

Report of a feasibility study of accident surveillance in general practice

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SUMMARY

Background: There is a nationally established mechanism for surveillance of accidents operating in a sample of accident and emergency (A&E) departments but no equivalent in primary care. Reduction of accidents presenting to hospitals or family doctors is a target set out in the Department of Health's *Our Healthier Nation* document.

Aims: To assess the merit and feasibility of collecting information on accidents in primary care, and documentation of the range and severity of accidents presenting.

Design of study: General practitioner (GP) reports following accidents to persons presenting to primary care.

Setting: GPs in six large practices in the Midlands (69 000 registered patients) completed questionnaires for 1233 persons sustaining accidents at home or during leisure activity during one year from September 1997.

Results: Main outcome measures were validation of results and description of the type of accidents presenting to primary care. Recruitment varied considerably between practices, but it was not possible for this to be validated, chiefly because of the limitations of morbidity coding systems. Overall, 18 per 1000 registered persons a year reported an accident initially to the GP, approximately one-sixth of the number presenting to A&E departments. Nine-tenths of the injuries reported were trivial or minor. There were similarities between GP and A&E patients concerning the mechanism or location of injury, but proportionately more elderly and females presented to primary care.

Conclusions: Surveillance of accidents in primary care is possible, but the discipline required for reliable data capture is considerable and hindered by limitations of morbidity coding systems regarding accidents. However, there are important differences in terms of the types of accidents and injuries seen and the age and sex of persons presenting in primary care and A&E departments.

Keywords: sentinel practices; accidents; surveillance.

Introduction

IN England and Wales, accidents are the most common cause of death in persons aged less than 35 years, and they account for 7% of National Health Service expenditure;¹ each year approximately one-fifth of the population receives medical treatment for accidents.² Since 1976, the Department of Trade and Industry (DTI) has collected information on home and leisure accidents presenting to 18 hospital accident and emergency (A&E) departments in the United Kingdom³ serving 5% of the population. The site and nature of injury is documented, but there is no assessment of severity; also, road traffic accidents (RTAs), works accidents, and assaults are not included. Data are published annually, with separate analyses referred to as the Home Accident Surveillance System (HASS) and the Leisure Accident Surveillance System (LASS). There is a paucity of information from primary care and studies have been limited by their small size, showing variation between general practitioners (GPs).⁴⁻⁶ Information based on patient recall of accidents is collected in the biennial Health Survey for England, but no distinction is made between hospital and primary care contacts. The World Health Organization included in its document, *Manifesto for safe communities*, a prevention strategy in which all local communities should have a mechanism to document the frequency and causes of accidents.⁷ In 1998 the new Labour government published a green paper, entitled *Our Healthier Nation*,⁸ with a target 'to reduce accidents involving a hospital visit or consultation with a family doctor by at least a fifth by the year 2010'.

The need for accident surveillance in primary care to supplement surveillance in A&E departments arises because:

- There may be demographic differences between the patients attending each setting — 'at risk' groups, such as the elderly and children, may be known to the primary healthcare team and interventions easier to provide. In the elderly, minor injuries, especially following falls, may be a precursor of major ones. Several studies have looked at interventions to minimise accidents in the elderly and some have shown benefit.⁹
- Patients attending general practice may be more co-operative in providing supplementary information because of their continuing relationship with the practice.
- Articles causing minor accidents are likely also to cause major accidents and these articles could be modified in the interests of safety. Concentration of enquiry into products which result in more serious injuries may lead to delay in identification of defective products.
- Good information on risk factors may be generated, particularly in the elderly and regarding the domestic environment.

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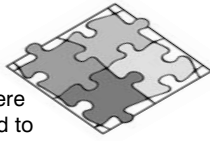
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HOW THIS FITS IN

What do we know?

Many accidents are preventable, and there is a need both to measure incidence and to achieve reductions.



What does this paper add?

