

**Hazard**  
**(Edition No. 21)**  
**December 1994**

**Victorian Injury**  
**Surveillance System**

**Monash University**  
**Accident Research Centre**



**VicHealth**

*This edition of Hazard presents an in-depth analysis and medical record follow-up of domestic violence cases on the VISS database. These analyses were undertaken as part of a Monash University Accident Research Centre study of domestic violence, funded by the Department of Health and Community Services. Results from the broader study are also summarized. Additionally there is an article on **smoking related injuries**.*

# Domestic Violence

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## Summary

Domestic violence is a public health problem which impacts on several sectors of the community. It is defined here as 'direct partner-inflicted violence, resulting in injury, to those aged 15 years and over, occurring both within and outside the home'

On the VISS database there were estimated to be 288 positive, 397 probable and 313 suggestive cases of domestic violence, representing 2% of all adult injury cases. Positive cases were found to be predominantly

women, especially those aged 20-30 years. Victims were most frequently hit by a partner or object, causing bruising and head injuries. Injuries in females presenting to emergency departments were 10 times more likely than those in males to be due to domestic violence. There were differences between the sexes in both the mechanism and type of injury experienced.

Suicide attempts and intended self harm in women were thought to be areas worthy of further investigation in the context of domestic violence.

Hospital medical records admissions follow-up found the utilisation of medical services by victims of domestic violence generally higher than that of controls. However only 11% were recorded as being given a referral by medical staff to an appropriate domestic violence service.

Women were highly represented in domestic violence deaths (90% of victims). Clinical staff interviews showed a lack of protocols and education in the eight participating hospitals for detecting and managing victims of domestic violence.



## Introduction

Domestic violence impacts on the economy, health services, policing, court and welfare systems, as well as on the victims and perpetrators of domestic violence. This report focuses on injuries presenting to the hospital and coronial sectors as the result of domestic violence and examines those cases in the context of all violence and all injury.

Consistent findings of a literature search:

Over-representation of women as victims of domestic violence, under detection of domestic violence, overuse of medical, health, psychiatric and social services by victims of domestic violence, repeated presentations, various barriers to the identification, management and recording of domestic violence, high rates of suicide by victims of domestic violence, a cyclical nature of abuse, a relationship between child and adult victimisation, history of family violence, a high incidence of domestic violence injury during pregnancy, and, a lack of protocols and training concerning the identification, management and recording of domestic violence by professional personnel.

## Definition

The definition of domestic violence varies across different groups and settings. This has posed major problems in accurately estimating the true prevalence of domestic violence.

1. Western Hospital 1/1/91 to 31/12/92, Latrobe Regional Hospital 1/7/91 to 30/6/93, Royal Melbourne Hospital 1/3/92 to 28/2/94 and Preston & Northcote Community Hospital 1/3/92 to 28/2/93.

Studies have used varying and overlapping definitions of domestic violence, which may include the related definitions of spouse abuse, partner abuse, wife abuse, and family violence. These differences have led to a number of estimates of the problem which cannot be compared.

The definition of domestic violence adopted here is 'direct partner-inflicted violence, resulting in injury, to those aged 15 years and over, occurring both within and outside the home'.

According to Stark and Flitcraft (1991) domestic violence encompasses three levels of delineation. That is, positive (definite partner-inflicted assault), probable (assaultive injury not recorded as a street assault, anonymous mugging or robbery) and suggestive (explanation inconsistent with the injury sustained) cases of domestic violence.

The Victorian Injury Surveillance System, Victorian Inpatient Minimum Dataset (hospital admissions) and Coroner's Facilitation System databases and hospital patient medical records were accessed to determine the level and nature of domestic

violence in the community. The results are outlined as follows.

## 1. Victorian Injury Surveillance System database

On the VISS database there were 7877 cases of adult violence. This represented 15% of all injury cases who had presented to the emergency departments of the Western Hospital, the Latrobe Regional Hospital and the Royal Melbourne Hospital (two years) and the Preston & Northcote Community Hospital (one year) aged 15 years and over.<sup>1</sup> The pattern of violence presenting to these hospitals is shown in Table 1.

VISS domestic violence cases shall be analysed according to positive, probable and suggestive cases as defined by Stark and Flitcraft.

### Positive domestic violence cases (n=288)

These represented 0.6% of all adult injury cases and comprised violence cases in which it was entirely clear in the narrative section on the VISS form that direct physical violence resulting in injury was inflicted on a

Adult Violence (Injured Persons)

Table 1

Types of Violence	Males		Females		Total	
	N	%	N	%	N	%
Assaults	3511	44	926	12	4437	57
Intended self harm, suicide	1089	14	1375	17	2464	31
Other*	754	10	222	3	976	12
<b>Total</b>	<b>5354</b>	<b>68</b>	<b>2523</b>	<b>32</b>	<b>7877</b>	<b>100</b>

VISS: >=15 yrs, WH (2yrs), LRH (2yrs), RMH (2yrs), PANCH (1yr)

Positive domestic violence cases are predominantly included in assaults.

