Hazard
(Edition No. 18)
March 1994

Victorian Injury
Surveillance System

Monash University
Accident Research Centre

ISSN-1320-0593

This edition of Hazard continues a detailed description of work related injuries from Hazard 17 focussing on several key areas for prevention. It also draws attention to the issue of children injured in the workplace. Additionally updates are provided on progress towards the prevention of dishwasher detergent poisonings, there is a summary of VISS information requests for 1993 and information on the Esso Home Safety Lecture Kit.

Work Related Injuries

Virginia Routley
Julie Valuri

Summary

The hazards discussed in this continued analysis of work related injury on the VISS database are trucks, chemicals, ladders, forklift trucks, scaffolding, flame, fire and smoke, electrical injuries, lifting and cardboard products. Additionally there are analyses of children in the workplace and on-the-job. The average overall admission rate for adult on-the-job presentations was 10%. Injuries from electrical wiring were more serious with an admission rate of 38%, as were those from trucks, ladders, forklift trucks and flame, fire and smoke (admission rates approximately 20%).

Analysis of data on these hazards revealed truck drivers falling from the truck, usually while loading or unloading were the major cause of truck related injuries. For chemical injuries it was caustic soda splashing into the eyes or onto the face or hands and causing partial thickness burns. For ladders, it was tradesmen falling by slipping or missing steps or the ladder itself slipping, most often causing fractures to the forearm or ribs. Forklift injuries were most often incurred when the forklift ran over an adjacent worker's foot or hit against the victim, causing injuries to the lower part of the body. Scaffolding injuries usually occurred to tradespersons working on construction sites where the victim most often fell from or was hit by the scaffolding, the latter while being dismantled. Injuries from flame and fire were usually partial thickness burns mostly caused by welding, particularly oxy welding and industrial equipment. Injuries from electrical wiring were one half shocks, one quarter burns. They were concentrated in the paper products and power generation industries.

Injuries to child workers most frequently occurred to children delivering newspapers and pamphlets by bicycle. The areas of production in which children were frequently injured were farms, factories and warehouses and construction sites. Child injuries in workplaces were generally quite severe with an admission rate of 36%.

Adults

Introduction

An overview of factors associated with injuries in the workplace is presented in Table 1 (re-printed from Hazard 17). Factors above a frequency of 200 presentations in the six related hospital years of data reviewed have been discussed in *Hazard 17*. A selection of those factors associated with below 200 cases for which there are ready countermeasures for prevention are discussed in this edition. The cases presented to the Western Hospital, Latrobe Regional Hospital over a period of two years and the Preston & Northcote Community Hospital and Royal Melbourne Hospital over one year. The injuries were defined as having occurred on-the-job.

Causes of Injury Table

The factors listed in Table 1 were either a breakdown factor (led to the injury occurring) and/or a mechanism factor (directly injured the victim). Due to this method of selecting cases and the fact that up to 2 of each factor type can be nominated per case there is some overlap between factors eg metal parts and foreign bodies with grinders and wind; ladders, trucks and water with various surfaces; meat and poultry with knives and slicers.

Causes of Injury **Table 1.**

Factors	Number of Cases		
	Presentations N	Admissions N	Adm/Pres. %
Metal parts or pieces of unknown origin	700	51	7
Foreign bodies nec	622	0	0
Industrial equip nec	550	94	17
Knives	515	42	8
Grinders	334	19	6
Concrete & other manmade outdoor surfaces	324	59	18
Welding equipment electric & ns	228	4	2
Hypodermic needles & syringes	225	0	0
Passenger cars or station wagons	222	30	14
Ground	212	46	22
Floors or flooring materials	206	20	10
Trucks	176	39	22
Stairs/steps	179	10	6
Chemicals	158	15	10
Ladders	111	22	20
Pipes	103	9	9
Fork lift trucks	102	20	20
Nails, screws, thumb tacks	102	10	10
Wind	97	2	2
Water not hot (associated with surfaces)	88	7	8
Beams, bars	84	10	12
Hammers, sledges & mallets	77	3	4
Meat & poultry (associated with knives, Haz 17)	75	5	7
Carts, other or n.s	62	4	6
Scaffolding	60	9	15
Skids, pallets	60	4	6
Cabinets, racks, room dividers	53	2	4
Hot water	51	2	4
Flame, fire smoke	51	11	22
Electrical wire or wiring system	51	19	38
Cardboard products	43	1	2

Causes of Injury

(Continued from Hazard edition 17)

Trucks (n = 176)

Truck related injuries, which occurred almost exclusively to males, were concentrated in the 30 to 39 year age group (one third of injuries). The most frequent occupation was truck driver (59%). Labourers and related workers (including garbage collectors) accounted for an additional 15% of cases, trades persons 10% and forklift drivers 2%.

The factory or warehouse was the location for one third of the injuries, 23% occurred on a public road, 11% in areas of commerce (eg. shop or pub), 4% in a parking area and 3% in a mine/quarry.

Victims falling from a truck accounted for 44% of injuries, these including the victims slipping and falling while loading or unloading. The injuries most often caused from falling were ankle and knee sprains/strains and lower arm and rib fractures. Trucks involved in collisions, most often when a car crashed into the truck, and victims being 'caught in or snagged' each caused 8% eg *'Driver of truck. Struck from behind by other vehicle. Hit head on windscreen', 'Whilst loading truck finger jammed between chain and trailer*

of truck'; over-exertion from loading and unloading trucks caused 6% eg *'Unloading truck. Moving pallet from truck wall, instant sharp pain in shoulder'* and the victims jumping or climbing down from the truck 4%.

Overall, fractures were the predominant injuries (22% cases), especially to the radius/ulna and fingers. Lacerations accounted for 21% of injuries, mainly to the face, scalp and fingers. Eighteen percent of truck related injuries were sprains/strains, mainly of the ankle.

Prevention

1. Mechanized loading and unloading devices eg forklifts.
2. Slip resistant treads on the steps.
3. Redesign of the placement of the steps, of the spacing between the steps and of the positioning of the grab rails in relation to the steps. (Haworth, N, 1994)
4. Truck cabins designed to provide better protection for occupants.
5. Fitting and wearing of improved truck seat belts, these being consistent with Australian Design Rule 5/02.

