Urban

Records   Recall

40% 46% 14%

Rural

Records   Recall

22% 34% 44%

The distribution of information on fractures in responding urban and rural probands. Both sexes from each area are grouped together. The percentage of fractures from each source of information is given.

a forgotten fracture. This means that all studies on fracture prevalence must be based on some kind of fracture documentation rather than proband memory only.

1 Colditz GA, Martin P, Stampfer MJ, *et al.* Validation of questionnaire information on risk factors and disease outcomes in a prospective cohort study of women. *Am J Epidemiol* 1986;123:894–900.
2 Nevitt MC, Cummings SR, Browner WS, Seeley DG, Cauley JA, Vogt TM, Black DM. The accuracy of self-report of fractures in elderly women: evidence from a prospective study. *Am J Epidemiol* 1992;135:490–9.
3 Bush TL, Miller SR, Golden AL, Hale WE. Self-report and medical record report agreement of selected medical conditions in the elderly. *Am J Public Health* 1989;79:1554–6.
4 Jónsson B, Gärdsell P, Johnell O, Redlund-Johnell I, Sernbo I. Differences in fracture pattern between an urban and a rural population: a comparative population-based study in southern Sweden. *Osteoporos Int* 1992;2:269–73.
5 Åkesson K, Gärdsell P, Sernbo I, Johnell O, Obrant KJ. Earlier wrist fracture: a confounding factor in distal forearm bone screening. *Osteoporos Int* 1992;2:201–4.

School injuries in Athens: socioeconomic and family risk factors

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Injuries are the main cause of morbidity and mortality in childhood, and there is increasing interest in injuries at school.[1-3] There is a strong socioeconomic gradient for childhood injuries and deaths.[4] We have undertaken a case-control study in Athens, Greece, to examine the importance of family and social risk factors for injuries at school – that is, an environment not directly related to home conditions and immediate family supervision. By matching cases and controls on the school we have controlled for the contribution of factors associated with the general school situation.

Methods: Between September 1992 and June 1993 one of us was present for a total of 80 nonconsecutive days at the accident and emergency clinics of one of the two major University Children's Hospitals in Athens. During this period, a total of 101 school children aged 5–14

years, resident in the Athens area, were brought to the clinics for an injury that had taken place at school and was sufficiently serious to require hospital contact. These children's schools were identified and three controls, exactly matched for school, age (single year), and gender, were randomly selected for every injury case from the respective class rosters. A standardised interview form was completed for 404 children by their teachers in collaboration with the children's families, and the variables shown in the table were assessed by modelling through conditional logistic regression.[5]

Results: Of the 101 injuries, 49 took place in playground areas, 39 in classrooms and corridors (mostly during breaks), 10 during sporting activities, and three during transportation to or from schools. Among the injured children, three had predominantly cerebral concussion,

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Multiple logistic regression-derived odds ratio estimates (and 95% confidence intervals) for school injury, associated with a series of family and socioeconomic variables

Variable	Categories or ordinal units	Odds ratio	(95% CI) (two tailed)	p value
Age		Matched variable		
Gender		Matched variable		
Paternal schooling	3 years	0·66	(0·44, 0·99)	0·04
Family integrity	Both parents (87/292)*	Baseline		
	Single parent (14/11)	5·11	(1·90, 13·71)	0·001
Sibship size	One	1·09	(0·73, 1·56)	0·65
Birth order	One	0·88	(0·62, 1·25)	0·46
Height	One quartile	0·92	(0·76, 1·11)	0·36
Body mass index	5 kg/m²	1·00	(0·91, 1·10)	0·96
Corrective spectacles	No (83/237)	Baseline		
	Yes (18/66)	0·93	(0·49, 1·77)	0·83
School performance	One grade worse (in a 3 grade scale)	1·39	(0·96, 2·03)	0·08
Previous injury (hospital outpatient contact)	No (42/175)	Baseline		
	Yes (59/128)	1·97	(1·18, 3·30)	0·01

* Number of cases/controls.

40 a bone fracture, 14 joint dislocation, nine had open wounds, and 35 had other injuries. The 101 children included in the study attended 99 different schools.

The table presents mutually adjusted odds ratio estimates for school injuries. These results indicate that paternal schooling is a statistically significant risk factor for school injuries; that history of a previous injury requiring medical attention is also a significant risk factor for a subsequent injury; that family disruption (single parenthood) is an important correlate of school injuries; and that relatively poor performance of the child at school may be associated with increased risk for school injuries. No substantial, significant, or suggestive associations of school injuries were found with any of the other variables studied.

Discussion: This was a hospital based case-control study. In Athens, almost all accident and emergency health care for children is provided by the two University Children's Hospitals, which accept emergency cases on alternating days throughout the year. Therefore, during the period of case ascertainment there was school population coverage of incident cases of childhood injuries seeking emergency hospital care. Furthermore, random selection of matched controls from the respective school population eliminates geography as a selection factor. All case-control studies of new cases evaluate the ratio of incidence density, rather than of cumulative incidence of a particular event.[5] Therefore, in our study there was no need to exclude controls who may have had a school injury in the past, although there were very few such children among the controls.

Our results indicate that the socioeconomic status of the family, as reflected in paternal education, is an important risk factor for school injuries. The implication is that low socioeconomic status increases the risk of injuries, not only by creating adverse environmental conditions,[4] but also through mechanisms related to behaviour and education that can operate even in the controlled school environment. A potentially important finding, that needs to be replicated elswhere, is that children from single parent families are five times more likely than those from intact families to sustain a school injury. Furthermore, this study, as well as earlier ones, suggests that children with history of a previous injury are at increased risk for another injury. The overall conclusion of this study is that educational and behavioral correlates of low socioeconomic status and single parenthood are important risk factors for school injuries, at least in some societies.

1 Schelp L, Ekman R, Fahl I. School accidents during a three school-years period in a Swedish municipality. *Public Health* 1991;105:113–20.
2 Lenaway DD, Ambler AG, Beaudoin DE. The epidemiology of school-related injuries: new perspectives. *Am J Prev Med* 1992;8:193–8.
3 Gratz RR. School injuries: what we know, what we need. *J Pediatr Health Care* 1992;6:256–62.
4 Santer LJ, Stocking CB. Safety practices and living conditions of low-income urban families. *Pediatrics* 1991;88:1112–8.
5 Breslow NE, Day NE. *Statistical methods in cancer research. Vol I. The analysis of case control studies.* Lyon: IARC Scientific Publication 32, 1980.