



**QUEEN'S
UNIVERSITY
BELFAST**

Partners in prevention: the role of health systems in the prevention of youth violence in post conflict Northern Ireland

Walsh, C., & Smith, R. (2022). Partners in prevention: the role of health systems in the prevention of youth violence in post conflict Northern Ireland. *Crime Prevention and Community Safety: An International Journal*, 24(4), 369–386 . <https://doi.org/10.1057/s41300-022-00159-9>

Published in:

Crime Prevention and Community Safety: An International Journal

Document Version:

Peer reviewed version

Queen's University Belfast - Research Portal:

[Link to publication record in Queen's University Belfast Research Portal](#)

Publisher rights

Copyright 2022, the Author(s).

This work is made available online in accordance with the publisher's policies. Please refer to any applicable terms of use of the publisher.

General rights

Copyright for the publications made accessible via the Queen's University Belfast Research Portal is retained by the author(s) and / or other copyright owners and it is a condition of accessing these publications that users recognise and abide by the legal requirements associated with these rights.

Take down policy

The Research Portal is Queen's institutional repository that provides access to Queen's research output. Every effort has been made to ensure that content in the Research Portal does not infringe any person's rights, or applicable UK laws. If you discover content in the Research Portal that you believe breaches copyright or violates any law, please contact openaccess@qub.ac.uk.

Open Access

This research has been made openly available by Queen's academics and its Open Research team. We would love to hear how access to this research benefits you. – Share your feedback with us: <http://go.qub.ac.uk/oa-feedback>

Partners in Prevention: The Role of Health Systems in the Prevention of Youth Violence in Post Conflict Northern Ireland

Authors:

Dr Colm Walsh (Corresponding Author), School of Social Sciences, Education and Social Work, Queen's University Belfast, colm.walsh@qub.ac.uk

Dr Ryan Smyth, Western Health and Social Care Trust

Funding:

This project was funded under the Northern Ireland, Cross Executive '*Tackling Paramilitarism and Organised Crime Programme*'

Abstract:

Interpersonal violence is a wicked and complex issue with youth disproportionately affected. Its effects are multifaceted, placing an additional burden across systems. Despite this, there continues to be an exclusive focus on police recorded crime data in the context of post-conflict Northern Ireland. Given the enduring issue around police legitimacy, it is likely that police related crime data is limited in its capacity to estimate incidences and trends of youth violence. Leveraging insights from other sources of data can add significant value in the prevention of youth violence. For example, there is significant utility in the use of health-related data in the prevention of higher-harm violence, however, in the context of Northern Ireland has been significantly under-evaluated. This retrospective cohort study sought to illustrate what could be gleaned using a novel approach to Emergency Department (ED) data. Routinely collected data was captured from youth aged 12-25 attending an ED trauma centre for violence related injuries between August 2020 and August 2021 was collated, coded and analysed. We found that young men were most likely to present to ED with violence related injuries; incidences were temporally clustered across several months of the year (i.e., Summer) and; younger aged youth were at greater risk of violence related injury during afternoon and early evening. These findings illustrate the utility of health data for violence prevention and the potential for integrating administrative datasets in the design of prevention policy. Limitations and implications for practice are discussed.

Keywords: Youth Violence, Public Health, Prevention

Introduction

Partners in Prevention: The Role of Health Systems in the Prevention of Youth Violence in Post Conflict Northern Ireland

Violence is a significant youth issue

Despite significant reductions during the late 1990's, there have become increasing concerns about the increasing frequency and intensity of interpersonal violence. Globally, there are an estimated 500,000 people murdered each year, and this appears to be increasing at an annual rate of 2% (Mitis and Sethi, 2015). Youth violence has received particular policy attention, with academic research consistently demonstrating that young people, particularly young males, are at elevated risk of violence related harms (WHO, 2011; Malik et al, 2020). Globally, five hundred young people die each day as a result of violence (Baxendale, Cross and Johnston, 2012) and the scale is so vast that it may even be the said that most violence is youth violence. Administrative data suggests that interpersonal violence is the second leading cause of death for those aged 10-19 (WHO, 2016; UNICEF, 2017). In the United States, violence related injuries are the leading cause of mortality for adolescents and account for elevated pressure on the health system (Hankin, Wei, Foreman and Houry, 2014). For every fatality, there are approximately twenty other victims who require medical attention (UNODC, 2019). In the UK, researchers have noted the rising trajectory of more serious injuries, including those caused by knives and sharps (Vulliamy et al, 2018; Wortley and Hagell, 2020) with predictions that the Covid-19 era could contribute to increased rates of violence (Ellis et al. 2021; Reid and Baglivio, 2022).

The impact extends beyond the physical impact to also include bio-psychological morbidities (Junger et al. 2001), an indicator of the long arm of harm associated with violence. In the most recent Global Burden of Disease (GBD) both self-directed and interpersonal violence were among the top five causes of global Disability Adjusted Life Years (DALYS), and the leading causes of mortality for individuals in the 10-24 age group (GBD, 2020). This represented a rise in global DALYS between 1990 and 2019. But not all youth appear to be at the same risk. It seems that those in areas of higher deprivation (Hughes et al, 2014) and young males are at elevated risk of violent injury. In Northern Ireland, there is growing

Partners in Prevention: The Role of Health Systems in the Prevention of Youth Violence in Post Conflict Northern Ireland

evidence that violence continues to affect young people in a myriad of ways and despite the transition towards peace, violence is highly clustered in certain communities where young people are exposed in the home and in the community, among peers, all of which take place in the context of ongoing paramilitary violence (Walsh and Gray, 2021; Walsh, 2022).

Indeed, violence is the single most commonly experienced trauma among young people in Northern Ireland (Bunting et al., 2020).

The benefits of leveraging health related data for violence reduction

From both a policy and practice perspective, violence prevention efforts have been traditionally perceived as residing in the realm of justice, with greater focus placed on the deterrent effects of prosecuting perpetrators. This has presented several challenges. Firstly, this siloed approach ignores the impact on victims, the connections between victimisation and perpetration and the wealth of data available that exists across other sectors that could increase preventative insights (Widom, 1989; Lee, Leckman, and Mbwambo, 2017; Hibdon, Telep and Huff, 2021). In contrast to the criminal justice focus on punitive responses, a public health framework places greater emphasis upon an upstream-downstream model (McKinaly, 1979), seeking to understand the needs of most at risk based upon known risk and protective factors. By understanding these more comprehensively, both victims and perpetrators can be supported at the earliest possible stage to prevent violence and interrupt pathways of harm.

