

V.I.S.S.

Hazard
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Victorian Injury
Surveillance System

Monash University
Accident Research Centre

The ninth edition of *Hazard* from VISS continues to explore the issue of sporting injuries in children. It also examines the all age injury data emerging from the most recently established VISS unit in the Latrobe Valley. An update on exercise bike related injuries to children is also included.

Sports Injuries in Children – the Five Most Commonly Presented Sports

Virginia Routley

Hazard 8 gave an overview of sports injuries for children aged under 15 years in the years 1989-90 and made some recommendations to reduce injuries generally. This edition of *Hazard* will, in turn investigate the 5 most frequently presented sports.

The tables below outline the general characteristics and injury locations of these 5 major sports- Australian Rules football, soccer, basketball, cricket and netball. More detailed injury tables are available for each of these sports on request from VISS.

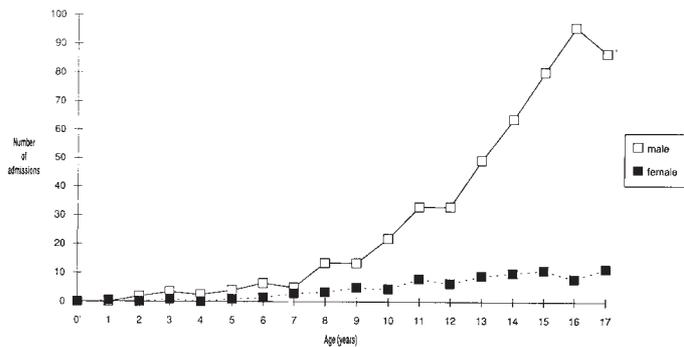


Table 1 - General Characteristics

SPORT	MALES	% of Total Cases	
		AGED 10-14 YRS	TRANSFERRED/ ADMITTED
Australian Rules Football	94	81	7
Soccer	93	80	7
Basketball	64	81	3
Cricket	86	70	8
Netball	6	90	4

VISS Under 15 Years 1989-90 Sports injuries

Fig. 1 - Injuries in Sport - Hospital Admissions



Victorian Annual Hospital Admissions Data 1986/87 and 1987/88

Table 2 - Location of Injury Percentages

Sport	School	Oval/ Court	Home	Other	Total
Football*1	34	38	7	21	100
Soccer	39	26	11	24	100
Basketball	43	27	10	20	100
Cricket	30	22	23	25	100
Netball	30	45	1	15	100

VISS Under 15 Years 1989-90 Sports injuries

*Australian Rules Football

Table 3 - Event Leading to Injury

	Percentages				
	F'ball*	Soc	B'ball	Cricket	Net
Slipped	4	4	2	2	1
Tripped	3	12	7	3	15
Fell on same level	13	15	16	10	19
Over-exerted,	66	58	63	38	55
Over-reached					
Dangerous posn.	4	5	2	33	2
Collision betw.	7	4	5	4	4
Horseplay	2	1	2	2	2
Other	1	1	1	4	1
Total	100%	100%	100%	100%	100%

VISS Under 15 Years 1989-90 Sports injuries

*Australian Rules Football

It is interesting to note the higher proportion of the 10-14 age group in all 5 sports and the consistency with hospital admissions data for children struck in sport as shown in Figure 1. (Ozanne-Smith et al, 1991)

Basketball appears to be the most even between the sexes, cricket has the youngest players and basketball and netball the less severe injuries. (Table 1)

Sports injuries overall however tend to be less severe than other injuries. Non-sporting injuries had an admission rate of 18% over the same period of time.

Investigation of the location of injury revealed that cricket injuries more often take place in gardens and back yards than other sports which is consistent with the apparent younger age group and less organised nature of cricket injuries. It should be noted that injuries which occur on school ovals are included with schools rather than ovals/courts (Table 2).

Table 1A

FREQUENCY OF INJURY BY SPORT

SPORTS	N
Football	825
Soccer	388
Basketball	286
Cricket	254
Netball	137



As shown in Table 3, the most frequent event which lead to injury occurring was over-exertion. This represented close to 60% of injury incidents for all sports with the exception of cricket where it was only 38%. Almost as common for cricket was 'moved person or thing into a dangerous position', presumably preceding the player being hit by the bat or ball. Falls were the other major event leading to injury and were especially high for netball and soccer (35% and 31% respectively).

Mechanism of Injury

The mechanism of injury is the actual cause of the injury.

'Hit against victim moving', usually in the form of a fall, was or was close to, the most common mechanism of injury for all sports other than cricket. For cricket it was 'hit by other moving', presumably again being hit by the bat or ball. Strain or over-exertion was especially high for netball and low for cricket. (Table 4)

Australian Rules Football

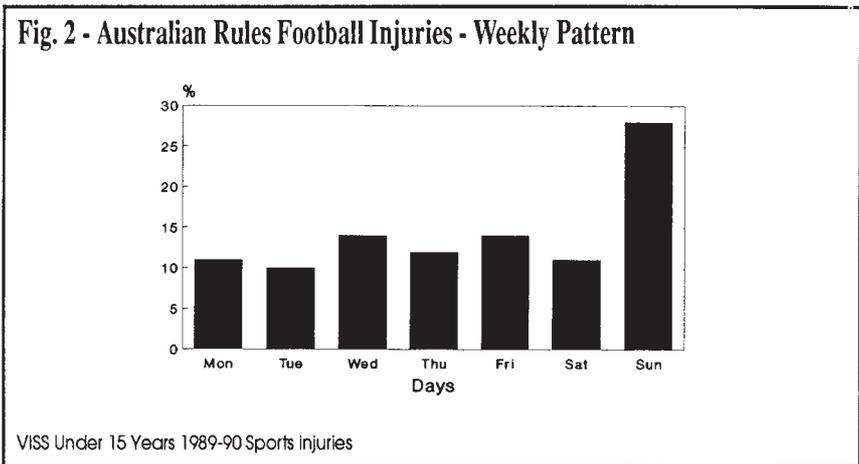
Among males presenting for injury, football was by far the most frequently presented sport (40% of males injured), and represented more than the next 3 sports combined: soccer, basketball and cricket. This does not necessarily mean that football is the highest risk sport as more boys participate in football than any other sports.

