

# HAZARD

VISAR

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Victorian Injury Surveillance  
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Monash University  
Accident Research Centre



VicHealth

*This edition of Hazard compares the injury profiles of different geographic regions in Victoria, indicating broad priority areas for prevention. Additionally, this important data set provides a reference baseline enabling evidenced based assessment of the impact of intervention strategies in these regions. There is less emphasis on prevention strategies in this, compared to previous editions of Hazard. Specific injury issues identified in this review will be addressed by in-depth investigation in future Hazard editions.*

## A profile of injuries to Victorian residents by broad geographic region

Karen Ashby, Voula Stathakis, Lesley Day<sup>1</sup>

### Summary

Three-quarters of Victorians reside in metropolitan areas, but represent only 70% of the injured population. In contrast, the 11% of Victorians that live in rural centres sustain 13% of injury deaths and admissions, and 21% of Emergency Department (ED) presentations. The remaining 13% of Victorians live in rural and remote areas, and comprise 17% of injury deaths and injury admissions, but only 8% of ED presentations. Notably, rates of injury death and admissions are 35-40% higher in rural centres and rural/remote areas compared to metropolitan centres.

While injury rates are higher in rural centres and rural/remote areas, the profile across the three groups shows few differences except for causes of injury. Notable differences include deaths from transport injury (metro 23%, rural 23%, rural/remote 33%), and admissions for self-harm (metro 8%, rural 7%, rural/

remote 4%). Means of suicide differed between rural/remote and the other groups. Hanging was the primary means in all groups, but with metropolitan and rural groups motor vehicle exhaust gassing (metro 24%, rural 27%) followed by firearms (metro 6%, rural 17%) were the next ranked means, with the order reversed for other rural/remote areas (firearm 24%, MVEG, 20%). Self-harm rates were highest in rural centres (125.3 per 100,000 population).

A total 1,542 Victorians died from an injury between 1997 and 1998, with males between 2.1 to 2.2 times as likely to be killed as females. Between July 1998 and June 1999, 63,557 Victorians were hospitalised for an injury, with 1.3 males admitted for each female. Between 28% and 31% of all injuries occurred in the home.

Suicide was the leading cause of injury death (metro 37%, rural 41%, rural/remote 33%), followed by transport injury. The elderly (80+ years) were the most likely

to die from injury, making-up 15% to 18% of injury deaths in each geographic group. Like deaths, hospitalised injuries peaked in the 80+ age group (metro 13%, rural 12%, rural/remote 14%). For older persons (70+ years) falls were the leading cause of hospital admissions in all regions, and the predominant cause of injury deaths.

Due to the distribution of injuries, successful injury prevention programs focusing on metropolitan areas have the greatest potential to seriously reduce the injury burden, and therefore social and economic costs and demands upon hospital beds. Additionally, implementation of evidence based falls prevention in the elderly would significantly reduce the injury burden. However, residents of non-metropolitan Victoria are over-represented in injury, and injury prevention efforts focused on rural and rural/remote communities will make a substantial impact on the problem and enhance social justice.

<sup>1</sup> Lesley Day is a Senior Research Fellow at the Monash University Accident Research Centre (MUARC)



## Introduction

The National Rural Health Strategy (1994) and the more recent rural health policy document, *Healthy Horizons* (1999), recognise the special needs of rural populations, who experience poorer health outcomes than the two-thirds of Australia's population who live in capital cities and metropolitan areas.

A report by the Australian Institute of Health and Welfare (AIHW) in 1998, found that Australians residing in rural and remote areas generally experienced higher mortality rates, lower life expectancy and higher rates of hospitalisation for various causes of ill health. There were significantly higher injury death and hospitalisation rates in rural and remote areas than in metropolitan areas with major causes of injury death and hospitalisations due to suicide, motor vehicle accidents, production related injuries, falls, burns and scalds, poisoning and drowning (Department of Human Services, 1995; AIHW, 1998).

Factors identified by the AIHW (1998) as having a detrimental affect on rural populations include:

- Geographic isolation and difficulties regarding access to health care
- Shortage of health care providers and services
- Socioeconomic differences
- Greater exposure to injury risks, particularly in farming and mining industries
- Lower road quality
- Small, sparsely distributed populations

Consequently, injury prevention in rural areas has been accorded some priority and many rural and remote communities are taking up the challenge. This edition of *Hazard* compares the injury profiles of different geographic regions in Victoria, indicating broad priority areas for prevention and providing reference profiles for communities within these geographic regions. There is less

emphasis on prevention strategies in this, compared to previous, editions of *Hazard*. Specific injury issues identified in this review will be addressed by in-depth investigation in future *Hazard* editions.

## Method

This profile has been produced from three injury databases covering all Victorian injury deaths (Australian Bureau of Statistics Death Unit Record File – ABS-DURF), Victorian public hospital admissions (Victorian Admitted Episodes Dataset – VAED) and approximately 80% of Victorian public hospital emergency department (ED) presentations (Victorian Emergency Minimum Dataset – VEMD).

Two years of both death data, January 1997 to December 1998 (n=3,081) and ED presentation data, January 1999 to December 2000 (n=393,496) were analysed. Given recent changes in the coding structure of hospitalised data, only one year, July 1998 to June 1999, of data, at this level of severity (n=63,557) was examined. Non-Victorian residents were excluded, with case identification based upon a Victorian postcode of residence for the injured person, a detail that is recorded in each of the databases utilised. Victorian residents accounted for 96.7% of registered injury deaths and 97.4% of both admitted and ED presentation injury cases.

A seven-category Rural, Remote and Metropolitan Areas (RRMA) classification was developed by the Department of Primary Industries and Energy and the (then) Commonwealth Department of Human Services and Health for the purposes of addressing the need for information about issues affecting rural and remote Australia. The classification involves categorising Statistical Local Areas (SLA), as listed in the 1991 Australian Standard Geographical Classification (ASGC), according to population numbers and an index of remoteness (Department of Primary Industries and Energy, and

Commonwealth Department of Human Services and Health; 1994).

The extensive use of this classification by policy makers, several Commonwealth, State and other agencies and academic institutions influenced our preference for the RRMA classification over other classifications such as the Accessibility/Remoteness Index of Australia (ARIA). The ARIA index has been designed to replace the RRMA classification and was developed by University of Adelaide researchers for the Commonwealth Department of Health and Aged Care (DHAC) in 1999, using a geographical approach with a focus on distance and its influence on access to services. Factors such as socioeconomic status, urban/rural distinctions and population size were not taken into consideration in its formulation (DHAC, 1999).

For ease of analysis in this review, the seven RRMA categories were collapsed into 3 broader regional categories:

- Metropolitan centres (Melbourne and Geelong)
- Large and small rural centres (population over 10,000 – 99,000)
- Other rural and remote areas (population <10,000)

As these RRMA classifications were based on 1991 Census SLAs, matching to current SLAs was required (ABS 1996, 2000). SLAs were then converted into postcodes using the Australian Bureau of Statistic's (ABS) postal area to SLA concordance report (ABS, 1999). Where postcodes fell into more than one SLA, and potentially more than one regional classification, the classification with the largest proportion of the postcode was selected. Figure 1 shows each classification and the SLAs that fall into each group.

## Metropolitan centres

Metropolitan centres are defined as the state capital statistical division plus other statistical subdivisions (SSDs) with populations of 100,000 or more in size. In Victoria, greater Geelong is the only other



major urban area. Hence it is combined with Melbourne to create an extended metropolitan area. Residents of metropolitan centres account for approximately 76% of the Victorian population (Table 1).

### Rural centres (large and small)

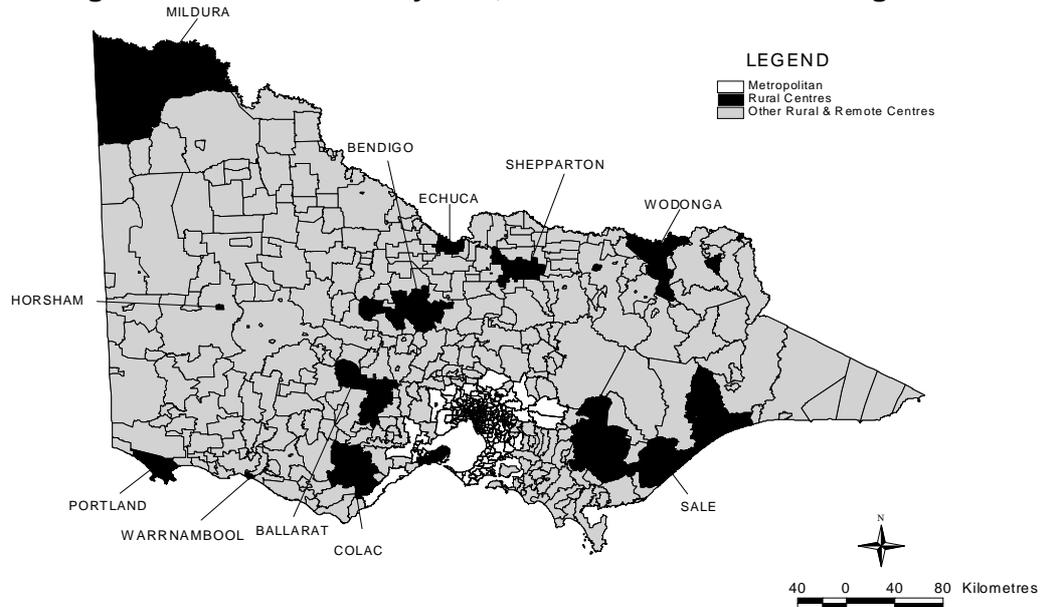
Rural centres consist of non-metropolitan SLAs. There are two sizes of rural centres, large and small. The populations of large rural centres mostly reside in urban centres with populations of 25,000 or more. Small rural centres contain urban populations of between 10,000 and 24,999 persons. Residents of rural centres account for almost 11% of the Victorian population (Table 1).

