ORIGINAL ARTICLE

Primary school accident reporting in one education authority

A H A Latif, W R Williams, J Sibert

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See end of article for
authors' affiliations

Correspondence to:
Dr W R Williams, School
of Care Sciences,
University of Glamorgan,
Pontypridd CF37 1DL, UK;
wrwillia@glam.ac.uk

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Background: Studies have shown a correlation between increased accident rates and levels of deprivation in the community. School accident reporting is one area where an association might be expected.

Aims: To investigate differences in primary school accident rates in deprived and more affluent wards, in an area managed by one education authority.

Methods: Statistical analysis of accident form returns for 100 primary schools in one education authority in Wales over a two year period, in conjunction with visits to over one third of school sites.

Results: Accident report rates from schools in deprived wards were three times higher than those from schools in more affluent wards. School visits showed that this discrepancy was attributable primarily to differences in reporting procedures. One third of schools did not report accidents and approximately half did not keep records of minor accidents.

Conclusions: The association between school accident report rates and deprivation in the community is complex. School accident data from local education authorities may be unreliable for most purposes of collection.

The Management of Health and Safety at Work Regulations 1992¹ brought schools into line with other places of work, in respect of health and safety issues in the UK. Schools now form one of the largest categories of work place. School accident rates are higher than those for a number of non-industrial sites, and may be responsible for an estimated 6 million lost school days per year.² Accurate statistics are not available, however, to support this claim.

In recent studies that have linked higher accident rates with deprivation, Reading and colleagues³ conducted a population based survey of attendance of preschool children in accident and emergency (A&E) departments, whereas Laing and Logan⁴ focused on data from babies and children up to 14 years of age. Death rates from all accidents in the latter age group have also shown a strong correlation with social deprivation.⁵ In contrast, a large study of 10 000 first time visits to A&E departments in South Wales, for the same age range, found no association with deprivation indices.⁶ There is a paucity of information on school accident rates in areas of different socioeconomic status.

Levels of deprivation in a locality, as indicated by government statistics, can be surprisingly variable, even within one education authority. As pupil catchment areas for primary schools are smaller than those for secondary schools, they may be a better reflection of the level of deprivation in their immediate surroundings. We undertook this study to investigate differences in accident reporting between primary schools in deprived and more affluent wards (local government electoral districts) within one local education authority (LEA) in Wales. We collected data for this study from accident form returns, and visited schools to monitor accident record keeping and reporting procedures.

MATERIALS AND METHODS

Accident reporting and analysis

Accident report returns ($n = 422$) for a two year period (April 1996–98) were collected from all 100 schools in one half of an area managed by one education authority. This area contains both deprived and relatively affluent wards. Wards in the 22

local authorities in Wales are given socioeconomic index scores, which make up the Welsh Office Index of Socio-Economic Conditions.⁷ This index is based upon the Jarman score, standardised mortality rates, and a housing condition index. Deprived wards have positive indices (an index of 0.0 is equivalent to a Wales rank of 404 out of 908). We classified schools as deprived or affluent, based on the status of the accommodating ward. The wards have an index range of 4.5 to 12.9 in the deprived group and -1.6 to -8.0 in the affluent group.

Schools are provided with information by the LEA to comply with statutory accident reporting requirements, as set out in RIDDOR (Reporting of Injuries, Diseases and Dangerous Occurrences Regulations).⁸ Head teachers are requested to report all accidents (on "accident at work forms") to the health and safety officer for the director of education. Pupil populations in the study groups for the two year period were 24 297 (75 schools in deprived wards) and 10 431 (25 schools in affluent wards). Data were entered into SPSS for analysis. Differences in accident report rates were tested for significance, using Student's independent t test. To compare report rates between schools with widely varying numbers of pupils (ranging from 25 to 436), we adjusted accident report numbers from each school for pupil number. Aggregated school report rates are expressed in terms of reports per 1000 pupils per year and individual school rates as reports per 100 pupils per year.

School selection

We selected schools for site visits in the 1999–2000 school year, after analysing the accident data. Selection was based on the different levels of reporting activity (high, low, and nil returns) and the three designations of school—infant (children aged 5–7), junior (children aged 7–11), and primary

Abbreviations: A&E, accident and emergency department; LEA, local education authority; RIDDOR, Reporting of Injuries, Diseases and Dangerous Occurrences Regulations

Table 1 Primary school accident rates (reports per 1000 pupils per year)

	Deprived wards	Affluent wards	Deprived/affluent
	Mean (SD)	Mean (SD)	Multiple
All schools (n=100)	17.6 (25.2)	5.3 (6.0)	3.3
All accident reporting schools (n=67)	21.7 (24.8)	7.4 (5.9)	2.9
Highest reporting primary schools (n=6)	58.2 (12.8)	17.4 (4.6)	3.3

(children aged 7–11). High and low reporters were selected from those schools with the highest and lowest rates of submitted reports in the designated categories, respectively. Non-reporting schools were selected from the 26 schools that had submitted no reports, by pairing schools in deprived and more affluent wards that had the least difference in school roll. We were able to visit up to 36 primary schools, so aimed to identify four schools in each of the nine categories, defined by school designation and reporting rate. There are few junior and infant schools in the affluent wards, however, so the main comparison is between primary schools in the deprived and affluent wards. We visited 18 primary, 10 infant, and eight junior schools, 21 of which were in deprived wards. The ages of these schools, from their commission dates, ranged from 2 to 132 years with mean (SD) values of 85 (39) and 65 (38) years for deprived and affluent wards, respectively. During the school visits, we asked head teachers about their criteria for reporting accidents, accident recording procedures, and the accident records kept on site.