Persons presenting to general practice as the first point of contact following accidents mostly have minor injuries and they are more likely to be female or elderly compared with those attending accident and emergency (A&E) departments. Rates of presentation were approximately one-sixth of those to A&E departments. The difficulties involved with accident surveillance in general practice are highlighted.

- The balance between primary and secondary care as to where accidents are treated may change;¹⁰⁻¹⁵ information from both sources is important.

The Public Health Information Strategy Implementation Project 19B, *Agreeing an accident information structure*,¹⁶ endorsed a Department of Health recommendation to set up a pilot scheme to explore the merit and feasibility of collecting community-based information on accidents, and to this end the DTI commissioned the current study.

Method

Accidents were defined by HASS/LASS criteria as any unintentional injury or suspected injury no matter how it was caused, except deliberately self-inflicted injuries and injuries resulting from physical attacks by other persons. Those involving brawls in children aged less than 10 years were included. Practices were given written guidance to include all registered patients attending the GP or practice nurse following accidents, excluding RTAs, accidents sustained in the course of paid employment, and accidents already treated in A&E departments. Those sustained at home (within the confines of the garden wall) were designated as *home accident* and those sustained elsewhere during leisure (as opposed to work-related activities) as *leisure accident*, ensuring comparability with HASS/LASS data.

Patients were included irrespective of subsequent referral to another agency or of injury severity. The study questionnaire was adapted from the standard HASS/LASS questionnaires with a five-point severity scale added — trivial (e.g. small bruise or graze), minor (e.g. small laceration requiring suturing/steristrips), moderate (e.g. possible fracture), serious (e.g. probable fracture, significant head injury), and major (e.g. life-threatening injury). At the time of consultation, practitioners recorded referrals to other agencies and the type of article involved, e.g. knife, surface, ball, etc.³ Data obtained were called GPHASS and GPLASS (Box 1).

The study was undertaken between September 1997 and August 1998 in six practices (four in Birmingham, one in Derby, and one in Peterborough). Halfway through the study, one Birmingham practice withdrew from the project because it had completed questionnaires on just 10 patients. The practice was replaced by another West

Midlands practice. All practices were included in the Weekly Returns Service (WRS) of the Royal College of General Practitioners¹⁷ and were familiar with the discipline of recording information from every contact on the practice computer. List sizes ranged from 8573 to 14 336, and the populations surveyed were 68 029 (first half-year), 69 381 (second half-year). The anonymised WRS morbidity database from each practice was examined in an attempt to validate recruitment levels. Over a one-month sampling period, rates of conditions recorded that were possibly the result of an accident were compared with the number of questionnaires returned by practices.

Results

In total there were 1668 injuries reported in 1233 patients. A total of 926 patients sustained one injured body part in their accident, 238 two parts, 41 three parts, and 8 four or more parts. Results presented relate to the number of persons rather than injuries; in the case of multiple injuries the most serious was listed. There was considerable variation in recruitment by practice: annual rates in the five practices included for the full year were 12, 14, 20, 27, and 30 per 1000 registered population. Pro rata, annual rates for the two practices in the study for six months were just 2/1000. Home accidents outnumbered leisure accidents (1.4 to 1) (Table 1). Females reported almost twice as many home accidents as males; however, for leisure accidents there was no sex difference. Overall, accidents were reported more commonly in females than males (1.4 to 1). Home accidents were more frequent than leisure accidents in all age groups except children aged 5 to 14 years, where the opposite was found (Table 2). Just 1% of patients saw other medical personnel prior to attending general practice.

Approximately 70% of accidents were reported as trivial, and less than 1% serious (Table 3). No patients consulted as a result of accidents with bonfires or fireworks. No further treatment was anticipated for 65% of accidents; 20% were referred to practice or community nurses for continuing care and 8% were referred to A&E. The majority of trivial and minor injuries were dealt with exclusively in primary care. Nevertheless, 40% of accidents referred to secondary care were minor, reflecting the need to exclude serious injury.

