



Hazard  
(Edition No. 13)  
December 1992

Victorian Injury  
Surveillance System

Monash University  
Accident Research Centre

This edition of hazard describes trampoline injuries to children in particular and makes design and behavioural recommendations. In addition intentional injuries are described both as they present to VISS and for Victorian Public Hospitals statewide. Details of the VISS relocation are included on page 13.

# Trampoline injuries

Virginia Routley

## Introduction

Trampolines turn a pair of ordinary legs into giant springs and are therefore exhilarating and great fun. They are regarded as valuable for teaching balance and co-ordination by physical education professionals (Guthrie 1978).

As a testimony to their popularity there are currently estimated to be 50,000 trampolines sold in Australia each year. Assuming a life of 5 years there should presently be at least 1/4 million trampolines in Australia (Australian Trampoline Sports Union 1992).

However many injuries are associated with trampolines. On the VISS database there are 452 cases of injury to children aged under 15 years over the period 1989-91. These children presented to the emergency departments of Royal

Children's Hospital, Preston & Northcote Community Hospital and Western Hospital (equivalent to one per hospital per week and 1% of the database in that period). Fortunately none of these was catastrophic but it is estimated that at least half could have been prevented by implementing simple practices which will be outlined later.

Given the relative infrequency of adult trampoline injuries, 0.06% of adult injury cases, this article will concentrate on children's injuries.

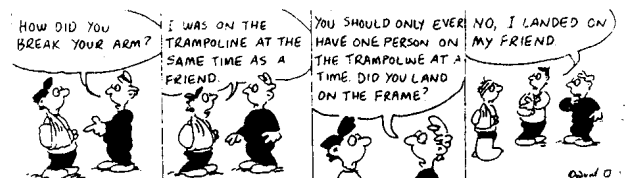
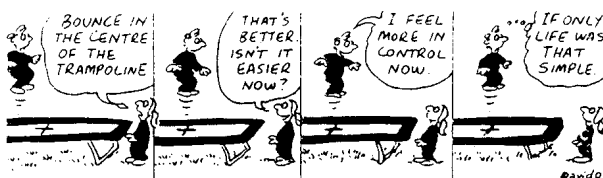
It should be noted that the number of trampoline injuries analysed is considerably greater than in any other report accessed.

Trampolines rank ninth after bikes, football, monkey bars, soccer, slides, basketball, skateboards and swings as a contributing factor in sport and recreational injury. They represent 4% of such injury cases.

## Children's Injuries

The majority (76%) of injuries were incurred in backyards. Forearm and wrist fractures, resulting largely from falls either onto the trampoline itself or the ground, were the most common injury (20% of injuries).

As can be seen in Figure 1 the injuries occurred for children of all ages but were most frequent for those aged 6 years.



Unlike most other injuries they occurred more often to girls than boys, 1.2:1 and the more severe injuries, those requiring admission to hospital, had an even higher ratio of 2.5:1. This higher incidence for girls is consistent with international trampoline studies cited (Hammer, Schwartzbach, Paulev 1981, Sherman 1991).

Overall 15% of presentations resulted in admission to hospital, representing a

slightly lower rate than for child injuries overall. Fractures, particularly to the forearm, represented almost 70% of admissions while concussion represented 7%.

The daily injuries peaked around 5pm on weekdays and between 3pm and 5pm on weekends. There was also a high number between 7pm and 9pm on Fridays (See Fig. 2).

The monthly pattern demonstrated a summer peak and a winter low (See Fig. 3).

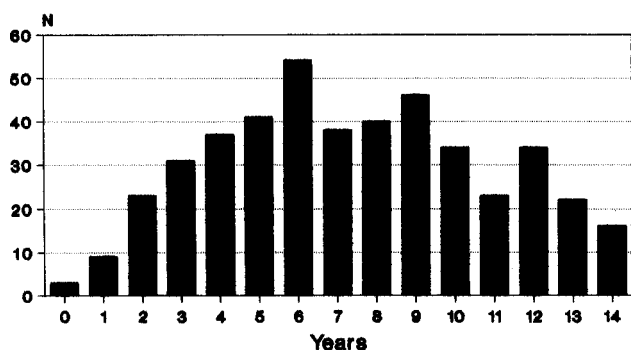
### Location

For the 409 cases where the injury location was known, they most often occurred in backyards (54% own home, 30% other home). Schools represented only 4% of injury locations.\*

Age Distribution

Figure 1

Trampoline Injuries (n=452)

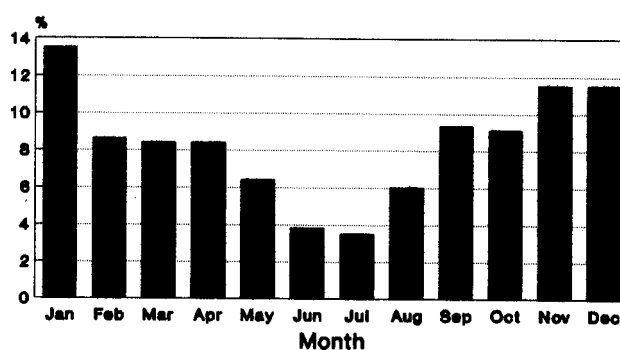


VISS Under 15 yrs 1989-91  
RCH, PANCH, WH

Monthly Pattern

Figure 3

Trampoline Injuries (n=452)

