

ORIGINAL ARTICLE

Use of, and outputs from, an assault patient questionnaire within accident and emergency departments on Merseyside

C A Young, J P Douglass

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See end of article for authors' affiliations

Correspondence to: C A Young, Environmental Criminology Research Unit (ECRU), Department of Civic Design, University of Liverpool, L69 7ZQ, UK; youngca@liverpool.ac.uk

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Objectives: To describe the implementation, use of, and outputs from an assault patient questionnaire (APQ) introduced in accident and emergency (A&E) departments to determine Crime & Disorder and Community Safety priorities on Merseyside, a metropolitan county in north west England, UK.

Methods: Why and how the APQ was implemented, data collected, and information obtained. The subsequent incorporation of the APQ into the Torex Patient Administration System (PAS) at the Royal Liverpool University Hospital A&E department and its routine completion by trained reception staff.

Results: Analysis is based upon anonymised data—for example, patient ID and date of birth information is suppressed. A summary of “baseline” information obtained from the data collected is provided.

Conclusions: It is possible for the APQ to be implemented at no extra cost in a large A&E department in an acute general teaching hospital. Valuable intelligence can be obtained for Crime & Disorder Act and Community Safety processes. The APQ forms part of a medium to long term strategy to prevent and reduce violent assaults in the community that subsequently require treatment in an A&E department. Such incidents include assaults both inside and outside licensed premises, attacks by strangers on the street, and domestic violence. Emphasis is also placed upon the feedback of results to staff in A&E departments.

Assault patient data collection is being implemented on Merseyside because of the need for accurate, consistent, baseline information regarding assaults in the community. Once available, this information can be used to analyse, monitor, evaluate, and even determine appropriate strategies or interventions in campaigns—implemented in accordance with community safety and crime and disorder legislation—to reduce assaults in the community. Assault reduction campaigns can include such interventions as high profile policing, social marketing (for example, Crystal Clear, which is aimed primarily at reducing glass related assault injuries), increased CCTV coverage, and domestic violence reduction measures, or combinations thereof. The APQ will also record the name of the licensed premises if this happened to be the location of the assault. In theory therefore, this information could be used by both police and local authority licensing departments in support of their efforts to maintain and promote safe leisure environments.

The APQ is required because of the well documented fact that crimes recorded by the police suffer from under-reporting, and even if a crime is reported, successive British Crime Surveys (BCS) have shown that it is not necessarily recorded.¹ The many reasons for the non-reporting of crimes include apathy on the part of the victim (the “nothing will get done so why bother” attitude) or a complaint is simply not forthcoming, a victim’s relationship with an offender, the categorisation of a crime simply as a “domestic”, the violence was perpetrated by the injured person, and/or fear of reprisals.

The APQ therefore provides an opportunity to improve both operational and research intelligence particularly for violent assault incidents occurring in the community. In reality around threefold to tenfold more violent offences that occur in the community result in hospital treatment, than are recorded by the police.² Evidence also indicates that over 95% of those who are treated for injuries sustained in violent incidents are treated in accident and emergency (A&E) departments.³ The

emergence of minor injuries units may have already, and continue to affect this statistic, but it does indicate that the first port of call for data has to be A&E departments. If collected correctly by an A&E department, the data can provide extremely valuable information regarding hotspots and help improve the targeting of community safety and crime reduction interventions of the kind described above. The data can also be used to measure the successes or failures of interventions, or to influence the process of an intervention before it fails, for example by using it as evidence when using decision support tools such as Health Impact Assessment. Feedback concerning subsequent community interventions and success stories should be reported to staff in the A&E department where ever possible, to emphasise the importance of the wider part they can play, in terms of community safety and crime reduction. This will ensure that A&E department staff understand the reasons why they are being asked to complete the APQ. In the longer term it may even reduce the pressure and workload in A&E departments to some extent, by reducing the number of serious assault injuries attending an A&E department. Extensive research has already been undertaken by the Cardiff Violence Prevention Group, which has been recognised by the Home Office for its effectiveness towards cutting violent crime. Reviews by Shepherd emphasise that A&E data can be used to direct police interventions that are known to be evidence based, such as targeted police effort.^{4,5}