Chemical Injuries (n = 158)

As for most work-related injury types, cases were predominantly male. Almost one half of injury and poisoning incidents occurred in a factory or warehouse, 16% in areas of commerce, 10% in a hospital and 4% in an educational environment.

The majority of injuries or poisonings (56%) occurred when chemicals splashed, sprayed or sprinkled onto the victim, 23% when the victim inhaled gases or fumes, 4% when chemicals were absorbed and 2% when chemicals were ingested.

Caustic soda was the major chemical involved, accounting for 17% of cases. The most frequent scenario for this chemical was it splashing into the eyes or face and onto the hands. Acid (including sulphuric acid, cyanide and nitric acid) caused 15% of injuries or poisonings, gases 9%, ammonia 3% and formaldehyde 2%.

Burns were the most frequent outcome (46% of injuries) and these occurred most often to the eyes. Nineteen percent of chemical injuries were poisonings (through the skin, lungs, mouth, etc), 13% were inflammations and 5% were foreign bodies eg. dust from powdered chemicals.

The manufacturing sector, especially the paper, paper products, printing and publishing industry (13%) and the chemical, petroleum and coal products industries (11%) were particularly highly represented. A further 11% occurred in the health industry, 10% in the transport and storage industry and 6% in construction.

Prevention

1. Protective clothing should be worn when handling chemicals eg. eye protection, gloves.
2. Employees should be trained in the safe use and handling of chemicals. (OH&SA - "Significant Incident Affecting Health and Safety", No. A37.)
4. If possible, a less dangerous cleaning agent should be used. (OH&SA - "Significant Incident Affecting Health and Safety", No. A37.)
3. Containers which contain, or have contained chemicals should be clearly and accurately marked. (Dept of Labour, No. 19, Feb 1991).

Ladders (n=111)

Injuries related to ladders occurred mostly to men (90% of cases) and were most often in factories and warehouses, shops and private homes (26%, 17% and 16% of cases respectively). Injuries were usually a result of falls, particularly over one metre. They were more serious than work injuries generally (20% ladder cf 10% non-ladder admission rate), in part because they were more likely to occur to older workers (35 years plus). These older workers accounted for 58% of ladder injuries but only 41% of other work-related injuries. Ladder injuries in the home which were not work related also disproportionally occurred to older men (20% of ladder injuries were to men aged 60-69 years). (Routley and Valuri, 1993)

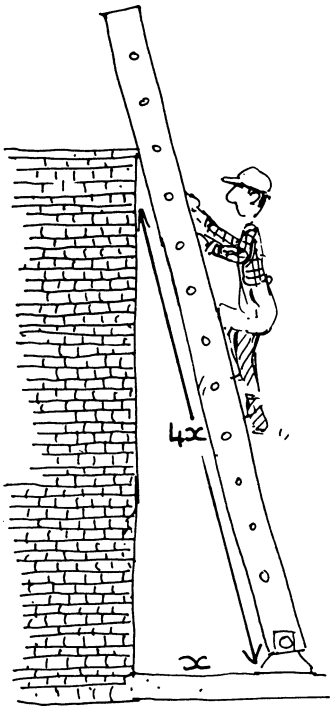
The most frequent injuries were fractures (35%), especially to the forearm and ribs; bruising (27%) and lacerations (22%), especially to the fingers.

Tradespersons, particularly painters and decorators, plumbers, electrical fitters and carpenters were occupations most frequently injured by or while using ladders.

The most frequent scenario (44% of cases) was the victim falling by slipping, missing steps or simply falling with no further details of how this occurred eg *'Standing on ladder at work. Fell approximately 2 metres'.* In this group there were three instances of the victim standing on the top step. Less frequent was the ladder itself slipping or collapsing (27% of cases) or victims, sometimes bystanders or passers by, being injured directly by the ladder (19%) eg *'Walking to work. Struck by ladder protruding from car'.* Other cases involved the victim being caught be-

tween the ladder and an object such as a plank or the ladder itself breaking (n=2).

Figure 1



Forklift trucks (n = 102)

Forklift injuries mostly occurred to men in factories or warehouses (71% of cases) and in areas of commerce (eg. shop or pub) (14%).

The most frequent scenarios were the forklift running over the victim's foot (24% of cases), being hit by the forklift (16%) and being trapped, caught or crushed between the forklift and an object or surface (13%). Objects falling off forklifts and hitting the victim, falls and the victim hitting against the forklift each caused 8% of cases; getting caught in the forklift 4%. (See Figure 2).

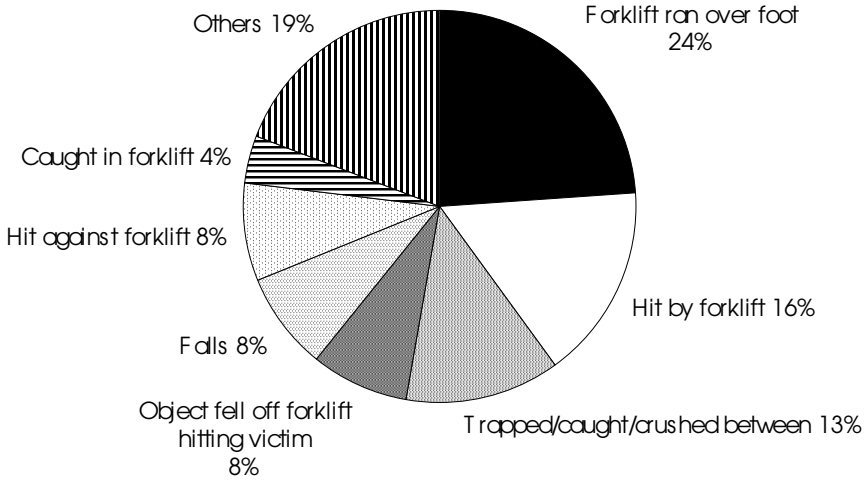
Almost half the injuries were to the lower part of the body, particularly the foot. Ten percent of injuries were foot fractures, 8% crushing injuries to the foot and 6% bruising of the foot.

