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CONSUMER PRODUCT-RELATED INJURY TO CHILDREN

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Abstract:

This research was undertaken to establish the role of consumer products in injuries to children to underpin an injury reduction program by the Consumer Affairs Division of the Commonwealth Department of Treasury.

National and Victorian data were analysed to identify the types of consumer products involved in unintentional injuries to children. Products were ranked by frequency of association for four levels of injury severity: deaths, hospital admissions and non-hospitalised cases. Injury Surveillance data from the U.S. Consumer Product Safety Commission was also examined for comparison.

In Australia in 1997, injuries to children aged 0-14 years led to a total of 347 deaths, about 58,000 hospitalisations and an estimated 576,000 non-hospitalised, medical attendances. In total, it is estimated that there were about 634,000 medically-treated child injuries in that year. Overall, 1 in 6 children in the population sustained an injury for which medical treatment was sought.

In terms of unintentional injury death, the priority areas within the scope of consumer product safety are drowning (swimming pools), mechanical asphyxiation (cots, strollers, bunk beds) and fires (matches and lighters). Priorities based on hospitalisations are more diverse with more causes involved. Falls emerge as a common issue in the under fives with falls from playground equipment featuring in the 5-9 year age group. Hospitalisation data also shows the importance of poisoning (medicines and household products) and burns and scalds (hot drinks, hot tap water) in the under fives and recreation and leisure injuries (bicycles, play ground equipment, skates, skateboards and trampolines) in the older age-groups.

Recommendations are made for general product safety and injury prevention strategies relating to individual products and causes. Key recommendations relate to general product safety, bunk beds, baby walkers and trampolines.

Key Words:

Consumer product safety, children, injury surveillance, falls

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EXECUTIVE SUMMARY

AIMS & OBJECTIVES

The primary aim of this project was to undertake research into the role of consumer products in injuries to children (aged 0 to 14 years) in order to support a proposed injury reduction program in this area.

More specifically, the aims are:

- 1) To undertake a review of recent Australian and international literature concerning injuries to children (0-14 years), and to thus identify the major causes of such injuries and the extent to which consumer products are involved.
- 2) To identify and comment on major sources of injury data in Australia and overseas that can assist in exploring the links between consumer products and injury.
- 3) To analyse available data to investigate:
 - The nature of injuries and what types of consumer products may be involved, and;
 - The ranking of occurrence and severity of injury by product type.
- 4) To establish and comment on patterns and trends in injuries to children as a basis for injury prevention programs.
- 5) Having regard to the consumer product safety responsibilities of Consumer Affairs, make recommendations on injury prevention measures to assist children.

METHODS

An overview of the numbers and rates of injury for children in Australia is reported for three mutually exclusive groups that broadly reflect the severity of injury : 1) injury resulting in death, 2) injury resulting in hospitalisation and 3) non-hospitalised injury requiring medical treatment (Emergency Department and General Practitioner attendances). These are presented by five-year age-group and gender. For each level of severity, numbers and rates of the major causes of injury (including identifiable products) are also presented.

National injury data for deaths and hospitalisations was provided by the Research Centre for Injury Studies (RCIS; formerly the National Injury Surveillance Unit) at Flinders University. Estimates of the number of non-hospitalised injuries were based on ratios of hospitalisations to Emergency Department presentations, using data from the Victorian Inpatient Minimum Dataset (VIMD) and the Victorian Emergency Minimum Dataset (VEMD), and applied to the national hospitalisation figures. The total estimate was then broken down into injury cause categories, age, and gender groups using the distributions in the 1996 VEMD presentations data.

An overall estimate of the number of general practitioner attendances by age and gender was also calculated. This was derived by applying the ratio of general practitioner attendances to Emergency Department presentations (1.1 : 1) used in previous studies (Watson & Ozanne-Smith, 1997). However, it was not considered appropriate to provide estimates of the numbers and rates of injury by cause for this group of injuries, given the small and geographically limited sample on which the estimate is based.

National non-fatal injury surveillance data was provide by the NCIS and comparison data from the US by the National Electronic Injury Surveillance System (NEISS) managed by the US Consumer Product Safety Commission.

A more comprehensive analysis of product-related injury data from the Victorian Coroner’s Facilitation System (VCFS) and the Victorian Injury Surveillance System (VISS) held at Monash University Accident Research Centre (MUARC) was undertaken to examine the involvement of products in unintentional deaths, hospitalisations and non-hospitalised injury at different ages (0 years, 1-4 years, 5-9 years and 10-14 years).

A search of the national and international literature relating to child injury was conducted and the results of the data analysis discussed in relation to the literature.

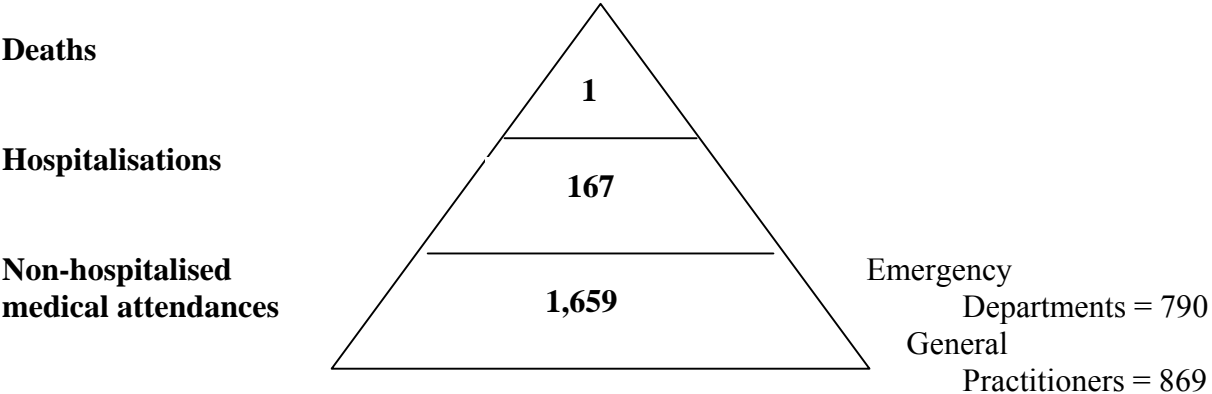
RESULTS

Magnitude of the problem

In Australia in 1997, injuries to children aged 0-14 years led to a total of 347 deaths, about 58,000 hospitalisations and an estimated 576,000 non-hospitalised, medical attendances at either hospital Emergency Department (274,104) or General Practitioners’ surgeries (301,514). In total, it is estimated that there are about 634,000 medically-treated child injuries in that year.

Overall, 1 in 6 children in the population sustained an injury for which medical treatment was sought. There were approximately 167 hospitalisations and 1,659 non-hospitalised medical attendances for every death (Figure 4.1).

Ratio of deaths, hospitalisations and medical attendances for injury in Australian children aged 0-14 years.



Overview

A marked decrease in death rate with increasing age is apparent to 14 years with the drowning peak in 0-4 year olds an obvious problem requiring intervention. Children in the 0-4 year age group are more vulnerable to injury, and death from injury, than other age-groups. Hospitalised and non-hospitalised injury rates for this younger age group are higher than for other children (5 to 14 years). The injury death rate for 0-4 year-olds is twice that of 10-14 year-olds and almost three times that of 5-9 year-olds. In terms of unintentional injury death, the priority areas within the scope of general consumer product safety are drowning, mechanical asphyxiation and fires.

Priorities based on hospitalisations are more diverse, with more causes involved. Falls emerge as a common issue in the under five year olds, with falls from playground equipment featuring in the 5-9 year age group. Hospitalisation data also show the importance of poisoning and burns and scalds in the under five year olds, and sports and recreation injuries in the older age-groups.

The location of injury occurrence varies with age, with the home particularly prominent for 0-4 year olds, where it represents the site for 73 percent of injuries. As children mature, the home decreases in importance with other locations increasingly involved and a more diverse spread of injury locations noted in the 10-14 year age group. This pattern reflects the increasing amount of time spent outside the home with increasing age. When estimated hours of exposure are taken into account for school and home injuries in older children, it is found that the risk of injury is similar (Goss, 1992).

Injuries in the first year of life

Data from the Victorian Injury Surveillance System suggest that nursery furniture is associated with 23 percent of injuries in this age group that are presented to hospital Emergency Departments, with falls accounting for almost 80 percent of these injuries. The most common items of nursery furniture associated with injury in this age group are prams and strollers, high chairs, baby walkers, bouncinettes, change tables and cots. Cots and pram/strollers are associated with fatal injuries in this age group.

Baby walkers allow an increased mobility beyond the developmental stage of the infant that often leads them into hazardous situations, which can result in a fall or accessing of hazardous substances such as hot beverages on coffee tables

Falls from heights also occur when infants are left unattended on beds, tables, chairs and couches or when bouncinettes are placed on elevated surfaces such as bench tops.

Infants become increasingly mobile in the first year of life, allowing them to access a wide range of hazards. Their small size in relation to their environment results in frequent scalds from pulling hot liquids down onto themselves from coffee tables or benches. They also access and frequently mouth a range of hazardous substances (e.g. cigarettes and medications) and objects left within their reach (e.g. coins).

Injuries to children aged 1-4 years

Drowning is the major cause of death in this age group with the majority occurring in backyard swimming pools. The hospital admission rate for this group is highest for falls. This is followed by poisoning and burns (principally scalds) which both peak in this developmental stage. Although this age group is treated as a single age category in this study, children are

still undergoing rapid development during this period which is reflected in the changing range and nature of factors involved in injury causation.

At two years of age the major factors associated with injury have changed considerably from those in the first year of life. The frequency of injury presentations to hospital Emergency Departments has almost doubled compared to the first year.

Furniture is still a predominate factor in injuries at this age. However, furniture is likely to be involved as a means of accessing hazards as well as being a fall hazard itself. Medications reach their peak involvement at this age and are represented by a high level of severity (16 percent of admissions at this age; Ozanne-Smith, 1992). Dog attacks, bicycles and tricycles and playground equipment (particularly slides) are also frequently associated with injuries. Finger jams in doors are also common at this age.

Toddlers apply their developing motor and cognitive skills to the task of exploring all aspects of their environment. While it must be accepted that infants and toddlers will experience minor injuries in the course of normal child development, it is unacceptable for children to suffer more serious injury. Thus a balance is required between a 'safe' environment and one which is stimulating and supportive of child development.

By the age of four years bicycles and playground equipment are more frequently involved in injury compared to younger children. Dog attacks remain constant and vehicles emerge as an important factor as children are transported more from their homes

As children of this age assert their independence, they are at risk of unwittingly exposing themselves or younger siblings to dangerous situations, such as the pre-school child who insists on crossing the road alone, or the four year old who loses control of the pram containing a younger sibling on a steep driveway.

Injuries to children aged 5-9 years

In this and other age groups (except less than 5 years), road trauma is the major cause of death from injury. Motor vehicles are also associated more severe injuries requiring hospital admission.

Sport and recreational factors, particularly bicycles and playground equipment predominate at this age. Falls remain the major cause of hospital admission due to injury. Among injuries requiring hospitalisation, falls from playground equipment provide an example of an injury type with a clear peak in this age-group, with monkey bars and other climbing equipment now predominant compared with the younger age group.

While males are generally over-represented in most categories of injury, the similarity in rates for males and females for playground equipment falls is noteworthy and probable relates to the relative levels of exposure.

Injuries to children aged 10-14 years

Motor vehicles remain a frequent factor in death and more severe injuries in this age group.

Although sports and recreational still dominate in both hospital admissions and Emergency Department presentations in this age-group, bicycles are more frequently involved and football and other ball sports have supplanted playground equipment. Other organised and

informal sport/recreational activities such as in-line skating and skate boarding are most frequent at this age.

Male overrepresentation is marked in this age-group, particularly among bicycle related and sporting injuries.

SUMMARY OF MAJOR RECOMMENDATIONS

GENERAL PRODUCT SAFETY

Policy

A systematic data driven approach to consumer product safety and a systematic approach to improving product design should be promoted to minimise product-related injury to children in Australia.

A general product safety directive should be adopted and enforced in Australia and New Zealand. This should take into account the observed strengths and limitations of the European Community's General Product Safety Directive (GPSD) of 1992.

Legislation, based on the U. S. model, should be introduced in Australia to require that manufacturers and importers to inform relevant consumer safety authorities of consumer complaints and other information pertinent to the safety of the products they manufacture or import.

Standardisation

As in the United States, mandation of standards should occur in Australia in cases where voluntary standards and marketplace forces have been shown to be ineffective in achieving compliance, and mandation is warranted by evidence.

Research and evaluation

The effects of the introduction of new standards and calls for the mandation of existing standards should be evaluated by monitoring injury data and conducting other investigations on products associated with injury such as cots, cigarette lighters, and baby walkers.

A model to identify priorities should be developed to assist with the setting of an evidence-based agenda for product-related injury prevention. An Australian injury cost and consequence model for product-related injury should be developed to assist in the evaluation of injury prevention programs.

Injury Data Collection

The establishment of a centralised clearinghouse is necessary to integrate and analyse data from all available sources (nationally and internationally) to identify potentially dangerous products and to disseminate information to regulators and other responsible bodies.

The National Coroners' Information System (NCIS), currently under development, should identify products and their involvement in deaths. This may require the development of a specialist module on product related deaths to supplement the core dataset. It may also require the development of data collection protocols and training for those investigating death scenes.

PRODUCT SPECIFIC RECOMMENDATIONS

Swimming Pools

The effectiveness of pool fencing legislation as a countermeasure to toddler drowning should be more fully evaluated. In particular, current pool compliance with regulations and methods of increasing compliance by pool owners should be investigated.

Nursery Furniture

The Australian standard for baby walkers, currently being developed, should address the major issue of baby walker falls (particularly down steps/stairs) in line with the recently strengthened US ASTM standard. Compliance with the standard and the injury rate should be monitored to establish whether mandating the standard is warranted.

A voluntary Australian/New Zealand standard for baby walkers should be supported with an extensive and ongoing educational campaign directed at parents, caregivers, retailers and nursery furniture importers (no baby walkers are currently manufactured in Australia).

The current development of the Australian/New Zealand voluntary standard on high chairs should be completed and released as soon as possible.

A standard should be developed for change tables. The standard should be based on the best available international standards or draft standards.

Children's furniture safety standards should be reviewed and modified, if necessary, at least once every five years to ensure that new requirements or revision of existing requirements occurs when new substantive information becomes available.

Ongoing surveillance of the second-hand products market should be undertaken to ensure the nursery furniture on display for sale complies with standards and to monitor any modification to product design and the general condition and level of maintenance of the furniture on sale.

Smoke alarms and other domestic fire prevention

Best practice state smoke alarm regulations should be implemented in all Australian States and Territories.

The availability and widespread installation of single purpose lithium smoke alarm batteries (which last ten years), mains powered smoke alarms and electric safety switches (power outlet, permanently installed switchboard units and portable units) should be promoted in existing homes.

Research into the development of suitable low cost, fire-retardant housing and furnishing/furniture materials should be promoted. Furthermore, information on the flammability of combinations of fabrics and fillings should be distributed to the furniture and furniture fabric industry.

Guidelines should be produced and implemented to improve data detail in surveillance systems, including the National Coronial Information System, so that the ignition source of the fire, premorbid conditions of victims, and alcohol involvement are routinely reported.

Poisoning

Medications identified in a recent MUARC study as warranting child resistant packaging (Scott & Ozanne-Smith, 1999b) should be mandated to be packaged in child resistant forms.

Comparisons of international poisoning rates and poisoning countermeasures are needed to identify best practice for childhood poisoning prevention.

Research is needed to identify children's means of access to pharmaceutical products that currently require child resistant packaging (eg paracetamol, Dimetapp, Demazin).

A study should be undertaken to identify the reasons for, and solutions to, the marked variation in geographic rates of childhood poisoning between rural and urban populations.

Bunk beds

It is clear that voluntary standards and the market have been ineffective in achieving compliance in Australia since the release of the Standard in 1994. In light of this, the current revision of the Australian Standard (AS/NZS 4220:1994 *Bunk Beds*) should be made mandatory. A precedent for mandating the Standard exists; from July 1, 1998 all cots supplied for household use on the new and second-hand markets must comply with the mandatory safety standard AS/NZS 2172: 1995.

An extensive and ongoing education program to warn parents and caregivers of the inherent dangers of bunk beds and to encourage appropriate use should support this move. A mandatory standard could also be supported by a recall or modification of non-compliant bunks, to reduce the number of hazardous bunks in the community.

Playground equipment

Develop strategies to increase compliance with the current Australian Standard for fall height, soft-fall undersurfacing requirements, design, siting and maintenance of equipment.

Further trial the combination of reducing fall heights to less than 1.5 metres and increasing compliance with under surfacing standards in preventing playground fall injuries.

Quantify children's exposure to different equipment types (e.g. by observational studies) to assess the risks of certain equipment for different aged children.

Bicycles

Encourage the enforcement of bicycle helmet wearing legislation.

Research, focused on the non-wearing group, as well as on the overall exposure of cyclists and helmet wearing rates is required to establish the current situation. This is particularly important in Victoria, as the state is seen as a world leader in bicycle helmet research and is best placed internationally to continue a series of evaluation studies.

Trampolines

Australia should adopt the 1999 version of the US trampoline standard ASTM F381:99 (which includes some but not all of the NZ Standard amendments), and incorporate the remaining NZ amendments.

Trampoline injuries should then be monitored to determine the effectiveness of the voluntary Standard and response of the market place to the standard. If it is shown to be ineffective, a mandatory standard and further attention to safe design should be considered.

Skates and skate boards

Refine and promote standards for helmets, both multi-purpose and specifically for in-line skating and skate boarding (with extended coverage to protect the back of the head).

Undertake further ergonomic and biomechanical research into the design of protective equipment, especially to improve the effectiveness of wrist guards.

Identify and address barriers to wearing protective equipment, especially among adolescents.

KEY RECOMMENDATIONS

General

A systematic data driven approach to consumer product safety and a systematic approach to improving product design is required to minimise product-related injury to children in Australia.

Bunk beds

In Australia, it is clear that voluntary standards and the market have been ineffective in achieving compliance since the release of the Standard in 1994. In light of this, the current revision of the Australian Standard - AS/NZS 4220:1994 *Bunk Beds* - should be made mandatory.

Baby walkers

The Australian Standard, currently being developed, for baby walkers should address the major issue of falls particularly down steps/stairs in line with the recently strengthened US ASTM standard.

A voluntary Australian/New Zealand standard baby walkers should be supported with an extensive and ongoing educational campaign directed at parents, caregivers, retailers and nursery furniture importers (no baby walkers are currently manufactured in Australia).

Compliance with the standard and the injury rate should be monitored to establish whether mandating the standard is warranted.

Trampolines

Australia should adopt the 1999 version of the US trampoline standard ASTM F381:99 (which includes some but not all of the NZ Standard amendments), and incorporate the remaining NZ amendments.

1 INTRODUCTION

1.1 BACKGROUND

Injury is a major health problem for children in Australia and other developed countries. For Australian children under the age of fifteen, injuries are the leading cause of death (ABS, 1999), the second most frequent cause of hospitalisation after respiratory diseases (AIHW, 1999), and a leading cause of Emergency Department attendances. Almost one in two deaths (ABS, 1999) and two in five hospitalisations are injury related (derived from Mathers et al, 1998, Tables C.5 & C.39).

A recent study by the Australian Institute of Health and Welfare (AIHW) indicates that unintentional injuries are responsible for 10.5 percent of the total burden of disease and injury in the 0-14 age group, accounting for over 22,000 Disability Adjusted Life Years (DALYs) (Mathers, Vos & Stevenson, 1999).

The major causes of unintentional injury deaths among children are motor vehicle accidents and drowning (NISU, 1998). These deaths are related to a combination of factors, including the interaction between the environment and the child, physical and psychological maturity and exposure to hazards. It is well-known that children's motor and cognitive skills are in a state of development. Exposure to a changing range of environments is also associated with this development, as are sociological and behavioural influences. Children sometimes lack the knowledge to avoid potentially dangerous situations or environments. Other factors that contribute to injury include product design, the layout of home environment, misuse of products and lack of use of safety products.

Injury prevention is an important public health issue and the public health community now recognises that injuries and the events associated with them are not the result of chance nor are they an inevitable consequence of growing up. Injuries among all age groups, especially children, can be prevented.

As a contribution to a safer environment, the Consumer Affairs Division, Department of the Treasury is investigating how injuries to children from consumer products can be reduced. The Monash University Accident Research Centre (MUARC) was contracted undertake a study to provide information on the role that consumer products play in injuries to children in order to underpin a proposed injury reduction program in this area.

1.2 AIM

To undertake research into the role of consumer products in injuries to children (aged 0 to 14 years) in order to support a proposed injury reduction program in this area.

More specifically, the aims are:

- 6) To undertake a review of recent Australian and international literature concerning injuries to children (0-14 years), and to thus identify the major causes of such injuries and the extent to which consumer products are involved.
- 7) To identify and comment on major sources of injury data in Australia and overseas that can assist in exploring the links between consumer products and injury.
- 8) To analyse available data to investigate:

- The nature of injuries and what types of consumer products may be involved, and;
 - The ranking of occurrence and severity of injury by product type.
- 9) To establish and comment on patterns and trends in injuries to children as a basis for injury prevention programs.
- 10) Having regard to the consumer product safety responsibilities of Consumer Affairs, make recommendations on injury prevention measures to assist children.

1.3 SCOPE

For the purposes of this study the definition of a **consumer product** is broadly taken as:

"A consumer product is any manufactured, processed, or agricultural product which is supplied in the course of business and is likely to be used by consumers regardless of whether the product is new, used, or reconditioned but specifically excludes motor vehicles and medical services."

Injury is defined by an internationally accepted and long-standing definition as ‘damage to the body caused by acute exchanges with environmental energy that are beyond the body’s resilience (Haddon, 1980). This energy can be mechanical (e.g. the impact of a fall), thermal (e.g. a burn), chemical, electrical or radiation related. The sudden absence of an essential energy source can also result in injury (e.g. a lack of oxygen in the case of asphyxia or drowning). Damage caused by lesser exchanges of energy over a longer time frame (such as hearing loss, over-use syndromes and lead poisoning) are usually understood to result in disease rather than injury (Ozanne-Smith & Williams, 1995).

For the purposes of this study, a **“true” injury** death or hospitalisation is defined as any case with an underlying cause of injury as defined by the Ninth Revision of the International Classification of Diseases (ICD-9 CM, Commission on Professional and Hospital Activities, 1986), E-codes E800-E999 excluding E870-879 (misadventures to patient during surgical an medical care and E930-E949 (drugs, medical and biological substances causing adverse effects in therapeutic use).

All causes within this definition are included in the overview of child injury in Australia (see Chapter 4) for completeness. However, motor vehicle accidents, food involved in choking incidents, and drugs and medications involved in unintentional poisonings are not, strictly speaking, within scope, as they do not fall within the jurisdiction of the Consumer Affairs Division of the Department of Treasury.

2 INJURY SURVEILLANCE SYSTEMS

There are several providers of injury surveillance data in Australia and overseas that have the ability to provide information on consumer product-related injury in children.

2.1 INTERNATIONAL INJURY SURVEILLANCE

Several overseas data systems provide general injury surveillance in enough detail to identify consumer product involvement in injury. These include the National Electronic Injury Surveillance System (NEISS) managed by the US Consumer Product Safety Commission, the Canadian Hospitals Injury Reporting and Prevention Program (CHIRPP), the Home Accident Surveillance System (HASS) and the Leisure Accident Surveillance System (LASS) managed by the Consumer Safety Unit at the British Department of Trade and Industry (DTI), and PORS/LIS managed by the Consumer Safety Institute in Amsterdam, The Netherlands.

Previous experience with information from these sources (Watson et al, 1997; Watson et al, 1999) indicates that data from non-English-speaking countries, such as The Netherlands, is difficult to access for more general purposes, such as an overview of product-related injury, because of the time required for translation. Requests for information on specific products or product groups, however, are usually processed in a timely way. Other systems may provide information that is difficult to compare directly with Australian data because of differences in coding systems (e.g. HASS and LASS).

The Canadian CHIRPP system and the US CPSC NEISS system are both derived from a similar system to the Injury Surveillance Information System (ISIS) used historically by both the Victorian Injury Surveillance System (VISS) and the National Injury Surveillance Unit (NISU). However, the CHIRPP system is not a representative sample of Canadian hospitals. Given the comparability of the NEISS coding system with data available in Australia, the fact that rates can be derived from the data, and a record of prompt data delivery, it was decided for the purposes of this study to focus any international comparisons on the NEISS data.

2.1.1 The US CPSC's National Electronic Injury Surveillance System (NEISS)

NEISS collects injury data associated with 15,000 consumer products from hospital emergency departments across the United States. The system consists of a national probability sample of 101 hospitals that are statistically representative of hospital emergency rooms nation-wide.

The on-site NEISS co-ordinator reviews each sample hospital's emergency department records daily and cases associated with consumer products are selected and the data entered onto computer. Each night, the central CPSC computer pools these hospitals' data and updates CPSC's central database.

From the data collected, estimates can be made of the numbers of injuries associated with consumer products and treated in hospital emergency departments. Data are collected on a broad range of injury-related issues, covering hundreds of product categories, and provide national estimates of the number, rate and severity of non-fatal product-related injuries.

Whenever the CPSC studies hazard patterns associated with specific types of injury in greater detail, the NEISS surveillance data serves as a source for in-depth follow-back studies (McDonald, 1996; Annest et al, 1996; CPSC, 1997).

2.2 AUSTRALIAN INJURY SURVEILLANCE SYSTEMS

2.2.1 Coroner's Data

The Victorian Coroners Facilitation System

At present the only computerised systems in Australia that allow the identification of deaths resulting from incidents involving consumer products are injury surveillance systems and the Victorian Coroners Facilitation System (VCFS). This database contains information from coronial investigations of all "unnatural" deaths in Victoria over six years, from July 1989 to June 1995. These "unnatural deaths", which are reportable under legislation (Coroners Act 1985), include all deaths that were unexpected, unnatural, or violent, which resulted from accident or injury, or occurred during an anaesthetic procedure. Most accidental deaths, by law, must be referred to the State Coroner, and are included on the VCFS.

Product involvement in the Victorian Coronial data can be identified through coded breakdown factors or text searches. However, information about the circumstances of death is limited to one-line narratives. The VCFS allows identification of individual cases by case number so that researchers can track back to individual Coroner's case files for detailed information about the circumstances surrounding the injury death. The VCFS will be superseded by the National Coronial Information System, which is expected to leave a gap in the availability of computerised Victorian Coroners data between June 1995 and December 1998.

Other States

In other states, product-related deaths may be identified through the injury surveillance systems and followed up through the State Coroner's Office. However, not all deaths will be captured through this method given the relatively small samples from which most State collections are drawn.

National Coronial Information System

Until recently, there has been no national systematic electronic collection of injury death data in Australia. The new National Coroners Information System (NCIS) will be the most advanced national electronic fatalities database in the world. Data are stored on a central computer and information will be accessed via an Internet connection. Because the information being retained is too complex for coding alone, the dataset has been designed with the capacity for text storage and retrieval. The main sources of information are the State coroners and the police, but other agencies will provide additional information. The dataset has two components – a core or minimum dataset and "add-on" modules for areas of specialised interest. To date no specialist modules are in place although work on the drug and suicide modules is proceeding. It is anticipated that these will serve as prototypes for later modules. These may include motor vehicles, firearms, and drowning.

Although several states are already inputting data to the system, access to the data is not yet available.

2.2.2 Hospital Emergency Department Injury Surveillance Systems

Only Victoria, South Australia and Queensland are able to respond to requests for Emergency Department presentation data at the level necessary to identify individual products.

The National Injury Surveillance Unit

The National Injury Surveillance Unit (NISU) operates as a program within the Research Centre for Injury Studies in the School of Medicine at the Flinders University of South Australia and as a collaborating unit of the Australian Institute of Health and Welfare.