### Other rural and remote areas

Other rural and remote areas are non-metropolitan SLAs with a population of less than 10,000 people. Remote areas are commonly associated with mining activities, broad-acre farming, Aboriginal communities and very low population densities and imply a distance from neighbours, large towns or cities, and the facilities and opportunities offered by large towns and cities (Department of Primary Industries and Energy, and Commonwealth Department of Human Services and Health; 1994). Residents of other rural and remote areas account for 14% of the Victorian population (Table 1).

**Regional Classifications by SLA, Victoria**

**Figure 1**



### Results

Analyses of each of the three databases, representing three levels of injury severity, were undertaken for the three regional categories.

The major proportion of all injuries, approximately 70% at all levels of severity, were to residents of metropolitan centres (Table 1). However, as residents of metropolitan centres account for 76% of the Victorian population, they are under-represented amongst the injured population. Rates of both death and

hospital admission for injury were 25-28% lower amongst residents of metropolitan centres than both rural centre and rural/remote areas (Table 1).

While residents of rural centres represent 11% of the Victorian population, they are over-represented in the injury populations at all levels of severity accounting for 13% each of injury deaths and admitted cases and 21% of ED presentations (Table 1). The rate of ED presentation for residents of rural centres is more than double that for residents of metropolitan centres and almost 4 times

### Annual average frequency and rate per 100,000 population by regional classification, Victoria

Table 1	Deaths – ABS –DURF			Hospital admissions – VAED			ED presentations – VEMD			Victorian ERP June 1999	
	N	Rate/100,000	% of total	N	Rate/100,000	% of total	N	Rate/100,000*	% of total	N	% of total
Metropolitan centres	1075	30.2	69.7	43,918	1234.1	69.1	140,718	4745.2	71.5	3,558,569	75.6
Rural centres (large & small)	199	40.3	12.9	8,325	1690.1	13.1	41,196	10035.9	20.9	492,583	10.5
Other rural & remote areas	268	40.8	17.4	11,314	1723.5	17.8	14,812	2707.7	7.6	656,437	13.9
<b>Total</b>	<b>1542</b>	<b>32.8</b>	<b>100</b>	<b>63,557</b>	<b>1350.1</b>	<b>100</b>	<b>196,726</b>	<b>5014.7</b>	<b>100</b>	<b>4,707,589</b>	<b>100</b>

\* VEMD represents 80% of statewide ED presentations; the rate has been scaled up to represent a Victorian statewide rate  
 Source: ABS-DURF 1997 to 1998, VAED July 1998 to June 1999, VEMD 1999 to 2000, ABS Estimated Resident Population 1999



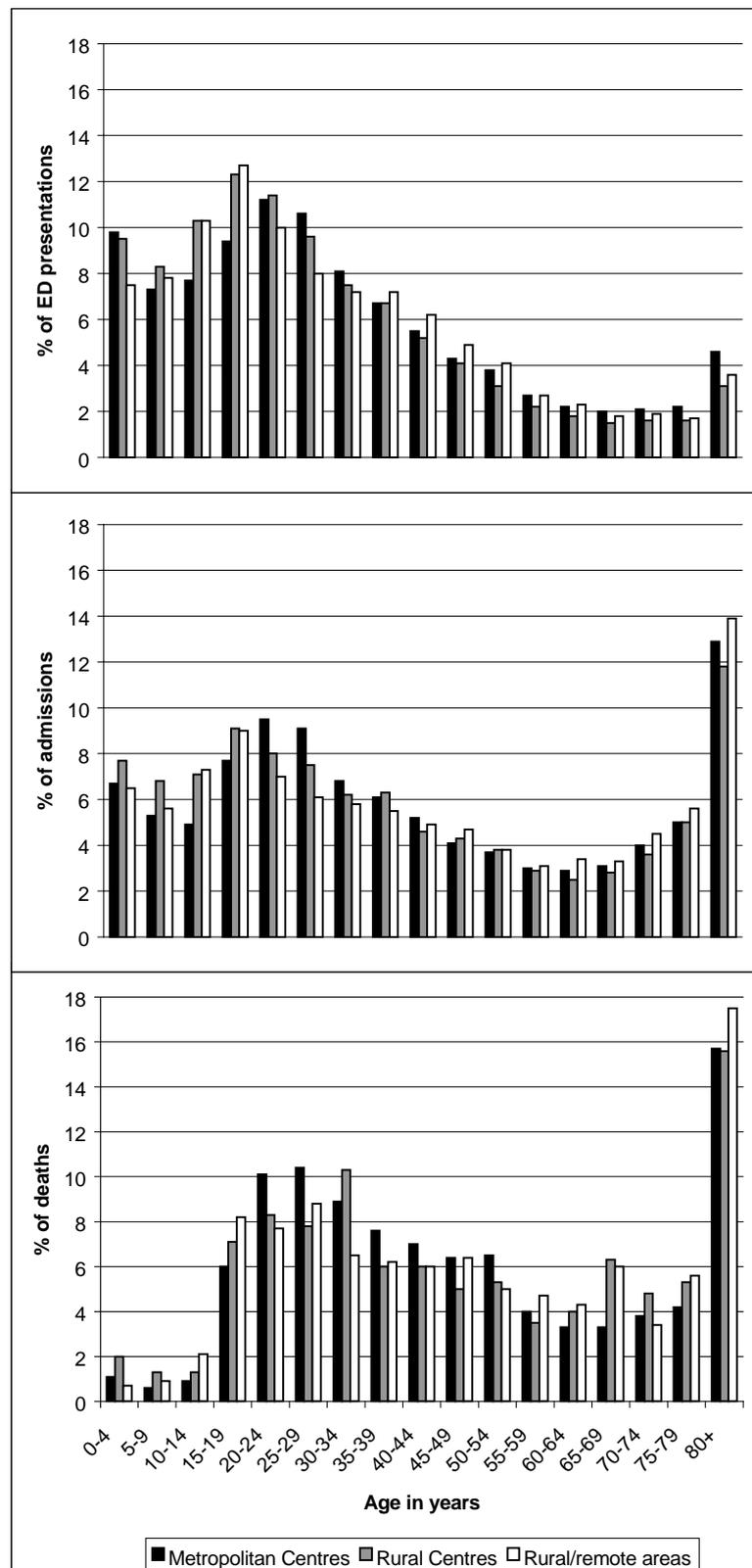
that of rural/remote areas residents (Table 1). This rate differential for emergency department presentations should be interpreted with caution. The VEMD does not capture all presentations in Victoria, and probably captures differing proportions of presentations in different geographic areas. In addition, the rate differential will in part reflect the differing patterns of health care utilisation across Victoria, with residents in rural/remote areas having reduced access to hospital emergency departments.

Residents of rural/remote areas account for 14% of the Victorian population and are over-represented among injury deaths and hospital admissions accounting for 17% of cases at these levels of severity. Rates of hospital admission and deaths were greatest amongst residents of rural/remote areas (Table 1). In contrast residents of rural/remote areas account for only 8% of ED cases, having the lowest rate of ED presentation amongst the regional groupings. Limited accessibility to hospital services in rural/remote areas is a plausible explanation for this trend, with minor injuries more likely to be treated by a general practitioner (Day et al, 1997), or left untreated.

Profiles by region are tabulated at the end of this report (pages 15-17). What is perhaps most striking about the comparative profiles is the similarity of injury patterns amongst regions, for most injury variables, particularly the gender of the injured person, nature of main injuries and body regions injured, broad causes of injury, intent and main locations where injuries occurred and activities being undertaken at the time of injury.

Differences in injury cause patterns across regional categories are apparent however, particularly for transport accidents, suicide, fall related deaths and hospital admissions and unintentional fatal drug and medication overdoses. These issues will be addressed in the discussion section (page 11).

**Injuries by age group, severity and regional grouping, Victoria**  
**Figure 2**



Source: ABS-DURF 1997 to 1998, VAED July 1998 to June 1999, VEMD 1999 to 2000



Data from each level of severity is now further examined by regional category.

## Deaths

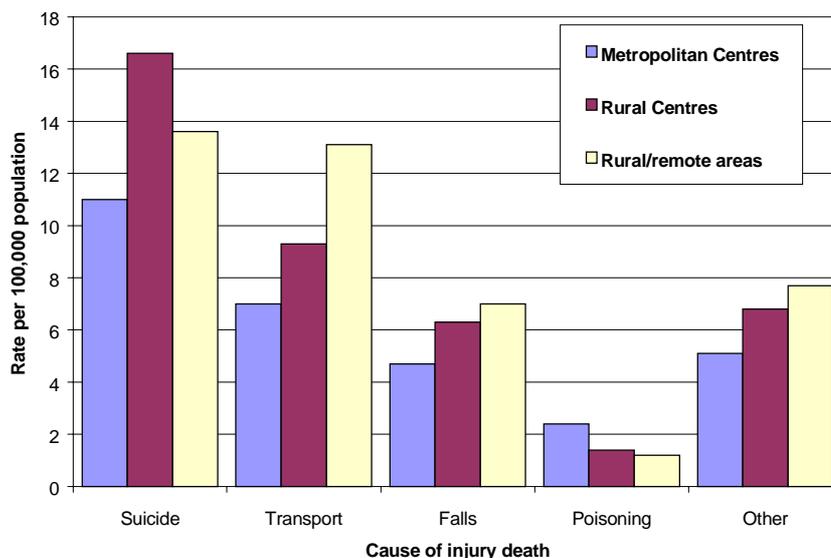
Death data are derived from the Australian Bureau of Statistics (ABS) death unit record file (DURF) which consists of information supplied by State Registrars of Births, Deaths and Marriages. Each death registered in Australia is classified by the ABS according to the World Health Organisation (WHO) International Classification of Diseases (ICD) coding system. All registered deaths for Victorian residents given an ICD9 'External Injury Cause' code by the ABS are included in this analyses for the 2 years January 1997 to December 1998 (n=3,081).