Prevention

1. Workers should stand no higher than the third rung from the top. Marking these rungs a different colour would assist in ensuring this is adhered to.
2. Ladder rungs should be slip resistant and muddy or slippery boots cleaned before mounting the ladder.
3. The ladder should be placed with the feet 1/4 of its working length away from the base of the structure. (See Figure 1)
4. The ladder should be frequently repositioned so that stretching is not required ie the centre of the body should be kept within the side rails.
5. The ladder should be located on a firm footing using slip-resistant feet, secure blocking or steel spikes or have someone hold the ladder.
6. Instructions on the ladder in regard to load limit and maintenance should be carefully followed.
7. There should be only one person on the ladder at a time and the ladder faced when ascending or descending.
   (Canadian Centre for Occupational Health and Safety)
8. Ladder work may be more safely undertaken by younger workers.
9. The Code of Practice 920 applies to ladders (Committee on Occupational Health and Safety in Commonwealth Employment, 1979). Additionally there are Australian Standards which apply to ladders. These are AS 1657 - 1972 (fixed, design), AS 1892.1 - 1986 (portable, metal), AS 1892.2 - 1992 (portable, timber), AS 1892.4 (Int) (portable, selection, safe use and care).
10. Bystanders should be protected from ladder injuries by limiting and clearly marking any protrusions in public areas or from vehicles.

Forklift Truck Injuries **Figure 2**

Causes of Injury



VISS: >= 15 yrs; WH(2yrs), LRH(2yrs), PANCH(1yr), RMH(1yr) *n=102*

Half of forklift injury cases (53%) were persons working near the forklift. A high proportion of injuries to adjacent workers was also found in Rechnitzer and Larsson's report "Forklift Trucks and Severe Injuries: Priorities for Prevention" in which they stated 45% of forklift injuries were to adjacent workers. They noted that the single most severe injury problem associated with the use of powered forklift trucks in working life appeared to be caused by the interaction of vehicles and adjacent workers.

Forklift injuries occurred most frequently in the manufacturing sector (38% of cases), in particular the food, beverage and tobacco and textiles industries. A third occurred in the transportation and storage industry, especially road transport and 10% in the wholesale/retail trades. This is similar to Rechnitzer and Larsson's observation that 'the three major industrial areas with high numbers of forklift injuries are manufacturing plants, warehouses/coldstores/wholesalers and freight handlers.' (See also children injured in areas of production).

Rechnitzer and Larrson's main conclusion was 'Forklift trucks are not recognised as vehicles - in rules, regulations or industry - they are thus not subjected to systematic traffic management, and the systematic traffic control systems required for forklift truck use, in different industrial environments have not been specified.'

Prevention

1. Forklift trucks be recognised as a 'heavy goods vehicle' which require appropriate facility design for their operation. Develop industry specific models for the layout of new facilities which incorporate the principles of effective traffic management and separation of forklifts, adjacent workers and other traffic.

   These models would be developed by working with specific industry leaders on new facility designs, which are being developed. This process would bring together the skills of the materials handling specialists, the client requirements and the occupational, health and safety requirements.
   (Rechnitzer and Larsson, 1992)

2. Protection for the feet of bystanders such as a ground level guard on forklifts.

3. In a freight terminal, no forklift and pedestrian movements should ever take place at the same level, in the same space.

   In a warehouse, all forklift movements should be separated from manual picking - in space, by the forklift truck filling shelves from one side and picking from the other - or in time.

   In a manufacturing plant, forklift trucks should be limited to specific areas and completely separated from pedestrian walkways and walk stations.
   (Rechnitzer and Larsson, 1992)

Scaffolding (n = 60)

Almost a third of the scaffolding injuries occurred when the victim fell while working on scaffolding, these incidents causing the more serious injuries. A quarter of these falls were from the scaffolding itself collapsing. In one-fifth of cases the victim was hit by pieces of scaffolding, usually when dismantling the scaffolding. Seventeen percent occurred while the victim was either putting up or dismantling the scaffolding and foreign bodies (eg. dust) went into their eyes.

Injury incidents mostly occurred on construction sites (48% of injuries), in areas of commerce (10%) and in factories or warehouses(8%). The majority of injuries were to trades persons (80%), particularly carpenters, bricklayers, plasterers and painters.

Most frequently injuries were to the hands and eyes (both 16%) and the ankle (11%). By nature of injury they were lacerations 20%, bruising 19%, fractures 16% and foreign bodies 13%.

Prevention

1. In Victoria there is the Scaffolding Act 1971 No. 8146.

2. The following Australian Standards apply to scaffolding equipment:

   - AS1418.2 (hoists)
   - AS1576.1 (general requirements)
   - AS1576.2 (couplers and accessories)
   - AS1576.3 (prefabricated and tube - and - coupler)
   - AS1576.4 (suspended scaffolding)
   - AS1577 (timber planks for scaffolding)
   - AS1578 (laminated timber planks for scaffolding)

3. Use of eye protection during erection and dismantling of scaffolding.

Flame, Fire and Smoke (n=51)

Injuries from flame, fire and smoke occurred mostly in Autumn (43% of cases) and were relatively severe (22% admitted). A factory or warehouse was their most frequent location (one half of injuries).

Partial thickness burns (88% of injuries) were most frequent to the face and scalp, eyes and hands. Welding and industrial equipment, particularly powered conveyors and cutting torches, were often associated with these burns. Structural steel, boilermaking and welding personnel, plumbers and production managers were the occupations most frequently injured.

Figure 3

Oxy welding equipment was responsible for 8 of these cases, 4 of them igniting clothes eg *Cutting steel with oxy torch. Overalls caught fire.* Flash burns from other welder types were responsible for 6 injury cases, mostly to the eyes. Igniting gas appliances, particularly hot water services, caused 5 injury cases, 4 cases were vehicle related eg *'Driving bus, air fan caught fire'*. Three cases each were caused by a fire on a dredger in an open cut mine, from an electrical circuit board and from petroleum products.

Prevention

1. The wearing of **leather aprons** and gloves while oxy welding.
2. The wearing of adequate face protection while welding.
3. Allowing excess gas to clear before attempting to ignite gas appliances.