\* Mostly assailants in fights and victims of injury unintentionally self-inflicted in anger.



partner.<sup>2</sup> Excluded were intended self-harm or suicide cases, those which on inspection of the narrative did not contain partner terms, those which were self-inflicted following on an argument with the partner, those which did not have the partner as the assailant or those which used the terms either 'claimed' or 'domestic' without further clarification.

### Characteristics

Presentations in this category were concentrated in the 20-29 year age group (39% of cases) and steadily declined after this age. Females represented 83% of presentations and a lesser proportion of admissions (72%). There were 43 cases of admission to hospital, representing 15% of all presentations. This compares with 17% for adult all-injury presentations.

There was no pattern of monthly distribution of cases which was easily explainable, basically peaks of March and July and lows of June and August. Almost 60% occurred in the home, largely the victim's own living/sleeping area.

### Mechanism of Injury

The most frequent mechanisms of injury were:

- i) To be hit by a partner or object (74%)
- ii) To be pushed against or otherwise forced to hit against an object or surface (12%)
- iii) To be grazed, abraded, lacerated or punctured by an object (12%).

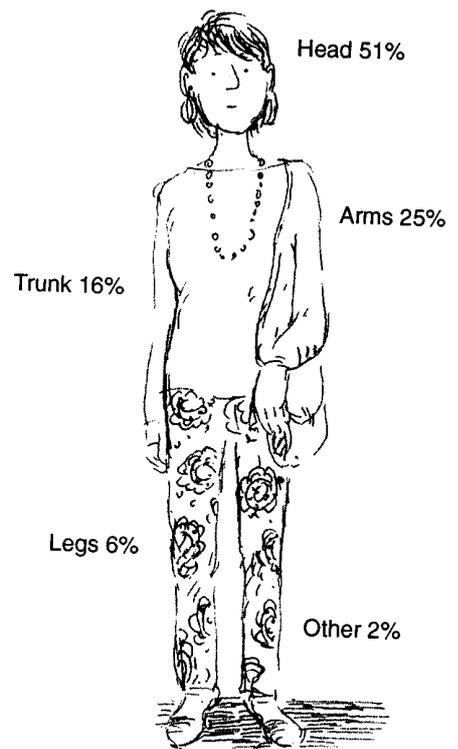
2. Husband, wife, boyfriend, girlfriend, domestic, partner, defacto, fiancee, boy friend, girl friend, man friend, lady friend.

Injuries to the first group were principally inflicted by the partner (91%), occasionally with the assistance of surrounding objects eg ashtrays, heaters, bottles. The head here was the most frequently injured body part (59% injuries), particularly face and scalp bruising and lacerations. Ninety percent of such victims were female, 10% male.

The second category was almost entirely female. They were most often pushed (n=13) eg 'Patient pushed into glass door by husband', thrown (n=10) eg 'Husband threw her onto kitchen tiles. Hit head' or forced to hit against something eg 'Boyfriend pulled her out of car, hitting head on road'. Injuries were most often inflammation, swelling and bruising.

The final category were most often male (64% of cases). The injuries were usually lacerations, punctures and penetrating wounds to the upper extremities and trunk. Knives and window glass were frequently used to cause the injury. The injuries were frequently severe with 36% admitted to hospital.

**Body parts injured Positive D.V. cases Fig. 1**



VISS: >=15 yrs, WH (2yrs), LRH (2yrs), RMH (2yrs), PANCH (1yr) n=473 injuries  
 Note: Up to 3 injuries can be noted per case, average here is 1.6.

**Nature of Injury (Positive D.V. cases) Table 2**

Nature of Injury	Domestic violence % (n=473 injuries)	All injury % (n=64,577 injuries)
Bruising	36	11
Lacerations	19	21
Inflammation, swelling, oedema, pain	15	12
Fractures	10	16
Other	20	40
<b>Total</b>	<b>100</b>	<b>100</b>

VISS: >=15 yrs, WH (2yrs), LRH (2yrs), RMH (2yrs), PANCH (1yr)  
 Note: Up to 3 injuries can be noted per case.



## Injuries

Up to 3 injuries can be noted per case (in order of severity). Domestic violence noted 1.6 injuries per case, compared with 1.2 for all-injury adult cases. The most frequently injured body part was the head (51% injuries) particularly face and scalp bruising, lacerations and inflammation, concussion, nose fractures and external mouth lacerations; followed by the arms (25%), particularly finger, hand and forearm lacerations and shoulder bruising and the trunk (16%), particularly bruising to the chest and lower back. (See Figure 1)

Only one quarter of adult injuries overall were head injuries compared with 51% for domestic violence cases. There is clearly therefore an over-representation of head injuries and bruising (see Table 2). In fact 3% percent of all bruising and 5% of all head bruising cases were associated with positive domestic violence.

## Disposal

Table 3 describes the outcomes of presentations to the emergency departments of Victorian Injury Surveillance System participating hospitals.

Clearly the most frequent outcomes were *asignificant treatment*, especially *treated referral GP* and *treated, no referral*.

It should be noted that at least 18 of the assailants were former partners, particularly boyfriends. There were 21 cases where defacto partners were assailants and 7 where the victim was pregnant, 3 at 17 weeks.