- Boys in the 10-14 year age group accounted for 81% of the injured children under 15 years. Within the 10-14 year age group both the number of presentations and severity increased with age ie 14% of this group's presentations were 10 year olds compared with 31% 14 year olds and 6% of this group's admittances were 10 year olds compared with 46% 14 year olds.
- Football injuries most often occurred between the hours of 1 and 2 pm during the weekday (15%), and on Sunday afternoon (31%) - school lunchtime

Table 4 - Mechanism of Injury

	Percentages				
	F'ball*	Soc	B'ball	Cricket	Netball
Hit agst victim moving	39	48	46	22	49
Hit by other moving eg ball	43	34	36	61	26
Collision betw.	3	2	1	4	1
Strain/over-exertion	12	13	15	7	23
Grazed, abraded	2	2	1	4	1
Other	1	1	2	2	0
Total	100%	100%	100%	100%	100%

VISS Under 15 Years 1989-90 Sports injuries *Australian Rules Football



and competition respectively. The various junior leagues in the Northern and Western suburbs play their games Saturday morning and Sunday afternoon. (Figure 2)

season. Perhaps players are less fit, the weather is more inviting for informal play, the ground is harder and players are getting used to the game. (Figure 3.)

- Injuries were highest in April and May (40%), the beginning of the football
- 43% of incidents occurred on an oval and 38% in the school playground (including school ovals).

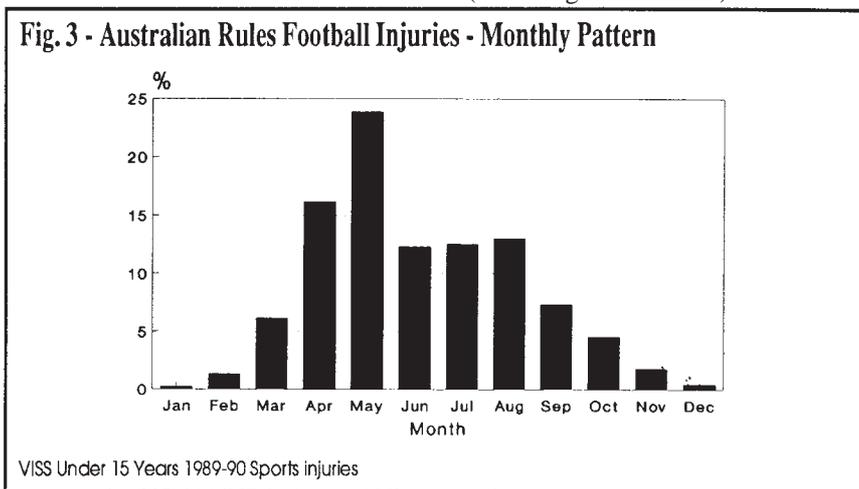
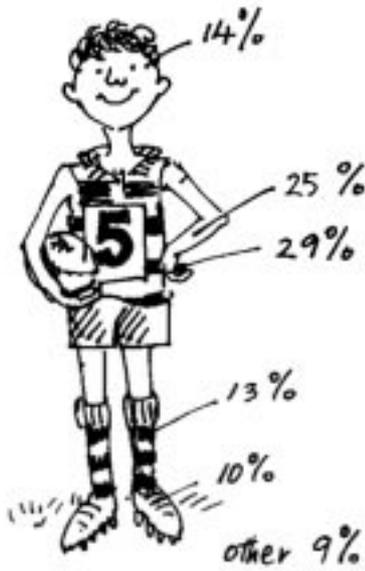


Fig. 4 - Australian Rules Football Injuries by Body Part



Note Up to 3 injuries recorded per case.
VISS Under 15 years 1989-90 Sports Injuries

- By injury type fractures/dislocations were the most common representing 32% of injuries followed by haemorrhage / bruising / swelling / abrasions (30%) and sprains / strains (24%).
- Overall fractures/dislocations to the fingers and to the elbow/wrist/forearm were each 10% of all football presentations. The former were largely caused by contact with the ball (56%) or being kicked by another player (10%) and latter by falls (39%) and tackling (including bumped, knocked over by) (29%).
- Other common injuries were finger sprain/strains, haemorrhage / bruising / swelling / abrasions to the fingers and concussion (each 6% of injuries). The concussions were largely a result of tackling and other forms of body contact (62% of concussions). They included 7 cases of being kicked in the head.
- Fractures to arms and legs and concussion were the major causes of admission.

Recommendations

- In order to prevent fingers being kicked while picking up a ball the 'kicking in danger' rule ie the ball not being able to be kicked off the ground, could be more strictly enforced.
- In competition a fresh ball could be brought on each quarter during wet weather since a heavy ball hitting cold fingers is possibly responsible for many of the finger injuries.
- 'Aussie footy', a modified rules game be more widely introduced for children and it possibly be extended beyond the age of 10 years. In it's current form the major differences between modified rules and traditional football are the smaller team numbers, ground and ball size, shorter length of quarters and reduced contact by not allowing tackling until the under 11 age division.

Modified rules have been varied in their acceptance throughout the various junior leagues, in many areas it is felt to be secondary to traditionalism.

