

V.I.S.S.

Hazard
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Victorian Injury
Surveillance System
Monash University
Accident Research Centre



VicHealth

This edition of Hazard examines the new VISS database, now 18 months into the collection. Examples are given of the usefulness of the new data and current VISS functions and developments in terms of the newly announced Vic Health funding to the year 2000 are outlined. Also in this edition drowning, as presented in previous editions of Hazard, is updated and injuries associated with baseball are investigated.

Injury Surveillance Developments - Towards 2000

Summary

The new VISS database is part of a comprehensive electronic emergency department management system. It is at the forefront of injury surveillance developments both nationally and internationally. The data in this report covers 20 hospitals over the 1996 period although 25 hospitals will eventually be covered. The new data system has both input functions, particularly relating to hospital liaison and quality control, and output functions, concerned with information requests and production of Hazard. Additionally VISS has responsibility for progressing the translation of injury surveillance and research into prevention and some additional objectives for 1997. Domestic violence and farm injury from

the new VISS database have been highlighted.

VISS prevention objectives complement the Charter definition of the International Federation for Emergency Medicine: "Emergency medicine is a field of practice based on the knowledge and skills required for the prevention, diagnosis and management of acute and urgent aspects of illness and injury affecting patients of all age groups with a full spectrum of episodic undifferentiated physical and behavioural disorders..."

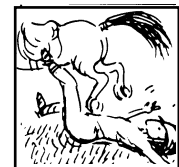
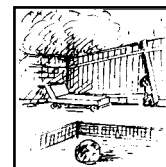
Drowning and near drowning

Children aged under 5 years were the most highly represented group for drownings, accounting for 22% of

deaths and 45% of near-drownings. These were particularly common in home pools and spas. Baths and ponds were other frequent locations. From the 1st July 1997 all existing residential swimming pools and spas will be required to have safety barriers. Natural features such as lakes, rivers, dams, the beach and ocean were a more common location for drowning in older age groups.

Baseball injuries

Being hit by the ball was the most common cause of injury for both adults and children, being hit by the bat for children only and sliding to base for adults only. Injuries were most commonly to the head and face for children and to the lower limbs for adults.



Injury Surveillance Developments - Towards 2000

Joan Ozanne-Smith

Introduction

Injury surveillance has been an important tool for injury epidemiology and prevention for some years in a few leading centres. Its use has become more widespread in recent years with injury surveillance systems reported by many developed countries in 1996, at the Third International Conference on Injury Prevention and Control. The Victorian Injury Surveillance System is a relatively early system, now in its tenth year of operation.

Second generation injury surveillance

Injury surveillance is entering a new era with refinements to many of the leading systems to enhance their sampling frames to ensure representativeness of their data (NEISS, LIS). Improved operating systems are also being implemented to take advantage of current technology.

Furthermore, substantial work has been undertaken by a WHO international working group to explore the implementation of an internationally agreed injury surveillance coding system. It is anticipated that international trials will be conducted to determine the potential to collect or to map data to the agreed dataset. This would allow international comparisons and pooling of data, where appropriate. It would also provide the basis for studies of world best practice as measured by low specific injury rates.

Direct computer entry of injury surveillance data at hospital emergency departments is another enhancement under investigation.

In Australia the National Injury Surveillance Unit has received funding from the Department of Health & Family Services to investigate methods of sampling and data collection for a nationally representative emergency department surveillance system, in consultation with other states. Queensland Injury Surveillance and Prevention Project is in the process of expanding their data collection to regional and remote hospitals and other developments are occurring in NSW and W.A.

VISS developments

The goal of VISS is to conduct injury surveillance for the purpose of injury prevention.

The data collection system

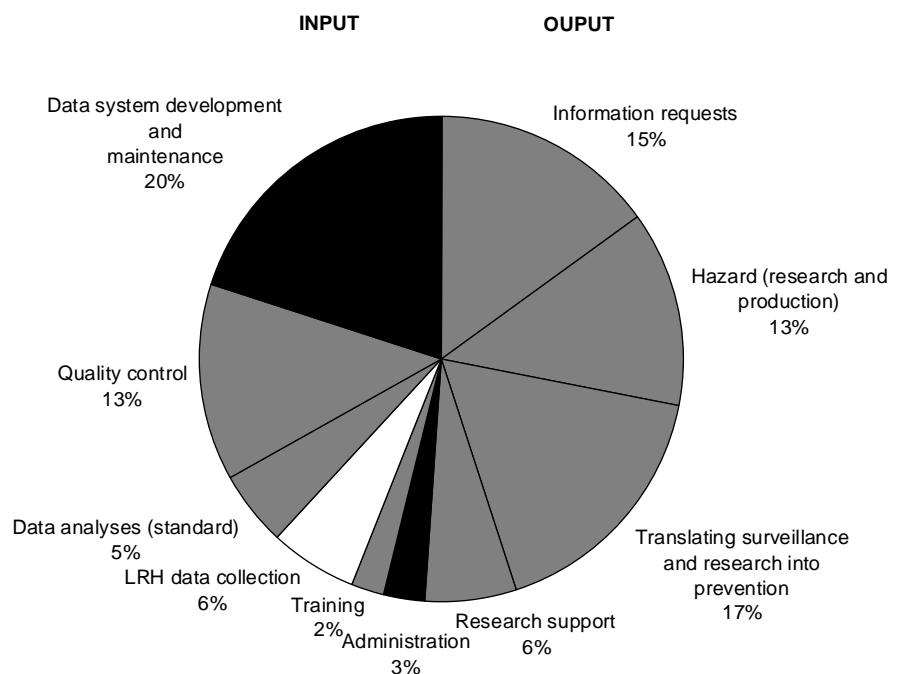
The new VISS data collection system consists of:

- electronic emergency department data collection in 25 Victorian public hospitals (listed on page 15). This provides approximately 85% coverage of statewide trauma cases.
- one full year of data is available for 20 hospitals to date and 2 further hospitals have entered the system more recently.
- the timely supply of data, within one month of real time for most hospitals.
- more detailed information than E-coded hospital admission databases.
- a more complete collection of road trauma and occupational injury cases than on police reported and occupational databases.