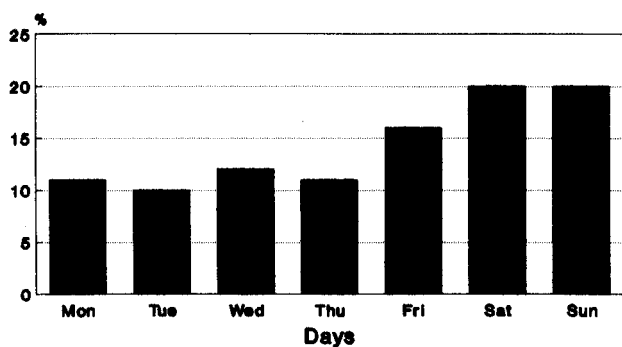


VISS Under 15 yrs 1989-91  
RCH, WH, PANCH

Weekly Pattern

Figure 2

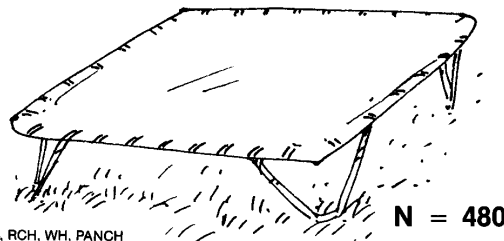
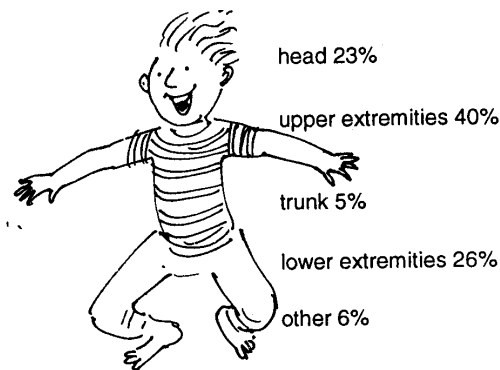
Trampoline Injuries (n=452)



VISS Under 15 yrs 89-91  
RCH, WH, PANCH

Injuries by body part

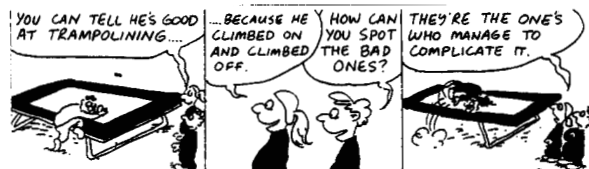
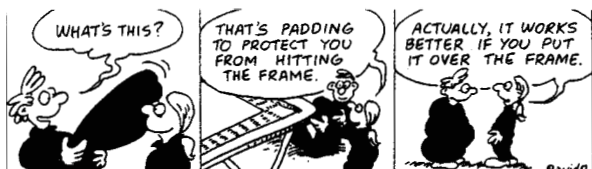
Figure 4



VISS, RCH, WH, PANCH  
under 15 yrs 1989-91

Note up to three injuries recorded per case

\* The Ministry of Education and Training has stipulated that trampolines can only be used if strict guidelines are followed as set out in its Schools Information Manual.



## Injury Causes

Falls up to and over one metre accounted for 31% and 21% respectively of events leading to injury.

Trampolines directly caused 167 cases of injury eg leg grazed on springs, while persons caused 78 - eg. landed awkwardly on ankle. Impact with the ground and man-made surfaces such as concrete, usually the result of a fall, caused 120 and 29 cases of injury respectively.

## Injuries (N = 480)

Fractures represented 37% of injuries, sprains/strains 20%, bruising 14% and cuts and lacerations 15%.

## Arm Fractures

Arm fractures represented 125 in injuries. They were most common to the radius/ulna and wrist (68% of arm fractures), followed by the upper arm and elbow (33%). They had a higher incidence of occurrence in the location 'other home' than other trampoline injuries (32% own home v 24% other home).

Arm fractures were more commonly caused by falling to the ground from a height than were other trampoline injuries (40% of arm fracture cases v 15% of other injury cases).

Face and scalp cuts and lacerations (N=34) were the most common injuries after radius/ulna fractures and they represented 7% of all injuries.

## Detailed Injury Causes

By analysing text descriptions of how the injury occurred it became apparent that the following factors were associated with a considerable number of the injuries:

## Sharing a Trampoline

Two typical examples of these 76 incidents were 'Jumping with a friend. Collided. Bumped heads' and 'Bouncing on a trampoline. Was bounced off by other boy. Landed on ground'.

The injuries most commonly caused by more than one person jumping on a trampoline at a time were fractures of the radius/ulna (n=17), fractures of the tibia/fibula (n=6) and cuts and lacerations of the face and scalp (n=6).

Injuries attributed to sharing were most often caused by bumping into or being bumped by other children (n=32 injury cases) and were often associated with the causes which follow eg frame, springs.

Supervision by adults to limit the trampoline to one person at a time should greatly reduce these injuries.

## Frame

A typical example of these 43 incidents which involved the victim hitting the frame was:

*'Jumped too high. Fell off. Landed on bar as fell'.*

Head injuries, especially cuts and lacerations to the face and scalp and, to a lesser extent concussion, represented half of injuries so caused. There was only one radius/ulna fracture.

Keeping to the centre of the mat and having a padded frame should have prevented most of these injuries.

Table 1

Detailed Injury Causes**	N
Sharing trampoline	76
Fell onto:-	
- frame	43
- springs	26
- obstacles on ground	22
- concrete, bluestone	28
Incorrect mounting/dismounting	18
Attempting tricks eg somersaults	11
Injured by tramp when not in use	13
Distracted by ball etc	6
Victim under trampoline	5

## Springs

Typical of these 26 injuries were:

*'Head caught in springs when bouncing on back'*

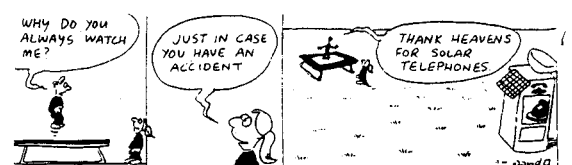
*'Trying to get off trampoline -landed between springs'.*

Although 20% of the injuries caused were arm fractures, facial cuts and lacerations, leg and foot bruising and sprains/strains were also common.