NISU holds a national compilation of Australian Emergency Department data collected in the NISPP/ISIS project in the period 1988 to 1994. Data was collected from the Emergency Departments of 50 hospitals nation-wide (some of which also provide data to State injury surveillance systems). The system allows the identification of products via product codes in the same way as the US CPSC's NEISS system. Unlike NEISS, however, the collection did not represent a probability sample of cases and cannot therefore be used to establish national estimates of injury associated with individual products. The system maintains information on approximately 700,000 injury cases, almost half of which are children aged 0-14 years.

The Victorian Emergency Minimum Dataset

Victoria currently has the largest injury surveillance system of any of the States. The Victorian Emergency Minimum Dataset (VEMD) began collecting data electronically from hospitals across Victoria in October, 1995. Twenty-five hospitals currently contribute data to the collection, which represents approximately 80% of state-wide emergency department presentations. The total number of cases on the database at October 31, 1999 was in excess of 655,000, of which over 176,000 are children aged 0-14 years. To identify individual products in this system requires a text search of one-line case description narratives. The quality of this text description and the detail is variable and 10 percent of cases (at January, 1997) do not record a text description. Therefore, at this stage, the value of the VEMD, in relation to consumer product-related injury, is in examining the involvement of individual products once identified, rather than trying to identify products that are frequently involved in injury as required for this project. A Level 2 data collection, which includes specific product coding and more detail about the circumstances of injury, including product involvement, is planned for hospitals in the Southern Healthcare Network in metropolitan Melbourne.

The Victorian Injury Surveillance System

The Victorian Injury Surveillance System (VISS) is an historical paper-based collection that closed in mid-1996. The collection used the NISPP/ISIS system which allows identification of individual products via product codes as well as text search of the one-line case narratives. The system collected data from the Emergency Departments of four Melbourne metropolitan hospitals and a regional hospital in Gippsland at different times over an eight-year period. VISS holds approximately 170,000 cases, of which about half (84,500 cases) are children aged 0-14 years.

2.2.3 General Practitioner Data

There are no national or state-wide injury surveillance systems that collect data at the General Practitioner (GP) level. However, a number of regional studies have been completed or are currently underway. Information about injuries treated by GPs in the Latrobe Valley was collected for a twelve-month period (7/11/94 to 6/11/95) through the Extended Latrobe Valley Injury Surveillance (ELVIS) system. This collection provides information about product-involvement in injury. However, it was felt that, for the purposes of this study, the sample was not large enough (1,887 children aged 0-14 years), or geographically diverse enough to provide indicators for the Australian population.

3 METHODS

3.1 INCIDENCE ESTIMATION AND DATA SOURCES

The numbers and rates of injury are presented in this report for three mutually exclusive groups that broadly reflect the severity of injury: (1) injury resulting in death, (2) injury resulting in hospitalisation, and (3) injury requiring Emergency Department treatment without hospitalisation. These are presented by gender and age. For each level of severity, numbers and rates of the major causes of injury (including identifiable products) are also presented.

The major data sources used in establishing the number of Australian child injuries were Australian mortality and hospital morbidity data held by NISU.

Estimates of the number of minor injuries resulting in medical attention without hospitalisation are derived from several sources and consist of two components: hospital Emergency Department presentations and General Practitioner attendances.

Estimates of the number of Emergency Department attendances were based on ratios of hospitalisations to Emergency Department presentations, using data from the Victorian Inpatient Minimum dataset and the Victorian Emergency Minimum Dataset (VEMD), and applied to the national hospitalisation figures¹. The total estimate was then broken down into injury cause categories, age, and gender groups using the distributions in the 1996 VEMD presentations data.

An overall estimate of the number of general practitioner attendances by age and gender was also calculated. This was derived by applying the ratio of general practitioner attendances to Emergency Department presentations (1.1 : 1) used in previous studies (Watson & Ozanne-Smith, 1997)². However, it was not considered appropriate to provide estimates of the numbers and rates of injury by cause for this group of injuries, given the small and geographically limited sample on which the estimate is based.

Injuries for which medical attention was not sought have been excluded from this study since there is no data available on the frequency of such cases.

Relevant Australian Bureau of Statistics age- and gender-specific estimates for the Australian resident population was used in calculating rates of injury per 100,000.

¹ Given the generally lower admission rate in Victoria, this may have resulted in some under-estimation of Emergency Department attendances for injury.

² The ratio of general practice to Emergency Department attendances in the Latrobe Valley is estimated to be 1.2 : 1 (Day, Valuri & Ozanne-Smith, 1997, p. 17). This ratio is similar to the 1 : 1 ratio determined by McClure & Ozanne-Smith (1996) in a study of the epidemiology of injury in the Australian Capital Territory in 1992. By applying a median point between these two studies of 1.1 : 1, the number of injury-related, non-hospitalised GP attendances was derived from the estimated number of Emergency Department attendances. The total number of non-hospitalised GP attendances was then distributed between age and gender on the basis of the distributions observed in the Latrobe Valley data.

3.2 PRODUCT INVOLVEMENT

3.2.1 United States Data (NEISS)

The CPSC provided an electronic file containing a Product Summary Report from the National Electronic Injury Surveillance System (NEISS) for all products associated with injury to children aged 0-14 years in 1998. This file was converted to Excel for subsequent analysis. The original data provided sample counts and national estimates for each product with percentage breakdowns for five-year age groups, gender and disposition.

Because the US injury estimates are based on a probability sample of the population, the rate of injury can be established which allows for direct comparison between five-year age groups. Population estimates from the US Census Bureau (July, 1998) were used to calculate injury rates for the each age group. It should be noted that the US data relates only to non-fatal injuries presenting to hospital Emergency Departments.

3.2.2 Australian Data (NISU)

A listing of products involved in injury in children aged 0-14 years, presenting to a sample of Australian hospital Emergency Departments, was supplied by NISU in electronic format and was converted to an Excel file for analysis. The method used to analyse the data was the same as that described below for the VISS data.

3.2.3 Victorian Data (MUARC/VISS)

Data analysis was conducted using the databases held at MUARC to establish the extent and pattern of consumer product involvement in children's injury, including ranking by frequency and severity.

Injuries were examined at three levels of severity: deaths; hospital admissions and Emergency Department presentations (which are not admitted to hospital).

To establish the sub-set of consumer product-related cases, data were extracted by first identifying the sub-set of cases aged 0-14 years, then excluding all intentional injury, the adverse effects of prescribed medication and medical and surgical complications.

In the two databases, from which product information was drawn, product "factor codes" were examined to determine the type of products involved in injuries. These factor codes are set out by the National Injury Surveillance and Prevention Project (NISPP) in Australia. They are based on the United States Consumer Product Safety Commission Product Codes, supplemented by the industrial machinery codes from the National Institute of Occupational Safety and Health (NIOSH), and have been further extended to support perceived local needs. The grouping of related codes into categories has also been provided by NISPP.

Mortality data were obtained from the Victorian State Coroner through the Victorian Coroner's Facilitation System. Investigation findings are coded according to a standard procedure. The codes used for activity, location, and products are based on the NISPP codes. Up to four factor codes are available for each death. In addition, the factor actually resulting in the death is coded in the "instrument of death" variable. Data presented in the body of this report refer to the first coded factor whereas data provided in the Appendices includes all factors.

Hospital admissions and emergency department presentation data were extracted from the Victorian Injury Surveillance System (VISS) database. For children, the data were collected at the Latrobe Regional hospital (two campuses: Moe and Traralgon) over five years, from July 1991 to June 1996; and at three metropolitan hospitals - the Royal Children's Hospital from 1988 to 1993, the Western Hospital from July 1988 to December 1993, and Preston and Northcote Community Hospital from November, 1988 to December 1993. The completion rate of data collection at participating hospitals ranged from 85% for presentations, to 100% for admissions (VISS, 1993). All available years of data were pooled for use in the study.

Hospital admissions included all cases presenting to one of the VISS emergency departments who were subsequently admitted to hospital. These included both the ward and short stay observation admissions. Emergency department (ED) presentations are all cases that were managed in the ED, with or without treatment, and then discharged.

The VISS database contains four fields that code for specific products or factors involved in the injury. The first two fields, the "breakdown factors", code products or factors that are involved in precipitating the event in which the injury occurred. The other two, the "mechanism factors", code products or factors which actually caused the injury (i.e. the bodily harm). For each person injured there can be up to two breakdown, and two mechanism, factors coded.

As each person's injury may have involved more than one product, the number of factors coded does not always represent the number of injured people. It does, however, indicate the frequency of involvement of certain products in injuries. For each set of data, the two breakdown factors have been combined as have the two mechanism factor codes.

For simplicity, and due to the possibility of double counting, the tables based on VISS data present a product only once, using the higher value of either the breakdown or mechanism factor for that product.

For all tables the proportion listed ("case percent") is the number of responses for that product, or product group, divided by the total number of injured people. This represents the proportion of all people with an injury involving that specific product. As more than one factor is coded per case, the proportions can sum to over 100 percent.

The listing of a product means that it has in some way been involved in the chain of events leading up to, and resulting in, the injury. It may be the direct cause of the injury or an indirectly associated factor. In the non-fatal database, product listing is based on self-report, the effect of which may be an under-estimation of product involvement.

"Sport and recreational activities" have been included as many factors within this category are consumer products (e.g. bicycles, and boats), and the majority of these injuries are product-related.

Products involved infrequently in injury have been excluded from the text and tables in the main body of the report.

Mortality were analysed using SPSS for Windows 9.0 (SPSS, 1999). Hospitalisations and emergency department presentations were analysed using the Injury Surveillance Information System (ISIS), which was developed as part of the National Injury Surveillance and Prevention Project, and is now copyright to the Australian National Injury Surveillance Unit, Adelaide.

4 AN OVERVIEW OF CHILD INJURY IN AUSTRALIA

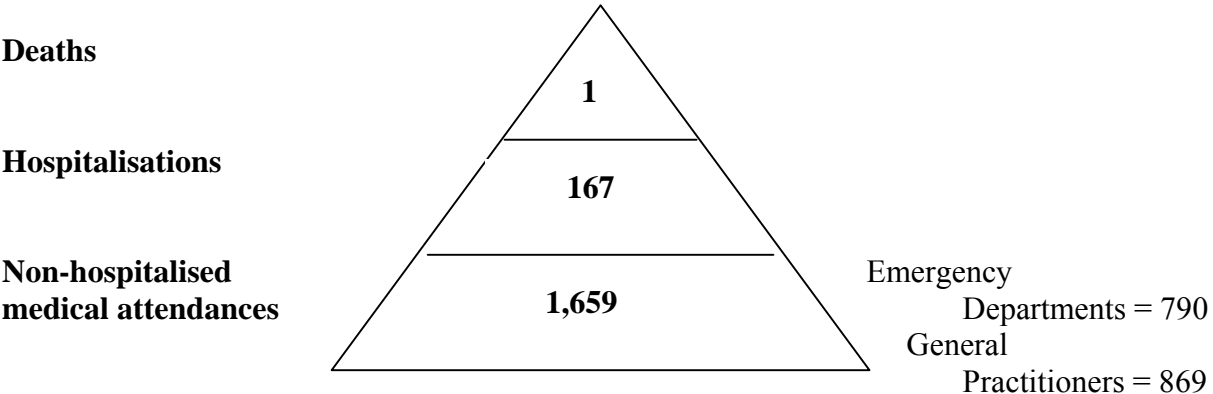
4.1 OVERVIEW

4.1.1 Magnitude of the Problem

In Australia in 1997, injuries to children aged 0-14 years led to a total of 347 deaths, about 58,000 hospitalisations³ and an estimated 576,000 non-hospitalised, medical attendances at either hospital Emergency Department (274,104) or General Practitioners' surgeries (301,514). In total, it is estimated that there were about 634,000 medically-treated child injuries in that year.

Overall, 1 in 6 children in the population sustained an injury for which medical treatment was sought. There were approximately 167 hospitalisations and 1,659 non-hospitalised medical attendances for every death (Figure 4.1).

Figure 4.1 Ratio of deaths, hospitalisations and medical attendances for injury in Australian children aged 0-14 years.



4.1.2 Cost of child injury in Australia

Moller (1998), using data supplied by the National Injury Surveillance Unit and a methodology developed by Monash University Accident Research Centre (Watson & Ozanne-Smith, 1997) for estimating injury costs, developed an estimate of the lifetime cost of injury to Australia for the year 1995-96. The total lifetime cost of injury for children aged 0-14 years was estimated at over \$1,365 million. Almost half this cost (\$677 million) was associated with the direct medical treatment of injury, with the remainder being morbidity and mortality losses.

³ Hospitalisation data provided by NISU for the period July 1, 1996 to June 30, 1997.

4.2 AGE AND SEX

Table 4.1 shows the number and rate of injuries for each level of severity by age and gender.

The death rate due to injury in children was highest for the 0-4 years age-group. The rate fell in the 5-9 year age-group and rose again in the 10-14 year olds (Figure 4.2). The death rate in the 0-4 year old group was almost three times that of 5-9 year-olds and twice that of 10-14 year olds. The hospitalisation rate showed a similar trend by age (Figure 4.3) with a lower rate for 5-9 year olds, although in this case the rate for 10-14 year olds was much closer to that of the under fives. In all age groups, males had a much higher death and hospitalisation rate than females ranging from 1.85 times in 5-9 year olds to two times in 10-14 year olds.

Table 4.1 Incidence and rate of deaths, hospitalisations and non-hospitalised, medically-treated attendances for all “true” injuries by age gender and age, 0-14 year-old children, Australia.

		Deaths ⁴		Hospitalisations ⁵		Non-hospitalised ⁶	
		N	Rate ⁷	N	Rate ⁴	N	Rate ⁴
Total		347	8.85	58,004	1,479.86	575,618	14,685.84
Gender							
Males		233	11.59	36,120	1,797.56	334,126	16,628.26
Females		115	6.02	21,884	1,145.66	241,492	12,642.51
Age-group (years)							
0-4	Total	190	14.70	20,094	1,554.92	189,733	14,681.94
	Males	126	19.89	11,616	1,751.18	105,593	15,918.72
	Females	64	10.17	8,474	1,347.30	84,139	13,377.44
5-9	Total	65	4.94	17,686	1,344.79	165,578	12,590.07
	Males	43	6.37	10,560	1,566.15	91,582	13,582.51
	Females	22	3.43	7,126	1,111.90	73,996	11,545.93
10-14	Total	92	7.01	20,224	1,541.34	220,307	16,790.30
	Males	63	9.37	13,944	2,075.63	136,971	20,388.75
	Females	29	4.52	6,280	980.77	83,337	13,015.06

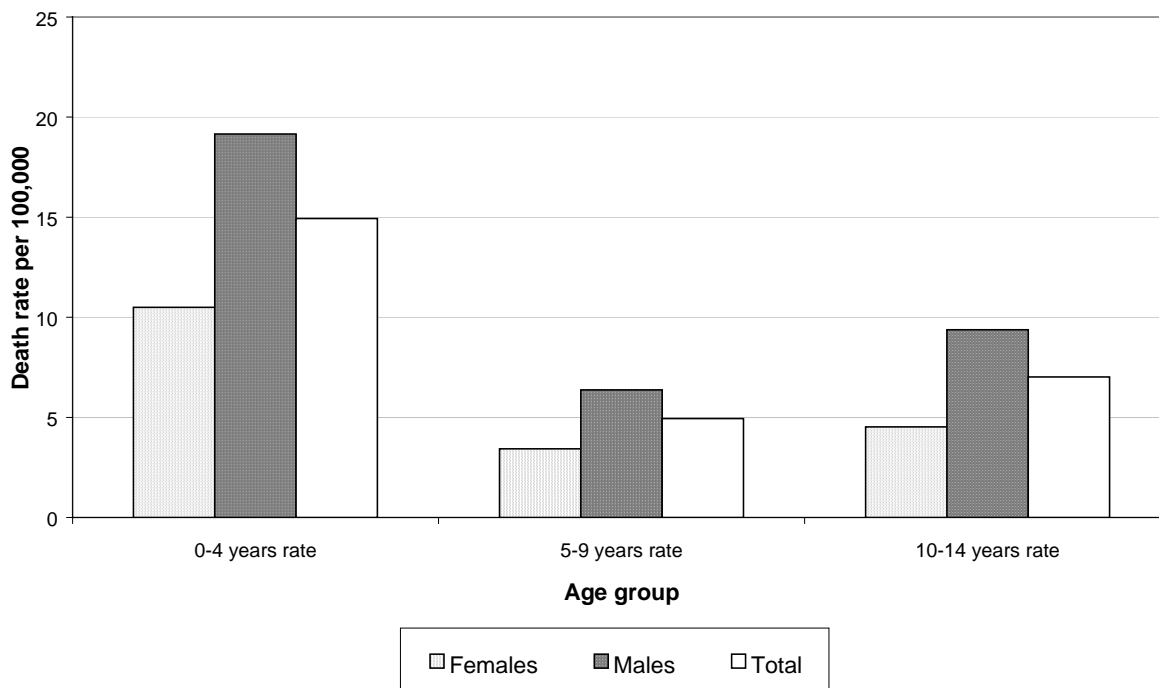
⁴ Period : January 1, 1997 to December 31, 1997. Source : NISU.

⁵ Period : July 1, 1996 to June 30, 1997. Source : NISU.

⁶ See Appendix Table 3 for the estimated number and rates of Emergency Department and General Practitioner attendances.

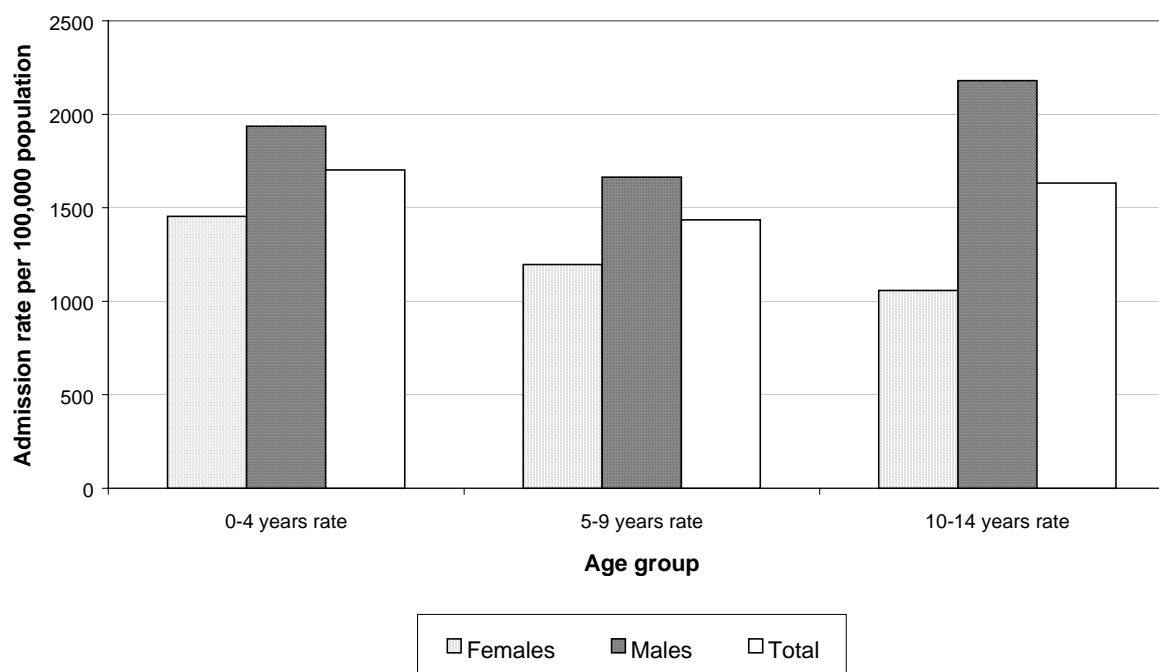
⁷ Rate per 100,000 population (Estimated resident population at June 30, 1997 : Appendix Table 2:)

Figure 4.2 Injury death rates, 0-14 year olds, Australia, 1997.



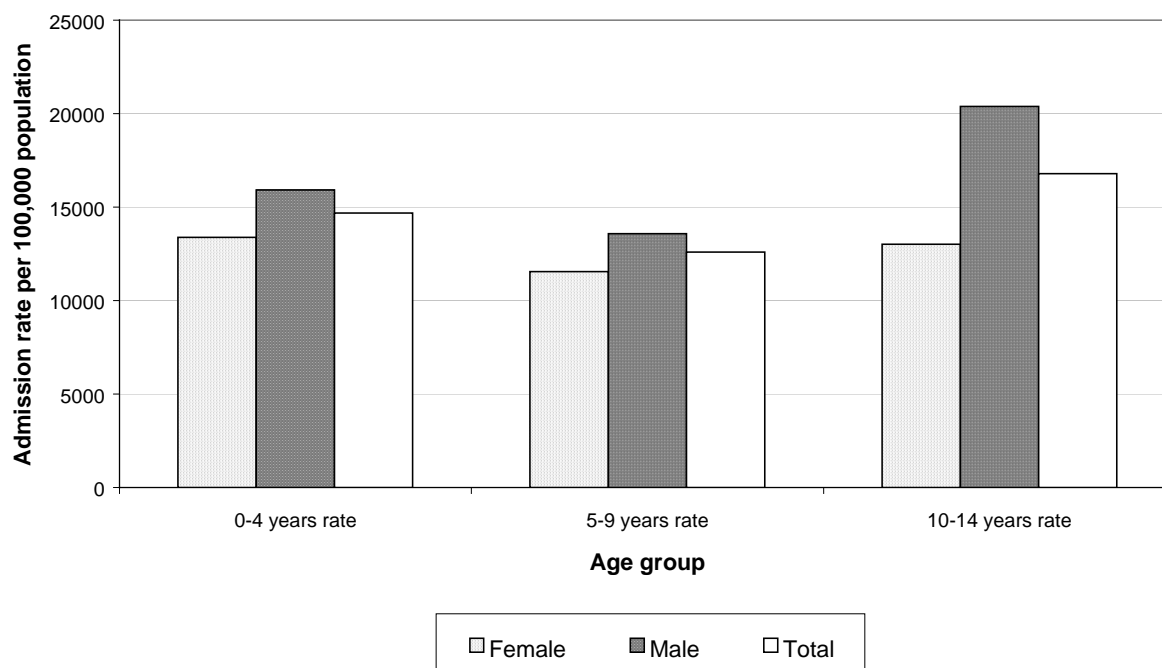
Source : NISU, Flinders University.

Figure 4.3 Injury hospitalisation rates, 0-14 year olds, Australia, 1996-97.



Source : NISU, Flinders University.

Figure 4.4 Injury medical attendances, 0-14 year olds, Australia, 1996-97.



Estimates derived from NISU Australian hospitalisation data and Victorian admission rates and Emergency Department to General Practitioner ratios (see Methods Section).

4.3 INTENT AND CAUSE OF INJURY

Injuries can be categorised by the medical description that identifies the nature and site of the injury (e.g. arm fracture) or by external cause that describes the circumstances of, and intent behind, an injury (e.g. fall from playground equipment). In the World Health Organisation (WHO) international Classification of Diseases (ICD) 9th Revision, the medical descriptions of injuries correspond to codes 800-999. The codes for external causes are preceded by an E (E800-E999). This classification of injuries is particularly useful in determining opportunities for action.

The categories of injuries used to analyse national mortality and hospitalisation data are shown in Appendix Table 1.

4.3.1 Deaths

Overall, for children 0-14 years of age, unintentional injuries accounted for almost 87 percent of all injury deaths (see Appendix Table 4). Figure 4.5 shows the distribution of major injury cause categories for child deaths. Traffic accidents (motor vehicles and other road vehicles) were the leading cause of injury-related deaths (35.7%), followed by drowning (22.2%), choking and suffocation (8.9%), homicide (8.4%), and fire and burns (4.6%). One in eight injury-related deaths (12.7%) were the result of an intentional act (homicide or suicide) with interpersonal violence (homicide) resulting in almost twice as many deaths as suicide.

The distribution of injury related deaths varies with age (see Figures 4.6 - 4.8). In the 0-4 year age group (Figure 4.6), drowning was the most common cause of death (31%), followed by motor vehicle traffic accidents (29%), and choking and suffocation incidents (14%). In 5-9 year-olds (Figure 4.7), motor vehicle traffic injuries account for the most deaths (45%), followed by drownings (18%) and interpersonal violence (12%). Motor vehicle traffic accidents account for almost half (47%) of the injury deaths in the 10-14 year-old age group (Figure 4.8), followed by suicide (18%), other unintentional (12%) and other transport accidents (8%).

4.3.2 Hospitalisations

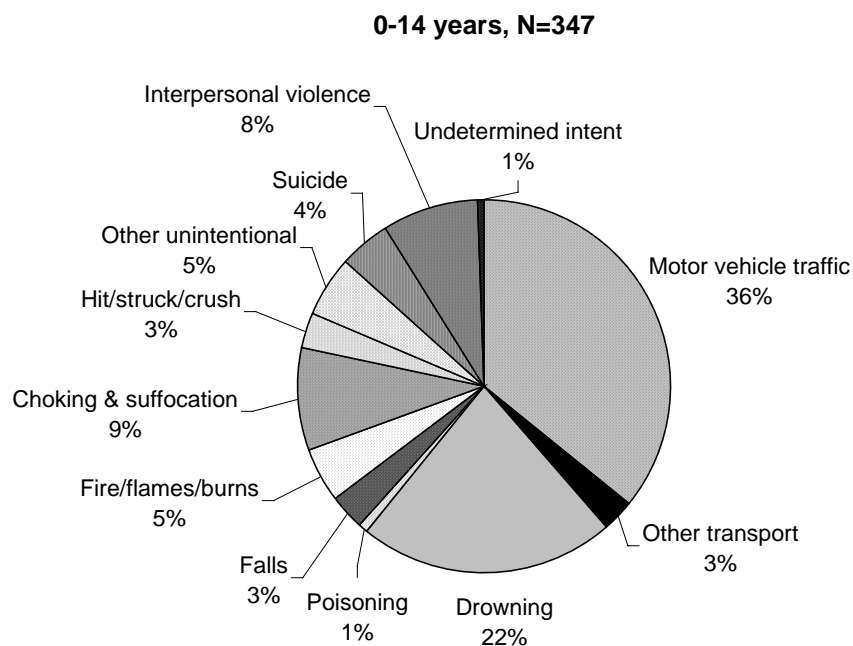
Unintentional injury accounted for almost 98 percent of all hospitalised injuries in children aged 0-14 years (see Appendix Table 5). Overall (Figure 4.9), falls were the leading cause of hospitalisation for injury (40.8%), followed by traffic accidents (14.5%), hit/struck or crush injuries (10.4%), poisoning (7.2%), and cutting or piercing injuries (6.4%). Intentional injury accounted for only two percent of hospital admissions with over two-thirds due to interpersonal violence.

Falls were the leading cause of hospital admission in all age groups, with motor vehicle traffic accidents the second leading cause of hospitalisation in the 5-9 year (Figure 4.11) and 10-14 year age groups (Figure 4.12) (15% and 23% respectively). A large percentage of injury-related hospitalisations were due to unintentional poisonings in the 0-4 year age group (Figure 4.10) (18%).

