Australian Government
Australian Institute of Criminology

Trends & issues in crime and criminal justice

ISSN 1836-2206 (Online) | ISBN 978 1 925304 42 8 (Online)

No. 595 April 2020

Abstract | The acute association between interpersonal violence, alcohol and drug use, self-harm, and mental health issues is relatively unexplored. Violence-related ambulance attendances were analysed, differentiated by type of violence and by victim or aggressor of violence, as well as the co-occurrence of alcohol and drug use, self-harm, and mental health issues. Ambulance attendances related to victims of violence had few co-occurring issues beyond alcohol and drug misuse. In contrast, attendances related to aggressors were more complex, with high proportions of co-occurring mental health, self-harm, and alcohol and drug issues. These findings demonstrate the utility of ambulance data for surveillance of interpersonal violence.

The feasibility and utility of using coded ambulance records for a violence surveillance system: A novel pilot study

Debbie Scott, Cherie Heilbronn, Kerri Coomber, Ashlee Curtis, Foruhar Moayeri, James Wilson, Sharon Matthews, Rose Crossin, Alex Wilson, Karen Smith, Peter Miller and Dan Lubman

Introduction

Violence

Violence may result in physical injury and death, and the psychological, social and economic harms can extend far beyond the initial violent act (Waters et al. 2004). Approximately 40 percent of Australians have experienced physical violence since the age of 15, and 20 percent of women and five percent of men have experienced sexual violence (Australian Bureau of Statistics 2017). Gender involvement in violence is tempered by violence type: community (involving unrelated parties who may or may not be known to each other), intimate partner (involving current or former spouses or partners), or other family (involving other family members). Males are both the predominant aggressors of violence and the victims of community violence, and females are most commonly the victims of family violence (Australian Bureau of Statistics 2017).

CRIMINOLOGY RESEARCH GRANT

Measuring violence

Violence prevalence studies in the community are often conducted using survey data (eg *Personal Safety Survey*; Australian Bureau of Statistics 2017). Surveys have limitations; for example, they can under-represent vulnerable and disadvantaged groups, such as those without stable housing or outside the school system. Additionally, self-reported patterns of violence are typically described over large intervals (eg the past 12 months) and may be unreliable due to recall bias (Yoshihama & Gillespie 2002). An alternative to surveys is police data; however, not all violent incidents are reported to police. The 2005 *Personal Safety Survey* found that only 36 percent of females who had experienced physical violence reported that incident to the police (Australian Bureau of Statistics 2006), and subsequent studies found that only 22 percent of family violence incidents were reported (Miller et al. 2016). Such survey data also cannot elucidate the complex risk factors that influence violence, such as alcohol and other drugs (AOD; Boles & Miotto 2003; Collins & Messerschmidt 1993), mental health issues (Arseneault et al. 2000; Shorey et al. 2012), and self-harm (Christoffersen, Soothill & Francis 2005; Witt, Hawton & Fazel 2014).

Alcohol and other drug use

Alcohol consumption reduces inhibitions and increases the likelihood and severity of violence (Fulu et al. 2013; Graham et al. 2011). Alcohol use is a risk factor for family violence (Klostermann & Fals-Stewart 2006), and increased alcohol availability is spatially associated with increased community violence (Gruenewald & Remer 2006) and family violence (Livingston 2011). An Australian study using Harm to Others Survey data estimated that up to 65 percent of 30,000 family violence incidents were alcohol-related (Laslett et al. 2015). Furthermore, policies restricting alcohol availability have reduced violence (Fitterer, Nelson & Stockwell 2015), suggesting that alcohol is an important factor in violence. Despite recent research on drug-specific relationships with violence—for example, cannabis and intimate partner victimisation (Smith et al. 2012) and methamphetamine and violence (McKetin et al. 2014)—comparisons across drug types yield inconsistent results (Cafferky et al. 2018). Further research is needed.

Mental health

Poor mental health is often described as an outcome of family violence (eg Free from Violence; Victorian Government 2017). However, research indicates that violence can be exacerbated by poor mental health, particularly when AOD use co-occurs (Elbogen & Johnson 2009; Nathanson et al. 2012; Shorey et al. 2012, Van Dorn, Volavka & Johnson 2012). Mental health conditions can also complicate service delivery for those seeking support for family violence (Sonenshone, Rubin & Tran 2017) and are associated with aggression towards healthcare workers (Crilly, Chaboyer & Creedy 2004).

Self-harm

Self-harm (including self-injury, suicidal ideation and attempt, and suicide) are also associated with violence and aggression. Men with a history of experiencing or witnessing self-harm are at greater risk of perpetrating sexual violence (Christoffersen, Soothill & Francis 2005), and women who experience sexual or family violence are at risk of developing self-harm (Rees et al. 2014). Collectively, these studies highlight the bi-directional association between self-harm and violence.

