

## ORIGINAL ARTICLE

## Development, utilisation, and importance of accident and emergency department derived assault data in violence management

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*Emerg Med J* 2004;21:473–477. doi: 10.1136/emj.2003.004978

**Objectives:** To develop formal processes for the collection, disclosure, and effective use of accident and emergency (A&E) department derived assault injury data for city violence reduction.

**Methods:** Over a four year period, managed by a multi-agency steering group, A&E data collection, collation, and disclosure processes were developed, instituted, and refined. Consultations and negotiations between agencies identified the most effective and ethical methods, appropriate recipients, and the nature of the information of most use.

**Results:** Disclosure of A&E data to city authorities, the police, and local media drew substantial attention and crime prevention resources to the locations of violence. As a result, a police task force responsible for targeting city street crime was funded, which analysed both A&E and police information. Monthly, electronic transfer of raw, anonymous data to the task force crime analyst informed and prompted violence prevention initiatives by several agencies. Police mounted overt and covert interventions targeted at violence hotspot licensed premises and used the data to oppose, on injury grounds, drinks/entertainment licence applications. Transport authorities established new half hourly night time city centre bus services. The local authority mounted an assault awareness campaign in schools and public libraries, and licensing magistrates used the data to measure, for example, the impact of continuous 36 hour drinks licensing on public safety.

**Conclusions:** The principal finding of this evaluation was that judicious sharing of unique information about locations and times of violence derived from A&E patients was a powerful and effective means of targeting police and other local resource to bring about violence reduction.

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The 1998 Crime and Disorder Act requires that the NHS collaborates with the police and local authorities to perform local crime audits and to develop crime reduction strategies and practice. The principal reason for this is the substantial extent to which assaults that lead to treatment are not reported to/recorded by the police,<sup>1,2</sup> which means that the NHS can contribute to violence reduction by collecting information about the circumstances, particularly locations and times of violence, from assault patients attending accident and emergency (A&E) departments. Such information can be obtained by means of an assault patient questionnaire, as developed by Goodwin and Shepherd<sup>3</sup> with the Home Office, and completed by receptionists for all patients reporting injuries sustained in assaults.

In 1996, predating the 1998 Act, a pioneering, NHS led, multi-agency group, the Cardiff Violence Prevention Group, was brought together in Cardiff, which included A&E, maxillofacial, liaison psychiatry, local authority, police, licensing magistrate, and victim support members. Its aims were to reduce violence by increasing—by all ethical means—the chances of violent offenders being brought to justice, by sharing A&E patient derived information about the circumstances of violence with the police, and developing integrated NHS and social services for victims.<sup>4</sup> Through the Cardiff Violence Prevention Group (CVPG) the collection of assault injury data from the A&E department in Cardiff was started and a dataset established. The specific aim of the project reported here was to develop formal processes for the collection, disclosure, and effective use of A&E derived assault injury data for city violence reduction.

## METHODS

Compilation of the A&E assault injury dataset began in 1996. Initially, the information was hand recorded by doctors, but gradually data entry became a routine part of the patient admission procedure, and was incorporated into the receptionists' role—identified as being the most effective means of collecting reliable data by Goodwin and Shepherd.<sup>3</sup> Standard sets of questions were asked of assault patients including the location of the assault according to the following categories: bar/pub, club, street, your home, someone else's home, workplace, or other. In addition, if the assault had occurred inside either a bar/pub or club, or on the street patients were asked to name the bar or club, or the street. Assault patients were also asked how many attackers there had been and to identify the assault weapon (body part, blunt object, sharp object, or unknown). Assault data, with all patient identifiers removed, were disclosed to the CVPG for discussion and action.

