Developing an Accident and Emergency Based Crime and Disorder Reduction Partnership Performance Measure

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Executive Summary

In order that resources are used most appropriately by local safety partnerships in challenging the causes and consequences of violent crime, it is essential that implementation is appropriately monitored and effectiveness determined. The principal cost from violent crime is the emotional and physical costs born by victims and it is therefore appropriate that these victim costs should provide a measure which can be used to target resources and to determine whether allocation is cost effective. Serious violent crime is partly defined by the severity of injury inflicted on the victim and therefore Accident and Emergency (A&E) data offers an opportunity to judge both the prevalence and seriousness of violence in local communities. A&E units across the UK collate and hold detailed information on patients' health following assault and recording practices can be easily refined so that epidemiological assault-related injury data is available. Given the potential utility of A&E data it is therefore surprising that less than ten A&E units have a long-standing active collaboration with their local safety partnerships across England and Wales. This report provides an overview of how A&E data are being used across nine hospitals in England and Wales and estimates the value, in terms of emotional and physical costs, of violent crime. These data are compared with local safety partnership activities and, although the sample is selective, suggest that partnerships between A&E units and safety partnerships can help target resources effectively and that doing so is cost effective in terms of the resources required to use those data against the potential savings in victim costs.

Key Findings

Crime and Disorder Reduction Partnership (CDRP) initiatives are not sufficiently well documented to quantify the resources used to tackle violent crime or to assess their effectiveness. A more transparent system should be implemented in order to track CDRP interventions and facilitate research into CRDP effectiveness.

A&E data represent the best available measure of the costs of violent crime. Therefore, they should be used to target CDRP resources. Although CDRP crime (iQuanta) statistics can be used to derive estimates of violent crime incident rates only, A&E data represent an objective measure of the victim costs of violent crime. A&E data offer the potential to be a highly efficient, reliable resource for crime prevention. However, at this stage, they are an underused resource. The use of A&E data to inform CDRP decision making on violent crime would greatly increase the efficiency of CDRP violence reduction strategies.

A positive and statistically significant relationship was observed between changes in A&E assault related treatment rates and CDRP violent crime rates. According to police data, increases in violent crime were associated with increases in A&E attendances. However, CDRP and A&E catchment areas were not the same. A&E assault data should be used to inform CDRP activities in their areas.

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Introduction

The 1998 Crime and Disorder Act placed a statutory duty on the police and local authorities to work together to develop and implement strategies for reducing crime and disorder in their areas. In addition, the Act placed a legal obligation on police authorities, probation committees and health authorities to co-operate in these new Partnerships. 371 such Partnerships in England and Wales are now established.

To date, accurate measures of the effectiveness of these Partnerships in reducing violent crime have not been available. Although police data are one potential source, there are major reporting and recording biases. For example, data matching studies have shown that only about a quarter of incidents which result in hospital treatment are represented in police records. Furthermore, police data are not available by victim age and gender. It has been recognised that health service derived data on violence-related injury can provide an alternative metric through which Partnership performance can be measured.

Violence related injuries presenting at hospital A&E departments are recorded shortly after the incident when the event is fresh in the minds of those injured and those who accompany them. Specificity and sensitivity analysis and comparisons with panel data on known correlates with violence have shown that A&E data are reliable and objective. The National Violence Surveillance Network (NVSN) was established in 1999 and now includes a structured (by Government Region) sample of over sixty Type I[1] A&E Departments in

[1] "A&E departments are defined as follows: Type 1 A&E department - A consultant led 24 hour service with full resuscitation facilities and designated accommodation for the reception of accident and emergency patients; Type 2 A&E department - A consultant led single specialty accident and emergency service (e.g. ophthalmology, dental) with designated accommodation for the reception of patients; Type 3 A&E department - May be doctor led or nurse led with designated accommodation for the reception of accident and emergency patients. A defining characteristic of a service qualifying as a type 3 department is that it treats at least minor injuries and illnesses (sprains for example) and can be routinely accessed without appointment. Type 3 services include all NHS Walk in Centres and other open access treatment services offering at least minor injury/illness services, whether located alongside a main A&E department or at another location. A service mainly or entirely appointment based (for example a GP practice or outpatient clinic) is not a Type 3 A&E service even though it may treat a number of patients with minor illness or injury" (National

England and Wales. Conditions of NVSN membership include the provision of high quality data and commitment to data sharing for the purposes of tackling community violent crime.

The use of A&E data to assess Partnership violence reduction performance has not yet been explored, although, in Cardiff this measure has been applied locally for eleven years. This research sought to assess how harm-based performance measures such as this can be used to inform practice in the context of a National Audit Office census of CDRPs.

Current Study

Data from nine Type 1 A&E units were accessed. These units had concurrent data from April 2002 to December 2004. They were each located in discrete communities not less than eight miles from another Type 1 A&E unit.

For each of the nine A&E units the local CDRP or Community Safety Partnership (CSP) was identified. Information describing activity in each CDRP or CSP was compared with A&E data. The first goal was to understand how CDRP activity (e.g. the use of A&E data to target resources) impacted on A&E attendances over time. Second, to better understand the relationship between A&E attendance and CDRP statistics(iQuanta) for violence: it was hypothesised that greater police activity would cause a reduction in A&E attendance. As greater police resources targeted at violent crime might also be expected to increase the number of violent incidents identified, it was hypothesised that the relationship between iQuanta statistics and A&E attendance would be negative. Third, since the true costs of crime are reflected in victim costs (Dolan & Moore, 2007), criminal justice costs, as well as the emotional costs to victims and the potential loss of productivity in the workplace, analyses sought to estimate the costs of violent crime for a particular area and compare these with the CDRP resources used to tackle violent crime.

Audit Office Press Notice, Department of Health: Improving Emergency Care in England, 2004)

Crime and Disorder Partnerships

The 1998 Crime and Disorder Act placed a statutory obligation on police and local authorities to cooperate in efforts to reduce crime and disorder in each local government area or London borough. In response to this, 371 Crime and Disorder Partnerships (CDRP; also known as Community Safety Partnerships) were established in England and Wales. These Partnerships involve, on a statutory basis, police authorities, local authorities, Primary Care Trusts or Local Health Boards, probation services[2] and fire and rescue authorities[1]. The aim of these Partnerships is to reduce crime, disorder and substance misuse in each Partnership area through intra-gency cooperation, the sharing of information about crime and the implementation of crime reduction strategies.

Each CDRP is required to follow a number of steps in establishing a crime reduction strategy for their area (Crime and Disorder Act, 1998, s.6):

1. Carry out a review of levels and patterns of crime in the area.
2. Consult with members of the public and minority groups that the CDRP perception of crime and disorder in the area is analogous to that experienced by these groups.
3. Formulate a three-year strategy for the reduction of crime and disorder problems in the area, including long-term and short-term performance targets. This strategy was to be made available to the public but this requirement was recently abolished.
4. This strategy should be kept under continuous review and be amended to improve the reduction of crime and disorder problems where necessary.

[2] Added in 2002 Police Reform Act

Following an audit of crime rates and the identification of disorder problems in the area, the CDRP is required to consult with members of the public and with minority groups in the area. The aim of this consultation is to ensure that the audit “has construed problems accurately” (Hough & Tilley, 1998, p. vii), and that the problems identified by the audit are reflected in community attitudes. Strategies are developed based on the findings. Crime and disorder reduction targets and performance targets are agreed. Primary objectives or targets for reduction, typically crime types, are identified and techniques for achieving these objectives are prescribed. Objectives and reduction techniques vary between CDRPs (Phillips, Considine, & Lewis, 2000).

Setting performance targets is an important aspect of the work of CDRPs. These performance targets allow CDRPs to estimate the success of their strategies. In order to determine the success of a strategy, i.e. a target outcome, performance indicators are required. These include reported crime figures, victim satisfaction and observation (Hough & Tilley, 1998). In terms of violent crime, three measures can be used to determine the incidence of violence in an area: victimisation surveys, police crime figures and emergency department records.

Police records are the most commonly used measure of violent crime. However, police recording methods have been shown to be inconsistent across areas. The introduction of the National Crime Recording Standard (NCRS) in 2002 aimed to rectify this problem by coordinating the methods for recording crime across police forces. Furthermore, it has been suggested that police records are not a reflection of rates of violent crime, but an indicator of police activity in an area (Shepherd & Sivarajasingam, 2005).

The role of the police as upholders of the law hinders their role as recorders of crime. Sutherland, Sivarajasingam and Shepherd (2002) compared attendances for violent injury at an A&E in Swansea with police recorded incidents of violent crime over a six-month period. They found that 65% of assaults that resulted in treatment in an A&E were not recorded by the police. Over the same period, 11% of police-recorded violent incidents did not result

in A&E treatment. Reasons cited by victims of crime for not reporting such incidents to the police included regarding the incident as too trivial, feeling that they could deal with the problem themselves, not being able to identify the assailant, fear of reprisals, a hostile attitude towards the police and not wanting to have their own conduct scrutinised (Nicholas, Kershaw, & Walker, 2007).

An alternative measure of violent crime is the victimisation survey. The British Crime Survey (BCS) is the most well known example of a victimisation survey in the UK. The survey is designed so that participants have the opportunity to give details on all crimes against them in the preceding year, no matter how trivial they may seem, and without any repercussions for the participant's assailant(s) or the participant themselves. The BCS is a very useful resource for estimating the incidence of unreported crime, and offers a reliable alternative to police recording statistics. Unfortunately, as is the nature of surveys, the BCS relies on sampling methods to take a representative picture of the experiences of the whole population. This sampling restricts the ability of the survey to identify changes in incidence of violent crime in a specific area. A second major obstacle to using the BCS to identify trends in violent crime is that it does not interview individuals under the age of 16 years about their experiences of crime. This is an important omission, particularly for the study of violence, as a large proportion of violence is committed by, and against, those aged less than 16 years (Home Office, 2006).