Electrical Wiring (n=50)

Injuries from electrical wiring were mostly electrical shock (50%) and partial thickness burns (28%), the latter largely to the forearm, face and scalp. They were relatively serious injuries, having the highest admission rate (38%) of all injury types. A factory or warehouse was their most common location (43% cases) and there were an additional 14% of cases in private enterprise areas.

One quarter of injuries from electrical wiring were caused by a failure or malfunction, another quarter by overexertion and one fifth by the person being in a dangerous position. Exposure to mains caused two thirds of injuries, exposure to other currents 14%.

One quarter of injuries from electrical wiring were in the paper products industry and almost all of these were electrical shocks from exposure to mains. They occurred by various means eg *'Working. Touched 240V power lead which had bare cable'* and *'Fitting water hose while lying over a junction box. Electrical fault'*.

Another quarter (n=14) were to workers in the electricity service industry. Seven of these victims suffered shocks or burns from switchboards. eg *'Working on electrical switchboard. Sustained shock 415 volts. Thrown back onto wall'*. Others were various eg *'Wiring lights. Screw driver slipped.', 'Repairing photo processing machine. Hand slipped onto 240V.'*

Overall electrical fitters and mechanics and plant and machine operators were the most frequent occupations to suffer injuries from electrical wiring systems.

Prevention

1. Electrical equipment and circuits should be turned off before attempting repairs.
2. Regular maintenance of electrical wiring and equipment.
3. Only qualified electricians should work on electrical equipment.
4. Insulated tools and appropriate clothing should be worn for electrical work.
5. Residual Current Devices should be fitted into the circuits of both domestic and industrial premises wherever practicable.
6. The Occupational Health and Safety Act 1985 and the Code of Practice for Temporary Electrical Installations on Building and Construction Sites apply to hazards associated with working on live electrical wiring. (OH&SA, 1991).

Cardboard Products (n=43)

Almost all concerned cardboard boxes or cartons. Over half (53%) occurred in a shop, particularly in supermarkets. Lacerations to the fingers and hand (31%) and lower back sprain/strains were the most frequent injuries. These injuries however were rarely serious ie admitted to hospital.

The majority of victims were injured by a knife or carton cutter slipping while they were opening cartons (n=16)

eg *'Cutting open boxes with knife. Slipped. Cut hand with knife'* or when moving boxes (n=15) eg *'Bent over to lift box of paper, over-exerted self'*. Others were directly injured by the boxes themselves (n=6) eg *'Working as a storeman when boxes fell onto his head'*. or by the box contents (n=6) eg *'Working when slipped over a carton and was hit by a piece of protruding steel'*. A few were a combination eg *'Unloading when carton slipped out of hands and landed on toe'*.

Storepersons, sales assistants and other labourers were the most frequently injured occupations.

Prevention

1. The wearing of leather gloves when opening boxes.
2. Blades should not be used which are longer than is necessary for the task. They should be retractable and training should be given, especially in the use of longer blades.

Lifting (n=1158)

The definition of lifting used in this article refers to carrying, stacking, hauling, holding, loading, unloading, moving, picking up, putting down, transferring or lifting. Needlestick injury cases, often associated with 'picking up' in the text search, have been excluded from the analysis.

One third of cases occurred in a factory or warehouse, 14% in a private enterprise area eg shop and 12% in hospitals. The means by which persons were directly injured are shown in Figure 4. Strain or overexertion and the victim being hit by a moving object were the most direct causes of injury.

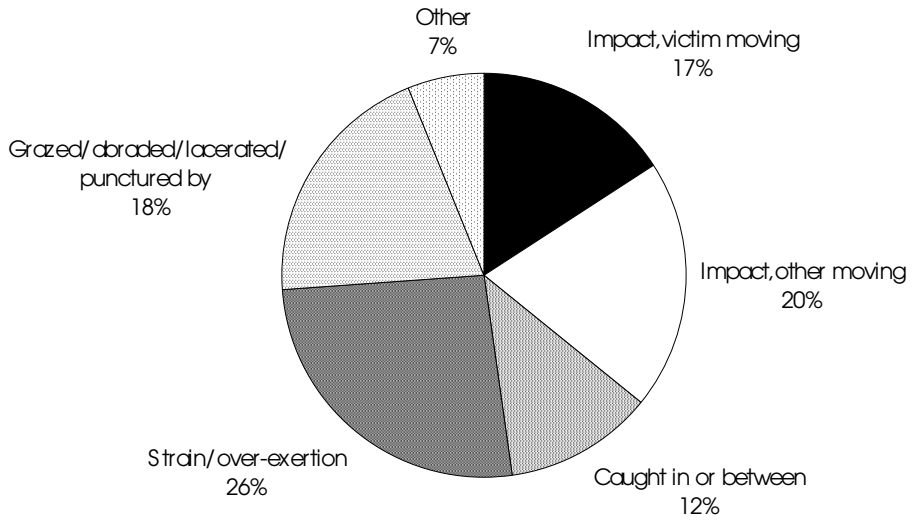
The most frequent injuries were to the fingers (20% of injuries), particularly lacerations; the hand other than fingers (8%), also largely lacerations; the lower back (12%), particularly sprain/strains and inflammation/ swelling/ oedema/ pain.

Factors most frequently involved were industrial equipment (26% of cases), especially forklifts, skids and pallets; motor vehicles (11%), particularly trucks and containers of various types (8%). The manufacturing, road transport and health industries were those industries where lifting injuries frequently occurred. The occupations most often injured were truck drivers (12% cases), registered nurses (5%) and various tradespersons such as metal fitters and machinists.

Finger injuries were most often caused by industrial equipment and knives (See Hazard 17), pipes and house construction materials. The mechanism of injury was usually 'grazed, lacerated, punctured' or 'caught in'.

One third of lower back sprain/ strains were incurred by nurses (state and enrolled) and ward helpers while lifting or transferring patients eg *'Lifting a patient from an ambulance stretcher when injured back'*, *'Transferring a patient from shower chair to walking frame, she injured her back'*. Other lower back sprain/strains were frequently incurred by truck drivers, cooks and cleaners.