Several detailed tables in the HASS and LASS report format³ were created, one of which is illustrated in Table 4. In summary, compared with persons with accidents presenting to A&E, in general practice there were proportionately:

- fewer males (home 35.0% versus 48.3%; leisure 39.6% versus 61.5%);
- more aged over 65 years (home 33.6% versus 16.4%; leisure 21.8% versus 9.6%)
- fewer reporting bone injuries (home 4.2% versus 11.1%; leisure 6.3% versus 15%);
- fewer reporting head injuries (home 16.5% versus 27.2%; leisure 21.0% versus 23.3%);
- more reporting bites and stings (home 15.6% versus 2.8%; leisure 8.4% versus 2.5%);
- fewer uncoded articles (home 6.9% versus 17.4%; leisure 5.6% versus 15.5%);
- fewer unspecified activities (home 1.8% versus 7.7%);

Data collected in this study were in a comparable format to that of the A&E-based HASS and LASS systems; hence tables were presented in the style of the HASS/LASS Annual Report. Additional tables, derived specifically from this general practice-based study, are marked with an asterisk. Copies of these tables are available on request.

Table GPHASS 1:	Mechanism by age and sex
Table GPHASS 2:	Mechanism by location within the home
Table GPHASS 3:	Mechanism by activity of the patient at the time
Table GPHASS 4:	Location of accident within the home by age
Table GPHASS 5:	Type of injury by age
Table GPHASS 6:	Type of injury by part of body injured
Table GPHASS 7:	Outcome of initial visit to general practice by age
Supplementary Table GPHASS 7:	Outcome by age (%)*
Table GPHASS 8:	Difference between date of accident and date of attendance at practice by age*
Table GPHASS 8a:	Difference between date of accident and date of attendance at practice by GP*
Table GPHASS 8b:	Difference between date of accident and date of attendance at practice by injury severity*
Table GPHASS 8c:	Difference between date of accident and date of attendance at practice by age*
Table GPHASS 9:	General categories of products
Table GPLASS 1:	Mechanism by age and sex
Table GPLASS 2:	Location of accident by age
Table GPLASS 3:	Activity of the patient at the time of the accident by age
Table GPLASS 4:	Sporting activity by age and sex
Supplementary Table GPLASS:	Ball sport — no stick*
Table GPLASS 5:	Type of injury by sporting activity
Table GPLASS 6:	Type of injury by age
Table GPLASS 7:	Type of injury by part of body injured
Table GPLASS 8:	Outcome of initial visit to general practice by age
Supplementary Table GPLASS 8:	Outcome by age (%)*
Table GPLASS 9:	Difference between date of accident and attendance at practice by age*
Table GPLASS 9a:	Difference between date of accident and attendance at practice by GP*
Table GPLASS 9b:	Difference between date of accident and date of attendance at practice by injury severity*
Table GPLASS 9c:	Difference between date of accident and date of attendance at practice by age*

Box 1. GPHASS and GPLASS tables.

Table 1. Persons reported with home and leisure accidents.

	Home	Leisure	Combined
Female	462	263	725
Male	249	259	508
Total	711	522	1233

leisure 4.8% versus 13.3%);

- more home accidents than leisure accidents (ratio 1.4:1), whereas in A&E there were fewer home accidents than leisure accidents (ratio 1:1.2).

Examination of the WRS morbidity database of each practice revealed many conditions possibly related to an accident, but there was little correlation in each practice with the number of questionnaires completed; expressed as a percentage of all possible conditions recorded, the proportion of questionnaires was small (range = 2% to 71%; 23% overall).

Discussion

Summary of results

In the six practices combined, the rate of home and leisure accidents presenting to GPs was 17.9/1000, equating to a

Table 2. Age of persons reported with accidents (rate/1000 population).