From a public health perspective, understanding incidences and trends of violence related harm can help to identify those most at risk of violence, and at the same time, provide a framework for a tiered response (Lee, 2017). To achieve this however, triangulation of data is preferable to a reliance on single sector data. For example, medical records, such as those obtained by Emergency Department (ED) have been shown to add value to insights already established from police recorded crime data (Hibdon, Telep, Huff, 2021; Sutherland,

Partners in Prevention: The Role of Health Systems in the Prevention of Youth Violence in Post Conflict Northern Ireland

Strang, Stepanek, Giacomantonio, Boyle and Strang, 2021). Whilst one could reasonably assume an overlap between health and police data, studies have found that despite some overlap, police data do not fully, or accurately capture the extent of violence in the community (Hibdon et al, 2021). With only a partial view, both operational decisions and policy decisions can be skewed (Weinborn et al, 2017). To illustrate this, Ariel et al (2015) found that almost 20% of ambulance hotspots were not recognised by the police as areas requiring specific police focus. In the United States, it has been estimated that only 41% of violent incidences are known to the police, and in other UK studies, it has been estimated that ambulance data contain between 60% and 90% of incidents that would others not have been recorded by police data only (Sutherland et al,2017; Sutherland et al, 2021). In other areas such as Brazil for example, it has been estimated that there is only a 50% overlap between police recorded rapes and those recorded by medics (Melo et al, 2020). Many incidences go unreported and the reasons for this are themselves complex and multi-faceted (Xie and Baumer, 2019).

The challenge of relying on police recorded data to understand the nature of violence becomes even more challenging in contexts where the legitimacy of the police remains questionable (Walsh, 2020). For example, in Northern Ireland (NI), police-community relations remain tense and despite enduring community violence and paramilitarism, health related data is not routinely joined up nor shared (Walsh and Gray, 2021). In fact, following a series of freedom of information requests in 2019, author one discovered that no health Trust in NI routinely collected violence related data (Walsh, 2019). In other parts of the UK, NHS ED's are required to comply with protocol 'ISB1594', which sets a minimum set of requirements for capturing violence related data. Embedded within this protocol is the expectation for ED staff to collect violence relevant data (e.g., time and date, time and date of arrival at ED, specific location of the incident and primary means of assault) and further,

Partners in Prevention: The Role of Health Systems in the Prevention of Youth Violence in Post Conflict Northern Ireland

share these data with cross sectoral community safety partnerships on a monthly basis ¹.

The rationale for the protocol is clear. Collecting data from the health system and combining this with police and empirical data, enhances our understanding of and responses to the harms associated with interpersonal violence (Ariel et al,2015; Sutherland et al,2021). And there is at least some supporting evidence that this approach pays dividends. Over a ten-year period of information sharing between ED's and Police in Cambridge, UK, assaults reduced by 37%, which some of attributed at least in part to this novel protocol (Boyle et al, 2018).

Secondly, the exclusive focus on justice responses (police, courts, prisons) stresses the primacy on deterrence without sufficient recognition bio-psycho-social factors that contribute towards the increased risk that within a given context, violence becomes more likely (Lee, Leckman, and Mbwambo, 2017). There is a wealth of evidence that victimisation increases the risk of perpetration (Widom, 1989; Kar, 2019). For example, in one NI study, Walsh, Doherty and Best (2021) found that across a custodial sample, youth who had been known to have been victims of violence were nine times more likely to have been convicted for a violent offence than those who had not been victims of violence. Further, in the context of Northern Ireland, youth who had been victims of paramilitary threat and assault were at elevated risk of higher harm violence (e.g., use of sharps). Observations such as these provide cumulative support to what Widom (1989) and others have described as the '*cycle of violence*' (Weaver, Borkowski and Whitman, 2008). The findings are so common that they have been colloquialised across justice fora as the '*victim-perpetrator-overlap*' and demonstrated in multiple studies (see for example (Lansford et al., 2007; Fox et al, 2015). ED's could serve as a site of early intervention, screening those most in distress and those most in need of support (Duffy et al., 2021), thus reducing psychological strain as well as

¹ <https://digital.nhs.uk/data-and-information/information-standards/information-standards-and-data-collections-including-extractions/publications-and-notifications/standards-and-collections/isb1594-information-sharing-to-tackle-violence-minimum-dataset>

Partners in Prevention: The Role of Health Systems in the Prevention of Youth Violence in Post Conflict Northern Ireland

addressing physical harm (Malvaso, Day, Casey and Corrado, 2017; Hasley, 2018; Baglivio, Wolff and Epps, 2021) . By understanding the needs of victims and connecting them to the services they require, at the point that they require them, evidence suggests that the ED environment could help to reduce further harm by reducing the criminogenic effects of victimisation and reducing pressures across the justice, health and social care systems (Carnell et al., 2006; Butts and Delgado, 2017; Watkins et al., 2021).

For example, in one ED based study in the United States, youth aged 18-24 were screened as they were waiting for a clinical assessment (n=300) (Hankin et al, 2014). On average, these youth were 21 years old and 60% were female. Of this sample, 6.3% reattended within 12 months of their initial presentation illustrating that hospital recidivism, although associated with a proportionally small group could be related to disproportional healthcare costs. Repeat visits were positively associated with risks identified during the initial presentation (peer influence, self-reported likelihood of violence and aggressive impulses). In another longitudinal study of more than 3000 emerging adults (18-25), youth attended ED on average 1.78 times, with violent offending (but not other types of offending) strongly associated with increased healthcare usage (Portnoy and Schwartz, 2021). In a UK based study examining all presentations of children 0-14 years old over a one-year period, Hughes et al (2014) found that from a sample of more than 3 million children, deprivation was a strong predictor of increased attendances for violent related injuries and despite even from elsewhere (See for example Anderson, 2001), school holiday periods appeared to provide a protective factor illustrated by fewer attendances. In another UK study, trauma service data was analysed retrospectively across a ten-year period (2004-2014) (Vulliamy et al, 2018). All of those included in the analyses were under the age of 25. 47.2% of the sample were aged 16-19, and 43.4% were aged 20-25. Only a minority were in the younger age group (12-15) (9.4%). The same study found that there were patterns of injury, with older youth experiencing the most severe forms of harm. However, most were considered to be '*non-critical*' injuries, with few requiring admission or surgery. Of the convergent findings, the

Partners in Prevention: The Role of Health Systems in the Prevention of Youth Violence in Post Conflict Northern Ireland

most stable is that there appears to be a small number of ED patients which account for a disproportionate amount of total ED visits (La Calle and Rabin, 2010) and violence related presentations appear to be predictive of a 'revolving door' cycle (Benedict et al, 2017).

The current study

From a prevention perspective, understanding the timing of incidences of violence related injury has significant potential. By leveraging data that approximates temporal clustering of violence, or that illustrate patterns in the data around specific times, days or months, prevention efforts could become more targeted. Despite assumptions of late evening and weekend risk of harm, the authors of one London based study reported that those under the age of 16 were most likely to be injured during the afternoon, whilst the older age groups were more likely to be injured after midnight (Vulliamy et al, 2018) adding support for how prevention efforts are designed, how they target the most vulnerable populations and when they are implemented.

Given the paucity of violence related data collected from within the ED systems across NI, the goal of the current study was to examine a limited amount of violence related data which was prospectively collected by one ED in Northern Ireland and to explore the utility of routine collection such data for understanding patterns of violence and preventing violence related harms.