Mechanism of Injury - Lifting **Figure 4**



VISS: >= 15 yrs LRH,WH (2 yrs),RMH,PANCH (1 yr) n= 1158

Prevention

1. Never combine work that involves loads and work that requires precision. (Falk, B 1984)
2. Redesign the job.
3. Provide mechanical handling equipment.
4. Provide training in manual handling skills.
   (OHS&A)
5. Where appropriate package smaller quantities of materials requiring manual handling eg cement.

Lifting of patients

6. A patient who cannot assist in the lifting should not be lifted alone.
7. Correct lifting procedures eg cradle, shoulder lifts should be used.
8. Mechanical lifting devices should be used for heavy patients, especially when they cannot assist.

Children

These 339 cases, aged under 15 years, presented over the period 1989-93 to the Western Hospital, Royal Children's Hospital and Preston & Northcote Community Hospital.

Child Workers (n=46)

All cases were aged over 10 years and one quarter were admitted to hospital. Over half (n=26) involved child workers delivering papers, pamphlets and phone books. Sixty percent of these paper boys etc were riding a bike and half of these in turn involved a collision with a car. Others were due to the load of papers causing the bike to overbalance or concentration being fully directed at the delivery task eg '*Delivering papers. Looking at letterbox numbers, rode a bike into parked truck'* and '*Paper round, crate moved forward. Lost control of bike. Fell onto road.*' Approximately half the bike riders noted having worn helmets. There were 7 dog bite cases, 5 of them to children delivering papers etc on a bike. eg '*Delivering papers. Was chased by a dog and bitten.'*

Other injuries were due to those working with food cutting their fingers with knives or slicers (n=5) eg *'Working in fish and chip shop. Slicer cut tip off right ring finger'*, the remaining cases were single incidents. The more serious of these ie those admitted to hospital were '*A 14 year old on work experience crushed a finger on a metal punch machine'* and *'Boy fell 4 m through the roof of a car parts retailer, then hit the banister of the stairs, fracturing his rib'*.

Prevention

1. Various health and safety regulations apply to children and young people in the workplace. Other than the Occupational Health and Safety Act 1985, relevant regulations refer to machinery (1985), general safety (1986), lead control (1988), tractor safety (1986) and lifts and cranes (certification of operators, 1972). (OH&SA, 1991)
2. Children or young people should not be left alone to operate machinery or equipment.
3. They should not be assigned potentially dangerous tasks for which they are untrained or ill equipped.
4. Young people engaged in casual or part-time work should be aware that they have as much right to safe working conditions as any other worker. Adequate training, instruction and close supervision of young people in workplaces are of paramount importance.
   (OH&SA., 1991)
5. Supervisors of children delivering papers and pamphlets on bikes should check that the load is in proportion to the size of both the child and the bike and that the bike is not unbalanced. They should also ensure that children do not commence their round without helmets.
6. Problems with unsecured dogs should be reported to local government authorities by supervisors.

Children Injured in Areas of Production (n=293)

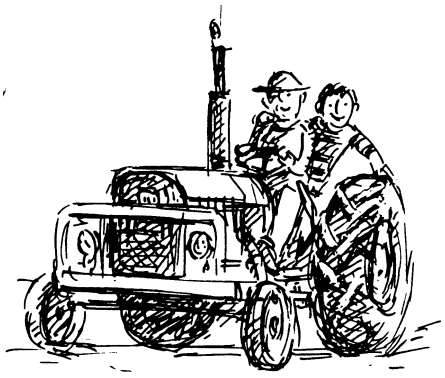
Most workplaces are very dangerous for toddlers and young children. Young children are naturally inquisitive and energetic and express no appreciation of danger. They are easily distracted and can move extremely easily towards something that catches their attention. It is not possible to adequately supervise a small child whilst carrying out a job in the workplace, especially if there are potential hazards such as machinery, electrical equipment or hazardous substances in the vicinity. (OH&SA, 1991).

Areas of production here refer to farms or primary production (n=137), factories or warehouses (n=78), construction sites (n=49), mines or quarries (n=5) and other industrial (n=24).

Farms

In the farm category since home, work and leisure are interconnected at this location, not all of the 137 injuries were related to the work aspect of farming.

Figure 5



However, injuries in the farm-home and farm-garden are excluded from these analyses. Injuries here were most frequent in the younger (under 3 years) and the older age groups (over 8 years). Admission rates were extremely high (40% admitted compared with 18% average for children). Injuries were frequently associated with motor cycles (n=21); naturally occurring environmental factors eg rocks, trees, hay (n=20); horses (n=16, 10 of which involved the child falling off while riding); tractors (n=8); poisons (n=6); machinery (n=5) and dogs (n=5). Motor cycles and horses were concentrated in the older age group, poisons in the younger.

The tractor injuries were extremely serious, almost all were admitted to hospital. They involved either the child being caught in a part of the tractor eg *'Caught in tractor power train. Spun around up to 150 times'* or the child falling from the tractor eg *'Sitting on mudguard of tractor. Fell forward between wheels, run over by tractor'*. One quarter of all tractor fatalities involve children (OH&SA 1991).

Motorbikes, often with 3 or more wheels, were also relatively serious with half the victims admitted to hospital. They most often occurred when the bike hit an irregularity such as a bump or a ditch and the child lost control and fell off. All children who ingested or inhaled chemicals eg '*Playing. Got bottle of drench concentrate, drank small amount'* or who were injured by farm machinery eg '*Put fingers in fruit grading machine. Got caught between cogs and chain'* were admitted to hospital.

Factories, Warehouses

The 78 injuries which occurred in factories or warehouses were frequently severe with 30% being admitted to hospital. Nine of the 78 children were injured while working, some on work experience. Injury cases were most frequent at 2 years of age. One quarter of injuries were from industrial plant or equipment, especially powered conveyors (n=4) eg '*Child held his hand on conveyor belt and hand was pulled down roller'* and forklifts (n=4) eg '*Playing with forklift. Patient standing on fork, sibling moved fork, hand and elbow caught'*.