4.3.3 Non-hospitalised Emergency Department attendances

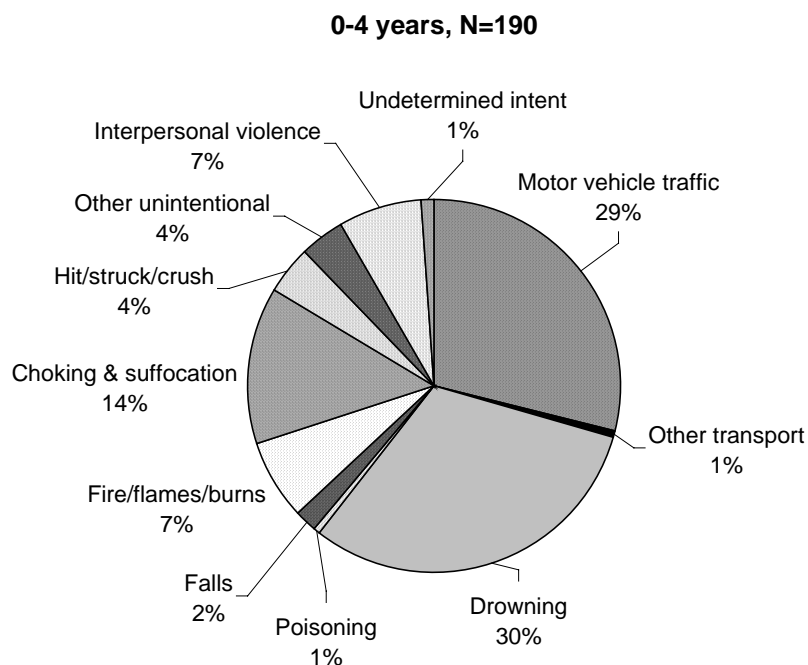
Of the estimated 274,104 non-hospitalised Emergency Department attendances (see Appendix Table 6) for injury in this age group, 98 percent were unintentional. Falls were the leading cause of non-hospitalised injury treated in hospital Emergency Departments (42.1%), followed by hit/struck or crush injuries (16.2%), traffic accidents (9.7%) poisonings (6.9%), and cutting/ piercing injuries (6.1%).

Figure 4.5 Injury-related deaths by cause category, children 0-14 years, Australia, 1997.



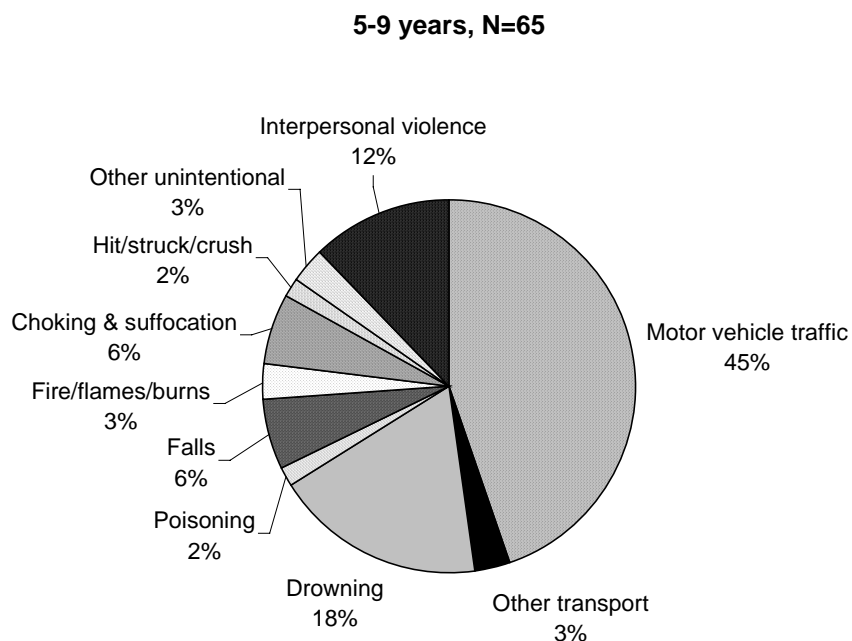
Source : NISU, Flinders University.

Figure 4.6 Injury-related deaths by cause category, children 0-4 years, Australia, 1997.



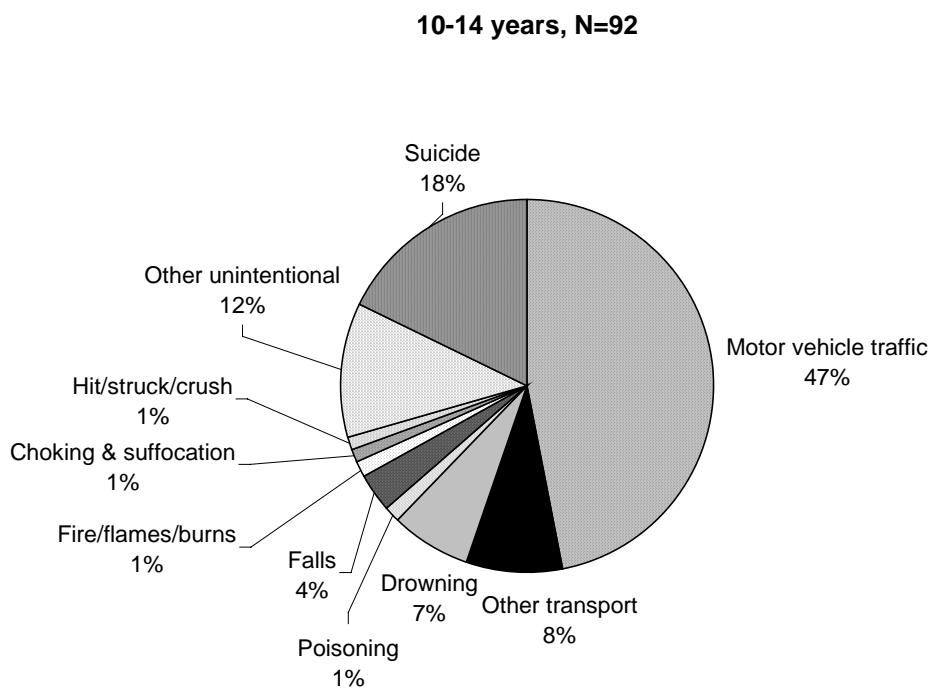
Source : NISU, Flinders University.

Figure 4.7 Injury-related deaths by cause category, children 5-9 years, Australia, 1997.



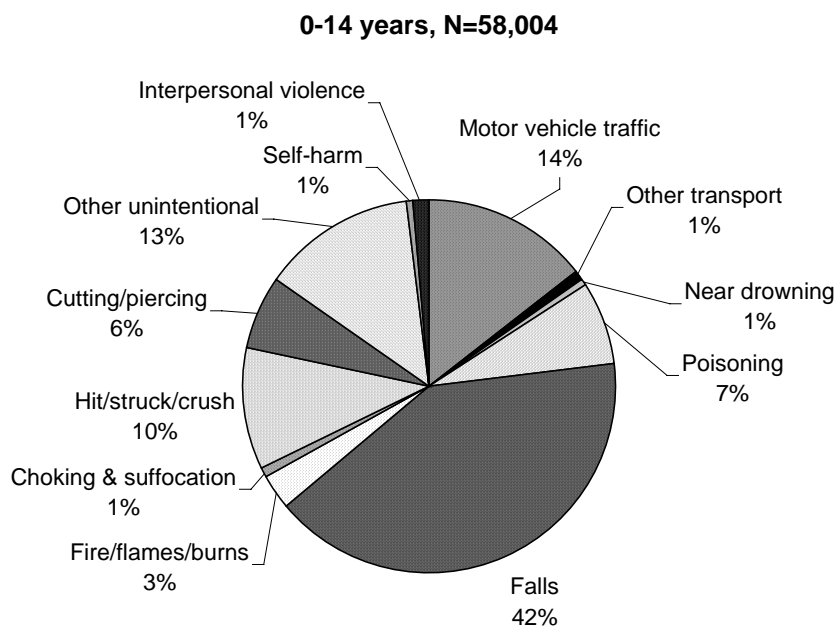
Source : NISU, Flinders University.

Figure 4.8 Injury-related deaths by cause category, children 10-14 years, Australia, 1997.



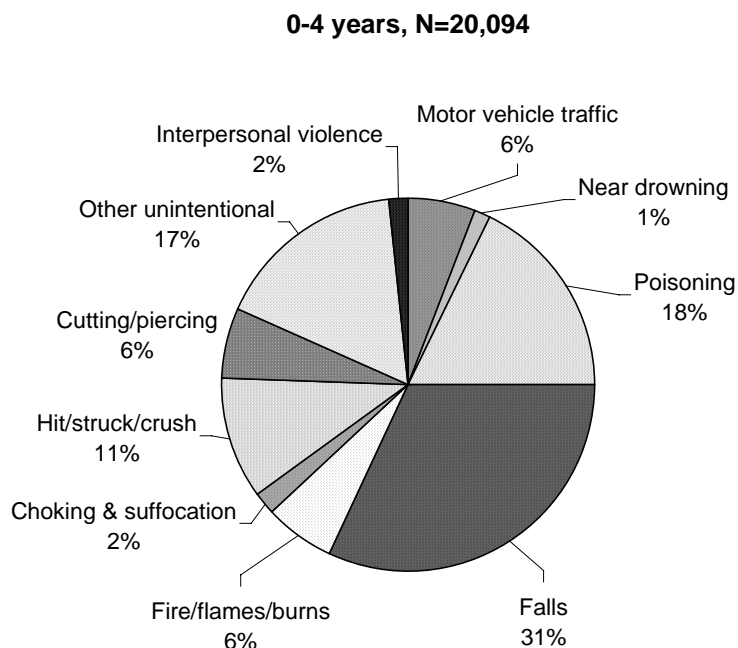
Source : NISU, Flinders University.

Figure 4.9 Injury-related hospitalisations by cause category, 0-14 years, Australia, 1996-97.



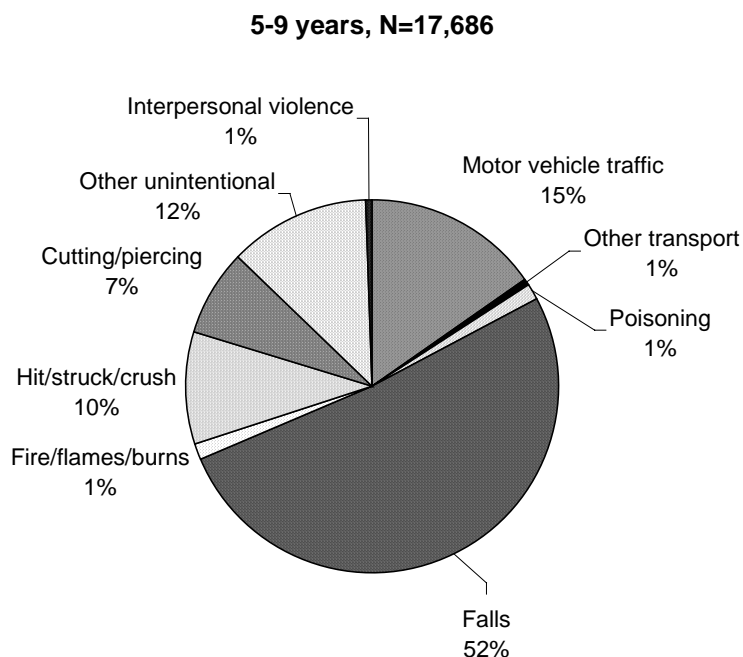
Source : NISU, Flinders University.

Figure 4.10 Injury-related hospitalisations by cause category, 0-4 years, Australia, 1996-97.



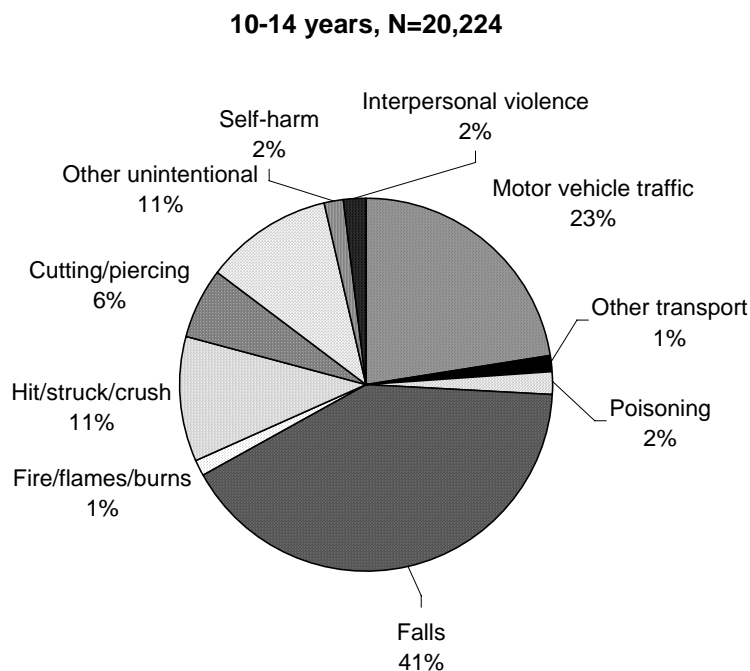
Source : NISU, Flinders University.

Figure 4.11 Injury-related hospitalisations by cause category, 5-9 years, Australia, 1996-97.



Source : NISU, Flinders University.

Figure 4.12 Injury-related hospitalisations by cause category, 10-14 years, Australia, 1996-97.



Source : NISU, Flinders University.

5 PRODUCT-RELATED INJURY TO CHILDREN

5.1 THE US DATA (CPSC NEISS)

5.1.1 Overview

The data provided by the US CPSC are based on non-fatal injury cases presenting to a representative sample of 101 hospital Emergency Rooms across the United States in 1998. The injury rates presented here are derived from this sample.

Table 5.1 presents a ranking of the top 40 products associated with non-fatal injury to children aged 0-14 years in the United States in 1998 and the rate of injury (per 100,000 population) associated with each product. Bicycles were most frequently associated with injury to children, while floors and stairs or steps ranked second and third respectively. Furniture items such as tables (5th), beds (6th), chairs (11th), and sofas (16th) figure prominently. Three of the top ten causes were sports (basketball (4th), football (7th), and baseball (10th), while other sports and recreational activities such as soccer (12th), in-line skating (17th), roller-skating (32nd), softball (37th) and gymnastics (40th) all appeared in the top 40. Some of the more unusual items associated with injuries across the age groups include coins (35th; presumably swallowed by younger children) and grocery or shopping carts (39th).

Notable gender differences are evident in the pattern of product-related injury between male and female children. Table 5.2 presents a comparison of products associated with injuries to males and females in the 0-14 year age group. Bicycles and accessories was the number one product associated with injury amongst males, but it ranked only third (after floors and stairs or steps respectively) amongst females. American football was the highest ranked sport amongst males (3rd), while basketball, in seventh place, was the highest ranked sport for females. Trampolines ranked markedly higher for females (12th) than it did for males (21st), as did swing sets (10th vs. 19th).

Most consumer products that appear on the list for males also appear on the list for females. However, football, skateboards (29th), poles (33rd), ball sports (36th), counters (benches) (39th) and fishing (40th) appeared in the males' list but not the females' list. Conversely, jewellery (14th), gymnastics (20th), roller skating (24th), softball (26th), footwear (38th) and volleyball (40th) appeared in the females' list but not the males'.

5.1.2 0-4 years

Products associated with injuries to children aged 0-4 years tend show a different pattern than those associated with injury in older children (see Appendix Tables 7, 10 & 13) due mainly to differences in exposure. Most of the top 10 products associated with injury to this age-group are furniture or structural features of the home (Appendix Table 7), while sports and recreational activities and equipment are more likely to be associated with injury in older children (Appendix Tables 10 & 13).

Other products especially prevalent for the 0 to 4 age group are grocery and shopping carts (15th), coins (18th), and baby specific items such as a baby strollers (29th) and baby walkers (31st) Bicycles and accessories is the highest ranked sport product in this age group (9th).

There is little difference in the patterns of product related injury between the two sexes in the 0 to 4 age group. Both females (see Appendix Table 8) and males (see Appendix Table 9) show similar frequencies of furniture and structure related injuries, and the top 6 products are

identical for both groups. Both groups have similar rankings for coins (17th for females, 19th for males), but jewellery ranks markedly higher for females (9th) than for males (33rd), probably due to traditional gender roles and clothing choice (by parents). Although this is a young age group, evidence of gender roles is apparent from the inclusions of hair curlers, curling irons, clips and hair pins (female, 40th) and baseball (male, 36th) - neither of which appears on the other gender's list.

5.1.3 5-9 years

The top product related to injuries in the 5 to 9 year old age group (Appendix Table 10) is bicycles, which is more than two and a half times more prolific than the second ranked product. While the furniture products that appeared in the younger group are generally present, there is a much greater proportion of sports and recreation related products in the top 40 list. Baseball (9th) makes the top 10 list for both genders.

The pattern of product related injuries is still quite similar for both males (Appendix Table 12) and females (Appendix Table 11) in this age group. Bicycles and accessories are the number one injury cause, although the incidence rate is much higher amongst males. Approximately one quarter of all products are sports related, although the sports differ somewhat between the sexes; in-line skating (10th) is the highest ranked cause for females, while baseball (5th) ranks highest for males. Products prevalent in the younger age group, such as jewellery and coins, appear only in the female group's list. Although both have similar numbers of sports-related causes in their top 40 list, sports have higher positions on those lists for males.

5.1.4 10–14 years

The 10 to 14 age group (Appendix Table 13) shows a significantly different pattern of products associated with injury compared to the younger age groups. The top five agents or products are all sports and recreation related, rather than structural features of the home or furniture. In fact, approximately half of all product causes in the top 40 list for this age group are sports and recreation related. A number of new products also appear in this age group, including all terrain vehicles (30th) and snowboarding (34th). These activities and products clearly require a minimum age before they can be used or attempted.

Differences between the two sexes are readily apparent for this age group. Injuries associated with football (ranked 1st for males – Appendix Table 14A) do not appear at all in the female top 40 list (Appendix Table 14). Other gender differences are also apparent: cheerleading (16th) and jewellery (26th) do not appear on the male list at all, while gas, air or spring loaded guns (25th) and all terrain vehicles (22nd) do not appear on the females' list. Products prominent in the younger groups appear much further down both lists, if they appear at all. For example, floors or flooring materials drops from 2nd in both sexes in the 5 to 9 age group down to 5th (females) and 7th (males) in the 10 to 14 age group.

Table 5.1 Consumer products most frequently involved in NON-FATAL⁸ injury: children aged 0 to 14 years, USA, 1998 (Source : US CPSC NEISS).

Ranking	Type of product	Rate per 100,000
1	Bicycles and accessories (exc. Mountain bikes)	617.83
2	Floors or flooring materials	463.76
3	Stairs or steps	369.19
4	Basketball (activity, apparel or equip.)	348.48
5	Tables, not elsewhere classified	329.74
6	Beds, not specified	282.99
7	Football (activity, apparel or equip.)	276.46
8	Doors, not specified	258.52
9	Ceilings and walls (part of completed structure)	182.03
10	Baseball (activity, apparel or equipment)	170.78
11	Chairs, not specified	169.69
12	Soccer (activity, apparel or equip.)	134.78
13	Monkey bars or other playground climbing equipment	131.28
14	Trampolines	129.74
15	Swings or swing sets	125.99
16	Sofas, couches, davenports, divans or studio couches	121.74
17	In-line skating (activity, apparel, equipment)	117.80
18	Knives, not elsewhere classified	107.68
19	Toys, not elsewhere classified	105.88
20	Nails, screws, tacks or bolts	103.11
21	Desks, chests, bureaux or buffets	94.58
22	Fences or fence posts	93.16
23	Cabinets, racks, room dividers and shelves	91.07
24	Bathtubs or showers	84.84
25	Slides or sliding boards	80.67
26	Jewellery	67.48
27	Windows or window glass, not specified	66.98
28	Porches, balconies, open-side floors or floor openings	65.06
29	Swimming pools, not specified	59.13
30	Bunk beds	59.01
31	Metal containers	58.59
32	Roller skating (activity, apparel or equip.)	57.90
33	Skateboards	50.13
34	Bedsprings or bedframes	49.23
35	Coins	47.93
36	Tableware and accessories	44.59
37	Softball (activity, apparel or equipment)	44.48
38	Rugs or carpets, not specified	44.46
39	Grocery or shopping carts	44.03
40	Gymnastics (activity, apparel or equip.)	43.86

⁸ Admissions and Emergency Department treatments.

Table 5.2 Ranking of consumer products associated with NON-FATAL injury by gender, children aged 0 to 14 years , USA, 1998 (Source : US CPSC NEISS).

Rank	Females	Males
1	Floors or flooring materials	Bicycles and accessories ⁹
2	Stairs or steps	Floors or flooring materials
3	Bicycles and accessories ¹	Football (activity, apparel or equip.)
4	Beds, not specified	Basketball (activity, apparel or equip.)
5	Tables, not elsewhere classified	Stairs or steps
6	Doors, not specified	Tables, not elsewhere classified
7	Basketball (activity, apparel or equip.)	Beds, not specified
8	Chairs, not specified	Doors, not specified
9	Monkey bars or other climbing equipment	Ceilings and walls (completed structure)
10	Swings or swing sets	Baseball (activity, apparel or equipment)
11	Ceilings and walls (completed structure)	Chairs, not specified
12	Trampolines	Monkey bars or climbing equipment
13	Sofas, couches, divans, etc.	Sofas, couches, divans, etc.
14	Jewellery	Fences or fence posts
15	Soccer (activity, apparel or equip.)	Toys, not elsewhere classified
16	In-line skating (activity, apparel, equip.)	Nails, screws, tacks or bolts
17	Desks, chests, bureaux or buffets	Knives, not elsewhere classified
18	Toys, not elsewhere classified	Soccer (activity, apparel or equip.)
19	Bathtubs or showers	Swings or swing sets
20	Gymnastics (activity, apparel or equip.)	In-line skating (activity, apparel, equip.)
21	Cabinets, racks, shelves, etc.	Trampolines
22	Nails, screws, tacks or bolts	Cabinets, racks, shelves, etc.
23	Slides or sliding boards	Desks, chests, bureaux or buffets
24	Roller skating (activity, apparel or equip.)	Slides or sliding boards
25	Coins	Bathtubs or showers
26	Softball (activity, apparel or equipment)	Windows or window glass, not specified
27	Fences or fence posts	Porches, balconies or open-side floors
28	Knives, not elsewhere classified	Bunk beds
29	Baseball (activity, apparel or equipment)	Skateboards
30	Porches, balconies, open-side floors	Coins
31	Windows or window glass, not specified	Bedsprings or bedframes
32	Swimming pools, not specified	Rugs or carpets, not specified
33	Bunk beds	Poles (exc. fence posts, fishing, playground)
34	Rugs or carpets, not specified	Metal containers
35	Grocery or shopping carts	Swimming pools, not specified
36	Metal containers	Ball sports (activity, apparel or equip)
37	Tableware and accessories	Grocery or shopping carts
38	Footwear	Tableware and accessories
39	Bedsprings or bedframes	Counters or countertops
40	Volleyball (activity, apparel or equip.)	Fishing (activity, apparel or equipment)

⁹ excludes mountain bikes

5.2 THE AUSTRALIAN DATA (NISPP)

The National Injury Surveillance Unit provided a standard set of output tables for children aged 0-14 years attending participating hospital Emergency Departments for injury during the period 1989-94.

Table 5.3 shows the top 40 rankings of consumer products associated with injury in this database. Concrete and other man-made surfaces are most frequently involved in injury, being a factor in more than one in eight injuries. Floors and bicycles ranked second and third respectively. No sports appear in the top 10; dogs (11th) appear before the highest ranked sport, organised football (12th). It is worth noting that only the top five products appear in 2% or more of injury cases, while the 40th ranked product (bricks or concrete blocks) only appears in one out of 200 cases.

5.3 COMPARISON OF U.S. AND AUSTRALIAN DATA

The pattern of products associated with injury to children varies considerably between the Australian and American data. The top ranked product in the Australian data set (concrete and other man-made outdoor surfaces) does not appear in the United States' list due to difference in coding frameworks. Furthermore, several categories of products such as animals (dog [11th], horse [28th]), food and drink (tea, coffee & other hot beverage [30th]), and motor vehicle (passenger car or station wagon [4th], vehicle part unspecified [21st], vehicle door [32nd]) that appear in the Australian data are also not included in the American data. Additionally, cultural differences account for categories such as netball (Aust. 31st) and rugby (Aust. 35th) not appearing in the US data. Similar reasons also explain the absence of baseball (US 10th) in the top 40 Australian data. It should be noted that the Australian data is historical, since the national collection ceased in 1994, while the US data is more current (1998).

In spite of the exceptions noted above, there are some striking similarities between the US and Australian product injury data. Bicycle, floors, and stairs or steps all appear in the top five positions for both countries. Sports account for seven products in the top 40 Australian data and eight in the US data, with the different codes of football and basketball appearing in the top three sports for each country. Structural items such as ceilings and walls, and doors, and furniture items such as beds, tables, and chairs all appear in the top 20 for both countries. Recreational items such as trampolines and skateboards also appear on both lists, although skateboards has a much higher ranking in the Australian data (16th) than in the US data (33rd).

Table 5.3 Consumer products most frequently involved in NON-FATAL injury to children aged 0 to 14 years, Australia, 1989-94 (Source : NISU, Finders University).

Ranking	Type of product	N	Case percent
1	Concrete and other man-made outdoor surfaces*	42,966	12.66%
2	Floors or flooring materials	25,824	7.60%
3	Bicycles or accessories	19,753	5.82%
4	Passenger car or station wagon	9,565	2.81%
5	Stairs or steps	7,431	2.18%
6	Monkey bars or other playground climbing apparatus	6,531	1.92%
7	Doors, not specified	5,532	1.63%
8	Beds, not specified	4,938	1.45%
9	Ceilings and walls (part of completed structure)	4,931	1.45%
10	Chairs, not specified	4,917	1.44%
11	Dog*	4,896	1.44%
12	Organised football (activity, apparel or equipment)	4,800	1.41%
13	Tables, not elsewhere classified	4,521	1.33%
14	Roller skating (activity, apparel or equipment)	4,339	1.27%
15	Trampolines	4,165	1.22%
16	Skateboards	4,041	1.19%
17	Swings or swing sets	3,977	1.17%
18	Fences or fence posts	3,717	1.09%
19	Door sills or frames	3,522	1.03%
20	Slides or sliding boards	3,333	0.98%
21	Vehicle part other or not specified	3,179	0.93%
22	Glass parts or pieces of unknown or unspecified origin	3,154	0.92%
23	Hot water*	2,826	0.83%
24	Cabinets, racks, room dividers and shelves, NEC	2,553	0.75%
25	Organised basketball (activity, apparel or equip.)	2,486	0.73%
26	Organised soccer (activity, apparel or equipment)	2,374	0.69%
27	Knives, not elsewhere classified	2,365	0.69%
28	Horse*	2,295	0.67%
29	Nails, screws, carpet tacks or thumbtacks	2,198	0.64%
30	Tea, coffee other hot beverage	2,171	0.63%
31	Netball organised outdoor (activity, apparel or equipment).	2,160	0.63%
32	Vehicle door	2,035	0.59%
33	Bunk beds	1,996	0.58%
34	Sofas, couches, lounges, divans or studio couches	1,995	0.58%
35	Rugby (activity, apparel or equipment)	1,990	0.58%
36	Informal football (activity, apparel or equipment)	1,980	0.58%
37	Toys, not elsewhere classified	1,899	0.55%
38	Bathtubs, showers incl. enclosures. (exc. faucets, spigots)	1,896	0.55%
39	Paper money or coins	1,787	0.52%
40	Bricks or concrete blocks (not part of structure)	1,700	0.50%

* Not included in US coding

5.4 THE VICTORIAN DATA

5.4.1 Deaths

All unnatural deaths investigated by the Victorian Coroner are recorded in the Victorian Coroner's Facilitation System, a computerised database containing information on deaths between 1989/90 and 1994/95. There were 359 unintentional child injury deaths recorded in this period.

The Coroner's Facilitation System includes 4 variables known as factor codes. These codes are based on the US CPSC's product codes. They identify particular products or agents involved in an injury death.

An analysis of the first factor recorded for unintentional child injury deaths indicates that, overall, land transport vehicles were associated with the greatest number of injury deaths (44%) in children aged 0-14 years. The majority of these involved passenger cars (65%). Environmental factors were associated with 23 percent of child deaths followed by sports and recreation products and activities (11%). The majority of injury deaths associated with recreational products involved drownings in swimming and wading pools (90%) and all but one of these occurred in the 0-4 year age group. Furniture and non-structural fittings were associated with 5 percent of unintentional child injury deaths. The majority of these involved drowning in baths, spas or hot tubs mainly in the 0-4 year age group.