Based on previous studies, we hypothesised that older age and male gender would be associated with increased levels of violent injury and that late night/early morning would be associated with clustering of incidences. We also hypothesised that those who presented with more severe injury would be more likely to re-attend ED with subsequent injuries.

Data and Method

We performed a retrospective cohort study of patients presenting to an urban emergency department in the city of Derry, Northern Ireland between August 2020 and August 2021. The department receives approximately 300 patients requiring trauma team activations per year. The department is one of two emergency departments which services a population of approximately 300,000 people across the entire Trust area and more specifically, a population of approximately 151,000 across the Derry and Strabane area. The department is situated within the Western Trust, one of five local health Trusts across NI. It also covers some of the most deprived areas in the region. In fact, 5 of the top 10 most deprived electoral Wards are within this Trust area. All patients who met criteria (had presented to ED for a violence related injury) between 2020 and 2021 were screened for inclusion. Data sharing for the purpose of the study followed three phases. During phase 1, author 1 (an academic) with author 2 (an ED consultant) to co-produce a broad set of inclusionary and exclusionary criteria, taking advice on what data was likely to be available. Patients under the age of 25 and over the age of 12 who were recorded by hospital staff as having presented to the emergency department following a violent injury were included. Accidental injuries (including sports related injuries) and those resulting from deliberate self-harm were excluded. A limited amount of demographic data (age and gender), injury characteristics (type of injury) and outcomes were recorded prospectively by hospital staff. The time that patients presented to ED was also obtained retrospectively from the hospital records. During phase 2, administrative staff in the ED completed the relevant database searches and generated a report with the required data. All data was anonymised, with any personally identifiable data removed. Whilst this presented an additional burden on administrative staff, reports were generated within 24 hours of the request, inferring that this was relatively easily done within the context of the IT system being used. During phase 3, the researchers coded and analysed the data.

Partners in Prevention: The Role of Health Systems in the Prevention of Youth Violence in Post Conflict Northern Ireland

First, univariate analysis was performed to characterize the study population using select variables, including gender, age, type of injury and outcome. Descriptive statistics are reported. Second, bivariate analysis with chi-square tests as well as group mean comparisons using independent samples t-tests, and one-way anova tests. Analyses were completed using SPSS v27.

This study was approved by QUB School of Social Sciences, Education and Social Work ethics committee.

Results

The sample

Between August 2020 and August 2021, a total of 91 youth aged 12-25 presented to the ED trauma activation team primarily for the treatment of interpersonal injury.

The mean age for youth presenting to ED with violent injuries was 18.2 (SD=2.7), ranging between 12 and 23 years old. In line with WHO (2011) definitions on childhood (<16), adolescence (16-19) and young adulthood (20-25), the age range was trichotomized into three age bands: 12-15; 16-19; 20-25. 46.2% (n=42) were within the 16-19, representing the single highest age band. Only a minority were within the 12-16 age band (15.4%, n=14). 79.1% (n=72) of all of those presenting were male compared with 20.9% (n=19) who were female.

Nature of injuries

Uncommon for Health Trusts in Northern Ireland, the type and nature of injury was recorded where this was the presenting/index challenge. Table 1 below illustrates the range of injuries over this period. 87.9% (n=80) of the sample waited on a clinical assessment however a

Partners in Prevention: The Role of Health Systems in the Prevention of Youth Violence in Post Conflict Northern Ireland

significant minority (12.1%, n=11) left ED without appropriate review and treatment. Of those reviewed, injuries ranged from bruising (23.5%) through to suspected traumatic brain injury (22.2%). However, only 5.5% of the sample were admitted to a ward indicating that most did not require ongoing observation and/or treatment.

Table 1: Index injury

Injury	%	n
No assessment undertaken	7.4	6
No clear injury	1.2	1
Contusion	23.5	19
Muscle	4.9	4
Fracture/dislocation	19.8	16
Wound/incision	12.3	10
Traumatic brain injury	22.2	18
Seizure	1.2	1
Other	7.4	6

A chi-square test of independence showed that there was a significant association between age and type of injury, $X^2(18, N=91) = 30.9, p = .03$ (see table 2) with those in the 12-15 age band more likely to present with probable traumatic brain injury than the other two older age groups. Likewise, those in the 16-19 age group were more likely to present with fractures, and those in the 20-25 age group were more likely to present with incision/wound. In the absence of additional data, it is difficult to fully appraise this relationship but could point to differences in the ways that youth engage in violence as they age with greater risk of transitioning from blunt force to sharps.

Partners in Prevention: The Role of Health Systems in the Prevention of Youth Violence in Post Conflict Northern Ireland

Table 2: Injury by age band

Age band	No assessment	No injury	Bruising	Muscle	Fracture	Wound	TBA	Seizure	Other
	% within age band								
12-15	7.1	0	28.6	0	7.1	0	42.9	0	14.3
16-19	2.4	2.4	16.7	9.5	28.6	9.5	14.3	2.4	0
20-25	11.4	0	22.9	0	8.6	17.1	17.1	1.1	2.2

Time and day of presentation

To identify any potential temporal patterns in the data, the date, day and time of presentations were analysed. Fig. 1 illustrates incidences over a 12 monthly period. Visually, it is clear that serious injuries are clustered across the summer months, in particular, August and September. In fact, these two months account of a total of 36.8% of the total presentations to this ED.

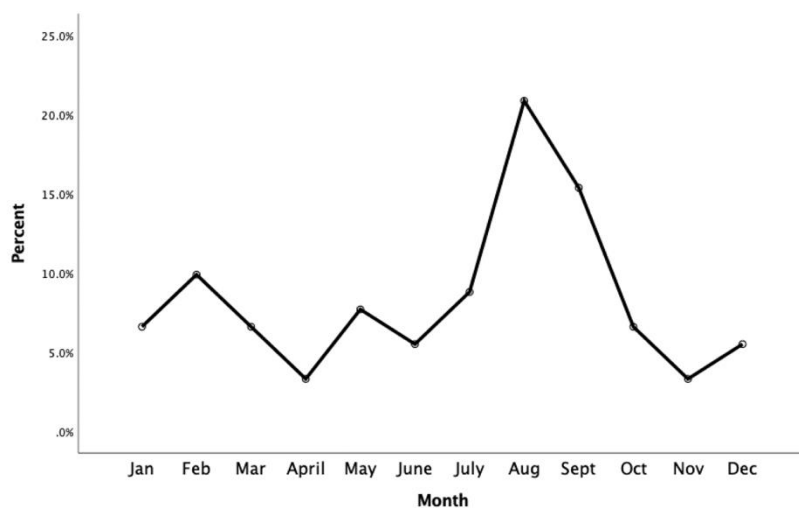


Figure 1: Violent related injuries (12 months)

Partners in Prevention: The Role of Health Systems in the Prevention of Youth Violence in Post Conflict Northern Ireland