Other injuries were varied and unless the child was working or it was stated that they were accompanied by parents it was not usually clear from the injury description why the child was on the premises. Particularly nasty incidents were falls from heights of at least 10 feet (n=6) eg '*Playing. Climbed over 3 ft stair railing. Fell 30 ft onto concrete on back.'*

Construction Sites

Almost all the 49 construction site injury cases occurred on or around partially built houses. The most common cause (45%) was children playing on the area around the house and being injured by materials, frequently nails eg *'Fell onto plank of wood with protruding nails'*. Playing on partially built structures, particularly falling from frames and cross beams were responsible for 35% of injury cases. As for children at other production areas, construction sites also had a higher than average admission rate (26%).

Children Injured in Areas of Production: Latrobe Valley (n=63)

Additional data from the Latrobe Regional Hospital (n=63) had a greater proportion of children's injuries occurring on *farms* and *other industrial locations* and less in *factories* than Melbourne hospitals. *Other industrial locations* was high due to 8 of the 14 in this category being injured when 2 carriages towed by a tractor rolled on their side at a power station Christmas party. The injury patterns for *farms* and *factories/warehouses* were similar to those already described for Melbourne.

Children who may have been injured while accompanying adults working in non-production areas have not been included since it is impossible to separate them from those injured while shopping, having a meal in a restaurant, supervising a swimming pool etc.

Prevention

1. Children should not enter work areas particularly where there are dangerous machinery, substances or a potential to fall from a height. A barrier may need to be constructed to prevent entry, particularly for farms and construction sites.
2. Children should not ride or be in the vicinity of tractors or forklifts. These or other equipment should only be used for the purpose for which they are intended, not for joy rides at Christmas parties etc.

References

Haworth, N., Monash University Accident Research Centre, Personal communication, 1994.

Occupational Health & Safety Authority, Dept. of Labour. *Workplace Safety Guide*. No. 13. Children and Young People in the Workplace. 1991.

Occupational Health & Safety Authority, Dept. of Labour. *Workplace Safety Guide*. No. 19. Feb. 1991.

Occupational Health & Safety Authority., Dept. of Labour, 'Significant Incidents Affecting Health & Safety', No. A37.

OH&SA, Dept. of Labour, *Workplace Safety Guide*. No. 15, Electrocution.

Rechnitzer, G and Larsson, T.J. Forklift Trucks and Severe Injuries: Priorities for Prevention. Monash University Accident Research Centre. August 1992.

Routley, V, Valuri, J. *Hazard 14*. Home Injuries. Victorian Injury Surveillance System. March 1993.

Routley, V, Valuri, J. *Hazard 17*. Work Related Injury. Victorian Injury Surveillance System. December. 1993.

Victorian Work-Related Fatalities

An article in the last issue of Hazard described Victorian work-related fatalities. In that article, statistics from the Victorian Occupational Health and Safety Authority's Statistical Profile were presented. We would like to clarify that the quoted number of deaths according to this source, 34, refers only to the traumatic work-related fatalities that have been investigated by the Occupational Health and Safety Authority. The Victorian Workcover Authority's database, on the other hand, records approximately 260 workplace deaths a year, the majority resulting from unspecified causes or heart attacks.

Dishwasher Machine Detergents - Update

Julie Valuri

There were 60 cases of dishwasher machine detergent ingestions recorded on the VISS database from 1988 to 1993. Of these 35 were admitted to hospital for further treatment. Almost all of the victims were under 3 years old with the majority being one year old (55% of all cases).

Two thirds of the cases involved the victim ingesting residue left in the dishwasher after it had completed its cycle, eg. '*Reached into dishwasher and put fingers in undissolved powder in dispenser*'. Almost all of these involved the use of a powder substance. Where as most of these cases involved a young child, there was one case of a 12 year old who was admitted with injuries to the mouth and oesophagus after having drunk from a glass containing dishwasher detergent residue, this having remained post-cycle.

Figure 1 shows the distribution of dishwasher machine detergent presentations in the VISS database over the last 6 years. A press release made by the Minister for Health in late 1989 to warn the public of the hazards may have contributed to the decrease in presentations in 1990 as the public would have become more aware of dishwasher ingestions, especially from the door (Hazard 4, 1989). The following factors may have contributed to the decrease in 1992 and 1993.

- In September 1991 a workshop was held to develop a strategy to prevent poisoning of young children from dishwasher machine detergents. From this an action plan was developed looking at child resistant packaging, modified dishwasher design, parental awareness, standards for caking of dishwasher machine detergents and reduced alkaline content of the detergents. (Hazard 10, 1992)
- January 1992 - there was a press release from the Royal Children's Hospital by the Minister for Health on the hazards of dishwasher machine detergents.

Since the workshop in 1991, manufactures have been working on modifying the design of machines and making buyers of machines aware of the problems of dishwasher machine detergents.

- In May 1992 Benckiser (a leading detergent manufacturer) was working on an education booklet on dishwasher machine detergents. Vulcan Australia had warning labels on machines and warnings in the instructor/user guides. They were also looking at ways of altering their machines. Simpson and Miele also had warnings in instruction booklets plus Miele developed new warnings to highlight the problem.
- In August of 1992 Benckiser completed an education booklet to be included in new machines with the sample pack of detergent and Simpson included new instructions in their booklet.
- June 1993 - Vulcan, Email, AEG and Bosch had warning labels on their machines. Miele was arranging for the label to be put on in Germany. ASEA and Cleanmate were considering warning labels and including warnings in their user manuals.
- Manufactures of dispensers (mostly produced by a single supplier in Italy) have a new design which incorporates a bulk dispenser in the door of the dishwasher. However, they are still having problems with post cycle sludge. Benckiser are currently working with these manufactures and others on solutions to the problem.

Manufactures are now conscious of the problem of dishwasher machine detergent poisoning and are moving towards a long term solution, ie. to relocate or redesign the dispenser. The European Consumers Union has also been informed regarding the problem.