A&E data are useful for investigating rates of violent crime as they provide a record of violent injury in an area. These data provide an alternative to police records of violent incidents that is both reliable and sensitive to small changes in incidence rates (Sivarajasingam, Moore, & Shepherd, 2007). A&E records include all assaults that result in treatment at an A&E in a particular area. Therefore, not all violent incidents within the catchment area of the A&E are recorded. Injuries must be sufficiently serious for an individual to seek treatment. However, the A&E practice of recording all treated incidents prevents the sampling errors that hinder the utility of the BCS. Furthermore, all age groups are included. Annual incidence of A&E attendance for violent

injury has been shown to reflect incidence of violent victimisation reported in the BCS (Sivarajasingam et al., 2007).

Applications of A&E data to Violent Crime Reduction

A&E data are most often used for the observation of trends in violent crime in an area. However, these data can also be used effectively for the identification of violence ‘hotspots’. Patient Management Systems can be adapted in order to obtain detailed information from patients about the circumstances surrounding their assault by collating information about the site, such as “Workplace”, “Street” or “Bar”. CDRPs can identify area types that require enhanced preventive effort at particular times of the week. Using this information, they can deploy resources where they are most needed. Figure 1 below demonstrates an example of daily distribution of violent injury by location type in Cardiff. Requesting information on the actual street or location of a violent incident, number of assailants involved and use of a weapon can further support CDRP and police intelligence of violence ‘hotspots’ and the nature of violence within an area. Currently, many A&E departments in England and Wales do not collect this valuable information (Shepherd & Sivarajasingam, 2005). In addition, the use of more advanced modelling techniques may allow such information to be used to project trends in rates and the nature of violent crime in an area. However, police record and demographic projections of crime trends in the past have been notable for their large errors, and so require further exploration.

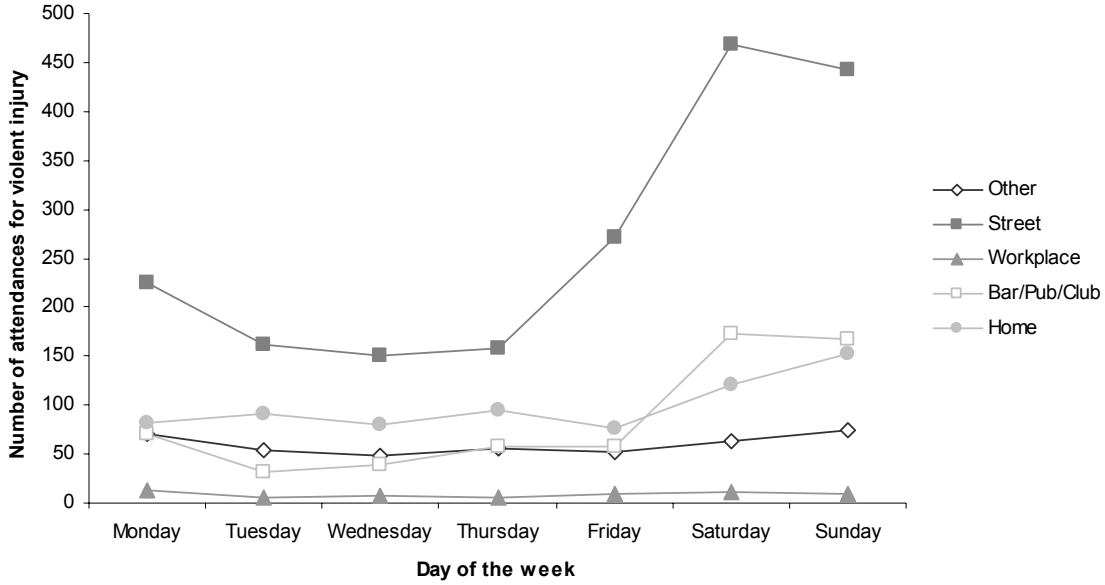


Figure 1 - Distribution of violent injury by assault site (Cardiff, 2006).

Costs of Violent Crime

The costs of violent crime detailed below are adapted from those described by Brand and Price (2000) and Dubourg and Hamed (2004). Prices indicated by the authors in their respective works were dependent upon the costs of goods and services at the time of publication. As the relative costs of goods and services increase with inflation, it was necessary to adjust these figures accordingly to reflect prices in 2007. The Office for National Statistics details monthly trends in the Retail Price Index (RPI), an indicator of inflation over a given time period. In order to calculate the updated costs of goods and services, the original costs are multiplied by the percentage increase in RPI between the two periods. For example, the RPI for August 1999 was 165.5 and the RPI for August 2007 was 207.3. Therefore, an item or service that cost £15,000 in August 1999 will cost approximately £18,789 in 2007[3].

[3] (207.3/165.5)*£15,000 = £18,789

Cost per person as a consequence of violent incident (£) (Brand & Price, 2000) updated for 2007 prices

	Emotional and physical impact on victims	Lost output	Victim services	Health services	Average
Wounding (serious and slight)	14,976	2496	7	1498	18977
Serious wounding	121,056	17472	7	10,608	149,144
Other wounding	150	499	7	250	906

Table 1 - Available estimates place the total average costs of violent crime at approximately £19,000 per victim.

Table 1 sets out the average cost to the victim and to the health services, of a non-fatal assault in the UK, as detailed by Brand and Price (2000). Brand and Price (ibid.) estimated that the direct emotional and physical cost of violent crime in England and Wales for the financial year 1999-2000 was over £14 billion. Not included in these costs is the estimated £5 billion spent "in anticipation of crime" (p.54), i.e. security expenditure and insurance administration costs and costs associated with the fear of crime (Moore, 2006). This figure does not include police expenditure on crime prevention. The costs as a consequence of violent crime include unpaid time off work, paid time off work (including lost output for the victim's employer), reduced efficiency at work, reduced enjoyment of leisure or social activities and increased fear, the emotional and physical consequences of violent victimisation and cost to victim services. Brand and Price made their estimations of the costs of violent crime using figures obtained from a Department of the Environment, Transport and Regions study of the costs of Road Traffic Accidents. These estimates included costs of loss of output due to injury, ambulance costs and the costs of hospital treatment, and human costs, which were calculated using Willingness to Pay (WTP) values. There is a recognised need for more accurate assessments of the costs of violent crime (Dolan & Moore, 2007) in particular approximations that account for the intangible costs of victimisation (Moore, 2006). Despite uncertainties in the Home Office estimates, they do provide an indication of costs that at least highlight the relative values of reducing violent crime. For the purposes of this report, we will take £19,000 as the cost of the consequences of violent crime. This is likely to be a gross underestimate as A&E data typically concerns more serious crimes (and therefore greater costs).

Dubourg and Hamed (2004) offered a re-evaluation of the costs of violent crime using a different methodology and a different definition of wounding (Table 2). These new estimates were based on evidence from victims about the actual outcomes of violent offences and quality of life-adjusted estimates. They also weighted their unit costs of violent victimisation by the probability of these costs actually being incurred, rather than the actual cost of their use. For example, costs to victim services were weighted by the probability that a victim of violence will actually utilise these services, which may substantially reduce the cost of some services. Therefore, such estimated costs are likely to be considerably lower than those estimated by Brand and Price. Dubourg and Hamed (2004) did not distinguish between the health-related impacts of different types of wounding, therefore estimating the cost of the physical and emotional impact on victims, lost output, victim services and health services costs of any non-fatal violence (excluding rape) at £7,075. Upon adjusting for inflation, this figure is approximately equal to £7,825 in 2007.

Cost per person as a consequence of violent incident (£) (Dubourg & Hamed, 2004) updated for 2007 prices

	Emotional and physical impact on victims	Lost output	Victim services	Health services	Average
Wounding (serious and slight)	5,037	1,290	8	1491	7,825
Serious wounding	5,037	1,290	8	1491	7,825
Other wounding	5,037	1,290	8	1491	7,825

Table 2 - Available estimates place the total average costs of violent crime at £7,825 per victim.

The costs to policing services and the Criminal Justice System (CJS) are outlined in Table 3 below.

Cost to policing and Criminal Justice System per violent incident (£) (Dubourg & Hamed, 2004) updated for 2007 prices

	Defensive Expenditure	Criminal Justice System
Wounding (serious and slight)	2	1,775
Serious wounding	2	14,345
Other wounding	2	978

Table 3 - Policing and CJS costs per violent incident.

Estimates for the costs of violent crime to each CDRP have been made below using the recommended figures cited by both Brand and Price (2000) and Dubourg and Hamed (2004). These estimates are referred to as “Brand and Price” and “Dubourg and Hamed”, respectively. Estimates are updated for 2007 prices using Retail Prices Indices (RPI).

Also detailed below are the potential personal and health-based savings based on a hypothetical 10% reduction in A&E attendances within an area. Potential savings for the CJS of an area are also included. The potential CJS savings are highly speculative as they assume that all woundings are detected by the police and are consequently dealt with by the CJS. In addition, it is likely that a 10% reduction in violent injuries treated in an A&E would require a large increase in policing, i.e. defensive expenditure. Reliable estimates for such costs are not available. Therefore, potential costs and/or savings for this aspect of violent crime have been avoided. These prices are adapted from Dubourg and Hamed (2004) and have been updated for 2007 prices using RPI.

Data and Analyses

iQuanta

iQuanta is a web-based system that provides performance management information about policing performance. It was set up in October 2003 and information contained within iQuanta is submitted by police forces to the Home Office on a monthly basis. Violent crime data for all CDRPs and CSPs were accessed from April 2000 to March 2007 and were classified as either Section 5 (serious offences) or Section 8A and 8D (less serious violent offences).

