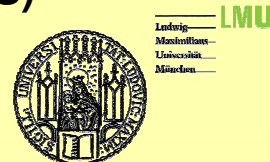


INJURY EPIDEMIOLOGY AT SCHOOLS IN GERMANY: School Injury Surveillance System (SISS)



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Introduction: Injuries at school are one of the most pressing public health problems during childhood and adolescents. Internationally, reports on the annual incidence of school injuries have ranged between 14 and 273 injuries per 1000 students. This results in significant health loss and medical spending. In addition to the medical consequences, concomitant educational failure results due to extended absence from school. It is evident that such high incidence rates call for preventive measures to reduce the numbers of accidents. In Germany, the national *School Injury Surveillance System (SISS)* was developed in the early 1970's to monitor the incidence and costs of injuries in order to guide the prevention efforts.

Objective:

- to describe the nationwide School Injury Surveillance System (SISS)
- to determine major trends and patterns of different school associated injury indicators

Population at risk: As part of comprehensive social insurance, the statutory pupils' accident insurance covers **all children and adolescents from nursery school through university** during their time at school and day-care, including their way to and from school. Presently this results in **17.5 million insured** young persons or 21.2% of the German population in general.

Case definition:

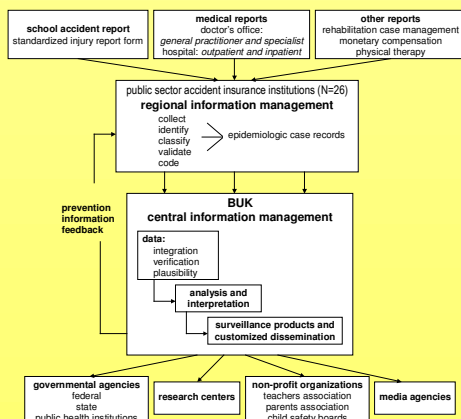
- acute external influence
- medical attendance
- damage to one's health
- case count per injured person

SISS data elements:

- demographics
- accident mechanism
- diagnosis
- type of school
- time and location
- school in session, vs. way to/from school

Methods

School Injury Surveillance System (SISS)

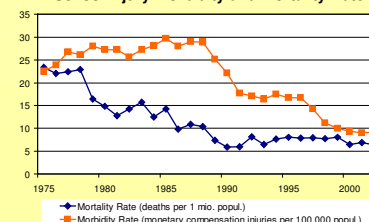


Results in 2002:

- nearly 1.6 million school related injuries received medical attendance
- incidence rate about 90 injuries per 1,000 person years
- approximately 40,000 injuries required hospitalization
- 1,601 cases of severe injury with monetary compensation due to disability from injuries at school, as well as, on their way to and from school
- 111 children and adolescents died in school-related accidents
- direct costs (medical care spending, non-medical rehabilitation costs and disability payments) of school related injuries were estimated to be approximately € 491 million

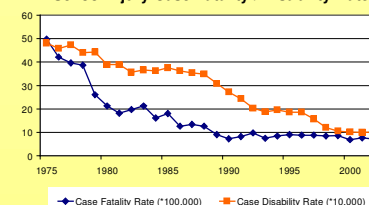
Trends 1975-2002:

School Injury Morbidity and Mortality Rate



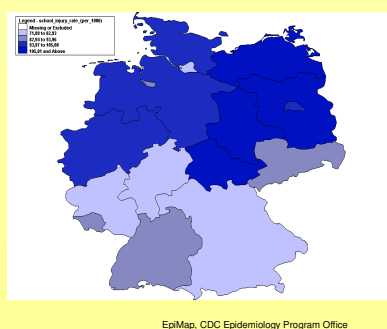
There is an unequivocal decline in the mortality and morbidity rates for serious school injuries. Between 1975 and 2002, the mortality rate declined from 23.4 to 6.4 per 1 million. This is a drop of 73% in about 30 years. At the same time, the morbidity rate for serious injuries (with monetary compensation) declined from 22.5 to 9.2 per 100,000, which is a drop of 59%. These declines in both rates are related to improvements in vehicle safety, infrastructure, rescue services, as well as medical care.

School Injury Case Fatality / Disability Rate



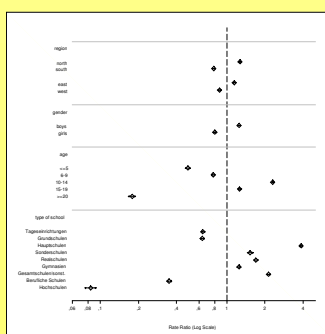
The case fatality rate (CFR) is the proportion of fatal injuries among all injuries and the case disability rate (CDR) is the proportion of monetarily compensated injuries among all injuries. There are differences between the time series of the C-Rates (CFR, CDR) and the M-Rates (mortality / morbidity rates) for the first decade. For fatal injuries, the CFR declines more than the mortality rate. The monetarily compensated injuries show opposite time trends. From 1975 until the early 1980's the CDR decreases but the morbidity rate increases.

School Injury Rate Map



The regional distribution of school injuries clearly shows a higher morbidity rate of school injuries with medical attendance in eastern and northern regions of the Federal Republic of Germany. The cartographical display shows considerably lower school injury rates in the south compared to the north.

Profile of School Injuries (IRR)¹



¹ Complementary set reference group approach

Relative risks are approximated by incidence rate ratios (IRR) of school injury determinant categories. They show a regional difference where as the northern and eastern parts of Germany have higher injury risks. The findings for gender and age are congruent with the literature. Boys are more at risk than girls and children aged 10-14 years are at higher risk compared with other age groups. In regard to type of school, *Hauptschulen* have the highest risk followed by *Gesamtschulen*. In addition, school injuries vary also according to activity, about 47% are related to sports, 31% to recess and 17% to class sessions. Among the different kinds of sports, ball games have the highest risk. Soccer has the greatest risk among ballgames.

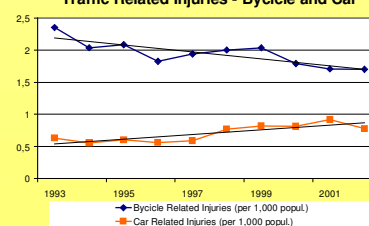
Limitations:

- information and measurement bias:
 - limited exposure data regarding school activity
 - accident mechanism
- limited information about costs for specific accidents
- administrative policy changes influence SISS

Strength of SISS:

- school as a fundamental and well defined setting
- long standing continuous inventory (30 years)
- well defined incident case definitions
- complete case recording for severe and fatal injuries
- reliable (birthday) sampling procedure for minor injuries
- integrated electronic data base with an independent two-site verification procedure

Traffic Related Injuries - Bicycle and Car



Over the last decade, bicycle related injuries declined by 28% (from 2.35 to 1.7 per 1,000 people). On the contrary, car related injuries increased by 22% (from 0.63 to 0.78 per 1,000 people). In part these changes are due to the fact that fewer students ride their bike. More parents take their children by car to school.

Conclusion:

- SISS measures the burden of school injuries in Germany
- Map:** distinct regional inequalities
 - Profile:** several demographic and school related disparities - high risk activities and groups:
 - sport
 - age 10-14
 - school type "*Hauptschule*" and "*Gesamtschule/Sonst.*" - north and east Germany
 - Trend:** lasting improvement has been made in reducing fatal and severe injuries during the last three decades

Future directions:

- expansion of data linkage: specific exposure data and school related contextual factors
- introducing evidence based prevention strategies by integrating surveillance results and epidemiologic methods

For more detailed results on specific aspects see www.unfallkassen.de -> Statistik und Epidemiologie