- Players could be matched on size rather than age in order to reduce injuries from body contact.
- There needs to be more research into Australian Rules football injuries in children. This sport has more players than any other sport and of 6 known studies 4 have concentrated on elite adult players, Most have not used incidence rates which take the number of playing hours into account in determining injury risk.

The influence of modified rules on injury reduction and the injuries relevant to the various positions need to be investigated. Also the impact of the accreditation of coaches on injuries.

Drs Nolan, McMahon, Jarman and Carlin from the Royal Children's Hospital, hope to undertake a community and hospital based study to assess the incidence, nature and treatment of Australian Rules Football injuries in children and adolescents. The purpose would be to identify in more detail the factors that contribute to these injuries, and to assess

the injury reduction impact of modified rules.

The behaviour of adult football and other sporting heroes in regard to injury is a possible influence on children's attitude to injury. The extolled 'courage' of footballers for playing football games with injuries could be questioned by those seriously interested in sports injury prevention and treatment (Age 8/10/91).

During the 1991 football season there were frequently cited instances of adult football players playing when injured, in fact the Brisbane Bears in one game fielded 6 injured players (Age 19/5/91). Hopefully pressure on the AFL clubs to increase the number of interchange players may improve this situation.

Since football injuries are so frequently presented any small improvements in football injury prevention should have a significant impact on the frequency of injury presentations overall.

It appears important that if Australian Rules is to maintain it's popularity with children that it improve it's safety image. It has been suggested that potential players are switching to basketball and soccer because they are seen to have lower injury rates.

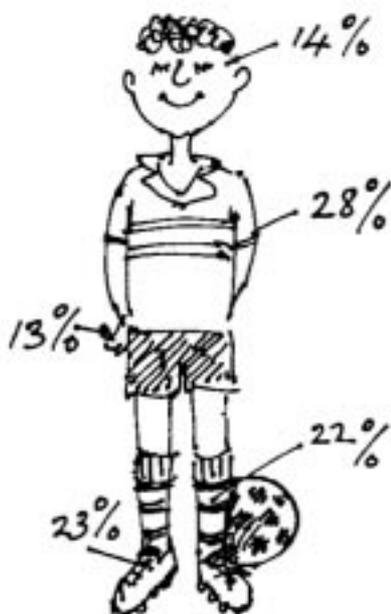


Soccer

The age and sex distributions of soccer injuries were very similar to those of football. However, although both shared a May peak, injuries were more evenly spread throughout the year and there was not the concentration of injuries on Sunday afternoons. Of the 390 children who presented with soccer injuries:

- 39% were incurred in the school playground, (including school ovals), and 26% on non-school ovals.
- In 58% of cases the event leading to injury was over-exertion, or over-reaching.

Fig. 5 Soccer Injuries by Body Part



Note Up to 3 injuries recorded per case.
VISS Under 15 Years 1989-90 Sports injuries

The wrist/forearm, ankle and foot were the most common body parts injured (22%,13% and 10% respectively). These were all over-represented relative to football, and finger injuries were a significantly lower proportion (only 9%) (Figure 5).

Close to one third of soccer injuries were caused by falls.

Approximately half of wrist/forearm injuries were caused by falls and they usually resulted in radius/ulna forearm fractures or wrist sprain/strains.

The most common injury types were fractures/dislocations (32%) and haemorrhage / bruising / swelling / abrasions (31%). Sprains/strains accounted for the majority of other injuries (24%). It is interesting to note the close similarity to Australian Rules Football injury types.

- Examining nature of injury and body part together the most common injuries were fractures/dislocations to the elbow/wrist/forearm (13% of soccer injuries) and ankle sprains/strains (8%). Concussion was relatively low compared with football (2% compared with 6%).
- Approximately the same percentage as for football were admitted (7%) but a higher proportion were due to fractures and a lower proportion to concussion.

Recommendations

Informal soccer players should play where possible on open grassed areas such as ovals so that when they fall they do not collide with obstacles such as school taps or walls and have a relatively soft landing.

Investigation be made into whether high boots reduce ankle sprains/strains.

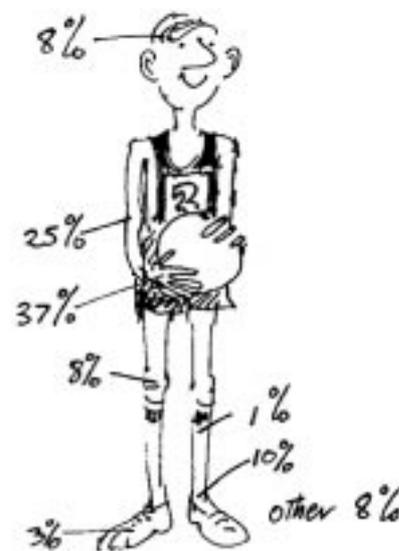
Modified rules (Rooball) with smaller team, grounds and ball size to be used extensively for children under 10 years and perhaps older age groups.

Basketball

There were 287 cases presenting with basketball injuries. As with other sports the majority (81%) were in the 10-14 year age group.

- The male/female ratio was more even than for other sports (64% male).
- Almost one quarter were injured on Fridays and only 6% on Sundays.

Fig. 6 - Basketball Injuries by Body Part



Note Up to 3 injuries recorded per case.
VISS Under 15 Years 1989-90 Sports Injuries

- Injury incidents were evenly presented throughout the year.
- Finger injuries were proportionally greater than for the other major sports (31% of basketball injuries) and body parts injured were similar to those of netball upwards from the knee. Basketball had a higher proportion of knee injuries than netball, netball the greater concentration of foot and ankle injuries (Figure 6 & 10).
- The most frequently presented injuries were sprains / strains (36%), haemorrhage / bruising / swelling / abrasions (29%) and fractures /



dislocations (28%). There were more sprains/strains than for sports other than netball and less concussion (only 1%) than for other sports.

