



## ER visits predict premature death among teenagers

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### ABSTRACT

**Background:** The purpose of this study was to investigate if teenagers visiting an emergency room because of injury have an increased risk of premature death ahead and, if so, identify possible risk factors and suggest preventive measures.

**Methods:** In January 2010, the personal identity numbers of 12,812 teenagers who had visited the emergency room at the University Hospital in Umeå, Sweden, during 1993 through 2006 because of injury were checked against the National Cause of Death Register in Sweden. Standardised mortality ratio and confidence intervals were calculated. For the unnatural deaths that took place in Sweden, the police report, autopsy protocol, and hospital records, if present, were studied.

**Results:** Thirty-eight fatalities were included giving a standardised mortality ratio of 1.44 (95% CI: 1.02–1.98). A majority of the decedents were males ( $n=32$ , 84%) and the median age at the time of death was 21 years. Twenty-three deaths were caused by unintentional injuries and ten by intentional injuries (all suicides), while five deaths were categorised as undetermined whether intentional or not. Seventy-four percent tested positive for either alcohol or drugs or a combination at the post mortem examination. Nine males and one female committed suicide, five tested positive for alcohol (one also for drugs), while four tested negative at the post mortem examination. One died abroad and in this case we lack information on alcohol and drugs.

**Conclusion:** Teenagers visiting an emergency room due to injury experience an increased risk of premature death by unnatural cause and those at risk are especially males. The use of alcohol and drugs often seems to contribute to their untimely deaths. Identifying those at risk when they visit the emergency room for an injury and to take preventive actions at this stage could be a way to reduce the number of fatalities.

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### 1. Background

More teenagers are killed by injury than disease in Sweden (Anon., 2009) and in other countries (Grossman, 2000a,b). Of those aged 15–24 years who die prematurely in the USA, 75% do so from unintentional injury, suicide or homicide and 25% die from disease, and among children 14 years and younger 50% die from injury (Grossman, 2000b). Much effort has been made to reduce the number of casualties among the young. The number of teenagers killed by injury decreased in northern Sweden over the past 20 years (Johansson et al., 2005) as well as in Sweden as a whole (Ekman et al., 2005) and in 13 out of 14 European countries (Morrison and Stone, 2000); however, more work is needed to further reduce these unnecessary deaths.

Alcohol and drugs contribute to both fatal and non-fatal injuries among the young and those under the influence also often sustain more severe injuries, require more hospital care, and have a worse outcome (Draus et al., 2008). A Finnish study on older teenagers reporting an injury found that the use of alcohol increased with age and almost 20% of the oldest teenagers were under the influence of alcohol when the injury occurred, with no sex difference in drinking-related injuries (Mattila et al., 2004). In a US study, almost 10% of the adolescents seeking medical attention due to blunt trauma tested positive for one or more drugs (Draus et al., 2008). Mattila et al. (2008) found in a study on adolescents that health compromising behaviour – such as recurring drunkenness and smoking – adopted at adolescence were strong risk factors for dying from an injury in adulthood, independent of socioeconomic background factors.

Furthermore, injury hospitalisation per se is a significant risk marker for subsequent injury hospitalisation. Individuals with a non-assaultive injury were more likely to be admitted for an assault than those with no previous injury admission. If the initial injury was a result of interpersonal violence, the risk of returning with an

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