Relationship between these factors—policy considerations

AOD use, mental health issues and self-harm are factors consistently associated with violence (Krug et al. 2002; McNiel & Binder 2007) and are being gradually incorporated into contemporary policy responses. For example, the Victorian Government strategy Free from Violence aims to prevent family violence and violence against women. This strategy recognises that AOD use increases the likelihood of violence and weakens prosocial behaviour; it aims to integrate violence prevention and AOD policy and service delivery. Although there is recognition that poor mental health and violence are associated, and that this needs to be better understood, policy integration is yet to commence (Victorian Government 2017). The *National Plan for Reducing Violence Against Women and Their Children* (Council of Australian Governments 2011) includes reducing AOD use as a means of reducing violence. It also recognises the interplay between violence, AOD and mental health. New South Wales has introduced violence screening for women seeking treatment for both AOD and mental health issues (Council of Australian Governments 2011).

There are fewer strategies focused on reducing community violence. There is no single strategy for reducing community violence in Victoria; however, the Ice Action Plan aims to reduce violence and acknowledges the role of AOD harm minimisation strategies in achieving that outcome (Victorian Government 2015). Other states, such as New South Wales and Queensland, are explicitly addressing alcohol as a cause of community violence, with policies such as lockout laws aimed at reducing community violence (Menéndez et al. 2015). There were no policies that considered mental health issues in community violence.

Ambulance attendances as a novel data source

Ambulance clinical records are an alternative data source that capture violent incidents where an ambulance responds. These detailed records can provide information about the characteristics of violence, the type of violence, the relationships between aggressors and victims and whether AOD, mental health or self-harm were also associated with the attendance.

Aim

The primary aim of this study was to pilot the use of coded ambulance clinical records for violence surveillance at the population level, similarly to work done in an established surveillance system of AOD and mental health-related harms (Lloyd, Gao et al. 2015; Lloyd, Matthews et al. 2015).
The secondary aim was to use these data to describe the association between AOD, mental health, self-harm and violence.

Methods

National Ambulance Project

Ambulance Tasmania and Ambulance Victoria provide electronic clinical records from ambulance attendances to Turning Point (Australia's leading national addiction treatment and research centre) for ongoing surveillance of AOD, self-harm and mental health related harms. Victorian data are filtered using broad parameters to maximise identification of cases potentially related to AOD, self-harm and mental health. Paramedics collect information electronically, using a series of response options (drop-down boxes) and free-text fields. These data were filtered using complex text mining methodologies at the category level (eg case type) or through a keyword search of free-text fields to identify potentially relevant cases. Tasmania provides all unfiltered clinical records.

These clinical records hold a wealth of information not otherwise accessible. At Turning Point, research assistants in a specialist team manually scrutinised each clinical record and, using a systematic and validated coding framework, identified and coded involvement of AOD, self-harm and mental health. The taxonomy and coding framework for violence-related attendances were piloted as a part of this project.

Piloting of coding violence-related ambulance attendance data

Development and coding of the violence module commenced in 2016 with funding from a Criminology Research Grant from the Australian Institute of Criminology. The pilot project used Tasmanian and Victorian data from the 2016–17 financial year (FY).

In Victoria, in the 2016–17 FY, 26 percent (*n*=128,641) of all emergency attendances were provided to Turning Point for coding, and 82,120 (64%) of these met inclusion criteria. AOD, mental health, self-harm or violence was associated with 17 percent of all Victorian attendances. In comparison, in the 2016–17 FY, coding of unfiltered data from Tasmania found that 11 percent of all attendances were related to AOD, mental health, self-harm or violence.

Case category definitions

A case met inclusion criteria if recent overuse or inappropriate AOD use, self-harm, mental health symptomology or violence were assessed as contributing to the ambulance attendance. This information was contained in paramedic documentation in the clinical record, through clinical assessment, patient self-report, details given by third parties during the attendance, and other evidence available at the scene.

The core criterion project staff used was: 'Is it reasonable to attribute recent (past 24 hours) over or inappropriate AOD use, mental health symptomology, self-harm or violence as a contributing reason for the ambulance attendance?'

Multiple substances, types of self-harm, mental health symptoms and violence could be coded for one ambulance attendance.

Violence-related ambulance attendances

A purpose-built violence module was piloted for this project, and attendances were coded using the categories below:

- *threatening behaviour*—explicit expression of intent to harm another person, with or without aggressive behaviour;
- *physical violence*—intentional use of physical force to harm another person where physical contact occurred;
- *sexual violence*—person was forced into unwanted sexual activity, where physical contact occurred; and
- *third parties* involved in the violent incident, as recorded by paramedics:
  - intimate partner violence—includes partner, de facto, married, estranged, previous relationship, other romantic relationships;
  - other family violence—includes other family, extended family, step, foster and adopted family members; and
  - community violence—includes police, paramedics, stranger, other known third party;
- role of patient in the violent incident:
  - victim—an individual who was the victim of violence;
  - aggressor—an individual who was the aggressor of violence; and
  - both—an individual who was both an aggressor and victim of violence.

Categories were not mutually exclusive (eg a patient could be coded as both victim and aggressor; incidents could involve both physical and sexual violence; and multiple third parties could be identified as being involved in the violent incident).