- Examining injury by body part revealed haemorrhage / bruising swelling / abrasions, fractures dislocations and sprains / strains - all of the fingers; ankle sprains/ strains and elbow / wrist / forearm fractures / dislocations to each represent approximately 10% of basketball injuries.
- Basketball had the lowest rate of admission due presumably to the relatively high proportion of sprains/strains as compared with the more severe fractures and concussion of the other sports.
- Finger injuries occurred proportionally more often in the school playground and less often on the court than other basketball injuries. This suggests that it is the less skilled and less supervised players injuring their fingers.
- Of the finger injury cases 73% were caused by the ball hitting the fingers or thumb.

Recommendations

- Finger strapping for injured fingers.
- Training and emphasis on the correct methods of catching and throwing.
- Smaller balls be used for younger players (as with modified rules) and a softer ball be developed which can be sold at a competitive price.

Cricket

There were 257 incidents of cricket injury presented. Of these, 86% were male, and 70% were aged 10-14 years, a younger group than the other major sports.

- Injury incidents were fairly evenly spread throughout the week with some concentration of organised cricket on Saturday morning and Wednesday evening - presumably competition and training.
- 80% of injury incidents occurred between October and February - in direct contrast to football, reflecting the different seasons. November had close to one quarter of injuries and a comparison can be made with the high winter sport's injury rate in May (Figure 7).
- 23% of injuries occurred in the home (compared with 1% for netball, and 7% for football). This percentage was higher than for other sports, confirming the relative informality of when many cricket injuries occur.

Body parts injured in cricket differed from the other sports in that the head, especially the face was the most frequently injured body part and fingers and elbow/wrist/forearm, common with

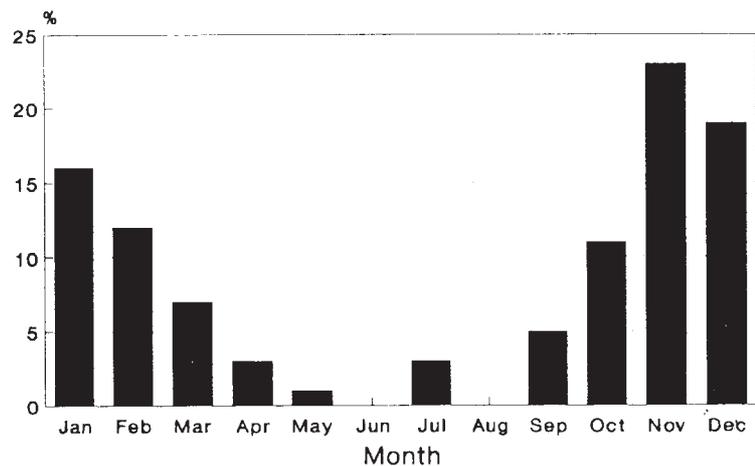
the other sports, were relatively infrequent. Only 6 of the players who received face injuries noted having worn a helmet and none noted having worn a face shield (Figure 8).

The face injuries most commonly resulted from being hit by the bat (56%) and a further 34% from the ball.

Almost all players injured from the bat had facial injuries (74%) and young players featured prominently in this group (51% of players with bat injuries were aged under 10 years compared with 30% of all injured cricket players). The location of these bat injuries were predominantly the school playground (34%) or garden/backyard (30%). The face injuries most often caused by the bat were face haematoma bruising (20%), face cuts and lacerations (17%) and nose fractures (11%).

Injuries from the ball were different however. The ball was almost as likely to injure the fingers as it was the face (27% fingers compared with 30% face) and the 10-14 age group was over-represented. Ball injuries occurred equally often on an oval, indicating competition, and in the school playground (both 31%). Only 15% of ball injuries

Fig. 7 - Cricket Injuries - Seasonal Distribution



VISS Under 15 Years 1989-90 Sports injuries



occurred in the backyard/garden. The injuries most often caused by the ball were face haematoma bruising (12%), finger sprains/strains (9%) and finger fractures (8%).

Fig. 8 - Cricket Injuries by Body Part



Note Up to 3 injuries recorded per case
VISS Under 15 Years 1989-90 Sports injuries

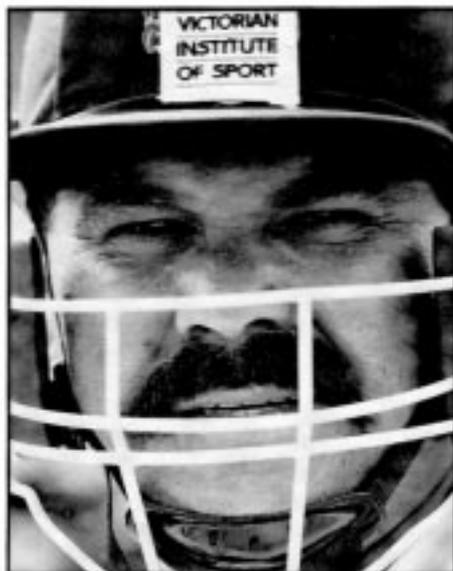
Concussion represented the highest proportion of admissions (27%).

- Haemorrhage / bruising / swelling / abrasions to the face represented 17% and lacerations /crush/ punctures to the face represented 9% of all cricket injuries. Ankle sprains/strains were the next most common injury representing 6% of cricket injuries.
- 33% of cricket injury cases were caused directly by the ball and 23% by the bat.

Recommendations

- Helmets with face shields should be worn by batsmen, wicket keepers and other in-fielders in order to reduce face injuries. Cricketing heroes should be encouraged to wear helmets as an example to younger players.