Tables 4-6 profile each of the three regions with respect to age patterns and Figure 2 shows the breakdown by region for broad age groups. Injury deaths were most common amongst those aged 80+, representing 15-18% of deaths in each region, with an average of three-quarters of these associated with falls on the same level. After the 80+ age group, the 25-29 age group provided the next peak for both metropolitan centres (10.4% of metro total) and other rural/remote areas (8.8%). Figure 2 indicates that the 20-29 age group accounted for a higher proportion of deaths and hospital admissions in the metropolitan group. Adolescents (15-19 years of age) ranked 5<sup>th</sup> for rural centres and 3<sup>rd</sup> for other rural/remote areas, representing 7.1% and 8.2% respectively of their region's total injured populations. The male to female ratio was consistent, 2.1:1 for both metropolitan and rural centres and 2.2:1 for other rural/remote areas (Tables 4-6).

## Causes of death

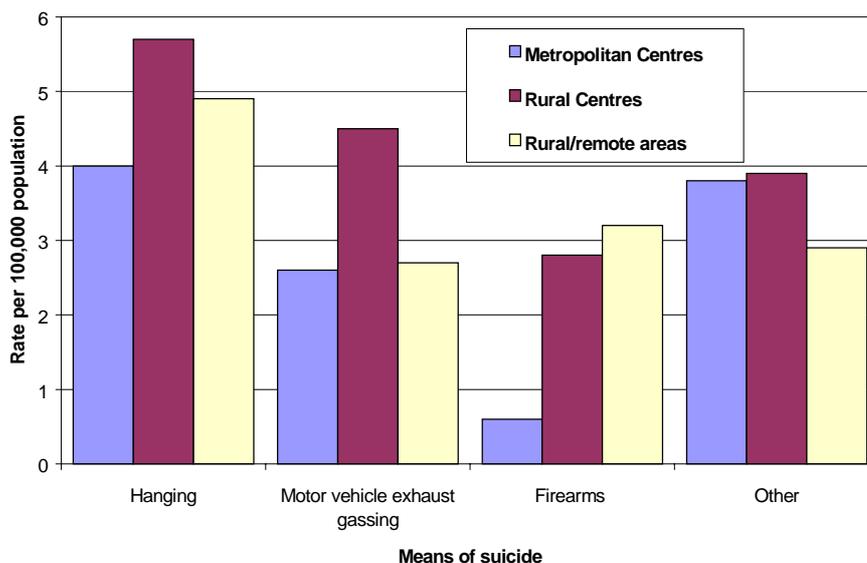
Suicide was the leading cause of injury death for all three regions representing 36.6% of metropolitan, 41.2% of rural, 33.2% of other rural/remote injury deaths reported for the two years 1997 and 1998. Rural centre populations exhibited the highest rates of suicide overall (16.6 per

**Annual average injury death rates by regional category, Victoria**  
Figure 3



Source: ABS-DURF 1997 to 1998

**Annual average suicide rates by means and regional category, Victoria**  
Figure 4



Source: ABS-DURF 1997 to 1998

100,000) and the highest rates of the most common means of suicide: hanging (5.7 per 100,000) and motor vehicle exhaust gassing (MVEG; 4.5 per 100,000; Figures 3 & 4).

Hanging was the main means of suicide in all three regions accounting for more than a third of suicides in each (Table 2). MVEG was the second major means of

suicide for metropolitan (23.9%) and rural centres (26.8%), followed by firearm suicides (5.6% metro, 17.1% rural) with the order reversed for other rural/remote areas (20.2% MVEG, 23.6% firearms; Table 2). The rate of firearm suicide was substantially higher for both residents of rural/remote (3.2 per 100,000) and rural



## Annual average frequency of injury death by major external cause groups and regional grouping, Victoria Table 2

ICD E-code groups*	Metropolitan Centres N=	Rural Centres N=	Other rural & remote areas N=
Suicide (total)	393	82	89
• Hanging	141	28	32
• Motor vehicle exhaust gas	94	22	18
• Firearms	22	14	21
• Other	136	18	18
Transport (total)	248	46	88
• Motor vehicle traffic	230	41	83
• Motor vehicle non-traffic	2	2	4
• Other vehicle	16	3	1
Falls (total)	166	31	46
• different level	18	2	2
• same level	148	29	44
Poisoning (total)	87	7	8
• Drugs, medicinal substances, biologicals	81	5	7
• Other solids, liquids, gases and vapors	6	2	1
Drowning	34	6	6
Inflicted by other	40	3	5
Choking/suffocation/ foreign body	27	7	3
Medical injury/late effect	23	5	6
Fire, burn, scalds	16	2	2
Other unintentional	13	4	3
Hit, struck, crush	8	2	6
Natural/environmental	7	2	1
Undetermined intent	7	1	3
Machinery	4	1	3
Cutting/piercing	2	-	1
<b>TOTAL</b>	<b>1075</b>	<b>199</b>	<b>268</b>

\*Unintentional unless otherwise specified

Source: ABS-DURF 1997 to 1998

centres (2.8 per 100,000) compared with residents of metropolitan centres (0.6 per 100,000; Figure 4).

Transport injury ranked second behind suicide as the leading cause of injury death in each region. For other rural/remote areas, transport was nearly equivalent to suicide for both rate per 100,000 population and frequency (Figure 3 and Table 2). The rate of transport death, particularly motor vehicle traffic deaths, was considerably more in rural/remote areas (13.1 per 100,000) than in rural centres (9.3 per 100,000) and considerably more in rural centres than in metropolitan centres (7.0 per 100,000;

Figure 3). Death rates amongst motor vehicle drivers or passengers and motorcyclist riders or passengers all followed this trend.

Motor vehicle traffic related injury was the leading single cause of death, exceeding any single means of suicide, for all regions, but was proportionally highest in other rural/remote areas (31.0%) compared to metropolitan (21.4%) and rural (20.6%) centres.

Almost all of the same level fall deaths were to persons aged 65 years and over (93.3% metropolitan, 98.2% rural, 97.6% other rural/remote).

Unlike the rates for other causes of death, the rate of unintentional drugs and medication poisoning was highest amongst residents of metropolitan centres, being more than twice that of residents of other regions (Figure 3).

The “other” causes of death category in Figure 3, which includes drowning and fires/burns/scalds, showed a general trend towards an increasing rate with increasing residential remoteness. However there were no distinct patterns among individual causes of death.

### Hospital Admissions

The Victorian Admitted Episodes Dataset (VAED) records hospital admissions for all Victorian public hospitals. VAED data, like ABS data, is coded using the ICD coding system. ICD version 10 was implemented in Victorian hospitals in July 1999 replacing ICD-9, changing the coding methods from numeric to an alphanumeric system. However, to allow for comparisons with ABS death data, for these analyses, ICD9 E-code mappings were analysed instead of ICD-10-AM external cause codes.

There were 63,557 cases of hospitalised injury for Victorian residents reported on the VAED in the twelve months July 1998 to June 1999. The male to female injury ratio was consistent across all regions at 1.3:1.

Hospitalised injuries, like deaths, peaked in the 80+ age group for all regions. Adolescents (15-19 years) were the next highest represented age group for both rural centres and rural/remote areas, representing 9.1% (n=757) and 9% (n=1,019) respectively of the injured population in each region. In the metropolitan region, hospitalised injuries were highest, after the 80+ age group, in 20-24 years (9.5% of metro) and 25-29 years (9.1%), with adolescents following as the third largest group (7.7%). Children (0-14 years) accounted for 16.9% of the metropolitan, 21.6% of the rural and 19.4% of the rural/remote hospitalised populations. A breakdown by age group and region is shown in Figure 2.



## Location

Both the VAED and VEMD record the location where the injury occurred. The proportion of cases occurring at a variety of locations is shown in Figure 5. Almost one-third of admitted cases report *unspecified* locations. When the location is specified, the *home* was the most common site for injury in each region ranging from 28.3% in rural/remote areas to 31.2% in rural centres. For the remaining categories the regions were proportionally similar, within 1-2% of each other, the only exception being injuries at *sporting and athletics area*, which reported proportionally more injuries for rural centres (7.1%, n=588) and rural/remote areas (6.0%, n=681) compared to metropolitan areas (4.4%, n=1,944).

