusted for the contextual variables. In the following three paragraphs we present the results by age group, and for each age group for the different educational levels.

Inequalities were more important in the youngest age group (20-34 years), as shown by the RR of the population with no schooling of 5.41 (95%CI: 3.9 to 7.4) for all injury causes in males and 4.38 (95%CI: 2.3 to 8.4) in females. The highest RR were found for drug overdose (RR: 11.7, 95%CI: 7.2 to 19.0 in men and RR: 4.5, 95%CI: 1.3 to 15.4 in women). Traffic injuries, falls and suicides also had higher RR at lower educational levels. In this age group, the RR of the population with primary studies was 3.17 (95%CI: 2.7 to 3.7) in males and 2.48 (95%CI: 1.9 to 3.3) in females for all injuries. The highest RR was for drug overdose and falls in males and for drug overdose and traffic injuries in females.

The second age group was 35-74 (35-49 for drug overdose). For all causes of injury mortality, the RR of the population with no schooling was similar for both sexes. In this age group RR were statistically significant for drug overdose and suicide in males and for falls in females. The RR for the population with primary studies was only significant for drug overdose in males.

RR in the  $\geq 75$  age group were smaller, with the exception of suicide. It is noteworthy that RR in traffic injuries in women were in the opposite direction (RR: 0.47, 95%CI: 0.25 to 0.87 for the population with no schooling and RR: 0.37, 95%CI: 0.19 to 0.71 for the population with primary studies).

Even after controlling for individual educational level, the percentage of neighbourhood unemployment was statistically significant for falls and total injury deaths, and the proportion of men in jail was statistically significant for drug overdose, pointing to a contextual neighbourhood effect (the higher the deprivation, the higher the mortality) after having taken into account all variables included in the model. For example, the RR of unemployment in death for falls was 1.05 in males and 1.03 in females, implying that for each point of increase in the unemployment percentage, the death rate increases 5% in males and 3% in females. No such relationship was observed for traffic injuries or suicides.

## Discussion

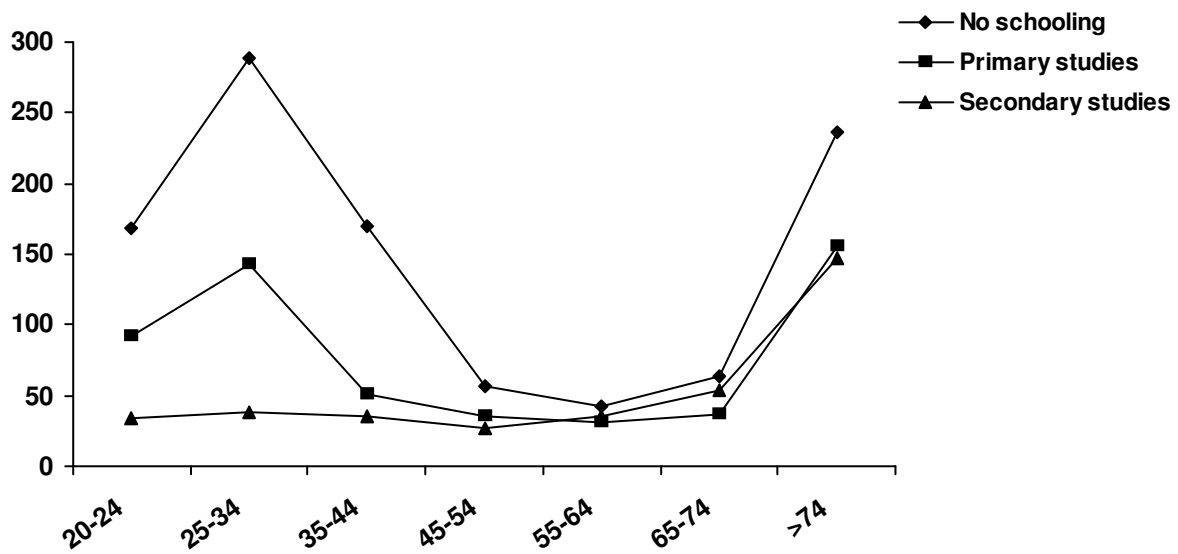
### *Main findings*

Inequalities in injury mortality by educational level follow a gradient, with highest risks for those with no schooling. Such inequalities were more important in the youngest age group and in men. Due to the higher rates in males, the rate difference (attributable risks) of educational level was much higher in men, although RR was similar in both sexes. For example, in the 25-34 age group it was 249.4 deaths per 100,000 inhabitants for the population with no schooling in men and 57.7 in women. The same pattern applied to other age groups. The higher rates in men may be due to differences in exposure to traffic and drug use.

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Figure 1. Age specific mortality rates due to injuries (per 100,000 inhabitants) by educational level. Males and females, Barcelona 1992-98.

Males



Females