- Investigations be made into the development of a multi-purpose helmet. Ideally this would have a removeable shield and could be used for cycling, horse riding, roller-skating as well as cricket and other sports.
- Gloves and other protective gear should be worn for informal games as well as competition.
- Kanga cricket (modified rules) be more widely adopted for competition.
- Children should be encouraged to play with softer than standard bats and balls as in kanga cricket. The development of new innovations such as low impact cricket balls should be encouraged.
- To reduce finger injuries the correct 'fingers pointing to the ground' method of catching should be emphasised (Howell 1989).



or



Fig. 9

Courtesy of the AGE



Netball

There were 137 incidents of netball injury. Of these, 90% were female and over half were incurred on Friday or Saturday.

The injuries were concentrated in the autumn and winter months, particularly May, which, as with football, accounted for nearly one quarter of injuries.

Fig. 10 - Netball Injuries by Body Part



Note UP to 3 injuries recorded per case.
VISS Under 15 Years 1989-90 Sports injuries

- The body parts injured were very similar to those for basketball predominately finger followed by elbow/wrist/forearm with a greater proportion of foot and ankle injuries (Figure 10).
- 35% of netball injuries were caused by falls.
- 21% of netball injuries were caused by the ball hitting the fingers or hand.

Knee injuries, regarded by netball administrators and sports medicine practitioners to be one of the most prevalent injuries were surprisingly uncommon in children (3% of netball injuries) as they were with NSW injury surveillance data (7% of injuries). (Carey Sept 1991). These should be compared with Egger's figure of 20% for all age groups.

Perhaps they are more frequent in adult players, more noticeable because they are more difficult and expensive to treat (Egger 1990) or due to their chronic nature are not presented to hospital Emergency Departments. There was also a discrepancy between VISS and Egger for ankle injuries (VISS 17%, Egger 40%).

- Sprains/strains accounted for 46% of injury types, a far greater proportion than for any of the other major sports.
- Examining body part by nature of injury the most frequently presented injury was ankle sprains / strains (22%), followed by finger and elbow / wrist / forearm strains / strains, finger haemorrhage / bruising / swelling / abrasions, finger and elbow / wrist / forearm fractures / dislocations (all between 11 and 15%, respectively).
- There were only 4 admissions due to the high proportion of minor injuries such as sprains/strains.

Recommendations

Given the high proportion of falls, investigations should be made into softening the surface of netball courts. Commonly of asphalt or concrete they provide the worst possible surface on which to fall and probably contribute to the foot and ankle sprains/strains and radius/ulna fractures which are the injuries which most commonly result from netball falls.

Skills in correct catching be emphasized in order to reduce finger injuries.

Research continue into whether ankle high boots promote or cause ankle sprains/strains.

As with basketball, smaller balls be used for younger players and a softer ball be developed which can be sold at a competitive price.

Modified rules (Netta) be used for young players.

General Recommendations

Since many injuries occur at home and in the schoolground children should be encouraged to wear protective gear for informal as well as competitive sport. Appropriate footwear is an important aspect of this.

Research should be undertaken into determining whether ankle high boots promote or prevent ankle sprains / strains.

Sporting heroes should be seen to be wearing protective gear, to be not playing if injured and to be advocating other safe play practices,

Conclusion

The concentration of injuries in the 10-14 year age group and its consistency with the increase in the frequency of sports injuries with age shown in figure 1 and confirmation in other sports literature is a very significant phenomenon. The games are no doubt played faster and more intensely as age increases, bodies are bigger causing the impact of collisions to be greater and older bodies may not be as fit as younger bodies. Presumably psychologists would also have something to add.

It appears therefore that sports injury reduction programs should be aimed primarily at adolescents for the most efficient use of resources.

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VISS in the Latrobe Valley - the first three months

Marga Penny

The first Victorian provincial town/rural injury surveillance unit commenced data collection at the Latrobe Regional Hospital, Traralgon and Moe campuses, on July 1, 1991. This commencement date was timed to coincide with the amalgamation of these two hospitals,

During the first three months (July 1-September 30, 1991), 1,969 injured people presented to the emergency departments at the Traralgon and Moe hospitals and were included in the Victorian data collection. The inclusion rate of all injuries and poisonings presenting to hospital is greater than 90% in the Latrobe Valley. This represents the first comprehensive all-age injury data collection for Victorian emergency department presentations.

According to figures from the Health Department Victoria, the Latrobe Regional Hospital services 88% of local residents who require admission to hospital (GRIB & LRC p8, 1991). A small minority of the more serious cases will be retrieved by ambulance or helicopter and taken to major referral hospitals and would therefore by-pass VISS. Also, some injuries to local residents occur when they are away from their local area. It is likely that VISS captures an even higher proportion of the injuries to local residents which require hospital treatment but not admission.

This introduction to the Latrobe Valley VISS collection describes the catchment area and its population profile. It focuses on the 1,463 cases of adult injury from July to September 1991, including the location of the injury event, factors involved in injury causation, the surprisingly high proportion of eye injuries (14% of total injuries), and the breakdown of occupational injuries.

Caveat:

These data only represent injury patterns over a three month period. Any seasonal variations need to be taken into account when drawing conclusions or making comparisons and this will be done with a full 12 months of data when available.