Relocation of the A&E department in 1999 to a new, fully computerised facility enabled the assault patient questionnaire to be incorporated into the patient admission software program. There were initial technical problems with the software for the new form, because some of the fields (questions) had to be completed before the next would appear—this caused problems for reception staff because, reportedly, assault patients were not always willing to provide answers to all questions.\* The problem was resolved and the new form went live, after receptionists were familiarised and trained in the utilisation of the assault

\*Note that while problems with the new software program were being resolved assault data were still being collected, but using the old system.

form. Consultations and negotiations between partner agencies were then carried out to address issues relating to the most appropriate methods of disclosing assault data to partner agencies, the recipients of the data, the type of assault information required, and patient confidentiality. Discussions took place in the context that GMC guidance, and human rights and data protection legislation, take account of the need for data sharing to detect and prevent violent crime. For responsive action by the police, data disclosure had to be on a regular, frequent basis. However, data obtained over months and years were also essential for measuring trends and violence prevention effectiveness, for example in relation to assaults in particular licensed premises.<sup>5</sup>

### Data analysis

Reception staff routinely asked all assault patients who attended the A&E department where the assault had occurred and recorded the response verbatim together with the name of the premises, school, or street where appropriate. Assault was as defined by the patient and not by either Home Office classifications or other hospital definition. It was recognised that this method may have limitations, but nevertheless provided valuable information, not available elsewhere. It was recognised, for example, that A&E data would include details only of assaults which resulted in treatment (95% of those who seek NHS treatment after assaults do so in A&E departments<sup>6</sup>), and that attendance might be influenced by A&E accessibility. Previous work<sup>7</sup> has established high specificity and sensitivity in terms of the validity of reports to A&E clerical staff by trauma patients of injury sustained in assaults and accidents.

### Analysis of trends

Aggregate assault data from April 1999—when the relocated A&E department was opened—to December 2001 inclusive were analysed by month, day, and location to determine proportion and percentage change. Age/sex trends in assault between April 1999 and March 2002 were analysed and linear regression analysis applied to determine significance.

## RESULTS

Between 1 April 1995 (when data collection began) and 31 March 2000 the number of assault patients recorded by reception staff at Cardiff A&E department increased by 6% per annum (fig 1). During the year 1 April 2000 to 31 March 2001 there was a 4% decrease in the overall number of assault attendances at the A&E department and an average of 363 assaults per month. In the following year (1 April 2001 to 31 March 2002) the number of assault attendances did not change. Overall, most (41%–48%) assaults occurred in the street and were most frequent at the weekend.

### Trends

Over the three year period 1 April 1999 to 31 March 2002 there was no significant change in the total number of assaults per month over time in Cardiff ( $y = -0.3x + 694$ ,  $r^2 = 0.009$ ,  $p > 0.05$ ) (fig 2). Statistical analysis of sex trends of assault patients attending the Cardiff A&E department (April 1999 to March 2002) did not show any significant trend in relation to men, but did show a significant decrease in the number of women ( $y = -0.4x + 629$ ,  $r^2 = 0.1$ ,  $p < 0.05$ ) (fig 2). Further analysis showed this decrease to be in injured women aged over 30 years ( $y = -0.2x + 324$ ,  $r^2 = 0.1$ ,  $p < 0.05$ ), and that the percentage change was significantly different for men compared with women ( $p < 0.01$ ).

### Data disclosure: police response

Police responses to receipt of A&E derived data were threefold, and progressively more interventionist. Firstly, an informal data matching exercise was undertaken in 1996/7, which established that police recorded only about 50% of assaults recorded in the A&E department. The second response, in 1997/8, was the establishment of a three officer task force that was responsible for coordinating and managing a fixed term, nine month initiative in which licensed premises identified as hotspots of violence were targeted, both overtly and covertly. The third response was a formal successful bid for Home Office targeted policing funding (£499 000), which was drafted by local authority (Cardiff County Council), CVPG, and police representatives working in partnership to support a large scale project designed to target alcohol related street crime (TASC) in Cardiff city centre and Cardiff Bay.