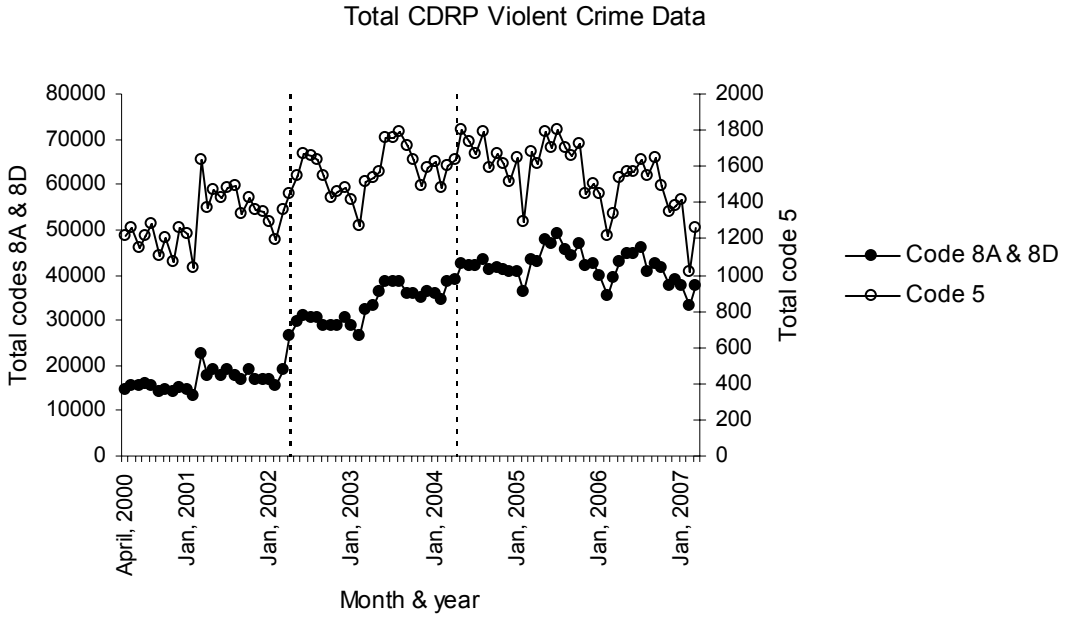


Figure 2 - Total iQuanta Data for England and Wales. The vertical dotted lines indicate the period of interest in this report.

Police recorded crime trends were disrupted by the introduction of the National Crime Recording Standard in April 2002 (especially for violence) and this effect persisted for at least two years after its introduction. This change led to all reports of incidents; whether from victims, witnesses or third parties, and whether crime related or not, being recorded (see also dotted lines in Figure 2). This obviated the need for police personnel to make judgements about whether reported incidents constituted crimes.

Hospital and affiliated CDRP data

St Mary's Hospital, Isle of Wight

St Mary's Hospital on the Isle of Wight provides an excellent case through which the relationship between A&E data and CDRP data can be assessed. The Isle of Wight CDRP is coterminous with the population served by St Mary's Hospital. This is almost the only hospital in the UK where coterminosity is assured (Noble's Hospital on the Isle of Man Hospital may be another example).

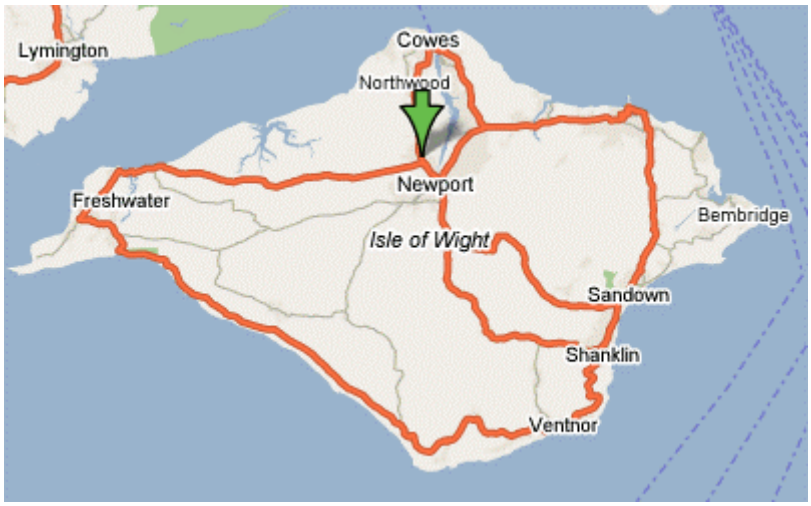


Figure 3 - St Mary's Hospital on the Isle of Wight is coterminous with the Isle of Wight, Hampshire CDRP (map ©2007 Google).

Figure 4 presents both monthly CDRP data for serious (Section 5) and less serious (Sections 8A and 8D) violent offences alongside the available A&E attendance data. It suggests that serious violent crime is rare on the Isle of Wight with usually no more than one such offence per month.

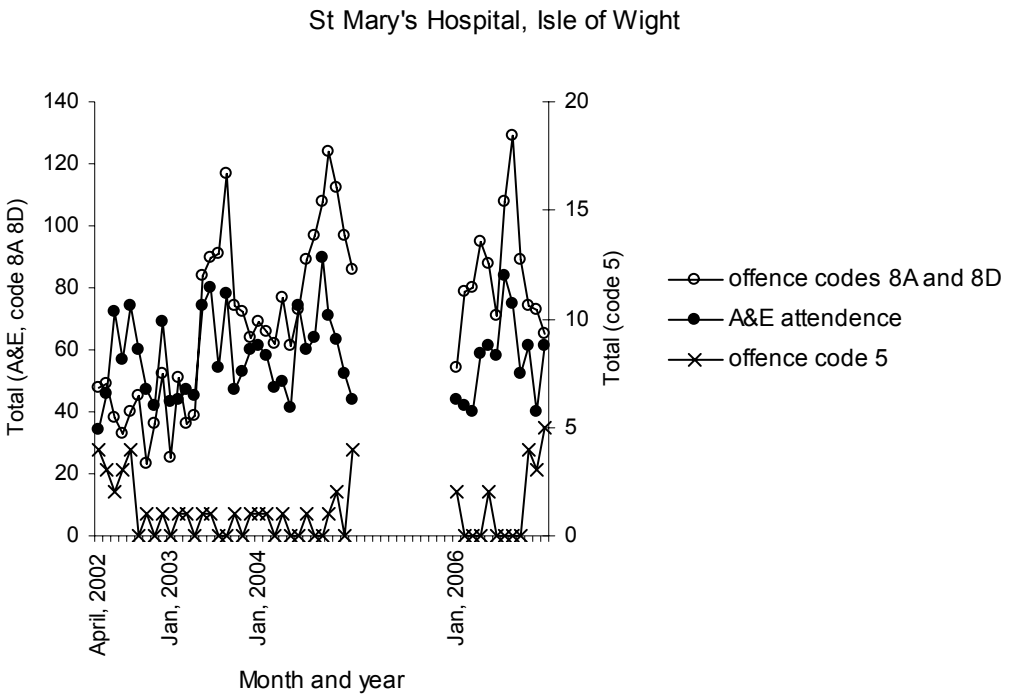


Figure 4 - Total Assault related injury and CDRP recorded violent offences (codes 5, serious wounding and 8A and 8D, less serious wounding).

Table 4 presents annual totals for both CDRP and A&E data together with cost estimates from Home Office statistics. For each year where A&E data are available, the estimated victim costs according to A&E data were approximately £10.5M. Furthermore, because the number of A&E cases was less than the total numbers of CDRP cases this *suggests* that a fraction of violent incidents observed in CDRP data results in serious injury requiring A&E treatment. However, this conclusion is seriously confounded by the aggregate nature of these data. The A&E data and CDRP data could conceivably be from different populations. There is no available means of using these data to assess whether all A&E attendances were present in the CDRP data.

Year	A&E	CDRP offence code			Percentage	Estimated Costs (£M)	
		5	8A & 8D	Total		Brand and Price (2007 prices)	Dubourg and Hamed (2007 prices)
2003	686	7	812	819	83%	12.84	5.37
2004	715	10	1052	1062	67%	13.38	5.59
2006	677	16	1005	1021	66%	12.67	5.30

Table 4 – Annual violence totals (for complete years only) for A&E and CDRP and A&E totals as a percentage of CDRP total.

	Physical and emotional impact on direct victims (£)	Victim services (£)	Lost output (£)	Health services (£)	CJS (wounding) (£)	Average (£)
Hypothetical savings	308,306	474	78,938	91,260	120,168	599,145

Table 5 - Area saving based on a hypothetical 10% reduction in A&E-treated violent incidents.

Isle of Wight Crime and Disorder Reduction Partnership

The Isle of Wight CDRP was established in 1999. It is responsible for managing the safety of a population of approximately 140,000 people. The group is made up of police and local authority representatives. A Violence and Damage Group has been in existence since June 2007. There is also a separate Domestic Abuse Forum, which meets on a quarterly basis. The CDRP has access to a police data analyst, and it is currently seeking (as of August 2007) to appoint a Partnership Analyst. The group utilises data from the following sources: Police incidents, police recorded crime and, from January 2007, A&E admissions data.

Violence Prevention Activities

- Town centre managers have been employed since Autumn 2007. This is an ongoing project (cost £650,000 per annum, funded by Local Authority).
- CCTV is in use. Modernisation and expansion of the CCTV network is planned for 2008 (funded by Local Authority).

- Youth schemes have been running since 2006. This is ongoing (cost £50,000 for two years, funded by LPSA2). In addition, there are a number of drug and alcohol rehabilitation measures in position.
- Police use A&E data to identify licensed premises associated with high rates of injury.

University Hospital of Wales

The Cardiff area has shown a year on year reduction in violent injury according to A&E data from the university Hospital of Wales, the only A&E unit within the County of Cardiff city centre area.