Alcohol and other drug-related ambulance attendances

Cases were coded as 'AOD-related' if any of the following contributed to the attendance:

- alcohol;
- illicit drugs; or
- pharmaceutical drug misuse, defined as diversion (taking medication not prescribed for that patient) or other inappropriate consumption (contrary to prescriber or manufacturer instructions).

Self-harm-related ambulance attendances

Cases were coded as self-harm if any of the following contributed to the attendance:

- threat of self-injury—threatening intentional injury, without suicidal intent;
- non-suicidal self-injury—non-fatal intentional injury, without suicidal intent;
- suicidal ideation—thinking about suicide, without acting on the thoughts; or
- suicide attempt—non-fatal intentional injury with suicidal intent.

Mental health-related ambulance attendances

Cases were coded as mental health-related if a mental health symptom was identified in the ambulance record (noting that symptom identification did not equate to a clinical diagnosis):

- anxiety—overwhelming and intrusive worry;
- depression—low mood, feelings of hopelessness, despair, worthlessness, anhedonia, change in sleep and appetite;
- psychosis—hallucinations or delusions;
- medically induced—cases where there was evidence that the presenting mental health symptoms (such as anxiety or psychosis) were related to a medical condition rather than a mental health disorder; and
- other—mental health symptoms otherwise unspecified.

Defining socio-economic status

Socio-economic status (SES) was defined by the Socio-Economic Indexes for Areas (SEIFA) data produced by the Australian Bureau of Statistics, using the Index of Relative Socio-economic Disadvantage (IRSD) 2016, based on patient residential postcode. The SEIFA-IRSD score was aggregated into quintiles for each state, where quintile 1 is the most disadvantaged, and quintile 5 the least disadvantaged.

Analysis and ethics

Descriptive statistics of characteristics of intimate partner, other family, and community violence-related ambulance attendances, and comparison of categorical variables using chi-square test, were conducted (Table 1).

Multivariate logistic regression, controlling for age and gender, was performed to identify characteristic predictors of violence with any of the three co-occurring issues, compared with 'violence only' attendances (defined as cases involving violence but not AOD, self-harm or mental health issues). The results of analyses are summarised in Tables 2 to 4. Odds ratios and 95 percent confidence intervals (CI) were reported for each group. All statistical analyses were performed using Stata 13.0; $p<0.05$ was considered significant.

Ethics approval was obtained from the Eastern Health Human Research Ethics Committee. Where any analysis yielded an $n<5$, an exact n was not reported, and no percentage is shown, in accordance with the ethics approval.

Results

In the 2016–17 FY, the project dataset contained 74,478 ambulance attendances in Victoria and 7,191 ambulance attendances in Tasmania. Of those, 7.7 percent ($n=5,735$) in Victoria and 7.8 percent ($n=560$) in Tasmania were related to violence.

The characteristics of violence-related ambulance attendances for the three types of violence (intimate partner, other family, and community violence) are shown in Table 1.

There were 2,845 ambulance attendances (*n*=2,448 Victoria and *n*=397 Tasmania) where the clinical documentation provided no information about the third party involved in the violent incident. Similarly, 106 Victorian ambulance attendances and fewer than five Tasmanian attendances provided no documentation about the role of the patient (aggressor or victim) in the violence. These were excluded from analysis because the type of violence and the role of the patient could not be classified (*n*≈2,955).

There was an age gradient for aggressors in violence-related attendances. In intimate partner and community violence-related attendances, 26 percent and 22 percent respectively were for patients over 60 years of age.

Regardless of whether the violence was intimate partner, family or community violence, attendances for victims of violence were more likely to be for physical violence; however, attendances for aggressors of violence were more likely to be for threatened violence.

Intimate partner violence related ambulance attendances

The largest proportion (84%) of intimate partner violence related ambulance attendances for victims were for females (Table 1). The age groups 18–29 and 30–39 formed the largest proportion of victims (each 30%). For aggressors of intimate partner violence related attendances, the largest proportion was of those over 60 years (26%), followed by 18–29 year olds (24%). The most disadvantaged SES group (quintile 1) formed the largest proportion of both aggressors and victims of family violence (36% and 31%, respectively), compared with 12 percent and 13 percent in quintile 5. The proportion of intimate partner violence related ambulance attendances for threats of violence was larger among aggressors (66%) than victims (16%), and the victims formed a larger group in physical violence-related attendances (86%) compared with aggressors (38%).

Analysis of co-occurrences of intimate partner violence, AOD, mental health symptoms and self-harm showed that 42 percent of intimate partner violence related ambulance attendances for victims were primarily violence only, and 37 percent involved AOD. Ambulance attendances for aggressors in intimate partner violence incidents were more complex: 16 percent involved violence only, but the largest proportion involved violence and mental health symptoms (28%).

Multivariate regression (Table 2) found that, in violence-related attendances for victims of intimate partner violence, gender was the only significant predictor; females were less likely to have an attendance with co-occurring issues. In contrast, among attendances for aggressors of intimate partner violence, co-occurring issues were significantly predicted by age group. The 50–59 age group was at higher risk of a violence-related attendance being associated with mental health or AOD use than those under the age of 18 years.

