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Socioeconomic differences in Swedish children and adolescents injured in road traffic incidents: cross sectional study

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Traffic related injuries are among the most common causes of death in childhood and in youth.[1] Young people belonging to a low social class and living in deprived socioeconomic areas are consistently at greater risk than others.[2 3] The extent to which socioeconomic differences in risks from traffic injury vary during childhood and adolescence deserves consideration.[4 5] We examined socioeconomic patterning in Swedish children and adolescents injured in road traffic incidents, considering four categories of road users.

Methods and results

We created a dataset of about 2.2 million children and adolescents (aged 0-19 years) living in Sweden at some time during 1990-4 by linking records from 13 Swedish national registers. We established their sex and year of birth by linking the Swedish population register to the national censuses of 1985 or 1990 or to the medical register of births, according to the person's age.

Subjects were divided into four age groups and allocated to one of four household socioeconomic statuses (table) based on that of the parent with the highest status. The Swedish socioeconomic status is a measure of class, based on occupation and the average level of education required for any particular occupation. Status was attributed to the parents by Statistics Sweden in the Swedish population and housing census of 1990.

We linked the data on sex, year of birth, and socioeconomic status of the young people to five annual national hospital discharge registers (1990-4) and to the national causes of death register. The latter has about 4.5% of cases lacking information on either E-code (cause of injury) or personal identification number of the injured person. We considered fatal and non-fatal injuries, based on the assumption that the number of lethal injuries did not vary greatly between socioeconomic groups.[2] We avoided double counting by excluding from the outpatient register any person with the same diagnosis in both registers within two months.

Four diagnostic categories were considered according to ICD-9 (international classification of diseases, ninth revision): pedestrian injuries, bicycle related injuries, injuries as motor vehicle passenger, and injuries as motor vehicle driver (table) (13 772 road traffic injuries in total).

We performed a series of regressions by category of injury diagnosis for each age group to calculate the relative risk of injury according to socioeconomic status. Children of households classified as high or intermediate level salaried employees were used as the reference group. We tested for—but did not find—a possible modification effect of sex of child on socioeconomic patterning; therefore boys and girls were considered together. However, the model used for the later regressions did include the variable for sex of child to test whether boys were at a much greater risk than girls, regardless of socioeconomic status. All analyses were performed using SAS version 6.12.

The relative risks of being injured in a traffic related incident were generally—but not consistently—greater for boys than for girls (table). Socioeconomic differences are negligible in the early years of life (0-4 years) but for all other age groups the relative risks are appreciably higher for children of unskilled workers than for those of high or intermediate level salaried employees. Relative risks are particularly pronounced at 10-14 years of age for non-pedestrians, and at 15-19 years for drivers and riders of motorised vehicles.

Relative risks (95% confidence intervals) of being injured in a road traffic incident*

			Motor vehicle	
Variables	**Pedestrian**	**Bicyclist**	**Passenger**	**Driver†**
ICD-9 codes	E819H	E807, E819G, E826	E819B, E819D	E819A, E819C, E819J
Age 0-4 years				
Injuries per 100 000 person years	5.61	18.02	8.05	
Sex:				
Female	1.0	1.0	1.0	
Male	1.40 (1.03 to 1.90)	1.44 (1.21 to 1.72)	0.94 (0.74 to 1.20)	
Household socioeconomic status:				
Employees with high or intermediate salaries	1.0	1.0	1.0	
Employees with low salaries	0.83 (0.46 to 1.48)	1.06 (0.79 to 1.41)	0.88 (0.56 to 1.38)	
Skilled workers	1.12 (0.71 to 1.78)	1.10 (0.86 to 1.41)	0.95 (0.65 to 1.40)	
Unskilled workers	1.55 (1.01 to 2.39)	1.10 (0.85 to 1.42)	1.23 (0.85 to 1.77)	
Age 5-9 years				
Injuries per 100 000 person years	12.78	9.88	14.11	
Sex:				
Female	1.0	1.0	1.0	
Male	1.62 (1.30 to 2.02)	1.55 (1.43 to 1.68)	1.16 (0.94 to 1.42)	
Household socioeconomic status:				
Employees with high or intermediate salaries	1.0	1.0	1.0	
Employees with low salaries	1.11 (0.75 to 1.66)	1.27 (1.11 to 1.44)	1.18 (0.84 to 1.66)	
Skilled workers	1.38 (0.99 to 1.98)	1.47 (1.31 to 1.64)	1.17 (0.86 to 1.59)	
Unskilled workers	2.33 (1.74 to 3.12)	1.51 (1.35 to 1.75)	1.40 (1.04 to 1.88)	
Age 10-14 years				
Injuries per 100 000 person years	16.53	130.44	17.22	25.78
Sex:				
Female	1.0	1.0	1.0	1.0
Male	1.04 (0.86 to 1.27)	1.98 (1.83 to 2.13)	1.01 (0.85 to 1.22)	5.72 (4.62 to 7.08)
Household socioeconomic status:				
Employees with high or intermediate salaries	1.0	1.0	1.0	1.0
Employees with low salaries	1.21 (0.90 to 1.62)	1.14 (1.02 to 1.27)	1.37 (1.03 to 1.83)	1.76 (1.36 to 2.27)
Skilled workers	0.84 (0.61 to 1.16)	1.18 (1.07 to 1.32)	1.06 (0.78 to 1.44)	2.32 (1.85 to 2.90)
Unskilled workers	1.09 (0.81 to 1.46)	1.37 (1.24 to 1.51)	1.36 (1.03 to 1.80)	2.18 (1.73 to 2.74)
Age 15-19 years				
Injuries per 100 000 person years	17.34	69.96	58.41	169.13
Sex:				
Female	1.0	1.0	1.0	1.0
Male	1.06 (0.88 to 1.28)	1.38 (1.25 to 1.51)	0.99 (0.89 to 1.09)	5.38 (4.96 to 5.83)
Household socioeconomic status:				
Employees with high or intermediate salaries	1.0	1.0	1.0	1.0
Employees with low salaries	1.05 (0.78 to 1.41)	0.99 (0.85 to 1.14)	1.34 (1.14 to 1.58)	1.41 (1.29 to 1.55)
Skilled workers	0.97 (0.72 to 1.31)	1.06 (0.92 to 1.22)	1.64 (1.41 to 1.90)	1.74 (1.60 to 1.90)
Unskilled workers	1.55 (1.20 to 2.00)	1.22 (1.07 to 1.40)	1.96 (1.70 to 2.26)	1.70 (1.57 to 1.86)

*Diagnostic category is according to ICD-9 (international classification of diseases, ninth revision).
†For moped related injuries, both drivers and passengers fall into the category "driver" because the classification does not distinguish between those two groups.

Comment

The relative risks of being injured in a road traffic incident are higher for 5-19 year olds belonging to a low social class than for those belonging to other classes. Specifically, socioeconomic differences are small for 0-14 year olds who are injured while they are passengers of motor vehicles. The socioeconomic gradient in 5-19 year olds with bicycle related injuries and 15-19 year olds injured as motor vehicle passengers and drivers, however, deserve attention.

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Correction

Post-combat syndromes from the Boer war to the Gulf war: a cluster analysis of their nature and attribution

In this article in our "War 2002" theme issue (9 February, pp 321-4) the authors, Edgar Jones and colleagues, inadvertently used the word psychoneurosis instead of neuropsychiatric in their discussion. The second sentence of the section "Implications for Gulf war syndrome" should read "Although most cases fell into the neuropsychiatric cluster, Gulf war veterans are found in all three groups."