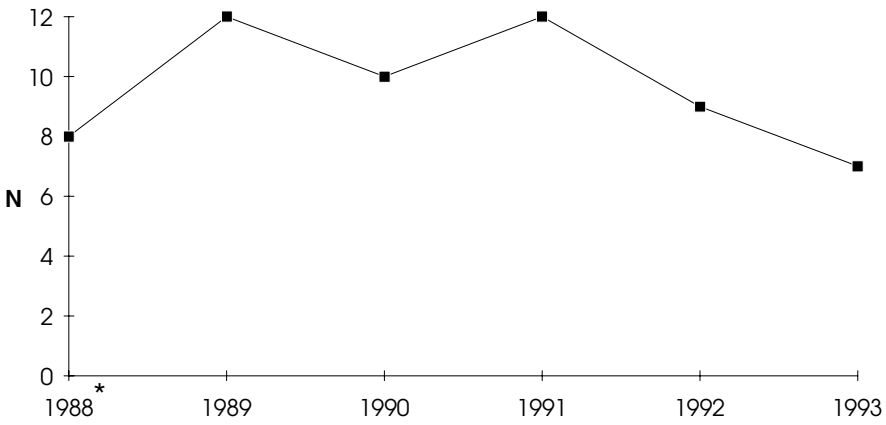
References

Dr Malcolm Dobbin, Health Physician, Department of Health and Community Services (Victoria), 1994.

VISS, *Hazard 4*, Drug Safety & Poison Control, November. 1989.

VISS, *Hazard 10*, School Injuries, March 1992, pg 9.

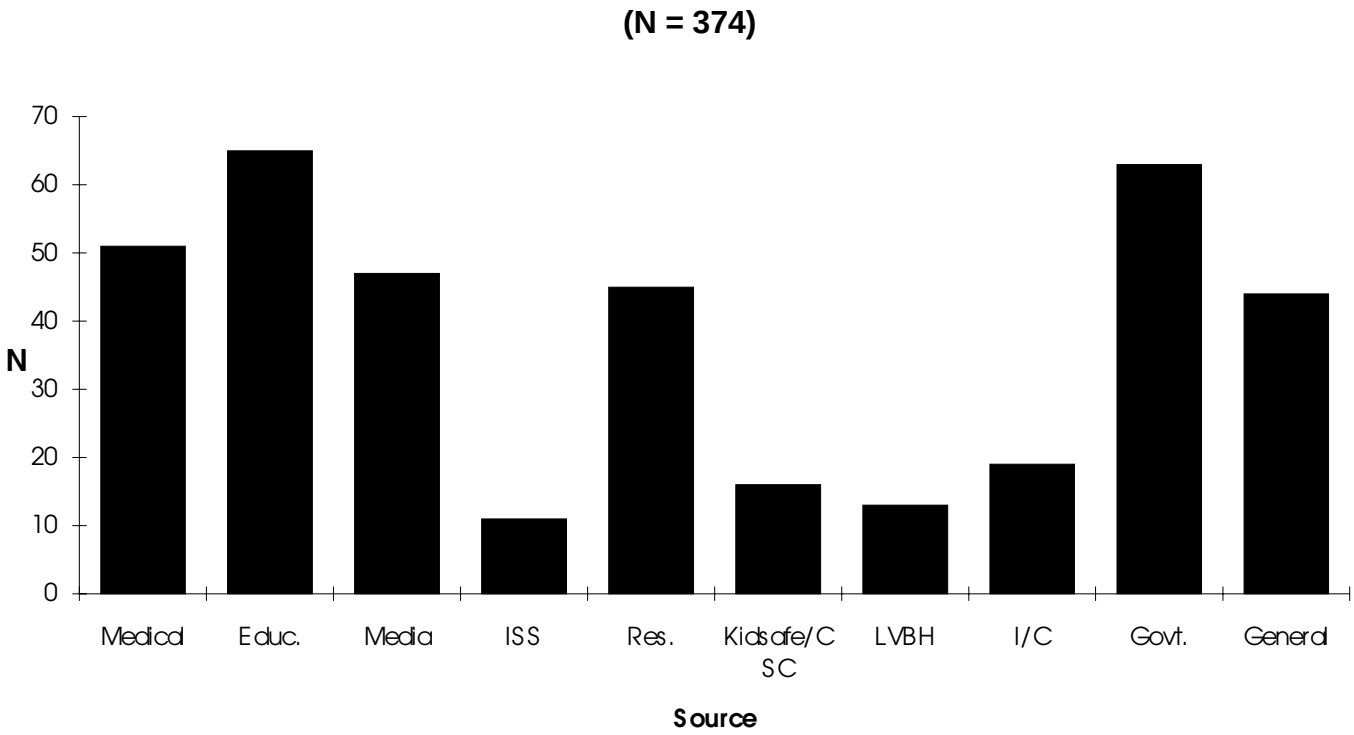
Dishwasher Detergent Presentations **Figure 1**