Almost half of the injuries were caused by the victim hitting the springs and 35% by the victim being "caught in or between".

Keeping to the centre and having the springs covered by frame pads should have prevented most of these injuries.

\*\* More than one cause can be attributed to an injury case.



## Obstacles on the Ground

These 22 incidents were usually associated with falls from the trampoline and/ or incorrect mounting/ dismounting.

Typical examples were:

*'Fell off. Hit back on shovel.'*

*'Jumping down from trampoline. Hit against edge of child's pool.'*

Keeping the area around the trampoline free of obstacles for 2 metres would have prevented most of these in juries.

## Concrete or Bluestone

A typical example of these 28 incidents was:

*'Jumping on trampoline. Fell onto concrete path.'*

Seventy percent of injuries in this category were to the head, in particular bruising and cuts and lacerations to the face and scalp and concussion. There was one skull fracture.

Twenty-seven of the injury cases occurred while landing on grass and 80% of these resulted in fractures. Grass therefore does not always have the qualities of absorption required to prevent injury. The ground surface around a trampoline should be tan bark, woodchips or other impact absorbing material.

## Incorrect Mounting/ Dismounting

Examples of these 18 injuries were:

*'Swung off trampoline with rope from tree. Landed on metal cricket stumps.'*

*'Jumping from trampoline. Feet slipped and landed on wrist hitting ground.'*

Climbing, rather than jumping on and off the trampoline would have prevented many of these injuries.

Additional descriptions of interest were:

*'Playing on trampoline. Wind blew child off'* and *'Fell through trampoline into pit. Cyanosed'*.

It should be noted that 12 incidents occurred when the trampoline was not in use. Examples were:

*'Trampoline leaning on side of fence. Brother leaned on it. Fell onto victim' and*

*'Child moving trampoline. Hit victim on head and thigh'.*

## Spinal Injuries

Silver, Silver and Godfrey published an article on 15 spinal injuries leading to paraplegia and quadriplegia caused by trampolines and there have been other references to the possibility of these injuries occurring. (S.A. Health Comm., 1986, Guthrie 1978)

However there were only 16 injuries in the region of the spine recorded in the VISS database. None required admission or affected the spinal cord and 11 of these were neck sprains/strains.

In the U.S.A. most spinal cord injuries had occurred while the trampoliner was attempting a somersault and had landed incorrectly (Guthrie 1978).

The Austin Hospital Spinal Unit which treats all severe spinal injuries in Victoria have treated only 3 cases of severe spinal injury from trampolines over the last 10 years (Spinal Unit Austin Hospital 1992).

## Mini Trampolines

Mini trampolines or trampettes were associated with 14 of the children's injury cases. The injuries caused were relatively minor and demonstrated no particular pattern. Only one injury, a fractured radius/ulna resulted in admission to hospital.

## Standards

There are no standards for trampolines in Australia other than for gymnastic trampolines to satisfy competition criteria. The two manufacturers, Hills Industries Ltd and Action, include multilingual safety pamphlets with the purchase of their trampolines and this practice should be encouraged. Safety pads and a video on safety and progressive skills learning are sold as

optional extras, the latter from Hills Industries Ltd.

## Further Research

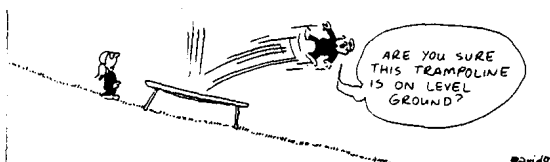
The most frequent description of how the injury occurred appeared to be *'fell off trampoline onto ground'*, often leading to a fractured forearm. Unfortunately an explanation such as this is limited in the extent to which it can provide detail to assist with prevention.

Further research into injury cases such as the above should be taken in the form of follow-up telephone surveys. These would survey the degree of supervision, the size of trampoline used, the type of surrounding ground cover, whether or not it was a pit or above ground model and whether or not spring and frame covers were used.

## Recommendations

Ideally if children want to trampoline they should be sent to a gymnasium or trampoline centre where there is supervision by trained personnel. There the trampoline itself should be watched by 4 spotters (who can be other children) who warn the trampoliner if they are moving off centre and push the trampoliner back if they move towards the edge. A harness should be used for difficult tricks for those who have reached the required skill level. (Australian Family Safety 1987).

However if parents strongly want to have a backyard trampoline it should ideally be placed over a pit deeper than 1 metre, to reduce the height of the fall, and have a fence around it at a distance of at least 2 metres to prevent unsupervised access to the trampoline.



At the very least the following design and behavioural guidelines should be followed:

## Design

1. A safety pad to cover the steel frame and springs. These are available from trampoline outlets and perhaps should be required to be included with the purchase of a trampoline.
2. The surface around the trampoline should be tan bark, woodchip, shredded tyres or spongy grass for a distance of 2 metres and a depth of 300mm and should be clear of obstacles such as bikes, rocks etc.
3. The condition of the trampoline should be regularly checked for tears, rust and detachments.

## Behavioural

4. Only one person jumping on the trampoline at a time.
5. The trampoliner should keep to the centre of the mat and face the end frame.
6. The trampoliner should not attempt tricks beyond their capability. Trampoliners should follow a programme of progressive trampoline learning.
7. Persons should not climb under the trampoline when it is likely to be used.
8. Trampoliners should climb on and off rather than jump on and off.
9. Performers should not be distracted.
10. An adult who has knowledge of trampoline safety should supervise.