Background on the Valley:

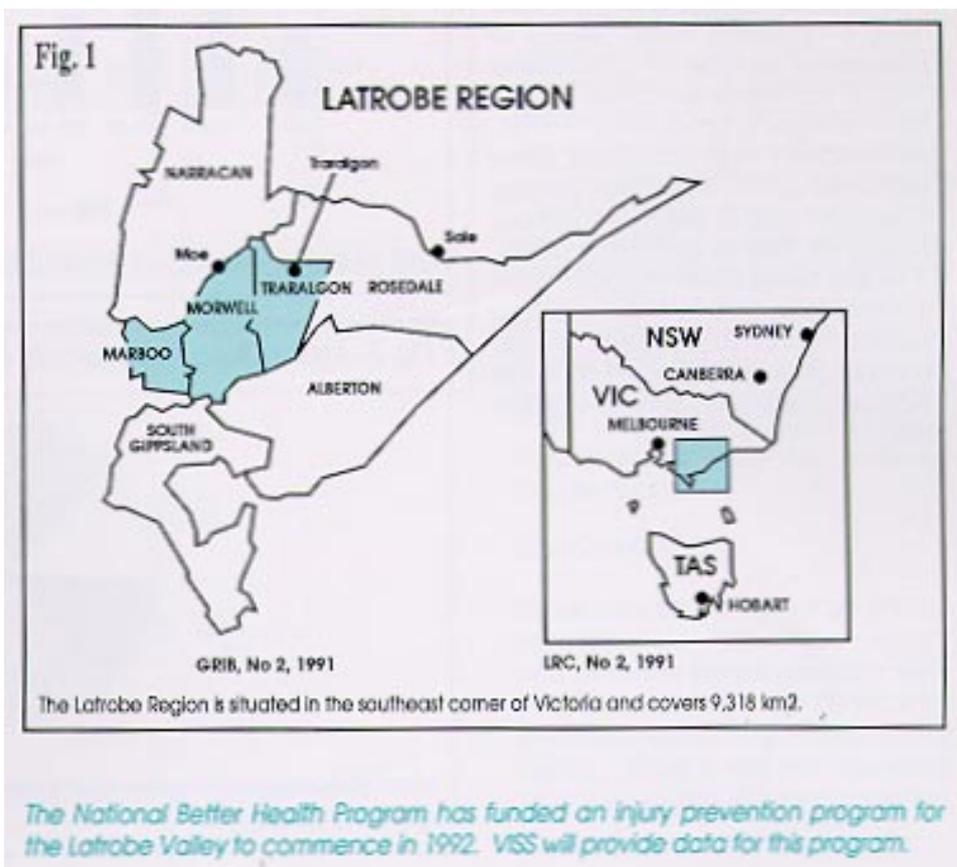
Demographics:

The sub-region of the Latrobe Valley serviced by Traralgon and Moe Hospitals is made up of the cities of Morwell, Traralgon and Moe, and the Shires of Mirboo and Traralgon. The population of this sub-region in 1991 was estimated to be 73,692 (ABS 1990). In addition,

the majority (67%) of residents of Narracan Shire (est. population in 1991 = 11,546) requiring admission to hospital also present to either Moe or Traralgon hospitals.

The age structure of the Latrobe Region differs from that of Victoria in two ways. It has a higher proportion in the 0 to 14 and 25 to 39 year age groups, indicating a population profile dominated by young families. There is also a higher proportion of males in the 25 to 44 year age group, reflecting the employment patterns found in the male dominated construction and energy industries (GRIB & IRC : p 2: July 1991).

The unemployment rate for June 1991 was 13.5%, compared to a rate of 9.6% for the same month in 1990 (GRIB & LRC, Nov 1991). The latest available unemployment figures for the entire state of Victoria are 10.5% (The Age, p.1, 13 December 1991).



Types of industry & agriculture:

Table 1 shows the industry grouping in the Latrobe Valley for employed persons. (ABS 1986)

The diversity of industries in the Latrobe Valley is also reflected in the wide range of occupational injuries (discussed below, p.12).

All-age injuries

There were 1,969 injury presentations in the first three months of Latrobe Valley injury data collection, comprising 506 children (aged 0 to 14 years) and 1,463 adults (15 years or older). Males are over-represented in each age group until the age of 70 years and older. The sex ratio for all injuries is 2.5 to 1.0 (male:female). In the 20 to 29 year age group the ratio is at its highest of 3.3 to 1.0.

Adult injuries

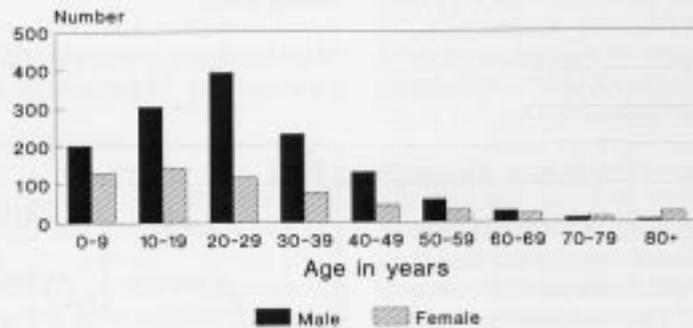
As shown in Table 2, almost one third of the incidents (32%) occur in the home of the injured person or in another home. In particular, they occur outside in the yard or garage or in the indoor living or sleeping area. **Areas of production** include mine or quarry (1.5%), factory/warehouse (1.6%), farm/primary production (3%), construction site (4%), and **other industrial** (8%). This latter coding category is used to describe workshops in both the private and public sector. **Outdoor recreation** includes both water-based and land-based recreation areas such as lakes or parks and playgrounds. **Areas of commerce** includes shops, pubs and amusement areas.