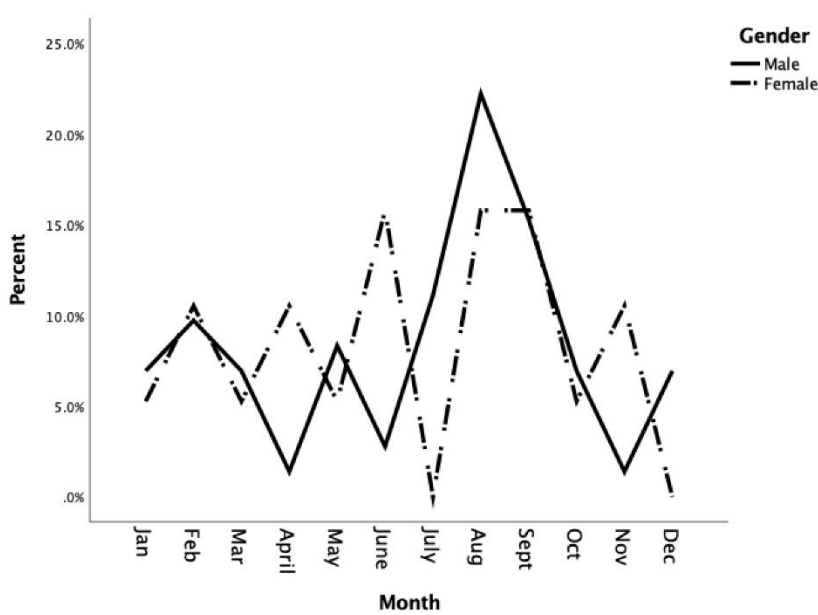


Figure 2: Violence related injuries by gender (12 months)

When the data was disaggregated by gender, the elevation during the summer months appears to be much steeper, and earlier for male youth than it was for female youth (see fig. 2). However, the trajectory for both male and female youth increased during July

and August

before reducing

significantly from September and into October. Whilst incidences increase again for males during December, this is not the case for females. In fact, like other months, there appears to be an inverse relationship.

There were statistically significant differences in the mean age of youth and presentations across the year ($f(11,79) = 1.99, p = .04$). Fig. 3 illustrates the means plot suggesting that there are particular points in the year that patients were more likely to be older (e.g., January and February), whilst there were other points in the year that patients were more likely to be younger (e.g. August, September and December). The effect size, using eta squared (Cohen, 1988) was .29 indicating a strong effect size. In fact, it was during the peak summer months (August, $m = 17.6$; September, $m = 17.7$) that injured youth appear to be on average younger than they appear to be during other times of the year, particularly January ($m = 20.2$), February ($m = 19.9$), May ($m = 19.6$) and July ($m = 19.6$). However, March ($m = 16.3$) and April ($m = 16.3$) appear to be the periods of time when the youngest victims seek medical treatment.

Partners in Prevention: The Role of Health Systems in the Prevention of Youth Violence in Post Conflict Northern Ireland

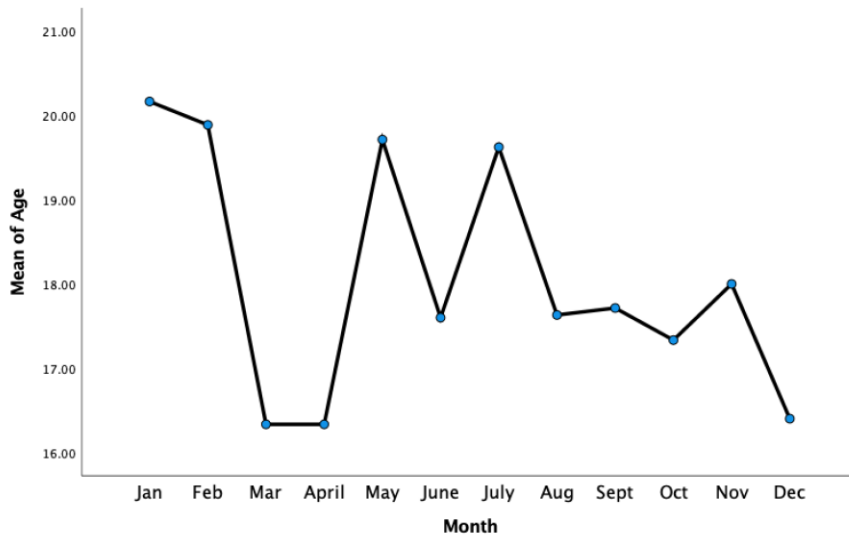


Figure 3: Mean age of victims (12 months)

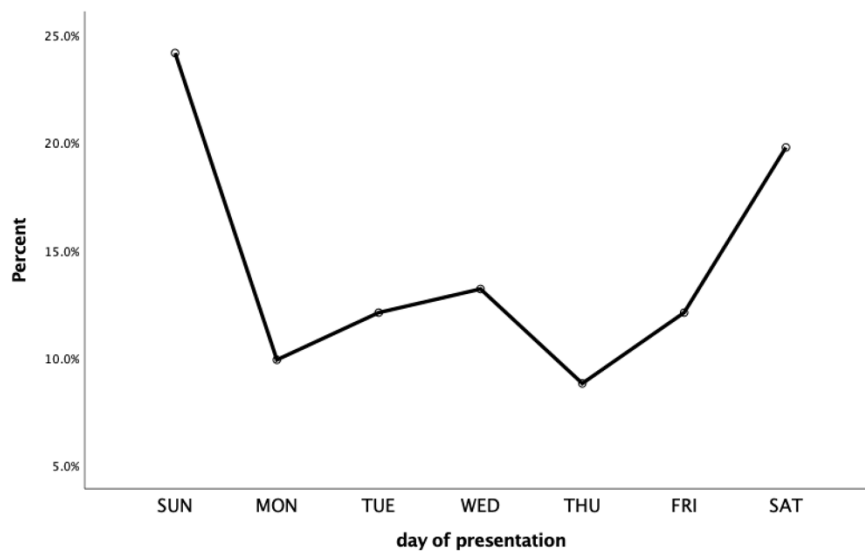


Figure 4: Proportion of ED presentations for violence related injury by day of the week

There also appear to be clear peaks and troughs throughout the week (see fig. 4). Maybe unsurprisingly, the weekend represents the busiest time for ED dealing with violence related injuries. Thursday and

Monday appear to be the quietest periods, with the latter preceding a swift rise, and the former reflecting a steep decline in injuries that require medical attention. A chi-square test of independence showed that there was a significant association between gender and the day on which youth presented to ED for the treatment of interpersonal violent injuries, $X^2(6, n=91) = 13.2, p = .04$. Fig. 5 illustrates these differences. Whilst there are clearly some elevated periods common to both male and female youth, there are other days of the week

Partners in Prevention: The Role of Health Systems in the Prevention of Youth Violence in Post Conflict Northern Ireland

where incidences appear to diverge based on gender. For example, whilst presentations appear to peak on Tuesdays for young women, they actually decline for young men. For male youth, incidences of violence related injury peak on Sunday. Similarly, mid-week, cases rise again for young men, but decline steeply for young women.