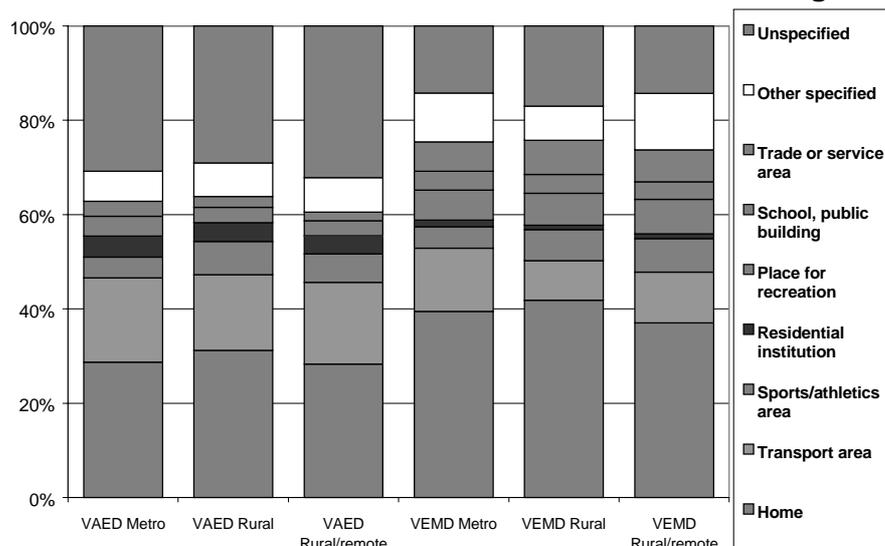
## Causes of hospitalisation

### Falls

Falls are the leading cause of hospitalisation for all regions representing 35.6% of metropolitan, 34.9% of rural and 35.9% of rural/remote injury cases (Table 3). The rate of fall hospitalisation increases with remoteness of residency with the greatest rate in the rural/remote population (Figure 6). The magnitude of difference in the rates across regions for different level and same level falls was similar to that for all falls. In each region almost half of the fall hospitalisations were to persons aged 70+ (46.8% metropolitan, 44.3% rural, 47.9% rural/remote), with a further substantial proportion of each being to children aged <15 years (18.0% metropolitan, 22.8% rural, 19.1% rural/remote). The home was the most common location for adult falls in all regions, accounting for approximately 40% of all adult hospitalised falls, and half of those in the 70+ age group. It is worth noting that there were proportionally slightly less adult home falls amongst residents of metropolitan centres, than the other two groups (all adults: 39.5% vs 44.5% rural and 44.1% rural/remote, 70+: 45.2% vs 53.6% rural and 52.3% rural/remote).

## Non-fatal injury by location and regional grouping, Victoria

Figure 5



Source: VAED July 1998 to June 1999, VEMD 1999 to 2000

## Injury hospitalisation frequencies by major external cause groups and regional grouping, Victoria

Table 3

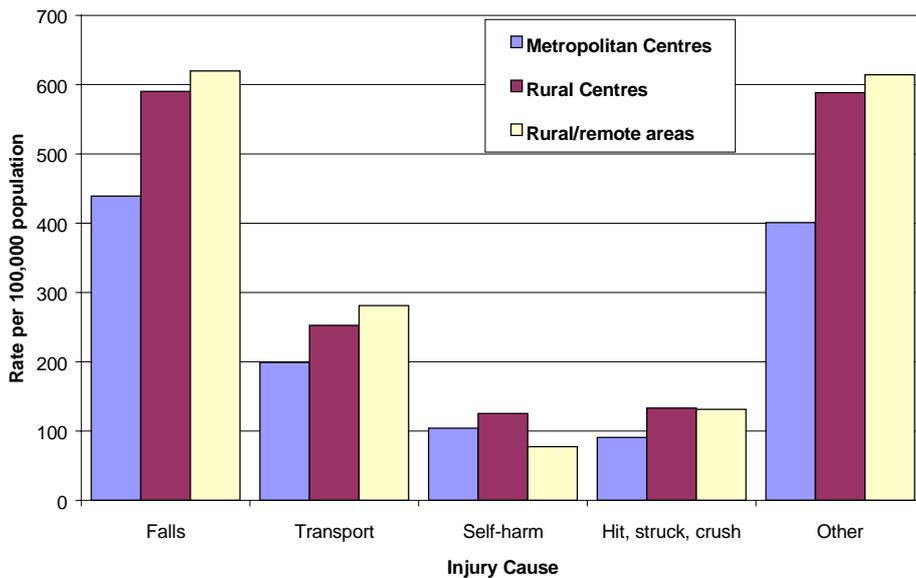
ICD E-code Groups*	Metropolitan Centres N=	Rural Centres N=	Other rural & remote areas N=
Falls (total)	15,630	2,908	4,068
- Different level	5,158	985	1,246
- Same level	10,472	1,923	2,822
Transport (total)	7,089	1,244	1,846
- Motor vehicle traffic	4,287	589	802
- Motor vehicle non-traffic	1,121	271	507
- Other vehicle	1,681	384	537
Other unintentional	3,503	898	1,338
Self harm (total)	3,706	617	508
- Poisoning by liquid or solid substance	3,143	522	416
- Other	563	95	92
Hit, struck, crush	3,235	656	861
Cutting/piercing (total)	2,544	404	532
- Powered hand tools	434	59	98
- Knives, swords, daggers	406	57	79
- Hand tools & implements	239	39	64
- Powered lawn mowers	97	18	29
- Other	1,368	231	262
Poisoning (total)	2,165	389	455
- Drugs, medicinal substances, biologicals	1,676	282	323
- Other solids, liquids, gases and vapours	489	107	132
Inflicted by other	2,195	395	348
Natural/environmental	838	267	557
Choking/suffocation/ foreign body	918	216	264
Fire, burn, scalds	711	143	248
Machinery	704	123	196
Undetermined intent	631	55	79
Near drowning	49	10	14
<b>TOTAL</b>	<b>43,918</b>	<b>8,325</b>	<b>11,314</b>

\*Unintentional unless otherwise specified

Source: VAED July 1998 to June 1999



**Injury hospitalisation rates by regional category, Victoria, 1998/99**  
**Figure 6**



Source: VAED, July 1998 to June 1999

Child fall hospitalisations are most commonly associated with falls from household furniture in the under 5 age group, falls from playground equipment in the 5-9 age group, and falls in sport in 10-14 year olds (Ashby & Corbo, 2000). The present review shows that child hospitalised falls from playground equipment were proportionally less in rural/remote areas (25.6%) compared to 30% in each of the other 2 regions. Falls during sport were proportionally less among child residents of rural centres (7.9%) compared to 10.9% in both of the other 2 regional groups, while falls from household furniture were consistent across all three regions. Detailed analyses of child falls and falls among older persons can be found in *Hazard* editions 44 and 45 respectively.

**Transport**

Transport related injury accounted for a further 15-16% of hospitalised cases in each of the three regions (Table 3). Within the ICD coding system, transport injuries are defined as those involving a device designed primarily for, or being used at the time primarily for, conveying persons or goods from one place to another (National Centre for Health Statistics,

1986). There are several broad categories within transport injury: motor vehicle traffic; motor vehicle non-traffic; air transport; water transport; rail transport; other road vehicle; and vehicles not elsewhere classified. Within these broad categories, further distinctions are made for specific vehicle or road user types. Figure 7 shows transport hospitalisation rates by category and user types where either the rate is high or where patterns across regions show marked differences.

The hospitalisation rates for motor vehicle traffic injury among drivers and passengers were broadly similar across geographic regions. There were notable differences in other categories. Pedestrian hospitalisation rates in metropolitan centres were more than double those for the other regions and motorcyclist rates increased with increasing remoteness (Figure 7).

In contrast, hospitalisation rates for motor vehicle non-traffic injury ie. motor vehicle accidents occurring entirely in any place other than a public highway, were markedly different, ie. considerably lower rates were reported for residents of metropolitan centres than the other regions (Figure 7). The rate of injury to

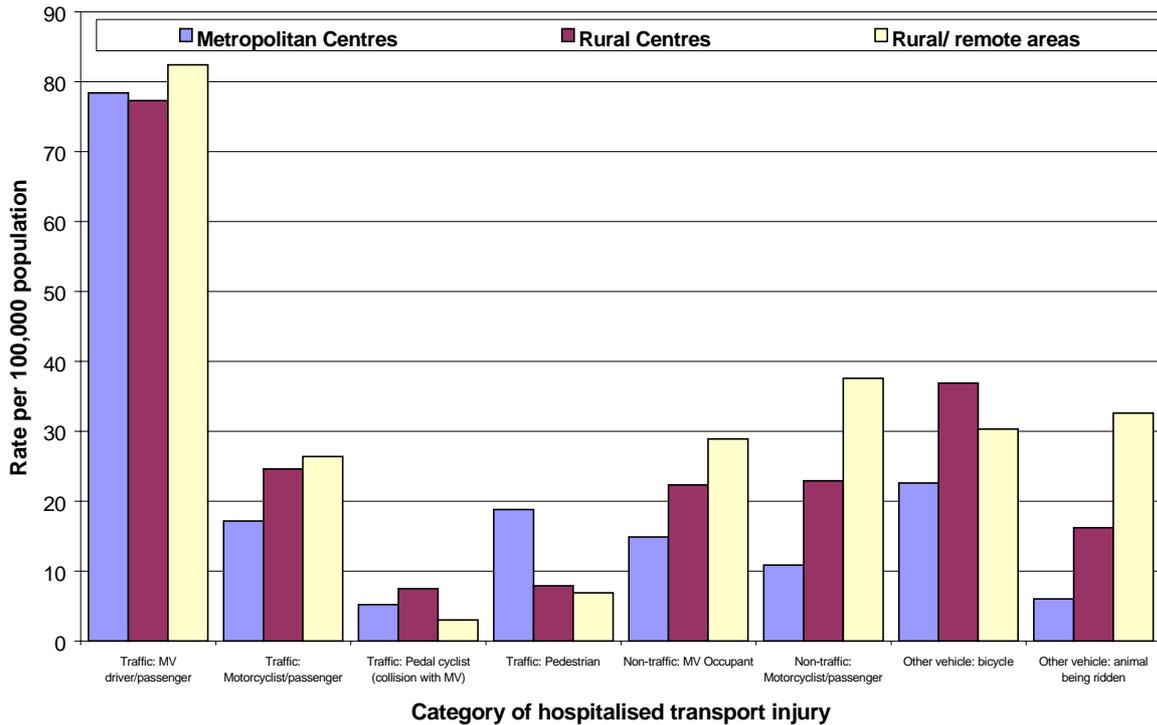
off-road motorcyclists was increased with increasing remoteness with the highest rate among residents of rural/remote areas (37.6 per 100,000) compared to rural (22.9 per 100,000) and metropolitan areas (10.9 per 100,000; Figure 7). There was insufficient detail within the location coding for these off-road motorcyclist cases to determine whether they occurred on farms, trail bike tracks or alternative areas for riding such as national parks or vacant land. A MUARC study by Haworth (et al, 1994) of injured off-road motorcyclists, aged less than 21 years, admitted to five metropolitan and two rural hospitals found that a third occurred in the bush or on bush tracks. A further 27% occurred on farms or in paddocks and 20% on motor-cross tracks (Haworth et al., 1994).

