

# Violence against ambulance personnel: a retrospective cohort study of national data from Safe Work Australia

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## Article history

Publication date: March 2018

Citation: Maguire BJ. Violence against ambulance personnel: a retrospective cohort study of national data from Safe Work Australia. *Public Health Res Pract*. 2018;28(1):e28011805. <https://doi.org/10.17061/phrp28011805>

## Key points

- Violence is a leading cause of injury among paramedics
- The rate of violence-related injury among paramedics in Australia went from 6 to 12 cases per million ambulance calls per year between 2003 and 2014
- Funding is needed for teams of public health officials, ambulance service administrators, paramedic professionals and university researchers to work together to develop, implement, test and publish the results of risk-reduction interventions

## Abstract

**Objectives and importance:** Paramedics have high rates of occupational injury and fatality. The objective of this study is to describe their specific risks of violence-related injury.

**Study type:** This retrospective cohort study is an examination of retrospective data provided by Safe Work Australia (SWA).

**Methods:** An examination of the 300 cases of serious claims of injury related to assaults, violence, harassment and bullying that occurred among individuals identified as ambulance officers and paramedics in Australia from 2001 to 2014. Paramedic risks likely vary by exposures such as hours worked and call volume. To examine how those exposures may influence risk, the available data were used to estimate rates based on hours worked and call volume.

**Results:** The data show that, for serious injuries among paramedics in Australia between 2001 and 2014, the total number of violence-related cases increased from 5 to 40 per year; the number of cases of injury secondary to assault tripled from 10 to 30; and the rate of cases by call volume doubled from 6 to 12. The cost of these injuries was approximately AUD\$250 000 for the year 2013–14. The median time at work lost per individual case of 'work-related harassment and/or workplace bullying' was 9.6 weeks. Although females comprised 32% of the paramedic workforce, they were the victims in 42% of cases of exposure to violence and 40% of harassment cases.

**Conclusions:** Although anecdotal reports indicate that some interventions have been attempted, violence against paramedics continues to be a growing problem in Australia. The data presented in this study allow for a better understanding of the problem and can support efforts by ambulance service administrators, physicians, paramedics and university researchers to work together to develop and publish evidence based, cost-effective solutions to reduce the risk of workplace violence. Effective solutions will likely be multifaceted and include training, engineering changes, community education and adjustments to agency policies. Because of the widespread nature of the risks, a national commission should be empowered to address this growing problem.

## Introduction

Paramedics provide a crucial component of Australia's public health, medical and emergency services systems. In Australia, approximately 16 000 full-time equivalent paramedics, and 9000 volunteers and first responders, respond to more than 3 million calls for assistance each year.<sup>1</sup> "No other group identified by Safe Work Australia [SWA] has a higher injury rate than paramedics."<sup>2</sup> Of 6720 paramedic injuries reported to SWA between 2000 and 2010, 175 (2.6%) were violence related.<sup>2</sup> Among 255 Australian paramedic respondents in one study, 222 (87%) reported being exposed to workplace violence.<sup>3</sup> Among all healthcare workers in Australia, ambulance officers were found to be at the greatest risk of workplace violence.<sup>4</sup> Globally, violence has been found to be a cause of injuries among emergency medical services (EMS) personnel in multiple countries.<sup>5-10</sup>

Recent newspaper reports indicate that the rate of violence against EMS personnel may be accelerating. In London, there were "582 reported assaults and 749 cases of abuse against paramedics in 2013 – up 23% compared with the previous year".<sup>11</sup> In another British ambulance service, the number of cases of violence against paramedics jumped from 69 to 188 in 1 year.<sup>12</sup> In Queensland, Australia, the number of violent incidents against paramedics increased from 205 cases in 2012–13 to 381 cases in the 2015–16 financial year.<sup>13</sup>

Although there are no paramedic-specific cost data available, SWA estimates that the average cost per incident of an occupational injury among all workers in Australia is AUD\$75 000.<sup>14</sup> Therefore, the cost of violence against paramedics could be considerable.

Maguire et al. found no peer-reviewed studies documenting the outcomes of any violence-prevention initiatives for EMS personnel.<sup>5</sup>

The aim of this paper is to describe the incidence of violence against ambulance personnel in Australia.