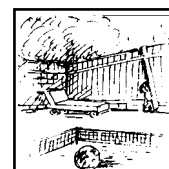
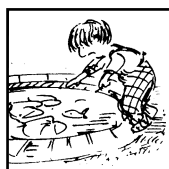
Injury data collection is part of a comprehensive electronic emergency department patient management system. In March 1997 the database contains 180,033 cases of injury.

VISS Input and Output Functions 1996

Figure 1



Source: Victorian Injury Surveillance System, 1997



The original VISS database 1988 - 1996 remains a rich source of detailed injury data on almost 170,000 cases who presented to a cluster of hospital emergency departments during that period.

VISS functions

Introduction

During 1996 VISS activities were about equally divided into input and output functions (figure 1).

Input

The database

Based in an Access operating system, the VISS database is established in a PC local area network environment. The system incorporates a standard reporting system, a query function and the capacity to export files to SPSS for detailed analysis. The database is continually updated and data merging functions include edit checks for format and range.

The datasystem will continue to undergo a process of development and refinement based on the experience of those collecting and using the data.

A considerable portion of the input function is focused on data quality control. The emphasis is expected to further shift to output as data quality issues are addressed and controlled.

Hospital liaison and quality control

Data quality is a major focus for a new datasystem. VISS has put quality control measures in place including the following:

- hospital liaison visits to discuss with the Emergency Department and Information Technology staff the utility of data, its in-hospital and local use, and validation checks on case capture rates and data

accuracy from alternate hospital records.

- regular feed-back of hospital injury data and data quality reports (on missing and invalid codes, etc.) to all participating hospitals.
- on-going data quality monitoring by hospital and by total dataset to ensure improvements in data quality and maintenance of standards.
- consultation, where appropriate, to assist hospitals e.g. with staff training, to enhance data quality, particularly for case narrative data.
- edit checks in the database software for format and range of data values.

Output

Information requests

While the datasystem requires data from 2 further hospitals before it can provide comprehensive epidemiological reports covering 25 major public hospital emergency departments throughout Victoria. It is capable of providing case series and regional data on many injury issues.

VISS undertakes analyses in response to information requests, particularly from the education, government,

research and industry sectors and the media (figure 2).

In order to demonstrate some of the capabilities of the new system, two examples of analyses undertaken in response to recent information requests are presented.

1) Domestic (partner inflicted) violence

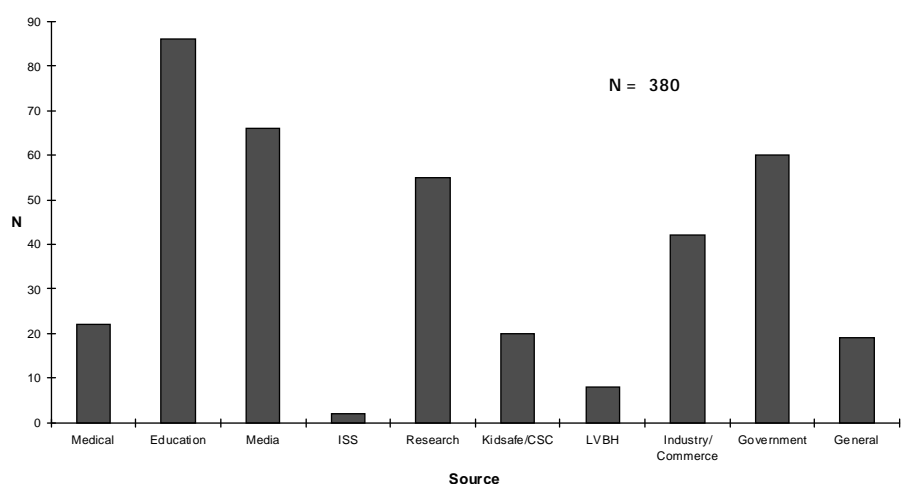
The new VISS database facilitates the identification of domestic violence cases due to the introduction of the human intent code 'maltreatment, assault by domestic partner'. This newly available specific code requires validation against other sources in the future.

Of 164,986 cases of injury on the database for which intent was known, 397 cases of injury from partner inflicted domestic violence were identified by the collecting hospitals. This represents 0.2% of all injury cases of known intent and 7.7% of all assault cases (excluding legal intervention).

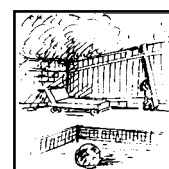
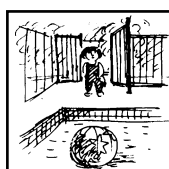
Of the 372 domestic violence cases, presenting for the first time with this injury cause, 283 (76.1%) were female and 89 (23.9%) were male (table 1).

VISS information request 1996 by client

Figure 2



Source: Victorian Injury Surveillance System, 1997



Domestic (partner inflicted) violence by age, sex and severity: new VISS database, 1996

Table 1

Age Group (years)	Emergency Presentations*							
	Admitted or Transferred				Non Admissions			
	Male		Female		Male		Female	
	N	%	N	%	N	%	N	%
15-19	-	0	0	0	5	6.6	19	7.5
20-29	2	15.4	14	45.2	40	52.6	109	43.3
30-39	6	46.1	9	29.0	17	22.4	85	33.7
40-49	4	30.8	3	9.7	7	9.2	22	8.7
50-59	1	7.7	4	12.9	4	5.3	11	4.4
60-69	-	0	1	3.2	3	3.9	4	1.6
70-79	-	0	0	0	0	0	2	0.8
	13	100	31	100	76	100	252	100

Source: new VISS injury database, January to December 1996.