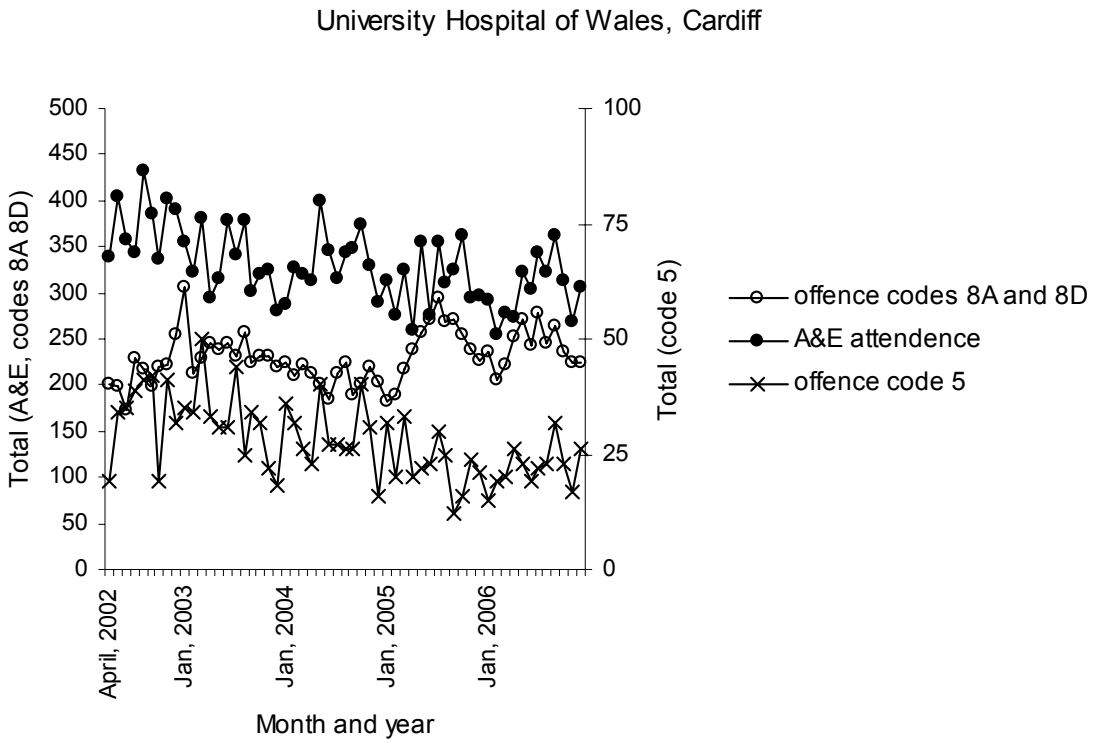


Figure 5 - Total Assault related injury and CDRP recorded violent offences (codes 5, serious wounding and 8A and 8D, less serious wounding).

Table 4 indicates that the A&E unit treated more assault victims than are recorded by Cardiff CDRP suggesting the A&E unit receives patients from outside the Cardiff CDRP or that some assaults relating in injury are not recorded in the Cardiff CSP.

Year	A&E	CDRP offence code			Percentage	Estimated Costs (£M)	
		5	8A & 8D	Total		Brand and Price (2007 prices)	Dubourg and Hamed (2007 prices)
2003	3994	389	2871	3260	123%	74.77	31.25
2004	3992	350	2507	2857	140%	74.73	31.24
2005	3742	278	2911	3189	117%	70.05	29.28
2006	3643	265	2906	3171	115%	68.20	28.51

Table 6 - Annual violence totals (for complete years only) for A&E and CDRP and A&E totals as a percentage of CDRP total.

	Physical and emotional impact on direct victims (£)	Victim services (£)	Lost output (£)	Health services (£)	CJS (wounding) (£)	Average (£)
Hypothetical saving	1,659,022	2,550	424,773	49,1076	646,633	3,224,055

Table 7 - Area saving based on a hypothetical 10% reduction in A&E-treated violent incidents.

Cardiff Community Safety Partnership

The Cardiff CSP was established in April 1999, and is responsible for a population of approximately 320,000 people, compared with the estimated catchment population of UHW of 500,000. The CSP strategic partners meet on a bimonthly basis, and aim to reduce all categories of crime and fear of crime in the area. A Violent Crime Task Group has been in existence in its current format since July 2000. There is a separate Task Group concerned with reducing domestic violence. The Violent Crime Group is made up of representatives from Police, Local Authority, NHS, Cardiff University, Licensees and Victim Support. The CSP has access to an analyst. The CSP utilises data from the following sources: Police incidents (since 1997), police recorded crime (since 1997), fire service records of emergency calls (since 2007), A&E records (since 1997), ambulance service data and some violence in schools data.

Violence Prevention Activities

- CCTV has been in use since 1995.
- Taxi marshals have been employed since 2006.
- Extra buses were run at night from 2004, but now only operate on New Years Eve.
- The Targeting Alcohol-related Street Crime (TASC) Project ran formally between 1999 and 2002, but still operates in principle with many aspects mainstreamed.
- Weapon amnesties have been run as determined by central government.
- The Lion's Breath project, which objectively determined alcohol misuse and harm in the city centre and implemented server training in licensed premises.
- City centre mobile and static Medical response team.
- A nighttime economy coordinator will be appointed in the near future.

Royal Sussex County Hospital

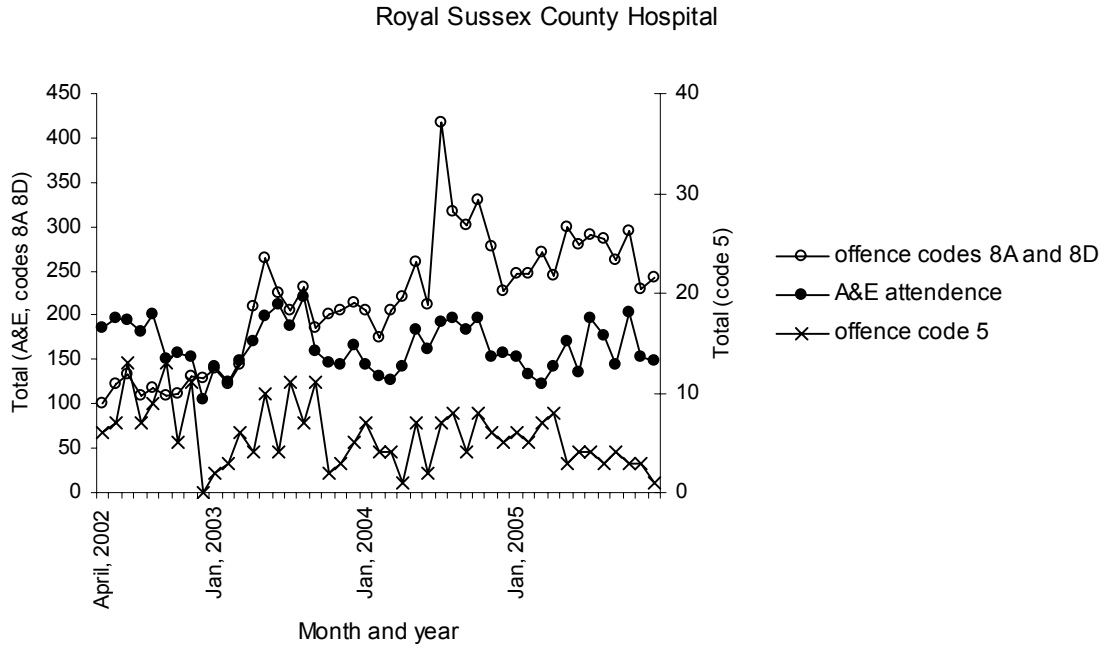


Figure 6 - Total Assault related injury and CDRP recorded violent offences (codes 5, serious wounding and 8A and 8D, less serious wounding).

Year	A&E	CDRP offence code			Percentage	Estimated Costs (£M)	
		5	8A & 8D	Total		Brand and Price (2007 prices)	Dubourg and Hamed (2007 prices)
2003	2017	68	2346	2414	84%	37.76	15.78
2004	1967	63	3147	3210	61%	36.82	15.39
2005	1879	51	3193	3244	58%	35.17	14.70

Table 8 - Annual violence totals (for complete years only) for A&E and CDRP and A&E totals as a percentage of CDRP total.

	Physical and emotional impact on direct victims (£)	Victim services (£)	Lost output (£)	Health services (£)	CJS (wounding) (£)	Average (£)
Hypothetical saving	855,697	1,315	219,091	253,289	333,522	1,662,915

Table 9 - Area saving based on a hypothetical 10% reduction in A&E-treated violent incidents.

Brighton Crime and Disorder Reduction Partnership

The Brighton CDRP has been in existence since 1998. It is responsible for a population of approximately 250,000 people. A separate Violent Crime Group was established in 1999. This group consists of police, council, a performance-monitoring officer, a drug and alcohol team, A&E staff, licensees, environmental health and fire and rescue service representatives. Activities of this group include intervention performance reviews, police enforcement reviews, the development of an action plan, street level interventions, safety standards for licensed premises and hot spot analysis. The CDRP has access to police analysts and CADDIE (Crime and Disorder Data Information Exchange). The CDRP has access to and uses the following data: Police recorded crime (since January 2004), fire service records of emergency calls (since August 2006), A&E data was available until June 2007, and ambulance service data (since 2002).

Violence Prevention Activities

- Police Community Support Officers (PCSO) operates in the city centres. CCTV has been in use in the area since 1999.
- A scheme offering extra buses at night has been ongoing since February 2006 (funded by Brighton and Hove Bus Company).
- Intermittent alcohol misuse campaigns have been conducted.
- Home Office Weapons Amnesties.
- 2 “Sussed about drugs” websites in place (cost £25,000 annually, funded by the CDRP).
- Private security guards (£45,000 annually, funded by Business Improvement Areas).