METHODS

To obtain the information, an APQ based upon one developed for use in Cardiff Royal Infirmary,⁶ was implemented in the

Abbreviations: APQ, assault patient questionnaire; PAS, patient administration system; TIIG, Trauma and Injuries Intelligence Group

Table 1 General format of APQ computer screen

Field	Comments
Age	Years (not DOB)—derived from main PAS
Sex of victim	M/F— derived from main PAS
Date	Of registration in A&E department— derived from main PAS
Time	Of registration in A&E department (not the time of the incident)—derived from main PAS
Where	Pick list— bar/pub, club, street, your home, someone else's home, workplace, etc
Other information	The name of the licensed premises or street can be typed here for example
How many attackers	1, 2, 3, 4, 5 or more
Sex of attacker(s)	M/F
Relationship with attacker	Pick list— acquaintance/friend, stranger, bouncer (pub doorstaff), partner, ex-partner, family member, etc
Attacked with	Pick list of weapons— body part (for example, fist), bottle, glass, knife, firearm, blunt object, etc
Other specify	Further brief free text information about the nature of the injury or the weapon used
Informed police	Y/N— has the <i>incident</i> (note—the word "assault" is avoided to minimise any possible legal implications) been reported
Ethnic origin of patient	Standard monitoring list— derived from main PAS

A&E department of the Royal Liverpool University Hospital (the "Royal") which is situated close to Liverpool city centre. The Royal is just one of several hospitals in the Merseyside area to trial the APQ, under the guidance of a multi-agency Trauma and Injuries Intelligence Group (TIIG). However, at the time of writing the Royal was the only A&E department able to implement a computerised APQ in reception and subsequently provide robust and reliable data for analysis. Other research has shown that receptionists were the most appropriate staff to complete the questionnaire and that hard copy APQ forms do have a tendency to be mislaid (or not be completed at all) in busy A&E departments⁶; this has certainly been borne out in other Merseyside hospitals involved in the trial. Therefore the Torex Patient Administration System (PAS) development officer at the Royal decided to computerise the questions (shown in table 1) on an "assault" screen (within the PAS), which is accessed by the receptionist after "assault" has been entered as the reason for attendance. (All A&E department patients at the Royal are triaged using the Manchester triage system.)

Some of the information is extracted from PAS instead of being requested from the patient a second time (age and sex for example). As the PAS has long contained "assault" as one of many "cause of injury" codes, the adding of the APQ form to the system has simply enabled further information, specific to that assault, to be collected. Before its addition, the trust was only able to count the number of assault incidents dealt with over a designated period of time.

In all of the above categories it is noted if the patient refuses to answer or is unable to answer any of the questions. For instance, the APQ might not be completed if a patient suffering from major injuries is rushed straight through for treatment. However, the patient record will still be tagged with an assault reference code, and it is estimated that this scenario occurs in around 15% of assault patient cases.

The questions shown in table 1 can form a "conversational script" as the receptionist runs through the registration process, instead of a rigid set of questions asked in a specific order.

The anonymised data from the APQ are stored in the PAS database but are exported monthly as a standalone file that can be read by spreadsheet software. In accordance with Caldicott guidelines the standalone file is supplied to the Environmental Criminology Research Unit (ECRU) based in the Department of Civic Design at the University of Liverpool for analyses and dissemination purposes.

RESULTS

APQ data have been available from the Royal on a routine basis since March 2000, and the dataset used here is for the period between March 2000 and September 2001 inclusive. A total of 6034 APQ "screens" were completed by reception staff during this 19 month period and figure 1 shows a monthly breakdown of this total.

The sex breakdown of victims was similar to findings in national studies⁷; 76.2% were male and 23.8% female.