## Sex Differences

There were 239 positive cases of female victims of domestic violence, 49 cases of males. The ratio of females

## Outcome of presentations to emergency departments

Table 3

Disposal	%	(n=288)
<b>Assessment only</b>		<b>9%</b>
<b>Minor Treatment</b>		<b>28%</b>
- Treated no referral	28%	
<b>Significant treatment</b>		<b>47%</b>
- Treated referral O.P.D	10%	
- Treated referral GP	20%	
- Treated other referral	6%	
- Casualty review	11%	
<b>Admissions</b>		<b>15%</b>
- Short stay observation ward	5%	
- Admitted (Short stay ward or inpatient ward)	10%	
<b>Transferred</b>		<b>1%</b>
<b>Total</b>		<b>100%</b>

VISS: >=15 yrs, WH (2yrs), LRH (2yrs), RMH (2yrs), PANCH (1yr)

to males is therefore 5:1. Female victims were 1.3% of all female injury cases, men 0.14% ie although rare compared with unintentional injury, women who presented to emergency departments with injury were approximately 10 times more likely than men to present with injuries attributable to domestic violence.

There were very clear differences between male and female domestic violence (See Table 4). Women were more likely than men to become victims in their own home, to have been injured by being hit by their partner or by hitting against something and to suffer bruising and inflammation, especially to the head. Men were more likely to be admitted to hospital ie their injuries were probably more severe. They far more frequently than women were lacerated or punctured by knives, especially to the head and arms. The *hit by a partner or object* category was of equal

proportions for men and women and this for men usually comprised being hit by cars, ashtrays, footwear etc, usually resulting in lacerations, abrasions or bruising.

## Domestic Violence Injuries Compared with all Injuries

Comparisons are made here of the proportions of domestic violence injuries with all injury for each sex, as in Table 4 but with more detail. Women's domestic violence injuries compared with all women's injury cases were most likely to be bruising and/or were to the head area. More precisely for bruising they were to the eyes, ocular adnexa, nose, mouth (external), ears, face and scalp, skull, external neck, head (other), lower and upper leg, forearm and trunk.

Men's domestic violence injuries compared with all men's injuries tended to be lacerations, abrasions,



**Positive domestic violence and all-injury comparisons by sex**

**Table 4**

Characteristic	Positive DV cases		All injury cases	
	Male (n=49)	Female (n=239)	Male (n=34,881)	Female (n=18,439)
	% Cases			
<b>Location</b>				
Own home	40%	50%	18%	32%
Other home	14%	8%	4%	3%
<b>Mechanism</b>				
Hit against victim moving	4%	13%	31%	44%
Hit by, other moving	45%	78%	21%	11%
Grazed,abraded,lacerated,punctured	43%	6%	20%	13
<b>Admission rate</b>	24%	13%	16%	20%
	(% Injuries)			
<b>Injuries (Up to 3 per case)</b>				
Lacerations	41%	16%	24%	15%
Bruising	14%	40%	10%	12%
Abrasions	13%	8%	5%	4%
Fractures	8%	9%	16%	18%
Inflammation,swelling,oedema,pain	4%	17%	11%	14%
Penetrating wound, punctures	11%	2%	2%	2%
Bites	5%	0.20%	1.50%	2%
<b>Body Part</b>				
Head injuries	25%	56%	28%	19%
Arms	46%	22%	35%	30%
Legs	8%	5%	22%	30%
Trunk	16%	16%	9%	11%
	(% cases)			
<b>Causes (Up to 2 per case)</b>				
Other adult	37%	72%	13%	6%
Knives	31%	3%	3%	3%

VISS: >=15 yrs, WH (2yrs), LRH (2yrs), RMH (2yrs), PANCH (1yr)

penetrating wounds, punctures and bites. More precisely than in Table 4 these were to the shoulder, the upper arm, the forearm, the face and scalp (including nose) and the chest. These were the injuries used to identify the suggestives.

It is interesting to note that for the positive domestic violence cases identified victims were less likely to have filled out forms than were injury cases overall (46% of forms completed by domestic violence victims compared with 63% for injury victims overall). Missing forms were

completed by data processors from hospital medical records.

**Probable Cases (n=397)**

Stark and Flitcraft define ‘probable’ as those cases where the injuries in the person are the result of an assault but the injuries were not sustained in a street assault, mugging or robbery. However if applied to the VISS population males heavily outweigh females since males predominate for violence related injuries. This is inconsistent with the male to female ratio for positive domestic violence cases.

An alternative method therefore was to read through a sample of one line descriptions of female assaults and estimate the numbers who could possibly be cases of domestic violence not already included under positives and apply the male:female positive ratio to that number of females. There were therefore 265 such probable female assaults, and 53 males making a total of 318 for probable cases.

Additionally there were 77 cases where the term *domestic* was noted in association with violence but a partner term was not included. These cases had previously been excluded from the positives.