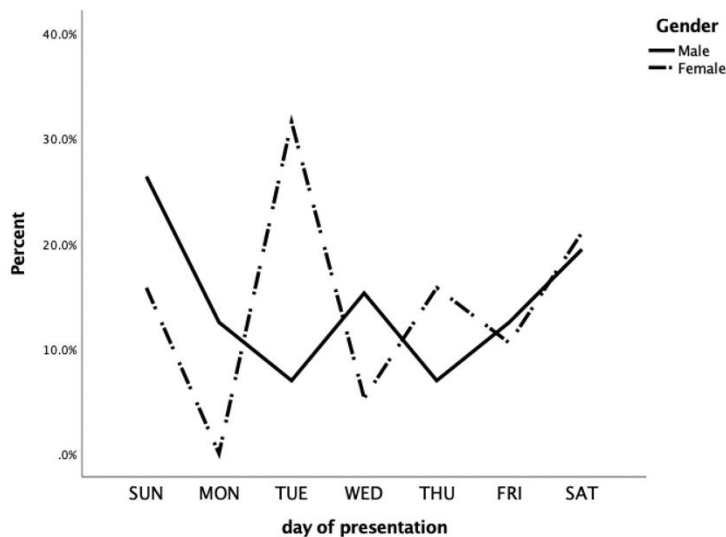


Figure 5: Proportion of presentations to ED for violence related injury by day of the week (gender)

Although not at the point of statistical significance, there do appear to be some important differences in ED presentations by the age of youth. Fig. 6 illustrates the percentage of cases over the seven-day week broken down by age band.

Whilst the younger age group end days (Fri and Sat), the older

age bands (16-19 and 20-25) appear to be more likely to present during weekdays, particularly Sundays.

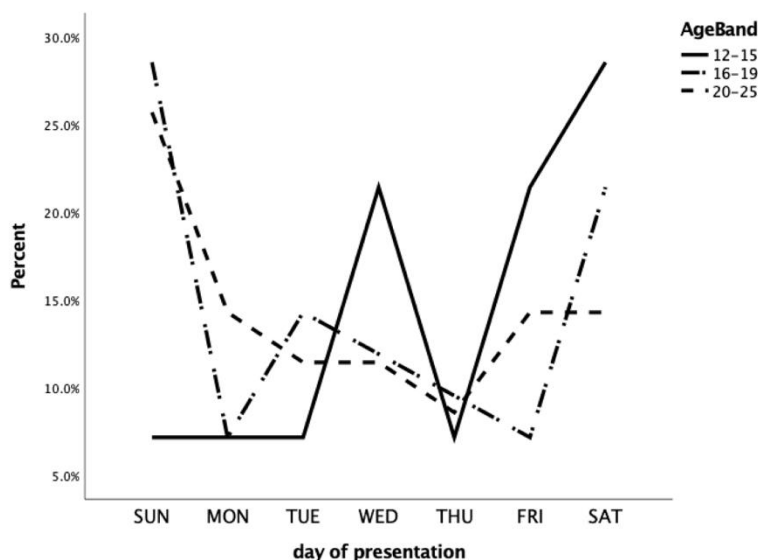


Figure 6: Proportion of presentation to ED for violence related injury by day and age

Based on findings from previous studies, the time of presentation was divided into five key bands: 6am-12pm; 12pm-6pm; 6pm-9pm; 9pm-12am and; 12am-6am. The majority of presentations took place between the hours of 12am and 6am (see table

Partners in Prevention: The Role of Health Systems in the Prevention of Youth Violence in Post Conflict Northern Ireland

3). However, more than one-fifth of all presentations took place between the hours of 12pm and 6pm suggesting that despite conventional assumptions in preventative practice, afternoons appear to be as much of, if not a greater risk for some young people as late evening and early hours. In fact, there was a statistically significant difference in the age band of young people and the time at which they presented to ED for the treatment of violent injuries $X^2(8, N=91) = 19.3, p = .01$. This observation could be investigated further.

Table 3: ED presentations by time

Time	%	n
6am-12pm	14.3	13
12pm-6pm	22	20
6pm-9pm	9.9	9
9pm-12am	18.7	17
12am-6am	35.2	32

Whilst only 7.7% of 20-25 and 33.3% of 16–19-year-olds presented between 12pm and 9pm, 57.2% of all presentations for 12-15 years olds took place prior to 9pm. Conversely, 48.6% of all presentations for the oldest age group (20-25) took place between 12am and 6am.

Multiple presentations

Using hospital-based ID codes, it appeared that almost one-quarter (24.2%) of presentations were actually multiple presentations, indicating that there was a small, but important sub-group of youth who are at elevated risk of poly-injury. It also appears that this group could be at greater risk of more serious injury given that the nature injuries appear to become more serious with subsequent presentations (see table 4).

Partners in Prevention: The Role of Health Systems in the Prevention of Youth Violence in Post Conflict Northern Ireland

Table 4: Injuries at subsequent presentation to ED

Injury	%	n
Fracture/dislocation	30	3
Wound/incision	50	5
Traumatic brain injury	10	1
Other	10	1

There was a statistically significant difference between those with single and multiple presentations, and the nature of injuries ($X^2(8, N=91) = 19.1, p = .01$). For example, those with a history of only a single presentation to ED were much more likely to require treatment for bruising (29% v 5.3%), whereas those with a history of multiple presentations were more likely to present with wounds or incisions (26.3% v 8.1%). They were also more likely to leave ED with an appropriate clinical assessment (21.1% v 3.2%). Mean time between first and second presentation appear to be relatively short at only 63.7 days (SD=103.2 days). However, with a large range (309 days), removing three outliers on the extremities (310 days; 134 days and 142 days), the time between visits reduced significantly to 6.43 days, ranging between 1 and 19 days). Given the relatively short time between presentations for a small number of youth, there may well be a reachable or teachable moment during each presentation to ED and previous studies have already isolated the benefit of identifying and supporting those most at risk of violence related harms and likely to present multiple times within the ED environment (e.g., Carnell, Eslinger and Stolley, 2006; Butts and Delgado, 2017).

Discussion

Violence is an enduring and wicked social problem (WHO, 2020). It disproportionately affects youth (Struyk et al. 2021) and elevates the risk of a range of psycho-social harms (Malik et al, 2020). Despite the promise of health-related surveillance (Hughes et al, 2014; Bandy, 2017), and increasing calls from international body's such as the World Health Organisation

Partners in Prevention: The Role of Health Systems in the Prevention of Youth Violence in Post Conflict Northern Ireland

to employ public health approaches (WHO, 2016), there are few examples of these whole system approaches to violence prevention in the NI context (Walsh, Doherty and Best, 2021; Walsh and Gray, 2021). From a public health perspective, understanding who is most at risk of violence, where and when is central to prevention. Whilst most health care professionals are legally mandated to screen for exposure to particular forms of violence (e.g., domestic abuse and maltreatment), there is no similar requirement to screen for other forms of violence including community violence (Struyk et al., 2021). This could be particularly problematic in contexts such as Northern Ireland where community violence persists (Bunting et al., 2020) and confidence in police remains strained (Walsh and Gray, 2021). Police recorded crime statistics, whilst publicly accessible and provide a partial overview of incidences and trends, do not fully capture the realities of exposure, and even less in terms of related harms.