The South Wales Police TASC project team became the police recipients of A&E data and electronic transfer of raw, anonymous data in spreadsheet format on a monthly basis was identified as the most appropriate disclosure method. First formal transfer of data occurred at the beginning of February 2000. It was agreed that subsequent data would be disclosed, in arrears, within the first seven working days of a new calendar month. The dataset included all records of assaults from the patient registration records, together with incidents only recorded by doctors, and therefore not detailed by receptionists during the registration process, and was compiled by the assistant directorate manager of the A&E department—also responsible for deleting confidential information. Ambulance registrations that accounted for 31%–33% of total assault patient registrations were also recorded, usually by reception staff, but sometimes (14%–18% of these assaults) lacked details on the precise location of assault, weapon used, and number of assailants. As a result of this data transfer, and combination with police data, the TASC project team developed and implemented a series of violence reduction interventions.<sup>8</sup>

Between July and October 2000 the TASC group identified 222 assaults from the hospital data that were not identified in any of the police records. In the newly developed TASC database in which information from four police sources (incident records, custody handling records, crime records, and CCTV records) and hospital data were combined, these 222 new incidents increased the total of known alcohol related assaults by 18%. It should be noted however that this collation of police data relating only to city centre violence required substantial Home Office time limited funding. However, A&E data were available without extra resource and continue to provide the only systematic source of information about the impact of violence in the whole city.

### Crown court appeal

A specific use of the dataset was to provide evidence at a magistrates' court hearing and at a crown court appeal, by the South Wales Police against the granting of an alcohol licence to a new nightclub, on the grounds of high numbers of assault injuries in and around licensed premises on a particular street in the city centre. This particular street had a disproportionate number of licensed premises, and was highlighted by police and CVPG as a problem location in terms of alcohol related violence. The granting of a further license was considered likely to compromise public safety to an unacceptable level. The appeal was not upheld: partly because it had been lodged only at the final stage of application, rather than at the preliminary planning application, and partly because the applicant was considered a responsible licensed premises manager. CVPG and the TASC project team considered the process to be an important signal

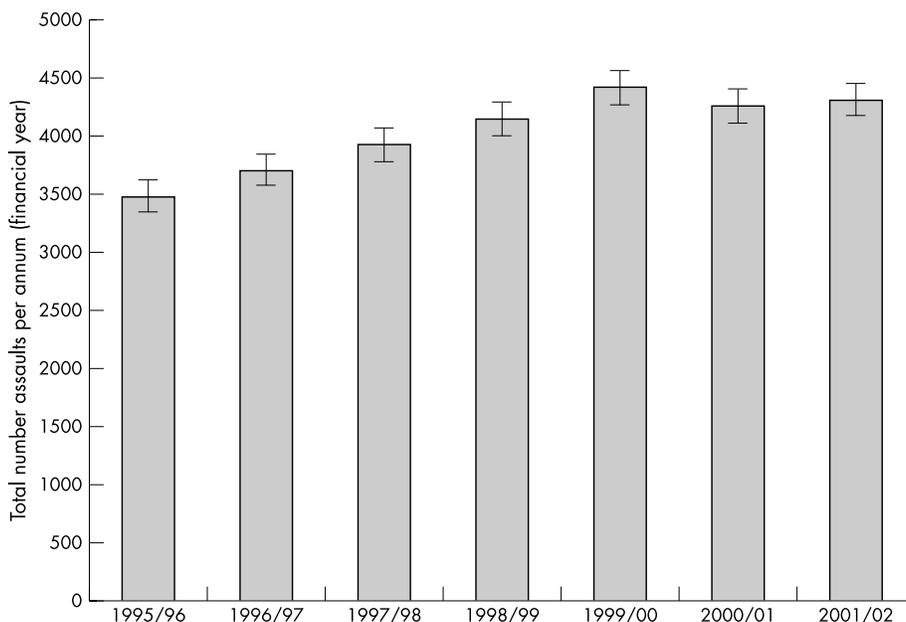


Figure 1 Total number of recorded assault attendances at the Cardiff A&E department.

to future licence applicants however, and also a valuable lesson in how to oppose, on injury prevention grounds, licence applications.