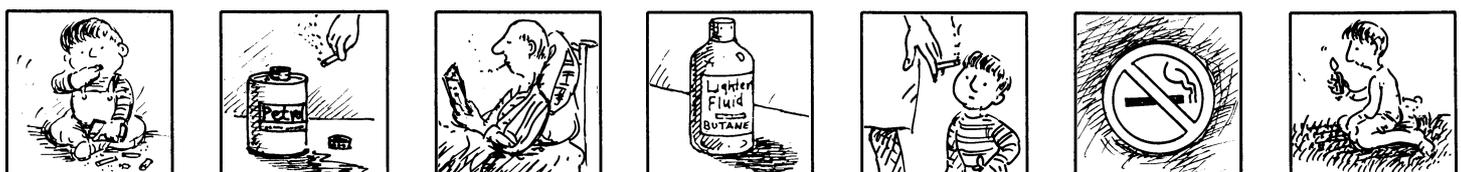
This probable group clearly should also contain the two cases which had the word ‘*claimed*’ in the description of how their injury occurred.

Summing the 3 categories gives a total estimate for probables of 397 cases.

**Suggestive Cases (n=313)**

Suggestive cases were defined as those cases whose explanations did not account for or were inconsistent with the injury sustained.

Detailed examination of the 2531 cases of all women who had injuries typical of domestic violence i.e. bruising and/or head injuries, yielded 261 suggestive cases after making certain assumptions e.g. aged under 50 years, not victims of motor vehicle accidents. It was impractical to apply the same methodology to men, lacerations being both their most common domestic violence and overall injury. Applying therefore the 5:1 female to male positive domestic violence ratio yielded 52 males giving a total of 313 suggestive cases.



## Suicide and Intended Self-harm

These cases have so far been excluded from the analysis because they have not neatly fitted into the definition of domestic violence injury.

The results of investigations of the one line descriptions for male and female presentations for suicides/intended self-harm aged between 15 and 50 years are shown below in Table 5.

Intended self-harm and suicide attempts were predominantly female (57% cases). They represented 7% of all female injury presentations, 21% of admissions. There is possibly some connection with domestic violence. Investigation of the 1782 female admissions aged under 50 years (the more likely group for domestic violence) revealed an extremely high proportion of 39% who had been admitted for self-harm or suicide compared with 13% for men in the same age group. Ninety percent of the female admissions for self-harm or suicide aged under 50 years had presented with poisonings, largely from sedatives, tranquillisers, psychotropics; paracetamol and other analgesics and alcohol (not rank ordered).

It appears that there needs to be further investigation of the relationship between self-harm, suicide and partner related violence. Many descriptives were not very revealing of the reasons for the suicide/intended self-harm attempts eg 'Having relationship problems. Drank methylated spirits plus self-mutilation'; 'Feeling depressed. Took 20 paracetamol tablets'.

## Suicide/intended self-harm presentations

Table 5

Cause	Male N	Female N	Total N	Total %
Domestic/relationship problems	42	125	167	7.2
Domestic Violence Related	5	18	23	1.0
Following argument with partner	42	75	117	5.1
Other/insufficient detail	967	1036	2003	86.7
<b>Total suicide/intended self-harm</b>	<b>1056</b>	<b>1254</b>	<b>2310</b>	<b>100.0</b>

VISS: WH (2yrs), LRH (2yrs), RMH (2yrs), PANCH (1yr). 15-50 years

## Summary of emergency department presentations Table 6 Major categories by sex as a proportion of all injury presentations

Domestic violence category	Male		Female		Total	
	N	%	N	%	N	%
Positive	49	0.1	239	0.5	288	0.6
Probable	93	0.2	309	0.6	402	0.8
Suggestive	52	0.1	261	0.5	313	0.6
Negative	34,687	65.0	17,630	33.0	52,317	98.0
<b>Total</b>	<b>34,881</b>	<b>65.4</b>	<b>18,439</b>	<b>34.6</b>	<b>53,320</b>	<b>100</b>

VISS: >=15 yrs, WH (2yrs), LRH (2yrs), RMH (2yrs), PANCH (1yr)

## Summary - Emergency department presentations (VISS)

The summary figures for domestic violence injury in Table 6 appear to represent a very small proportion of injury presenting to the emergency departments of VISS hospitals, even combining positives, probables and suggestives leads to only 2% of all emergency department presentations. These results appear to be inconsistent with published literature, particularly that coming from the U.S.A.

The difference could partially be explained by the results of the Brisbane

telephone survey in which 50% of domestic violence victims presented to general practitioners (GPs) and only 10% to emergency departments. The likelihood of presenting to G.Ps rather than emergency departments may be different in the U.S.A. At least one of the U.S.A studies took place in inner-urban black communities and applied solely to women (Stark and Flitcraft) so the socio-economic base would differ from the VISS database.

The VISS data includes 2 years of rural data (Latrobe Regional Hospital) and this hospital appears to have a much lower level than the inner urban Royal Melbourne and Western



Hospitals in particular, thereby reducing the overall proportion of domestic violence injury. Also the approximately 12% of missed presentations may contain over-representation of domestic violence victims, assuming they are less likely to complete forms than other injury cases (85% of all possible forms completed RMH, WH, PANCH, LRH (Moe), 100% LRH (Traralgon).