An analysis including all four coded factors was conducted for each age group. This was considered necessary to identify products involved, for example, in deaths where fire, flame and smoke were recorded as the first factor and where several factors may have been associated with a death. Because there may be up to four coded factors for each death, factor totals will be greater than the number of cases and case percentages will sum to more than 100%. Table 5.4 presents the factors associated with unintentional child injury deaths (aged 0-14 years). Appendix Tables 15-17 include all recorded factors for each age group.

Passenger cars are the most commonly cited product across all age groups (Table 5.4), appearing as a factor in 38% of cases. Water appears in 20% of cases, while flame, fire, and smoke are cited in just under 10% of all deaths across the age groups. Bicycles and heavy vehicles over 3 tonnes also each appeared in 6.7% of cases, although it is likely that these cases involved passenger cars as well. All in all, a total of 96 different products were cited in the 359 death cases in the database.

0-4 year-olds

In the 0-4 year age group (Appendix Table 15), the most common factors associated with injury deaths were water (27 percent of cases) and passenger cars (26.5 percent). Swimming pools were the most common product (apart from motor vehicles) associated with injury death. In total there were 33 deaths associated with swimming and wading pools (16 percent of all deaths in this age group). Another five deaths (2.6%) were associated with spas or hot tubs. A total of eleven deaths (5.7%) were associated with baths and showers (including fittings and enclosures).

Fire, flame and smoke were associated with 11 percent of injury deaths in this age group (21 cases) with six cases involving lighters and four involving matches. Farm tractors were associated with eight deaths (4%). Nursery furniture was associated with 6 deaths, four of which involved asphyxiation when the child was caught between the cot and the

mattress/base or between the bars. The other two cases involved prams. In one, the pram collapsed causing asphyxiation. In the other, an open car door hit the pram when the car reversed.

The data for this age group were further broken down into infants aged less than one year and children aged 1-4 years to approximate the developmental changes that occur at around age one when children begin to walk and are generally more independently mobile.

Less than one year old

For children aged less than one year of age (see Appendix Table 15A) passenger vehicles were associated with 23% of deaths, and heavy vehicles (larger than 3 tonnes) with 14%. Water was associated with 17% of deaths, with pools appearing in 5.7% of cases overall and bathtubs and showers appearing in 8.6%. Nursery furniture was a factor in 5 cases (14%), with cots and baby carriages/prams present in 2 cases each.

1-4 year-olds

The top product in this age group (Appendix Table 15B) was water, which was present in 29% of deaths. Passenger cars (27%) and swimming pools (18%) also featured prominently. Other prominent products included flame, fire, and smoke (present in 13% of deaths), and dams and ponds (7.6%). Transport-related products such as heavy vehicles larger than 3 tonnes (5%) and farm tractors (5%) are also common. This age group shows a relatively similar pattern to the youngest group, with the greatest difference being the increased appearance of fire, flame, and smoke in the older group (20 cases vs. one).

5-9 year-olds

In the 5-9 year age group (Appendix Table 16), the most common factors associated with injury deaths were, again, passenger cars (49%) and water (12%). However, drownings in this age group tend to be associated with natural bodies of water or dams rather than with swimming pools. Public transport (trains, trams) were involved in 10 percent of deaths and heavy vehicles in 8 percent.

Fire, flame and smoke were associated with 10 percent of injury deaths (8 cases) in this age group with three cases involving matches or cigarette lighters. Bicycles were associated with four deaths (5%).

10-14 year-olds

In the 10-14 year age group (Appendix Table 17), the most common factors associated with injury deaths were passenger cars (55%), bicycles (20%), and water (12%). Drowning deaths in this age group were more likely to be associated with natural bodies of water (rivers or sea) than with swimming pools. Motorcycles were associated with almost 11 percent of deaths in this age group (9 cases.) Alcohol and other drugs were a factor in 8 percent of cases (7 cases). Fire/flame and smoke was associated with 6 deaths (7%), with 3 of these involving fuel-burning lighting equipment (3.6%) and one involving matches (1%).

Table 5.4 Products and agents associated with unintentional child injury deaths, 0-14 years (Victorian Coroner's Facilitation System, 1989-95).

Product or agent	N	Case %
Passenger car or station wagon	138	38.44
Water, not hot	72	20.06
Flame, fire, smoke	35	9.75
Built-in swimming pools	27	7.52
Bicycles or accessories	24	6.69
Heavy truck utility or van >3 tonnes	24	6.69
Dam, pond	20	5.57
Train, tram	14	3.90
Creek, stream, river	12	3.34
Farm tractors	11	3.06
Stick, branch, tree	10	2.79
Rope or string	9	2.51
Alcohol (beverage)	8	2.23
Matches, not specified	7	1.95
Above-ground swimming pools	6	1.67
Bathtubs, showers, incl. fixtures & access	6	1.67
Lighter fluids	6	1.67
Motorcycle, not specified	6	1.67
Trailer/horsefloat	6	1.67
Bathtub or shower enclosures, not specified	5	1.39
Bus >20 seats	5	1.39
Light truck utility or van <3 tonnes	5	1.39
Small rocks & stones	5	1.39
Whirlpools, hottubs or home spas	5	1.39
Electrical wire or wiring system	4	1.11
Meat, poultry	4	1.11
Other drugs or medications	4	1.11
Poles, (exc. fence posts, fishing, pole vaults)	4	1.11
Sea, ocean, estuary	4	1.11
Traffic control devices	4	1.11
Baby mattresses or pads	3	0.84
Boats, boat motors & access incl. sail boats & boards	3	0.84
Cots	3	0.84
Drains, grates, grills (roads)	3	0.84
Fences or fence posts	3	0.84
Fuel-burning lighting equipped	3	0.84
Motorcycle <250 CC	3	0.84
Other electric lighting equipment	3	0.84
Baby carriages & prams	2	0.56
Brick, stone or masonry chimneys	2	0.56
Candles, candlesticks & other candle holders	2	0.56
Cliff	2	0.56
Ditches & potholes	2	0.56
Farm mowers	2	0.56
Horse	2	0.56
Portable electric heaters	2	0.56
Sofas, couches, lounges, divans	2	0.56
Stairs or steps	2	0.56
Three or more wheel motorcycle	2	0.56

Cont. overleaf

Table 5.4 Cont. **Products and agents associated with unintentional child injury deaths, 0-14 years** (Victorian Coroner's Facilitation System, 1989-95).

Product or agent	N	Case %
Unspecified food	2	0.56
Wading pools	2	0.56
Window blinds, venetian blinds or indoor shutters	2	0.56
Baby gates or barriers	1	0.28
Beds, not specified	1	0.28
Bedspreads, throws or comforters	1	0.28
Biscuits	1	0.28
Blankets, not specified	1	0.28
Buildings, office, plant, residential etc	1	0.28
Cabinet or door hardware	1	0.28
Caravan	1	0.28
Cat	1	0.28
Chemical compounds (gaseous)	1	0.28
Cigarette or pipe lighters	1	0.28
Clotheslines, clothes drying racks or clothes horses	1	0.28
Clothing accessories	1	0.28
Clothing, not specified	1	0.28
Containers, not specified	1	0.28
Cot extender rails or youth bed rails	1	0.28
Desks, chests, bureaux or buffets	1	0.28
Dog	1	0.28
Draperies, curtains, shower curtains	1	0.28
Drums, pulleys, sheaves	1	0.28
Electrical wire, not specified	1	0.28
Floors or flooring material	1	0.28
Footwear	1	0.28
Fuel storage tanks	1	0.28
Gutters, kerbing (road), not incl. house, building	1	0.28
Handrails, railings or banisters	1	0.28
Hot water	1	0.28
Irrigation equipment	1	0.28
Leaves, flowers	1	0.28
Mattresses, not specified	1	0.28
Mountain climbing (activity, apparel or equipped)	1	0.28
Nonglass bathtub or shower enclosures	1	0.28
Other bedding	1	0.28
Plastic bags	1	0.28
Reptiles	1	0.28
Sheets or pillowcases	1	0.28
Silo loaders, augers	1	0.28
Sun	1	0.28
Swimming (activity, apparel or equipped)	1	0.28
Swimming pool equipped (exc. diving board, slide, chemicals)	1	0.28
Swimming pools, not specified	1	0.28
Tables, NEC	1	0.28
Tyres, not attached or under repair	1	0.28
Waste containers, rubbish baskets and bins	1	0.28

5.4.2 Hospital admissions

An analysis of products associated with injury resulting in hospital admission was undertaken using data from the Victorian Injury Surveillance System. Table 5.5 shows the ranking of the major product or agent categories involved in injury and Table 5.6 shows the top 40 individual products involved in injury admissions for children aged 0-14 years. Appendix Tables 18-23 list the individual products and groupings associated with injury admissions for children by 5-year age groups.

Overall, activities and products associated with sports and recreation (Table 5.5) accounted for the greatest number of injury admissions (26.5%) in children aged 0-14 years. These mainly involved bicycles (6% of all admissions), playground equipment (including climbing equipment : 3% of all admissions, slides : 1.5%, swings : 1%), horseback riding (1%), trampolines (1%), roller-skating (1%), organised football (0.75%), and skateboards (0.6%). (See Table 5.6.)

Structural features had the next highest involvement in injury (26%) due mainly to falls onto man-made surfaces. These include : concrete and other man-made outdoor surfaces (11% of all admissions), floors (6%), and steps and stairs (1.3%). Doors and door frames also featured highly in this category, associated with a total of 6% of all injury requiring hospital admission.

Furniture and fittings were involved in 10.5 percent of admissions. These included cabinets and shelving (2%), chairs (1.5%), beds (1.2%), tables (0.8%), bathtubs (0.8%) and bunk beds (0.7%). Animals were involved in 7.5 percent of injuries requiring admission, the majority of which were related to dogs (2.5% of all cases) and horses (1.2%).

Yard and garden equipment were associated with 6.4 percent of all injury admissions in children while drugs and medication were associated with 3.7 percent of all cases. Tablets or capsules ranked 10th (2.1%) overall, sedatives and tranquillisers, etc, ranked 20th (1.14%), liquid drugs ranked 22nd (1.1%), and ointments and topical medicines ranked 32nd (0.8%).

Scald injuries associated with hot water ranked 8th overall (2.6%) (Table 5.6), and tea, coffee and hot beverages ranked 12th (1.7%). It should be noted that mulch materials, ranked 30th (and associated with 0.8% of injury admissions) features in the top 40 rankings of products due to its use as an undersurfacing for playground equipment. Its function is protective rather than causal.

0-4 year olds

The main group of products related to injury admissions in 0-4 year olds (Appendix Table 18) was structural features (28% of all admissions) due mainly, of course, to their association with falls. Floors were the associated with 7.4 percent (ranked 1st) of injury admissions in this age-group while concrete and other man-made surfaces (ranked 2nd) were associated with 6 percent, and steps and stairs (ranked 21st) a further 1.7 percent (Appendix Table 19). Doors (ranked 4th), and door sills or frames (ranked 6th) were associated with 5.0 percent and 4.8 percent of admissions respectively.

Furniture and non-structural fittings were associated with 17 percent of injury admissions. The main products in this group were : cabinets and shelves (4%, ranked 7th), chairs (2%, ranked 15th), beds (2%, ranked 16th), tables (1.9%, ranked 19th), and bathtubs (1.7%, ranked 20th). Bunk beds were associated with 0.6 percent of injury admissions (ranked 38th) in this age group.

Drugs and medications were also frequently associated with injury admission in this age-group (14%). Sedatives, tranquillisers, etc. (2.4%, ranked 11th), aspirin substitutes (1.0%, ranked 29th) and antihistamines (0.6%, ranked 34th) were the drugs most likely to be associated with injury admissions. Medications in tablet or capsule form (2.5%, ranked 10th), liquid form¹ (2.3%, ranked 12th) and ointments (1.6%, ranked 23rd) were also prominent.

Seventy-one percent of all poisonings presenting to hospital Emergency Departments in this age-group were due to medications with the remainder relating to the ingestion of household chemicals. Of the medication ingestions, 45 percent required hospital admission.

Results of an in-depth analysis of the VISS data relating to medication poisonings in early childhood (Routley, Ozanne-Smith & Ashby, 1996), which examined the text narrative for each case presenting to an Emergency Department in the collection, indicated that paracetamol, vaporiser solutions (including essential oils), asthma medications, and benzodiazepines were most commonly associated with admissions in this dataset (Appendix Table 35). The peak age for medication ingestions is 2 years with the majority of incidents occurring in the victim's own home.

Recreation injuries are associated with 9.4 percent of injury admissions in this age-group. The main products associated with these injuries are : bicycles or accessories (1.9%, ranked 17th), slides (1.2%, ranked 26th), swings (1.1%, ranked 27th), and climbing equipment (0.6%, ranked 37th).

Children's nursery furniture is associated with 3.7 percent of injury admissions in this age-group with the majority of cases related to prams (0.6%, ranked 36th).

Hot water (4.9%) and hot beverages (3.5%), as a source of scald injuries, also ranked highly at 5th and 8th respectively.

Other highly ranked agents or products involved in child injury admissions (Appendix Table 19) include : dogs (3.2%, ranked 9th), paper money or coins (1.7%, ranked 22nd), toys (1.0%, ranked 28th), and pesticides (0.8%, ranked 33rd).

Less than one year old

The major product grouping associated with injury in the under one year age-group (Appendix Table 18A) was structures or parts thereof (34% of cases). Floors and flooring material (16.3% of all cases; ranked 1st) and concrete and other man-made outdoor surfaces (5.6%; 4th) were the top ranked agents in this category (Appendix Table 19A). Doors (4.1%, 7th) and doorsills or frames (3.9%, 9th) also feature prominently.

Furniture ranked second (19%) in terms of category groupings (Appendix Table 18A). Cabinets, racks, room dividers and shelves (4.4%, 6th) and beds (4%, 8th) were the top ranked product in this group (Appendix Table 19A). Other products such as tables (11th), and chairs (25th) also appear on the list.

Food and drink accounted for 18% of admissions (Appendix Table 18A). Hot water (8.2%, 2nd) and tea, coffee and other hot beverages (6%, 3rd) both ranked very highly, underlining the

¹ Excluding aspirin substitutes, iron preparations and antihistamines

frequency with which infants are burned or scalded (Appendix Table 19A). Fruit and vegetables (29th) also appeared in the top 40 list.

Children's and child's nursery equipment was the 4th largest product group, appearing in 14% of injury cases (Appendix Table 18A). Carriages and prams (2.3%, 12th) and walkers or jumpers (2.2%, 13th) are the largest causes in this group (Appendix Table 19A). Baby exercisers (20th), changing tables (22nd), and strollers (24th) are other frequently cited products in this group. Other nursery products include baby bottles (32nd), high chairs (34th), and bassinets or cradles (35th).

Other major product groupings in the infants (under 1 year old) age group are drugs and medications (9%), kitchenware (5%) and vehicles, air or land (5%) (Appendix Table 18A). The highest ranked product from these groups is passenger car (5th) (Appendix Table 19A). Further detail can be seen in Appendix tables 18A and 19A.

1-4 year olds

The product grouping of structures and parts appears in 27% of injury cases in this age group, making it the most frequently cited group (Appendix Table 18B). Concrete and man-made surfaces is the number 1 ranked specific product, appearing in 6.1% of cases (Appendix Table 19B). Floors and flooring materials ranks second at just under 6.1%. Door sills and frames (4.9%, 5th) and stairs and steps (1.6%, 22nd) also feature prominently in this group.

Furniture and non-structural items appear in 16% of injury cases (Appendix Table 18B). Cabinets, racks, room dividers and shelves (4.4%, 7th) ranks highest in this group. Chairs (2.1%, 14th) and beds (1.7%, 17th) also feature, as do tables (19th), sofas and couches (29th), and bunk beds (32nd).

Drugs and medication is the 3rd largest product grouping accounting for 15% agents associated with injury in this age-group (Appendix Table 18B). Tablets and capsule drugs (2.8%, 10th) ranks highest of these (Appendix Table 19B), closely followed by barbiturates, sedatives, and tranquillisers (2.7%, 11th), liquid drugs excluding aspirin substitutes (2.4%, 12th) and other drugs or medications (2.4%, 13th). Other drugs also appear down the list, including ointments and topical medicines (18th) and aspirin substitutes (27th).

Food and drink (11%) ranks 4th in the product groupings (Appendix Table 18B). Hot water (4.4%, 6th) and tea, coffee, and other hot beverages (3.2%, 9th) are the top ranked products. These figures again indicate the propensity for burn and scald injuries in young children. Nuts (30th) also appears as a specific product indicating the high incidence of choking on food for children of this age.

Other major products (Appendix Table 19B) implicated in injuries for children this age include dogs (8th), paper money and coins (21st, representing choking once more), and a variety of playground equipment including slides and sliding boards (24th), swing sets (25th), and monkey bars (33rd). For more detail see Appendix tables 18B and 19B.

5-9 year olds

Sports and recreation injuries were the major source of injury hospital admissions in the 5-9 year age-group (Appendix Table 20) accounting for 38 percent of all hospitalised injuries. Thirteen of the top 40 individual products (Appendix Table 21) fall under this heading with five these being playground equipment. Climbing equipment was associated with the most playground injuries (8.2% of all injury admissions, ranked 3rd overall), followed by slides

(3%, ranked 6th), swings (2%, ranked 10th) and other and unspecified playground equipment (3%, ranked 15th and 14th respectively). Mulch materials, although not coded in this category, was ranked 7th in the overall product listing for this age group, as it is the surface onto which most playground falls occur. Other highly ranked sports and recreation equipment associated with injuries in this age-group are bicycles (8.2%, ranked 4th), trampolines (2%, ranked 9th), roller skates (1%, ranked 22nd), and flying foxes (0.8%, ranked 27th).

Structures are related to almost 27 percent of injury hospital admissions in the 5-9 year age group. Man-made outdoor surfaces (13%, ranked 1st) and floors (4.5%, ranked 5th) are the most common structures associated with injury admissions, mainly due to their association with falls, while doors (2%, ranked 11th) and door frames/sills (2%, ranked 13th) also feature, as do walls/ceilings (0.8%, ranked 24th) and stairs or steps (0.8%, ranked 26th).

Furniture and non-structural fittings were associated with 6.2 percent of injury admissions, the main products being chairs (1%, ranked 19th), bunk beds (1%, ranked 20th) and beds (1%, ranked 21st).

Animals were associated with 4.6 percent of injury admissions in this age group. These were mainly due to dogs (2.3%, ranked 8th) and horses (1.1%, ranked 18th).

Yard and garden equipment, which includes fences (2%, ranked 12th), poles (0.6%, ranked 38th) and gates (0.5%, ranked 39th) was associated with a total of 4 percent of injury admissions.

Other products or agents which ranked highly were pins and needles (1.3%, ranked 17th), hot water (0.9%, ranked 23rd), roofs (0.7%, ranked 29th) and coins (0.7%, ranked 30th).

10-14 year olds

Sports and recreation activities and/or products were associated with 47 percent of all hospital admitted injuries in the 10-14 year age-group, with 17 of the top 40 products or agents associated with injury in this age group falling into this category (Appendix Table 22). Bicycles were associated with the most injuries in this category (12.3%) ranking second overall (Appendix Table 22). Other sports and recreational activities that were often associated with injury include horseback riding (3.4%, ranked 6th), football (organised, “football” and informal, ranked 7th, 15th and 28th respectively), roller-skating (8th) and skateboards (10th).

Playground equipment only appears twice in the top 40 products associated with injury in this age-group with monkey bars and other playground climbing equipment (ranked 12th) related to 1.4 percent of injuries and unspecified playground equipment (ranked 34th) accounting for 0.7 percent.

Structures were associated with 27 percent of injuries in this age-group with man-made outdoor surfaces (1st) and floors (4th) the most common.

Vehicles were associated with 15 percent of hospital admitted injuries in this age group and, although passenger vehicles are associated with the majority of these (11%, ranked 3rd), motorcycles begin to make an appearance in the top 40 products at 9th (2%), 32nd (0.7%) and 33rd (0.7%).

Animals are the next most frequent group associated with injuries accounting for 6 percent of hospital admissions in the 10-14 year age group. Unlike the younger age groups horses (ranked 5th, 3.7%) are associated with more hospitalised injury than dogs (ranked 16th, 1.3%).

Other products associated with hospitalised injury in this age group include petrol, (20th, 1%), alcohol (24th, 0.9%), and knives (26th, 0.8%).

Table 5.5 Ranking of broad product or agent GROUPINGS associated with injury ADMISSIONS, 0-14 years, VISS (1989-96), N=13,696.

PRODUCT OR AGENT GROUPING	N	Case %
Sports and recreation	3,621	26.44
Structures and parts thereof	3,590	26.21
Natural/environmental	2,285	16.68
Misc./unclassifiable	1,429	10.43
Furniture & non-structural fittings	1,373	10.02
Vehicles - air/land	1,243	9.08
Animals	1,023	7.47
Yard and garden equipment	873	6.37
Food and drink	699	5.10
Drugs, medications, biological factors	497	3.63
Toys	368	2.69
Kitchenware	323	2.36
Personal use items	269	1.96
Children nursery equipment	246	1.80
Packaging materials/containers	227	1.66
Misc. cleaning/maintenance consumables	218	1.59
Industrial equipment	163	1.19
Space heating cooling ventilation	137	1.00
Craft and hobby equipment	127	0.93
Workshop tools	73	0.53
Fabrics drapery soft furnishing	67	0.49
General housewares	65	0.47
Kitchen appliances	59	0.43
Medical equipment	47	0.34
Entertainment apparatus	45	0.33
Laundry appliances	38	0.28
Other household appliances	38	0.28
Cosmetics and related preps	27	0.20
Chemicals and compounds	21	0.15
Security safety & protection	20	0.15
General utility appliances	15	0.11
Commercial & business equipment	13	0.09
Agricultural equipment	5	0.04
Laundryware	4	0.03

Table 5.6 Products or agents associated with child injury ADMISSIONS, 0-14 years, VISS (1989-96), N=13,696.

Rank	Type of product	N	Case %
1	Concrete & other man-made outdoor surfaces	1,533	11.19
2	Passenger car or station wagon	1,133	8.27
3	Bicycles or accessories	845	6.17
4	Floors or flooring material	783	5.72
5	Doors, not specified	432	3.15
6	Door sills or frames	409	2.99
7	Monkey bars and other playground climbing equipment	408	2.98
8	Hot water	353	2.58
9	Dog	343	2.50
10	Tablet or capsule drug, NEC	286	2.09
11	Cabinets, racks, room dividers & shelves	279	2.04
12	Tea, coffee, other hot beverages	228	1.66
13	Slides and sliding boards	214	1.56
14	Fences or fence posts	201	1.47
15	Chairs, not specified	197	1.44
16	Vehicle part other or not specified	194	1.42
17	Stairs or steps	172	1.26
18	Beds, not specified	168	1.23
19	Horse	162	1.18
20	Sedatives, tranquillisers	156	1.14
21	Swings and swing sets	153	1.12
22	Liquid drugs (exc. Aspirin subs, iron preps, antihistamines)	152	1.11
23	Tableware and accessories	147	1.07
24	Other drugs or medications	140	1.02
25	Horseback riding (activity, apparel or equipment)	139	1.01
26	Paper money or coins	134	0.98
27	Tables, NEC	123	0.90
28	Trampolines	115	0.84
29	Roller skating	113	0.83
30	Mulch materials (man made)	112	0.82
31	Bathtubs, showers, incl. Fixtures & access	110	0.80
32	Ointments and topical medicines	107	0.78
33	Organised football	103	0.75
34	Bunk beds	95	0.69
35	Motorcycle, not specified	86	0.63
36	Playground equipment, not specified	86	0.63
37	Skateboards	82	0.60
38	Pins and needles	81	0.59
39	Sofas, couches, lounges, divans	72	0.53
40	Ceilings & walls (part of completed structure)	70	0.51

5.4.3 Non-hospitalised Emergency Department Presentations

Data from hospital presentations reported in the Victorian Injury Surveillance System (VISS) were examined for injury events involving consumer products. Table 5.7 shows the rankings of general product categories involved in injury across the broad 0 to 14 age group, while Table 5.8 displays the specific products involved in injury in rank order. Appendix Tables 24 to 29 show similar details broken down by five-year age groupings.

Across all ages, sports and recreation products were involved in more injuries (28.7% of all presentation cases) than any other category of products (Table 5.7). Major products associated with injuries in this category include bicycles and accessories (5.5% of all cases; 3rd ranked product), monkey bars and other playground climbing equipment (1.8%; 8th ranked product), organised football (1.6%), roller skating (1.2%), organised basketball (1.2%), and trampolines (1.1%) (Table 5.8).

Structures were associated with 26.8 percent of all presentations - only slightly less than the sports and recreation category. Specific products include the two highest ranked individual products in concrete and other man-made outdoor surfaces (9.9% of cases) and floors (6.5%). Stairs or steps (2.2%; 5th ranked product) and doors (1.9%; 6th) also ranked highly.

Furniture and non-structural fittings were associated with ten percent of non-hospitalised Emergency department attendances. Products most frequently associated with injury in this category include beds (1.7%; 9th), chairs (1.7%; 10th) and tables (1.6%; 11th).

Animals were associated with almost 4.5 percent of Emergency Department presentations in children, with dogs (1.8%; 7th) its most common product. Other categories well represented include yard and garden equipment (2.6% of all presentation cases) and food and drink (2.5% of cases). However, neither of these categories has any single product that appears in 1% or more of cases.

0-4 year olds

In contrast to the overall data for children aged 0 to 14 years, structures is the most prominent category of products (28.5%) involved in emergency department presentations for 0-4 year olds (Appendix Table 24). The two highest ranked specific products, floors (9.4%) and concrete and other man-made outdoor surfaces (5.9%) fall into this group (see Appendix Table 25). Doors and door sills or frames (ranked 7th and 9th respectively), ceilings and walls (1.4%; 15th), and structural tiles (1%, 19th) also rank highly in this group.

Furniture and non-structural fittings ranks second in product groupings and is associated with injury in 15.6% of cases. Major products within this group are beds (3.4%; 3rd), tables (3.3%; 4th), chairs (3%; 6th); many others in this category also appear in the top 40 list (see Appendix Table 25).

Sports and recreation products ranked third among the product groups, associated with 9.1% of cases. The leading products in this grouping include bicycles or accessories (2.1%; 10th) and swings and swing sets (1%; 21st). A large number of moderate and lesser-ranked products accounts for this categories high position amongst product groupings.

While animals ranks slightly higher (4.4% of cases) as a product group, drugs and medications appear in a much higher proportion of cases for this age group (4.3%) than in the 0 to 14 collective group (1.9%). Primary products in this group include aspirin substitutes (1%; 20th), liquid drugs excluding aspirin substitutes (0.7%; 32nd) and tablet or capsule drugs

(0.7%; 33rd). Other products that young children are likely to ingest include coins (0.8%; 26th).

Less than one year old

Structures and parts thereof is the most prominent grouping of products related to injury presentations in the infant age group (Appendix Table 24A). Over one third of cases (36%) cite a product from this grouping, with the major specific products being floors or flooring material (18.8%, 1st), concrete and man-made surfaces (7.3%, 2nd), and stairs or steps (3.5%, 6th) (Appendix Table 25A).

Children's nursery equipment and consumables appear in 17% of presentation cases, making it the second largest grouping (Appendix Table 24A). Baby walkers or jumpers (3.7%, 5th) are frequently cited, as are baby carriages and prams (3.3%, 7th). High chairs (12th), changing tables (17th), strollers and pushers (21st), and baby exercisers (22nd) all rank highly (Appendix Table 25A).

Furniture and non-structural fittings ranks 3rd amongst product groupings, appearing in 15% of injury presentation cases. Frequent offenders in this category include beds (5.3%, 3rd) and tables (2.7%, 10th). Chairs (14th) and sofas, couches, lounges, & divans (15th) also fall into this category.

Food and drink appear in 8% of presentation cases. The leading culprit is hot water (2.9%, 8th), and tea, coffee and other hot beverages (2.5%, 11th) also features.