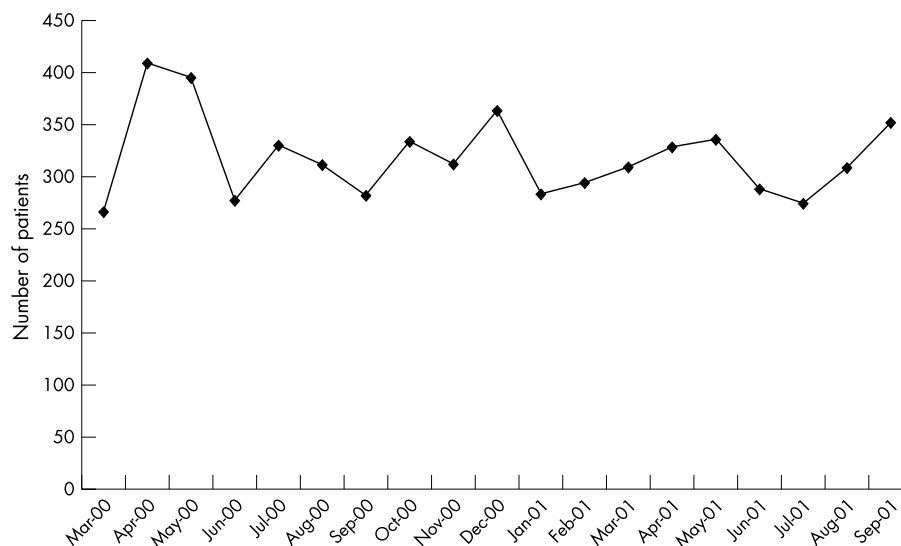
**Figure 1** All assault patients recorded by the Royal Liverpool A&E department by month.

Table 2 Assaults as percentage of A&E department attendance

General A&E department attendance—Mar 2000 to Sep 2001	APQs completed Mar 2000 to Sep 2001	APQs as percentage of general A&E department attendance
129180	6034	4.7

However, seasonal trends in the data from the Royal are less evident in figure 1 when compared with the same national studies mentioned above, which exhibit peaks in July to September and troughs in February to April.⁷ Patterns at the Royal seem to be quite random although there is a vaguely discernible peak around April/May in both 2000 and 2001.

Of the 6034 assault patients recorded on APQs, 82.3% claimed to have been attacked by a man, 7.1% by a woman, and 3.1% by a gang/group of both men and women. Some 7.5% either did not know, refused to say, or were unable (because of severity of injury) to state the sex of the person who had attacked them.

The total number of patients treated per year at the Royal A&E department exceeds 100 000. However, these patients are distributed between general A&E department, ophthalmic A&E department, dental A&E department, and the recently opened acute medical A&E department. General A&E department treats the largest proportion of patients but it is expected that some of the strain placed upon it will be eased by the acute medical admissions unit. Double counting should be avoided, as users of all A&E departments will normally present initially at the general A&E department—the only department at which the APQ is completed. Table 2 shows the total number of patients attending general A&E department between March 2000 and September 2001 and the number of assault patients treated in the same period (that is, 6034, as discussed above). It can be seen that assault patients at the Royal account for 4.7% of all general A&E department attendance.

The most common day of the week on which an assault took place during the study period March 2000 to September 2001 was a Sunday, followed by Saturday and Friday.

The date and time of registration in the Royal A&E department are used as a proxy for the date and time of an alleged assault incident. It is therefore likely that the Sunday peak is attributable to those injured in the early hours of Sunday morning after a Saturday night out. Figure 2 shows the time of

Table 3 Relationship of assault patient with attacker

Relationship with attacker	Female patient %	Male patient %
Acquaintance/friend	16.05	8.40
Bouncer	1.61	3.48
Ex-partner	6.42	0.26
Family member	6.98	2.02
Not known	7.82	10.03
Partner	13.05	0.65
Police	0.49	0.94
Refused to answer	2.02	1.48
Stranger	42.29	70.27
Unable to answer	0.77	1.26
Work client/customer	2.16	0.76
Work mate/colleague	0.28	0.35

day of all recorded assaults between September 2000 and September 2001 inclusive (the time stamp was not added to the APQ until September 2000).

It can be seen from figure 2 that the busiest period in the A&E department, in terms of numbers of assault patients to treat, is between 2 01 am and 3 am. This suggests the reason, cited above, for the Sunday peak. However, because of the nature of the time stamp, as a proxy for the time of the incident, the peak period for assaults in the community may be earlier than shown above. Another A&E department on Merseyside attempted to record the time of the alleged assault incident on their paper APQ forms by asking the patient directly—the result was a similar shaped graph to figure 2 except that the peak shifted left and occurred between 1 01 am and 2 am.

The relation between the assault patient and their attacker is explored in table 3. It is interesting to note that the answer to this question was left blank in only seven cases of 6034 APQs despite the personal nature of the question.