North Devon & District Hospital

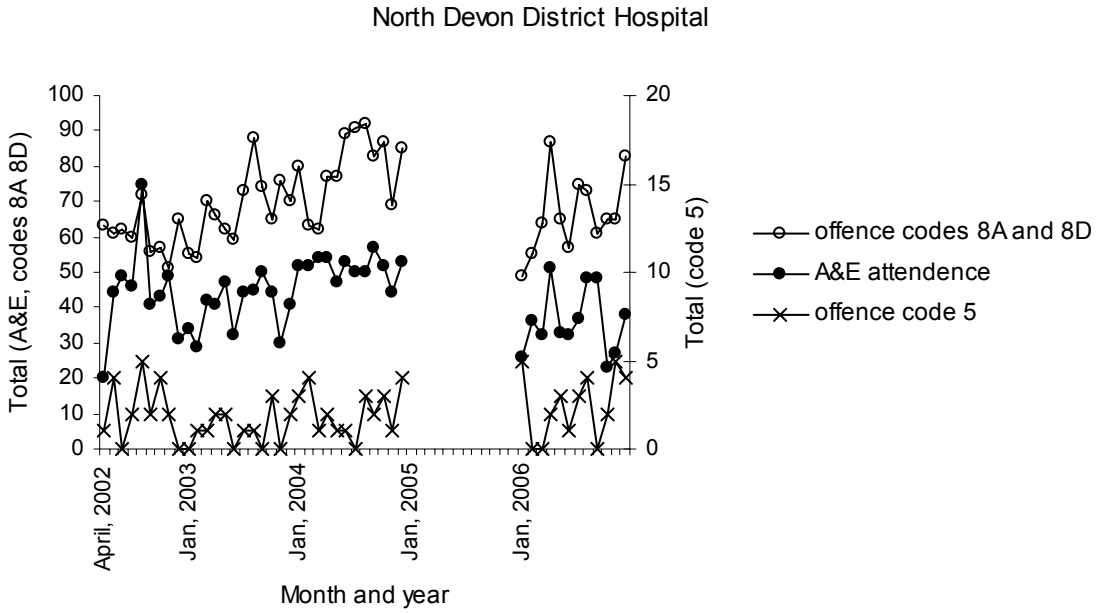


Figure 7 - Total Assault related injury and CDRP recorded violent offences (codes 5, serious wounding and 8A and 8D, less serious wounding).

Year	A&E	CDRP offence code			Percentage	Estimated Costs (£M)	
		5	8A & 8D	Total		Brand and Price (2007 prices)	Dubourg and Hamed (2007 prices)
2003	479	13	812	825	58%	8.97	3.75
2004	618	25	955	980	63%	11.57	4.84
2006	431	29	799	828	52%	8.07	3.37

Table 10 - Annual violence totals (for complete years only) for A&E and CDRP and A&E totals as a percentage of CDRP total.

	Physical and emotional impact on direct victims (£)	Victim services (£)	Lost output (£)	Health services (£)	CJS (wounding) (£)	Average (£)
Hypothetical saving	196,277	302	50,255	58,099	76,503	381,435

Table 11 - Area saving based on a hypothetical 10% reduction in A&E-treated violent incidents.

North Devon and Torridge District joint CDRP

The North Devon and Torridge District joint CDRP (Safer North Devon) was established in 1998 and is responsible for a population of approximately 155,700 people. The estimated catchment population of North Devon District Hospital is 160,000. The CDRP does not have a separated Violent Crime group. However, it does have two Domestic Violence groups and fora. A DV Strategic action plan is available. DV groups meet bi-monthly. The CDRP's Domestic Violence groups have limited access to an analyst. The CDRP utilises the following data: Police incidents (since 1998), police recorded crime (since 1998), Registered Social Landlords (RSL; since 2003), school exclusions data (since 2004) and ambulance service data (since 2004).

Violence Prevention Activities

- CCTV since 1997.
- Intermittent alcohol misuse campaigns (estimated total cost £12,000, funding Safer Devon Partnership).
- Rural 'head camera' project ran between 2006 and 2007 (domestic violence; cost £9,000, funded by Safer Devon Partnership).
- Weapons detectors in licensed premises (cost £2,200, funded by Safer Devon Partnership).
- Youth schemes.
- "Addressing Controlling Behaviour" available through probation services.
- A number of substance misuse initiatives.
- Pattern changing for victims of Domestic Violence (costs £8,600 p/a, funded by Devon County Against Domestic Violence and Abuse).

Hinchingbrooke Hospital

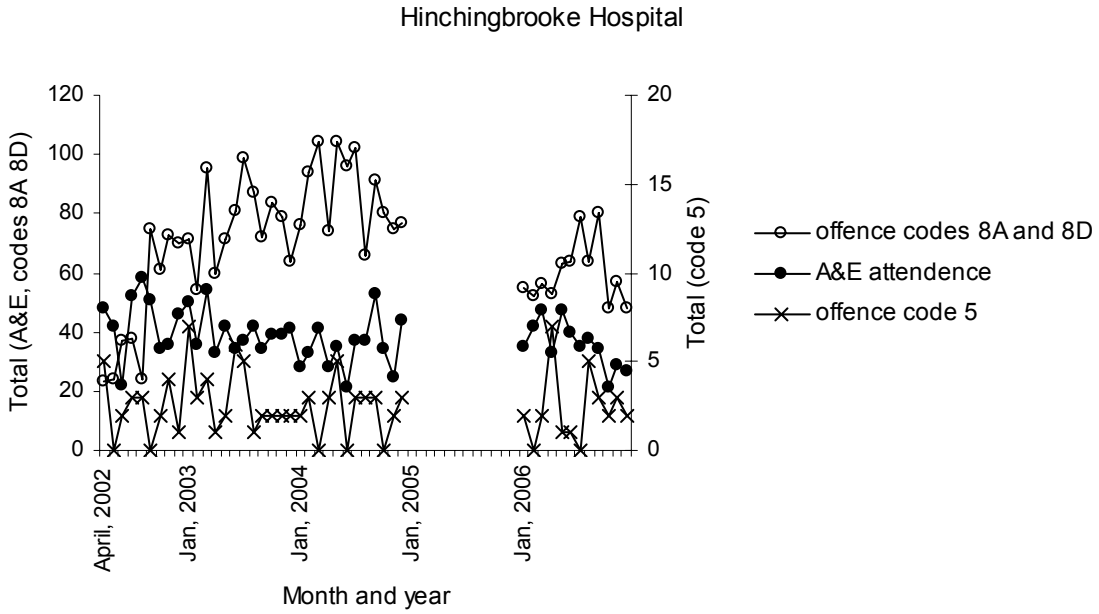


Figure 8 - Total Assault related injury and CDRP recorded violent offences (codes 5, serious wounding and 8A and 8D, less serious wounding).

Year	A&E	CDRP offence code			Percentage	Estimated Costs (£M)	
		5	8A & 8D	Total		Brand and Price (2007 prices)	Dubourg and Hamed (2007 prices)
2003	481	37	917	954	50%	9.00	3.76
2004	416	27	1039	1066	39%	7.79	3.26
2006	428	28	719	747	57%	8.01	3.35

Table 12 – Annual violence totals (for complete years only) for A&E and CDRP and A&E totals as a percentage of CDRP total.

	Physical and emotional impact on direct victims (£)	Victim services (£)	Lost output (£)	Health services (£)	CJS (wounding) (£)	Average (£)
Hypothetical saving	194,911	300	49,905	57,694	75,970	378,780

Table 13 - Area saving based on a hypothetical 10% reduction in A&E-treated violent incidents.

Huntingdonshire Crime and Disorder Reduction Partnership

The Huntingdonshire CDRP came into existence in 1998, and is responsible for a population of approximately 166,000 people. The estimated catchment population of Hinchingbrooke Hospital is 160,000. The CDRP does not have a separate Violent Crime Group. However, there is a problem-solving group that takes action on relevant issues as and when necessary. The activities of the group are to assess and analyse problem areas and the policing of these areas. An analyst is available to the CDRP on a part-time basis. The CDRP has access to the following data: Police incidents (since 2000), police recorded crime (since 2000), Council records of antisocial behaviour (since 2003), A&E data (since 2004) and ambulance service data (2005). There is a full-time domestic violence coordinator for the area.

Violence Prevention Activities

- There are a number of PCSOs in place in the area (Cost £500,000 for 3 years, funded by District Council and Additional Government funding). These PCSOs have now been mainstreamed by Cambridgeshire Constabulary, resulting in no reduction in the number of PCSOs in Huntingdonshire.
- All four market towns within the CDRP area have CCTV (cost £300,000 per annum. Set-up cost was £1.8m).
- Extra buses at night.
- Two separate alcohol misuse campaigns – Pubwatch (no cost) and Huntingdon Business Against Crime (HBAC; Cost £160,000 approx).
- Domestic violence mobile units.
- Domestic Violence Advocacy Service.
- Domestic Violence campaigns run throughout the year.
- Home Office Weapons Amnesties.
- Ongoing partnership with Registered Social Landlords and Cambridgeshire County Council to deal with ASB-youth (funded by

Single Regeneration, Oxmoor Opportunities Fund, Government Grants).

- Extra buses are funded by a nightclub located close to one of the market towns.