Age (years)	Home	Leisure	Combined	Population
0-4	21.9	9.7	31.7	4422
5-14	7.4	15.5	22.9	9700
15-64	6.7	4.8	11.5	44889
65+	24.8	11.8	36.6	9643

Table 3. Distribution (%) of all accidents by age and severity.

Age (years)	Severity (%)					n
	Trivial	Minor	Moderate	Serious	Major	
0-4	73	16	9	2	0	135
5-14	73	17	9	1	0	218
15-64	67	22	11	0	0	506
65-74	72	19	7	1	1	151
75+	68	21	10	2	0	201
Overall	70	20	10	1	0	1233

Table 4. GPHASS: mechanism of accident by location within the home. GP data: falls are common in bedrooms, living/dining areas, and gardens. Not surprisingly, bites/stings chiefly occur outdoors and crushing/piercing injuries and burns most frequently occur in the kitchen. Comparison with A&E: the distribution of accidents by location is similar in both GP and A&E populations (allowing for differences in rates of unspecified accidents). A greater proportion of accidents presenting to GPs occur in gardens/grassed areas.

Mechanism	Location																											Row totals	GP% A&E%
	Kitchen/utility room	Bathroom/toilet	Living/dining area	Bedroom	Stairs inside	Hall/lobby	Landing	Cellar/basement	Storeroom/cupboard	Porch/threshold	Conservatory	Other indoors (home)	Unspecified home (in/outdoor)	Garden/grassed area	Yard/driveway/path	Patio	Stairs/steps — outdoor	Garage	Greenhouse	Shed, etc.	Other outdoors (home)	Kitchen (communal home)	Communal living area	Bedroom (communal home)					
Fall on same level	18	15	24	20	54	9	1	1	3	3	13	6	39	10	1	9									1	160	22.5	12.6	
Fall on/from stairs	1												4													75	10.5	9.8	
Fall on/from ladder			1		1						2	1	2													8	1.1	1	
Fall from building			1																							1	0.1	0.4	
Other fall	2		7	18	1						1	8	5	5	2											52	7.3	16.8	
Struck — moving objects	5	2	6	2	2	2					6	4	11		1			1				1				44	6.2	5.6	
Struck — static object	6	5	8	5	2	1	4				16	2	14	3				1	1			2	1			71	10.0	11.4	
Struck — other	1		8			1					7	3		1			1							1		23	3.2	3.9	
Crushing/piercing	21	5	9	7						3	10	10	16	3	1			1								89	12.5	15.9	
Bite/sting	1		8							1	10	18	67	1								1				111	15.6	2.8	
Foreign body ^a	1										3	2	3													9	1.3	4.7	
(Suspected) poisoning		1																								1	0.1	1.5	
Chemical effect	1																									1	0.1	0.2	
Thermal effect	18	1	8	2						1		6		3												40	5.6	3.6	
Electric/radiation											1															1	0.1	0.2	
Acute overexertion	1	1	2	1			1					4	1													12	1.7	1.8	
Other	2	1	1	1	1						1	1	5													13	1.8	7.7	
Column totals	78	31	83	60	62	16	5	2	1	11	1	83	56	170	20	4	10	3	2	2	5	1	2	3	711	100	100	100	
GP%	11.0	4.4	11.7	8.4	8.7	2.3	0.7	0.3	0.1	1.5	0.1	11.7	7.9	23.9	2.8	0.6	1.4	0.4	0.3	0.3	0.7	0.1	0.3	0.4	100				
A&E%	9.3	2.8	10.7	7	7.5	1.8	0.4	0	0	1.4	0.1	10.5	28	10.5	3.9	0.4	0.9	0.9	0	0.3	1.1	0	0.2	0.5	100				

^aPinch/crush, cut/tear, and puncture are amalgamated.

UK rate of approximately 1 million episodes per year with a comparable A&E figure of six million.³ The practice populations were representative nationally in terms of age and sex. Less than one-tenth of all accidents presenting in primary care were referred to secondary care at the initial presentation, suggesting that the A&E HASS/LASS system misses relatively few serious injuries.