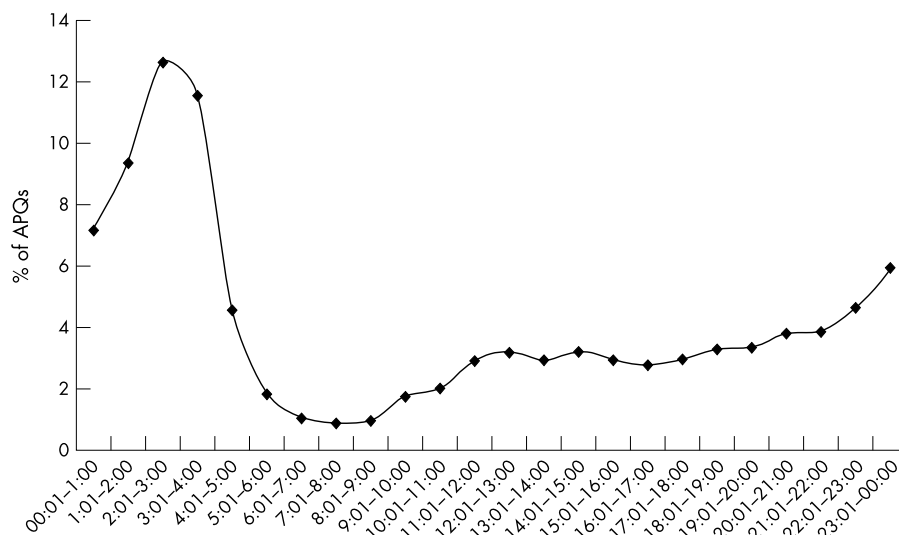
**Figure 2** Time of day of assault patient registration in A&E department (September 2000 to September 2001).

Table 4 Reported location of the assault incident

Location of assault	Female patients %	Male patients %
Bar/pub	8.37	8.16
Club	6.07	7.25
Not known	1.19	1.26
Other	3.00	3.90
Refused to answer	0.35	0.39
Someone else's home	6.42	1.96
Street	47.10	68.96
Unable to answer	0.28	0.11
Workplace	4.19	2.79
Your home	22.96	5.18

While over 70% of male (42.3% of female) assault patients were attacked by strangers, just under 20% of female assault patients were assaulted by a partner or an ex-partner (compared with less than 1% of male assault patients). Although it is not within the scope of this paper, nor was it behind the original reasoning for the APQ, this does imply the presence of some form of domestic violence within a significant proportion of female assault victims. Agencies involved in the prevention and treatment of domestic violence issues would clearly be interested in the intelligence obtained from the APQ—at the same time upholding the need for patient confidentiality in these sensitive situations. These concerns surrounding domestic violence are also supported by table 4, which shows that almost 30% of female assault patients were attacked in their own or someone else's home compared with just over 7% of male assault patients.

Together, pubs and clubs account for the location of around 15% of assaults on both male and female assault patients, but the street is clearly the most common place to be assaulted, irrespective of sex. An examination of just a week's worth of data from 163 A&E departments throughout England and Wales found that facial injuries caused by assault were most commonly inflicted on the street, followed by public drinking establishments.⁸

The use of particular types of weapons in an assault is shown in table 5. This information can be used to monitor changes in the use of potentially lethal weapons such as knives. The problem of attacks with air rifles is also currently

on the community safety agenda but it is probable that their use is hidden within the "other" category on the APQ. The incidence of firearms also seems to be quite low but this might be attributable to a fear of reprisals on the part of the victim or could be hidden within the "refused" or "unable" to answer categories. In a situation when multiple "weapons" have been used and the assault patient is willing to admit what they were attacked with, the receptionist is trained to enter the most dangerous and potentially harmful weapon in the "weapon" category, and anything else in the "other" category. However, this is always going to be rather subjective as actually being punched in the head is clearly more physically damaging than being threatened but not attacked with a knife.

The use of certain weapons such as bottles and glasses is of concern when monitoring and evaluating social marketing campaigns such as Crystal Clear. Figure 3 displays the pattern of use of such weapons as a rate per 100 patients. It can be seen that in assaults, up to 11% (the April 2000 data point) of victims were attacked by someone with either a bottle or a glass in any single month.