As an additional explanation there is not necessarily a consistency of the definition of domestic violence between studies eg suicide attempts following quarrels. These have been excluded under our definition of partner-inflicted injury but have possibly been included in other studies.

Under reporting appears to be considerably less in Victorian Injury Surveillance System hospitals compared with emergency department studies elsewhere. The role of the Victorian Injury Surveillance System form as a pseudo-protocol could be a partial explanation.

Even allowing for all these partial explanations, the 2% of all emergency department cases presenting with possible, probable or suggestive domestic violence remain less than other studies suggest.

### Under detection

As estimate of under detection of domestic violence, calculated by estimating probable and suggestive cases as a proportion of total positive, probable and suggestive cases, yielded 70%. This is based on the assumption that detection equates with the victim clearly stating in the VISS narrative that their injuries were directly partner inflicted i.e. positive domestic violence cases.

## 2. VISS Admissions - Medical records followup

Data was extracted, with Ethics Committee approval, from the hospital medical records of 44 definite cases of domestic violence and 44 controls (initially selected from all VISS cases admitted to hospital). However, some of the data which could have provided considerable insight into the circumstances surrounding certain cases of domestic violence were not included in medical histories. Females comprised 75% of the victims of domestic violence requiring hospital admission.

An overview of the total number of hospital presentations/admissions to the index hospital highlights the repeated use of services by the domestic violence cases. A larger number of domestic violence victims (57%) were recorded as having more than one prior admission to the index hospital than the controls (36%). Similarly, more victims of domestic violence (57%) were noted as having previous presentations to the index hospital than were the control group (9%).

A number of differences were found between the domestic violence and control groups. Significant differences were found for involvement of police and ambulance services, a history of alcohol abuse and current alcohol abuse, injuries to the head and trunk, referral to a social worker, and previous non-domestic violence related presentations or admissions to hospital for the domestic violence group. Although this supports the general premise that the utilisation of medical services by victims of domestic violence is

generally higher than that of controls, only 11% of victims were recorded as being given a referral by medical staff to an appropriate domestic violence service. In fact, referrals to the outpatient department, general practitioners and psychiatrists were more common in the control group than the domestic violence group. Although partly explained by the presence of suicide attempts in the control group, this suggests that domestic violence victims may not be followed up appropriately by medical services.

Interestingly, 20% of the control group (women under 40 years selected from VISS presentations as negative cases of domestic violence) were excluded from the study because they were subsequently found to have a history of suspected abuse when their medical records were examined in detail. This appears to have some connection with the figure of 39% of female admissions on the VISS database aged under 50 years who had been admitted for self-harm or suicide (discussed under VISS suicide attempt section, page 6). The similarity with other studies merits further research using a larger sample of medical records to determine the significance of this result.

A crude estimate of under detection can be extrapolated from the analysis of medical records cases. In all, a total of 55 potential controls were selected and 11 (20%) rejected after examination of the files. Although the numbers are very small these figures give a very crude estimate of the potential level of under detection of domestic violence defined in the broader sense (beyond domestic violence injury). It suggests that up to 1 in 5 admissions for injury in women under 40 years, (after presentation at



emergency departments), may be associated with a history of domestic violence, or be self-inflicted injury following a domestic dispute. However this crude estimate should be interpreted with caution.

### 3. Admissions data - Victorian Inpatient Minimum Database (VIMD)

The hospital admissions for assault in Victoria are shown in Table 7 for the period 1987/88-92/93. Males are disproportionately represented in admissions to hospital for assault, with an overall male to female ratio of 5:1 compared with deaths due to assault

with a ratio of 1.5:1. However, because of the coding system, the proportion of admitted cases resulting from domestic violence injury cannot be discriminated from the database. It is clear that VIMD in its current form can offer little useful information on hospital admissions due to domestic violence. Additional codes in the ICD classification for type of perpetrator in assault cases would clarify and contribute to information on the nature and extent of domestic violence cases admitted to hospital.

### 4. Deaths - Coroner's Facilitation System

Domestic violence injury deaths as a proportion of all injury death are low

(Table 8). However, the proportions of assaultive deaths in women due to domestic violence for the financial years 1989/90 and 1990/91 were 71% and 42% respectively, whereas the proportions for men were only 3% and 2.4%. Not only are deaths due to assault in women more likely to be as a result of domestic violence compared with men, but of all domestic violence deaths, women are highly overrepresented (90% of all domestic violence victims).