Because of its unique access to victims, health systems can play a pivotal role in collecting violence related data that when combined with other sources, increase insights for prevention (Hibdon, Teitel and Huff, 2021). In 2015, the WHO spelt this out clearly, challenging national governments to take the issue of violence and health seriously. They argued that:

1. Health has a duty to prevent death and morbidity
2. Health has a powerful economic interest in preventing violence since it absorbs a substantial proportion of direct health costs
3. Health systems are uniquely situated to capture relevant data
4. Youth violence prevention should be included in every national action plan for public health.

The criminogenic effects of exposure to community violence are well established (Fowler et al., 2009), but despite the increased healthcare burden (Flannery, Singer and Wester, 2001;

Partners in Prevention: The Role of Health Systems in the Prevention of Youth Violence in Post Conflict Northern Ireland

Portnoy and Schwartz, 2021), health systems are generally not well designed to identify those traversing between them, or to complement other data sources to provide a fuller picture of prevalence and exposure. Given this health burden (GBD, 2020), it is in the interests of health systems to become more pro-actively involved in its prevention. Data driven responses have the potential to improve health care responses, as well as to contribute towards preventing hospital recidivism (Carnell and Esligner, 2006; Watkins et al., 2021).

Using this small but novel dataset, taking prospectively collected data from one ED in Northern Ireland, it is clear that there is significant potential for health data to contribute towards increased surveillance of violence related injury. Further, given the well-established associations between victimisation and perpetration (Widom, 1989; Fox et al, 2015), by identifying those most in need of support, the routine collection and sharing of health data has the potential to prevent both incidences and the harms associated with interpersonal violence (Quigg, Hughes and Bellis, 2011).

Our hypothesis that incidences would be temporally clustered within discrete months of the year was supported and despite previous evidence from other studies (e.g., Hughes et al, 2014), the late summer months were associated with higher incidences of violence related injury. Combined, August and September accounted of more than one-third of the annual total number of injuries. This variation in observation may be accounted for by the wider age range of this sample, extending up to and including the age of 24 compared with an age range of 10-14 in the Hughes et al (2014) study. This difference therefore may be attributed to changes to the routine activities of older youth (Lobo Atunes and Ahlin, 2017) and other factors including increased temperatures (Anderson, 2001) that may have a differential impact on the socialisation, recreational activities and behaviours of older youth compared with younger children. Therefore, the data, whilst limited, generally support these finding and points to the potential role of a range of contextual factors that may impact on community

Partners in Prevention: The Role of Health Systems in the Prevention of Youth Violence in Post Conflict Northern Ireland

violence and violent victimisation. More consistent data collection and further analyses will help to test these observations further and unpack the reasons behind them.

Whilst a call for integrating research evidence into health system practices it is also of note that this study also illustrated that the rise for young males appeared to be steeper and begin much earlier in the Summer than it was for young women. Although these gender patterns reflect wider criminal justice research, predicting the periods of time where violence is more likely to be elevated and for whom could help health systems prepare and at the same time contribute towards wider prevention activities in the community.

Our hypothesis that incidences would also be clustered around late evening/early morning during the weekend was only partially supported. On aggregate, Saturday and Sundays reflected the busiest times for youth presenting to ED, however, when this data was disaggregated by age and by gender, several divergent findings emerged. For instance, the youngest age group appeared to be more likely to present earlier in the weekend, whilst older youth appeared to be more likely to present later in the weekend and during weekdays. Only a minority of patients were 12-16, indicating that these injuries could be less serious/less likely to require medical attention. Conversely, those in 16-19 age band were most likely to require clinical support.

In keeping with previous findings (e.g., Vulliamy et al, 2018), this NI data confirms that younger youth also appear to present earlier in the day, particularly during the hours of 12am and 6pm, and that there is a stronger association between older youth presenting late night/early morning. This has significant implications for both ED based interventions and for community-based supports. Understanding when, when and how to interrupt incidences is critical and practical responses should be tailored to the different needs of these different populations.

Partners in Prevention: The Role of Health Systems in the Prevention of Youth Violence in Post Conflict Northern Ireland

Whilst of interest, there are several limitations with the data to draw conclusive findings from the temporal data (months of the year, days of the week and times of the day). For example, this is based on presentation to ED as opposed to the data and the time of violent incidents. There could indeed be a time lag between victimisation and assessment. This uncertainty could be reduced by full implementation of the NHS protocol which not only requires ED staff to capture incidences of violent injury but to also record the date, time and location of incidents (Quigg, Hughes and Bellis, 2011).

Despite the need for clinical assessment and treatment, only a minority of youth appear to be admitted to a ward- one indication of the severity of injury. This reflects similar studies elsewhere that there is a small but important subgroup youth who require greater clinical care (La Calle and Rabin, 2010; Hankin et al, 2014). In this sample, they tended to be those who were male, and who first presented with a wound/incision, as well as those who failed to engage in a medical assessment. Therefore, ED based interventions could triage victims of violence at elevated risk more quickly and prioritise those in need for specialist supports in the community.

Whilst this data is unable to capture the extent to which these injuries were known to the police, evidence from previous studies predict that only a minority are likely to be known to the police thus limiting the utility of police recorded crime data alone (Ariel et al, 2015; Xie and Bummer, 2019; Hibdon et al, 2021; Sutherland et al, 2021). This extends the utility to hospital related data by increasing our understanding of those most likely to be victims of violence in the community. With the cumulative evidence providing support for the reciprocity of violence exposure, and its traumatic effects (Lansford et al, 2007; Ford et al, 2012), the routine collection of ED data could also help to identify those at elevated risk of perpetrating violence in the community, thus contributing to the prevention of wider harm. This appears all the more crucial given the fact that for most recidivists in this sample, the mean time between first and second presentation was less than 7 days (ranging between 1 and 19

Partners in Prevention: The Role of Health Systems in the Prevention of Youth Violence in Post Conflict Northern Ireland

days) in line with previous studies (Vulliamy et al, 2018). That is not to say that health related data, alongside police recorded crime data provides the full picture. Indeed, benefits aside, this study also noted several limitations. Firstly, as has been found in previous studies (see for example Quigg, Hughes and Bellis, 2011), violence related data used in this study was not systematically collected by trained ED staff, and despite collecting more violence related data than other health Trusts in NI, they did not employ the recommended NHS protocol for minimum collection of violence related data. This is a challenge for the health system in post conflict NI. It also infers that this data could be an underestimate and incomplete version of the experience of victims using this ED. Secondly, previous studies have found that deprivation is associated with higher rates of presentation (Hughes et al, 2014). Without a location identifier, this dataset was unable to test for such associations. Further, violence related data was only collected when violence related injury was the index clinical concern. This underestimate is actually exacerbated further given that the period under review was during Covid, when it is well established that incidences of community violence reduced significantly only to rise (and even supersede) the pre-covid rates (Ellis et al, 2021; YEF, 2022).