**Data disclosure: CVPG response**

CVPG responses to the assault injury dataset were to identify particular locations (licensed premises, schools, streets, etc) where high numbers of assault injuries were arising and consequently to focus resources to reduce assault in these locations. In addition to concentrating police attention at licensed premises and street locations of violence, letters identifying assault injury hotspots were sent to public service managers, including the local education authority (schools violence) and local bus company managers (to request late night transport from the city centre to permit faster dispersal of licensed premises customers at closing time and thereby reduce the likelihood of assault). CVPG and Cardiff Bus

management then met to identify barriers to provision of late night bus services, opportunities for education and protection of bus staff, and opportunities for joint working to tackle these problems.

**Education authority intervention**

Summary data of pupil registrations at the Cardiff A&E department after assaults were considered and analysed by Cardiff School Service (chief schools officer and central services manager/health and safety advisor). They concluded that most assaults were incidents in schools outside their jurisdiction; that most incidents affected the secondary sector; that most incidents involved the use of fists, feet, or other body parts during normal school hours; that over half the incidents in Cardiff schools occurred during the afternoon; that only 8% of Cardiff school incidents related to injuries inflicted on staff members and that there were only

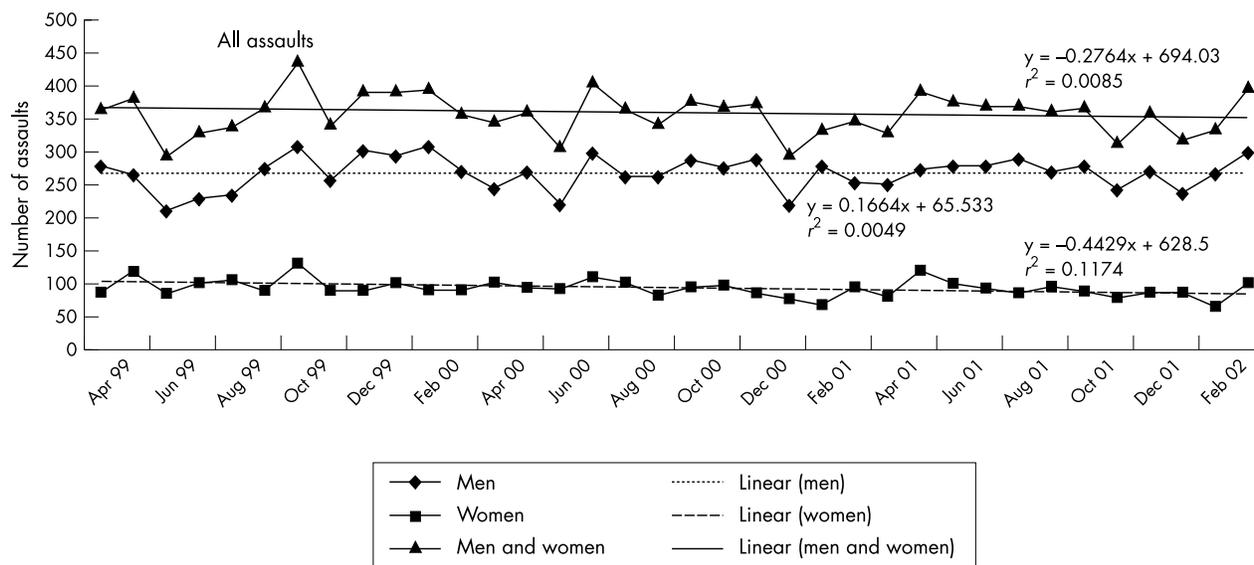


Figure 2 Trends in the numbers of recorded assault attendances between 1 April 1999 and 31 March 2002 at the Cardiff A&E department.

about eight referrals to the A&E department in all per month. This level of violence was not deemed to be an excessive problem by the schools service, but it was recognised that efforts to reduce the problem to the lowest practical level should continue. As a result, an assault awareness campaign was started, in which the CVPG "Silence Hurts Too" posters, designed to encourage reporting of violence, were requested and prominently displayed in Cardiff secondary schools. Evaluation showed that pupils had responded to these.