With respect to ‘other road vehicle’ injuries ie. injuries not involving an interaction with a motor vehicle, bicycle hospitalisation rates were greatest for residents of rural centres (36.9 per 100,000). Injuries associated with animals being ridden, of which an estimated 96% are horses (Williams & Ashby, 1995), fall into this ‘other road vehicle’ category. Animal related transport injuries were twice as likely to occur amongst residents of rural/remote areas (32.6 per 100,000) than rural centres (16.2 per 100,000) and six times more likely than to residents of metropolitan centres (6.0 per 100,000; Figure 7). It is worth noting that unlike the gender pattern for most other causes of injury, horse-riding injury is more common among females who account for 60-75% of such injury (Williams & Ashby, 1995).

**Self-harm**

Self-harm was proportionally lower in the rural/remote group (4.5% of hospitalised cases for that region) compared to both metropolitan (8.4%) and rural centres (7.4%). Like suicides, self-harming rates were highest amongst residents of rural centres (125.3 per 100,000 population; Figure 6). However, unlike suicides where the rate was lowest in the metropolitan population, non-fatal self-





Source: VAED, July 1998 to June 1999

harm is lowest amongst the rural/remote population (77.4 per 100,000; Figure 6).

**Unintentional poisoning**

Hospitalisation rates for unintentional poisoning were lowest amongst residents of metropolitan centres, a direct contrast to unintentional poisoning deaths where rates per 100,000 were highest for this regional group (Figure 3). Rates of hospitalised poisoning by drugs and medications, both intentional and unintentional, were highest amongst residents of rural centres (57.2 per 100,000) compared to the metropolitan (47.1 per 100,000) and rural/remote (49.2 per 100,000) regions.

**Other injury causes**

Between 10% and 14% of hospitalisations falling into the ‘hit, struck, crush’ injury cause category were associated with sports injury. The rate of injury for these causes in rural populations (18.1 per 100,000) was twice the metropolitan rate (9.3 per 100,000), but similar to that in

rural/remote populations (16.8 per 100,000).

Patterns of injury rates for other causes eg. cutting and piercing injury, burns and scalds, choking and suffocation, near drowning and machinery related injury, generally followed the same trend ie, higher rates of injury in rural and rural/remote regions than metropolitan centres. Injury rates associated with power tools were highest in the rural/remote category, 14.9 per 100,000 compared to 12.0 per 100,000 for the other two groups. Rates for hand tools and powered lawn mowers also followed this pattern.

Animal related injury excludes animals being ridden (coded as transport) but includes bites from both venomous and non-venomous creatures, particularly dogs, and being butted by, fallen on, gored by, pecked by, run over by or stepped on by an animal. Rates of animal related injury amongst residents of rural/remote areas (84.9 per 100,000) were more than 1.5 times that for residents of rural

centres (54.2 per 100,000) and more than 3.5 times that for residents of metropolitan centres (23.5 per 100,000). With the exception of dog bite, all other rates increased with increasing remoteness. Dog bite rates were highest in rural centres (9.1 per 100,000) compared with 6.6 per 100,000 for the metropolitan and 7.2 for the rural/remote groups. This rate differential would be explained, at least in part, by increased exposure. Hazard 34 reported a higher dog ownership rate per dwelling for persons living in rural Victoria (49.2 per 100 dwellings) compared to metropolitan Victoria (30.1 per 100 dwellings; Ashby et al., 1998).

Hospitalisation rates for interpersonal violence were highest in the rural centre group (80.2 per 100,000) compared with 61.7 per 100,000 for the metropolitan group and 53.0 per 100,000 for the rural/remote group.



## Nature of injury and body region

There was virtually no variation in ranking between residential regions with respect to both the nature of the injury or body region injured (Tables 4-6). For all three regional groups hospitalised injuries were most frequently to the upper limbs (range 25.7%-27.9%), followed by the lower limb (22.3%-24.0%) and the head (11.0-12.3). Fractures were most common, (38.0%-38.7%), followed by open wounds (14.1%-16.3%), poisoning (9.3%-12.8%) and intracranial injury (5.3%-8.0%).

Shortest hospital stays were reported for residents of metropolitan centres with 60.0% hospitalised for less than 2 days, compared to 56.0% of residents of rural centres and 53.1% of residents of rural/remote areas. In contrast, hospital stays for a period of 2-7 days were least common amongst residents of metropolitan centres (25.2%) when compared to the other groups (29.7% rural centres, 32.2% rural/remote areas). Longer stays for periods of 8-30 days and 31+ days were proportionally similar amongst regions accounting for 13% and 2% of cases in each region (Tables 4-6). The combination of a higher hospital admission rate and the increased length of stay once admitted means that total beds days used per head of population for rural, and rural/remote areas, would be higher than that for metropolitan populations, although the actual number of bed days used is highest in metropolitan areas.

## Emergency Department Presentations

The Victorian Emergency Minimum Dataset (VEMD) records public hospital emergency department (ED) presentations to 28 Victorian EDs, representing approximately 80% of statewide ED presentations. The VEMD reported 393,449 cases of injury to Victorian residents in the two-year period 1999-2000.

ED presentations for injury peaked in adolescents (15-19 years) for both rural centres and rural/remote areas, representing 12.3% (n=10,154) and 12.7% (n=3,748) respectively of the injured population in each region (Figure 2). For metropolitan residents, peaks occurred amongst 20-24 years (11.2% of metro) and 25-29 years (10.6%).

Children (0-14 years) accounted for 24.8% of the metropolitan, 28.1% of the rural and 25.6% of the rural/remote hospitalised populations. Young children (aged 0-4 years) ranked third in metropolitan regions as the group most presenting to ED's behind persons aged 20-24 and 25-29 years. Breakdown by age group and region are shown in Figure 2. The male to female injury ratio was 1.6:1 for both metropolitan and rural centres and 1.9:1 for rural/remote areas.

## Location and activity

The most common locations for injury resulting in ED presentation varied little across regions with the *home* being the leading site accounting for 39.5% (n=111,281) of injury in metropolitan centres, 41.8% (n=34,418) in rural centres and 37.0% (n=10,964) in other rural/remote areas (Figure 5). *Unspecified places and road, street and highway*, were the next most common locations for each of the three regions. *Trade and services areas, places for recreation and athletics sports areas* accounted for much of the remaining, but varied in importance by region, with a tendency towards more injuries located at sporting areas in rural/remote areas and less located in transport areas in rural centres (Tables 4-6).

The activity being undertaken when injured displayed very similar patterns for rural centres and other rural/remote areas where the top five activities reported for each group, in rank order, were *leisure, unspecified, working for income, sports and other specified* (Tables 5 & 6). Metropolitan centres also featured *leisure* and *unspecified* as the leading activities but had more cases undertaking *other specified* activities

than *working for income* and *sport* (Table 4).

## Cause of ED presentation

Low falls (same height and up to a level of one metre) are the leading cause of ED presentation for all three regions, representing 27.5% of metropolitan, 25.4% of rural and 25.8% of rural/remote injury cases (Tables 4-6). More than a third of low falls in each region were amongst children (33.6% metropolitan, 37.9% rural, 35.8% rural/remote). Low falls were most common amongst the youngest children (0-4 years) in metropolitan centres (12.3% of metropolitan low falls), but were more common in the 10-14 age group for the other 2 regions (13.8% rural and 14.6% rural/remote of low falls in each region respectively). Amongst the youngest children (0-4 years) the proportion of falls at home was marginally lower in rural/remote areas compared to the other centres (77% vs 81%). For older children, the opposite was apparent. Falls at home were marginally higher in rural/remote areas compared to the other centres (35% vs 32%), but lower for falls at schools and public buildings (19% vs 23%).

Low falls were also common amongst the 80+ age group ranging from 8.6% of rural low falls to 11.7% of metropolitan low falls. The locations at which low falls in this age group occurred showed some variation by region. Home falls were proportionally less, and falls in residential institutions proportionally more, in metropolitan regions compared with other regions (59% vs 66% and 18% vs 15% respectively). Low falls in the 80+ age group in rural/remote areas occurred more often in hospitals (4.1% vs 1-2%) and less on roads, streets or highways (3% vs 6%) than in the other groups. Further patterns of low falls for both children and older persons are described elsewhere (*Hazard* editions 44 & 45).