The total number of deaths due to domestic violence for the two years was 30. Of these, the main perpetrator was the husband (61% in 1989/90 and 50% in 1990/91) or boyfriend (22% in 1989/90 and 25% in 1990/91). The

**Frequency and Percentage of Hospital Admissions for Assault**

**Table 7**

Admissions	1987/88	1988/89	1989/90	1990/91	1991/92	1992/93
Intentional injury by another	1986	2048	2078	2252	2275	2371
All injuries public hospitals	51242	53037	52418	55663	57571	65907
% injuries due to assault	3.9	3.9	4.0	4.0	4.0	3.6

VIMD: 1987/88-92/93 >= 15 yrs

**Deaths due to all injuries, assaultive injuries, and domestic violence injury Percentages of all injury deaths due to domestic violence injury.**

**Table 8**

Deaths	1989/90			1990/91		
	Male n (%)	Female n (%)	Total n (%)	Male n (%)	Female n (%)	Total n (%)
Deaths due to domestic violence	1 (0.1)	17 (3.6)	18 (1.1)	1 (0.1)	11 (2.4)	12 (0.7)
Deaths due to assault	32 (2.6)	24 (5.0)	56 (3.3)	41 (3.5)	26 (5.7)	67 (4.1)
Deaths due to all injury *	1221 (100)	475 (100)	1696 (100)	1175 (100)	456 (100)	1631 (100)

\* Deaths due to all injury includes all intentional and unintentional injury. Coroner's Facilitation System. (Victoria) 1989/90 to 1990/91.



use of guns and knives as weapons of death in domestic violence, in a high proportion of cases, provides some support for countermeasures aimed at gun and knife control.

## 5. Clinical staff interviews

Additionally a total of 21 senior doctors and nurses from Emergency Departments and social workers were interviewed in eight VISS and non-VISS hospitals regarding their experience and knowledge of domestic violence. Overall, the results show in most of the eight participating hospitals a lack of protocols and education for detecting and managing victims of domestic violence.

## Recommendations

A number of recommendations are made to assist in obtaining a better understanding and hence reducing domestic violence:

### Data

1. Standardisation of definitions and terminology of domestic violence.
2. Investigation of the feasibility of linkage of justicial and police databases to give expanded measures of the prevalence of domestic violence
3. Data collection from general practice to determine the prevalence and characteristics of domestic violence presentation to this sector.

### Education and Training

4. Collaboration between Medical, Nursing and other relevant professional bodies to develop hospital protocols for the detection, management and prevention of domestic violence.

## Research

5. Estimation of the level of under reporting of domestic violence injuries to the health care system by means of community surveys.
6. Ongoing reviews of successful countermeasures and implementation strategies.
7. Exploration of the role of domestic violence in suicide and attempted suicide and self-harm.
8. Determination of the most effective service provision model for domestic violence victims in crisis.

## General

9. Adoption and implementation of the recently developed National and State Strategies for the Prevention and Control of Interpersonal Injury and Suicide.

## Acknowledgements

Irene Brumen and Fiona Williams for their contributions to the Monash University Accident Research Centre report on which this article was based.

The above analysis has been part of a Monash University Accident Research Centre exploratory study commissioned by the Victorian Department of Health and Community Services.

A limited number of copies of the full 140 page report, 'Domestic Violence: Patterns and Indicators', which includes an extensive literature review is available from MUARC for persons with a professional interest in the area.

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# Smoking Related Injuries

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Cigarette and other smoking related products have been identified as responsible for deaths and severe injuries in the VISS and Coronial databases. These causes of injury are preventable by several measures.

## VISS Database

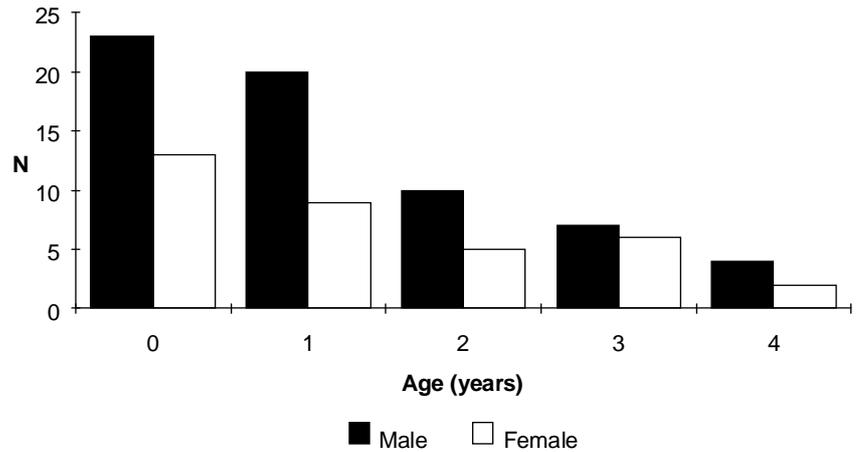
The following information is based on data collected from patients who presented with injuries or poisonings at the Emergency Departments of the Royal Children's Hospital (1988 - 93), Western Hospital (1989 - 93), Preston and Northcote Community Hospital (1989 - 93), Royal Melbourne Hospital (1992 - 93) and Latrobe Regional Hospital (91/92 - 1994). As collection of children's data commenced before that of adults, children's injuries are over represented resulting in the proportion of child injuries on the database being twice that of the all age parts of the collection. It was considered more appropriate to this topic to examine the complete database rather than investigate adults and children separately.

There are 165 cases of smoking related injuries recorded in the VISS database. Of these, 67% involved cigarettes, 30% cigarette lighters and 3% lighter fluids. Matches have been excluded in this group of injuries as they have multiple purposes and will therefore be examined separately later.