### Transport services

Cardiff Bus reported increasing violence against drivers and vehicles particularly stone and brick throwing. This was resulting in the withdrawal of suburban services on a regular basis in certain "no-go" areas of the city. Misconceptions about levels of violence in Cardiff were dealt with: no significant change in violence injury rates (A&E derived data) had actually occurred over the previous three years in the city centre. In a consultation exercise the availability of an NHS traumatic stress clinic (a further result of CVPG work) for those injured in assaults, including bus staff with violence related stress was emphasised, as was the potential for improving a driver development course in the areas of conflict management by means of police and NHS input. A commercial transport-entertainment industry partnership was also established. Eventually, a new late night half hourly bus service was introduced.

A specific A&E consultant led intervention was targeted at managers of bar/club venues with high numbers of assault injuries. The objective was to motivate the managers to review their safety procedures by confronting them with injury rates and the threat of media exposure, which provided a powerful motive to reduce violence. In summary, an A&E consultant and an oral and maxillofacial surgeon met with the managers of two clubs identified from A&E data as violence hotspots. Details of injuries and treatment resulting from assault inside these clubs were disclosed, and managers were informed that violence in their premises was being audited by the A&E and that a progress report would be published six months later and disclosed to the local media.<sup>5</sup> There was a significant reduction (event ratio 0.5; 95%CI 0.3 to 0.7) in the number of assaults that occurred in licensed premises that were subject to this intervention combined with high profile police intervention.<sup>5</sup>

Successive licensing magistrate members of CVPG also used the dataset to identify trends, answer relevant queries, for example whether off licensed premises could be identified as assault injury hotspots and to assess the impact of 36 hour licensing during New Year celebrations. Numbers of assault injuries arising in licensed premises during the period 31 December 2000 to 1 January 2001 inclusive (36 hour opening) were compared with numbers of assaults in licensed premises over the same period the previous year (31 December 1999 to 1 January 2000; not 36 hour opening). From 31 December 1999 to 1 January 2000 inclusive there were 12 A&E recorded assaults associated with bars/clubs, in comparison with nine during the 36 hour licensing period the following year (31 December 2000 to 1 January 2001).

CVPG also used the dataset to assess the impact of large public events on assault injury, for example the 2001 Football Association (FA) cup final—an event that attracted unprecedented numbers of visitors into the city centre. Numbers of A&E recorded assaults occurred in Cardiff city centre during the cup final weekend (11–13 May 2001) were compared with numbers recorded during the previous weekend (4–6 May 2001) and during the same weekend the previous year (12–14 May 2000; when the event had not been hosted by Cardiff). This exercise was repeated two weekends later (26–28 May 2001) when the Nationwide League play off matches

were hosted. Comparisons were made with the previous weekend (19–21 May 2001), and previous year (27–29 May 2000). In contrast with London, the usual venue for the national football finals in England, Cardiff is policed by one basic command unit and served by one A&E department—facilitating the measurement of the overall impact on police/health services.

Fourteen A&E recorded assaults occurred in Cardiff city centre during the weekend of the 2001 FA cup final (11–13 May 2001). During the previous weekend (4–6 May 2001) 12 assaults were recorded, and during the same weekend the previous year (12–14 May 2000), seven assaults. During the weekend of the Nationwide League play off matches (26–28 May 2001) 18 A&E recorded assaults occurred in Cardiff city centre compared with nine assaults the previous weekend (19–21 May 2001) and 18 in the equivalent weekend of the previous year (27–29 May 2000).