RESULTS

Accident reporting

The distribution of accident reports among the 100 primary schools (fig 1) shows that the reporting profile of schools is quite different in deprived and affluent wards. Report numbers per school range downward from 26; one third of the schools made no reports. Of the 422 primary school accident reports, 88% are from those in deprived wards. The accident report rate from schools in deprived wards is several times higher than that from schools in affluent wards, when calculations are based on all schools, or accident reporting schools only (table 1). Differences in the mean accident rates of schools in the deprived and affluent wards are significant for all schools, accident reporting schools, and highest reporting schools ($p < 0.05$). However, there is a contradiction in the notion of high reporting by schools throughout the deprived wards. In deprived wards, there are no reports from schools containing 39% of that pupil population, compared to a figure of 26% in affluent wards.

Reporting activity

Figures 2 and 3 show the levels of accident recording and reporting in the 36 visited schools. There are few infant or junior schools in the more affluent areas and none that are

Figure 1 School accident reporting by deprivation category.

high reporting. The reporting patterns in infant and junior schools are very similar to those of the designated primary schools. Some high and low reporting schools have substantial records in their accident books. Forty five per cent of the non-reporting schools keep accident books which contain relatively few entries. Although the sample size is small, the high reporting schools tend to have fewer pupils. Mean attendance values for high and low reporting infant/junior schools are 99 and 175 respectively; respective primary school values are 176 and 284.

Accident recording and reporting procedures

Inspection of the school accident books showed that entries frequently duplicated the accident report forms, but varied widely in the quality of information they provided. Missing

Figure 2 Infant and junior school reports/entries per 100 pupils/year, for the 1996–98 period. Figures in parenthesis are average school rolls for the same period. D, deprived; A, affluent wards. D1–D7 and A1–A3 are infant schools; D8–D13, A4, and A5 are junior schools. D11, accident book data for one year. **Figure 3** Primary school reports/entries per 100 pupils/year, for the 1996–98 period. Figures in parenthesis are average school rolls for the same period. D, deprived; A, affluent wards. D17, D21, A10, accident book data for one year or less.

Table 2 Summary of school accident recording and reporting procedures

Type of accident record	n
No reports, no accident book at school	5
Accidents reported but no accident book kept	2
No reports, accident book kept	3
Accident reports duplicated as entries in accident book	8
All accidents entered into an accident/incident book; more serious accidents also reported on accident forms	8
Noteworthy accidents entered in accident book; other more serious accidents entered on accident forms only	8
Accident report forms not sent to LEA but kept at school as an accident file	2

ages sometimes made it difficult to establish the level of accident susceptibility of particular classes. Another problem was the deficiency in recording visits to hospital A&E departments, which made it difficult to assess the severity of injury and the treatment received.

In all school sectors, there are wide differences in the injury criteria used when completing accident report forms. Information supplied by the head teachers revealed that non-reporting schools tend to use accident report forms for serious injuries, such as fractures and wounds requiring suturing. Another qualification for non-reporting is the keeping of report forms on the school site, unless particular forms are requested by the LEA. Head teachers may also select the accident forms that they forward to the LEA. In contrast, high reporting schools tend to report minor accidents, which can include everything other than slight cuts and grazes. Table 2 summarises the procedures for recording and reporting accidents in the 36 schools.

DISCUSSION

Our study reveals a wide variation between schools in one LEA in the recording of accidents, and sometimes a complex philosophy behind the recording and reporting procedures. We find that it is only possible to comment on a school's accident record after inspecting all documentation, including accident/incident books and report forms kept on site. This information is not always available.

The inspected school sites varied extensively, in age, size, maintenance standard, and designation. Age of school site is a misleading variable, however, as some of the older schools had new extensions or buildings on site. Size is also a difficult variable to measure. Some older schools with few pupils occupied large sites, whereas others were confined and short of space, even for storage. The separate infant and junior school buildings constituting a primary school might be on the same site or on different sites. The oldest schools were not necessarily the worst maintained, but often had major defects such as steps and unstable perimeter walls.