Like activity, the patterns of injury cause were similar for rural centres and rural/remote areas. Following *low falls*, the most common causes of injury were *struck by collision with persons* (15.2%



and 12.4% of causes for respective regions), *cutting/piercing* injury (13.3%, 10.4%), *struck by collision with object* (9.1%, 12.4%) and *unspecified causes* (9.1%, 8.6%). Sixty-eight percent of rural and 71% of rural/remote injuries coded as *struck by or collision with person* occurred during sport and recreational activities. *Cutting and piercing* was the second most common cause of injury amongst residents of metropolitan centres, followed by *unspecified* (Table 4).

Amongst all groups, injuries were predominantly unintentional, representing 84.4% of metropolitan, 91.0% of rural and 91.7% of rural/remote injury cases (Tables 4-6). Intentional self-harm and assaults were more common amongst residents of the metropolitan centres (3.4% and 4.3% respectively) compared to rural centres (1.5% and 3.6%) and rural/remote areas (1.6% and 2.8%).

### **Nature of injury and body region**

Open wounds, fractures and sprains/strains were most common amongst residents of all regions and, combined, account for more than half of the injuries for each region (Tables 4-6). Poisoning was twice as common in residents of metropolitan centres (5.4%) than for residents of rural centres (2.5%) and rural/remote areas (2.8%).

The hands including fingers were the single most common body region injured for all regions ranging between 14.0% of metropolitan centres to 17.7% of rural centres (Tables 4-6). The face accounted for an average of 7% of cases for each region and ranked second behind hands/fingers as the most common body region injured in each regional grouping. Injuries to the head, ankle and wrist were also common (Table 4-6).

Most injured persons in each regional grouping were treated and discharged home without further treatment (79.4% metropolitan, 86.4% rural, 73.5% rural/remote). The highest rate of hospital admission was amongst the rural/remote

group (23%), compared to 10% of cases in rural and 15.4% of cases in metropolitan centres.

### **Discussion**

The state of Victoria is located in south-eastern Australia and makes up only 3% of the country's land area and its residents comprise 25% of Australia's total population. Applying the RRMA classification to 1999 ABS estimated resident population (ERP) figures sees 76% of the population residing in metropolitan centres, 11% in rural centres and the remaining 14% residing in other rural and remote areas. It has been noted that the rate of injury related deaths increases significantly with increasing remoteness and this pattern is clearly evident for Victorian residents (Table 1; AIHW, 1998). Similarly, injury-related hospitalisation rates were much higher in rural and remote areas (1723.5 per 100,000) compared to metropolitan areas (1234.1 per 100,000) which was also found by the AIHW report (1998).

While rates are highest in the non-metropolitan groups, the greatest number of injuries still occur to residents of metropolitan centres, hence there is a need to balance injury prevention priorities between the greatest frequency and highest rates of injury.

Criticism of the use of hospitalisation data as a measure of health status is understandable as factors that influence hospital treatment such as accessibility to medical services is a major problem in rural areas (Department of Human Services, 1995). This issue is addressed, in some part, by the inclusion of injury death data within the analysis.

The range of coverage of the participant VEMD hospitals can in part explain the relatively low proportion of residents of rural/remote areas in ED presentations, as compared to hospitalised cases and deaths. Only nine of the 28 VEMD participant hospitals are located outside the Melbourne metropolitan region (including Geelong) and in the main these are major regional hospitals. Poor

accessibility to hospital ED's in rural/remote areas may also contribute to the lower proportion of residents of rural/remote areas presenting to ED's. In a 12 month program of general practice (GP) injury surveillance in a defined region of country Victoria, one-third of GP attendees in the Churchill and Traralgon areas (both rural/remote) reported that they presented because it was closer to home than a hospital ED, compared to 4% in Traralgon (rural centre), then the site of a campus of the Latrobe Regional Hospital (Day et al., 1997).

### **Health Services**

Keleher (1999) argues that the focus of the rural health problem has been the shortage of GPs and ongoing hospital closures at the expense of other influential factors such as infrastructure, socioeconomic differences and health sustaining environments. Statistics show that people living in rural and remote areas have far less access to health care compared to those living in metropolitan areas and the number of GPs and pharmacists drops dramatically in rural and remote areas (AIHW, 1998). Another distinctive difference between metropolitan residents and rural residents is the type of care they receive, eg. a rural patient with a chronic condition requiring follow-up treatment is more likely to be hospitalised than a metropolitan patient, especially if they have to travel a great distance to get to the hospital (AIHW, 1998).

### **Transport related injury**

Transport injury deaths increase with increasing remoteness. The Victorian rural/remote area rate of 13.1 per 100,000 is double the rate for metropolitan centres (7.0 per 100,000). Transport-related admission rates were approximately 40% higher for rural/remote areas compared to metropolitan rates. Importantly, the key components of this increased rate across regions are seen in motor-vehicle non-traffic injury (Figure 7).

Factors contributing to higher transport injury death rates for rural and remote



area residents include greater exposure to high-speed travel, longer-distances, poor road quality, alcohol consumption patterns, age of vehicles and seatbelt wearing (Moller, 1994). Another suggested contributing factor relates to the location of the accident itself, the more remote the greater the delay in medical treatment which in turn results in a greater number of fatalities (AIHW, 1998).

**Suicide**

Consistent with the data presented here, the Victorian Suicide Prevention Task Force (1997) reported that suicide rates, particularly for young males, are generally higher in rural areas compared to metropolitan areas, and are highest for parts of rural Victoria with populations of less than 20,000 persons. Reported contributing factors to suicide in rural and remote areas include: high unemployment; lower access to or use of mental health services; social isolation; conservative/traditional nature of rural communities particularly in relation to the gender roles; issues of sexual identity conflict; and readier access to firearms (AIHW, 1998; Suicide Prevention Task Force, 1997).

**Falls**

Victorian fall-related death and hospitalisation rates increase with increasing rurality and remoteness, particularly for those aged 65 years and above. Possible explanations for these higher rates among non-metropolitan areas include relative social isolation, the lack of access to direct amenities such as indoor plumbing, and control of extreme temperatures (AIHW, 1998). An additional explanation may be that older people stay at home longer in more remote areas because of decreased access to residential care facilities in their local area.

**Unintentional drug and medication overdoses**

The death rate for unintentional drug and medication overdoses in

metropolitan regions at 2.3 per 100,000 is double that for both the rural and rural/remote regions (Figure 3).

In contrast, admission rates for unintentional poisoning were lowest in the metropolitan region. Unpublished work by MUARC indicates that unintentional poisoning admission rates amongst children aged less than five years are twice as high (4.6 per 1,000) in regional populations compared to metropolitan populations (2.0 per 1,000). Further research is proposed to identify the reasons for, and solutions to, the variation in geographic rates of childhood poisoning.

**Injury prevention priority areas**

Across Victoria most injuries are associated with transport injuries, suicide and falls. Priority areas on the basis of frequency, for statewide injury prevention policy and strategic action should include transport injury, suicide, falls, self harm and sports injury. While frequencies and rates provide a solid foundation for the identification of injury prevention priorities, other factors such as potential for prevention and predicted uptake of available interventions influence the final shape of policies and programs.

Preventative programs are proceeding in a number of injury areas including: transport injury; suicide; falls prevention; farm injury; child injury; drowning; and responsible pet ownership. These issues are highlighted in strategic plans produced both by government and non-government organisations, the most relevant of which are noted below.

Seventy percent of injuries in Victoria occur in metropolitan areas, and consequently successful injury prevention programs in these areas have the potential to greatly reduce the injury burden. However, residents of non-metropolitan Victoria are over-represented amongst the injured population. Rates of both death and hospital admission for injury were 30-40% higher amongst residents of non-metropolitan areas.

Comparative profiles show that there are similarities in injury patterns between regions, especially for gender, the nature of the injuries and body region injured, the intent, location where injuries occurred and activities being undertaken at the time of injury. It is when we move beyond the broad cause categories of transport, suicide and falls, the patterns particular to residential locality begin to emerge. Priority areas for injury prevention can be identified within these causes, and, given the over-representation of rural and rural/remote residents, injury prevention effort should include a focus on rural and rural/remote communities.

Key injury priorities for non-metropolitan areas identified in this review, by severity, include:

<p><b><u>Deaths</u></b></p> <ul style="list-style-type: none"> <li>* Motor vehicle traffic injury</li> <li>* Suicide, especially firearms</li> <li>* Falls, especially in the 65+ age group</li> </ul> <p><b><u>Non-fatal injury</u></b></p> <ul style="list-style-type: none"> <li>* Falls, 70+ at home and children</li> <li>* Motor vehicle traffic injury</li> <li>* Motor vehicle non-traffic injury, especially motorcycles</li> <li>* Sports</li> <li>* Animals</li> </ul>
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The Victorian Government is developing a new framework of goals and priorities for rural and regional Victoria out to the year 2011. The Whole of Government Rural Strategy being developed by the Department of Premier and Cabinet will focus on key objectives and policy goals that will deliver prosperity and enhanced quality of life in rural and regional Victoria. The strategy will cover social, health, economic and environmental perspectives, and will develop key concepts such as accessibility, sustainability, responsiveness, safety and the importance of community (Department of Human Services, 2001). Implementation of these broader strategies, in addition to specific injury prevention strategies and programs, will contribute to injury reduction among rural Victorians.