This dataset, whilst useful, was limited in its potential to more wholly inform a preventative response. Additional data, including relevant predictors of victimisation and perpetration were not routinely collected. Crucially, this data is not currently joined up/shared with other services (e.g., justice and education). This is despite NI's intimate relationship with community violence. Joined up systems are possible (Hibdon, Telep, Huff, 2021; Sutherland, Strang, Stepanek, Giacomantonio, Boyle and Strang, 2021). Data protection is not a bulwark and so this study presents a challenge, as well as an opportunity for administrators to make best use of existing data to enhance outcomes for communities, support victims at the time that their needs are most acute and contribute to the prevention of violence. Of course, the data itself was limited to those who presented to ED. It is highly likely that there are clusters of other victims neither known to police nor to the health system, particularly among young

Partners in Prevention: The Role of Health Systems in the Prevention of Youth Violence in Post Conflict Northern Ireland

people who are less likely to seek support or treatment. Notwithstanding these limitations, this study has demonstrated the utility of ED data in surveillance management and programme design. Using even limited data, it is possible to make inferences about the needs of victims of violence, enhance and test efforts to identify those most at risk of revictimization and also inform the design of interventions aimed at reducing perpetration.

Public health approaches in the field of violence prevention appear to offer a relatively novel framework for understanding and preventing youth violence. A pre-requisite is that appropriate data is not only collected- but shared (Boyle et al, 2018; Hibdon, Telep, Huff, 2021; Sutherland, Strang, Stepanek, Giacomantonio, Boyle and Strang, 2021). This study has illustrated what can be gleaned from a small number of violence related variables collected prospectively within ED. An additional issue therefore for health systems to consider how similar data can be collected and shared (Quigg, Hughes and Bellis, 2011). Privacy legislation and introduction of GDPR appears to have added additional challenges to information sharing across systems. However, some argue that this need not be the case. With the absence of personally identifiable information, privacy issues can be avoided and therefore, challenges on the grounds of privacy can be negated (Sutherland et al, 2017; Hibdon et al, 2021). On these grounds, data sharing should be prioritised (Hibdon et al, 2021). Linked data has the potential to monitor trends, to increase injury surveillance, shape policy and inform prevention efforts (Boyle et al, 2018; Tainter et al, 2020). Combined, these approaches could reduce pressures on front line services and reduce the *'revolving door'* effect, particularly where the community are central to the analyses and response (Benedict et al, 2017; Sharkey et al, 2017).

References

Anderson, C. (2001) Heat and violence. *Current Directions in Psychological Science*. Vol.

Partners in Prevention: The Role of Health Systems in the Prevention of Youth Violence in Post Conflict Northern Ireland

Antunes Lobo, M. J. and Ahlin, E. (2017) Youth exposure to violence in the community: towards a theoretical framework for explaining risk and protective factors. *Aggression and Violent Behavior*. Vol. 24

Ariel, B., Weinborn, C. and Boyle, A. (2015) Can routinely collected ambulance data about assaults contribute to reduction in community violence? *Emergency Medicine Journal*. Vol, 32, No. 4, pp 308–313.

Baglivio, M., Wolff., K and Epps, N. (2021) Violent juvenile's adverse childhood experiences: Differentiating victim groups. *Journal of Criminal Justice*. Vol. 72

Baxendale, S., Cross, D and Johnston, R. (2012) A review of the evidence on the relationship between gender and adolescent's involvement in violent behaviour. *Aggression and Violent Behavior*. Vol. 17, pp 297-310

Benedict, T. F., Amanullah, S., Linakis, J. G., & Ranney, M. (2017). Emergency department utilization among assault-injured youth: Implications for youth violence screening. *Paediatric Emergency Care*. Vol. 33, pp 607–612

Boyle, A. A., Martin, M. S., Ahmed, H., Snelling, K., Dean, J. and Price, J. (2018) Changing epidemiology of assault victims in an emergency department participating in information

Partners in Prevention: The Role of Health Systems in the Prevention of Youth Violence in Post Conflict Northern Ireland

sharing with police: A time series analysis. *Emergency Medicine Journal*. Vol. 35, pp 608–613.

Bunting, L., McCartan, C., Davidson, G., Grant, A., McBride, O., Mulholland, C., Murphy, J., Schubotz, D., Cameron, J. and Shevlin, M.(2020) *The mental health of children and parents in Northern Ireland*. Belfast, Northern Ireland: HSCB

Butts, J. and Delgado, S. (2017) *Repairing trust: young men in neighbourhoods with cure violence programs report growing confidence in police*. John Jay College of Criminal Justice, Research and Evaluation Center: New York, NY.

Carnell, C., Eslinger, D.M. and Stolley, P.D. (2006) Hospital based violence intervention programs work. *The Journal of Trauma, Injury, Infection and Critical Care*. Vol. 61

Duffy, M., Walsh, C., Mulholland, C., Davidson, G., Best, P., Bunting, L., Herron, S., et al. (2021) Screening children with a history of maltreatment for PTSD in frontline social care organisations: an explorative study. *Child Abuse Review*, doi.org/10.1002/car.2735

Ellis, A.J., Briggs, D., Lloyd, A., and Telford, L. (2021) A ticking time bomb of future harm : lockdown, child abuse and future violence. *Abuse: An International Impact Journal*, Vol, 2, No. 1, pp. 37-48.

Flannery, D.J., Singer, M.I. and Wester, K. (2001) Violence exposure, psychological trauma, and suicide risk in a community sample of dangerously violent adolescents. *Journal of American Child and Adolescent Psychiatry*. Vol. 40, pp 435–42.

Partners in Prevention: The Role of Health Systems in the Prevention of Youth Violence in Post Conflict Northern Ireland

GBD (2020) Global burden of 369 diseases and injuries in 204 countries and territories, 1990-2019: a systematic analysis for the global burden of disease study 2019. *Global Health Metrics*. Vol. 396, No. 10258, pp 1204-1222

Hankin, A., Wei, S. and Foreman, J. (2014) Screening for violence risk factors identifies young adults at risk for return for emergency department visit for injury. *Western Journal of Emergency Medicine*. Vol. 15, No. 5

Hibdon, J., Telep, C. and Huff, J. (2021) Going beyond the blue: the utility of emergency medical services data in understanding violent crime. *Criminal Justice Review*. Vol. 46, No. 2

Hughes, K., McHale, P., Wyke, S., Lowey, H., Bellis, M.(2014) Child injury: using national emergency department monitoring systems to identify temporal and demographic risk factors. *Injury Prevention*. Vol. 20, No. 2, p74-80

Junger, M., Stroebe, W. and van der Laan, A. M. (2001). Delinquency, health behaviour and health. *British Journal of Health Psychology*. Vol. 6, pp103–120.