VISS:RCH,WH,PANCH (Presentations from LRH, RMH negligible) ** RCH data only*

VISS Data Information Requests

VISS Data Information Requests for 1993

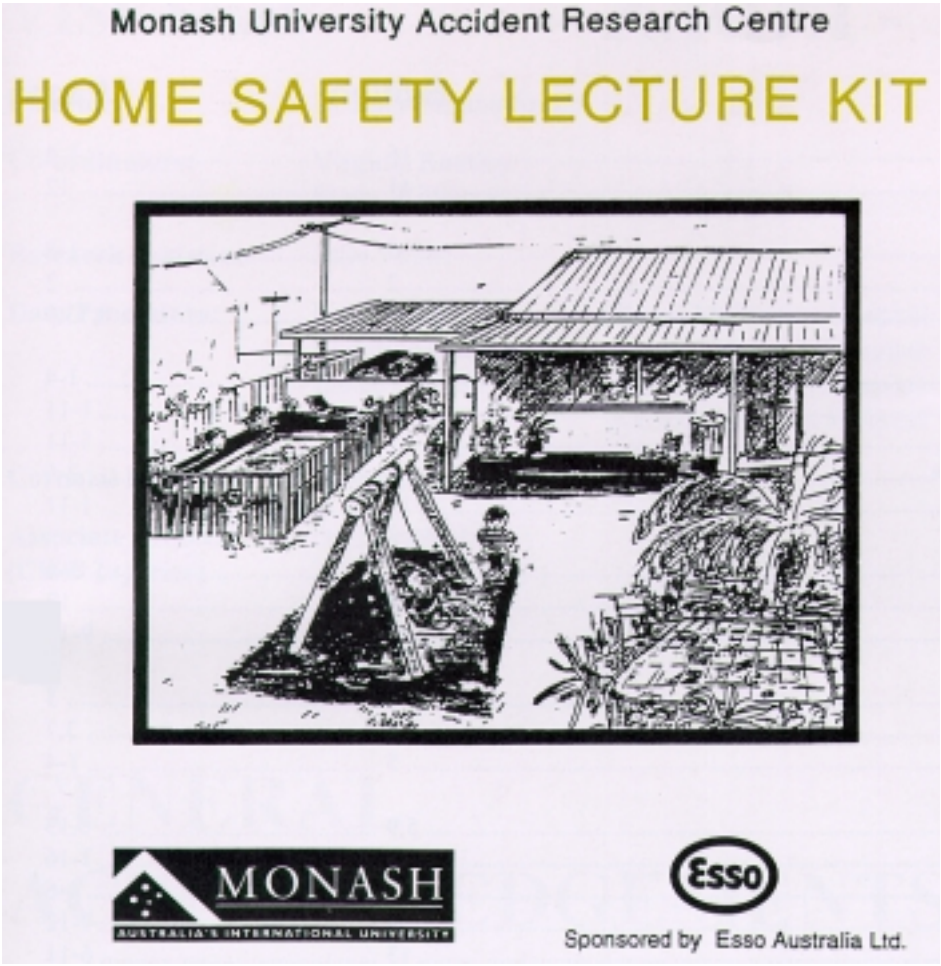


Educ. = Education; ISS = Injury Surveillance Systems (except VISS); Res = Research;
Kidsafe/CSC = Kidsafe (formerly CAPFA) and RCH Child Safety Centre;
I/C = Industry/Commerce; LVBH = Latrobe Valley Better Health Program;

The annual number of requests for data information and back copies of Hazard has continued to increase. The rise in data information requests since 1992 has been in all categories with the exception of Research, formerly the largest category, and the Child Safety Centre (CSC).

The Research decline can be attributed to the completion of several substantial research projects eg Australian Rules Football Injuries in Children and Adolescents, the Safe Accident Free Environment study. The decline in CSC requests is due to most children's injury topics now being covered by Hazards and the change in the Centre's policy from direct involvement to referring the requestor onto VISS. The Latrobe Valley Better Health Program has now been allocated it's own category since its number of requests is substantial and it does not fit easily into the other categories. The CSC and Kidsafe have now been combined.

The Medical category comprised largely hospital, particularly emergency department staff and ambulance organizations; Education was principally tertiary students and teachers; Media was principally the Sunday Age, Herald-Sun, local newspapers, radio and television; ISS included several requests from Canada as well as interstate surveillance systems; Industry/commerce included various companies seeking information on topics ranging from scalds to angle grinders, lawnmowers, architectural glass and drugs. The Government category was most frequently Federal, Victorian and interstate health and consumer affairs departments, local government bodies, members of Parliament and Vicroads. General included concerned community groups and individuals.



Monash University Accident Research Centre has developed a Home Safety Lecture Kit, sponsored by Esso Australia. The kit consists of a scientific background paper, together with a lecture outline and accompanying visual aids. The background paper describes the epidemiology of home injury in Victoria and is based on Coroner's and VISS data. The lecture covers patterns of home injury, hazards most commonly associated with both fatal and non-fatal home injury, and strategies for prevention. The lecture outline is easy to follow and assumes no background knowledge in injury research or prevention. Each kit comes with a choice of either coloured slides or overheads to support the lecture outline.

Monash University Accident Research Centre considers that the extension of the 24 hour safety model, embraced by Esso Australia, to other companies to be of particular importance and considers the Kit to be a mechanism for promoting that concept. Companies and organisations have much to gain from the prevention of injuries to employees occurring outside the workplace.

Kits will be available in May, 1994, for either purchase or hire by companies, community health centres, maternal and child health centres, health promotion professionals, community groups, schools, and other organisations. A kit will cost $130 to purchase, or $35 to hire. For further information contact Christine Chesterman on (03) 903 2880.

Short Course in Injury Research and Prevention

The Monash University Accident Research Centre will conduct a five day Short Course July 4 - 8 1994.

Venue: St Hilda's College University of Melbourne.

Topics will include:

- Principles of Injury Prevention
- Evaluation
- Implementation of National Health Goals and Targets
- Product safety
- Sports Injury Prevention
- Successful countermeasures and their implementation in road safety.

For further information and registration form, please contact:

Ms Fiona Williams,
Short Course Co-ordinator,
Accident Research Centre,
Monash University,
PO Box 197, Caulfield East 3145
(Phone: 903 2886)

- INDEX -

** Special edition*

VISS Staff

Director:	Dr Joan Ozanne-Smith	
Co-ordinators:	Virginia Routley Fiona Williams	
Research Assistant:	Julie Valuri	
Data Processors:	Karen Ashby	Royal Melbourne Hospital
	Christine Chesterman	Royal Children's Hospital
	Janice Groethe	Royal Children's Hospital
	Julia Palmer	Latrobe Regional Hospital
Coronial Data:	Barbara Fox	
Associate Director: (Child Injuries)	Dr Terry Nolan	

How to Access VISS Data:

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

GENERAL ACKNOWLEDGEMENTS

Participating Hospitals

Royal Children's Hospital

Western Hospital

Preston & Northcote Community Hospital

Latrobe Regional Hospital (Traralgon and Moe)

Royal Melbourne Hospital

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

Coronial Services

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

National Injury Surveillance Unit

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

VISS is located at:

7th floor, Tower Building
Monash University
26 Railway Avenue
Caulfield East

Postal address:

PO Box 197
Caulfield East
Victoria 3145

Phone:

Reception	(03) 903 2880
Co-ordinators	(03) 903 2885
	(03) 903 2886
Director	(03) 903 2884
Fax	(03) 903 2882

HAZARD VOLUME 1 -

Bound Edition of Hazards 1 - 10

These are available from VISS. A handling and postage fee of $10 applies.

Project Funded by
Victorian Health Promotion Foundation

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

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