Table 1: Characteristics of violence-related attendances by violence type and role of patient in violent incident, Victoria and Tasmania

	Intimate partner				Other family				Community			
	Victim		Aggressor		Victim		Aggressor		Victim		Aggressor	
	N	%	*N*	%	*N*	%	*N*	%	*N*	%	*N*	%
Gender												
Male	**122**	**15.7**	224	53.5	245	48.6	598	57.0	707	67.1	1,717	61.3
Female	**656**	**84.3**	194	46.3	258	51.2	450	42.9	345	32.8	1,078	38.5
Age group												
<18	17	2.2	**15**	**3.6**	**86**	**17.1**	**330**	**31.4**	73	6.9	**219**	**7.8**
18–29	231	29.7	**100**	**23.9**	**133**	**26.4**	**301**	**28.7**	341	32.4	**645**	**23.0**
30–39	231	29.7	**90**	**21.5**	**74**	**14.7**	**179**	**17.1**	230	21.8	**485**	**17.3**
40–49	187	24.0	**63**	**15.0**	**88**	**17.5**	**101**	**9.6**	229	21.8	**543**	**19.4**
50–59	75	9.6	**41**	**9.8**	**57**	**11.3**	**56**	**5.3**	114	10.8	**282**	**10.1**
>60	37	4.8	**110**	**26.3**	**66**	**13.1**	**83**	**7.9**	66	6.3	**626**	**22.4**
Location type												
Private	**604**	**77.7**	335	80.0	406	80.6	885	84.3	546	51.9	**1,313**	**46.9**
Public	**160**	**20.6**	77	18.4	89	17.7	155	14.8	485	46.1	**1,382**	**49.4**
Unknown	**13**	**1.7**	7	1.7	9	1.8	10	1.0	22	2.1	**104**	**3.7**
Socio-economic status[a]												
Quintile 1	276	35.9	130	31.4	151	30.6	255	24.4	326	31.4	**766**	**27.6**
Quintile 2	136	17.7	81	19.6	103	20.9	198	19.0	203	19.6	**509**	**18.4**
Quintile 3	142	18.5	83	20.1	92	18.7	185	17.7	192	18.5	**419**	**15.1**
Quintile 4	119	15.5	67	16.2	86	17.4	213	20.4	175	16.9	**529**	**19.1**
Quintile 5	95	12.4	53	12.8	61	12.4	193	18.5	141	13.6	**550**	**19.8**
Threat												
Yes	**127**	**16.3**	278	66.4	71	14.1	**740**	**70.5**	**116**	**11.0**	**2,082**	**74.4**
No	**651**	**83.7**	141	33.7	433	85.9	**310**	**29.5**	**937**	**89.0**	**718**	**25.6**
Physical violence												
Yes	**669**	**86.0**	161	38.4	449	89.1	**362**	**34.5**	**853**	**90.5**	**910**	**32.5**
No	**109**	**14.0**	258	59.3	55	10.9	**688**	**65.5**	**100**	**9.5**	**1,890**	**67.5**

a: Socio-economic status is quantified by SEIFA-IRSD. Quintile 1 is the most disadvantaged, and quintile 5 is the least disadvantaged

Note: Bold indicates statistical significance at $p<0.05$

Table 2: Predictors of having co-occurring issues within violence-related ambulance attendances for intimate partner violence, by patient role in violent incident, Victoria and Tasmania

Covariates	Victim			Aggressor		
	Odds ratio	95%CI	*p*-value	Odds ratio	95%CI	*p*-value
Gender						
Female	0.6	0.4–0.9	0.008	1.0	0.6–1.7	0.939
Age group						
<18	–	–	–	–	–	–
18–29	1.1	0.4–3.0	0.826	3.7	1.1–12.1	0.034
30–39	1.1	0.4–3.1	0.793	5.3	1.5–18.6	0.009
40–49	1.2	0.4–3.2	0.768	5.5	1.5–20.6	0.011
50–59	2.1	0.7–6.1	0.194	13.9	2.4–82.6	0.004
>60	0.8	0.3–2.6	0.709	2.2	0.7–7.0	0.178
Location type						
Private place	–	–	–	–	–	–
Public place	1.3	0.9–2.0	0.127	1.2	0.6–2.6	0.651
Socio-economic status						
Quintile 1	–	–	–	–	–	–
Quintile 2	1.1	0.7–1.7	0.726	1.7	0.8–3.7	0.190
Quintile 3	1.1	0.7–1.7	0.654	2.2	0.9–5.4	0.073
Quintile 4	1.1	0.7–1.6	0.828	1.0	0.4–2.1	0.912
Quintile 5	1.2	0.7–1.9	0.505	1.6	0.6–4.0	0.353
Constant	**1.7**	**0.6–4.9**	**0.335**	**1.1**	**0.3–3.5**	**0.901**

Other family violence related ambulance attendances

In ambulance attendances for victims of other family violence, females and males were more similarly affected (51% and 49% respectively; Table 1). The largest age group for aggressors of other family violence related attendances was under the age of 18 years (31%).