The recording of patient ethnicity is too broad an issue to describe and discuss here and is subject to wider debate within the NHS. However, the problems of capturing these data are sufficient to make the quantification of racial violence from the APQ difficult. This is despite the fact that ethnicity has been recorded on the APQ since November 2000. From this point in time, 46.8% of assault patients described themselves as white, but 50.6% were either not entered on the APQ screen or were listed as "unknown". Some 1.8% of assault patients (n=62) described themselves as being in an ethnic group other than white. Before accurate information can be assembled and disseminated around the issue of racial harassment and violence several obstacles must be tackled, the first of which is to reduce the percentage either entered as "unknown" or not recorded at all.

Interestingly, only 49.8% of all assault patients stated that they had reported the assault to a police officer but this could not be cross checked with police recorded crime data. It may be the case that the patient mistakenly believes that the presence of police at the scene of an incident automatically guarantees the recording of a crime. It is also not clear what proportion of the remaining 50.2%, who had not reported the incident, intended to do so at a later stage.

Table 5 Assault weapons used in an assault

Month	Weapon										Total APQs
	Blunt object	Body part	Firearm	Bottle	Glass	Knife	Not known	Other	Refused-answer	Unable-answer	
Mar-00	38	149	0	18	7	8	35	0	11	0	266
Apr-00	52	243	1	24	20	18	32	7	11	0	408
May-00	39	248	1	16	19	18	30	5	15	3	394
Jun-00	33	151	0	6	14	10	49	7	7	0	277
Jul-00	30	185	0	14	13	16	62	2	6	0	330
Aug-00	21	188	3	12	9	10	57	7	2	2	311
Sep-00	29	182	1	17	12	10	24	5	0	2	282
Oct-00	26	190	2	16	15	20	55	7	2	0	333
Nov-00	38	192	1	10	14	14	30	8	1	3	311
Dec-00	49	203	1	11	11	16	51	10	5	4	362
Jan-01	31	173	1	8	10	9	32	12	3	3	282
Feb-01	32	177	2	11	13	14	25	9	3	5	293
Mar-01	37	180	0	19	9	19	28	9	1	6	308
Apr-01	24	221	0	13	8	12	42	2	1	3	327
May-01	41	190	1	12	9	18	49	4	0	9	334
Jun-01	25	192	1	5	8	14	31	8	1	2	287
Jul-01	22	184	0	15	10	3	30	6	1	1	273
Aug-01	24	194	0	12	13	16	38	8	0	4	306
Sep-01	31	197	0	17	19	17	60	8	3	2	350

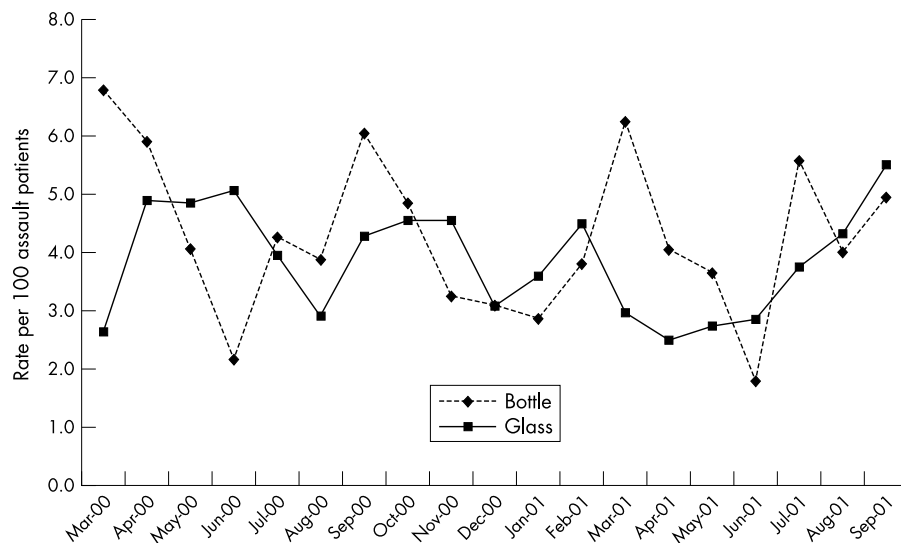


Figure 3 Use of bottles and glasses as assault weapons (rate per 100 assault patients).