Table 1:

Industry groupings	N	%
Electricity, gas	8,776	26
Community services	4,898	14
Trade (wholesale/retail)	4,890	14
Manufacturing	3,426	10
Construction	2,887	8
Finance	1,905	6
Agriculture, forestry	1,852	5
Recreation, personal services	1,307	4
Public administration	1,120	3
Transport	743	2
Mining	576	2
Communication	417	1
Not elsewhere classified	342	1
Not specified	840	2
Total	33,979	100

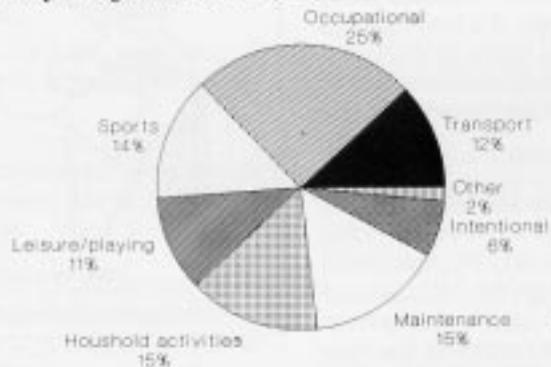
Source: Australian Bureau of Statistics, 1986 Census. Cities of Morwell, Traralgon and Moe, and shires of Traralgon, Mirboo and Narracon

Fig. 2 - Age and Sex



VISS: Latrobe Regional Hospital (1/7/91 to 30/9/91)

Fig. 3 - Activity Being Undertaken by Injured Person



VISS: Latrobe Regional Hospital, Age 15 years and over (1/7/91 to 30/9/91) Total Presentations 1969



Table 2 - Location

	N	%
Own home	390	27
Areas of production	276	19
Areas used by transport	228	16
Sports areas	209	14
Areas of commerce	114	8
Other home	81	5
Other residential	43	3
Outdoor recreation	37	2
School	25	2
Public institutions	14	1
Unknown/NEC	46	3
Total	1,463	100

VISS: Latrobe Regional Hospital. Age 15 years and over 1.7.91 to 30.9.91

Table 3 - Breakdown Factors

	N	%
Sport & recreation (including bicycles)	176	18
Vehicles	141	14
Structures	131	13
Workshop tools	118	12
Environmental features	82	8
Kitchenware & appliances	54	5
Garden equipment	45	4
Miscellaneous (Foreign bodies)	39	4
Industrial plant/equipment	37	4
Animals & insects	34	3
Food & drink	31	3
Furniture	30	3
Other	87	9
Total	1005	100

Note: Up to two factors can be recorded per case. Persons accounted for an additional 601 factors.

VISS: Latrobe Regional Hospital. Age 15 years and over 1.7.91 to 30.9.91
Total Presentations = 1,463

Context:

Other maintenance includes many farm-related activities such as chopping wood, and tending animals and other livestock (e.g. feeding, milking, mustering and so on) (Fig. 3).

Intent:

One hundred and thirty of the injuries (9%) were considered to have been caused intentionally. Assaults accounted for 88 presentations, 42 were possibly self inflicted and the intent was unknown in 4 cases. Some of the people involved in fights were initially engaged in other activities (such as playing sport or dancing at a club) and were therefore coded differently.

This explains the apparent discrepancy between the percentages for intentional injuries presented in the above two sections.

Severity:

A total of 8% of patients were admitted to hospital or were transferred to a hospital elsewhere. This is a much lower admission rate than is found, for example, at the Royal Children’s Hospital where 20% of children who present following an injury or poisoning are admitted, (8% of Latrobe Valley children aged 0-14 yrs are admitted). This difference does not necessarily indicate that injuries that occur to Latrobe residents are less severe. There are a number of possible explanations, including the fact that large Melbourne hospitals receive serious injury referrals from the whole state, children may be admitted to hospital with injuries of lesser severity than adults, or Latrobe Valley residents utilize hospital facilities for minor injuries, rather than presenting to local doctors.

Breakdown factors:

These can be an object or activity associated with ‘What went wrong?’ and describe which factor(s) were involved in the preliminary phase of the event that resulted in the person being injured. Table 3 indicates the major factors associated with injury causation.



The most common sporting and recreation factors were football (n=61), basketball (n=21), and skiing (n=16). Power grinders (45) and electric welding equipment (26) were the most common workshop tools. Cars accounted for 84 of the vehicles, and motor bikes for 30, stairs (33) and the floor (25) were the most common structures involved in precipitating an injury event.

Occupational injuries:

Nineteen percent of injuries (n=364 occurred while the injured person was at work (Tables 4 & 5). Although the numbers are relatively small, and the data are not adjusted for seasonal variations, two sectors appear to be over-represented for injuries. The manufacturing sector makes up 10% of the workforce yet it has the highest proportion of injuries (26%) and construction workers, who comprise 8% of the workforce account for 20% of occupational injuries.

Eye injuries

During the three month data collection period there were 269 people who sustained an eye injury, or 14% of all presentations. Most of these (88%) were older teenagers and adults (aged 15 years or older). Eye injuries to this age group are discussed in detail (Tables 6 & 7). A relatively high proportion (23%) did not know when the injury occurred. This is not surprising as the onset of symptoms of many eye injuries caused by the presence of foreign bodies, irritants or corneal abrasions is often gradual.

Common foreign bodies were metal particles (either hot or cold), wood, sawdust, grit, dust and chemicals.