If the above had been adhered to, it is estimated that many of the injuries reported here would not have occurred and the severity of even more would have been reduced.

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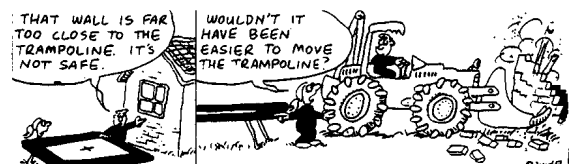
## Additional Information

Additional information on trampolines and/or progressive learning is available from:

1. The Child Safety Centre, Royal Children's Hospital 'Trampolines for Use at Home' (pamphlet) Ph: 345-5085.
2. Adelaide Sports Publishers for 'Backyard Trampolining' (booklet) which outlines both safety rules and a programme of trampolining learning. The cost is \$9.00 and their address 10 Caroon Ave, Para Hill. S.A. 5096.
3. Hills Industries, P .0 Box 378, Melrose Park, S.A. 5039 for 'Trampolining for Beginners' (video) which demonstrates safety and progressive skills learning. The cost is \$22.45.

## Acknowledgements

Adelaide Sports Publishers for permission to reproduce Mark David's cartoons.



# Intentional Injury

Virginia Routley  
Joan Ozanne-Smith

## Introduction

In order to determine the nature and dimensions of the problem of intentional injury as it presents to public hospitals, analyses were undertaken on emergency department presentations at several Melbourne hospitals and the Latrobe Regional Hospital. Additional analyses were undertaken on Victorian hospital admissions for the 5 year period July 1986- June 1991.

## VISS Hospital Presentations

Intentional injury in the form of fights, assaults, child abuse and intended self-harm is a significant cause of emergency department presentations and admissions to hospitals participating in the Victorian Injury Surveillance System (VISS) for adults and a minor cause for children.

This section investigates the data relating to violence on the VISS database in regard to age, sex, severity, location, cause, nature of injury and body part injured.

Intentional injury was extracted from the VISS database where the context was 'fight, riot or quarrel' or 'intended self-harm' or the victim group was 'suicide' or 'intended violence'. There was overlap between these criteria but the categories which follow have been so defined that they are mutually exclusive.

## Children

There were 546 cases of intentional injury to children aged under 15 years who presented to the emergency departments of the Royal Children's Hospital (RCH), Western Hospital (WH) and Preston & Northcote Community Hospital (PANCH) over the 3 year period 1989-91. Intentional injury represented 1.3 % of all presentations in this category.

Three quarters of all child intentional injury cases were aged 10 to 14 years,

60% were male and 35% of the total were admitted to hospital.

Intentional injury for children broadly fell into 4 main categories. These were fight or quarrels between children, intended self-harm, child abuse and child assaults. The selection criteria for each of these categories using the Injury Surveillance Intelligence System (ISIS) coding system are outlined in Appendix 1a

## 1. Fight or quarrel between children (n=222)

Almost forty percent of intentional injury cases were involved in a fight or quarrel with other children - usually siblings at home or other students at school and 80% were boys. The predominance in the older age group is shown below in Figure 1.

The school playground was the most common location for such injuries to occur (40% of injury cases in this category). It was followed by own home (22%), footpaths (11%), residential institutions (7%), other home (4%) and school, not playground (4%).

It is interesting to note that 41% of injuries were to the head including the face and 31% to the hand and wrist including metacarpal fractures, presumably to the aggressor (11% of all injuries in this category).

Fighting appears to be predominantly in the form of punches to the head and face.

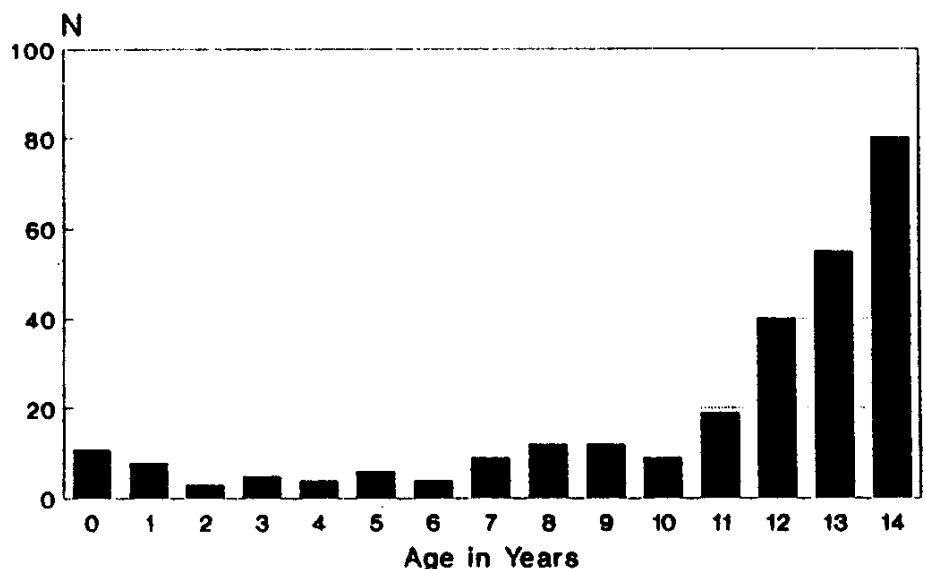
## School Playground Injuries

Almost one quarter of the 80 school playground fight or quarrel injury cases occurred in March and the proportion of males was higher in the schoolyard group than for fights or quarrels generally (85% v 77%). Injuries were more likely to be to the head and hands than non-school playground injuries.