## Methods

This retrospective cohort study is an examination of data provided by SWA for the years 2001 to 2014p (p = preliminary). SWA is an Australian Government statutory body established in 2008, whose functions include to "collect, analyse and publish data or other information relating to OHS [occupational health and safety] and workers' compensation in order to inform the development or evaluation of policies in relation to those matters".<sup>15</sup>

SWA provided data about all claims of serious injury during the study period among individuals identified as ambulance officers and paramedics, which met the following mechanisms of injury: being assaulted by a person or persons; exposure to workplace or occupational violence; other harassment; and work-related harassment and/or workplace bullying. To be

included by SWA, a case must meet the following definition: "A workers' compensation claim for a death, permanent incapacity, or a temporary incapacity requiring an absence from work of one working week or more lodged in the reference year, and accepted for compensation by the jurisdiction by the date the data are extracted for publication. Claims in receipt of common law payments are also included."<sup>16</sup>

SWA uses a variety of categories in its reports; for example, it defines workplace violence as "any incident where a person is abused, threatened or assaulted in circumstances arising out of, or in the course of their work".<sup>17</sup> "Mental disorders" are defined as "psychological injuries".<sup>18</sup> SWA defines workplace bullying as "repeated unreasonable behaviour directed towards workers or a group of workers, that creates a risk to health and safety" and harassment as "unwelcome behaviour that intimidates, offends or humiliates a person".<sup>19</sup>

SWA refers to the group of injured workers as "ambulance officers and paramedics". In other countries, ambulance personnel are sometimes referred to as paramedics, emergency medical technicians or EMS personnel. This paper generally refers to all ambulance personnel as paramedics. Data about the number of 'qualified ambulance officers' and 'total incidents' are published by the Australian Government's Productivity Commission in its *Report on government services*<sup>1,20</sup>; the word 'incidents' is used by the Productivity Commission to describe ambulance call volume.

Paramedic risks are likely to vary by exposures such as hours worked and call volume. To examine how those exposures may influence risk, estimates of rates were based on hours worked and call volume. Hours worked are an estimate calculated by multiplying the number of workers by 1800 hours worked per year.<sup>21</sup> The injury rate is calculated by dividing the total number of cases by the estimated hours worked and multiplying by 10 million to get an estimated rate per 5000 equivalent full-time workers. The rate per one million incidents is the total number of violence cases divided by the total number of incidents and multiplied by one million.

The study meets the STROBE standards for cohort studies.

The project (# H16/06-157) was approved by the Central Queensland University ethics committee on 14 June 2016.

## Results

SWA provided data on 300 cases of serious injury among paramedics that occurred between 2001 and 2014p. The available SWA data are only Australia-wide and do not include state-level results. Results are presented by the number of cases; a breakdown of the cases by gender,

mechanisms of injury and body part injured; and the trend in cases and rates during the study period. Rows and columns may not always add up to total values because of the way SWA reports the data.

SWA provided the number of cases classified as ‘being assaulted by a person or persons’ and the total number of cases classified as assaults, violence, harassment and bullying per year (Table 1).

**Table 1.** Cases of violence-related injury and rates among paramedics

Year	No. cases of serious injury after being assaulted by a person or persons <sup>a</sup>	Total number of assaults, violence, harassment and bullying-related cases <sup>b</sup>	Total qualified ambulance officers	Hours worked
2001–02	na	5	na	na
2002–03	10	15	na	na
2003–04	10	15	na	10 083 600
2004–05	15	25	na	10 693 800
2005–06	10	15	6 313	11 363 400
2006–07	10	20	6 548	11 786 400
2007–08	15	20	6 799	12 238 200
2008–09	10	25	7 306	13 150 800
2009–10	10	20	7 837	14 106 600
2010–11	20	30	8 244	14 839 200
2011–12	10	25	8 801	15 841 800
2012–13	25	40	9 152	16 473 600
2013–14p	30	40	9 631	17 335 800

