



## Recent trends in hospital admissions and mortality attributable to penetrating injuries in Queensland

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Media reports suggest that the number of assaults due to penetrating injuries (e.g.: knife attacks, glass assaults) have increased in Queensland in recent years. However, this remains conjecture, since there have been no attempts to evaluate trends in relation to penetrating injuries. The purpose of this report is to describe recent trends in penetrating injuries which resulted in a hospital inpatient admission or a death.

Hospital morbidity data were drawn from the Queensland Admitted Patient Data Collection (QHAPDC) for the years 2002/2003 to 2008/2009. Injury separations were defined according to the criteria applied by the Australian Institute of Health and Welfare (AIHW)<sup>1</sup>. This requires an ICD-10-AM code in the range S00-T75 or T79 in the principal diagnosis field and excludes transfers from other acute hospitals. Penetrating injuries were defined as those resulting from both a firearm discharge\* and those caused by a sharp object<sup>†</sup>.

Mortality data for Queensland residents were drawn from the Australian Bureau of Statistics (ABS) mortality collection for the years 2003 to 2007. Injury deaths were coded to underlying cause of death according to AIHW definitions<sup>2</sup>. This requires a code in the ranges V01-Y36, Y85-Y87 or Y89 in the cause of death field. Penetrating injuries were coded using the same definitions as applied to hospital separations

The data are described using age standardised rates with 95% confidence intervals. Rates are standardised to the Australian population for 2001. Annual percent change (APC) is reported with confidence intervals as a measure of the strength and significance of the trend – confidence limits that include zero represent a non-significant trend.

### Hospital morbidity:

There were 533,817 hospital episodes of care for injury between 2002/2003 and 2008/2009, which represents 5.5% of all separations for the period. Penetrating injuries accounted for 4.3% of all episodes of care resulting from an injury. Hospital admission rates for penetrating injuries were higher amongst males compared to females for every year of the study period (Table 1). The mean age of patients with penetrating injuries was 29.8 years (95% CI: 29.6 – 30.0 years), which was lower than the mean age for patients with non-penetrating injuries (mean age: 39.4 years; 95% CI: 39.3 – 39.4 years). Hospital episodes of care for penetrating injuries were more likely to involve a sharp object than a firearm (98.3% vs 1.7%).

There was clear evidence of a trend in hospital episodes of care for injuries overall, with the rate per 100,000 increasing from 1784.6 in 2002/2003 to 2081.5 in 2008/2009 (APC=2.2; 95% CI: 1.7-2.8). There was no evidence of a trend to support claims that penetrating injuries have increased in recent years for males (APC: 0.3; 95% CI: -0.7 to 1.3) or females (APC: 0.9; 95% CI: -1.7 to 3.5).

\* Firearm discharge was defined by codes W32-W34, X72-X74, X93-X95, Y22-Y24, Y350-Y3509, Y364-Y3649

† Sharp object injuries were defined by the codes W25-W26, W46, X78, X99, Y28, Y354

Penetrating injuries attributable to assault accounted for 13.1% of episodes of care resulting from a penetrating injury. Admission rates for these injuries were higher amongst males than females across the study period (Table 2). There was a significant trend which showed that penetrating injuries attributable to assault have increased with time amongst males (APC: 3.7; 95% CI: 1.1 to 6.4), although there was no corresponding trend for females (APC: 1.8; 95% CI: -2.0 to 5.8).

**Table 1. Trends in hospital episodes of care for penetrating injuries: Age standardised rates by sex for Queensland 2002/2003 – 2008/2009**

Year	Persons		Males		Females	
	ASR <sup>1</sup>	95% CI <sup>2</sup>	ASR <sup>1</sup>	95% CI <sup>2</sup>	ASR <sup>1</sup>	95% CI <sup>2</sup>
2002/2003	82.5	79.6-85.5	118.3	113.4-123.3	46.5	43.4-49.7
2003/2004	82.9	80.1-85.9	117.3	112.5-122.3	48.2	45.1-51.4
2004/2005	84.5	81.6-87.4	115.4	110.7-120.3	53.1	49.9-56.5
2005/2006	81.7	78.9-84.6	115.4	110.8-120.3	47.2	44.2-50.4
2006/2007	80.9	78.2-83.7	115.0	110.4-119.7	46.5	43.6-49.6
2007/2008	80.7	78.0-83.5	114.4	109.8-119.0	46.5	43.6-49.6
2008/2009	88.6	85.8-91.4	122.9	118.3-127.7	53.6	50.5-56.8
APC <sup>3</sup> (95% CI)	0.5 (-0.8 - 1.8)		0.3 (-0.7 - 1.3)		0.9 (-1.7 - 3.5)	

<sup>1</sup>Age Standardised Rate (per 100,000)