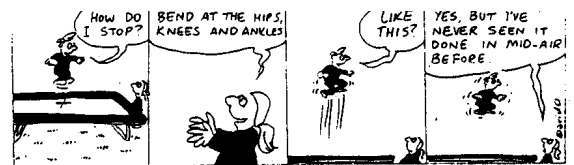
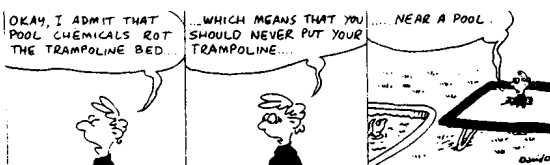
Fight or Quarrel

Figure 1

## Age pattern



VISS RCH, WH, PANCH < 15 yrs



A typical description was 'At school. Victim was punched in the face by a "friend"'.  
 More extensive teacher supervision in the playground or increased availability of other activities could be useful in reducing this problem.

In addition to the above there were 11 cases where the victim injured themselves in anger, following a fight or quarrel eg 'Fighting at school. Lost temper; Put fist through window. Cut by pieces of glass'.

Four children attempted suicide after a fight or quarrel and have therefore also been included in the self-harm category.

Four children attempted suicide after a fight or quarrel and have therefore also been included in the self-harm category.

## 2. Intended Self-Harm (n=135)

As can be seen in Figure 2 almost all of these children were in the 12-14 year age group and three quarters were female. This sex difference contrasts with that for deaths which are predominantly male ie young male self-harm more frequently results in death. Eighty percent were admitted, an exceptionally high admission rate.

### Drugs and Medications

Drugs and Medications	N	%
Sedatives, tranquillisers, psychotropics etc	39	25
Paracetamol & other non-aspirin analgesics	38	25
Alcohol	12	7
Aspirin or aspirin compounds	11	7
Antihistamines	5	3
Tablet or capsule drug nec	25	17
Other drugs or medications	26	16

### Total

156 100

\* It should be noted that up to 2 medications can be recorded per person.

For the 101 cases where the location was known, 67% of incidents were incurred in the victim's own home, 11% in other homes, 8% in residential institutions and 7% in schools.

Poisoning by chemical ingestion was the most common mechanism of injury (87% of intended self-harm cases). The pattern of drugs and medications ingested is shown in Table 1.

Poisoning was attributed to 78 different substances and brand names. The sedatives etc group were most frequently benzodiazepines (n=25) and tricyclic antidepressants (n=7). The most common analgesic was paracetamol (n=34).

One third of the 117 children who were poisoned by ingesting drugs ingested more than one drug at the time. These took the form of tablets and alcohol or whatever appeared to be available.

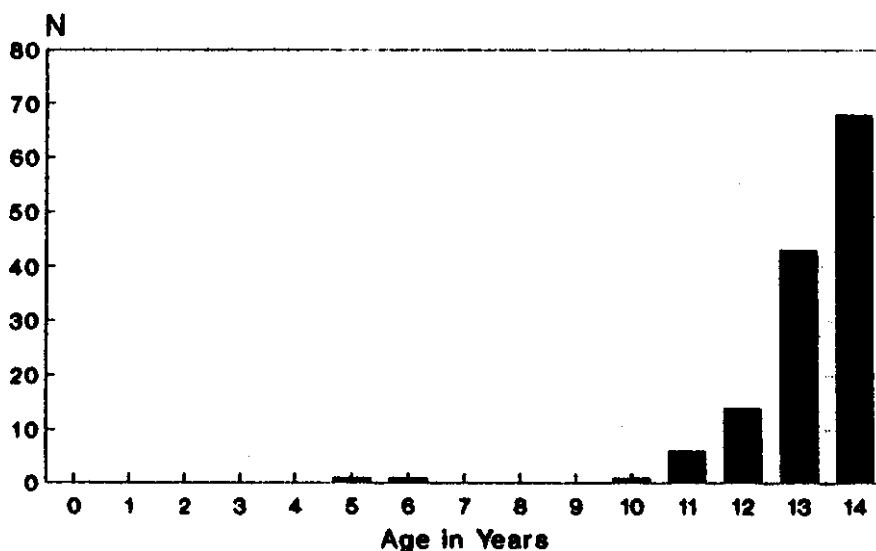
Reasons given for intended self-harm varied widely but broadly fell into groups of:

- Children who had a previous history of mental illness. A typical example was 'In bed. Heard voices telling her to kill herself. Took 24 tablets, 500 mg paracetamol.'
- Children who were experiencing typical teenage problems. These were most commonly associated with the family, school, boyfriends or personal inadequacy. A typical example was 'Depressed. Family problems. Child ingested 18 x 100mg epilepsy tablets.' The majority fell into this category.
- Children who took drugs for what they perceived as pleasure. A typical example was 'With school friends. Ingested unknown quantities of tricyclic anti-depressant tablets' or 'Buying a pizza. Ingested 8 antihistamine tablets'.

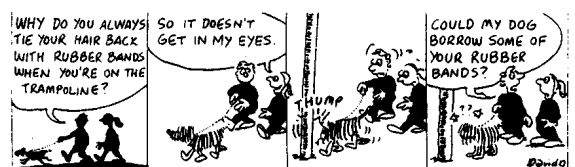
## Intended Self-harm

Figure 2

### Age Pattern for Children



VISS < 15 yrs RCH, WH, PANCH, 1989-91



### 3. Child Abuse (n=109)

Child abuse represented 0.3% of all child injury cases in this 3 year sample. Child sexual abuse cases do not generally enter the hospital via the Emergency Department system, and are not part of the VISS data collection. Child abuse accounted for 4% of child injury deaths from July 1989 to June 1990 in the Victorian Coroner's data. (State Coroner's Office, 89/90)

Children aged under 2 years were grossly over-represented (38% of injury cases) as were 14 year olds (15%). There were slightly more boys than girls. (Figure 3)

Sixty percent of the 87 incidents occurred where the location was known occurred in the child's own home other less common locations were other homes (10%), footpaths (6%) and schools (5%). There were 4 cases of sexual assault in this emergency department data collection.