In other family violence related attendances, age group was the only significant predictor of co-occurring issues for both aggressors and victims (Table 3). In attendances for victims, the age groups 18–29, 40–49 and 50–59 were respectively 140 percent, 120 percent and 100 percent more likely to have co-occurring issues than those aged under 18 years. Aggressor age groups of 18–29, 30–39, 40–49 and 50–59 were associated with increased likelihood of having co-occurring issues by 70 percent, 86 percent, 181 percent and 30 percent respectively.

Table 3: Predictors of having co-occurring issues within ambulance attendances for other family violence, by role of patient in violent incident, Victoria and Tasmania

Variables	Victim			Aggressor		
	Odds ratio	95%CI	*p*-value	Odds ratio	95%CI	*p*-value
Gender						
Female	0.8	0.5–1.1	0.202	1.24	0.91–1.69	0.167
Age group						
<18	–	–	–	–	–	–
18–29	2.4	1.4–4.3	0.003	1.7	1.2–2.5	0.005
30–39	1.2	0.7–2.3	0.580	1.9	1.2–2.9	0.006
40–49	2.2	1.2–4.1	0.013	2.8	1.5–5.3	0.001
50–59	2.0	1.0–4.0	0.049	1.3	1.7–11.1	0.003
>60	1.0	0.5–1.9	0.872	1.4	0.8–2.4	0.308
Location type						
Private place	–	–	–	–	–	–
Public place	1.5	0.9–2.2	0.106	1.02	0.67–1.54	0.935
Socio-economic status						
Quintile 1	–	–	–	–	–	–
Quintile 2	1.4	0.8–2.3	0.249	0.9	0.6–1.4	0.597
Quintile 3	1.3	0.7–2.2	0.381	1.0	0.6–1.6	0.928
Quintile 4	1.1	0.6–1.9	0.714	1.0	0.6–1.6	0.978
Quintile 5	1.2	0.6–2.2	0.645	0.8	0.5–1.3	0.464
Constant	**0.8**	**0.4–1.4**	**0.347**	**2.2**	**1.5–3.3**	**<0.001**

Community violence related attendances

Males dominated community violence related ambulance attendances (Table 1; 67% of victims and 62% of aggressors). Both aggressors (31%) and victims (28%) in community violence related attendances were more likely to be from the most disadvantaged socio-economic group (quintile 1). Of the 2,800 community violence related attendances for aggressors, 729 (26%) involved an explicit threat or physical violence towards a police officer, and 1,168 (42%) towards a paramedic.

Regression analyses of ambulance attendances for community violence (Table 4) found no significant predictors of co-occurring issues in victim-related attendances. However, in aggressors, age group and socio-economic status were significant predictors. The risk of having co-occurring issues was 170 percent and 160 percent higher in age groups 40–49 and 50–59 than in those aged under 18. Living in the third quintile of socio-economic status increased the odds of having co-occurring issues by 81 percent.

Table 4: Predictors of having co-occurring issues within violence-related ambulance attendances for community violence, Victoria and Tasmania

Variables	Victim			Aggressor		
	Odds ratio	95%CI	*p*-value	Odds ratio	95%CI	*p*-value
Gender						
Female	1.0	0.8–1.3	0.691	1.2	1.0–1.5	0.063
Age group						
<18	–	–	–	–	–	–
18–29	1.2	0.7–2.0	0.459	1.6	1.1–2.3	0.025
30–39	1.2	0.7–2.1	0.414	1.2	0.8–1.8	0.425
40–49	1.4	0.8–2.3	0.272	1.7	1.2–2.6	0.009
50–59	0.9	0.5–1.6	0.705	1.6	1.0–2.6	0.047
>60	0.8	0.4–1.6	0.593	0.9	0.6–1.4	0.722
Location type						
Private place	–	–	–	–	–	–
Public place	0.9	0.7–1.2	0.715	0.9	0.7–1.1	0.156
Socio-economic status						
Quintile 1	–	–	–	–	–	–
Quintile 2	1.1	0.8–1.6	0.595	0.9	0.7–1.2	0.427
Quintile 3	1.0	0.7–1.4	0.948	1.8	1.3–2.6	0.001
Quintile 4	1.2	0.8–1.7	0.446	1.4	1.0–1.8	0.051
Quintile 5	0.9	0.6–1.4	0.715	1.1	0.8–1.4	0.608
Constant	**1.1**	**0.7–1.9**	**0.693**	**3.2**	**2.1–4.7**	**<0.001**

Discussion

This project demonstrated that coded ambulance clinical records are a rich, timely source of information for population surveillance of violence in families and the community and could be routinely used to capture details of violent events. These data are not subject to the issue of recall bias and are more likely to capture vulnerable and hard-to-reach populations, because of the universal nature of ambulance services. The data can also provide details of both those affected by violence (victims) and the perpetrators of the violence (aggressors). Further, given that only half to three-quarters of violence-related attendances are co-attended by police, ambulance data can provide a more complete understanding of the complexity of violence than police data alone (Scott et al. 2020).