### DISCUSSION

During the first five years of data collection (1995–2000) the number of assaults reported at the sole Cardiff A&E department increased by 6% per annum (fig 1), consistent with the efforts of the CVPG to establish systematic assault data collection. These findings may reflect changes in ascertainment as recording processes matured. Relocation of the A&E department to a new out of city centre site in April 1999 did not affect this trend. However, over the following year (2000/2001) assault injuries decreased by 4% and this reduction was maintained over the following year, consistent with interventions implemented by the CVPG/TASC in 2000/1 beginning to take effect. This was encouraging because during this same period there was also a steady increase of an estimated 1% per annum in the population of Cardiff as a result of net inward migration (Cardiff Research Centre Estimate) and a substantial increase in licensed premises capacity in the city centre.

Analysis of age/sex trends over the study period (April 1999 to March 2002; fig 2) showed that there was no significant trend for men, in all age categories, but that there was a significant decrease in the number of assaults in which women aged over 30 were injured in the intervention city. The reasons for this sex specific decrease require further research.

The disclosure of A&E data resulted in the identification of substantially more incidents of violence than were known to the police. As this analysis only related to alcohol related incidents within a comparatively small area of Cardiff (police areas 29/30), an even greater number of additional assaults would have been identified if all A&E data were cross referenced with all police records.

A&E derived data allowed licensing magistrates to measure the local effect of continuous licensed premises opening and of the FA cup final and league play off football matches on assault injury levels. In relation to this, there was no evidence that these factors increased assault incidence or seriousness. Although 36 hour continuous opening was associated in this study with reduced assaults, a multi-city study is necessary to confirm this finding. This study highlights the importance and reliability of A&E derived assault data, which in this study required no additional resource.

From an A&E perspective, the principal findings of this evaluation are firstly, that unique information about locations of violence derived from A&E patients can be used successfully to target police resource and bring about violence reduction in those locations targeted. Secondly, A&E consultants, as senior and persuasive advocates for injury prevention can significantly improve the violence reduction efforts of the police. Thirdly, A&E derived information about violence can be used effectively to galvanise local authorities,

the police, and the entertainment industry through publication in local media. Fourthly, A&E derived information allows the NHS to contribute uniquely as a partner in the fulfilment of its Crime and Disorder Act, 1998 obligations. Most importantly perhaps, this contribution depends on active commitment of local emergency medicine specialists to collect and disclose data and to collaborate with the police to target limited resources to best effect. A multi-agency group, such as the CVPG, now replicated throughout England and Wales as crime reduction partnerships, provides a forum, and focus for audit and opportunity for interagency action. If organised appropriately, this can support and spur on the efforts of constituent agencies to achieve outcomes not possible from agencies working in isolation.

### ACKNOWLEDGEMENTS

We thank our Accident and Emergency consultant colleagues Rupert Evans, Peter Richmond, and Roger Evans for their enthusiastic support and assistance; the emergency unit receptionists—particularly Gwenn Bunn and Justin Bishop—for supervising data collection; Roy Simmons for software and data management. We acknowledge the assistance of Karen Ingram (Cardiff County Council), Kevin Tumulty (South Wales Police), David Parr (Cardiff Victim Support), and Anne Knight/Pauline Jones (Chairs: Cardiff Licensing Committee). We are very grateful to Alun Michael JP, MP, (then Minister of State, Home Office) for taking up the proposal that the NHS should be a statutory partner in local crime reduction (1998 Crime and Disorder Act).

### CONTRIBUTORS

A L Warburton was the principal researcher and J P Shepherd conceived and supervised the project and chaired the project

management group. Both authors jointly designed the project protocol and drafted and edited the manuscript.

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Funding: Wales Office of Research and Development (WORD).

Conflicts of interest: none declared.

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