Injuries were predominantly bruising (55%), cuts and lacerations (9%), burns

(7%), fractures (6%) and concussion (3%).

Body parts injured were predominantly the head and face (51% of injuries) and the trunk (22%). The majority of children had multiple injuries (an average of 1.7 injuries per child).

One quarter had been noted previously by the treating doctors as being 'children at risk'.

### Group Comparison

A comparison of the peak age groups is revealed in Table 2.

### 4. Child Assaults (n=74)

Child assaults comprised largely attacks by individuals and gangs. They usually took place in the school ground (30% of known locations) or on a footpath (11%) or public road (8%). Typical examples were:

*'Watching football. Four boys approached him and started punching and kicking him',*

*'Leaving school was assaulted by older boy who squeezed his rib cage, and*

*'Using toilet facilities. Group of girls followed. Hit in face. Bunt hair'.*

### Adults

(15 years and over)

Intentional injury represented a much greater problem to adults than children. During the 12 month period 1/7/91 to 30/6/92, 1,652 cases of intentional injury to adults presented to the Emergency Departments of the Latrobe Regional Hospital and the Western Hospital. They represented 13% of all adult injury presentations.

The frequency of presentations declined with age from a peak in the 20-24 age group (25% of injury cases). Similarly to the children's collection, sixty-eight percent were male and 30% were admitted to hospital.

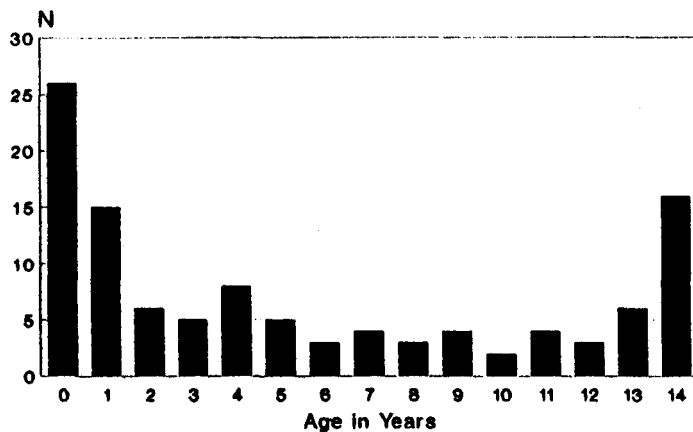
The types of violence have been grouped into fights or quarrels, intended self-harm and assaults. For all these types of violence there was a summer high and mid-year low. (Figure 4.)

Selection criteria are outlined in Appendix 1b.

### Child Abuse

Figure 3

#### Age pattern



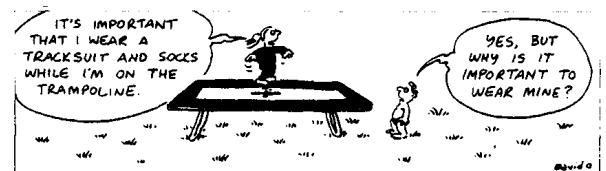
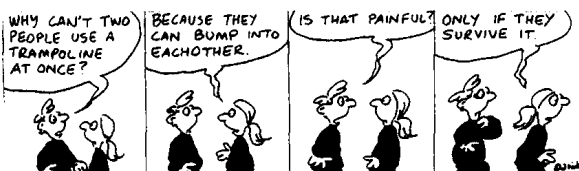
VISS < 15 yrs RCH, WH, PANCH, 89-91

### Child Abuse: Comparison of Age Groups

Table 2

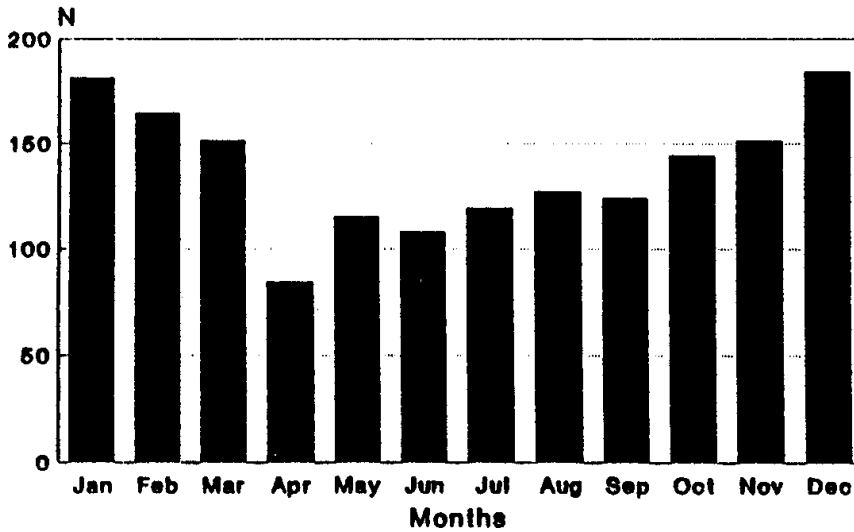
Variables	Percentage	
	Under 2 Years (n=42)	13 & 14 Years (n=21)
Own Home	53	36
Head Injuries	66	40
Bruising	57	49
Fractures	10	0
Inflammation & swelling	0	17
Admitted to hospital	68	13

Although for both groups the victim was most likely to have been hit by the aggressor the older group was more likely than the younger to have been injured with the aid of a belt or chair or to have hit against a wall.