There are, of course, limitations to these data. These data are collected for the clinical treatment of patients, so the information held in the record is dependent on paramedics' professional judgement of patients' treatment needs. However, this is also a strength of these data, because the paramedics capture all clinically relevant data which include detailed descriptions of the violent event. As in all surveillance systems, the nature of the data means that causality cannot be determined. Indeed, where violence, mental health and AOD issues were identified, these data did not assume causality but did identify acutely co-occurring issues. It is also important to note that, although ambulance data capture a broad section of the community, only those violent incidents necessitating an ambulance are included. In these data, the primary filtering undertaken in Victoria did not appear to significantly affect the percentage of attendances that were coded as related to AOD, mental health, self-harm or violence. Nevertheless, it is important to acknowledge that the filters for the pilot data used in this project are focused on identifying AOD, mental health and self-harm, and are not specific to violence.

This study found that the largest proportion of violence-related ambulance attendances were for community violence. Violence-related ambulance attendances for victims of all three types of violence (intimate partner, other family, and community) were more commonly associated with physical violence and had fewer acutely co-occurring issues. When co-occurring issues were present, this was most commonly AOD involvement. The issue of how AOD relates to victims of violence is complex, because the relationship is bi-directional; nevertheless, meta-analyses have shown a clear positive association between AOD use and violence victimisation (Cafferky et al. 2018; Devries et al. 2014). In intimate partner violence related attendances, victims were more commonly female; in other family violence and community violence, there was a larger proportion of males. Where male patients were victims of intimate partner violence, they were also more likely than females to have a more complex attendance that involved AOD, mental health or self-harm related issues. These data reinforce the importance of gender in any discussion of violence policy, but they also demonstrate that gender-related trends may differ according to the type of violence (intimate partner, other family, and community). Any effective policy response to violence should consider the role of gender in the specific type of violence being addressed.

Ambulance attendances to treat the aggressor of violence formed a large proportion of all violence-related attendances. This reflects the complexity of violence, whereby many of the individuals experiencing harm and requiring ambulance treatment were being violent towards others. Undeniably, ambulance attendances for aggressors of violence were more complicated than attendances for victims of violence, with more co-occurring mental health, self-harm or AOD-related issues. Although this may be partly related to the filtered dataset, it also captures the complexity of treatment needs for those with mental health and AOD issues who may also be violent towards others.

Ambulance attendances to treat aggressors were often for a threat of violence rather than physical or sexual violence. This is likely to reflect management of co-occurring aggression and mental health issues in the community, rather than actual physical injury having been inflicted.

An interesting finding was the higher than expected proportion of aggressors among those aged over 60 years. The majority of these were associated with mental health symptoms related to pre-existing conditions that may contribute to aggression (eg dementia). Although these data demonstrate the complex health needs of aggressors of violence, they also identify a need for awareness of the contribution of particular medical conditions to violence-related ambulance attendances in an ageing population and the likely flow-on effects to carers in both family homes and nursing homes.

These data demonstrate the importance of integrated and collaborative responses to violence, particularly in family violence. Health, family violence, AOD services and mental health services must collaborate and share information, or the violence will continue. Current models that focus only on gender and empowerment will not sufficiently address the contribution of mental health and AOD issues to violence (Alcorn 2019; Short et al. 2019). Indeed, a recent meta-analysis found that AOD use and mental health have a complex but robust relationship to violence, regardless of perpetrator or victim status or population group (Duke et al. 2018).

The primary aim of this study was to explore the feasibility of using coded ambulance data for violence surveillance, similarly to the established AOD and mental health related harm surveillance methodology (Lloyd, Gao et al. 2015; Lloyd, Matthews et al. 2015). Other datasets capture violence-related information—for example, police family violence and assault data; injury surveillance systems using emergency department or inpatient data; mortality; or specific coronial datasets (Scott & Faulkner 2019). Each of these datasets provides valuable, specific details, but each is limited by the information available and coding structure. For example, injury surveillance data generally focus on health-related consequences, often not capturing the co-occurring role of AOD in the incident. Coronial data are a rich information source, but they only comment on fatal incidents and can take up to three years to be available (Studdert et al. 2016). Police data provide detailed information, but our data show that police attend only half to three-quarters of violence-related incidents in the community (Scott et al. 2020).

We have demonstrated that coded ambulance data identify and characterise a wide range of violence-related information, particularly the complex, acute associations between AOD, mental health, self-harm and violence. Routine coding and reporting of these data could be a valuable source of information to sit alongside health, police, coronial and survey data to inform policy development and interventions.