Occupational:

Almost half the eye injuries (42%) occurred on the job, mostly in the construction (44), service utilities (29) and manufacturing (17) industries. The occupations most often affected were tradespersons (44), labourers (30) and the drivers or operators of plant or

Table 4 - Industrial groupings:

	N	%
Manufacturing	97	26
Service utilities (gas & electricity)	79	22
Construction	73	20
Community services, health	46	13
Agriculture	21	6
Transport	18	5
Mining & minerals	14	4
Other	16	4
Total	364	100

VISS: Latrobe Regional Hospital. Age 15 years and over 1.7.91 to 30.9.91
Work-related injuries

Table 5 - Occupation:

	N	%
Tradespersons	132	36
Plant & machine (operators/drivers)	76	21
Labourers, related workers	66	18
Professional/service	60	17
Managers, admin.	25	7
Clerks	5	1
Total	364	100

VISS: Latrobe Regional Hospital. Age 15 years and over 1.7.91 to 30.9.91
Work-related injuries

Table 6 - Type of eye injury:

	N	%
Foreign body	129	47
Abrasions	40	15
Inflammation/pain	32	12
Cuts & lacerations	24	9
Burn	16	6
Haematoma	15	5
Penetrating wound	7	2
Other	11	4
Total	274	100

Note: Five of the 269 people injured both eyes.
VISS: Latrobe Regional Hospital. Age 15 years and over 1.7.91 to 30.9.91

machinery (26). The most common types of equipment responsible for eye injuries on the job were grinders, buffers or polishers (24) and welding equipment (16).

Safety glasses were reported to have been worn in only 40 cases (36%). This low figure might be due to under-reporting of

eye protection by respondents. It might also reflect a high wearing rate of adequate protection among the remainder of the workforce resulting in protection from injury, it does however raise the question of the adequacy of the eye protection used by those injured while wearing it.



Non-occupational:

Table 7 shows the activities in which the people not on the job were engaged.

	N	%
Maintenance	67	43
Leisure/playing	26	17
Transport	16	10
Sports	12	7
Household activities (sleeping, washing etc.)	13	8
School (excl. sport)	3	2
Fight	9	6
Other	11	7
Total	157	100

VISS: Latrobe Regional Hospital. Age 15 years and over 1.7.91 to 30.9.91
Non-occupational eye injuries

Over half of the incidents (59%) occurred at home, and the majority of these (70%) happened in the garden, garage or yard. Sixteen people were victims of assault (10% of all eye injuries). A much lower proportion of people in the non-work category reported the use of a safety device. Only 21 (13%) stated that they were wearing safety glasses.

Comment:

There appears to be a strong need for an intervention program aimed at reducing the number and severity of eye injuries in the Latrobe Region. In particular, people engaged in high-risk activities such as using grinders need to use appropriate

eye protection, as glasses might not be adequate. Sixteen of the 61 people who were wearing eye protection (26%) state that a foreign body entered their eye, either from the side or from the base of their protective clothing. This phenomenon has been described elsewhere (SAHC, March 1991). The program should be aimed particularly at employers, workers and home handy-persons. Such a program would be relatively inexpensive and any improvements could be monitored by VISS.

Although only three months of data have been analysed it appears that some injuries are sustained by people who have

no direct involvement in the activity which places them at risk. For this reason it is strongly suggested that bystanders need to protect themselves from eye injury, in particular supervisors need to set an example to colleagues, whilst at the same time protecting themselves. One possible intervention could be that in the work place, and even at home, a line could be painted on the ground to define a 'danger zone' beyond which eye protection should be worn.

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 Injury Surveillance Monthly Bulletin No. 31 Eye Injury; South Australian Health Commission, Epidemiology Branch, March 1991.
 Latrobe Regional Commission 'The Gippsland Magazine' No 2 1991,

Exercise Cycle Update

In a previous edition of *Hazard* (No 5, May 1990) and more recently in the Medical Journal of Australia (Sept 1991) VISS has highlighted the dangers of exercise cycles. Young children (usually aged 1 to 2 years) have become injured as a result of their finger coming into contact with an exposed and moving part of the equipment. To September 1991, there have been 41 such cases recorded in the VISS database. Again we remind our readers that this represents only a sample of injuries to children in the northwest region of metropolitan Melbourne and that an unknown number

of similar injuries may have presented elsewhere.

The types of injuries are of concern for two reasons. The injuries are potentially disabling and could easily be prevented. A majority of children (63%) sustain injuries that need plastic surgery and several may even lose one or more fingers. Secondly the design of the equipment lends itself readily to modifications which would minimize the risk of further finger entrapment injuries.



What is being done?

Following the publication of the MJA article the Federal Minister for Justice and Consumer Affairs, Senator Michael Tote, issued a national media release. It warned owners of exercise bicycles of the dangers and advised them to be cautious if children were present. The Minister went further by issuing a *warning notice about possible hazardous goods* (Consumer Protection Notice No. 18 of 1991) under the Trade Practices Act 1974. This described the possible risks of finger and limb entrapment injuries which may be caused by unguarded sprockets, chains and spoked wheels of home exercise cycles.

The campaign continues with the release of the Injury Surveillance Bulletin (no. 37 & 38, Sept-Oct 1991) from the South Australian Health Commission (SAHC) which calls for the establishment of an Australian Standard for the design of exercise cycles. A recent survey conducted by the SAHC Public and Environmental Health Division found that only one of the 14 new cycles examined in retail outlets was satisfactory in terms of child safety.

VISS is working closely with the Victorian Ministry of Consumer Affairs and more recently with the Federal Ministry for Justice and Consumer

Affairs, providing timely and detailed information about finger injuries from exercise cycles and supporting actions that will improve the design of this hazardous equipment. Although such changes will benefit the owners of new cycles it is most important that owners of existing machines be reminded of the hazard these cycles pose to young children.

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How to Access Viss Data

VISS collects and tabulates information on injury problems in order to lead to the development of prevention strategies and their implementation. VISS analyses are publicly available for teaching, research and prevention purposes. Requests for information should be directed to the VISS Coordinators or the Director by phoning (03) 99051805. **The VISS fax number is (03) 9905 1809.**



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Royal Victorian Eye and Ear Hospital

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Business Model Systems

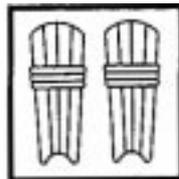
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