Monthly Pattern



VISS >= 15 yrs LRH WH 7/91 TO 6/92

1. Fight or Quarrel (n= 981)

Three quarters were male and 19% were admitted to hospital. As occurred for intended violence overall one quarter were in the 20-24 year age group.

The victim's own home represented 33% of the 722 known locations, 24% were in areas of commerce eg pubs, other homes (13%), footpaths (12%) and roadways (6%).

Over half of the injuries were to the head (cf 41% for children) and 17% were to the hand and wrist (cf 31% for children). Possibly an adult aggressor is less likely to present at an emergency department with his/her injured hand than is a child.

It should be noted that 39 cases, mostly poisonings, were deliberate self-harm or suicide attempts after a fight, or quarrel and have therefore also been included in both categories, eg 'Argument with husband. Ingested bottle of eye medication, alcohol and slashed wrists.'

2. Intended self-harm (n=495)

Over half were in the 15 to 29 year age group and there was a dramatic drop in presentations after 50 years of age. Slightly over half were female compared with only 20% in the Victorian Coronial Services data and 64% were admitted to hospital.

This compares with Victorian Coronial Services data where half of self-inflicted deaths occurred in the 20-40 year age group and such deaths dropped steadily from a peak in the 20-29 year age group. It appears that men, especially the elderly have a relatively high 'success rate' and women aged 15 to 19 years are relatively 'unsuccessful'. (Henderson, 1992)

It is interesting to note that in the VISS 25 to 35 year age group males outnumbered females. The men in this age group used a greater variety of and more violent methods than did the women who most often used drugs and medications.

Of the 338 cases where the location was known 78% of incidents were incurred in the victim's own home, 6% in areas used by transport and 5% in other home.

Three quarters were coded as suicide attempts.

Eighty-three percent of intended self-harm cases were poisonings by ingestion and 7% lacerations, largely to the forearm and wrist. Poisonings could be attributed to barbiturates, sedatives, tranquillisers, psycho tropics etc (46% of drugs and medications), alcohol (16%) and paracetamol and other analgesics (9%). Razors and knives most often caused the cuts and lacerations. Other less common methods were hanging, inhalation of exhaust fumes and natural gas, jumping from windows and trains, self-immolation, gunshot and swallowing a glass of drawing pins.

In contrast, hanging accounted for 26% of 'successful' suicides, poisoning by chemical ingestion ( 19% ), shooting (18%) and car gassing (18%). (Henderson, 1992)

Only 4% of the 324 more severe intentional injury cases ie admissions were caused by heroin, cocaine or amphetamines. Reasons given for intentional injury ranged from the more common marital to other relationship and work related problems.

3. Assaults (n=215)

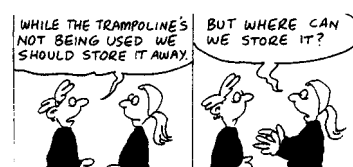
The age pattern was similar to that for intended violence for adults overall, 10% were admitted and 81% were male.

The known locations were principally private enterprise areas (25%) eg pubs, own homes (13%), footpaths (16%), public roads (15%) and other homes (6%).

The activities in which they were engaged were leisure or recreation, excluding sport (28%), working (20%), pedestrian (16%), eating or drinking (8%), sleeping or resting (7%) and riding or driving in a passenger car (6%).

Injuries were principally to soft tissues of the face and head (65% of injuries) and upper extremities (20%).

Implements (other than persons) were not used in the majority of cases. However knives were responsible for 6 injury cases whereas glass from bottles or drinking glasses caused 9.



## Domestic Injuries

Sixty percent of the injury cases incurred in the victim's own home as a result of fights, quarrels or assaults were male. There was a slight tendency for women to have a greater proportion of injuries to the head and men to the hand. It seems that either female victims misrepresent the cause of injuries or they do not present to hospital with their injuries. Additional investigation will need to be undertaken into the inconsistency of VISS data with domestic violence as portrayed by the media and wider society.

## Victorian Public Hospital Admissions

The Victorian five year frequencies and rates for intentional injuries (1986 1991) and the proportion of injuries that were intentional is shown by age group in Table 3 (Langlois et al, 1992). The additional analyses presented below are also based on datasets prepared by Langlois.

### Self inflicted injury

Of the 11,943 cases of self inflicted injury (52% of all intentional injury cases) admitted to hospital in Victoria over the five year period, 60% were female. The major mechanism was poisoning (87% of self inflicted injury cases) and 7% were cutting or piercing instruments. The highest rates were in the 15-19 years age group, and the highest age rate by sex was in 15-19 year old females. Firearms represented 1% of self inflicted injury resulting in hospital admission. However, 18% of deaths by suicide in Victoria were reported to be caused by firearms (Henderson 1992).

### Intentional injury - inflicted by others

The great majority of the 10,817 intentional injuries inflicted by others (48% of intentional injury cases), which resulted in hospital admission over the five year period were due to unarmed fight/brawl (73%), and another 10%

resulted from cutting or stabbing. Less than 1% were due to firearms.

Child battering/maltreatment represented 3% of total intentional injuries inflicted by others, with 89% of these occurring within the first 5 years of life.

### Comparison of presentations to the VISS sample data of emergency department presentations with statewide hospital admissions (VHA) for intentional injuries.

There were similarities between the VHA and VISS data collections in regard to the age patterns and the predominance of female poisoning as a proportion of self-harm cases.

Differences emerged in regard to the age of child abuse and to self-harm as a proportion of all intentional injury.

Child abuse featured significantly in the VISS data for 14 year olds but not in Victorian Hospital Admission data. An explanation could be the much higher admission rate for the under two year olds than the 14 year age group, or the reliability of reporting may not be as high from this source.