## Resources guide

### Transport injury

- Australian Transport Council (ATC). (2000) 'The National Road Safety Strategy 2001-2010'. Canberra: Australian Transport Safety Bureau. Available from: Australian Transport Safety Bureau. PO Box 967, Civic Square ACT 2608 Ph: 1800 621 372 Website: [www.atsb.gov.au](http://www.atsb.gov.au)
- 'Road Safety Strategy for Victoria 2000-2005: Discussion Paper'. Available via: <http://www.vicroads.vic.gov.au/road-safe/index.htm>
- Day L. Ashby K. & Stathakis V. (1997). Unintentional Farm Injury. *Hazard* 33: 1-13. Victorian Injury Surveillance and Applied Research System, Monash University Accident Research Centre\*,
- Fragar LJ. & Franklin RC. (1999) Farmsafe Australia – Goals, Targets & Strategy 1996-2001: Mid-term Review. Rural Industries Research and Development Corporation & Australian Centre for Agricultural Health and Safety: Moree. Available from Australian Centre for Agricultural Health and Safety, PO Box 256, Moree NSW 2400. Ph: 02 6752 8215 Fax: 02 6752 6639

### Suicide

- Suicide Prevention Task Force. (1997). Suicide Prevention: Victorian Task Force Report. Melbourne. Available from: Information Victoria, Level 1, 356 Collins Street, Melbourne 3000, Victorian. Ph: 1300 366 356. Website: <http://hna.ffh.vic.gov.au/info/sptf>
- 'LIFE – Living Is For Everyone. A framework for prevention of suicide and self-harm in Australia', (2000). Available from: Mental Health and Special Programs Branch, Department of Health and Aged Care. Ph: 1800 066 247 Fax: 1800 634 400 Website: <http://www.mentalhealth.gov.au>

### Falls

- Cassell E. & Lee C. (2000). 'Prevention of falls injuries among older community-dwelling Victorians'. *Hazard* 45: 1-13. Victorian Injury Surveillance and Applied Research System, Monash University Accident Research Centre\*. (A fuller resource guide for falls prevention in older persons is provided in *Hazard* 45)
- Ashby K. & Corbo M. (2000). 'Child fall injuries: an overview'. *Hazard* 44: 1-17. Victorian Injury Surveillance and Applied Research System, Monash University Accident Research Centre\*.

### Animal related injury

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- Ashby K. (1996) Dog Bites. *Hazard* 26: 7-13. Victorian Injury Surveillance and Applied Research System, Monash University Accident Research Centre.\*
- Ashby K. Routley V. & Stathakis V. (1998) Enforcing legislative & regulatory injury prevention strategies. *Hazard* 34: 1-12. Victorian Injury Surveillance and Applied Research System, Monash University Accident Research Centre.\*
- Day L. Ashby K. & Stathakis V. (1997). Unintentional Farm Injury. *Hazard* 33: 1-13. Victorian Injury Surveillance and Applied Research System, Monash University Accident Research Centre.\*
- Williams F, & Ashby K. (1995). Horse related injuries. *Hazard* 23: 1-13. Victorian Injury Surveillance and Applied Research System, Monash University Accident Research Centre.\*

\* All *Hazard* publications are available either by telephoning 03 9905 1805, Faxing 03 9905 1809, E-mailing: [viss.enquire@general.monash.edu.au](mailto:viss.enquire@general.monash.edu.au) or Website: <http://www.general.monash.edu.au/muarc.hazard/hazidx.htm>



## Glossary

ABS - Australian Bureau of Statistics  
AIHW - Australian Institute of Health and Welfare  
ASGC - Australian Standard Geographical Classification  
ARIA - Accessibility/Remoteness Index of Australia  
DHAC - Commonwealth Department of Health and Aged Care  
DURF - Death Unit Record File  
E-code - External Cause of Injury Code  
ED - Emergency Department  
ERP - Estimated Resident Population (ERP)  
ICD - International Classification of Diseases  
MVEG - Motor vehicle exhaust gassing  
MUARC - Monash University Accident Research Centre  
RRMA - Rural, Remote & Metropolitan Areas  
SLA - Statistical Local Areas  
SSD - Statistical subdivision  
VAED - Victorian Admitted Episodes Dataset  
VEMD - Victorian Emergency Minimum Dataset  
VISAR - Victorian Injury Surveillance and Applied Research System  
WHO - World Health Organisation

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## Database descriptions

### **Australian Bureau of Statistics (ABS) - Death Unit Record File (DURF)**

The Australian Bureau of Statistics (ABS) death unit record file (DURF) consists of information supplied by State Registrars of Births, Deaths and Marriages. Each death registered in Australia is classified by the ABS according to the World Health Organisation (WHO) International Classification of Diseases (ICD) coding system. MUARC has access to data for the period 1990-1998.

### **Victorian Admitted Episodes Dataset (VAED)**

The VAED contains information on admissions to Victorian hospitals over a 12 year period - July 1987 to June 1999. For most of the period covered, the data was collected by Health Computing Services Victoria under the direction of Human Services Victoria. Detailed information on hospital admissions, from admission to discharge, is collected. The information on the nature of injury is based on the diagnosis by physicians. MUARC has access to those records which involve injury and poisoning.

### **Victorian Emergency Minimum Dataset (VEMD)**

The electronic VEMD database records details of injuries treated at the emergency departments of 28 major public hospitals, 26 of which cover a general adult community (see page 15). The total number of cases on the database to April 2001 was approximately 991,779. For most hospitals the period January 1996 to March 2001 is covered. The injury variables collected include injury cause, location, activity, nature of main injury, body region, human intent and a narrative describing the injury event. VEMD hospitals represent approximately 80% of statewide emergency department presentations. The data provided to MUARC does not include all ED presentations, only injury specific cases. Hence it is not possible to analyse any VEMD data which may have been re-categorised to a non-injury grouping. A MUARC study found that the VEMD captured only 82% of possible VEMD presentations.



Profile of injured residents of Metropolitan Centres, Victoria by rank order of injury variables

Table 4

	Deaths – ABS		Hospital admissions – VAED		ED presentations – VEMD	
		%		%		%
<b>Age in years</b>	80+	15.7	80+	12.9	20-24	11.2
	25-29	10.4	20-24	9.5	25-29	10.6
	20-24	10.1	25-29	9.1	0-4	9.8
	30-34	8.9	15-19	7.7	15-19	9.4
	35-39	7.6	30-34	6.8	30-34	8.1
<b>Sex M:F</b>	2.1:1		1.3:1		1.6:1	
<b>Intent</b>	Unintentional	56.9	Unintentional	85.1	Unintentional	84.4
	Self harm	36.6	Self harm	8.4	Interpersonal violence	4.3
	Interpersonal violence	3.7	Interpersonal violence	5.0	Self harm	3.4
	Other/unknown	2.8	Other/unknown	1.5	Other/unknown	7.9
<b>Cause of injury event</b>	Motor vehicle traffic	21.4	Falls, same level	23.8	Fall up to 1m	27.5
	Falls, same level	13.8	Falls, different level	11.7	Cutting/piercing object	10.2
	Hanging suicide	13.1	Motor vehicle traffic	9.8	Unspecified	10.1
	Motor vehicle exhaust gas suicide	8.7	Hit, struck, crush	7.4	Struck by/ collision with object	9.8
	Accidental overdose	7.5	Intentional poisoning	7.4	Struck by/ collision with person	9.3
	<b>Nature of main injury</b>	<i>NOT AVAILABLE</i>		Fractures	38.3	Open wound excl. eye
			Open wound	16.3	Fracture	19.2
			Poisoning	12.8	Sprain/strain	14.0
			Intracranial	5.4	Superficial	7.9
			Traumatic complications	4.4	Poisoning	5.4
<b>Body region injured</b>	<i>NOT AVAILABLE</i>		Upper limb	27.9	Hand/fingers	14.0
			Lower limb	22.3	Face excl. head	8.5
			Other, unspecified	18.6	Head excl. face	5.9
			Head	11.0	Ankle	5.5
			Face excl. eye	6.4	Wrist	4.8
<b>Location where injury occurred</b>	<i>NOT AVAILABLE</i>		Unspecified	30.8	Home	39.5
			Home	28.7	Unspecified	14.2
			Transport (traffic & non-traffic)	17.9	Road, street or highway	13.4
			Sports & athletics areas	4.4	Place for recreation	6.4
			Residential institution	4.4	Trade/service area	6.2
<b>Activity when injured</b>	<i>NOT AVAILABLE</i>		Unspecified	42.2	Leisure	43.1
			Other specified	32.3	Unspecified	22.9
			Sports	5.9	Other specified	9.1
			Vital activities	5.8	Working for income	9.0
			Leisure	5.7	Sports	6.3
<b>Departure Status</b>	<i>NOT APPLICABLE</i>		Discharge home	78.1	Discharge home/ nursing home	79.4
			Transfer to acute/ extended care/ rehab/ geriatric facility	12.9	Admitted	15.4
			Transfer to nursing home	1.7	Transferred to another hospital	2.4
			Died	1.5	Left before being seen by doctor	1.7
			Discharge home with post-acute care	1.3	Left at own risk after treatment commenced	1.0
<b>Length of stay</b>	<i>NOT APPLICABLE</i>		< 2 days	60.0	<i>NOT APPLICABLE</i>	
			2-7 days	25.2		
			8-30 days	12.5		
			31+ days	2.2		