DISCUSSION

Some of the results described above raise some further questions. For instance the monthly counts and random peaks of APQs identified in figure 1 might be a result of the smaller size and shorter duration of the dataset currently available from the Royal. Continuing with the APQ to obtain a more substantial baseline dataset is reason enough to carry on with the data collection process at the Royal.

Likewise, the results shown in table 2 are not entirely consistent with studies at the national level. Assault patients at the Royal account for 4.7% of all general A&E department attendance. The national figure seems to be around 2.5%⁷ and a localised two month study in Paisley, Scotland⁹ also indicated that 2.4% of total new A&E department attendances were victims of assault. Table 2 merits further investigation because many factors might influence this finding, one of which is that table 2 takes just general A&E department attendance into account and omits the other three A&E departments (discussed above) at the Royal.

The daily distribution of APQs demonstrated in figure 2 (although potentially skewed by the weekend peak for assaults) might be a result of the finite time lag between an assault taking place and registration in the A&E department—a patient must walk or be transported from the location of the assault to the A&E department. Despite this, the growing number of premises with extended licences (that is, beyond 11 pm) in Liverpool city centre might at least be a contributory factor towards the occurrence of the peak phase between midnight and 4 am. Also, because not all assault patients will be innocent victims it can be assumed that a proportion of the patients gathered in the A&E department between the peak hours of midnight and 4 am might be aggressive and possibly under the influence of drugs or alcohol, or both. Thus, even if figure 2 cannot inform practitioners and agencies of the precise moment when an assault takes place in the community it should at least be used to target resources toward the peak periods within the A&E department. For example, the security implications may require responses such as security personnel or police cover, or CCTV to ensure both staff and patient safety.

The proportion of people attacked with bottles and glasses shown in figure 3, seems to fit with previous research findings.¹⁰

It is important to note that all of the patient information obtained, and published in this paper, remains anonymous and that the results obtained so far are extremely valuable. However, it is appropriate here to suggest improvements to the APQ at the Royal (although they apply to the APQ

incorporated within the PAS of any A&E department). These improvements retain the anonymity component when dealing with patients but nevertheless help to concentrate the targeting of assault reduction interventions in the community more effectively. Possible improvements include:

(1) Tag each assault patient record (that is, home address) with its postcode “sector” that identifies a minimum of several hundred, and sometimes thousands, of individual addresses within a district or neighbourhood. A “unit” postcode refers to around 20 or 30 addresses and the house number would be required to pinpoint a specific address. For example CH2 2AZ is a unit postcode (or inward code as defined by the UK’s Royal Mail) in Cheshire that identifies 40 houses ranging from numbers 1 to 40. In this case the “sector” refers to the “CH2 2” part only, which contains thousands of properties.

(2) Install a street gazetteer and/or a third party database of licensed premises, which allows a receptionist to pick from a drop down list on the data entry screen. Assuming that they do not click on the first item on the list to save time this will ensure that street names or licensed premise names will be entered into the PAS database with the correct spelling, on a consistent basis, thus allowing more accurate identification of hotspots. This method will save time anyway because it removes the necessity to type a street/pub name in full on the computer keyboard.

The above options are not intended to be exhaustive. Indeed either an auto-complete mode within the APQ, or an algorithm embedded in computer software that is able to identify mis-spellings of the same location after the data have been recorded, might be alternatives to option 2. Either way exact locational accuracy will always be difficult to achieve, licensed premises change name often, new ones are constantly opening, and because victims are very rarely aware of their precise 12 figure Ordnance Survey grid reference!

However, if accurate assault location information (for example, the name of premises) can be relayed to the police in a timely fashion and is then acted upon by them, the results could be dramatic. It is not uncommon for several unconnected violent incidents to flare up in the same evening within the same premises and the police do accept that information known to A&E department staff about the circumstances and trends in violence would help to improve (operational) policing.¹¹ Less urgent, but still appropriate, a list of accurate premise names obtained from the APQ could be used by licensing departments to assess premises safety (venue size, layout, staffing), suggest improvements to door and internal security, and encourage the use of toughened glassware and/or plastic receptacles.¹²

While changes like these to the PAS may well incur a cost, they ensure that data quality is vastly improved while patient confidentiality is maintained.