The higher proportion of self-harm among intentional injuries for VHA than VISS presentations (52% VHA cf 25% children, 30% adults VISS) could be explained by the relatively high admission rate for self-harm injuries.

Table 3

Intentional injury rate, frequency and as a proportion of total injury, by age group, Victorian Public Hospital Admissions 1986 - 1991

Age group	Intentional injury	*All Injury	% intentional 100,000 pop	Rate(years)
< 1	188	3,356	5.6	62.3
1-4	200	17,483	1.1	16.4
5-9	69	17,945	0.4	4.6
10-14	541	18,518	2.9	31.6
15-19	3,661	27,873	13.1	199.9
20-24	4,538	28,388	16.0	264.0
25-29	3,642	22,608	16.1	211.6
30-34	2,726	18,249	14.9	165.7
35-44	3,723	28,434	13.1	126.5
45-54	1,781	21,486	8.3	86.3
55-64	801	23,609	3.4	41.9
65-74	502	28,251	1.8	38.2
75-84	267	28,344	0.9	39.0
85+	121	17,357	0.7	67.1
<b>TOTAL</b>	<b>22,760</b>	<b>301,901</b>	<b>7.5</b>	<b>109.6</b>

\* Includes both self-inflicted injury and injury inflicted by others.



## Conclusion

This article describes the intentional injury problem as it presents to public hospitals.

Clearly violence is a deep-seated social problem, the reasons for which are complex and for which the solutions are multi-disciplinary.

Existing health sector data sources can make a substantial contribution to the surveillance of intentional injury for those injuries of sufficient severity to result in hospital presentation. There is potential for some under-estimation of the proportion of injuries presenting which are intentional, since they may not be reported as such by the injured person.

The VISS data collection for adult injuries will be enhanced by the availability of a full year of data from the Royal Melbourne Hospital and the Preston and Northcote Community Hospital by about March 1993. Since the VISS data contains one line narratives for each unit record, considerably more detailed data is available for further analysis.

## References

Henderson, M. 1992 Victorian Injury Deaths and the Potential for Prevention, *Hazard* ed. 11, Victorian Injury Surveillance System

Langlois, I. Hawkins, C. Penny, M. Brumen, I. Saldana, R. 1992 *Non-Fatal Injuries in Victoria: An Overview*, Monash University Accident Research Centre (in preparation).

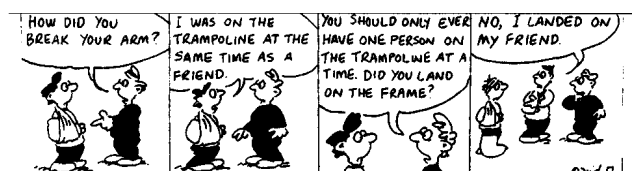
State Coroner's Office, 1989/1990 *Victoria Unnatural Deaths*

## Appendix 1a – Children

'Fight or quarrel between children' includes those cases where 'child other than victim' was a factor and either the context was 'fight, riot or quarrel' or the injury description contained the text 'fight, argue (argument etc) or dispute'. Intended self-harm includes those cases where the victim group was suicide attempt or the context intended self-harm. Child abuse cases were included where the victim group was 'intended violence' and 'adult' a factor. Child assaults were selected where the victim group was 'intended violence' and 'child other than the victim' a factor - excluded from this group the 'fight or quarrel between children' category.

## Appendix 1b – Adults

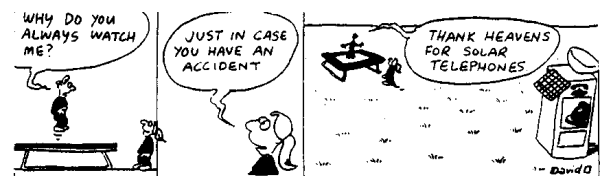
'Fight or quarrel' cases were those where the context was 'fight, riot or quarrel' or where the text 'fight, argue (argument etc) or dispute' was included in the injury description. 'Intended self-harm, includes those cases where the victim group was 'suicide attempt' or the context 'intended self-harm'. 'Assaults' includes cases where the victim group was 'intended violence' but excludes the category of 'fight or quarrel' and the context 'self-harm'.



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\* Special edition



# General Acknowledgements

## Participating Hospitals

Royal Children's Hospital

Western Hospital  
(Footscray and Sunshine)

Preston and Northcote  
Community Hospital

Latrobe Regional Hospital  
(Traralgon and Moe)

Royal Melbourne Hospital

The contributions to the collection of VISS data by the directors 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.

# 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.

## VISS is located at:

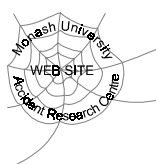
Building 70  
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Wellington Road  
Clayton, Victoria, 3168

### Phone:

Reception	(03) 9905 1808
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Director	(03) 9905 1810
Fax	(03) 9905 1809

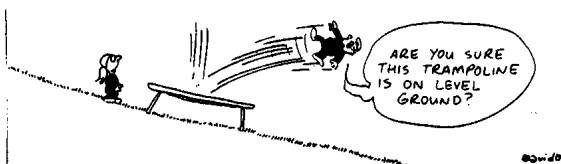
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Recent issues of *Hazard*, along with other information and publications of the Monash University Accident Research Centre, can be found on our internet home page:

<http://www.general.monash.edu.au/muarc>



**National Better Health Program**  
VISS is funded by the National Better Health Program

*VISS is a project of the Monash University Accident Research Centre  
in association with the Royal Children's Hospital*



*Hazard was produced by the Victorian Injury Surveillance System  
with the artistic and graphics assistance of Education Resource Centre, Royal Children's Hospital*

*This .pdf issue reconstructed by Glenda Cairns*