* First presentation for this injury.

The peak age group for all categories, except male admissions, was 20-29 years. The admission rate was 14.6% for males compared with 10.9% for females suggesting that a greater proportion of males receive more severe injuries. These results confirm an earlier study with a more limited database (Sherrard et al, 1994).

2) Farm injury

Data from the new database will be particularly useful for providing detailed data on farm related hospital admissions and emergency department presentations. Farm related injury is not identified in the Victorian Inpatient Minimum Dataset (VIMD). The Victorian Emergency Minimum Dataset (VEMD), of which VISS is a subset, will cover all major farming areas in Victoria compared with the earlier VISS database which was confined to Melbourne metropolitan hospitals other than the Latrobe Regional Hospital.

There were 1337 cases of farm injury recorded on the database during 1996, representing 1% of all cases recorded for that year.

Injuries peaked in the 20-24 year old age group and 73% of victims were male. Almost a quarter required hospital admission and the most common causes of injury were falls, being struck by or colliding with an object or person, cutting or piercing injuries, horse related, motorcycle riders and other animal related (table 2).

Examples of description of injury events associated with these cases include:

- Motorbike hit embankment, thrown off and hit a tree.
- Head injury, fell under tractor, tractor ran over right side of body.
- Hot water in gum boot while working in the dairy.

- Fell down a rabbit hole while fencing.
- Fall from horse hitting head, not wearing a helmet.
- Kicked by a cow during milking.

Further data from the new database is included in the articles which follow on baseball and drowning/near drowning.

Hazard

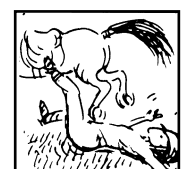
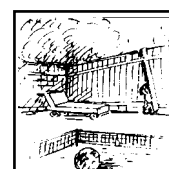
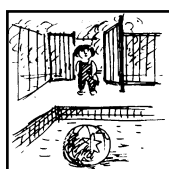
The quarterly publication of Hazard provides a vehicle for the widespread and timely dissemination of data and injury prevention information on important and emerging injury issues. Now in its 30th edition, Hazard has a circulation of 2500, including an international mailing list of 117, in 20 countries and, in addition to a large Victorian reach, it circulates to 190 interstate professionals and organisations.

Translating injury surveillance and research into prevention

In order to prevent injuries, it is necessary to do more than analyse data and disseminate information. In the absence of infrastructure in many potential areas of injury prevention, a major function of VISS is to actively pursue the implementation of its findings to the point where responsibility is accepted by an appropriate authority.

This process involves advocacy to government and industry, network and coalition building, the development of safety products, additional policy research and many other activities.

Current VISS focuses for translating injury surveillance and research into prevention include:



**Farm Injury by cause of injury,
new VISS database 1996**

Table 2

External Cause of Injury	N =	% of total
Motor vehicle driver	10	0.7
Motor vehicle passenger	11	0.9
Motorcycle driver	95	7.1
Motorcycle passenger	12	0.9
Pedal cyclist rider or passenger	11	0.8
Pedestrian	4	0.3
Horse related	137	10.2
Other transport	15	1.1
Fall up to 1 metre	207	15.5
Fall over 1 metre	92	6.9
Fire, flame, smoke	3	0.2
Scalds	6	0.4
Contact burns (hot object)	15	1.1
Poisoning - medication	1	0.1
Poisoning - other or unspecified	15	1.1
Firearm	4	0.3
Cutting, piercing object	180	13.5
Dog related	8	0.6
Other animal related (excludes dog or horse)	103	7.7
Struck by or collision with object or person	232	17.4
Machinery	63	4.7
Electricity	5	0.4
Hot conditions	1	0.1
Other causes	67	5.0
Unspecified caused	39	2.9
Invalid code	1	0.1
Total	1337	100

Source: new VISS injury database, January to December 1996

1997 objectives

While VISS will continue the functions described above, in 1997 it will address some further specific objectives including:

- data linkage between emergency department and hospital admission databases to provide information for epidemiological and research purposes.
- the development of a sampling frame of hospitals which will both collect in-depth injury data and agree to patient follow-up for research and prevention purposes.
- assistance with the development of national coronial and sports injury surveillance datatypes.

References

Sherrard, J, Ozanne-Smith, J, Brumen, I, Routley, V, & Williams, F; *Domestic Violence: Patterns and Indicators*, MUARC Report No. 63, November 1994.

- the development of a marketable spill resistant mug to prevent child scalds.
- the prevention of access to the means of suicide, particularly car exhaust gassings.
- enhancement and mandation of nursery furniture standards and the development of effective standards where none exist (high chairs, baby walkers).

VISS review and funding

Following an external review of VISS in February 1997, the Victorian Health Promotion Foundation has provided continuation funding to December 2000. This funding, which is gratefully acknowledged, provides the opportunity for longer term planning and development than has been previously been possible.

The development of a supermarket trolley standard.



Update on unintentional drowning

Karen Ashby

Introduction

Approximately 70 Victorians drown each year and another 107 are hospitalised in near-drowning incidents. Drowning is the most common cause of death from injury for Australian children aged less than 5 years (Kidsafe, 1995).

An overview is presented of unintentional drowning for Victoria examining deaths and hospital admissions databases. Insufficient detail is provided in the hospital admission database for a comprehensive description of near drownings due to missing data and non-specific locations. Hence these data are supplemented by information on admitted cases from emergency department presentations. Drowning and near drowning in home pools will be considered in detail in the context of legislative requirements from July 1997.