Darlington Memorial Hospital

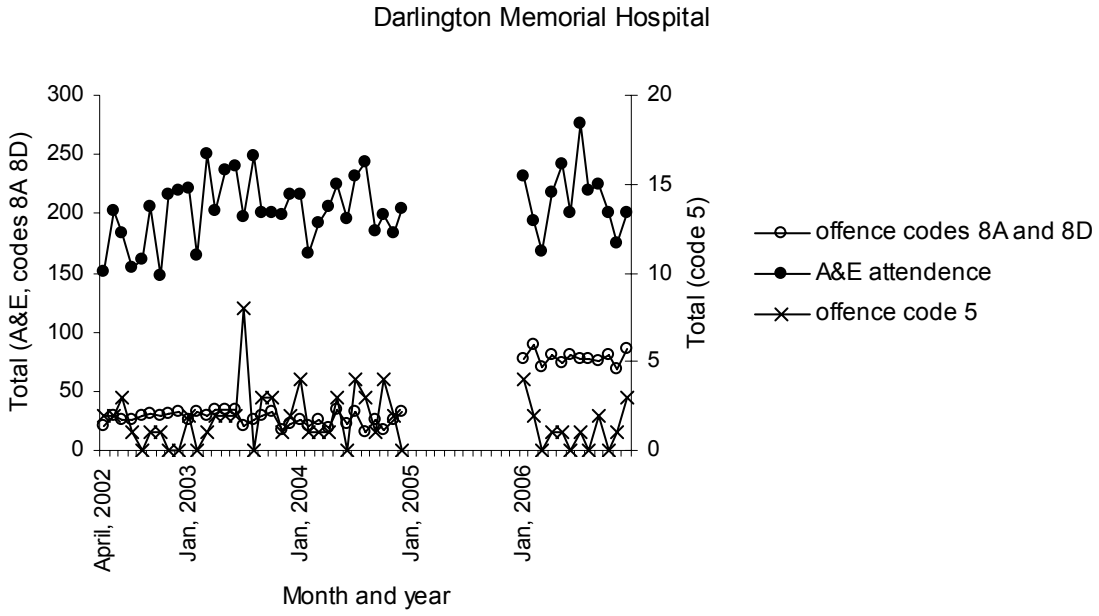


Figure 9 - Total Assault related injury and CDRP recorded violent offences (codes 5, serious wounding and 8A and 8D, less serious wounding).

Year	A&E	CDRP offence code			Percentage	Estimated Costs (£M)	
		5	8A & 8D	Total		Brand and Price (2007 prices)	Dubourg and Hamed (2007 prices)
2003	2576	26	340	366	703%	48.22	20.16
2004	2447	24	294	318	769%	45.81	19.15
2006	2549	15	940	955	266%	47.72	19.95

Table 14 – Annual violence totals (for complete years only) for A&E and CDRP and A&E totals as a percentage of CDRP total.

	Physical and emotional impact on direct victims (£)	Victim services (£)	Lost output (£)	Health services (£)	CJS (wounding) (£)	Average (£)
Hypothetical saving	1,160,815	1,784	297,213	343,605	452,448	2,255,865

Table 15 - Area saving based on a hypothetical 10% reduction in A&E-treated violent incidents.

Darlington CDRP

Darlington CDRP was established in 1998. It is responsible for a population of approximately 99,000 whereas the catchment population of Darlington Memorial Hospital is 250,000. A Violent Crime group was established in October 2005. The group meets on a fortnightly basis to identify trends in violence and to identify suitable action to be taken. There is a separate group for domestic violence. The CDRP meets on a quarterly basis. The police are in the process of hiring an analyst to support the CDRP. They also have access to the police analyst. The CDRP uses the following data: Police incident (since 2001) and police-recorded crime (since 2001).

Violence Prevention Activities

- City centre wardens (since 2001, cost breakdown - £495,000 salary p/a, £350,000 capital to install and approx £87,500 running costs p/a, funded by Local Authority).
- CCTV since 1994 (funded by Local Authority).
- Alcohol Enforcement Campaign between November 2006 and January 2007 (cost £30,000, funded by Local Authority).
- Safer Schools partnership (since 2007, cost £100,000 approx., funded by Local Area Agreement).
- Youth schemes take place in hot spot areas when necessary.
- Anger management classes run as part of Youth Offending/Parenting service.
- Drug Intervention Team (since March 2005, cost £182,147, funded by Home Office).

Bassetlaw District General Hospital

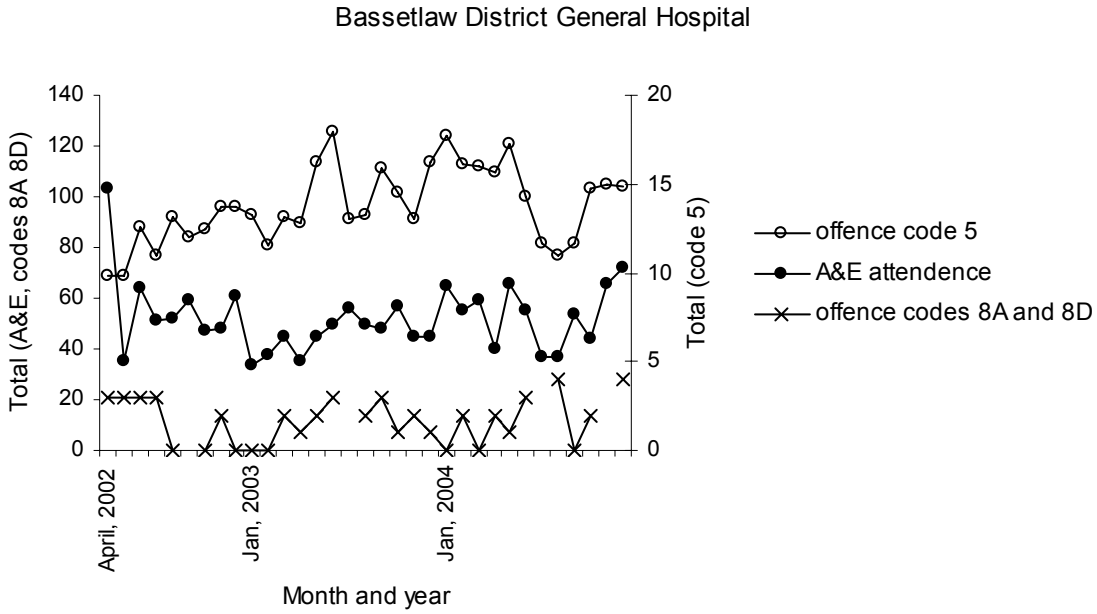


Figure 10 - Total Assault related injury and CDRP recorded violent offences (codes 5, serious wounding and 8A and 8D, less serious wounding).

Year	A&E	CDRP offence code			Percentage	Estimated Costs (£M)	
		5	8A & 8D	Total		Brand and Price	Dubourg and Hamed
2003	548	16	1198	1214	45%	10.26	4.29
2004	650	16	1233	1249	52%	12.17	5.09

Table 16 - Annual violence totals (for complete years only) for A&E and CDRP and A&E totals as a percentage of CDRP total.

	Physical and emotional impact on direct victims (£)	Victim services (£)	Lost output (£)	Health services (£)	CJS (wounding) (£)	Average (£)
Hypothetical saving	296,010	455	75,790	87,620	115,375	575,250

Table 17 - Area saving based on a hypothetical 10% reduction in A&E-treated violent incidents.

Bassetlaw, Newark and Sherwood Community Safety Partnership

Some form of CDRP has been in existence in the Bassetlaw, Newark and Sherwood areas since 1998. This CDRP is responsible for a population of approximately 215,000, whereas Bassetlaw District General Hospital's estimated catchment population is 120,000. The CDRP also has a separate Violent Crime group, which was established in December 2006. There is an analyst available to the group. Police-recorded crime data have been available to this group for analysis since December 2006.

Violence Prevention Activities

- CCTV is available in Newark and Sherwood. This scheme has been ongoing since 1999. CCTV is being put in place in Bassetlaw (cost - £350,000, annual revenue - £200,000, initial funding was provided by Council (£350,000) and Local Businesses (£50,000).
- A Town Centre Violent Crime initiative was run between December 2006 and March 2007 (cost £30,000, funded by Home Office).

Peterborough District Hospital

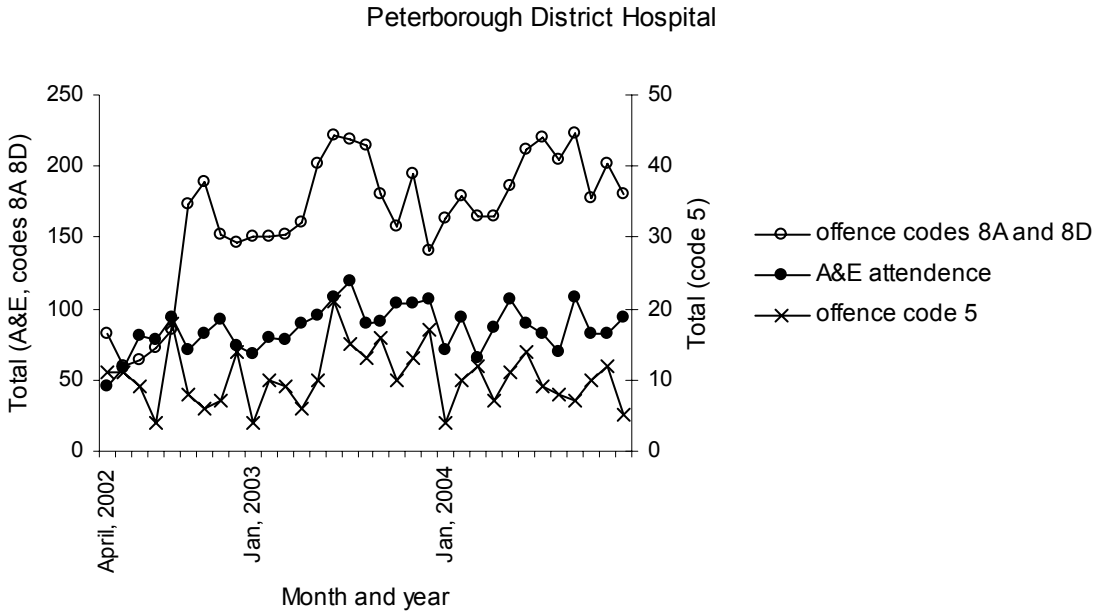


Figure 11 - Total Assault related injury and CDRP recorded violent offences (codes 5, serious wounding and 8A and 8D, less serious wounding).

Year	A&E	CDRP offence code			Percentage	Estimated Costs (£M)	
		5	8A & 8D	Total		Brand and Price (2007 prices)	Dubourg and Hamed (2007 prices)
2003	1133	144	2143	2287	50%	21.21	8.87
2004	1032	109	2279	2388	43%	19.32	8.08

Table 18 – Annual violence totals (for complete years only) for A&E and CDRP and A&E totals as a percentage of CDRP total.