	Deaths – ABS (%)		Hospital admissions – VAED (%)		ED presentations – VEMD (%)	
<b>Age in years</b>	80+	15.6	80+	11.8	15-19	12.3
	30-34)	10.3	15-19	9.1	20-24	11.4
	20-24	8.3	20-24	8.0	10-14	10.3
	25-29	7.8	0-4	7.7	25-29	9.6
	15-19	7.1	25-29	7.5	0-4	9.5
<b>Sex M:F</b>	2.1:1		1.3:1		1.6:1	
<b>Intent</b>	Unintentional	53.5	Unintentional	87.2	Unintentional	91.0
	Self harm	41.3	Self harm	7.4	Other/unknown	3.8
	Other/unknown	3.4	Interpersonal violence	4.7	Interpersonal violence	3.6
	Interpersonal violence	1.8	Other/unknown	0.6	Self harm	1.5
<b>Cause of injury event</b>	Motor vehicle traffic	20.4	Falls, same level	23.1	Fall up to 1m	25.4
	Falls, same level	14.4	Falls, different level	11.8	Struck by collision with person	15.2
	Hanging suicide	14.1	Hit, struck, crush	7.9	Cutting/piercing object	13.3
	Motor vehicle exhaust gas suicide	10.8	Motor vehicle traffic	7.1	Struck by collision with object	9.1
	Firearms/explosive suicides	7.1	Intentional poisoning	6.4	Unspecified causes	9.1
<b>Nature of main injury</b>	<i>NOT AVAILABLE</i>		Fracture	38.7	Open wound excl. eye	20.2
			Open wound	14.3	Sprain/strain	17.6
			Poisoning	11.8	Fracture	12.5
			Intracranial	7.3	Foreign body	6.5
			Sprain/strain	3.8	Injury to muscle or tendon	6.1
<b>Body region injured</b>	<i>NOT AVAILABLE</i>		Upper limb	26.8	Hand incl. fingers	17.7
			Lower limb	22.8	Face excl. eye	8.0
			Other/unspecified	18.3	Ankle	6.9
			Head	11.7	Wrist	6.3
			Face excl. eye	7.1	Head excl. face	6.2
<b>Location where injury occurred</b>	<i>NOT AVAILABLE</i>		Home	32.2	Home	41.8
			Unspecified	29.1	Unspecified	17.0
			Transport (traffic & non-traffic)	16.0	Road, street, highway	8.4
			Sports & athletics area	7.1	Trade or service area	7.2
			Residential institution	4.0	Place for recreation	6.8
<b>Activity when injured</b>	<i>NOT AVAILABLE</i>		Unspecified	41.4	Leisure	47.9
			Other specified	27.3	Unspecified	19.6
			Leisure	8.5	Working for income	10.5
			Sports	7.5	Sports	7.9
			Vital activities	6.8	Other specified	5.3
<b>Departure Status</b>	<i>NOT APPLICABLE</i>		Discharge home	80.2	Discharge home/nursing home	86.4
			Transfer to acute/extended care/ rehab/ geriatric facility	9.3	Admission to ward	9.5
			Change to designated rehab unit	1.9	Left before seeing doctor	2.0
			Transfer to nursing home	1.5	Left at own risk after treatment commenced	0.7
			Left against medical advice	1.3	Transferred to another hospital	0.6
<b>Length of stay</b>	<i>NOT APPLICABLE</i>		<2 days	56.0	<i>NOT APPLICABLE</i>	
			2-7 days	29.7		
			8-30 days	12.7		
			31+ days	1.6		



**Profile of injured residents of Other Rural and Remote areas, Victoria by rank order of injury variables**

**Table 6**

	<b>Deaths – ABS</b>		<b>Hospital admissions – VAED</b>		<b>ED presentations – VEMD</b>	
		(%)		(%)		(%)
<b>Age in years</b>	80+	17.6	80+	13.9	15-19	12.7
	25-29	8.8	15-19	9.1	10-14	10.3
	15-19	8.2	10-14	7.3	20-24	10.0
	20-24	7.7	20-24	7.0	25-29	8.0
	30-34	6.5	0-4	6.5	5-9	7.8
<b>Sex M:F</b>	2.2:1		1.3:1		1.9:1	
<b>Intent</b>	Unintentional	61.7	Unintentional	91.7	Unintentional	91.7
	Self harm	33.3	Self harm	4.5	Other/unspecified	3.9
	Other/unspecified	3.1	Interpersonal violence	3.1	Self harm	1.6
	Interpersonal violence	1.9	Other/unspecified	0.7	Interpersonal violence	2.8
<b>Cause of injury event</b>	Motor vehicle traffic	30.8	Falls, same level	24.9	Fall up to 1m	25.8
	Fall, same level	16.3	Falls, different level	11.0	Struck by collision with person	12.4
	Hanging suicide	11.8	Hit, struck, crush	7.6	Cutting piercing object	10.4
	Firearms/explosive suicide	7.9	Motor vehicle traffic	7.1	Struck by collision with object	9.5
	Motor vehicle exhaust gas suicide	6.5	Animal/plant related excl. being ridden	4.1	Unspecified	8.6
	<b>Nature of main injury</b>	<i>NOT AVAILABLE</i>		Fractures	38.0	Fracture
			Open wound	14.1	Open wound excl. eyes	16.7
			Poisoning	9.3	Sprain/strain	14.5
			Intracranial	8.0	Superficial excl. eye	7.5
			Sprain/strain	4.4	Foreign body	6.8
<b>Body region injured</b>	<i>NOT AVAILABLE</i>		Upper limb	25.7	Hand, incl. fingers	15.5
			Lower limb	24.0	Face, excl. eyes	6.9
			Other/unspecified	16.3	Ankle	6.3
			Head	12.3	Wrist	6.0
			Abdomen/pelvis	6.1	Forearm	5.4
	<b>Location where injury occurred</b>	<i>NOT AVAILABLE</i>		Unspecified	32.2	Home
			Home	28.3	Unspecified	14.3
			Transport areas	17.3	Road, street, highway	10.8
			Sports, athletics area	6.0	Place for recreation	7.3
			Residential institution	3.9	Athletics, sports area	7.1
<b>Activity when injured</b>	<i>NOT AVAILABLE</i>		Unspecified	47.7	Leisure	46.0
			Other specified	23.1	Unspecified	16.9
			Leisure	7.4	Working for income	12.1
			Sports	7.3	Sports	8.7
			Vital activities	5.7	Other specified	6.6
	<b>Departure Status</b>	<i>NOT APPLICABLE</i>		Discharge to home	79.7	Discharge to home
			Transfer to acute/ extended care/ rehab/ geriatric facility	10.7	Admitted	23.0
			Discharge to home with district nursing arranged	2.1	Transferred to another hospital	1.5
			Death	1.4	Left before being seen by doctor	1.3
			Transfer to nursing home	1.3	Left at own risk after treatment commenced	0.5
<b>Length of stay</b>	<i>NOT APPLICABLE</i>		<2 days	53.1	<i>NOT APPLICABLE</i>	
			2-7 days	32.2		
			8-30 days	12.7		
			31+ days	2.1		



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**Professor Tom Triggs**, Monash University Accident Research Centre  
**Professor Joan Ozanne-Smith**, Monash University Accident Research Centre  
**Dr Mark Sinclair Stokes**, Monash University Accident Research Centre  
**Associate Professor Peter Cameron**, Royal Melbourne Hospital

## VISS Staff

**Director:** Dr Mark Sinclair Stokes  
**Co-ordinator:** Ms Karen Ashby  
**Research Assistants:** Ms Maria Corbo  
Ms Voula Stathakis  
**Medico/Clerical Support Officer:** Ms Christine Chesterman

## General Acknowledgements

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<i>From October 1995</i> Austin & Repatriation Medical Centre Ballarat Base Hospital The Bendigo Hospital Campus Box Hill Hospital Echuca Base Hospital The Geelong Hospital Goulburn Valley Base Hospital Maroondah Hospital Mildura Base Hospital The Northern Hospital Royal Children's Hospital St Vincents Public Hospital Wangaratta Base Hospital Warrnambool & District Base Hospital Western Hospital - Footscray Western Hospital - Sunshine Williamstown Hospital Wimmera Base Hospital	<i>From November 1995</i> Dandenong Hospital  <i>From December 1995</i> Royal Victorian Eye & Ear Hospital Frankston Hospital  <i>From January 1996</i> Latrobe Regional Hospital  <i>From July 1996</i> Alfred Hospital Monash Medical Centre  <i>From September 1996</i> Angliss Hospital  <i>From January 1997</i> Royal Melbourne Hospital  <i>From January 1999</i> Werribee Mercy Hospital  <i>From December 2000</i> Rosebud Hospital
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## Coronial Services

Access to coronial data and links with the development of the Coronial's Services statistical database are valued by VISS.

## National Injury Surveillance Unit

The advice & technical back-up provided by NISU is of fundamental importance to VISS.

## How to Access VISS Data:

VISS collects and tabulates information on injury problems in order to lead to the development of prevention strategies and their implementation. VISS analyses are publicly available for teaching, research and prevention purposes. Requests for information should be directed to the VISS Co-ordinator or the Director by contacting them at the VISS office.

## Contact VISS at:

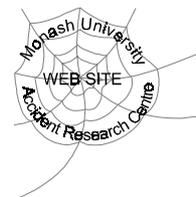
MUARC - Accident Research Centre  
PO Box 70A  
Monash University  
Victoria, 3800

### Phone:

Enquiries	(03) 9905 1805
Co-ordinator	(03) 9905 1805
Director	(03) 9905 1815
Fax	(03) 9905 1809

### Email:

[viss.enquire@general.monash.edu.au](mailto:viss.enquire@general.monash.edu.au)



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