Deaths (Victorian Coroner's Facilitation System)

Five years of Coronial data (July 1989 to June 1994) of drowning (n = 350 cases), indicated that 30% of unintentional deaths from drowning were to children under 15 years. Children aged 0-4 were the most highly represented group, accounting for 22% of the total number of deaths.

Almost a third of all-age deaths from drowning occurred in lakes, rivers or dams, 28% at home, 17% in the ocean and 10% at the beach (Table 1). Fifteen percent of deaths from drowning were the result of boating incidents.

Of the 98 deaths at residential locations, half were in home pools/spas, 29% in the bath, 7% in dams and 1% in fishponds.

There were an additional 100 cases of intentional drowning (98% suicides). They have, however, been excluded from this analysis.

Hospital Admissions

Hospital admissions data, supplied by the Department of Human Services, was collected from Victorian public

hospitals, for the period July 1987-June 1995. After deaths and intentional self harm were excluded there was an annual average of 101 near-drownings. Forty-one percent of near drownings occurred in a swimming pool, (at least 25% at residential locations). Evidence from admitted cases from the VISS database suggests that a proportion of the pool related near drownings in the 'not specified' category probably occurred at residential locations. Sixty-four percent of near drownings at home involved

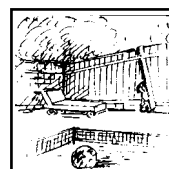
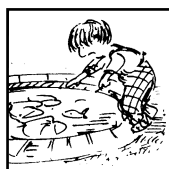
Unintentional drowning and near-drowning by location - all ages

Table 1

Location	Unnatural Deaths N = 350 %	Hospital Admissions (Near drownings) N = 804* %
Pool/spa	16	41
- home	14	16
- public/ns	2	25
Bath	8	11
Other home (excl. pool and bath)	6	2
- dams	2	
- pond	1	
Lake, river, dam (not home)	32	N/A
Ocean	17	N/A
Beach	10	N/A
Farm	2	2
Place for recreation not elsewhere specified	N/A	6
Other	9	16
Not specified	-	10
Missing	-	12
TOTAL	100	100

Source: Unnatural deaths - Victorian Coroner's Facilitation System, July 1989 to June 1994
Hospital admissions - Victorian Inpatient Minimum Dataset, July 1987 to June 1995

* There were a further 51 cases of drowning recorded in the VIMD for the same period, who died post admission to hospital.



swimming pools, another 28% baths and the remaining 9% spas, ponds and other specified locations (table 1). Table 2 shows the breakdown of location by age group for hospital admissions, a second table, based on coronial data is also included for comparison.

Near-drownings were most common in the 0-4 age group (45% of near drownings). The annual average for the 1-4 age group was 46 (a rate of 15/100,000).

More details on circumstances of near drowning are available for admitted cases who presented to selected hospital emergency departments.

An examination undertaken of 118 near drowning presentations, to selected emergency departments, from 1988 to 1996, who required admission, indicated that 11% of near drowning cases related to ponds. All victims were less than 3 years of age and 62% of cases occurred at the child's own home. Typical scenarios included "Child not seen for 10 minutes, found face down in 18" deep fish pond".

Emergency Department Presentations

There were 30 cases of near drowning recorded by the VISS databases which did not require hospital admission. Forty percent required follow up at a general practitioner and 10% a review in the emergency department. Seventy-seven percent were children, 60% were under 5 years. There is some bias towards children in this database. A similar proportion to admissions (43% vs 44%) involved swimming pools which again were the most common site for near-drowning.

Comparisons of fatal / non-fatal submersions

From the above datasets, the ratio of deaths to hospital admissions (excluding deaths) is 1:2.3 and of emergency department presentations (excluding admissions) to admissions 1:3.9.

Lack of sufficient detail and missing data for the place of occurrence in the hospital admission data limits the comparison which can be made. It appears, however, that survival is most

likely following submersion in public pools and also more common for home pools than for other locations. This, no doubt, relates to time of rescue and treatment.

Supplementary codes are required in hospital coding systems to improve data quality. Linking of coronial, hospital admission and emergency department data would assist with the more comprehensive description and monitoring of drowning/near drowning in the future.

Drowning and near drowning - age by location **Table 2**

VIMD (excl deaths)	0-4 n	5-14 n	15-24 n	25-39 n	40-59 n	60+ n	TOTAL n
Pool/spa home	114	10	1	1	0	1	127
Pool/spa not specified	127	38	12	11	8	7	203
Bath	71	9	3	1	0	2	86
Other home	14	0	0	1	1	2	18
Farm	11	1	0	1	1	1	15
Place for recreation not elsewhere specified	2	16	12	13	3	4	50
Other	13	20	32	35	22	6	128
Not specified	9	19	17	15	12	7	79
Missing	4	17	36	19	14	8	98
TOTAL	365	130	113	97	61	38	804

Source: Hospital admissions - Victorian Inpatient Minimum Dataset, July 1987 to June 1995

Coroner's Database (deaths)	0-4 n	5-14 n	15-24 n	25-39 n	40-59 n	60+ n	TOTAL n
Home pool/spa	39	2	2	1	1	5	50
Public pool/spa	0	3	0	3	1	1	8
Home other	6	2	0	3	0	1	12
Home bath	10	2	0	6	5	5	28
Home dams	4	1	1	0	0	1	7
Home pond	1	0	0	0	0	0	1
Lake, river, dam (not home)	6	10	23	20	27	26	112
Ocean	1	2	9	16	19	11	58
Beach	0	1	7	7	10	11	36
Farm	3	1	1	0	0	1	6
Other	6	4	6	5	4	7	32
TOTAL	76	28	49	61	67	69	350

Source: Unnatural deaths - Victorian Coroner's Facilitation System, July 1989 to June 1994. Shaded areas highlight the more frequent cases per year of age or location.