	Physical and emotional impact on direct victims (£)	Victim services (£)	Lost output (£)	Health services (£)	CJS (wounding) (£)	Average (£)
Hypothetical saving	469,973	722	120,331	139,117	183,180	913,320

Table 19 - Area saving based on a hypothetical 10% reduction in A&E-treated violent incidents.

Peterborough Community Safety Partnership

Peterborough Community Safety Partnership came into existence in 1998. It is responsible for a population of approximately 163,000 people whereas the estimated catchment population of Peterborough District Council is 432,000. The partnership consists of a Domestic Violence Forum (established in 1996), Peterborough Evening Partnership (established in 2004), which deals with alcohol-related violent crime and Peterborough Open Out Scheme (established in 2001), which covers hate crime. The National Intelligence Model (NIM) deals with robbery. The Peterborough Domestic Violence Forum is made up of representatives from over 30 organisations, including Police, Local Authority, Health Services, Probation, Local Children Safeguarding Boards, Women's Aid, Social Services and Victim Support. The Peterborough Evening Partnership consists of representatives from the Police, Peterborough City Council, licensees, Drink Sense and trading Standards. Peterborough Open Out consists of representatives from the Police, Local Authority, Victim Support, local voluntary agencies and Registered Social Landlords. The aims of the Domestic Violence Forum are to enable efficient cooperation between agencies and professionals that support people affected by DV. An action plan is available. A Community Safety Research and Information Officer works as part of the Community Safety Team. The CSP utilises data from the following sources: police incidents, police recorded crime, fire service emergency calls, Safer Schools Partnership data and school exclusions.

Violence Prevention Activities

- City Centre Wardens have been in place since 2003.
- CCTV has been in use since 1997 (cost £900,000, funded by Peterborough City Council).
- Alcohol Misuse Enforcement Campaign (Home Office).

- Intermittent Domestic Violence Enforcement Campaign (costs £15,000, funded by Home Office).
- Home Office weapons amnesties.
- Safer Schools Partnership (since 2005).
- Youth schemes (funded by local businesses, Peterborough City Council and Police).

Stoke Mandeville Hospital

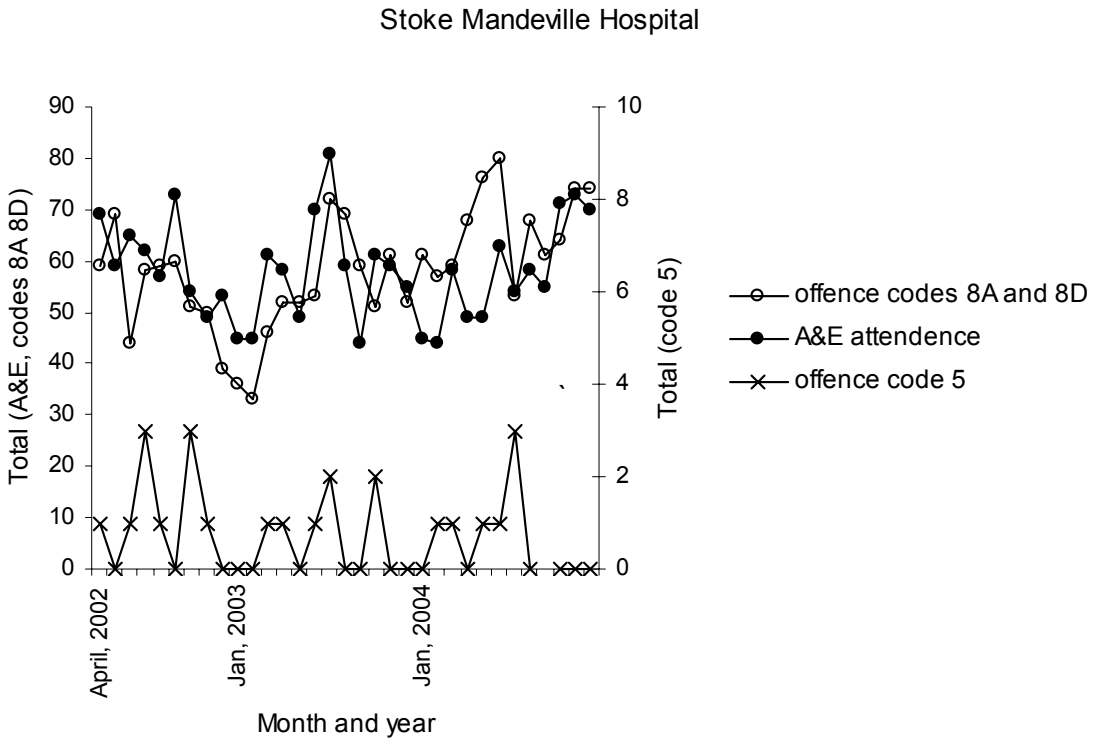


Figure 12 - Total Assault related injury and CDRP recorded violent offences (codes 5, serious wounding and 8A and 8D, less serious wounding).

Year	A&E	CDRP offence code			Percentage	Estimated Costs (£M)	
		5	8A & 8D	Total		Brand and Price	Dubourg and Hamed
2003	687	7	636	643	106%	12.86	5.38
2004	689	7	795	802	85%	12.90	5.39

Table 20 – Annual violence totals (for complete years only) for A&E and CDRP and A&E totals as a percentage of CDRP total.

	Physical and emotional impact on direct victims (£)	Victim services (£)	Lost output (£)	Health services (£)	CJS (wounding) (£)	Average (£)
Hypothetical saving	313,771	482	80,337	92,877	122,298	609,765

Table 21 - Area saving based on a hypothetical 10% reduction in A&E-treated violent incidents.

Aylesbury Vale Community Safety Partnership

The Aylesbury Vale Community Safety Partnership has been in existence since 1998, and is responsible for a population of approximately 168,000 people, compared with an estimated catchment population for Stoke Mandeville Hospital of 500,000. While the partnership does not have a separate Violent Crime Group, it does have a *Domestic Violence Champions Group*. The activities of this DV group were to establish the effectiveness of ongoing interventions and to discuss potential future interventions. The CDRP has a Violent Crime Action Plan and a county-wide DV Strategy. There is a Police Violent Crime analyst in the area who can utilise data relating to *police incidents* and *police recorded crime*.

Violence Prevention Activities

- Police community support officers (PCSO) work in the town centre during the daytime. This activity has increased in recent years.
- The town centre is equipped with CCTV (funded by Local Authority and Police).
- A Thames Valley Police Alcohol campaign has begun recently.
- A Domestic Violence publicity campaign will be running between November 2007 and March 2008 (cost - £3,000, funded by LPSA 2 Pump Priming Funding).
- Home Office Weapons Amnesty.
- There is a Safer Schools Partnership in place.
- Addressing controlling behaviour classes have been for three years for perpetrators of violence (cost - £60,000, funded by Local Authorities, County Council and LPSA2 Funding).

Discussion

The above data provide insights into the relationship between CDRP data, A&E data and CDRP activities designed to reduce harm. The Isle of Wight provides an interesting insight into the relationship between CDRP and A&E

data due to the almost certain coterminosity between A&E catchment and CDRP areas, coterminosity which is not assured in other areas. In the above, A&E catchment areas are larger than the population covered by each hospital's local CDRP and that one A&E can therefore cover more than one CDRP. This implies that any use of A&E data must involve geographic information so that incidents can be tied to CDRPs. The Isle of Wight A&E catchment area and the Isle of Wight CDRP populations are the same and these data can therefore provide means to assess the relationship between A&E and CDRP data. In the Isle of Wight, CDRP recorded violence was greater than that recorded in the A&E unit which is consistent with the view that a subset of violent crime is sufficiently serious to require A&E services and that A&E data can therefore provide a measure of serious injury through violence. However, the CDRP and A&E data are not individualised such that we cannot determine the strict relationship between CDRP and A&E recorded violence; it is plausible that a significant proportion of those identified in A&E data are not detected in CDRP data, i.e. the A&E and CDRP populations do not overlap.

Data from the Isle of Wight and elsewhere also suggest that CDRP and A&E data are positively associated (a conjecture which is tested more formally below). This is consistent with the view that both A&E and CDRP counts are caused by the same underlying phenomena, violent crime. However, as CDRP recording practices were changed in 2002 to involve victim self-report data (see above), the criteria for what constitutes violent crime is more arbitrary in CDRP compared to A&E data where it is victims clinical need which defines the crime. Thus, although A&E and CDRP data are positively associated only A&E data can provide a measure of cost, in terms of victim costs.

Despite the Isle of Wight's relatively small size (population of approximately 140,000) the cost savings involved with reducing A&E assault related attendance by 10% is substantial. These savings are related to the A&E units size and in Cardiff, for example, a 10% reduction would reduce costs by an estimated £3.2M – this is particularly poignant because Cardiff A&E shows a

reduction in A&E assault related attendances of over 9% between 2003 and 2006. When comparing these potential savings with the investment made by CDRPs we found that, first, the level of investment did not appear to match the potential savings. For example, £12k was spent on an alcohol misuse campaign and even £0.5M for a three year CCTV project in Huntingdon appears small compared to the potential savings. What was striking, however, was the systematic lack of detailed information available from CDRPs. It is reasonable to assume that interventions should be based on sound evidence and involve rigorous means to evaluate impact. We argue here that A&E data provides one such measure of effectiveness however CDRPs appeared unable to provide detailed information on the activities they have been involved with. So although considerable savings can be made this survey of CDRPs and their associated A&E units suggests a need for greater rigour and accurate measurement so that CDRP activity can be properly evaluated.