2014p = 2014 preliminary data; na = not available

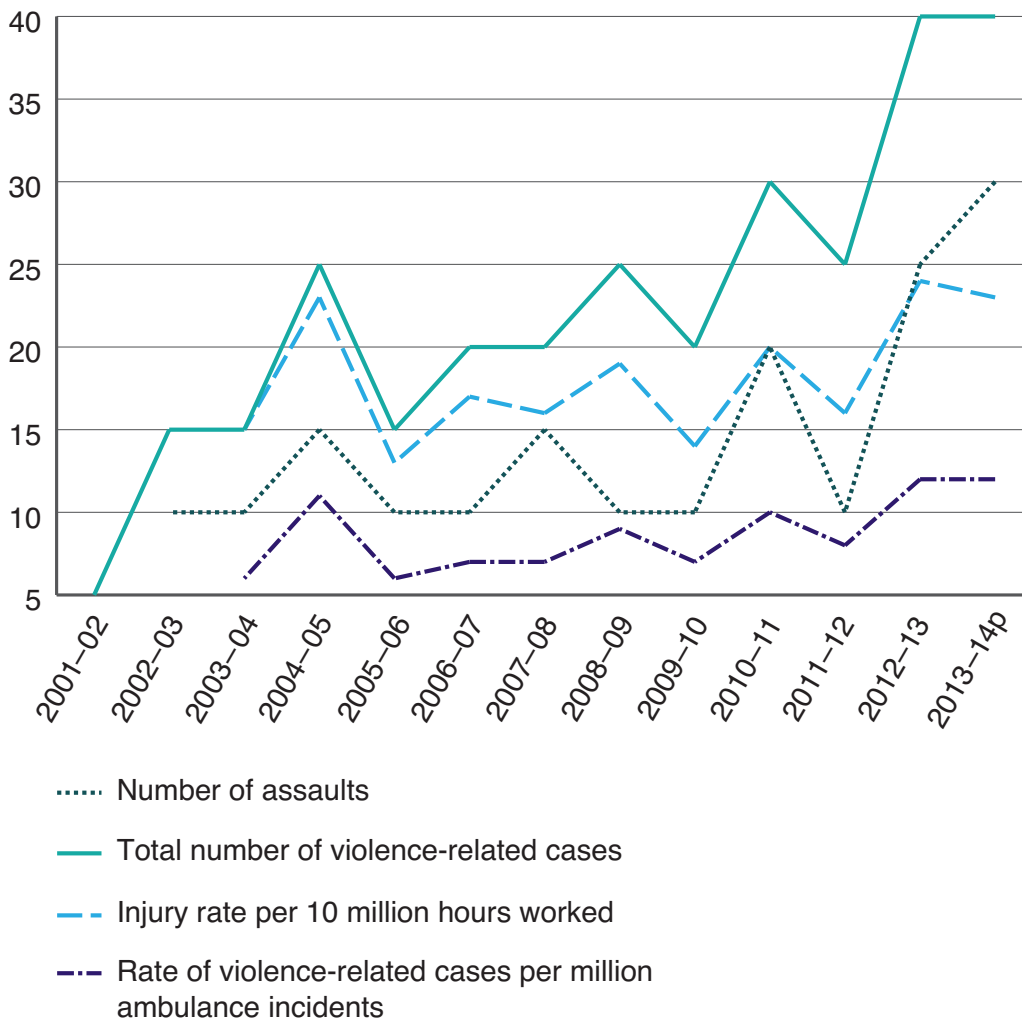
<sup>a</sup> n = 185

<sup>b</sup> N = 300

To illustrate how the risks of violence and assault vary by exposure, Figure 1 shows the trend lines for cases of assault and violence, as well as the rate of violence-related cases per 10 million hours worked per year, and the rate of violence-related cases per one million ambulance incidents per year for 2001–02 to 2013–14p.

The figure shows the variability over time and illustrates that the trend is increasing for all four measures. The most dramatic increase is in the number of violence-related cases per year, which increased from 5 to 40 during the study period.

**Figure 1.** Trends in cases and rates of violence-related injury among paramedics



2014p = 2014 preliminary data

Table 2 shows the breakdown in cases by sex by the main mechanisms: assault, violence and harassment/ bullying. The median time lost from work was 3.7 working weeks. Work-related harassment and/or workplace

bullying resulted in the highest median amount of lost work time of 9.6 weeks. Female paramedics were the victims in 35% of the assault cases, 42% of the violence-related cases and 40% of the harassment cases.

**Table 2. Median time lost from work, and cases of violence-related injury or harassment among paramedics by sex (N = 300)**

Mechanism of injury or disease	Median time lost from work (working weeks)	Total no. cases (%), 2001–2014p	No. female cases (%)	No. male cases (%)
Being assaulted by a person or persons	2.4	185 (62)	65 (35)	120 (65)
Exposure to workplace or occupational violence	8.6	60 (20)	25 (42)	35 (58)
Work-related harassment and/or workplace bullying	9.6	50 <sup>a</sup> (17)	20 (40)	25 (50)
Other harassment	5.2	5 (2)	na	na

2014p = 2014 preliminary data; na = not available

<sup>a</sup> Includes 5 cases where the sex was not specified.

Table 3 illustrates a breakdown of the 185 assault cases by nature of injury and bodily location. The highest percentage of injuries were classified as 'traumatic joint/

ligament and muscle/tendon injury'. The body part most injured was 'upper limbs'.

**Table 3. Cases of serious injury among paramedics after being assaulted by a person or persons, 2001–2014p (n = 185)**

Injury	Type	No. cases (%)
Nature of injury	Fractures	10 (5)
	Mental disorders	20 (11)
	Musculoskeletal and connective tissue diseases	10 (5)
	Traumatic joint/ligament and muscle/tendon injury	80 (43)
	Wounds, lacerations, amputations and internal organ damage	50 (27)
Body location of injury	Head	25 (14)
	Lower limbs	10 (5)
	Multiple locations	30 (16)
	Psychological system	20 (11)
	Trunk	35 (19)
	Upper limbs	65 (35)
<b>Total</b>	–	<b>185 (100)</b>

2014p = 2014 preliminary data

SWA reported no fatal injuries due to violence against paramedics during the reporting period.