General recommendations

- Ensure that home ponds are covered by wire mesh.
- Children on farms should be provided with a safe play area, fenced, away from water including sump holes, irrigation channels, dams and troughs.
- Nappy buckets should not be left in reach and children's wading pools should be emptied when not in use. Children can drown in only 5cm of water.

Home swimming pools

Home pools/spas accounted for 51% of the deaths, 31% of hospital admissions and 30% of presentations (excluding admissions) in the 0-4 age group for drowning and near drowning.

The available literature cites proper pool fencing as the most effective means by which much of the drowning relating to toddlers and young children can be prevented. Opponents of pool fencing claim that the ability of children to climb pool fences negates its effectiveness. However, children usually do not develop the necessary climbing skills to negotiate such fences until the age of three. The databases studied in compiling this article show that between two-thirds (hospital admissions) and three-quarters (other databases) of children involved in near-drowning were under 3 years. This is supported by studies in Queensland eg. Pitt et al, 1991, found the high proportion (90%) of children involved in home pool drownings were under 3 years. Nixon (1979) found that a 1.2 metre fence was an effective preventative measure for 80% of three year olds and almost all two year olds (cited in Nixon et al, 1995).

An examination of the injury narratives of home pool drownings and

near drownings for both the Coronial and VISS databases showed the following:

- Sixty percent of home pool drownings recorded by VISS and almost one third of pool drownings recorded on the Coronial database occurred in the victim's own home, with another 34% (VISS) and 32% (Coroner's) in a home other than the victim's.
- Sixteen percent (VISS) and 33% (Coronial) of cases noted that the child was left unsupervised, unattended or had gone missing, including wandering into another property, when the incident occurred. Examples include "A 19 month old infant wandered into the neighbours premises after palings on wooden fence had been knocked down and fell into the pool and drowned" or "Not seen for 15 minutes, got through gap in non-safety fence to above ground pool".
- Only 8% (VISS) and 24% (Coroner's) noted pool fencing in place. Of these cases drowning incidents still occurred when children climbed the fence (8% VISS and 9% Coroner's cases), often using an object to assist them eg. "Climbed over pool fence using bike, face down in water, immersed for 10 minutes" or "Deceased died from drowning as a result of climbing a rubbish bin located near the pool and falling in". A number of cases indicated that gates to pool fences had been left open or were in need of repair (12% VISS and 15% Coroner's), eg. "Deceased accidentally drowned in the backyard swimming pool. The gate was faulty and prevented it from shutting properly" or "Deceased drowned in home pool. A fence and gate surrounded the pool, but other children requested it open to give access to sandpit on other side of house".

Legislation

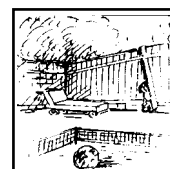
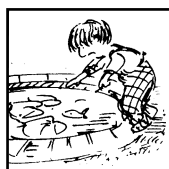
From 1st July 1997 Victorian law will require that all existing residential swimming pools and spas have safety barriers to prevent a young child's unsupervised access. A barrier refers to a fence, wall, gate or screen as well as locks, latches or other devices to doors, gates and windows.

While all pools and spas built since April 1991 must already meet these minimum requirements, from July this will also apply to pools built prior to 1991 and penalties will apply for non-compliance.

To ensure correct barriers are in place pool owners must either

- install a fence in accordance with Australian Standard 1926 preventing access by young children to the swimming pool or spa; **or ensure that**
- the allotment fence on the property boundary or other fence surrounding the pool area is not less than 1.5m in height and is in a state of good repair; **AND**
- gates and doors providing access to the pool are fitted with self-locking or self-latching devices not less than 1.5 metres above the ground; **AND**
- openable windows which open directly onto the pool area are securely fitted with fly wire screens. Otherwise they must be fitted with self-locking or self-latching devices at least 1.5 metres above floor level.

Source: Safepool Brochure, 1996, Building Control Commission and Kidsafe, Victoria.



Enforcement

A recent newspaper report indicated that some councils plan to use aerial mapping and computerised information to identify home-owners with unfenced swimming pools once fencing becomes mandatory on July 1, 1997 (Nancarrow, 1996).

Non-compliance with the legislation is an offence and is liable for a fine of up to \$500.

While some estate agents are informing clients of the new regulations, widespread advertising in the property sections of the newspapers and elsewhere still features unfenced pools. Clearly, property advertisements featuring unfenced pools could lead to prosecutions of the owners after July 1, 1997.

Recommendations to pool and spa owners

- Ensure all backyard pools and spas are fenced in accordance with AS 1926. Isolation fencing of pools is best, including a self-closing and latching gate.
- Ensure that there are no objects surrounding the pool or spa which children can climb on to gain access to the pool.
- Never prop open gates or doors leading to pools and spas.
- Ensure that at least one parent has training in resuscitation techniques.
- Children should always be supervised by an adult when near water. Older children should not be responsible for younger children.

Baths

Bath related incidents represented 29% of drowning deaths and 28% of near drownings occurring in a home (own or other) (table 2).

Baths accounted for 13% of the deaths, 19% of hospital admissions and 10% of presentations (excluding admissions) in the 0-4 age group for drowning and near drowning.