Of the specific products not yet mentioned, passenger cars (5.2%, 4th) ranks highest. Notable products particular to this age group include cigarettes, cigars, pipes or tobacco (32nd), grocery or shopping trolleys (33rd), and baby capsules (40th). Further detail can be found in Appendix Tables 24A and 25A.

1-4 year olds

Structures and parts thereof appear in 27% of injury presentations, making in the most common grouping (Appendix Table 24B). Specific products in this category include floors or flooring material (7.8%, 1st) and concrete and man-made surfaces (5.5%, 2nd). Doors (2.8%, 6th), door sills or frames (2.4%, 8th) and steps or stairs (2.3%, 9th) all also appear in the top 10 products (Appendix Table 25B).

Furniture products appear in 16% of presentations (Appendix Table 24B). Prominent products in this grouping include tables (3.3%, 3rd), chairs (3.1%, 4th), and beds (3%, 5th). Cabinets, racks, room dividers and shelves (11th), sofas, couches, lounges, and divans (16th) and bedsprings or bedframes (20th) all appear in the top 20 as well (Appendix Table 25B).

Sports and recreation related agents are cited in 10% of injury presentation cases. Bicycles and accessories (2.2%, 10th) is the highest ranked product in this grouping. Other products include slides and sliding boards (15th), swings and swing sets (19th), trampolines (30th), and monkey bars (40th).

Other prominent product groupings include miscellaneous products (9%), natural and environmental factors (6%), and animals (5%). Specific products not yet mentioned include passenger cars (2.8%, 7th), tea, coffee, and other hot beverages (17th, but above hot water at 22nd), and paper money or coins (24th - generally through being ingested).

5-9 year olds

The grouping of sports and recreation products has the highest frequency of association with injury in this age group, appearing in over a third (33.7%) of cases (Appendix Table 26). Bicycles and accessories (6.7% of cases; 2nd ranking), monkey bars and other playground climbing equipment (4.6%; 4th), and trampolines (1.7%; 8th) all appear in the top 10 products (Appendix Table 27). Furthermore, a total of nine other products in the top 40 fall into this category, including swings and swing sets (13th), roller skating (14th), and unspecified playground equipment (17th). Appendix Table 27 shows the full listing of products in this category.

Structures are a factor in over a quarter (25.9%) of injury cases (Appendix Table 26) with concrete and other man made surfaces ranking highest (11.9%) in the individual product listing for this age group (Appendix Table 27). Floors ranked third among individual products (4.6%) and stairs or steps ranked ninth (1.7%). Doors (11th) and ceilings and walls (16th) also rank highly.

Furniture and non-structural fittings are associated with 6.6% of injury presentations in this age-group (Appendix Table 26). Major products in this category include beds (1.3%; 15th), tables (1%; 19th), and bunk beds (1%; 20th). Other prominent product categories in the 5 to 9 age group include animals (4.9% of cases), with dogs associated with 2.2 percent of all injuries (6th).

The pattern of injury presentation in this age group differs significantly from the younger 0 to 4 age bracket. Although the top 3 categories are common to both, their order has altered, and sports and recreation product related injuries are associated with over three and a half times more injuries in the 5 to 9 year age group. There are understandably less drugs and medication related presentations in the older group, and nursery furniture items such as prams and high chairs, and items that present specific hazards to the very young - such as coins - are also absent in the 5 to 9 year group.

10-14 year olds

Almost half (49.9%) of the products associated with injury presentations in the 10 to 14 age group fall into the broad category of sports and recreation (Appendix Table 28). Bicycles and accessories (8.3% of cases; 2nd rank), organised football (4.6%; 4th), organised basketball (2.6%; 6th), roller skating (2.4%; 7th) and unspecified football (2%; 9th) all appear in the top 10, while other sports such as organised soccer (12th), skateboards (13th) and netball (16th) also rank inside the top 20. In all, 22 out of the top 40 products fall into the sports and recreation category (see Appendix Table 29).

Structures and parts are a factor in 25.4% of injury presentations, making it the second largest category. The category contains the highest ranked product in terms of injury association - concrete and other man-made outdoor surfaces (13.3% of cases). Floors or flooring materials ranks 5th among products (4.4%), while stairs or steps ranks 9th (2.1%).

Animals are associated with 4.1 percent of all injuries in this age group with dogs (1.7%; 10th) the highest ranked individual product in this grouping, followed by horses (1.2%, 20th). This rise in animal-related product injuries is probably due to increased participation in horseback riding (25th) by older children.

The difference in product patterns for this age group (compared to the younger groups) is attributable to increased participation in a range of activities, especially sporting activities. Children of this age are less likely to be injured in association with furniture and household products because of their increasing involvement in activities outside the home. Interestingly, beds do not make the top 40 list in this age group after being a prominent product in the lower age groups' lists.

Table 5.7 Ranking of broad product or agent GROUPINGS associated with injury PRESENTATIONS, 0-14 years, VISS (1989-96), N=69,655.

PRODUCT OR AGENT GROUPING	N	Case %
Sports and recreation	19,982	28.69
Structures and parts thereof	18,649	26.77
Natural/environmental	8,824	12.67
Misc./unclassifiable	6,685	9.60
Furniture & non-structural fittings	6,305	9.05
Vehicles - air/land	3,474	4.99
Animals	3,102	4.45
Yard and garden equipment	1,822	2.62
Food and drink	1,704	2.45
Drugs, medications, biological factors	1,325	1.90
Toys	1,296	1.86
Kitchenware	1,285	1.84
Personal use items	1,149	1.65
Children nursery equipment	1,083	1.55
Packaging materials/containers	1,072	1.54
Misc. cleaning/maintenance consumables	1,059	1.52
Industrial equipment	766	1.10
Space heating cooling ventilation	463	0.66
Craft and hobby equipment	443	0.64
Workshop tools	337	0.48
Fabrics drapery soft furnishing	333	0.48
General housewares	282	0.40
Kitchen appliances	261	0.37
Medical equipment	250	0.36
Entertainment apparatus	220	0.32
Laundry appliances	218	0.31
Other household appliances	188	0.27
Cosmetics and related preps	172	0.25
Chemicals and compounds	114	0.16
Security safety & protection	94	0.13
General utility appliances	78	0.11
Comm & business equipment	43	0.06
Agricultural equipment	32	0.05
Laundryware	26	0.04

Table 5.8 Products or agents associated with child injury PRESENTATIONS, 0-14 years, N=69,655.

Rank	Type of product	N	Case %
1	Concrete & other man-made outdoor surfaces	6,902	9.91
2	Floors or flooring material	4,491	6.45
3	Bicycles or accessories	3,845	5.52
4	Passenger car or station wagon	2,824	4.05
5	Stairs or steps	1,527	2.19
6	Doors, not specified	1,334	1.92
7	Dog	1,258	1.81
8	Monkey bars and other playground climbing equipment	1,244	1.79
9	Beds, not specified	1,196	1.72
10	Chairs, not specified	1,182	1.70
11	Tables, NEC	1,124	1.61
12	Organised football	1,116	1.60
13	Door sills or frames	1,030	1.48
14	Ceilings & walls (part of completed structure)	944	1.36
15	Fences or fence posts	894	1.28
16	Roller skating	809	1.16
17	Organised basketball	799	1.15
18	Trampolines	760	1.09
19	Cabinets, racks, room dividers & shelves	680	0.98
20	Slides and sliding boards	663	0.95
21	Football (activity, apparel or equipment) not specified	572	0.82
22	Swings and swing sets	570	0.82
23	Nails, screws, tacks	541	0.78
24	Vehicle part other or not specified	537	0.77
25	Knives, NEC	535	0.77
26	Glass parts or pieces, origin unknown	530	0.76
27	Toys, not specified	517	0.74
28	Foreign body NEC	506	0.73
29	Skateboards	500	0.72
30	Wood items, NEC	489	0.70
31	Informal football	478	0.69
32	Sofas, couches, lounges, divans	466	0.67
33	Ball sports, not specified	443	0.64
34	Hot water	442	0.63
35	Bathtubs, showers, incl. Fixtures & access	385	0.55
36	Bunk beds	375	0.54
37	Basketball	372	0.53
38	Organised soccer	368	0.53
39	Metal parts or pieces of unknown or unspecified origin	367	0.53
40	Tea, coffee, other hot beverages	364	0.52

6 LIMITATIONS

The concept of “exposure” is basic to epidemiological research. Ideally, the rate of injury is quantified by dividing the incidence of injury by exposure to the possibility of injury. This can only be achieved if there is both accurate and reliable injury and exposure data.

Population-based incidence data are often used to prioritise injury prevention programs without reference to the issue of exposure. Injury rates are frequently calculated using the total or age relevant population as the denominator, more often than not, because there is no relevant exposure data available. The CPSC data reported in this study is presented in this form as rates per 100,000 population for each relevant age group. However, such denominators are imprecise, and risk is often underestimated, by attributing it to both the exposed, and unexposed, in the population (Abdulwadad, Ozanne-Smith & Day, unpublished manuscript).

Knowledge about exposure can lead to more accurate estimates of both the absolute and relative risks associated with different products. This can be especially meaningful where there is a need to target individual or group risks instead of societal risks (Venema, 1997) as it enables the identification of higher risk injury types and risk population groups. This can improve the priority setting process and facilitate the choice and targeting of injury prevention programs. It may be, for example, that a product ban is recommended for a high injury, low exposure product, particularly if its utility is questionable (Abdulwadad et al, unpublished manuscript).

However, exposure measurement is rarely found in the area of consumer safety. There are several definitions of exposure and numerous ways to measure it. In the field of home and leisure accidents (where most injuries to older persons occur), exposure time is the most common measurement of exposure. However, very little has been done in Australia on this issue, although some methodologies have been developed in relation to exposure of cyclists (Drummond & Jee 1989; Drummond & Ozanne-Smith, 1991).

A crude measure of exposure is ownership of specific items. The Australian Bureau of Statistics conducted a survey household exposure to safety hazards and the prevalence of safety products in the home throughout Victoria during October, 1998.

While exposure data are essential in estimating the risk associated with individual consumer products, accurate estimates of the incidence of injury associated with these products are also vital in this exercise.

Data from the original Victorian Injury Surveillance Systems (and other collections in Australia) allow the ranking of different products according to the frequency of injuries. However, it is not possible to accurately estimate the incidence of injuries associated with individual products because those systems, which comprehensively collect data on products associated with injury, were not representative samples of the population. However, methods have been developed to establish crude incidence estimates from this data.

These systems (VISS and NISU) are both now historical collections and, although the product rankings are broadly validated by more recent US data from the CPSC, the information is becoming dated.

Where data is collected on a population basis, as with the VIMD and the VEMD, the level of detail currently available is generally not sufficient to accurately and reliably identify most

individual products. The VEMD has a text narrative field through which products can be identified. However, this is often a time-consuming process and the textual data is often poor (Ozanne-Smith et al, 1999). In the case of the VIMD, which relies on ICD coding, only certain products are coded. Enhancements designed to provide at least generic product information are required in future developments to injury data systems.

7 ISSUES & INTERVENTIONS

The issue of consumer product-related injury in children is of national and international importance and there is an abundance of literature in this area. This chapter will explore some of the problems and issues associated with general product and child safety. Child safety interventions will be examined for the major causes of injury, where products have been identified in the aetiology of the injury event, or where protective products have the potential to reduce injury, with the primary focus being on the more severe injuries.

7.1 GENERAL PRODUCT SAFETY

Because individuals in industrialised countries live in an essentially man-made environment, consumer products are significantly associated with injury. Consumer products are defined, in accordance with the European Economic Community General Product Safety Directive (COM(90)259) as :

“any manufactured, processed or agricultural product supplied in the course of business and likely to be used by consumers. It applies irrespective of whether or not the product is new, used or reconditioned.”

In accordance with the GPSD a safe product is defined as :

one which does not present an unacceptable risk by virtue of its composition, use, wrapping, presentation and labelling, conditions of assembly, maintenance or disposal, instructions and direct and indirect effects on or with other products.”

(Page, Lee & Powell, 1993).

Product safety in Australia is largely administered under the Trades Practices Act of 1974. Routine product safety functions are maintained by the federal Department of Treasury's Consumer Affairs Division, state and territory Departments of Consumer Affairs or Offices of Fair Trading and the Australian Competition and Consumer Commission.

Products may be involved in causing injury in a number of ways:

1. Physical failure of a product due to
 - a fault in manufacturing or design
 - a lack of maintenance
2. Inadequate design of a product
 - design inappropriate for normal use of the product
 - design inappropriate for the specific age or ability groups intended to use the product
 - inadequate protection against foreseeable mishandling or misuse of the product
 - inadequate protection for non-users (bystanders)
3. Inadequate instructions
 - for use or maintenance
 - due to lack of safety warnings
4. Not influenced by any shortcoming in the product due to
 - misuse beyond the influence of the supplier
 - unforeseen human or environmental factors

(Australian Consumers Association, 1989)

7.1.1 Size and nature of the problem

It is estimated that over 70 percent of all unintentional injuries are associated with consumer products. In Australia this amounts to over 3 million medically treated injuries annually at an estimated lifetime treatment cost of \$2.8 billion. The total lifetime cost (treatment cost plus lost productivity) is estimated at \$9.2 billion (estimates based on Watson & Ozanne-Smith, 1995, 1997).

At least 15 percent of all unintentional injuries are directly related to a *design failure or product malfunction*. It is estimated that *product-caused* injury accounts for over 650,000 medically treated cases annually, of which 42,000 result in hospitalisation and 490 result in death. The estimated lifetime treatment cost of annual *product-caused* injury is \$562 million with a total lifetime cost of almost \$1.7 billion (derived from Watson & Ozanne-Smith, 1995 & Watson & Ozanne-Smith, 1997).

7.1.2 Risk groups and risk factors

The incidence and severity of injury in a population and the risk of injury to an individual is determined by a number of factors, including:

- the design of the man-made environment
- the abilities and skills of the user, and
- the behaviour of the user.

A weakness in one or more of these factors increases the risk of injury (Moller, 1995).

For example, where there are issues associated with the abilities or behaviour of the user, as is the case particularly with the young and the elderly, the design of a product becomes a vital factor in reducing risk. The very young are particularly at risk because of the greater possibility that they might use products in ways that were not intended by the manufacturer.

The ISO/IEC Guide 50 (1987) recognises the distinction between products designed specifically for children, and those which children come in contact with, in the course of everyday life. It states that :

“Products that are not made specifically for children, but which they are likely to come into contact, should be designed so that they reduce the danger to children to a minimum compatible with their intended use. In the case of products which are intended for use by children, the need for them to be designed so as to minimise hazards under intended and anticipated conditions of use is even more important ... It should always be remembered that children have a remarkable ability to use products in ways not originally contemplated by designers, manufacturers and parents.”

The physical size of children (in particular) is another substantial risk factor in a world largely designed for adults.

Little information is available on the exposure to products as a major risk factor for injury. ABS and other Household Safety Surveys, in conjunction with relevant injury data, provide some valuable information on product related risks.

There is also some evidence that people from non-English speaking backgrounds are over represented in exposure to some products associated with unacceptable levels of risk e.g. babywalkers (Ozanne-Smith & Brumen, 1993; ABS, 1992).

One of the major problems associated with consumer product safety is the huge range of products available. Risk groups and risk factors vary in relation to particular products. For example, the types of products involved in injury vary with the age of the consumer. In the United States, Miller has identified the proportions of the cost of injury contributed by many products for various age groups (Miller, 1998). Stairs and steps account for the greatest proportion of the cost of injury in the age groups, 0-4 years, 30-39 years, 40-49 years and 50-59 years. Bicycles account for the greatest proportion in the 5-9 and 10-14 year age groups while basketball injuries account for the greatest cost in the 15-19 and 20-29 year age groups. Floors are associated with the greatest proportion of cost in older persons (60 years plus) because of the high rate of injurious falls in this group.

7.1.3 Barriers to progress

There are several barriers to progress in product safety in Australia.

Jurisdictional barriers

Issues relate to jurisdiction where common injuries related to consumer products are not clearly accepted as core business by any government department. For example, the Federal Office of Road Safety does not appear to regard design features of motor vehicles which enable suicide by exhaust gassing as core business (500 deaths annually in Australia) (Routley and Ozanne-Smith, 1998). Similarly, it is difficult to identify government departments which accept responsibility for a range of other product related injuries, such as dog bites, off-road motor cycle injuries, home design (structures and fixtures) and childhood poisoning.

Lack of a systematic approach

To date in Australia, responsible authorities do not appear to take a systematic data driven approach to product safety. A single complaint about the safety of a product, in the current system, can divert attention and resources from larger product related injury issues.

A systematic approach to product design is also required to minimise product-related injury to children.

Lack of data

Current coding systems used in the health sector (most notably hospital separations) and coronial databases do not consistently identify consumer product involvement in injury. There is also no current mechanism for identifying emerging hazards associated with consumer products since there is no system requiring the reporting of hazards identified by manufacturers or importers.

7.1.4 Proven and promising interventions

Safety standards

While over time there appears to be an evolutionary development observable for design and safety improvements to products independent of the product standard processes, voluntary standards can provide guidance to manufacturers, importers, wholesalers, retailers and consumers. Compliance with Australian/NZ voluntary standards may provide some market advantage and protection in the case of legal action arising from safety problems. However, there are few real incentives to conform to standards.

Mandatory safety standards are most often applied in the areas of motor vehicle and workplace safety and are less common in the area of general consumer product safety. However, mandatory product safety standards have the most potential to protect the most vulnerable consumers - the young and the elderly - from poorly designed products.

Australia constitutes a small market and, therefore, is not well placed to influence or dictate international product design. World Trade Organisation agreements can serve as barriers or as an adjunct to safety standards. On the one hand, standards in Australia have been described as non-tariff barriers to trade. On the other hand, Australia is able to “piggy-back” on US and other overseas and international standards (as with child-resistant cigarette lighters), where exporting manufacturers are already required to meet these standards, either by local mandation of standards or market forces.

Horizontal standards are being progressively developed to provide generalisable rules (e.g. entrapment, stability) to assist manufacturers in the design of products and simplify the standards making process.

Mandatory reporting of hazards

Australia needs to mandate the reporting of hazards identified by manufacturers, importers and retailers. The Mistral fan inquiry, for example, provides evidence of the need for such legislation in Australia (Cassell & Ozanne-Smith, 2000), where evidence of a severe product failure, known to the manufacturer, was not reported to authorities. A system of mandatory reporting applies in the US and forms a fundamental component of the product safety process.

The European General Product Safety Directive

The European General Product Safety Directive (COM(90)259) – while non-specific, places some responsibility on producers and sellers of products. A refined, more specific, version should be considered for Australia.

Greater involvement of key stake holders

The skills, energy and commitment of key stakeholders need to be harnessed in the implementation of product safety initiatives (e.g. plumbers on the issue of reducing domestic hot water temperatures; hirers and hardware chains regarding do-it-yourself injuries). The workshop methodology developed in relation to a number of specific poisoning agents (e.g. eucalyptus oil), which involved key stakeholders in the ownership of the problem and scoping potential solutions, has wider application.

7.1.5 Major research gaps

The application of the Haddon method of devising injury prevention strategies and countermeasures to specific product related injuries may provide solutions which lie in the chain of events leading to injury, rather than concentrating on the product may be fruitful, particularly where design of the product is difficult to change.

Studies are needed to evaluate the effectiveness of new mandatory and voluntary standards (for example the standards and regulations relating to cots, child resistant cigarette lighters and the US baby walker standard).

Biomechanical research to determine the forces involved in injury, design improvements or design for protective equipment has been poorly resourced to date.

The absence of exposure studies to determine relative risks, benefits/cost analyses and targeting interventions has hampered decisions on the appropriate actions to take with many products of concern (e.g. babywalkers).

A priority-setting model should be developed to assist with the setting of an evidence-based agenda for product-related injury prevention.

An Australian cost model for product-related injury needs to be developed and resources devoted to its application in research. Such a model would provide a tool for cost estimates on injury related to most products as well as a mechanism for undertaking benefit/cost analyses.

7.2 CHILD INJURY TRENDS

Child injury deaths are on a downward trend over the period 1979-97 (see Appendix Table 30), indicating that significant achievements have been made. With the exception of fire and flame, all major cause and age combinations have trended downward. The changes have varied for different age groups and have not been uniform over time.

Hospitalisation trends for child injury in Australia are not currently available (James Harrison, NISU, personal communication). However, Victorian public hospital admissions indicate a significant increase in hospital admissions due to injury in children in both the 0-4 and 5-14 year age groups (Stathakis, 1999; see Appendix Tables 31 & 32).

Falls and poisoning, the most common causes of injury hospitalisation in 0-4 year olds, are responsible for the upward trend in injury hospitalisations in young children. Admissions for near drownings, fire/burn injuries, scalds, dog bites and motor vehicle traffic injuries all decreased significantly in the 11 years between July 1987 and June 1998 (Stathakis, 1999).

An upward trend for injury hospitalisations in the 5-14 year age group is also evident over the 11 year period in Victoria. However, the clear declining trend evident for the first six years of the period studied shows that the introduction of Casemix funding has complicated the tracking of admissions (see Appendix Table 32). It is not clear whether the overall increasing trend is due to the significant increase in fall injury hospitalisations over the period (which account for a major proportion of injury admissions) or is an effect due solely to Casemix, or to a combination of both. Pedestrian and bicycle injury hospitalisations are declining in this age-group (Stathakis, 1999). Irrespective of whether or not there is a real increase in the rate of severe injury in this age group, there is an increase in hospitalisations and real associated costs.

Advances have been made in important child injury priority areas. However, a number of priority issues still remain. At each stage of development there are specific risks that require attention (Moller & Kreisfeld, 1997).

7.3 OVERVIEW OF CHILD INJURY BY DEVELOPMENTAL STAGE

It is well known that children's motor and cognitive skills are in a state of rapid development throughout their early years. Exposure to a changing range of environments is also associated with this development, as are sociological and behavioural influences. All of these factors are reflected in circumstances leading to an injury.

7.3.1 Overview

A marked decrease in death rate with increasing age is apparent to 14 years with the drowning peak in 0-4 year olds an obvious problem requiring intervention. Children in the 0-4 year age group are more vulnerable to injury and death from injury than other age-groups. Hospitalised and non-hospitalised injury rates for this younger age group are higher than for other children (5 to 14 years) (Appendix Tables 5 & 6). The injury death rate for 0-4 year-olds is twice that of 10-14 year-olds and almost three times that of 5-9 year-olds (Appendix Table 4). In terms of unintentional injury death, the priority areas within the scope of general consumer product safety are drowning, mechanical asphyxiation, and fires.

Priorities based on hospitalisations are more diverse with more causes involved. Falls emerge as a common issue in the under five year olds with falls from playground equipment featuring in the 5-9 year age group. Hospitalisation data also show the importance of poisoning and burns and scalds in the under five year olds and sports and recreation injuries in the older age-groups.

The location of injury occurrence varies with age with the home particularly prominent for 0-4 year olds, where it represents the site for 73 percent of injuries. As children mature, the home decreases in importance with other locations increasingly involved, and a more diverse spread of injury locations is noted in the 10-14 year age group. This pattern reflects the increasing amount of time spent outside the home with increasing age. When estimated hours of exposure are taken into account for school and home injuries in older children, it is found that the risk of injury is similar (Goss, 1992).

7.3.2 Injuries in the first year of life

Data from the Victorian Injury Surveillance System suggests that nursery furniture is associated with 23 percent of injuries in this age group presenting to hospital Emergency Departments, with falls accounting for almost 80 percent of these injuries. The most common items of nursery furniture associated with injury in this age group are prams and strollers, high chairs, baby walkers, bouncinettes, change tables and cots. Cots and pram/strollers are associated with fatal injuries in this age group.

Baby walkers allow increased mobility beyond the developmental stage of the infant that often leads them into hazardous situations, which can result in a fall, or accessing of hazardous substances such as hot beverages on coffee tables

Falls from heights also occur when infants are left unattended on beds, tables, chairs and couches, or when bouncinettes are placed on elevated surfaces such as bench tops.

Infants become increasingly mobile in the first year of life, allowing them to access a wide range of hazards. Their small size in relation to their environment results in frequent scalds from pulling hot liquids down onto themselves from coffee tables or benches. They also access and frequently mouth a range of hazardous substances (e.g. cigarettes and medications) and objects left within their reach (e.g. coins).

7.3.3 Injuries to children aged 1-4 years

Drowning is the major cause of death in this age group with the majority occurring in backyard swimming pools. The hospital admission rate for this group is highest for falls. This is followed by poisoning and burns (principally scalds) which both peak in this developmental stage. Although this age group is treated as a single age category in this

study, children are still undergoing rapid development during this period which is reflected in the changing range and nature of factors involved in injury causation.

At two years of age the major factors associated with injury have changed considerably from those in the first year of life. The frequency of injury presentations to hospital Emergency Departments has almost doubled compared to the first year.

Furniture is still a predominate factor in injuries at this age. However, furniture is likely to be involved as a means of accessing hazards as well as being a fall hazard itself. Medications reach their peak involvement at this age and are represented by a high level of severity (16 percent of admissions at this age) (Ozanne-Smith, 1992). Dog attacks, bicycles and tricycles, and playground equipment (particularly slides) are also frequently associated with injuries. Finger jams in doors are also frequent at this age.

Toddlers apply their developing motor and cognitive skills to the task of exploring all aspects of their environment. While it must be accepted that infants and toddlers will experience minor injuries in the course of normal child development, it is unacceptable for children to suffer more serious injury. Thus a balance is required between a 'safe' environment and one which is stimulating and supportive of child development.

By the age of four years bicycles and playground equipment are more frequently involved in injury compared to younger children. Dog attacks remain constant and vehicles emerge as an important factor as children are transported more from their homes

As children of this age assert their independence, they are at risk of unwittingly exposing themselves or younger siblings to dangerous situations, such as the pre-school child who insists on crossing the road alone, or the four year old who loses control of the pram containing a younger sibling on a steep driveway.

7.3.4 Injuries to children aged 5-9 years

In this and other age groups (except less than 5 years), road trauma is the major cause of death from injury. Motor vehicles are also associated more severe injuries requiring hospital admission.

Sport and recreational factors, particularly bicycles and playground equipment predominate at this age. Falls remain the major cause of hospital admission due to injury. Among injuries requiring hospitalisation, falls from playground equipment provide an example of an injury type with a clear peak in this age-group, with monkey bars and other climbing equipment now predominant when compared with the younger age group.

While males are generally over-represented in most categories of injury, the similarity in rates for males and females for playground equipment falls is noteworthy and probable relates to the relative levels of exposure.

7.3.5 Injuries to children aged 10-14 years

Motor vehicles remain a frequent factor in death and more severe injuries in this age group.

Although sports and recreational still dominate in both hospital admissions and Emergency Department presentations, bicycles are more frequently involved and football and other ball sports have supplanted playground equipment. Other organised and informal

sport/recreational activities such as in-line skating and skate boarding are most frequent at this age.

Male overrepresentation is marked in this age-group, particularly among bicycle related and sporting injuries.

7.4 DROWNING

There were 77 drowning deaths in children in Australia in 1997, 68 percent of whom were males. By far the majority of drowning deaths (77 percent) occurred in the 0-4 year age group (Appendix Table 4). Fifty-nine children aged 0-4 years drowned in Australia in 1997 representing almost a third of all injury deaths in this age group, with males accounting for 64 percent.

There were also 359 hospital admissions for near drowning in children in 1996/97, almost three-quarters of these were aged 0-4 years (Appendix Table 5). It is estimated that between five and ten percent of these admissions will suffer some neurological damage (Pitt, 1986).

Drowning locations vary with age. Forty-four percent of drowning deaths and 63 percent of near drownings in 0-4 year-olds occurring in swimming pools. The vulnerability of Australian toddlers to drowning, particularly in domestic swimming pools, is well-documented (Nixon et al 1995). As children get older and gain more independence, an increasing number drown in public waterways (lakes, rivers, creeks) and beaches.