Injury cases which were smoking related accounted for 0.1% of cases on the database. Although this is quite low, the injuries sustained by the victim can be quite severe. Smoking related injuries have a 33% admission rate which is almost twice the rate for all injuries.

**Age and Sex Distribution Children Under 5 years**

**Figure 1**



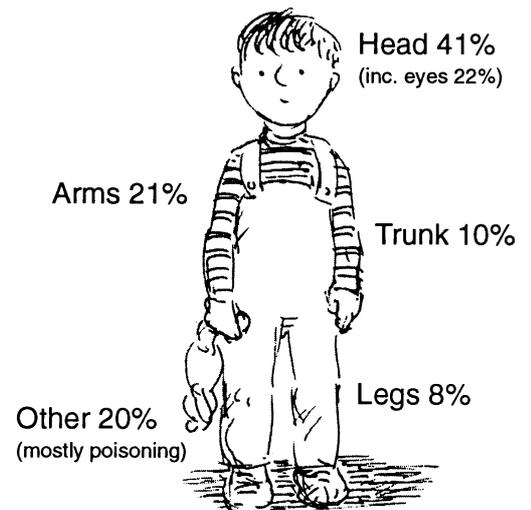
Source: VISS: RCH, WH, PANCH, RMH, LRH n = 165

The majority of injuries (60%) were to children under 5 years of age with two thirds of these occurring to children under 2 years old (See Figure 1.) Two thirds of these child injuries were to males. The injury pattern in other age groups was fairly even except for a peak of 9% in the 15 to 19 year age group. This also showed that the majority of injuries were to males.

Almost two-thirds of smoking related injuries occurred in the home with most in the living/sleeping area. Fifty-eight percent of the victims were playing when the injury occurred, 4% were fighting/quarrelling, 4% intended to harm themselves and 3% were injured while at work.

The most common types of injury were burns (63%), mainly to the eyes, hands, face and scalp; and poisonings mainly from ingesting cigarettes. The most frequent body parts injured are shown in figure 2.

**Body Part Injured Figure 2**



Source: VISS: RCH, WH, PANCH, RMH, LRH. (n=224 injuries)  
NB: Up to 3 injuries per case.



## Cigarettes or tobacco (n = 112)

Almost all of the injuries involved cigarettes and the majority occurred while children were playing. Over half were under 2 years old. Twenty-two percent of the victims required admission to hospital.

The most common causes of injury from cigarettes were the victim walking or running past or into someone with a lit cigarette (31%) injuring their eyes, and ingesting cigarettes (29%). There were also cases (6%) where the victim was handling volatile substances, eg. petrol, and then lit a cigarette causing the substance to ignite. Most of these cases occurred as a result of the victim still having traces of the substance on their hands.

Other causes of injury from cigarettes included: falling asleep while smoking (5%), children eating butts or ash left in ashtrays (4%) and explosions from gas leaks (2%).

Half of the injuries (51%) sustained from cigarettes were burns, especially to the eyes (21% of injuries); 26% poisonings and 6% foreign bodies, almost all to the eyes.

Four cases appear to be possible incidents of child abuse.

## Cigarette Lighters (n = 51)

Injuries from cigarette lighters were quite severe with an admission rate of 51%. Most injuries (41%) occurred to children under 5 years old, particularly 2 year olds. Over half (51%) of the under 5 year olds required admission.

In almost one half of cases the victims were playing with the cigarette lighter when the injury occurred and half of these involved a child setting a piece

of clothing/soft furnishing alight. Twelve percent involved fuel, gas, oil and aerosol spray when a lighter was used therefore causing an explosion to occur, and 8% set their hair alight.

Although most of the injuries were unintentional, there were cases found that were possibly self inflicted.

Over a third (35%) of the injuries were to the upper limbs, especially the hands, and 33% were to the head and face.

The Metropolitan Fire Brigade initiated a Juvenile Fire Awareness and Intervention Program (JFAIP) eight years ago on the premise that children light fires by playing with matches. They quickly identified that young children (aged 2, 3 & 4 years) found it difficult to light matches. It was discovered that children viewed cigarette lighters as toys and they were able to run them along the floor on carpet creating a spark wheel. (T. Hunter, personal communication) Therefore it seems that cigarette lighters are a greater problem to young children than matches.

## Lighter Fluids (n = 5)

All five cases were admitted to hospital and were mostly 10 to 19 years of age. Four of the cases involved the victim inhaling/sniffing lighter fluid and one involved an explosion when used over a barbeque.

## Matches (n = 63)

Injuries from matches have not been included when examining smoking related injuries as they are considered to be a multipurpose product. There were however, 63 cases found on the database.

Most of the injuries occurred to children in the 10 to 14 year age group (32%) and the under 5 year age group

(30%). The overall admission rate was 36% but for the 10 to 14 year age group the rate was higher with 50% being admitted.

Over half of the victims (57%) were playing with matches when, in most cases, they received burns. Of those playing with matches, almost half involved petrol, gas or hairspray. Sixteen percent involved a matchstick being inserted into the ear and in over half of the cases the victim was playing. Lighting matches near gas stoves, ovens and gas water services caused 10% of injuries to occur.