Kar, H. (2019) Acknowledging the victim to perpetrator trajectory: Integrating a mental health focused trauma-based approach into global violence programs. *Aggression and Violent Behavior*. Vol. 47, pp 293-297

LaCalle, E. and Rabin, E. (2010) Frequent users of emergency departments: The myths, the data, and the policy implications. *Annals of Emergency Medicine*. Vol. 56, pp 42–48.

Partners in Prevention: The Role of Health Systems in the Prevention of Youth Violence in Post Conflict Northern Ireland

Lee, B. (2017) Causes and Cures XII: Public Health Approaches. *Aggression and Violent Behavior*. Vol. 33

Lee, B., Leckman, J. and Mbwambo, J. (2014) Violence and health: current perspectives from the WHO violence prevention alliance. *Aggression and Violent Behavior*. Vol. 19

Malik et al. (2020) Violence related knife injuries in a UK city: epidemiology and impact on secondary care resources. *Clinical Medicine*. Vol. 20,

Melo, S. N., Boivin, R, and Morselli, C. (2020). Spatial dark figures of rapes: (In) consistencies across police and hospital data. *Journal of Environmental Psychology*. Vol. 68

Mitis, F., and Sethi, D. (2015) Male-one-male violence: A leading cause of death around the world. In Mihalic, S., Irwin, K. (2003) Blueprints for Violence Prevention: From Research to Real-World settings-Factors Influencing the Successful Replication of Model Programs. *Youth Violence and Juvenile Justice*. Vol. 1, No. 4

Portnoy, J. and Schwartz, J. (2021) Adolescent violent delinquency associated with increased emergency department useage in young adulthood. *International Journal of Offender Therapy and Comparative Criminology*, doi: 10.1177/0306624X211066835

Quigg, Z., Hughes, K. and Bellis, M. (2011) Data sharing for prevention: a case study in the development of a comprehensive emergency department injury surveillance system and its use in preventing violence and alcohol-related harms. *Injury Prevention*, Vol. 18

Partners in Prevention: The Role of Health Systems in the Prevention of Youth Violence in Post Conflict Northern Ireland

Reid, J. and Baglivio, M. (2022) Covid 19's impact on crime and delinquency. *Crime and Delinquency*, Vol. 68, No. 8

Sharkey, P., Torrats-Espinosa, G. and Takyar, D. (2017). Community and the crime decline: The causal effect of local non-profits on violent crime. *American Sociological Review*. Vol. 86, No.6, pp 1214–1240.

Sutherland, A., Strang, L., Stepanek, M., Giacomantonio, C., Boyle, A. and Strang, H. (2021) Tracking violence crime with ambulance data: how much crime goes uncounted? *Cambridge Journal of Evidence-Based Policing*. Vol. 5, No. 20

Sutherland, A., Strang, L., Stepanek, M., Giacomantonio, C., Boyle, A. and Strang, H. (2021) *Using ambulance data for violence prevention*. RAND Corporation.

Tainter, F., Fitzpatrick, C., Gazillo, J., Riessman, R. and Knodler, M, Jr. (2020) Using a novel data linkage approach to investigate potential reductions in motor vehicle crash severity—An evaluation of strategic highway safety plan emphasis areas. *Journal of Safety Research*. Vol. 74, pp 9–15.

UNODC. (2019) *Global Study on Homicide*. Vienna: Austria. United Nations

Vulliamy, P., Faulner, M., Kirkwood, G., West, A., O'Neill, B., Griffiths, M., Moore, F. and Brohi, K. (2018) Temporal and geographical patterns of stab injuries in young people: a retrospective cohort study from a UK major trauma centre. *BMJ Open*,

Partners in Prevention: The Role of Health Systems in the Prevention of Youth Violence in Post Conflict Northern Ireland

Walsh, C. (2019) *Pathways and Outcomes: A Review of what Administrative Data in NI Can Tell Us about the Prevalence and Prevention of Paramilitary and Serious Youth Violence*. Belfast: Department of Justice.

Walsh, C. and Schubotz, D. (2020) Young men's experiences of violence and crime in a society emerging from conflict. *Journal of Youth Studies*. Vol. 23, No. 5, pp 650–666

Walsh, C., Doherty, K. and Best, P. (2021) A novel approach for understanding trauma-related youth violence in low resource contexts: A retrospective case file review in Northern Ireland. *Violence: An International Journal*

Walsh, C., and Gray, A.M.(2021) *The trauma of violence and its impact on young people in Northern Ireland: the state of evidence*. ARK. Retrieved from: <https://www.ark.ac.uk/ARK/sites/default/files/2021-08/policybrief20.pdf>

Walsh, C. (2022) *Accelerators: Targeted Youth Services' Contribution Towards the Attainment of Multiple Sustainable Development Goals (SDGs)*. Queen's University Belfast and Education Authority.

Watkins, J., Scoggins, N., Cheaton, B., Nimmer, M., Levas, M., Baumer-Mouradian, S. and Melzer-Lange, M. (2021) Assessing improvements in emergency department referrals to a hospital based violence intervention program. *Injury Epidemiology*. Vol. 8, No. 1

Weaver, C.M., Borkowski, J.G. and Whitman, T.L. (2008) Violence breeds violence: childhood exposure and adolescent conduct problems. *Journal of Community Psychology*. Vol. 36, pp. 96–112

Partners in Prevention: The Role of Health Systems in the Prevention of Youth Violence in Post Conflict Northern Ireland

Weinborn, C., Ariel, B., Sherman, L. W. and O'Dwyer, E. (2017) Hotspots vs. harmspots: Shifting the focus from counts to harm in the criminology of place. *Applied Geography*. Vol. 86, pp 226–244.

WHO. (2014) *Youth and health risks: report from the 64th World Health Assembly*. Geneva: Switzerland. World Health Organisation

WHO. (2020) *Global Status Report on Preventing Violence Against Children 2020*. Geneva: World Health Organization

Williams, D.J. and Donnelly, P.D. (2014) Is violence a disease? Situating violence prevention in public health policy and practice. *Public Health*. Vol. 128, pp 960-967

Widom, C.S. (1989) Child abuse, neglect and adult behavior: Research design and findings on criminality, violence, and child abuse. *American Journal of Orthopsychiatry*. Vol. 59, pp 355–367

Wortley, E. and Hagell, A. (2020) Young victims of youth violence: using youth workers in the emergency department to facilitate 'teachable moments' and to improve access to services. *Arc Dis Child Education Practice Education*. Vol. 106

Xie, M., & Baumer, E. P. (2019) Crime victims' decisions to call the police: Past research and new directions. *Annual Review of Criminology*. Vol. 2, No. 1, pp 217–240.

Partners in Prevention: The Role of Health Systems in the Prevention of Youth Violence in
Post Conflict Northern Ireland

YEF. (2022) *Statistics update: what's happening to crime and violence?* London: Youth

Endowment Fund available from: <https://youthendowmentfund.org.uk/wp-content/uploads/2022/02/YEF-Statistics-update-February-2022-FINAL.pdf>