A detailed analysis of the Victorian data illustrates this pattern. In an overview of coronial data, Stathakis and Scott (1999) show that drowning was the most common cause of death to children aged 0-4 years between 1989 to 1995 in Victoria. The location for these drownings was predominantly the backyard swimming pool (47%), followed by dams/rivers/creeks (21%), bathtubs (15%) and spas (7%). In contrast, drowning deaths among children aged 5-14 years were mainly natural freshwater sites (35%) such as lakes, dams and rivers. Ocean and beach drowning deaths were fewer (10.7%) (Ashby, 1997).

There may be some differences between States in the proportions of the different age groups that drown in the locations outlined for Victoria, but the broad pattern is similar.

7.4.1 Swimming pools

A New Zealand study (Geddis, 1984) that examined the exposure of a nation-wide sample of 8,430 children aged 1-3 years to water hazards and the incidence of potential drowning accidents reported that 60% of the children were exposed to one or more water hazards. The most common hazard was domestic swimming pools to which 39% of the children were exposed. Since birth, 734 of the children (8.7%) had experienced a total of 867 water accidents where, but for a chance finding, drowning could have happened (Geddis, 1984).

To date, the main emphasis in drowning prevention for young children in Australia has been to encourage swimming and water safety training in young children, to encourage greater supervision of young children on properties where there is a pool, spa or dam and, more recently, to legislate for compulsory fencing of backyard pools.

Whether training in swimming and water safety in young children is protective against drowning is not clear from current research. A randomised controlled trial of the effectiveness of water safety and swimming lessons (of 8-12 weeks duration) for children 24-

42 months old reported improvements in toddlers' swimming ability and water safety skills (Asher et al, 1995). However, the authors concluded that pool fencing and other barriers to water, and parental supervision still remain the most important prevention strategies to reduce drowning in young children.

A Cochrane Collaboration evaluation of current evidence on the effectiveness of pool fencing to prevent drowning in young children (Thompson & Rivara, 1997) found that pool fencing reduces the risk of drowning, with almost a four-fold protective effect compared to an unfenced pool. Isolation fencing (which encloses the pool only) was shown to be far more protective than perimeter fencing (fencing property and pool).

Most Australian States and Territories now require fencing around new domestic pools and spas to prevent toddler drowning. There are varying requirements in each state or territory for existing pools – from none at all to provision of safety barriers to prevent unsupervised child access. Regulations were introduced in NSW in 1990, then repealed following intense lobbying and media advocacy by an organised group of pool owners. In contrast, since July 1 1997, the Victorian Building Act and Regulations has required that all existing residential pools and spas (new and established) be provided with safety barriers to prevent unsupervised child access. Similar regulations apply in Queensland. No state has adopted a full isolation-fencing requirement for existing pools, even at the point of sale of the property.

A recent survey by Monash University Accident Research Centre of local councils in Victoria showed a wide variation in the enforcement of pool fencing regulations by local councils. At least 25% of pools in homes advertised for sale in two major Melbourne newspapers on March 14, 1998 would probably not comply with pool fencing regulations at the time of sale (Ashby et al 1998). The authors recommend that compliant pool fencing be enforced on the sale of residential properties with pools. The findings of this study were supported by an ABS survey later in 1998, which found that 28 percent of domestic swimming pools did not have child resistant gates attached to the fence around the pool, compared to 72.4 percent in 1992. The data were self-reported. (ABS, 1999b).

The greatest hindrance to determining the effectiveness of pool fencing has been poor compliance with regulations (Ashby et al, 1998) and poor maintenance of fencing. The effectiveness of Queensland pool fencing regulations (including enforcement provisions) is currently under evaluation, complicated by evidence that children are drowning in fenced pools because of inadequacies in fencing, gate locks and other deficiencies.

Also of concern is the relative complacency of pool owners about their pool fencing, even when it was inadequate. Recent research conducted in Brisbane (Fisher & Balanda, 1997) reported that pool owners, even those with toddler aged children, were less likely than non-pool owners to perceive having a childproof fence around the pool as an important aspect of care giving for young children. The authors recommended that the safety knowledge, attitude, and behaviour of pool owners need to be enhanced.

The recent spate of toddler drownings in backyard pools in Victoria has prompted the Victorian government to announce a crackdown on pool and spa safety. Seven toddlers drowned in backyard pools between October, 1999 and mid January, 2000, compared to four drownings in the whole summer season in 1998/99 and seven in the whole of 1998/99 (Victorian Government Media Unit, Jan. 18, 2000).

Measures to be introduced in the campaign, overseen by the Building Control Commission, include :

- spot inspections of backyard pools and spas by local council officers to ensure compliance;
- a moratorium to give pool owners an opportunity to notify their council they will install pool fencing within three months;
- an advertising campaign focusing on the requirements for pool and spa barriers and supervision of children and
- information sheets for building surveyors and pool and spa owners on the obligations of pool safety.

A recent in-depth study of coronial information on 33 toddler drownings in backyard swimming pools in Victoria (Blum & Shield, in press) found that 56 percent of the pools did not have complete isolation fencing. Of the 44 percent which did, only three appear to have met the Australian Standard for swimming pool fencing (AS1926). In no case did a child gain unaided access to a pool with a fully functional gate and fence that met the standard. In the majority of cases where toddlers gained access to fenced pools, they did so via faulty or inadequate gates, or through gates that were propped open. Seven children drowned in unfenced pools at a time when they were believed to be inside the house. In all but one of these cases, parents had relied on locked back doors for protection.

These findings highlight the need for both the installation of Australian Standards-approved fences and gates and for the regular maintenance of existing fences and gates. They also reinforce the inadequacy of door locks (where the pool is accessible from the house) and supervision as primary prevention strategies.

New technology alerting systems to monitor children's access to the vicinity of hazards also warrants investigation.

7.4.2 Baths

The NISU data indicates that there were nine drowning deaths in baths in the 0-4 year age group in Australia in 1997. Data from the Victorian Coroner's Facilitation System showed that baths were associated with five percent of all deaths in the 0-4 year age group. Bathtub drownings accounted for 15 percent all toddler drownings (Stathakis & Scott, 1999).

While overall mortality from drowning in the United States has been declining for the last 60 years (Baker et al, 1992), drowning in infants - often in the bath - has increased during the last two decades (Brenner et al., 1994). An examination of the Victorian Coroner's data indicated that all bath tub drownings occurred in children aged two years or less and 44 percent of these were less than one year of age. All occurred when the baby or toddler was left unattended, or in the care of an older sibling.

Alternatives to adult bathtubs for infants and toddlers are recommended. Near drownings in bath tubs are rare in Sweden, where adults use showers and infants are bathed in small tubs, but are frequent among toddlers in Japan, where large sunken tubs are often left filled with water (Mizuta et al 1993, Tanaka, 1993). The increasing fashion for spas in Australian bathrooms may present a similar drowning hazard to toddlers.

7.5 MECHANICAL ASPHYXIATION

Of the 31 choking and suffocation deaths that occurred in children aged 0-14 years in Australia in 1997, the majority (n=20 or 65%) were due to mechanical asphyxiation. The majority of these deaths (n=17, 85%) occurred in the 0-4 year age group. Data from the Victorian Coroner's Facilitation System (1989-1995) suggest that, in this age group, almost half of mechanical suffocation deaths are related to nursery furniture.

7.5.1 Nursery furniture

A search of the Victorian Consultative Council on Obstetric and Paediatric Mortality and Morbidity data (1985 to 1988 inclusive) (Ozanne-Smith & Heffernan, 1990) and the Victorian Coroner's Facilitation System (1989/90-1994/95) revealed 15 deaths related to nursery furniture. Eleven were associated with cots and their environs, while single deaths related to a stroller, pram, change table and high chair. Thirteen of these deaths involved mechanical asphyxiation including all of the cot-related deaths and the deaths associated with the pram and strollers.

There have been several other deaths related to nursery furniture in Victoria since 1995, but no data is yet available. Unpublished reports include more cot-related deaths such as a portable cot collapsing onto the child when the locking device had not been securely engaged, and a further pram-related death involving entrapment.

Cots

Of the cot-related deaths, seven children strangled or suffocated as a result of the cot design or modification, including one whose clothing was caught on a wing nut. Another three children were strangled; two as a result of accessing blind or curtain cords and the other by accessing elastic attached to a toy on the cot. One child fell from the cot into a clothes basket and suffocated.

The relatively high injury mortality associated with cots is consistent with overseas reports (de Graaf, 1987; NEISS, US CPSC data) and further emphasises cot-related injuries as an important target for injury prevention. United States data suggests that cots are associated with nine times as many deaths as any other single nursery furniture product (Death Certificate Files, 1989-93, US CPSC). As a result of deaths there have been recent product recalls for specific models of cots and playpens, particularly in the US.

In Australia, the Standard for household cots (AS/NZS 2172-1995) was made mandatory for both new and second hand cots from the 30th June 1998. The Standard addresses the problems of entrapment, suffocation, sharp edges and protrusions, low or flimsy drop-side railings and inadequate instructions and labelling. It also requires warnings regarding hazards in the cot environs.

Following the introduction of the mandatory standard for household cots, several surveys have been undertaken to monitor compliance with standard of cots available for sale in retail outlets. In Brisbane, the Australian Consumer Competition Commission (ACCC) surveyed 24 styles of new cots, of which four were found to be in serious breach of the standard and were subsequently withdrawn from sale (Barry, 1998).

Nine months after the introduction of the mandatory safety standard, the Australian Consumers Association also tested 11 commonly available new cots (ACA, 1999). In the

view of the Australian Consumers Association (ACA) testing laboratory, none of the 11 tested cots completely met all the mandatory safety requirements, and only three substantially met most. While many of the failures identified did not pose a risk as dangerous as head entrapment or strangulation, the ACA believes that cots should be free of any potential hazard. The ACA argues that many of the problems found could easily have been avoided, if manufacturers had considered *all* sections of the standard thoroughly (in the spirit it was intended) and designed the products accordingly.

The NSW Office of Fair Trading also initiated a compliance program throughout NSW, focusing on educating suppliers of new and second-hand cots of the requirements of the standard. A survey by that department found that there was a generally high level of compliance among suppliers of new cots, the majority of which displayed a standards mark. This was also the case with suppliers specialising in the sale of second hand nursery furniture. The area of most concern was the lack of knowledge and awareness of suppliers of general household second hand furniture and antique stores. These suppliers generally were unaware, or did not understand the scope, of the new requirement and had dangerous cots readily available for sale. The Department intends contacting charitable organisations and local councils about the second-hand cots and cots retrieved from landfill areas which are being recycled (Barry, 1998).

A survey, focussing on hazardous products in thrift stores, was conducted by the CPSC (1999) in the United States, and it found that 12 percent of general thrift stores sell cribs (cots) that do not meet current federal safety standards. The CPSC has prepared a “Thrift Store Checklist” designed for store owners and managers to use before accepting donations or consignments for their stores. The checklist is being distributed through the National Association of Resale and Thrift Shops and national organisations as well, as to state and local governments, for distribution to local and independently owned stores.

The CPSC has also drafted model legislation for state governments to make it illegal for commercial bodies who sell or provide children’s products for public use, such as thrift stores, to sell or distribute certain hazardous products. The model legislation focuses only on children’s products which violate federal safety regulations or have been recalled for safety reasons. This approach ensures that the most vulnerable population affected by unsafe products – children – are protected, and it is easier to enforce. The CPSC intends to distribute this model legislation to organisations such as the National Association of Attorneys General and the National Governors Association.

Prams/strollers

MUARC has undertaken in-depth investigations of three deaths associated with pram/stroller units for the Victorian Coroner (Rechnitzer, 1998). In each of the incidents the infant died from asphyxiation after being left sleeping in the unit. Two cases involved the same model pramette (convertible pram/stroller). In both cases the fabric mattress on the adjustable backrest of the pram was not adequately secured to the frame and could, therefore come loose without the parent knowing. The backrest lost support and tipped down, resulting in the baby sliding down head first into the fabric sleeve that formed, which in turn resulted in asphyxiation. These incidents resulted in the international manufacturer recalling the pramettes and retro-fitting a design countermeasure.

The other death involved a pramette unit in which the rear flap had been unclipped, apparently enabling the infant to move backwards, resulting in instability and the pram

tipping rearwards and trapping the infant. The manufacturer subsequently added a non-removable sleeve to the backboard of new models.

These deaths highlight the need for improvement in design standards and ongoing scrutiny of product performance. As a result of the in-depth investigation of these cases, including Coronial inquests, amendments to the Australian Standard (AS/NZ 2088 : Safety of prams and strollers) have occurred which are aimed at preventing these types of incidents. These preclude the use of loose fittings, and require testing to help ensure designs which prevent entrapment and possible strangulation/asphyxiation. Other issues regarding the design and testing of pram and stroller units have also been identified from these incidents. The investigator also recommended that the standard be made mandatory and that bio-fidelic test procedures be introduced (Rechnitzer, 1998).

7.5.2 Bunk beds

Bunk beds also represent a life-threatening hazard to young children in particular, because of the possibility of entrapment and subsequent asphyxiation (Watson et al, 1997). The existing voluntary Australian/New Zealand Standard generally adequately addresses the safety issues raised by the examination of the literature and the analysis of the injury data. It is also clear that, in Australia, voluntary standards and market forces have been ineffective in achieving compliance with the standard since its release in 1994 (Watson et al, 1999).

While a number of Australian manufacturers now produce a safer bunk, most also continue to produce unsafe products. The bunk bed associated with the 1998 death of a three-year-old child in NSW did not conform to the standard. Although the manufacturer of that bed had developed a standards approved bunk bed, the bulk of its manufacture since the introduction of the standard in 1994 has been non-complying bunks (Thompson, 1998).

It is clear that, in Australia, voluntary standards and the market have been ineffective in achieving compliance. In light of this, the current revision of the Australian standard should be made mandatory. A precedent for mandating the standard exists (From July 1, 1998 all cots supplied for household use on the new and second-hand markets must comply with the mandatory safety standard AS/NZS 2172 : 1995).

7.6 FIRE/FLAMES/BURNS & SCALDS

In 1997 there were sixteen deaths in children in Australia, caused by fire, flames, burns and scalds (seven percent of total injury deaths). Males were over-represented, accounting for twelve (75 percent) of these deaths. Children aged 0-4 years were most at risk from fire/flames/burns, accounting for thirteen deaths (77 percent) in this category. At least six of these involved house fires, one was a clothing ignition, and the remaining cases were coded as "other, unspecified thermal".

In 1996/97 there were 1,736 child injury hospitalisations due to fire/flame, etc., with 1,215 (69 percent) in the 0-4 year age group. The majority of hospitalisations in young children (1,054, 87 percent of hospitalisations for this cause) were due to contact with hot substances or objects.

The long-term implications of injury from burns or scalds is significant in terms of the social, economic, and health costs to the child and their family. A recent Australian study (AIHW, 1999) found burns and scalds resulted in the most severe types of injury to children, when length of stay in hospital was used as the severity score.

As Penny (1992) suggests, the young child's natural curiosity, combined with an environment that expose it to products which burn or scald, may lead to an injury occurrence. Clearly the role of consumer products must be considered together with the child's physical capabilities when injury prevention measures are formulated. Different preventive strategies are required, depending on the contextual and environmental aspects of the injury (Towner & Ward, 1998).

7.6.1 Cigarette lighters & matches

At least 13 of the 30 fire deaths in children (0-14 years) recorded in the Victorian Coroner's Facilitation System (1989-1995) resulted from fire play. Almost half the fire deaths in the 0-4 year age group involved children playing with ignition sources, with cigarette lighters and matches equally implicated. The majority of non-fatal cases involving cigarette lighter burns were to children in the 0-4 year age group, with over half requiring admission to hospital (Cassell, Routley & Ozanne-Smith, 1997).

In the US, fire play by children using cigarette lighters and matches was the second most common cause of house fires after cigarettes. Ongoing analysis of US fire statistics by the National Fire Protection Association (NFPA) indicated a steady and significant growth in cigarette lighter-related injury, with lighters accounting for a larger proportion of child fire-play deaths in the 1990's. In the US between 1992 and 1996, home fires started by children playing with lighters averaged 160 deaths, 1,320 injuries and 8,500 fires per year. Home fires started by children playing with matches averaged 108 deaths, 711 civilian injuries and 8,100 fires. (Hall, 1999).

The US CPSC implemented child-resistance requirements for lighters in mid-1994, and the fire statistics for the full year (1995-96) following the legislation indicated a substantial lessening of the problem. While the NFPA continues its own tracking of the problem, the CPSC is using a special data collection through fire departments for a more in-depth investigation (Hall, 1999).

A ban on the sale of non-child-resistant cigarette lighters came into effect in Australia on October 1, 1997. No evaluation has yet been undertaken to assess the effect of the legislation (Gail O'Bryen, ACCC, personal communication).

To date, engineered solutions appear to be far more practical for lighters than for matches. The Department of Trade and Industry (DTI) in the U.K. commissioned the National Engineering Laboratory to research the feasibility of a child resistant match box. This study concluded that, although there were a number of child resistant designs available, the majority had never been tested. Also, those made from traditional materials could not be made child resistant because they would always be accessible if children used their teeth. Problems with the manufacture of child resistant matchboxes made from traditional materials also made them impractical. Most designs required loose flaps of some time that interlocked together. Any misalignment of the flaps during the manufacturing process, which runs at 70,000 boxes per hour, could cause the production to jam (David Mornington, DTI, personal communication).

New materials, such as plastics or a combination of plastics and more traditional materials, were also considered. However, the cost of plastics was prohibitive, estimated to double or triple the cost to the consumer. There were also environmental concerns about the use of plastics (David Mornington, DTI, personal communication).

The DTI subsequently explored other ways of preventing children playing with matches which resulted in further research into the warnings given on the match box for parents to “Keep Out of Reach of Children”. The DTI have since tested a new warning “Fire Kills Children”, and a logo, which should be more effective than the original (David Mornington, personal communication).

7.6.2 Smoke alarms

In the case of house fires, very young children are particularly vulnerable because they depend on adults for assistance to escape the fire. When a housefire occurs, one of the most important risk factors for death is the absence of a smoke alarm (Runyan et al., 1993). Many international studies have shown the effectiveness of domestic smoke alarms in preventing death and injury from house fires (Ozanne-Smith and Watson, 1991).

Door-to-door smoke alarm give-away schemes have been reported to reduce the annualised fire injury rate by 80% and the injury rate per 100 fires by 74% in the targeted high fire injury risk area in a controlled trial in Oklahoma City (Mallonee et al., 1996). Injury deaths were also shown to have been reduced in a pre-post evaluation study of a campaign run by the Baltimore Fire Department (Hammond & Varas 1990). Both these intensive community-based campaigns successfully engaged high fire-risk (usually low-income) populations e.g. renters, migrants and illegal aliens. The success of the Baltimore program was ascribed to the amount of media attention it received coupled with a reduced or absent financial barrier, and the need for the target group to engage in a one-time activity (Hammond & Varas 1990).

New research (DiGuseppi & Higgins, 2000), which systematically reviewed interventions to promote smoke alarms concluded that while education, particularly when delivered in a clinical setting, modestly increases smoke alarm ownership and function, compulsory tenant’s education may be effective in preventing fires, and community programs that directly provide smoke alarms appear effective in preventing injuries.

Fire prevention authorities should trial and evaluate the effectiveness of a local doorstep purchase/free installation smoke alarm scheme in high house fire-risk localities.

Begg et al (1998) showed, in a case-control study in Melbourne, that houses without smoke alarms have a more than five times greater risk of fatal and injurious fires than homes with smoke alarms.

The current Victorian smoke alarm implementation program aimed to achieve 100% penetration in owner-occupied houses by 1998. ABS surveys show that the fitting of smoke alarms into Victorian households increased from 39% in 1992 to 84% in October 1998. The installation of smoke detectors in households with young children (aged less than 5 years) increased from 46 percent to 92 percent in the same period.

Legislation requiring smoke alarms to be fitted to all residential properties in Victoria came into effect on 1 February 1999.

Research conducted for the Victorian Building Control Commission (Beever & Britton, 1999) concluded that the current legislation requiring new households to have a mains powered smoke alarm, and for all existing households to have at least a battery powered smoke alarm, appears to be appropriate and cost-effective.

The Home Safety Survey indicates that nearly half of all households in Victoria test their smoke detectors less than monthly, with 11.5 percent never testing their alarm (ABS, 1999). The recently developed single purpose lithium smoke alarm battery (estimated to last ten years) is designed to prevent removal of the battery for other purposes and to overcome battery maintenance problems. The design improvements, recommended to US manufacturers by the U.S. National Centre for Injury Prevention and Control Task Force, include a silencing button that will allow people to turn off a smoke alarm for 15 minutes, so there is no need to disable it to prevent false alarms due to cooking. Recent Australian research (Beever & Britton, 1999) recommends the use of ionisation type smoke alarms over the use of photoelectric alarms in domestic dwellings, except in circumstances where false alarms are experienced.

These authors also recommend that action be taken to reduce the risk of fire in rented accommodation. The findings of smoke alarm operability studies in the US, confirmed by research in the Australian context, indicate that the most cost-effective solution is the installation of mains powered smoke alarms (Beever & Britton, 1999).

7.6.3 Domestic sprinkler systems and building controls

Studies cited in a Health Canada report on children's injury (Health Canada, 1997) suggest that automatic sprinkler systems, when coupled with smoke alarms, are 98 percent effective in suppressing and reducing fires. They can also reduce property loss by up to 75 percent. This passive measure is also considered highly effective in reducing injury and death as it is not dependent on residents to respond to fires, therefore potentially putting themselves at risk.

Recent Australian research (Beever & Britton, 1999) also concluded that domestic sprinklers would reduce the number of fatalities and injuries in household fires, and also significantly reduce property loss, if installed in Australian dwellings. However, it was not considered cost-effective to recommend extending building codes to require the installation of sprinklers in domestic dwellings at the present time. The authors concluded that smoke alarms and fire extinguishers are currently far more cost-effective than sprinklers. However, the adoption of domestic sprinklers should be reassessed in the future, as their cost-effectiveness should improve with expected changing demographics and reducing costs.

Building code regulations in force in other countries that may warrant consideration include: the requirement for two protective pathways out of every room in the home (one can be by fire brigade ladder through a window); dampers used in vents (triggered by smoke detectors) to stop recirculation of smoke; fire brigade inspection of new wood stoves and fireplaces; and the mandatory use of chimney sweeps once a year in households with open fires (Schaenman, 1993).

7.6.4 Upholstered furniture

In the U.K. upholstered furniture cannot be sold for home use if it does not meet stringent open flame and smouldering tests. The equivalent Australian standard is voluntary rather than mandatory. The report by Beever & Britton (1999) made no recommendation for upholstered furniture and mattress flammability regulations for Australia. However, it did

recommend that research into the development of suitable low cost materials be promoted and that information on flammability of combinations of fabrics and fillings be distributed to the furniture industry. They also argue that the public should have access to information which allows the purchase of furnishings that will not create potentially hazardous situations.

7.6.5 Children's nightwear

Safety standards, including labelling and fabric standards for children's nightwear, were introduced in Australia in 1978 and a significant decline in burns due to fire and flames in children has been attributed to this initiative (Laing & Bryant, 1991). Alternative explanations include changes to home heating technology and the demise of more dangerous heating methods.

Long standing legislation in Britain to restrict the flammability of children's nightwear has also been associated with a decrease in burn injuries. There has, however, been a reappearance of burns due to the ignition of nightwear - attributed to young girls wearing cotton T-shirts as nightdresses. T-shirts are not covered by existing British legislation requiring flame retardant nightwear since they are not sold as sleepwear (Wilson & Bailie, 1999).

7.6.6 Products related to scalds and contact burns

Young children are particularly vulnerable to scalds. The VISS (1989-96) data indicate that the majority of hospitalisations to children aged 0-4 years caused by burns and scalds are due to hot water (including boiling water from kettles and hot tap water), hot beverages and cooking scalds. Studies on the epidemiology of burn injuries suggest that there are four universal sources of scalds in the home : hot beverages, hot tap water, saucepans of hot liquids and boiling water from kettles (Ryan et al, 1992; Sorenson & Vindenes, 1993; Waller & Marshall, 1993; Yeoh et al, 1994; Ramanathan et al; 1994; Mercier & Blond, 1995).

Rivara et al, (1999) suggest a multi-faceted approach towards injury prevention from burns and scalds using a combination of product modification, media publicity, and legislation. They are also critical of the fact that, in America, there has been no proper evaluation of the effectiveness of wide-based cups or guard rails on stoves.

Hot beverages

In 1992, VISS (Penny, 1992) identified that the major cause of scald injuries to children presenting to hospital Emergency departments was hot drinks being pulled or knocked onto young children. An updated analysis of the narratives attached to all admitted cases of child scalds in the VISS database revealed that this was still the case, with 42 percent of scald injuries to children aged under 5 due to tea and coffee (see Appendix Table 34). Young children aged one to two years are at highest risk of hot drink scalds (Cassell et al, 1995).

However, there has been little evidence of success in reducing these shorter hospital stay scald injuries, particularly those associated with tea and coffee (NIPAC, 1999).

The Victorian Injury Surveillance System has developed designs and endeavoured to publicise the use of spill-resistant mugs to the Australian public to prevent young children pulling hot drinks onto themselves (Cassell et al., 1995). The availability of a safe, attractive spill-resistant mug would facilitate the promotion of this countermeasure to child scalds to parents and carers of young children.

The essential features of a safe spill-resistant mug are a narrow mouth, a wide, high-friction base for maximum stability and a sip-through lid which stays on (with minimum spillage) when the mug is in use or tipped over.

However, production costs have prevented the trialling of this strategy. A proposal is currently before the National Health and Medical Research Council to fund the development and trialling of a prototype spill-resistant hot beverage mug.

Cooking scalds

Other design solutions for kettle-related and saucepan-related scalds need to be further explored. While there is potential for injury reduction in curly cords and cordless appliances, there has been no evaluation of their effectiveness. New designs incorporating the use of heavier materials and a lower centre of gravity in appliances (to prevent tipping) should also be considered and kitchens should be designed to eliminate dangerous pathways between key work areas. Stove guards should be used to reduce the risk of young children pulling cooking vessels onto themselves.

Contact burns

Heater, stove and oven guards are available to prevent contact with these hot surfaces and ironing should be separated in either time or place from young children.

Hot tap water

In 1996/97, there were 517 hot tap water scald admissions to Australian hospitals, accounting for 30 percent of all child injury admissions due to fire/flames/burns and scalds. The majority of these (n=437, 85%) occurred in children aged 0-4 years.

Clear evidence of success of a legislative intervention in reducing hot tap water scalds comes from the United States. Five years after the introduction of hot tap water legislation in Washington State, the attendant reduction in mean hot water temperatures lead to a 50 percent reduction in scalds in young children (Erdman et al., 1991). Multi-media campaigns, in conjunction with local initiatives such as promoting the use of hot water testing cards, have also been successful in both the US and New Zealand in effecting lower domestic water heater temperatures (Katcher, 1987; Waller et al., 1993).

Over the last few years, most Australian states have undertaken multi-strategy approaches to scald reduction. In 1994, the National Plumbing Code was amended to allow a maximum hot tap water temperature of 50°C in new residential bathrooms. Victoria, South Australia, Queensland, Tasmania and Western Australia have all passed legislation requiring the mandatory implementation of the voluntary Code (NIPAC, 1999). However, there is no requirement in any state or territory for safe delivery temperatures in existing bathrooms, even on replacement of hot water services.

In the two years following the introduction of the new plumbing code and a state-wide awareness campaign, New South Wales reported a 50 percent reduction in serious scald cases (five days hospitalisation or more) (Department of Health & Family Services, 1998). However, the self-report ABS Home Safety Survey (ABS, 1999b), conducted in Victoria in October 1998, found that a significant proportion of Victorian households (71%) had the temperature of their hot water systems set a level which could scald or burn a small child when the hot water was running at its hottest.