APQ data collection at the Royal originally began in response to Crystal Clear (mentioned earlier in this paper), the social marketing campaign aimed at reducing glass related assault injuries. At this time consistent, quality data did not exist and the under-reporting of crime discussed above led to the requirement for a data source other than the police's recorded crime information, in order for effects of the campaign to be accurately measured and evaluated. The APQ implemented at the Royal, and described in this paper has begun to plug that gap, but it could also in theory be used as a prompt to ask the patient whether they would like to report the offence and would they like the A&E department staff to help them do this? However, to help expand accurate, computerised data collection to all A&E departments in Merseyside the multi-agency TIIG has been established with funding from Merseyside Health Action Zone and the Safer Merseyside Partnership. TIIG will develop and extend the scope (to include all traumas and other accidental injuries including fire related) of computerised data collection, which in turn will benefit future analysis and targeting. Crystal Clear is in its third phase on Merseyside and continues to emphasise the safe use and disposal of bottles and glasses. It now also tackles the incidence of all violent assaults and the environmental and safety impacts of leaving glass in public places such as parks and beaches (in addition to a licensed premises curtilage).

The authors are also conscious of the concerns surrounding the under reporting of crime There are clear differences between actual, reported and recorded crime and part of TIIG's remit is to deliver a truer picture of violent assaults. To capture these data, the TIIG group are embracing the NHS reforms relating to access to healthcare facilities, by introducing the APQ into minor injuries units and NHS Walk in centres. A longer term objective for TIIG is also to consider the capture of data from within primary care. As assault victims may present at multiple healthcare providers, the issue of data linkage is of paramount importance in the avoidance of double counting. It is hoped, however, that the linkage of APQ sources with data from the ambulance and police services, will eventually improve intelligence on violent assaults substantially.

Conclusion

This paper has emphasised the valuable part that can be played by A&E department staff in obtaining useful intelligence to both support and determine community safety and crime reduction initiatives. Assaults in the community are a multi-agency problem that require effective partnership working and it is paramount that the data collectors (that is, the A&E department staff) are kept fully informed of strategy progress and their role within it. This paper has also shown that a minimum set of questions can be incorporated within an APQ in an A&E department at no extra cost, depending on the information technology expertise that exists locally within the A&E department or hospital as a whole. If external software suppliers have almost complete control, the questions could be added by them as part of a larger system upgrade or during a routine maintenance period perhaps, to minimise costs. The data collection behind the information shown in the tables and figures should be at least

maintained and taken forward to use as a consistent baseline dataset that can help determine the processes involved in containing and perhaps reducing assaults and the injuries associated with them.

ACKNOWLEDGEMENTS

A&E department staff across Merseyside and especially at the Royal Liverpool and Broadgreen University Hospital Trust for their continued efforts in capturing and supplying the APQ data. This research is part of the Safer Merseyside Partnership SRB programme for regeneration, crime reduction, crime prevention, and community safety.

Contributors

Chris Young, at the University of Liverpool, was asked by the Safer Merseyside Partnership to undertake an evaluation of a social marketing campaign (Crystal Clear) to reduce glass related assault injuries. After a short review it was evident that a "baseline" dataset did not exist—that is, the number of existing glass related assault injuries was not known and for various reasons including under reporting, police recorded crime data did not fill that gap. A police officer, Sgt Ian Cooper, had however made links with the A&E departments at both Aintree hospital and the Royal Liverpool hospital. It was via this relationship that the project developed and the need for a paper became apparent especially as a great deal of the Merseyside work was based on the research and experiences undertaken in Cardiff. Another consequence of the evaluation was the general inconsistency of data between health and crime agencies which resulted in the formation of a separate major initiative—the Trauma and Injury Intelligence Group or TIIG for short. John Douglass is a TIIG researcher based at the University of Liverpool. The data analysis was undertaken by Chris Young but the paper was discussed and written in partnership by both Chris Young and John Douglass.

Authors' affiliations

C A Young, J P Douglass, Environmental Criminology Research Unit (ECRU), Department of Civic Design, University of Liverpool, Liverpool, UK

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