An examination of the narratives of bath drownings and near drownings on the Coroners and admitted cases recorded by VISS showed the following:

- Thirty six percent of drownings (n = 10) and 83% of near drownings (n = 20) in the bath were to children aged less than 5 years.
- Sixty percent of deaths (n = 6) and half of near drownings (n = 10) in the under 5 age group occurred when the child was left unattended eg. "In bath, mother left to answer phone, returned 1 to 3 minutes later, child had slipped out of inflatable plastic chair". Flotation chairs were implicated in one death and at least one admission to hospital.
- Ten percent of drownings (n = 1) and one quarter of near drownings (n = 5) in the under 5 age group occurred when the victim was left in the care of a sibling, eg. "Mother left (child) with older child, found face down in bath".
- Adults aged between 27 and 80 accounted for another 57% of drownings (n = 16). Almost a third of cases (n = 5) involved drugs or alcohol. Another third of adult victims (n = 5) suffered medical conditions which contributed to their death (mostly epilepsy). Perhaps showers are a safer alternative for people with epilepsy.

- Of the 6 cases of drowning/near drowning involving older children ie, 5-14 years, half had a history of epilepsy.

Recommendations

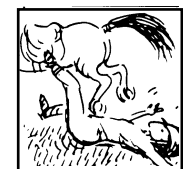
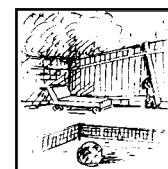
- Young children must never be unattended in the bath or under the supervision of another child.
- Bath seats are not a substitute for adult supervision.
- Cordless phones or answering machines are alternatives to leaving children while speaking on the telephone.

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- Kidsafe Magazine, Summer 1995, The Drowning Factors, Water Safety, page 3.
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- Nixon, J., Pearn, J., Oldenburg, B. and Pitt, W., 1995, Review of countermeasures to reduce drowning, near-drowning and spinal injuries from diving into shallow water, Commonwealth Department of Human Services and Health.
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Acknowledgements

Dr Arlie McQueen Kidsafe, Victoria for her valuable contribution.



Baseball injuries

Karen Ashby

Introduction

The Australian Baseball Federation had more than 143,000 formally registered players in 1993. Results from a recent Australian Bureau of Statistics population survey monitor (1995/96), ranked participation in baseball, for adults, approximately 45th behind other sporting and recreational activities. Baseball ranks 13th (for children) and 16th (for adults) in terms of sport and recreation injury presentations to Australian hospital emergency departments (Finch et al, 1995).

Emergency Department Presentations

The original VISS database which operated in five public hospitals for varying periods between 1988 and 1996¹, recorded 115 cases of injury to baseball players, 57% of which were to children (under 15 years of age) and 43% were to adults. These cases will be examined in detail. This distribution reflects an over-representation of paediatric centres at the 5 hospitals (see also new electronic statewide database).

More than three quarters of injured children were 10-14 years of age and 61% of injured adults were aged 15-24 years. Eighty-six percent of injured children and 96% of injured adults were male.

¹ The original Victorian Injury Surveillance System (VISS) collected detailed information from 7 campuses of 5 Victorian public hospitals; Royal Children's Hospital (1988 to 1993), Western Hospital - Footscray and Sunshine campuses (1989 to 1993), Preston and Northcote Community Hospital (1989 to 1993), Royal Melbourne Hospital (March 1992 to February 1994) and Latrobe Regional Hospital - Traralgon and Moe campuses (July 1991 to June 1996).

Common causes of injury to baseball players

Table 1

Mechanism of injury	Child injury cases (N = 66) %	Adult injury cases (N = 49) %
Collision/jamming		
- hit by ball	32	27
- hit by bat	27	6
- collision with other player	9	14
- misjudging catch	6	2
- collision with fixed object	0	2
Sliding	8	24
Fall, slip or trip	11	10
Over-exertion		
- running	0	10
- other	3	4
Other	4	1
TOTAL	100	100

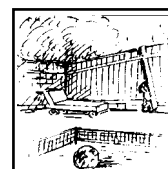
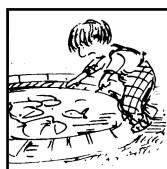
Source: Victorian Injury Surveillance System, 1989 to 1996 Royal Children's Hospital, Western Hospital, Preston and Northcote Community Hospital, Royal Melbourne Hospital and Latrobe Regional Hospital.

In Australia the regular baseball season runs between the months of September and April. Injuries to children most often occurred early in the season, with 36% of injuries occurring in October or November. Adult injuries, however, were more common in the months of May and July (each 18% of total) coinciding with the provincial baseball season which runs from mid April to mid September.

Areas for organised sport were the site of 88% of adult and 33% of child cases. Children were also injured at school (33% of total child cases), residential locations (12%) and parks or playgrounds (8%).

Forty-seven percent of injured children and 90% of injured adults were participating in organised competition or practice when injured. Another 18% of injured children were participating in informal baseball and a further 9% playing in the area where a match was taking place.

The available literature generally recognises three main mechanisms of traumatic injury in baseball - sliding, jamming/collisions and falls. Over-exertion injuries are also common, particularly for adults (15% of adult total recorded by VISS). Examination of the narratives recorded by VISS allows for further breakdown of the jamming/collision category into those injuries sustained when misjudging a catch and those cases where the player is hit by the ball in the course of the game. A comparison of the most common mechanisms for child and adult baseball injuries is shown in Table 1.



Being struck by the ball was the most common cause of injury for both adults and children (27% of adult and 32% of child cases) eg. "Playing baseball, missed catch, ball hit player on the nose". Almost half of the children who were struck by the ball were struck in the face.

Other injuries to children occurred when they were struck by the bat (27%), 22% of which occurred after the child moved into close proximity to the batter and another 11% fell, slipped or tripped.

A further 24% of adults were injured whilst sliding to base, eg. "Playing baseball, sliding to 2nd base, other player had foot on base, base didn't give".

The use of safety or protective devices was noted in only 15% of child and 18% of adult cases.