The introduction of legislation for all new and existing hot water services in Australia has been hampered by the lack of evidence regarding cost benefit. The cost of tempering valves (currently \$200 installed) creates considerable resistance from builders, manufacturers and consumers. However, the cost should be significantly reduced over time as more manufacturers build in safety features. Estimates of the cost of treating serious scald injuries (five or more days hospitalisation) range from \$60,000 to \$100,000 (Scott, 1995) and, while some reports have explored potential energy savings as part of the benefits, these findings have not been published or verified (NIPAC, 1999).

7.7 POISONING

While accidental poisoning accounts for very few childhood injury deaths (3 in 1997) in Australia, it is a major cause of hospitalisation. Children in the 0-4 year age group are particularly vulnerable to accidental poisoning accounting for 85 percent of hospital admissions from this cause. In 1996/97, 3,652 children under the age of five were hospitalised as a result of a poisoning incident. The majority of these were due to accessing drugs and medicines².

Patterns typically found in Australia, and other Westernised countries, include: the incidence peak of poisoning at 2 years of age; a generally higher incidence of males compared to females in the majority of reports; the location of most incidents in the home; similarity of agents; low mortality and short length of stay of poisoning hospital admissions (Campbell and Oates 1992, Melis and Bochner 1990, Lacroix et al., 1989, Petrodou et a., 1997, Repetto 1997, Routley et al., 1996, Yamamoto et al., 1991, Waldman, 1993, Ozanne-Smith 1995, Wiseman 1995).

A further consistent observation in the literature is that childhood poisoning is a heterogeneous issue with no single agent, or agent group, accounting for a large proportion of cases (Campbell and Oates 1992, Melis and Bochner 1990, Lacroix et al., 1989, Petrodou et a., 1997, Repetto 1997, Hoy et al 1998, Routley et al., 1996). The means of access to poisoning agents by young children has not been well documented except for a small number of agents including eucalyptus oil, rodenticides, benzodiazepines, tricyclic anti-depressants, and paracetamol (Day et al., 1997; Parsons et al., 1996; Ozanne-Smith et al., 1998).

² Some features of the data coding systems limit the extent to which specific childhood poisoning agents can be identified. The potential for inconsistent classification exists (Cummings et al., 1995). Evidence suggests that misclassifications are not uncommon. There is some potential for different interpretation of the E-codes by the hospital medical records clerks. This is particularly applicable for poisoning as the clustering of drugs into functional groups in the E-code framework creates a situation where the same drug or substance can feasibly be categorised into more than one E-code.

The major limitation of broad E-code categories is that the researcher is unable to identify specific drugs or substances within those categories. The development of a better coding system, or an extension to the ICD-9 E-Codes would enhance the ability to identify agents involved. The ICD-10, which came into effect in Victoria in July 1998, allows identification of an increased number of subclasses within the current broad E-code categories, and will facilitate more consistent classification. However, identification of specific poisoning agents is still limited. The ICD-10 coding manual actually contains a comprehensive listing of specific poisoning agents from which coders extract this valuable information to broad groupings of agents. A submission has been made by MUARC to the National Coding Centre seeking greater specificity of poisoning agents in future revisions of the ICD-10.

Children aged less than one year are more likely to access household chemicals whereas children aged 1-4 years are more likely (over 70%) to access pharmaceuticals. The rate of poisoning hospitalisations for children aged under five years is more than double for rural children compared to their urban counterparts (Ozanne-Smith & Scott, 2000).

The rate of hospitalisation for poisoning in children less than five years of age, at least in Victoria, has significantly increased in the last ten years (Stathakis, 1999). Comparative data are scarce, however; the Victorian hospitalisation rate is almost double that of Maryland USA, suggesting that world best practice is yet to be achieved in Victoria and Australia. One major difference in practice is that the US requires child resistant packaging for all oral dosage prescription medications, as well as for a range of over-the-counter medications and a variety of other products. The US EPA also requires that most pesticides be in child-resistant packaging and the CPSC is considering child resistant closures for classes of products containing petroleum distillates (CPSC, 2000).

In terms of prevention, an agent specific approach, in addition to generic measures, is justified. Child resistant packaging has been demonstrated to be the most effective intervention currently available (Scherz 1969; Clarke & Walton 1979; Walton 1982; Morris & Klinberg, 1986; Sibert et al., 1997; Wiseman et al., 1987; Rodgers 1996).

Recommending increased supervision of children has little potential benefit (Ozanne-Smith et al, 1998). Also, poisoning of children by agents required to have child resistant closures suggests there is room for improvement of the efficacy of child resistant closures (Ozanne-Smith et al., 1998; Hoy et al 1998).

The potential importance of augmenting child resistant packaging with safe storage has been noted. The effectiveness of CRC's may be compromised if medications are transferred to other containers, left open, or fail because of wear or clogging of their locking mechanism (Steele and Spyker, 1985). Access to poisoning agents frequently occurs during times when the agent was not in its usual storage place (Ozanne-Smith et al, 1998). This suggests the current safe storage options may not be practical in all circumstances e.g.. during periods of illness, the medication may be left out of the cupboard in sight as a reminder to administer it at the appropriate times.

Promising approaches to child-resistant packaging include designs that rely on differences in cognitive skills between adults and children, rather than physical strength or dexterity (Hunter & Hunter, 1991). Other potential solutions to child poisoning include the incorporation of antidotes routinely into pharmaceuticals of high risk (e.g. methionine with paracetamol) and improvements to treatment protocols.

A strategic poisoning prevention research and development agenda is warranted to underpin the reversal of the apparent increase in childhood poisoning hospitalisation rates. The first of several research components - to identify additional pharmaceuticals warranting child resistant packaging on the basis of toxicity, severity and frequency - has recently been completed by MUARC (Scott & Ozanne-Smith, 1999a). The implementation of recommendations from this study is expected to be facilitated by the intersectoral steering committee established for that purpose. MUARC has also recently reported on "The feasibility of using current data bases for enhancing the poisoning prevention efforts of the (Victorian) Department of Human Services" (Scott & Ozanne-Smith, 1999b). Further research relating to the efficacy of child resistant packaging is required, particularly the extent to which child resistant packaging fails, and the reasons that failures occur. There is also a need to establish the potential for safe storage of medications when in use.

7.8 FALLS

While falls accounted for only 11 deaths in children aged 0-14 years in Australia in 1997, hospitalisation data indicate that there were 23,678 hospital admissions in 1996/97 (NISU). Overall, falls account for 41 percent of all child injury admissions and 42 percent of Emergency Department presentations. Although there are significant numbers of fall injuries in each five-year age group (see Appendix Table 5), the rate of fall injury admissions peaks in the 5-9 year age-group where a large proportion (31 percent) are due to falls from playground equipment.

Previous work on product-related falls in children (Ozanne-Smith & Brumen, 1996) using the VISS database indicates that bicycles were the leading product associated with child falls resulting in hospital admission in children aged 0-14 years, with several categories of playground equipment also ranking highly (Appendix Table 36). Nursery furniture (all products) also ranked highly overall in fall hospital admissions.

Differences in product involvement by five-year age group are apparent. Products associated with hospitalised falls in children under 5 years were more likely to be structural features of the home such as steps and stairs, furniture and nursery equipment (Appendix Table 37). Fall injuries to 5-9 year olds were predominantly related to playground equipment, bicycles, trampolines, skates and skateboards and bunk beds. Bicycles and sports and recreational products were associated with fall injuries in 10-14 year-olds. Skates and skateboarding, horseback riding and ball sports were the major causes of fall injuries in the older age group.

This section, while not exhaustive, will examine interventions where there is potential to reduce fall injuries related to consumer products in children.

7.8.1 Bunk beds

It is clear from the current evidence that bunk bed injuries are a significant cause of fall injuries in Australia, particularly in the 5-9 year-old age group. Victorian injury surveillance data shows that 86 percent of bunk bed related injuries in the under fifteen age group occur in children under the age of ten. Although bunk-bed injuries peak in the 5-9 year age group, they still account for a similar number of injuries as individual nursery products in the 0-4 year age group. The main cause of non-fatal injury is due to a fall from the top bunk resulting in a fracture (33 percent), mainly to the upper extremity (75 percent) (Watson et al, 1997).

While bunk beds and conventional beds are almost equally represented in fall injuries in 5-9 year olds, bunk bed injuries are generally more severe than conventional bed injuries due to the increased fall height (Hawkins, 1992). Using South Australian Injury Surveillance Control Unit data, Thompson (1995) estimated that the relative risk of hospital-treated injuries associated with bunk beds was five times higher than for conventional beds.

Compliance with the guard rail requirements of the standard would significantly reduce fall injuries associated with bunk beds while adherence to the structural dimensions relating to entrapment hazards would eliminate deaths by asphyxiation (see Section 7.5.2).

7.8.2 Nursery furniture

In Australia, the major items of nursery furniture associated with injury in 0-4 year olds are : prams, cots, high chairs, baby walkers, strollers, change tables and baby bouncers. Injury associated with nursery furniture is most likely to occur in the first year of life. While mortality associated with nursery furniture, particularly cots (see Section 7.4.1), generally occurs as the result of asphyxia, falls are the most common cause of non-fatal injury for each of the products listed.

A detailed analysis of nursery furniture-related injuries is provided in a previous MUARC report (Watson et al, 1997), the main features of which were updated in 1998 (Watson, Routley & Ozanne-Smith, 1998).

Falls were the most common cause of non-fatal injury in every product category (65 percent overall) ranging from 43 percent in the case of baby bouncers to 77.5 percent in the case of change tables.

Injuries to the head and face were most prevalent in all product categories, accounting for 63.5 percent overall (and up to 82 percent for stroller-related injuries) and reflecting the fact that babies and toddlers are “top heavy”. Injuries to the upper extremities were next at 15.3 percent of injuries recorded (and up to 22.3 percent for cots). Bruising, inflammation and/or swelling was the most common type of injury (31.3 percent), followed by lacerations (16.1 percent), concussion (11.2 percent), and fractures (8.3 percent).

A comparison of hospital admission rates in the Victorian collection for the different products suggests that baby exercisers or bouncers are associated with the most severe non-fatal injuries, with almost one in three injuries resulting in hospital admission. This is due to the fact that falls from bouncers are usually from a height when caregivers place the bouncer on an elevated surface such as a bench-top. These are followed by high chairs and strollers both of which have admission rates equal to, or higher than, the overall admission rate for children under 5 years of age.

In at least four of the nursery furniture products (cots, prams, strollers, and high chairs) product failure was indicated as causal in a small percentage (approx. 6 %) of injury cases. Product failures included collapse, malfunction or entrapment hazard. High chairs had the greatest percentage of identified product failure (8 percent), due mainly to the tray falling off and allowing the baby to fall out. Seven percent of cot injuries were attributed to failure on the part of the product, mainly entrapment hazards. The main problem identified for prams and strollers was collapse of the product, resulting in it folding up on the child. Almost half of identified malfunctions in prams involved the restraint breaking or coming undone.

There is currently no Australian/New Zealand Standard for change tables. Standards for high chairs and baby walkers are currently being developed and the voluntary standard for prams and strollers is under review.

Baby walkers

Data from NISU suggest that baby walkers cause more injuries to infants than any other nursery product (Watson et al., 1997), with the risk of injury from baby walkers being around four times that of prams/strollers and of high chairs (Williams, 1994). Children of less than one year of age sustain the majority of injuries (85 percent), with two-thirds of all injuries occurring as the result of a fall. The majority of injuries (66 percent) occur to the head and face (Watson et al., 1997).

Contrary to popular belief, baby walkers provide no benefit to development and they do not help a child to learn to walk earlier. They do, however, provide an advanced degree of mobility, speed, height, and freedom of movement at an age when the baby is not developmentally ready. These factors contribute to the high frequency and severity of injuries associated with baby walkers (Watson et al., 1997).

Baby walker injuries as a proportion of all nursery furniture injuries in Victoria fell from 19 percent in 1989 to 7 percent in 1993. This downward trend appears to have coincided with a strong intervention program to discourage the use of baby walkers that resulted in Coles-Myer withdrawing the product from sale in 1992. Other major retailers followed in July 1995, when they agreed to a request by the Consumer Affairs Minister to participate in a voluntary ban on the product (Watson et al. 1997). However, a follow-up study of the availability of baby walkers in Victorian stores in 1998 found that 78 percent of specialist nursery furniture retailers and 38 percent of major department stores were still stocking baby walkers (Ashby et al, 1998).

The CPSC began a mandatory rule-making proceeding on baby walkers and stair fall hazards in 1994. The CPSC has kept open its mandatory rulemaking, pending its evaluation of the industry's conformance to the new strengthened voluntary ASTM standard. The standard requires that the baby walker must 1) be too wide to fit through a standard doorway or 2) have features, such as a gripping mechanism, to stop the walker at the edge of a step. Compliance with this safety standard is measured by a new test procedure developed by the US CPSC, in consultation with industry (Jacobson, 1998).

Although the voluntary standard did not have an "effective date", mobile walkers manufactured after June 30, 1997 must meet all new and existing mandatory and voluntary requirements to receive certification by the Juvenile Products Association, Inc.

The rate of baby walker-related injuries to young children treated in U.S. Emergency Departments decreased significantly (55 percent) during the period in which the new voluntary Standard was being developed (based on CPSC data from 1992 to 1998). However, since the new walkers designed to help prevent falls down stairs have only been available since late 1997, it is clear that additional factors have contributed to the decrease in injuries. One factor may have been the increase in public awareness of the serious hazards associated with mobile baby walkers as a result of education activities on the part of the CPSC, the American Academy of Pediatrics, and consumer organisations such as National SAFE KIDS Campaign. Another factor contributing to the decrease may have been the use of activity centres that offer parents a stationary alternative to traditional mobile walkers (Jacobson et al, 1999).

The CPSC estimates that, with the introduction of the new and stronger standard and the introduction of stationary alternative products (stationary play stations) onto the market, projected baby walker injuries in the US will decrease by two-thirds in the four years following the introduction of the strengthened standard (Jacobson, 1998). Similar reductions could be expected in Australia if a similar strategy were implemented.

The Australian Standard for baby walkers currently being developed should address the major issue of falls, particularly down steps/stairs, in line with the recently strengthened US ASTM standard. The standard should be supported with an extensive and ongoing educational campaign directed at parents, caregivers, retailers, and nursery furniture importers (no baby walkers are currently manufactured in Australia). Compliance with the voluntary standard

and the injury rate should be monitored to establish whether mandating the standard is warranted.

7.8.3 Playground Equipment

Injury associated with playground equipment is a relatively common occurrence in childhood, and is the third most common reason (after asthma and chronic tonsillitis/adenoid disease) for children 5 to 9 years of age to be admitted to hospital (Public Health Branch, 1995). Each year in Victoria, around 1,000 children are admitted to hospitals with injuries caused by falls from playground equipment (Altmann et al, 1996). Of these children, three-quarters have upper limb fractures. Using Victorian injury surveillance data as a basis for extrapolation, it is estimated that each year approximately 2,500 children present to Victorian public hospital emergency departments with an upper limb fracture after having fallen from playground equipment.

Playground equipment injuries are frequently severe, and studies have indicated that the proportion of children requiring hospital admission from playground related injuries is higher than that of children with other types of injury (Altmann et al, 1996; Mott et al, 1994). In Victoria, 22 percent of children with playground equipment injuries and 32 percent of the cases with upper limb fractures that present to emergency departments are admitted to hospital. This is greater than the proportion (17%) of children admitted with an injury from any cause (Altman et al, 1996).

Victorian data and international studies (Chalmers & Langley, 1990) indicate that the peak age group for playground equipment related injuries is the 5 to 9 year old age group. Two-thirds of the children admitted to Victorian hospitals and nearly 60 percent of those presenting to emergency departments with playground equipment related injuries are in this age range.

The majority of playground equipment injuries are caused by falls. Victorian data on playground equipment-related injuries indicate that 83% of admissions and more than three-quarters of emergency department presentations are caused by falls. Nearly three quarters of all playground-related injuries are caused by falls either from climbing equipment (39%), slides (19%) or swings (14%).

Although playground safety interventions have been directed at head injury prevention, local and international studies have repeatedly found that upper limb fractures are the most frequent significant injury, and they typically result from falls from height (Altmann et al 1996; Chalmers & Langley 1990; Ball & King 1991; Mulder et al 1995; King & Ball 1989; Mayr et al 1995; Chalmers et al 1996; Ozanne-Smith et al 1991). In Victoria, upper limb fractures account for 75 percent of hospital admissions from falls from playground equipment, and 42 percent of all emergency department presentations involving playground equipment. Obviously, fractures incapacitate children for substantial periods of time. Upper limb fractures utilise considerable health system resources, and involve many indirect costs, such as parental loss of productivity.

Despite the decrease in head injury hospitalisations from playground falls over the 11 year period between July 1987 and June 1998, the rate of hospitalisation from playground falls has increased due to a significant increase in upper limb fractures (see Appendix Table 33).

Two major factors influence the severity of playground equipment injury in the event of a fall - fall height, and the ground surfacing (Mayr et al 1995, Chalmers et al 1996, Briss et al.,

1995). Due to elementary physics, as the height of equipment increases so does the risk and severity of injury in the event of a fall. The 1981 Australian Standard for playground equipment states that the maximum fall height of equipment should not be over 2.5m, although the equipment can be up to 6m high (e.g. a roof).

A case-control study from New Zealand has shown that the risk of injury in the event of a fall from playground equipment increased dramatically for heights over 1.5 metres (Chalmers et al 1996). After adjusting for various factors (such as child's age, weight, and the presence of impact absorbing surfaces), children falling from over 1.5m were found to have four times the risk of injury compared to those falling from 1.5m and below. The risk of injury increased with increasing fall height, to the extent that children who fell from over 2.25m had 13 times the risk of injury of those who fell from 0.75m or below.

The second factor influencing the severity of a fall is the surfacing under and around the equipment. In the New Zealand case-control study, it was found that children falling on non-impact absorbing surfaces, such as concrete, asphalt and grass, had twice the risk of injury compared to those who fell on impact absorbing surfaces such as bark chips, sand, and rubber matting (Chalmers et al 1996). However, the depth of the under-surfacing was not taken into account in this study. Other studies have also reported that surfaces such as asphalt and concrete are associated with higher injury rates (Sosin et al 1993). These studies have not specifically addressed the effectiveness of undersurfacing in preventing arm fractures.

The standard on playgrounds is in the process of revision and a new Australian/New Zealand Standard on playground undersurfacing was published in 1996 (AS/NZS 4422, Standards Australia 1996). It sets surfacing requirements and is based on testing methods to prevent possible brain injury. Undersurfaces are tested using an instrumented headform dropped onto the designated surface. The deceleration/time trace is used in a calculation to produce a head injury criteria (HIC) value, which is a calculation of the severity of a deceleration impact on the brain. To comply with the standard, the tested surface must yield HIC values of not more than 1000.

While a surface designed for the prevention of brain head injury addresses the most serious outcome, it only addresses part of the injury problem. The efficacy of impact absorbing surfaces in preventing other injuries, particularly upper limb fractures, is yet to be determined. It may be that these surfaces are not effective in preventing non-brain injuries, despite the contrary views of some researchers (Briss et al 1995).

There is a definite lack of quantitative scientific data on the mitigation of playground injuries due to resilient surfaces and fall heights. The small number of studies that have attempted to measure the injury risks associated with height of equipment or the type of undersurface have raised significant issues. However, most have methodological problems (Mott et al 1994; Mayr et al, 1995; Briss et al 1995; Sosin et al, 1993; Sacks et al 1990). Deficiencies include : not controlling for exposure, the height and weight of the child, the height of the fall, measuring the height of the fall from the tallest piece of equipment in the playground, using small sample sizes, and lengthy delays in following up cases after injury.

There is only one analytic (case-control) study which has accurately identified the risk of injury associated with fall height (Chalmers et al 1996). This study raised the issue that the current standards are not providing the safest maximum fall heights for children. The authors suggested that the maximum fall height in the standards should be lowered from 2.5 metres to 1.5 metres. The authors state there would be a 45 percent reduction in Emergency Department for this cause if early childhood education centres and schools lowered fall

heights of playground equipment and complied with the undersurfacing standard. This reduction would be much greater if all public and home playgrounds were to comply.

There is a need for more research to determine what fall heights are relatively safe for children, due to the widespread implication such research findings would have on the design and manufacture of playground equipment.

The New Zealand study did not fully evaluate impact-absorbing surfaces, in that depth of loose fill was not taken into account and there were very few children who fell onto the newer synthetic surfaces (Chalmers et al 1996). It is timely that the effectiveness of surfaces complying with the new undersurfacing Standard in preventing other injuries, particularly upper limb fractures, is evaluated. It is also important that a criterion for risk of upper limb fracture is established, as has been done for head injury, which can then be used in the testing of surfaces.

The high exposure of virtually all children to playgrounds either at school, home, or in public parks, and the frequency and severity of injuries, particularly upper limb fractures, justifies a thorough investigation of the determinants of injury associated with playground equipment, particularly fall heights and undersurfacing.

Monash University Accident Research Centre is currently undertaking a major NHMRC-funded, case-control study aimed at investigating the major determinants of upper limb fractures in children falling from playground equipment. The study aims to determine the relationship between fall height and undersurfacing and risk of upper limb fracture in children and so determine the effectiveness of the Australian and New Zealand standard in preventing these injuries to children.

7.8.4 Trampolines*

Overseas and Australian injury data indicate that many children are injured as a result of trampoline use. In Victoria alone, an average of 179 children (18.6/100,000) are hospitalised annually as a result of trampoline injury. Australian Bureau of Statistics data indicate that 8.6 percent of all Victorian households have trampolines (Murphy, 2000).

Data from this study (see Chapter 5) indicate that, for children aged 0-14 years, trampolines rank 14th in terms of products associated with non-fatal injury in the United States (see Table 5.1) and 15th in Australia (Table 5.3). The Victorian data indicates that trampolines rank 28th in terms of injury hospital admissions in this children 0-14 years (Table 5.6) and 18th for Emergency Department presentations (Table 5.8). Males and females are equally represented. Seventy eight percent of child trampoline injuries occur at home.

Injuries are predominantly fractures and the body site most often injured is the upper limb. Only two cases of spinal cord injury have been reported in Australia during the period 1986 to 1997. Falls up to and over one metre accounted for at least 60% and 13% respectively of trampoline related injuries presenting to emergency departments.

There are many contributing risk factors associated with trampoline use including exposure, age, misuse, poor quality equipment/design faults, improper siting of trampolines, and lack of supervision.

* Mainly from Murphy, C. Trampoline injuries. Hazard, Edition No. 42, March 2000 : 1-14.

The frequency of trampoline-related injuries has fuelled growing international concern regarding the potential injury risk associated with trampoline use, particularly for children, which has resulted in US injury researchers calling for a ban on the manufacturing and sale of trampolines for private recreational use.

In contrast, Australian injury researchers propose the development of a voluntary Australian standard to facilitate the design, behavioural and environmental conditions required to reduce trampoline injuries. This approach is considered appropriate for Australia because the New Zealand standard has apparently stabilised an upward trend in injuries in that country. Also, there is a relatively low incidence of trampoline injuries in Australia, and there has been no advocacy to ban other recreational activities that are associated with higher rates of injury than trampolines.

In 1997, the New Zealand Standard for trampolines was developed. It was based on the US ASTM F381:95 Standard for trampolines but including a number of amendments. The plateauing of trampoline injuries in NZ (1988-1996) is attributed to the development and implementation of this trampoline Standard.

It is proposed that Australia adopt the 1999 version of ASTM F381:99 (which includes some but not all of the NZ Standard amendments), and that this new Standard should incorporate the remaining NZ amendments. In the current climate of harmonisation of Australian and NZ Standards, this should be a relatively simple process. The ASTM and NZ Standards clearly state appropriate design, environmental, and behavioural countermeasures to limit the risk and severity of injury e.g., width of pads which adequately cover the suspension system and testing of padding to impact peak force. One issue for further consideration is the inclusion of a ladder as part of the integral structure of the trampoline.

A voluntary trampoline standard would provide the opportunity for industry to make necessary changes to maximise safety of trampolines without prohibitive expense to either the industry, the consumer or Standards Australia. A Standard should also advise owners on retrofitting safety features to existing trampolines.

Additional factors which could be considered by a standards committee are the functional characteristics of trampolines and the interaction between the size and weight of the user. A distinction should be made between domestic and sports trampolines in relation to bounce heights, size, mats, and springs.

Public education and safety awareness are key elements of the introduction and enforcement of a standard for trampolines. The profile of trampolining as a sport will soon be raised when trampolining becomes an official sport at the 2000 Sydney Olympic Games. Hence, the year 2000 is an opportune time to raise support for a trampoline standard.

Because of the lag time between implementing a voluntary standard and bringing all trampolines up to that standard, an educational program should be introduced to improve the safety of existing trampolines. Trampoline injuries should be monitored to determine the effectiveness of the voluntary Standard and response of the market place to the standard. If it is shown to be ineffective, a mandatory standard and further attention to safe design should be considered.

7.9 OTHER SPORTS AND RECREATIONAL INJURIES

7.9.1 Skates & Skateboards

Together roller-skating and skateboards are associated with 1.4 percent of child injury admissions and 1.9 percent of non-hospitalised child injury presentations (VISS, 1989-996), with most of the injuries occurring in older children aged 10-14 years.

While little work has been done specifically on skate board injuries, the injuries and the issues involved are very similar to those of in-line skating.

The increase in the popularity of in-line skating, in particular, has led to a concomitant increase in skating injuries in both Australia and overseas (Routley 1997; Towler & Brown. 1994; Heller et al 1996; QISPP 1996; Ellis et al 1995; McGraw & Beattie 1996; Tse et al 1987; Schieber et al, 1996).

Studies show that 15 to 28 percent of inline skating injuries presenting to hospital emergency departments are admitted to hospital (Sherker & Cassell, 1998) Falls are the most common cause of injury accounting for more than three-quarters of in-line skating injuries presenting to Victorian Emergency Departments..

The report indicates that falls typically involve two groups :

1. (the most typical fall) novice skaters, wearing little or no safety gear, either losing their balance while skating outdoors or falling after striking a surface defect or debris, or
2. experienced skaters performing tricks, often at considerable speed.

The main risk factors for injury are speed, obstacles, lack of braking ability, and hard landing surfaces. Falls due to equipment failure or involvement of motor vehicles are relatively rare.

The first part of the skater's body to contact the ground sustains the major force of the fall. Falls usually occur onto an outstretched arm onto a hard surface. Upper limbs are, therefore, the most common site of injury, with the wrist being particularly vulnerable. The most common types of injuries are fractures, sprains, and strains. Approximately five percent of in-line skating injuries are to the head.

Protective equipment provides a barrier between the body and the ground, absorbing or dissipating the potentially injurious forces. It is generally recommended that all skaters wear, and ensure proper fit of, protective equipment including a helmet, wrist guards, and knee and elbow pads. It is especially important that young children wear helmets when skating because the risk of head injury is greatest for younger skaters.

While the use of protective equipment by injured skaters is reportedly associated with decreased likelihood of hospitalisation (Adams et al 1996), the effectiveness of protective equipment has not been fully researched. Wrist guards have been subjected to some epidemiological case-control evaluations as well as some biomechanical analysis. They have been found to provide a clear protective effect against wrist fractures. However, there is some concern that wrist guards may transfer the force of the fall further up the arm, resulting in forearm fractures rather than wrist fractures. This issue requires further investigation.

7.9.2 Bicycles

Bicycles are the most common recreational product associated with injury to children (0-14 years) presenting to Emergency Departments in Australia (NISU). The involvement of bicycles in injury to children increases with age and accounts for over 8 percent of hospital admitted injuries in 5-9 year olds and over 12 percent in 10-14 year olds (VISS). Bicycles were also associated with five and ten percent of injury deaths in 5-9 year olds and 10-14 year olds respectively (Victoria, CFS).

The greatest risk to cyclists is head injuries (Rivara, 1997a). These account for about one-third of these cyclist injuries (Rivara, 1997b). There is strong evidence from the US and Australia that both the incidence and severity of head injuries are lower in cyclists wearing helmets than those who are not (Rivara, 1997a, 1998).