Analyses

The relationship between CDRP and A&E data

Having determined in which CDRP each hospital was situated, the iQuanta and A&E data were collated and coded as a panel dataset with total A&E admissions as the dependant variable and minor and serious iQuanta data as the predictors. These monthly count data were analysed using the fixed effects xtpoisson routine in Stata v9 to determine their relationship, if any. The time period was restricted to April 2002 to December 2004, the period in which all nine hospitals have complete data. There were 297 observations across 9 groups. Results indicated positive and significant associations both with Code 5 ($\beta = 0.009$, $z = 8.53$, $p < 0.001$) and Codes 8A & 8D ($\beta = 0.001$, $z = 6.11$, $p < 0.001$). The positive association between both Code 5 and Codes 8A & 8D with A&E data is consistent with the hypothesis that A&E assault related injury and CDRP violent crime are caused by the same phenomena (violent crime).

Summary of Local CDRP Activity by Hospital

To assess whether CDRP activity affected A&E costs, CDRP activities were tabulated and encoded. The following tables provide information on CDRP activity.

				Action plans		Advisers					Data		
	Analyst	**Violent Crime Group**	**Domestic Violence Group**	Violence	DV	Police	Council/LA	NHS	Fire Service	ON	Police data	A&E Data	Other data
Stoke Mandeville Hospital	PT		Y	Y	Y						N	N	N
Royal Sussex County Hospital	PT	Y				Y	Y	Y			Y	Y	Schools
University Hospital of Wales	FT	Y	Y			Y	Y	Y			Y	Y	Schools
Hinchingbrooke Hospital	PT			Y		Y				Y	Y	Y	RSL
Bassetlaw District General Hospital	PT	Y				Y	Y		Y		Y	N	N
Peterborough District Hospital	FT	Y	Y	Y		Y	Y				Y	N	Y
North Devon District Hospital	PT		Y		Y	Y	Y				Y	N	Exclusions
Darlington Memorial Hospital	PT	Y	Y	Y		Y				Y	Y	N	N
St Mary's Hospital	PT	Y	Y	Y		Y	Y				Y	Y	N

Table 22 – Overview of CDRP activity for each hospital.

	Violence Prevention Activities*											
	CCTV	DV	OH	SS	RSL	T	WWW	PS	YS	SM	CW	Other
Stoke Mandeville Hospital	Y		Y	Y								
Royal Sussex County Hospital	Y		Y			Y	Y	Y				
University Hospital of Wales	Y					Y						Y(1)
Hinchingbrooke Hospital	Y	Y	Y		Y	Y			Y			
Bassetlaw District General Hospital	Y											Y(2)
Peterborough District Hospital	Y	Y	Y	Y					Y		Y	
North Devon District Hospital	Y	Y	Y	Y					Y			
Darlington Memorial Hospital	Y		Y	Y					Y	Y	Y	
St Mary's Hospital	Y								Y	Y	Y	

(1) – Medical response team, Lions Breath Project, TASC(Maguire & Nettleton, 2003), Children and Young Peoples Partnership
(2) – Violent crime initiative
* - DV, Domestic Violence; CCTV, Closed circuit surveillance cameras ; OH, Alcohol misuse programmes; SS, Safer schools; RSL, Registered Social Landlords; T, Traffic; WWW, internet self-help pages (e.g. for substance misuse); PS, Private security; YS, Youth schemes; SM, Substance misuse; CW, City centre wardens; Other, e.g. Lions Breath.

Table 23 - Overview of CDRP activity for each hospital.

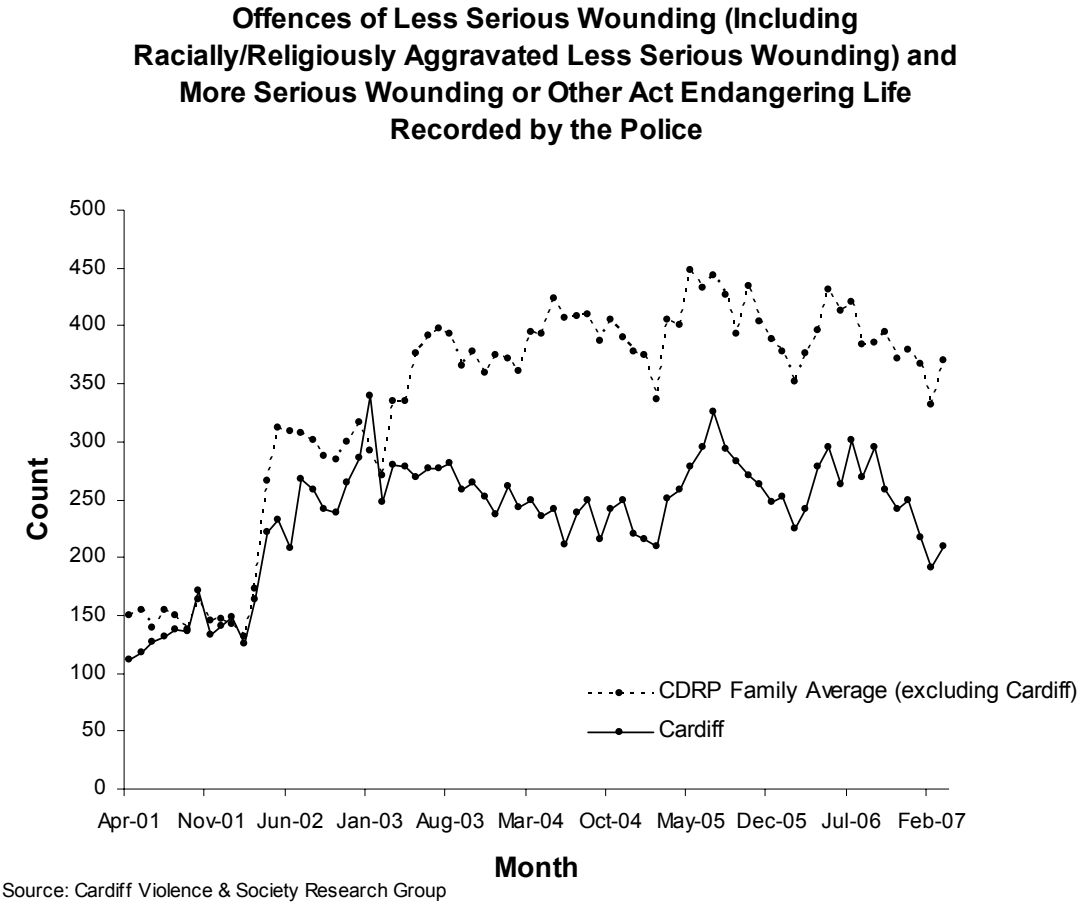
To assess the relationship between CDRP activity and A&E attendance, A&E data were modeled using linear regression. This model provided a very rudimentary indicator of change over time (April 2002 – December 2004) for each A&E unit. A trend score of less than zero indicates that A&E assault related injuries fell over time, while a trend score greater than zero indicates that it increased over time.

The data presented in Table 23 were used to define an activity score. Points were awarded based on extent of violence prevention activity by each CDRP. For example, employing a full-time analyst resulted in two points being awarded. Other full-time violence prevention activities, such as using CCTV, were also awarded two points. Part-time, or short-term violence prevention activities, such as alcohol reduction campaigns, received one point each. One point was awarded for each use of data sources, such as police records, hospital attendance data, Safer Schools data etc. One point was also awarded for each individual violence group, such as having a separate domestic violence group, and one point for having a recent action plan. One point was awarded for each group represented by a CDRP committee. For example, having a group membership that consisted of police, local authority and fire service would receive three points.

Hospital	Trend	Activity	Costs (£M) 2003/2004[§]	A&E
Hinchingbrooke Hospital	-0.008	17	3.26	**Y**
University Hospital of Wales	-0.004	21	31.24	**Y**
Stoke Mandeville Hospital	ns	9	5.39	N
Royal Sussex County Hospital	ns	16	15.39	**Y**
Bassetlaw District General Hospital	ns	9	5.09	N
Darlington Memorial Hospital	0.004	17	19.15	N
St Mary's Hospital	0.005	16	5.59	N
Peterborough District Hospital	0.006	20	8.08	N
North Devon District Hospital	0.008	15	4.84	N

Table 24 – Trends in violent crime compared to level of CDRP activity, use of A&E data and costs of violence to each CDRP.

[§] Dubourg and Hamed (2004) estimates of the costs of violence for each CDRP (updated for 2007 prices)



Source: Cardiff Violence & Society Research Group

Figure 13 – Relationship between number of Cardiff wounding offences and number of woundings in other CDRP family cities.

From 2002 onwards, Cardiff outperformed its CDRP family's average monthly count by approximately 111 incidents per month, a reduction of over 30%. Assuming a cost of approximately £7,085 per offence, this result suggests a net saving of £788k per month. The extent that the use of A&E data contributes towards this saving is unknown. However, even a modest effect may translate into savings which are far greater than the costs of developing and using this resource. Similar analysis in Huntingdon yielded a saving of 20% on their CDRP family from January 2005 onwards (monthly average = 63, CDRP family = 81).

Conclusions

CDRP initiatives are not sufficiently well documented to quantify the resources used to tackle violent crime or to assess their effectiveness. A more transparent system should be implemented in order to track CDRP interventions and facilitate research into CRDP effectiveness.

The cost of criminal wounding has been estimated at between £7,805 and £19,000 per victim. These estimates are, at present, approximations of the true cost of crime to individuals and society. Further development of crime cost estimates is required. A&E records allow an objective estimate of the financial costs of crime, but do not allow for estimations of the emotional costs.

A&E data represent the best available measure of the costs of violent crime and should therefore be used to target CDRP resources. Although CDRP crime (iQuanta) statistics can be used to derive estimates of violent crime incident rates, only A&E data represent an objective measure of the victim costs of violent crime. A&E data allow detailed descriptions of violence rates in an area. They have the potential to be highly effective sources of information in violence prevention, the allocation of medical resources and policy-making. At present, these data are an underused resource.

A positive and statistically significant relationship between changes in A&E assault related treatment rates and CDRP violent crime rates was found. According to police data, increases in violent crime were associated with increases in A&E attendances. However, CDRP and A&E catchment areas were not the same. A&E assault data should be used to inform CDRP activities in their areas.

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