These devices included helmets, gloves, jaw guards or masks, knee pads and catcher's equipment. There is likely to be an underestimation of the wearing rates of protective equipment associated with the cases recorded by VISS. Some of the equipment, eg. gloves, are considered such a normal part of the uniform that players may not consider them as safety devices and as such neglect to note their use on the VISS form.

Twenty-three percent of injured children (n = 15) and 12% of injured adults (n = 6) required hospital admission. Sixty percent of the children requiring admission had been hit in the face by either the ball or baseball bat. Another 27% of the cases requiring admission were limb fractures.

A further 38% of child and 51% of adult cases required follow up review or referral for their injuries.

VISS can record up to 3 separate injuries per case. More than half (54%) of the injured children sustained injuries to the head and face, particularly face and scalp bruising (10% of total injuries), face and scalp lacerations (7%) and concussion (7%). Another 11% of child injuries were to the fingers, particularly sprains/strains (6%).

Almost half of the total number of injuries to adult players were to the lower limbs, particularly strains or sprains of the ankle (20% of total injuries) and knee (6%). Fractures accounted for a further 20% of injuries sustained, particularly to the nose (4%) and tibia/fibula (4%).

New Public Hospital Electronic Database

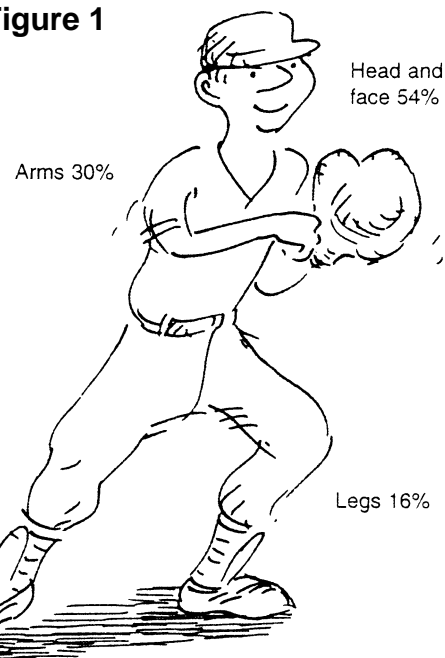
During 1996 there were 47 cases of injury to baseball players recorded on the new VISS electronic database. To date this statewide collection of emergency department presentations contains data from 22 of the 25 major public hospitals.

Sixty-two percent of injuries recorded on this database were to adults and 38% were children under 15 years of age. Eighty-three percent of injured players were male.

Fifty-five percent of cases occurred at sporting arenas, 26% at places for recreation and 13% at school.

Injury scenarios were similar to those recorded in the original VISS database. The most common cause of injury was, again, being struck by the ball (30% of total). Other common causes of injury included those associated with sliding to base (11%), being struck by the bat (11%), falls (11%) and collisions with another player (9%).

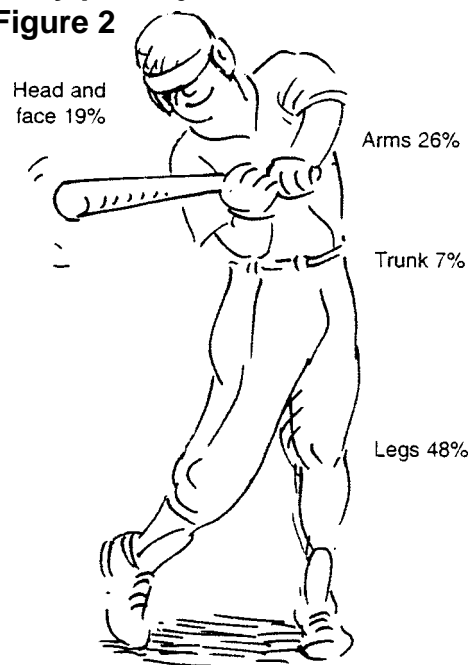
Body part injured - children Figure 1



Children N = 70 injuries

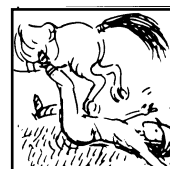
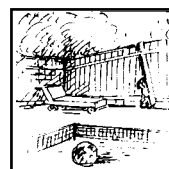
VISS: RCH, WH, PANCH, 1989-1993,
LRH July '91-June '96
<15 yrs (up to 3 injuries per case)

Body part injured - adults Figure 2



Adults N = 54 injuries

VISS: WH (2 yrs), RMH (2 yrs),
PANCH (1 yr), LRH (5 yrs)
>=15 yrs (up to 3 injuries per case)



Fractures (23% of total), superficial injuries (19%), muscle or tendon injuries (17%) or sprains and strains (13%) were the most common injuries sustained. Body regions affected were mostly the hand and fingers (17% of total), face, excluding the eye (13%) and the forearm (13%).

Thirty-eight percent of injured players were referred to a general practitioner for follow-up, 21% were discharged without referral, 13% were scheduled a return visit to the emergency department and 13% were advised to return to the emergency department if required. Only 2 injured players required admission.

Prevention

The Monash University Accident Research Centre recently undertook a critical review of the available literature relating to baseball injuries, with an emphasis on countermeasures (Finch and Valuri, 1996). Many of the following recommendations for the prevention of baseball related injury are based on the resulting report.

Ball impact

Being struck by the ball was the most common cause of injury, recorded by VISS, affecting both adult and child baseball players. In these circumstances, the wearing of appropriate safety equipment is vital.

The following safety equipment should, when appropriate, be worn to reduce the impact when struck by the ball.

- Good quality, double eared helmets with face protectors offering protection to the face from the tip of the nose to below the chin, including the teeth and facial bones, to assist in preventing head and facial injuries when batting.

- Energy absorbing chest padding to distribute blows over a broader area of the chest when batting, pitching or catching.
- Properly fitting genital protection, particularly by children.
- Shin protection, breast plate and a helmet with a mask when catching.
- Gloves when fielding and catching.