## Discussion

The number of assault cases increased from 10 to 30 cases per year over the study period, and the total number of violence-related cases increased from 5 to 40. The number of cases of serious injury secondary to assault among paramedics in Australia tripled between 2001 and 2014. However, paramedics are not alone in seeing an increased risk of occupational assault: SWA reports that the number of assault cases for all workers in Australia “more than doubled” during the same period.<sup>22</sup>

The size of the paramedic workforce almost doubled over the study period, and the number of ambulance calls increased by one million calls per year. Examining the possible effects of these changes showed that injuries still increased over the study period. The rate of injuries based on work hours increased from 15 to 23 per 10 million work hours, and the rate of injuries per million ambulance incidents increased from 6 (95% CI 3,10) to 12 (95% CI 8,16).

For Australian paramedics, being assaulted by a person or persons results in a median time lost from work of 2.4 working weeks. In the dataset sent to the author, SWA reported that for the years 2000 to 2014p, the median time lost from work (working weeks) for Australian paramedics being assaulted by a person or persons was 2.4 weeks. In the *Australian workers' compensation statistics, 2014–15*, SWA reports that the median time lost from work for all assaulted workers ranged between 4.2 and 5.0 weeks of lost work time between 2000 and 2014.<sup>22</sup>

According to SWA, the median compensation cost per case of assault against a worker ranged between AUD\$6000 and AUD\$8300 over 2000 to 2014.<sup>22</sup> The average cost per case for all workers is approximately AUD\$7433. Although there are no data about how compensation claims among paramedics may differ from other occupations, the available data indicate that the cost for the 30 cases of assault against paramedics was approximately AUD\$250 000 dollars for 2013–14.

In 2011, females comprised 32% of the paramedic workforce<sup>23</sup>, and 35% of cases of assault. However, in the categories ‘exposure to workplace or occupational violence’ and ‘work-related harassment and/or workplace bullying’, females were the victims in about 40% of the cases. Boyle found that female paramedics had higher risks of sexual harassment and sexual assault; for example, 89% of female paramedics experienced verbal abuse compared with 80% of male paramedics, and 38% of females experienced sexual harassment compared with less than 10% of male paramedics.<sup>3</sup> These findings suggest that female paramedics have a greater risk of at least some types of violence-related incidents, so there is a need for gender-specific research and interventions.

Although anecdotal reports indicate that ambulance services in Australia and internationally have attempted interventions to reduce the risks of violence, no peer-reviewed studies documenting the effectiveness of any

interventions were found during a systematic review of the literature.<sup>5</sup> Effective interventions will likely include a multistage process<sup>24</sup> and a multifaceted approach<sup>4</sup> including legislative efforts to increase penalties for assault, and changes to agency policies related to incident reporting.<sup>25</sup> Training and community education should also be considered.

The results of this study indicate the need for interventions and strategies to better manage violence against paramedics. Because this is an international issue, it is imperative that the results of any interventions be published so that EMS agencies around the world can begin to develop a set of best practices for occupational violence prevention.

## Limitations

The SWA data include only serious injuries that resulted in at least a week of lost work time and were approved for compensation. Such cases may be a small fraction of the total number of actual violence cases against paramedics. The data do not include more specific incident data that might help to explain causes or circumstances of the injury, or may help to identify potential interventions to prevent future injuries.

The broad data available from SWA help to identify the scope and nature of risks to paramedics, as well as the changes in case numbers over time in the Australian population. Future occupational risk studies will require more specific numerator data, as well as access to reliable denominator data such as hours worked by male and female paramedics. Because these data are solely from Australia, they may not be generalisable to other countries.

## Conclusions

Violence against paramedics threatens hundreds of professionals every year in Australia alone. Although the SWA data are sufficient to show that the problem is large and growing, more detailed data owned by the ambulance agencies is needed to conduct specific analyses and develop interventions. The data presented in this study allow for a better understanding of the problem and create a foundation for efforts of public health officials, ambulance service administrators, physicians, paramedics and university researchers to work together to develop prospective risk-reduction interventions and to implement evidence based, cost-effective solutions to reduce the risks of workplace violence. Effective solutions will likely be multifaceted and include training, changes related to tools or engineering, community education, and adjustments to agency policies. Because of the scope of the issue, a national commission should be empowered to address this growing problem.

## Acknowledgements

The author thanks SWA for providing the data needed for this report.

## Competing interests

None declared

## Author contributions

BM is the sole author.

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