Feasibility of routine accident surveillance in primary care

Questionnaires from a large number of accidents were obtained and the quality of completion was good; the proportion of missing data was less than in other work.^{3,4} Eborall¹⁸ was critical of data derived from A&E departments because of the volume of uncoded data. This study was conducted in a small number of large practices; however, the relatively large variation in practice recruitment rates, and the very low rates in the practice that withdrew and its replacement, suggests that recording opportunities were likely to have been missed. Possibly doctors did not see the point of accident surveillance or the logistics of the study were perceived as being too difficult. On occasions doctors may have forgotten about the study because of the infrequent presentation of eligible accidents to an individual practitioner (one case a fortnight on average); this may be particularly important where injuries are minor and the need for detailed enquiry not routine. However, restriction of surveillance to patients presenting with injuries of moderate severity or worse would mean an individual practitioner seeing such a patient once every three months, a factor mitigating even further against high quality recording. One of the practices involved for six months felt that the presence of a minor injuries unit nearby accounted for low recruitment rates. Other factors, such as practice accessibility, may be important, and patients living near to an A&E department have been shown to be more likely to use it than those living further away.⁵

Validation of recruitment using the WRS database was unsuccessful. However, the large discrepancy between the database and number of questionnaires reported by practices may lie in the imprecision of the word 'accident'. The limitations of Read codes used to summarise diagnoses also contributes to the discrepancy; some injuries, e.g. sprains/strains, superficial injuries or contusions are often not the result of an identifiable accident. Often, these terms are used to reassure patients suggesting simple explanations for symptoms even though there may be little evidence of injury (for example, knee, back, or chest wall sprains). Furthermore, injuries owing to work, injuries initially treated elsewhere and RTAs were excluded from the study, but these would be identified in the search of the WRS database.

A good surveillance system must provide information on all dimensions of accidents. When considering events causing injury there are four dimensions of interest: the event itself, the offending article, the nature of the injury/injuries sustained, and the management of the condition. Prevention is concerned chiefly with the first two dimensions and health care with the latter two. However, health care providers do not normally interrogate patients in a structured way for the

preventive aspects. Detailed surveillance as described in this paper encompassing all of these dimensions would be limited to an appropriately sampled network of practices. Validation of patient-specific data is difficult and there would be further costs involved in this process. The preponderance of minor injuries, the logistical difficulties encountered in this project, and problems inherent in Read codes as descriptors of accidents, suggests there is little point in all GPs routinely collecting information on accidents presenting to primary care. A nationally representative surveillance network could help inform targets in the *Our Healthier Nation* document, but considerable resources would be required. A routine monitoring programme of accident surveillance in general practice would require participation of more practices than in this study. A population of 150 000 (20 practices) is probably a minimum requirement for a national programme and substantially more if regional data are considered desirable.

Surveillance is not a 'no cost' option and the costs of enhanced surveillance need to be justified — £9 per questionnaire completed in this study. There has been an increase in the utilisation of computers in primary care since initiating this study; costs may decrease if the process of data collection is fully automated and computer prompts might increase completeness of data capture. However, appropriate software would be required and there are a number of primary care computer suppliers. Whatever the means of data capture, medical staffing resources are finite and not all practitioners are interested in accident surveillance. This study helps inform whether the likely effort involved is worthwhile.

Conclusions

- Approximately nine-tenths of injuries presenting to primary care were trivial or minor, many patients with more serious injuries were referred on to A&E departments.
- There are similarities between general practice and A&E patients concerning the mechanism or location of injury, but GPs see proportionately more elderly patients and more females.
- Approximately six times as many persons with home or leisure accident episodes present to A&E compared with general practice.
- The collection of information on accidents presenting to primary care is feasible, but considerable effort is required to ensure high quality recording.

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