References

URLs correct as at February 2020

Alcorn G 2019. There are ways to reduce domestic violence that have nothing to do with the patriarchy. *The Guardian*, Australia edition, 9 July. https://www.theguardian.com/society/commentisfree/2019/jul/10/there-are-ways-to-reduce-domestic-violence-that-have-nothing-to-do-with-the-patriarchy

Arseneault L, Moffitt TE, Caspi A, Taylor PJ & Silva PA 2000. Mental disorders and violence in a total birth cohort: Results from the Dunedin Study. *Archives of General Psychiatry* 57(10): 979–986

Australian Bureau of Statistics 2017. *Personal Safety Survey 2016.* ABS cat. no. 4906.0. Canberra: Australian Bureau of Statistics. https://www.abs.gov.au/ausstats/abs@.nsf/mf/4906.0

Australian Bureau of Statistics 2006. *Personal Safety Survey 2005*. Canberra: Australian Bureau of Statistics

Boles SM & Miotto K 2003. Substance abuse and violence: A review of the literature. *Aggression and Violent Behavior* 8(2): 155–174

Cafferky BM, Mendez M, Anderson JR & Stith SM 2018. Substance use and intimate partner violence: A meta-analytic review. *Psychology of Violence* 8(1): 110–131

Christoffersen MN, Soothill K & Francis B 2005. Who is most at risk of becoming a convicted rapist? The likelihood of a rape conviction among the 1966 birth cohort in Denmark. *Journal of Scandinavian Studies in Criminology and Crime Prevention* 6(1): 39–56

Collins JJ & Messerschmidt PM 1993. Epidemiology of alcohol-related violence. *Alcohol Research and Health* 17(2): 93

Crilly J, Chaboyer W & Creedy D 2004. Violence towards emergency department nurses by patients. *Accident and Emergency Nursing* 12(2): 67–73

Council of Australian Governments 2011. *National Plan to Reduce Violence Against Women and Their Children 2010–2022*. Canberra: Department of Social Services. https://www.dss.gov.au/women/programs-services/reducing-violence/the-national-plan-to-reduce-violence-against-women-and-their-children-2010-2022

Devries KM et al. 2014. Intimate partner violence victimization and alcohol consumption in women: A systematic review and meta-analysis. *Addiction* 109(3): 379–391

Duke AA, Smith KMZ, Oberleitner LMS, Westphal A & McKee SA 2018. Alcohol, drugs, and violence: A meta-meta-analysis. *Psychology of Violence* 8(2): 238–249

Elbogen EB & Johnson SC 2009. The intricate link between violence and mental disorder: Results from the National Epidemiologic Survey on Alcohol and Related Conditions. *Archives of General Psychiatry* 66(2): 152–161

Fitterer JL, Nelson TA & Stockwell T 2015. A review of existing studies reporting the negative effects of alcohol access and positive effects of alcohol control policies on interpersonal violence. *Frontiers in Public Health* 3(253): 1–11

Fulu E et al. 2013. *Why do some men use violence against women and how can we prevent it? Quantitative findings from the United Nations Multi-Country Study on Men and Violence in Asia and the Pacific*. Bangkok: United Nations Development Programme, United Nations Population Fund

Graham K, Bernards S, Wilsnack SC & Gmel G 2011. Alcohol may not cause partner violence but it seems to make it worse: A cross national comparison of the relationship between alcohol and severity of partner violence. *Journal of Interpersonal Violence* 26(8): 1503–1523

Gruenewald PJ & Remer L 2006. Changes in outlet densities affect violence rates. *Alcoholism: Clinical and Experimental Research* 30(7): 1184–1193

Klostermann K & Fals-Stewart W 2006. Intimate partner violence and alcohol use: Exploring the role of drinking in partner violence and its implications for intervention. *Aggression and Violent Behavior* 11(6): 587–597

Krug EG, Mercy JA, Dahlberg LL & Zwi AB 2002. The world report on violence and health. *The Lancet* 360(9339): 1083–1088

Laslett A-M et al. 2015. *The hidden harm: Alcohol's impact on children and families*. Canberra: Foundation for Alcohol Research and Education

Livingston M 2011. A longitudinal analysis of alcohol outlet density and domestic violence. *Addiction* 106(5): 919–925

Lloyd B, Matthews S, Gao CX, Heilbronn C & Beck D 2015. *Trends in alcohol and drug related ambulance attendances in Victoria: 2013/14*. Fitzroy: Turning Point

Lloyd B, Gao CX, Heilbronn C & Lubman DI 2015. *Self-harm and mental health-related ambulance attendances in Australia: 2013 data.* Fitzroy: Turning Point

McKetin R et al. 2014. Does methamphetamine use increase violent behaviour? Evidence from a prospective longitudinal study. *Addiction* 109(5): 798–806

McNiel DE & Binder RL 2007. Effectiveness of a mental health court in reducing criminal recidivism and violence. *American Journal of Psychiatry* 164(9): 1395–1403

Menéndez P, Weatherburn D, Kypri K & Fitzgerald J 2015. Lockouts and last drinks: The impact of the January 2014 liquor licence reforms on assaults in NSW, Australia. *Crime and Justice Bulletin* 183. Sydney: NSW Bureau of Crime Statistics and Research