In the primary school groups distinguished by socioeconomic factors, we identified a threefold increase in the number of school accident reports in the deprived wards. This difference is consistent among the school groups tested and could be attributable to different reporting procedures or to fewer serious accidents in low and non-reporting schools. There are also differences in school designation and size, which could contribute to this finding. Our site visits revealed that the differences in accident report numbers from schools in the deprived and more affluent areas are mainly attributable to methods of reporting. For example, the reporting criterion in one non-reporting infant school was a visit to A&E for sutures or a suspected fracture. In one non-reporting primary school, the given criteria included broken bones but not cuts requiring suturing. In another non-reporting primary school, six A&E visits were listed in the accident book but had not been reported. The reasons for the differences in reporting

procedures may include school size, a greater awareness of the threat of litigation, and different practices for recording data. Head teachers of smaller schools may be more aware of injuries, because they may provide first aid, fill in report forms, and undertake the duty of accident reporting. Staff in six schools (two infant, one junior, three primary) spontaneously mentioned concerns about possible litigation. These schools were both low and non-reporting schools in deprived and affluent wards.

The four highest reporting schools in deprived wards recorded minor accidents in their accident books. Three of these schools copied their accident book entries onto accident report forms, thereby generating a large number of reports. The other school had a policy of reporting all playground accidents, which ceased after the yard was resurfaced. Serious accidents in these four schools (those needing A&E attendance) number less than 10 per school over the two year survey period. This A&E attendance rate is not dissimilar to that of the highest reporting schools in the more affluent wards, which do not report minor accidents. After making this observation, we reapproached the head teachers of the four highest reporting infant or junior schools in the deprived wards, to investigate more fully the reasons behind their high reporting strategy. The head teachers from one infant and one junior school stated that full accident reporting was a requirement of the LEA. The other head teachers appeared to be influenced by worry over possible litigation.

The problems associated with the collection of reliable school accident data have been well documented. They include under reporting⁹ and the different injury criteria used for reporting and referral to A&E departments.¹⁰ Based on analysis and observation, we can state that the current mechanism of accident recording and reporting allows for over reporting by some schools and concealment by others. By using severe injury descriptors as the basis for filing report forms and not keeping accident books, non-reporting schools risk not knowing their accident statistics. Little more than half of our school sample kept records of minor injury. This compares unfavourably with a 1992 survey of primary head teachers in North Stafford, which found that almost all (99.6%) kept an accident log.¹⁰

LEAs require serious accident reporting as part of their RIDDOR arrangements. However, accidents in the RIDDOR category are uncommon; figures for the relevant LEA (for all schools, 1996–2000) show a range of 3–16 per year, 40 in total. All categories of accident in the local authority are entered on the same type of accident at work form. This type of report form is considered to be too complex for minor accidents and some schools are designing their own forms, thereby making data collection even more complex. In the absence of school access to a computer database held by the LEA, a more suitable form is needed for less serious injury, sickness, and first aid treatment, which could be based on the Department of Trade and Industry's LASS (Leisure Accident System)¹¹ categorisation of injury. LEAs that require accurate accident data for identifying trends, areas needing improvement, risk assessment, allocation of financial resources, or first aid provision

(for comparative, insurance, and investigative purposes), need to introduce firm control on recording and reporting procedures. Data collection is costly and there is little point in accumulating unreliable data or data not put to good use. The school accident data made available to us were unreliable for most of the above purposes.

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Authors' affiliations

A H A Latif, Royal Glamorgan Hospital, Ynysmaerdy, Llantrisant CF72 8XR, UK

W R Williams, School of Care Sciences, University of Glamorgan, Pontypridd CF37 1DL, UK

J Sibert, Llandough Hospital, Penlan Road, Penarth CF6 4XX, UK

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ARCHIVIST Subdural haemorrhage

Until quite recently studies have been reported which tend to play down the role of inflicted injury in subdural haemorrhage in young children. A study in Seattle (Kenneth W Feldman and colleagues. *Pediatrics* 2001;**108**:636–46) has confirmed the importance of child abuse.

The study included all children under the age of 3 years with subdural haemorrhage or effusion presenting to two centres in Seattle between March 1995 and December 1998 apart from those with a previously known bleeding disorder, previous neurosurgery, perinatal brain injury, meningitis, renal dialysis, or severe dehydration. Medical, radiological, ophthalmoscopic, and social work data were collected prospectively. Thirty-nine children (mean age 8.7 months) had a diagnosis of child abuse (18 definite, 17 highly likely, 4 likely) and 15 (mean age 19 months) of unintentional injury (6 definite, 7 highly likely, 2 likely). All of the 15 had suffered major trauma (road traffic accident (passenger) 6, road traffic accident (pedestrian) 3, fall from more than 10 feet 3, kicked by horse 1, furniture fell on child 1). For 33 of the 39 children with a diagnosis of abuse the presenting history was of either a minor fall or no explanation. Twelve children had injuries classed as indeterminate as regards the presence or absence of abuse. Chronic subdural haemorrhage was found in 17 children in the abused group and 8 in the indeterminate group but in none of the unintentional injury group, and long bone or rib fractures in 20, 1, and 1 in the three groups. Twenty-eight of the children with a diagnosis of abuse had retinal haemorrhages.

In this series 76% of children with subdural haemorrhage but without an obvious history of severe accidental injury were thought to have been abused. Younger age, chronic subdural haemorrhage, and associated long bone or rib fractures were features associated with a diagnosis of abuse.