<sup>2</sup>95% Confidence Interval

<sup>3</sup>Annual Percent Change

Source: Queensland Hospital Admitted Patient Data Collection 2002/2003 to 2008/2009. Extracted 31 March 2010

**Table 2. Trends in hospital episodes of care for penetrating injuries due to assault: Age standardised rates by sex for Queensland 2002/2003 – 2008/2009**

Year	Persons		Males		Females	
	ASR <sup>1</sup>	95% CI <sup>2</sup>	ASR <sup>1</sup>	95% CI <sup>2</sup>	ASR <sup>1</sup>	95% CI <sup>2</sup>
2002/2003	10.3	9.3-11.3	17.2	15.4-19.2	3.3	2.5-4.2
2003/2004	9.6	8.7-10.7	15.2	13.5-17.1	4.0	3.2-5.1
2004/2005	10.8	9.8-11.9	17.6	15.8-19.6	3.9	3.1-4.9
2005/2006	10.6	9.6-11.6	16.5	14.8-18.4	4.5	3.6-5.6
2006/2007	10.7	9.8-11.8	17.8	16.0-19.7	3.6	2.9-4.6
2007/2008	11.4	10.4-12.4	18.3	16.6-20.3	4.3	3.5-5.3
2008/2009	12.5	11.4-13.6	20.9	19.0-22.9	3.9	3.1-4.9
APC <sup>3</sup> (95% CI)	3.4 (1.8 - 5.2)		3.7 (1.1 - 6.4)		1.8 (-2.0 - 5.8)	

<sup>1</sup>Age Standardised Rate (per 100,000)

<sup>2</sup>95% Confidence Interval

<sup>3</sup>Annual Percent Change

Source: Queensland Hospital Admitted Patient Data Collection 2002/2003 to 2008/2009. Extracted 31 March 2010

**Mortality:** There were 7,582 registered injury deaths between 2003 and 2007, which represents 6.2% of all registered deaths during the period. Penetrating injuries accounted for 5.9% of all injury deaths. Males accounted for the majority of deaths due to both penetrating injuries (84.3% vs 15.7%) and non-penetrating injuries (68.8% vs 31.2%). The mean age of death for penetrating injuries was 46.8 years (95% CI: 45.0 – 48.6 years), which was lower than that for non-penetrating injuries (Mean age: 50.3 years; 95% CI: 50.0 – 50.9 years). Firearms accounted for 67.9% of deaths attributable to penetrating injuries.

There was a significant decline in injury deaths over the study period (Table 3: APC: -4.9; 95% CI: -6.5 to -3.3), with age standardised rates decreasing from 41.4 per 100,000 in 2003 to 34.8 per 100,000 in 2007. Deaths associated with penetrating injury remained stable over the study period (APC:-7.8; 95% CI: -15.3 to 0.3). The data for deaths due to penetrating injuries was too sparse to support analyses by sex and intent.

**Table 3. Trends in mortality attributable to penetrating injuries: Age standardised rates for Queensland 2003 – 2007**

Year	Total Injury Deaths		Penetrating Injury Deaths	
	Rate <sup>1</sup>	95% CI <sup>2</sup>	Rate <sup>1</sup>	95% CI <sup>2</sup>
2003	41.4	39.3-43.5	2.9	2.4-3.5
2004	41.6	39.6-43.7	2.3	1.8-2.8
2005	38.2	36.3-40.2	1.9	1.5-2.3
2006	35.6	33.8-37.4	2.1	1.7-2.6
2007	34.8	33.0-36.6	2.1	1.7-2.6
APC <sup>3</sup> (95% CI)	-4.9 (-6.5 – -3.3)		-7.8 (-15.3 – 0.3)	

<sup>1</sup>Age Standardised Rate (per 100,000)

<sup>2</sup>95% Confidence Interval

<sup>3</sup>Annual Percent Change

Source: Australian Bureau of Statistics (ABS) Underlying Cause of Death Data 2003 to 2007. Extracted 31March 2010

In summary, hospital morbidity data provides support for the claim that penetrating injuries resulting from assault have increased in recent years, although the trends identified in this report were specific to assaults where the victim was male. The mortality data remains inconclusive as subgroup analyses were not supported by the data: this was due to the small numbers of deaths due to penetrating injuries overall. Nevertheless, it is important to recognise that hospital inpatient and mortality data describe the most serious of injuries. Less serious injuries are excluded, including those that are treated in the emergency department, by general practitioners or at the scene by paramedics, as well as those that go untreated.

<sup>1</sup>Bradley C and Harrison J (2008). Hospital separations due to injury and poisoning, Australia 2004–05. Injury Research and Statistics Series Number 47. (Cat. no. INJCAT 117) Adelaide: AIHW

<sup>2</sup> AIHW: Henley G and Harrison JE (2009). Injury deaths, Australia 2004–05. Injury research and statistics series no 51. (Cat. no. INJCAT 127). Adelaide: AIHW