Miller P et al. 2016. *Alcohol/Drug-involved Family Violence in Australia (ADIVA).* Geelong: National Drug Law Enforcement Research Fund

Nathanson AM, Shorey RC, Tirone V & Rhatigan DL 2012. The prevalence of mental health disorders in a community sample of female victims of intimate partner violence. *Partner Abuse* 3(1): 59

Rees S et al. 2014. Onset of common mental disorders and suicidal behavior following women's first exposure to gender based violence: A retrospective, population-based study. *BMC Psychiatry* 14(312)

Scott D & Faulkner A 2019. The role, importance and challenges of data for a public health model. In D Higgins, B Lonne, T Herronkohl & D Scott (eds), *Revisioning a public health approach to child protection*. Denver: Springer

Scott D et al. 2020. *The use of ambulance data to inform patterns and trends of alcohol and other drug misuse, self-harm and mental health in different types of violence.* Report to the Criminology Research Advisory Council. Canberra: Australian Institute of Criminology

Shorey RC, Febres J, Brasfield H & Stuart GL 2012. The prevalence of mental health problems in men arrested for domestic violence. *Journal of Family Violence* 27(8): 741–748

Short J, Cram F, Roguski M, Smith R & Koziol-McLain J 2019. Thinking differently: Re-framing family violence responsiveness in the mental health and addictions health care context. *International Journal of Mental Health Nursing* 28(5): 1206–1216

Smith PH, Homish GG, Leonard KE & Cornelius JR 2012. Intimate partner violence and specific substance use disorders: Findings from the National Epidemiologic Survey on Alcohol and Related Conditions. *Psychology of Addictive Behaviors* 26(2): 236–45

Sonenshone AW, Rubin DJ & Tran J 2017. *Orange County Women's Health Policy Brief: Domestic violence, mental health, and substance abuse*. Orange County, CA: Orange County Women's Health Project

Studdert D, Walter S, Kemp C & Sutherland G 2016. Duration of death investigations that proceed to inquest in Australia. *Injury Prevention* 22(5): 314–20

Van Dorn R, Volavka J & Johnson N 2012. Mental disorder and violence: Is there a relationship beyond substance use? *Social Psychiatry and Psychiatric Epidemiology* 47(3): 487–503

Victorian Government 2017. *Free from violence.* Melbourne: Victorian Government

Victorian Government 2015. *Ice action plan.* Melbourne: Victorian Government

Waters H et al. 2004. *The economic dimensions of interpersonal violence.* Geneva: World Health Organization

Witt K, Hawton K & Fazel S 2014. The relationship between suicide and violence in schizophrenia: Analysis of the Clinical Antipsychotic Trials of Intervention Effectiveness (CATIE) dataset. *Schizophrenia Research* 154(1): 61–67

Yoshihama M & Gillespie BW 2002. Age adjustment and recall bias in the analysis of domestic violence data: Methodological improvements through the application of survival analysis methods. *Journal of Family Violence* 17(3): 199–221

Dr Debbie Scott is the Strategic Lead, Population Health, at Turning Point, with affiliations with Eastern Health and Monash University.

Dr Cherie Heilbronn is a Research Fellow in Population Health at Turning Point, with affiliations with Eastern Health and Monash University.

Dr Kerri Coomber is a Research Fellow at the Centre for Drug use, Addictive and Anti-social behaviour Research, School of Psychology, Deakin University.

Dr Ashlee Curtis is a Research Fellow in the School of Psychology at Deakin University.

Dr Foruhar Moayeri is a Research Fellow in Population Health at Turning Point, with affiliations with Eastern Health and Monash University.

Dr James Wilson is a Research Officer in Population Health at Turning Point, with affiliations with Eastern Health and Monash University.

Dr Rose Crossin was a Research Assistant in Population Health at Turning Point, with affiliations with Eastern Health and Monash University, at the time of writing.

Mr Alex Wilson is the Coordinator of Research at Ambulance Tasmania.

Professor Karen Smith is the Director of Research and Evaluation at Ambulance Victoria, with affiliations to Monash University.

Professor Peter Miller is a Professor of Violence Prevention and Addiction Studies at the School of Psychology, with affiliations to the Centre for Addiction and Mental Health in Canada and the National Drug Research Institute at Curtin University.

Professor Dan Lubman is the Executive Clinical Director of Turning Point, and Professor of Addiction Studies at Monash University.

General editor, *Trends & issues in crime and criminal justice* series: Dr Rick Brown, Deputy Director, Australian Institute of Criminology. Note: *Trends & issues in crime and criminal justice* papers are peer reviewed. For a complete list and the full text of the papers in the *Trends & issues in crime and criminal justice* series, visit the AIC website at: aic.gov.au

ISSN 1836-2206 (Online)

ISBN 978 1 925304 42 8 (Online)

©Australian Institute of Criminology 2020

GPO Box 1936
Canberra ACT 2601, Australia
Tel: 02 6268 7166

Disclaimer: This research paper does not necessarily reflect the policy position of the Australian Government

aic.gov.au