Modification of playing environments

Impacts with standard stationary bases while sliding incorrectly to base can cause serious injuries to the hands and feet. The use of breakaway/quick release bases has been promoted to reduce the load impact generated should a player impact with the base. An American study has estimated that the use of break-away bases could represent an 80% reduction in the risk of injury involved in sliding (Janda et al, 1993). Players should be instructed in correct sliding techniques.

Over-use injury

Good preparation before playing any sport is important. Pre-season stretching and strengthening programs combined with continued stretching and warm-up programs, prior to play, throughout the season will assist in reducing the likelihood of injury.

Overuse injuries, particularly to pitchers, though not commonly recorded by VISS, are regularly identified in the available literature. Pre-season stretching and strengthening programs combined with regular evaluation, correction of pitching techniques and limiting the number of pitches thrown by an individual pitcher could assist in reducing overuse injury to pitchers.

Other

- Encourage children to play TeeBall as a means of developing good techniques.
- Pad fences, walls and posts to prevent injury if fielders collide with these solid objects when attempting to take a catch.
- Use protective screening to protect players in dugouts or on benches.
- Use safety screens during practice, particularly during batting practice.

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- Flower, L., Victorian Baseball Association, personal communication, 1996.
- Janda, DH., Maguire, R., Mackesy, D., Hawkings, RJ., Fowler, P. and Boyd, J., 1993, Sliding injuries in college and professional baseball - a prospective study comparing standard and break-away bases,
- Preventing Baseball Injuries Fact Sheet, 1996, Monash University Accident Research Centre.

Acknowledgments

Sports and Recreation Victoria for sponsorship of separate fact sheets for baseball and softball, part of a series of sports injury prevention fact sheets.



**Public Health Association
Annual Conference 1997
Theme: *Rights to Health***

Venue: Melbourne

Date:

Sunday 5 Oct-Wed 8 Oct 1997

The Injury Special Interest Group of PHA has organised a forum session at the Conference. It is a debate on the topic '**Self responsibility or government regulation-how far should governments regulate to protect people's health and safety?**' It will be followed by a proffered papers session, and injury researchers and practitioners are urged to submit papers on the issue of regulation (and the effects of self/deregulation) in injury prevention. Abstracts are due in on Friday May 16 1997. The conference has a heavy emphasis on violence issues (other scheduled forums include: Violence against women, Health in conflict settings and Violence against children) so injury researchers and practitioners could also take the opportunity to showcase their work in the intentional injury area.

Contact: Erin Cassell at MUARC ((03) 9905 1857) for more details.

17-20 May 1998, Amsterdam, The Netherlands



4th World Conference in Injury Prevention and Control

Building partnerships for safety promotion and accident prevention.

The conference in 1998 will highlight the specific developments made in the various regions worldwide in accident and injury control programs. It will pinpoint the divergences as well as the similarities in the respective regions of the globe in terms of: the need for control programmes, the approaches observed in injury control, the techniques applied and achievements in closing the gap between research and intervention. The deadline for submission of abstracts is 1 June 1997.

The conference is an initiative of: The World Health Organisation and its Collaborating Centres for Safety Promotion and Injury Control. The Consumer Safety Institute in Amsterdam is the co-ordinating institute in the host country.

For more information or registration: <http://www.consafe.nl/conference/>

Or ask the Conference Secretariat for the Second announcement

/call for papers: **P.O. Box 1558, 6501 BN Nijmegen, the Netherlands.**

Phone: +31 24 323 44 71, Fax: +31 24 360 11 59

Victorian Community Safety Week 1997

September 7 to September 13, 1997

**The theme for community safety week is
'local action for a safer community'**

For information contact:

Donna McCormick,
Victorian Community Council
Against Violence
(Phone: 03 9655 5220)

or Gayle Smith,
Victorian WorkCover Authority
(Phone: 03 9628 8543)

Sports injury countermeasure reviews

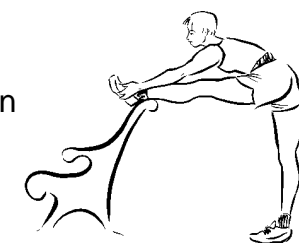


Monash University Accident Research Centre, in conjunction with Sport and Recreation Victoria, have recently launched five detailed reviews of countermeasures for baseball, cricket, equestrian activities, running and softball.

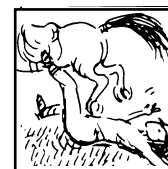
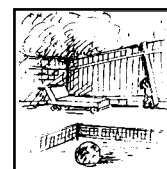
Fact sheets describing key recommendations have also been prepared and are available free of charge.

Detailed reports are available at a cost of \$15.00 (including postage & handling).

For further information please contact the Accident Research Centre on (03) 9905 1805 or Sport and Recreation Victoria on (03) 9666 4211.



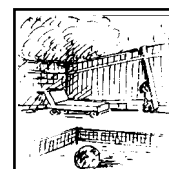
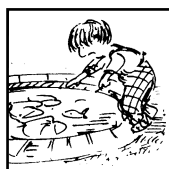
Illustrations by Debbie Mourtzious



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* Special edition



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Ballarat Base Hospital	Royal Melbourne Hospital
The Bendigo Hospital Campus	Royal Victorian Eye and Ear Hospital
Box Hill Hospital	St Vincent’s Hospital
Dandenong Hospital	Wangaratta Base Hospital
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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:

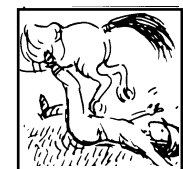
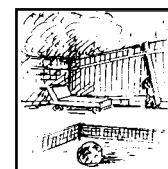
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