## Deaths

The following information is based on unnatural death data from the Victorian Coroner's Facilitation System database during the period 1989/90 to 1991/92. Over the 3 years there were 31 smoking related and 8 match related deaths investigated by the coroner.

## Smoking Related

Forty-five percent of the smoking related deaths were persons aged 65 years and over and the majority of deaths (77%) were males. Alcohol was identified as a contributing factor in 13% of all smoking related deaths.

Almost half (48%) of the deaths occurred in the victim's own home, with half of these in the bedroom. Twenty-six percent occurred in a residential institution (incl. hospitals) and 26% in other residential areas (eg. tent, caravan).

The causes of death in the majority of cases (74%) were burns from fires. Smoke from fires caused another 23% of deaths.

Most of the injuries (42%) were from a fire ignited by a discarded



smouldering cigarette and an additional 29% were caused when someone dropped a cigarette on falling asleep. Cigarette lighters were the cause in 16% of deaths and almost all of the cases involved a child under 5 years old playing with the lighter. One of these cases involved the victim inhaling the gas from a cigarette lighter.

**Match Related**

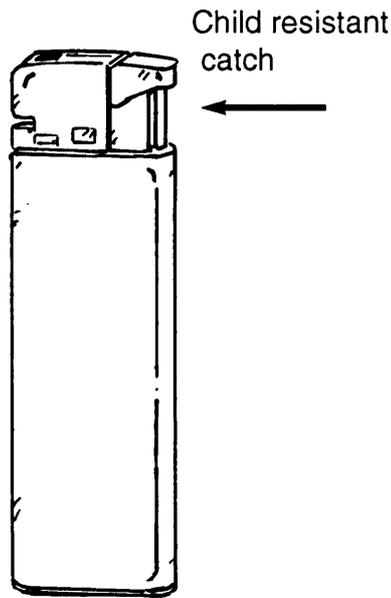
Of the eight cases of deaths related to matches, 6 occurred in the same incident and 2 in one other. The fire in the first group was started with matches, but unfortunately no other details were supplied. The second was started by either a burning match or a smouldering cigarette igniting a cushion.

**References**

Commander Terry Hunter, Officer in Charge, Fire Prevention Department, Metropolitan Fire Brigade, (personal communication), 1994.

\* Research Assistant, Monash University Accident Research Centre

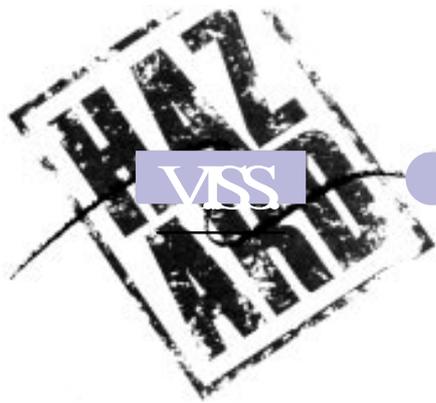
**Child Resistant Cigarette Lighter Figure 3**



**Prevention**

1. Child Resistant Cigarette Lighters. (See Figure 3.) These are mandatory in the U.S. and the Cricket brand is available in many supermarket outlets in Australia. Australian regulations may be required for widespread uptake in this country.
2. Cigarette lighters and matches must be very carefully used so as to restrict access to children. A child resistant matchbox which has been developed in the U.K. could be introduced to limit access to matches by children. (T. Hunter, personal communication)
3. Smoke detectors may alert victims to fires before injuries are inflicted.
4. Prevention of smoking will reduce exposure to the risks described above.
5. Self extinguishing cigarettes developed in the USA which do not remain alight unless puffed regularly could reduce the risk of fires from discarded cigarettes.





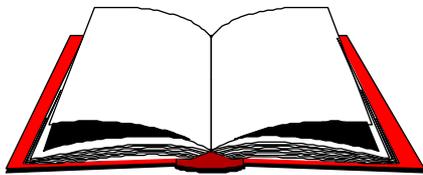
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\* Special edition



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# 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-ordinators or the Director by contacting them at the VISS office.

# General Acknowledgements

## Participating Hospitals

- Royal Children's Hospital Latrobe Regional Hospital  
(Traralgon and Moe)

The contributions to the collection of VISS data by the director and staff of the Emergency Departments of these hospitals, other participating clinicians, Medical Records Departments, and ward staff are all gratefully acknowledged. The surveillance system could not exist without their help and co-operation.

## Coronial Services

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

## National Injury Surveillance Unit

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

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# Project Funded by Victorian Health Promotion Foundation

*VISS is a project of the Monash University Accident Research Centre.*



*Hazard was produced by the Victorian Injury Surveillance System  
with the layout assistance of Glenda Cairns, Monash University Accident Research Centre.  
Illustrations by Jocelyn Bell, Education Resource Centre, Royal Children's Hospital.*

ISSN-1320-0593

*Printed by Sands and McDougall Printing Pty. Ltd., North Melbourne*