However, some high-risk groups continue to avoid wearing helmets. Inconvenience and the 'nerd' effect are still major barriers to helmet wearing, particularly among adolescents (Rogmans, 2000). Victoria managed to increase helmet wearing rates from 5 percent in the 1970s to 83 percent in 1992 (Graitcer, 1995) through continuous promotion and, ultimately, compulsory legislation introduced in 1990. However, wearing rates have since dropped. Low penalties and lack of enforcement of helmet regulations by police appear to be major contributors to this situation. Immediately after the introduction of the Bicycle Helmet Legislation, the helmet wearing rates rose from 65% to 78% for children 5-11 years, but studies show it is the under 18 year olds who are now the main group of helmet offenders. The penalties for non-compliance have not deterred 25% of bicyclists, mainly aged 13-18 years, who do not wear a helmet (Ashby et al, 1998).

Research focused on the non-wearing group, as well as on the overall exposure of cyclists and helmet wearing rates, is required to establish the current situation. This is particularly important in Victoria, which is seen as a world leader in bicycle helmet research and is best placed internationally to continue a series of evaluation studies.

Other measures that can reduce injury risk for cyclists include the stability of construction of bicycles, cyclists' conspicuity, and road design. Many researchers (e.g. Rivara 1997b; Towner & Ward 1998) suggest that more attention should be given to environmental issues such as separate lanes for cyclists and motorised vehicles. This has proven to be most effective in preventing injury, when properly applied, as in the Netherlands. A line marked on the road, however, does not provide sufficient separation from other road traffic.

7.9.2 Motorcycles and trail bikes

Trail bikes refer to motor cycles designed primarily for off-road use, and the category includes dirt bikes, min-bikes, and 3 or 4 wheeled agricultural vehicles. Trail bikes represent a significant cause of injuries in the 10 to 14 year old age group. Eight deaths associated with trail bikes were recorded in Victoria between 1990 and 1994, which accounts for 9% of injury related deaths in this age group. Trail bikes are also implicated in hospital admissions (accounting for around 3% of injury hospitalisations) and Emergency Department presentations (around 1-2%) for children in this age group (VISS). Injuries from a trail bike accident are thus more likely to be serious than not.

Trail bike riders run the greatest risk of suffering an injury to their legs (40% of all injuries), arms (23%), and head and face (21%). Approximately one third of injuries were fractures, one third superficial, and the remainder open wounds (13%), sprains (8%), intra-cranial injuries (4%), or miscellaneous (11%). Clearly intra-cranial wounds pose the greatest threat

to life, and the value of wearing a helmet cannot be stressed enough. Of the eight deaths reported in the data, at least 5 of the cases were not wearing a helmet, while it is unknown if the other 3 were wearing a helmet or not.

The wearing of helmets and safety equipment and clothing is a crucial issue in combating trail bike injury. Only about 60% of presentation cases were reported as wearing any protective gear in the VISS data. Furthermore, only 62% of those who suffered a head injury reported wearing a helmet of any sort.

While the wearing of helmets for on-road motorcyclists is compulsory in Australia, it is impossible to police on private properties where a large proportion of injuries occur. The value of such legislation is highlighted by Towner and Ward (1998), who report that introduction of helmet legislation in the U.K. has coincided with a reduction in motorcycle fatalities, while in the USA the repealing of such legislation has corresponded with an increase in fatalities.

Haworth et al (1994) suggest that children as young as 4 years of age use small off-road motorcycles in Australia. Furthermore, children between the ages of 6 and 12 years may not possess the sensory motor co-ordination to adequately operate and control a motorcycle, and their smaller size and weight adds to this difficulty. Begg (1997) suggests a number of measures that could be taken to decrease trail bike injuries, including education for riders regarding protective equipment, relevant legislation for off-road motorcycling, and education for parents about the relative risks related to a) different types of motorcycles and b) the harsh reality that protective equipment will not prevent all injuries.

8 RECOMMENDATIONS

8.1 GENERAL PRODUCT SAFETY

8.1.1 Policy

A systematic data driven approach to consumer product safety and a systematic approach to improving product design should be promoted to minimise product-related injury to children in Australia.

A general product safety directive should be adopted and enforced in Australia and New Zealand. This should take into account the observed strengths and limitations of the European Community's General Product Safety Directive (GPSD) of 1992.

Legislation, based on the U. S. model, should be introduced in Australia to require that manufacturers and importers to inform relevant consumer safety authorities of consumer complaints and other information pertinent to the safety of the products they manufacture or import.

8.1.2 Standardisation

As in the United States, mandation of standards should occur in Australia in cases where voluntary standards and marketplace forces have been shown to be ineffective in achieving compliance, and mandation is warranted by evidence.

8.1.3 Research and evaluation

The effects of the introduction of new standards and calls for the mandation of existing standards should be evaluated by monitoring injury data and conducting other investigations on products associated with injury such as cots, cigarette lighters, and baby walkers.

A model to identify priorities should be developed to assist with the setting of an evidence-based agenda for product-related injury prevention.

In-depth studies (case series and case-control) should be undertaken to investigate the circumstances of injuries to assist the development of standards and other preventive measures. For example, an experimental study should investigate the contribution of the physical features of play equipment (e.g., height) and under-surfacing to play ground fall-related arm fractures.

Biomechanics studies should be undertaken, where appropriate, to determine the forces involved in injury events to improve the design of products and protective equipment.

In-depth case investigations should be undertaken to determine specific design faults e.g. coronial investigations on prams.

Exposure studies are necessary to assist with determining appropriate interventions, relative risks, benefits/cost analyses, and targeting interventions.

Surveys should be conducted to determine barriers to the adoption of injury countermeasures and consumer access to safe products and safety products.

An Australian injury cost and consequence model for product-related injury should be developed to assist in the evaluation of injury prevention programs.

Haddon's matrix should be used to identify potential points of intervention, strategies, and countermeasures to specific product related injuries. This would broaden the search for solutions beyond a focus on the product itself to the chain of events leading to injury. It would be a particularly useful approach in cases where the design of a product is difficult to change.

Injury Data Collection

The coding systems used in the various health sector databases need to improve to facilitate the more consistent identification of the involvement of consumer product in injury. This is particularly important for hospital admissions data because hospitalisations account for the greatest proportion of costs associated with injury. Currently, information relating to the cause of injury in hospital admissions databases is confined to ICD-9 E-codes or ICD-10 codes and it is not possible to fully identify the level of consumer product involvement in hospitalised injuries directly from this data. Hospital based injury surveillance should collect product-related injury data in sufficient detail and sufficient numbers to provide useful in-depth analyses and reliable secular trend data. It should contain sufficient cases by state to allow comparisons to identify best practice and effective interventions. There is potential for state/Commonwealth collaboration so that sufficient cases can be collected. Queensland and Victoria are currently the most advanced states in injury surveillance. The report from a feasibility study for a national injury surveillance system with this capacity is currently under consideration by the Commonwealth Department of Health and Aged Care.

A similar system to that operated by the Consumer Product Safety Commission in the United States should be developed, where representative injury surveillance data are utilised as the basis of specific, in-depth, product-related injury studies.

The establishment of a centralised clearinghouse is necessary to integrate and analyse data from all available sources (nationally and internationally), to identify potentially dangerous products, and to disseminate information to regulators and other responsible bodies.

Data validation studies in hospitals should be conducted to confirm trends in reported injury data.

Linkage of emergency department injury surveillance and hospital admission datasets should be undertaken to provide reasonably comprehensive information on moderate and severe injury cases (admissions). A pilot study by VISS is currently in progress.

The National Coroners' Information System (NCIS), currently under development, should identify products and their involvement in deaths. This may require the development of a specialist module on product related deaths to supplement the core dataset. It may also require the development of data collection protocols and training for those investigating death scenes.

8.2 PRODUCT SPECIFIC

8.2.1 Swimming Pools

Research and evaluation

The effectiveness of pool fencing legislation as a countermeasure to toddler drowning should be more fully evaluated. In particular, current pool compliance with regulations and methods of increasing compliance by pool owners should be investigated.

8.2.2 Nursery Furniture

Standardisation

A simple, appropriately biofidelic infant dummy should be developed (replacing the cylinder now in use) and anthropomorphic data taken into account when developing safety standards.

Consideration should be given to developing a restraint standard common to all nursery furniture. Within the standard various models of restraint could be specified. These could be referred to, where applicable, by other nursery furniture standards. The current development of Australian/New Zealand voluntary standards on high chairs should be completed and released as soon as possible.

The Australian standard for baby walkers (currently being developed) should address the major issue of baby walker falls, particularly down steps/stairs in line with the recently strengthened US ASTM standard. Compliance with the standard and the injury rate should be monitored to establish whether mandating the standard is warranted.

The current development of the Australian/New Zealand voluntary standard on high chairs should be completed and released as soon as possible.

A standard should be developed for change tables. The standard should be based on the best available international standards or draft standards.

Children's furniture safety standards should be reviewed and modified, if necessary, at least once every five years to ensure that new requirements or revision of existing requirements occurs when new substantive information becomes available.

Community service TV advertisements should be produced to alert parents and caregivers to the risks associated with nursery furniture at the time when new major preventive measures are being implemented, such as a new voluntary standard or the introduction of a mandatory standard.

Compliance with voluntary nursery furniture standards should be actively encouraged by a range of education and awareness raising measures such as seeking industry co-operation, public education through the media, and consumer hot-lines. Mandation should be considered if these measures are ineffective in reducing injury.

Australia/New Zealand should focus on improving safety requirements for nursery furniture in line with countries such as the U.S. that are also major importers of nursery equipment, in order to avoid conflict with "non-tariff" barriers to trade agreements.

Research and evaluation

Household surveys should be undertaken to collect additional information with regard to nursery furniture and other consumer products of interest. It is recommended that the surveys be undertaken collaboratively with other sectors or state departments interested in exposure data. Routine Computer Assisted Telephone Interviews (CATI), currently conducted by the health sector in South Australia and Victoria may be an inexpensive mechanism for obtaining the required information.

Observational surveys of retail outlets should be conducted to determine compliance of nursery furniture with Australian and overseas standards (where no Australian standards exist).

Ongoing surveillance of the second-hand products market should be undertaken to ensure the nursery furniture on display for sale complies with standards and to monitor any modification to product design, the general condition, and level of maintenance of the furniture on sale.

In depth studies are required to evaluate the performance of nursery products available in the market place against the test procedures detailed in relevant standards.

A relative risk study should be undertaken to determine the safest sleeping environment, cots, and/or beds for children of different ages.

Follow-up case series studies should be undertaken to identify nursery products associated with child injuries that require in-depth investigation.

In-depth case investigations of nursery furniture involved in child deaths should be routinely conducted.

8.2.3 Smoke alarms and other domestic fire prevention

General

Best practice state smoke alarm regulations should be implemented in all Australian States and Territories.

The availability and widespread installation of single purpose lithium smoke alarm batteries (which last for ten years), mains powered smoke alarms and electric safety switches (power outlet, permanently installed switchboard units and portable units) should be promoted in existing homes.

Research and evaluation

Fire prevention authorities should trial and evaluate the effectiveness of a local doorstep purchase/free installation smoke alarm scheme that promotes the use of lithium battery smoke alarms in high house fire-risk localities. The most cost-effective solution for protecting tenants of rental properties is the installation of mains-powered smoke alarms.

Research into the development of suitable low cost fire-retardant housing and furnishing/furniture materials should be promoted and information on the flammability of combinations of fabrics and fillings should be distributed to the furniture and furniture fabric industry.

Injury Data Collection

Guidelines should be produced and implemented to improve data detail in surveillance systems, including the National Coronial Information System, so that the ignition source of the fire, premorbid conditions of victims, and alcohol involvement are routinely reported.

A specific module for fire and scalds related deaths should be developed for the National Coronial Information System as soon as possible.

The quality and accessibility of data collection systems on fire-related injuries should be improved and systematic monitoring and routine sharing of information instituted among agencies with responsibility for prevention and control measures.

8.2.4 Products related to scald and contact burns

General

A spill-resistant hot beverage mug should be introduced onto the Australian market.

Kitchens should be designed to eliminate dangerous pathways between key work areas.

Research and evaluation

New designs should be developed for cups, mugs, some electric kettles and coffee makers that incorporate the use of heavier materials and a lower centre of gravity to prevent tipping over.

8.2.5 Poisoning

General

Education programs are needed for medical practitioners to encourage them to prescribe routinely away from trade names that are not packaged with child resistant packaging. Similar programs for pharmacists are also necessary to encourage preferential dispensing of medications packaged in child resistant forms.

Standardisation

Medications identified in a recent MUARC study as warranting child resistant packaging (Scott & Ozanne-Smith, 1999b) should be mandated to be packaged in child resistant forms.

Packaging decisions should be incorporated within the scheduling process and be included within the Standard for Uniform Scheduling of Drugs and Poisons.

Packaging of pharmaceutical products should be linked with particular schedules, in line with best practice identified within the USA Poison Prevention Packaging Act (1970, United States Congress 147-1476).

Recommendations should be made to the Trans-Tasman Harmonisation authorities to act to enhance packaging for child poisoning prevention.

Research and evaluation

Comparisons of international poisoning rates and poisoning countermeasures are needed to identify best practice for childhood poisoning prevention.

Research is needed to identify children's means of access to pharmaceutical products that currently require child resistant packaging (eg paracetamol, Dimetapp, Demazin).

A study should be undertaken to identify the reasons for, and solutions to, the marked variation in geographic rates of childhood poisoning between rural and urban populations.

Data Issues

A review is needed of Poisons Information Centres data collection procedures and the operation of their databases to improve the utility of data for research purposes.

Advocacy is required to enhance the recording of medication implicated when databases record poisoning using the ICD coding system. Although the newly introduced ICD-10 allows identification of an increased number of sub-classes of poisoning agents within the current broad E-code categories and facilitates more consistent classification, the identification of specific poisoning agents will still be limited.

8.2.6 Bunk beds

Standardisation

It is clear that, in Australia, voluntary standards and the market have been ineffective in achieving compliance since the release of the Standard in 1994. In light of this, the current revision of the Australian Standard, AS/NZS 4220:1994 *Bunk Beds*, should be made mandatory. A precedent for mandating the Standard exists: from July 1,1998, all cots supplied for household use on the new and second-hand markets must comply with the mandatory safety standard AS/NZS 2172; 1995.

An extensive and ongoing education program to warn parents and caregivers of the inherent dangers of bunk beds and to encourage appropriate use should support this move. A mandatory standard could also be supported by a recall or modification of non-compliant bunks, in order to reduce the number of hazardous bunks in the community.

Research and evaluation

Injuries associated with bunk beds should be monitored to facilitate future reviews of the Standard (preferably every five years). In particular, the injury rates in the 5-9 year age group caused by falls while sleeping in the upper bunk should be monitored to determine whether bunk beds are suitable for this age group.

8.2.7 Playground equipment

General

Develop strategies to increase compliance with the current Australian Standard for fall height, soft-fall undersurfacing requirements, design, siting and maintenance of equipment.

Research and evaluation

Further trial the combination of reducing fall heights to less than 1.5 metres and increasing compliance with under surfacing standards.

Develop a test for predicting the likelihood of limb fractures in the event of a fall.

Evaluate the efficacy of impact absorbing surfaces in preventing limb fractures.

Quantify children's exposure to different equipment types (e.g. by observational studies) to assess the risks of certain equipment for different aged children.

Include controls in future playground studies in order to estimate injury risk more accurately.

8.2.8 Bicycles

General

Encourage the enforcement of bicycle helmet wearing legislation.

Research and evaluation

Research, focussing on the non-wearing group as well as on the overall exposure of cyclists and helmet wearing rates is required to establish the current situation. This is particularly important in Victoria, as the state is seen as a world leader in bicycle helmet research and is best placed internationally to continue a series of evaluation studies.

8.2.9 Trampolines

Standardisation

Australia should adopt the 1999 version of the US trampoline standard, ASTM F381:99 (which includes some but not all of the NZ Standard amendments), and incorporate the remaining NZ amendments.

Public education and safety awareness are key elements in the introduction and enforcement of a Standard for trampolines. The 2000 Sydney Olympic Games represents an opportunity to raise support for a trampoline standard with trampolining featuring as an Olympic sport for the first time.

Trampoline injuries should be monitored to determine the effectiveness of the voluntary Standard and response of the market place to the standard. If it is shown to be ineffective, a mandatory standard and further attention to safe design should be considered.

8.2.10 Skates and skate boards

General

Promote the use of full protective gear to skaters and skateboarders of all ages and abilities.

Encourage hire outlets to provide protective equipment along with skates in a package deal.

Standardisation

Refine and promote standards for helmets, both multi-purpose and specifically for in-line skating and skate boarding (with extended coverage to protect the back of the head).

Research and evaluation

Undertake further ergonomic and biomechanical research into the design of protective equipment, especially to improve the effectiveness of wrist guards.

Identify and address barriers to wearing protective equipment, especially among adolescents.

8.3 KEY RECOMMENDATIONS

8.3.1 General

A systematic data driven approach to consumer product safety and a systematic approach to improving product design is required to minimise product-related injury to children in Australia.

8.3.2 Bunk beds

It is clear that, in Australia, voluntary standards and the market have been ineffective in achieving compliance since the release of the Standard in 1994. In light of this, the current revision of the Australian Standard, AS/NZS 4220:1994 *Bunk Beds*, should be made mandatory.

8.3.3 Baby walkers

The Australian Standard currently being developed for baby walkers should address the major issue of falls, particularly down steps/stairs, in line with the recently strengthened US ASTM standard.

A voluntary Australian/New Zealand standard for baby walkers should be supported with an extensive and ongoing educational campaign directed at parents, caregivers, retailers, and nursery furniture importers (no baby walkers are currently manufactured in Australia).

Compliance with the standard and the injury rate should be monitored to establish whether mandating the standard is warranted.

8.3.4 Trampolines

Australia should adopt the 1999 version of the US trampoline standard, ASTM F381:99 (which includes some but not all of the NZ Standard amendments), and incorporate the remaining NZ amendments.

9 REFERENCES

ABBREVIATIONS

ABS	Australian Bureau of Statistics
ACA	Australian Consumers Association
AIHW	Australian Institute of Health and Welfare
CPSC	Consumer Product Safety Commission (USA)
JAMA	Journal of the American Medical Association
MUARC	Monash University Accident Research Centre
NISU	National Injury Surveillance Unit

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10 APPENDICES

OVERVIEW TABLES (CHAPTER 4)

Appendix Table 1 Major categories of injury cause used to analyse mortality and hospitalisation data.

Category of injury	Corresponding ICD-9 code
All "true" injuries	E800-E999
All unintentional injuries	Excluding E870-E879 & E930-E949 E800-E929
Motor vehicle and other road traffic injuries	Excluding E870-E879 E810-E829
Motor vehicle occupants	E810-E825; .0, .1, .9
Pedestrians	E810-E825; .7 & E826-E829; .0
Cyclists	E810-E825; .6 & E826-E8829; .0
Motor cyclists	E810-E819; .2, .3 & E820-E825; .2, .3
Other transport	E800-E807; E830-E838; E840-E845; E846-E848
Drowning/near drowning	E910
Swimming pools	910; .5, .6
Poisoning	E850-E869
Falls	E880-E888
From playground equipment	E844.0
Fire/flames/scalds	E890-E899
Hot tap water	E924.0
Choking & suffocation	E911-E913
Hit/struck/crush injuries	E916-E918
Cutting/piercing injuries	E920
Other unintentional	E900-E929
Dog bite	Excluding E911-E913; E916-E918 & E920 E906.0
Foreign body	E914-E915
All intentional injury	E960-E999
Self-harm	Excluding E930-E949 & E980-E989 E952-E959
Interpersonal violence	Excluding E930-E949 E960-E999
Undetermined intent	Excluding E980-E989 E980-E989

Appendix Table 2 Estimated resident population by single year of age, Australia, June 1997 (Australian Bureau of Statistics).

Age	Male	Female	Persons
0	129,685	122,851	252,536
1	131,239	124,592	255,831
2	133,796	126,710	260,506
3	134,108	127,121	261,229
4	134,498	127,688	262,186
0-4 years	663,326	628,962	1,292,288
5	134,406	127,533	261,939
6	136,552	129,950	266,502
7	136,842	129,932	266,774
8	133,712	127,066	260,778
9	132,752	126,403	259,155
5-9 years	674,264	640,884	1,315,148
10	132,505	126,177	258,682
11	134,598	128,000	262,598
12	133,787	128,318	262,105
13	134,786	128,808	263,594
14	136,121	129,009	265,130
10-14 years	671,797	640,312	1,312,109
0-14 years	2,009,387	1,910,158	3,919,545

Source : <http://www.abs.gov.au>

Appendix Table 3 Estimated number of non-hospitalised, medically-treated attendances for all “true” injuries by age gender and age, 0-14 year-old children, Australia.

		Emergency Department		General Practitioner		All medically treated, non-hospitalised	
		N	Rate	N	Rate	N	Rate
Total		274,104	6993.26	301,514	7692.58	575,618	14685.84
Gender							
	Males	162,510	8087.54	171,616	8540.71	334,126	16628.26
	Females	111,594	5842.13	129,898	6800.38	241,492	12642.51
Age-group (years)							
0-4	Total	103,198	7985.68	86,535	6696.26	189,733	14681.94
	Males	57,240	8629.24	48,353	7289.48	105,593	15918.72
	Females	45,957	7306.80	38,182	6070.64	84,139	13377.44
5-9	Total	73,315	5574.66	92,263	7015.41	165,578	12590.07
	Males	42,773	6343.66	48,809	7238.86	91,582	13582.51
	Females	30,542	4765.61	43,454	6780.32	73,996	11545.93
10-14	Total	97,591	7437.72	122,716	9352.58	220,307	16790.30
	Males	62,497	9302.96	74,474	11085.7	136,971	20388.75
	Females	35,095	5480.92	48,242	7534.14	83,337	13015.06

Appendix Table 4 Deaths by cause of injury, intent, age and gender, 0-14 year-old children, Australia, 1997 (NISU)

Cause of injury (ICD-9)	Gender	Age group (years)							
		0-4		5-9		10-14		Total	
		N	Rate	N	Rate	N	Rate	N	Rate
All "true" injuries (E800-E999)*	Total	190	14.70	65	4.94	92	7.01	347	8.85
	Males	126	18.99	43	6.37	63	9.37	232	11.54
	Females	64	10.17	22	3.43	29	4.52	115	6.02
All unintentional injuries (E800-E929)#	Total	174	13.46	57	4.33	70	5.33	301	7.67
	Males	117	17.63	35	5.19	52	7.74	204	10.15
	Females	59	9.38	20	3.12	18	2.81	97	5.07
All motor and other road Vehicles (E810-E829)	Total	55	4.26	29	2.20	40	3.05	124	3.17
	Males	35	5.28	17	2.52	28	4.17	80	3.98
	Females	20	3.17	12	1.88	12	1.87	44	2.30
Motor vehicle occupants (E810-E825; .0, .1, .9)	Total	28	2.17	18	1.37	19	1.45	65	1.66
	Males	16	2.41	8	1.19	12	1.79	36	1.79
	Females	12	1.91	10	1.56	7	1.09	29	1.52
Pedestrians (E810-E825; .7 & E826-E829; .0)	Total	27	2.09	5	0.38	10	0.76	42	1.07
	Males	19	2.86	4	0.60	6	0.89	29	1.44
	Females	8	1.27	1	0.16	4	0.62	13	0.68
Cyclists (E810-E825; .6 & E826-E829; .0)	Total	0	0.00	4	0.30	10	0.76	14	0.36
	Males	0	0.00	3	0.15	9	1.34	12	0.60
	Females	0	0.00	1	0.16	1	0.16	2	0.10
Other transport (E800-807; E830-E838; E840-E845; E846-E848)	Total	1	0.08	2	0.16	7	0.54	10	0.25
	Males	1	0.15	2	0.30	7	1.04	10	0.50
	Females	0	0.00	0	0.00	0	0.00	0	0.00
Drowning (E910)	Total	59	0.35	12	0.91	6	0.46	77	1.96
	Males	38	5.73	9	1.33	5	0.74	52	2.59
	Females	21	3.34	3	0.47	1	0.16	25	1.31
Swimming pools+	Total	26	2.01	2	0.15	2	0.15	30	0.77
	Males	19	2.86	0	0.00	1	0.15	20	1.00
	Females	7	1.11	2	0.31	1	0.16	10	0.52
PoisoningΔ (E850-E869)	Total	1	0.08	1	0.08	1	0.08	3	0.08
	Males	1	0.15	1	0.15	1	0.15	3	0.15
	Females	0	0.00	0	0.00	0	0.00	0	0.00
Falls (E880-E888)	Total	4	0.31	4	0.30	3	0.23	11	0.28
	Males	0	0.00	2	0.30	2	0.30	4	0.20
	Females	4	0.64	2	0.31	1	0.16	7	0.37
Fire & flames (E890-E899)	Total	13	1.01	2	0.15	1	0.08	16	0.41
	Males	10	1.51	1	0.15	1	0.15	12	0.60
	Females	3	0.48	1	0.16	0	0.00	4	0.21
Choking & suffocation (E911-E913)	Total	26	2.01	4	0.30	1	0.08	31	0.79
	Males	20	3.02	2	0.30	0	0.00	22	1.09
	Females	6	0.95	2	0.31	1	0.16	9	0.47
Hit/struck/crush (E916; E917; E918)	Total	8	0.62	1	0.08	1	0.08	10	0.26
	Males	6	0.90	1	0.15	1	0.15	8	0.40
	Females	2	0.32	0	0.00	0	0.00	2	0.10
Other unintentional ⁱ	Total	7	0.54	2	0.15	10	0.76	19	0.48
	Males	4	0.60	2	0.30	7	1.04	13	0.65
	Females	3	0.48	0	0.00	3	0.47	6	0.31

Table 4 cont. Deaths by cause of injury, intent, age and gender, 0-14 year-old children, Australia, 1997.

Cause of injury (ICD-9)	Gender	Age group (years)							
		0-4		5-9		10-14		Total	
		N	Rate	N	Rate	N	Rate	N	Rate
All intentional injury (E952-E999)	Total	14	1.08	8	0.60	22	1.67	44	1.12
	Males	9	1.35	6	0.88	11	1.63	26	1.29
	Females	5	0.79	2	0.31	11	1.71	18	0.94
Suicide (E952-E959)	Total	0	0.00	0	0.00	15	1.14	15	0.38
	Males	0	0.00	0	0.00	8	1.19	8	0.40
	Females	0	0.00	0	0.00	7	1.09	7	0.37
Interpersonal violence (E960-E999)	Total	14	1.08	8	0.61	7	0.53	29	0.74
	Males	9	1.36	6	0.89	3	0.45	18	0.90
	Females	5	0.79	2	0.31	4	0.62	11	0.58
Undetermined Intent	Total	2	0.15	0	0.00	0	0.00	2	0.05
	Males	2	0.30	0	0.00	0	0.00	2	0.10
	Females	0	0.00	0	0.00	0	0.00	0	0.00

Source : NISU, Flinders University, Adelaide.

NOTES :

- * Excluding E870-E879 (medical misadventure & complications of surgery) and E930-E949 (adverse effects of prescribed medication).
- # Excluding E870-E879 (medical misadventure & complications of surgery).
- + E Code 910 and ABS Drowning data code 1-4, 20, 23-26.
- Δ All poisoning deaths attributed to opiates and related medications (E850/.0-.2)

Appendix Table 5 Hospital ADMISSIONS by cause, intent, age and gender, 0-14 year-old children, Australia, 1996-97.

Cause of injury (ICD-9)	Gender	Age group (years)							
		0-4		5 to 9		10 to 14		Total	
		N	Rate	N	Rate	N	Rate	N	Rate
All "true" injuries (E800-E999)	Total	20,094	1,554.92	17,686	1344.79	20,224	1,541.34	58,004	1,479.87
	Males	11,616	1,751.18	10,560	1566.15	13,944	2,075.63	36,120	1,797.56
	Females	8,478	1,347.94	7,126	1111.90	6,280	980.77	21,884	1,145.66
All unintentional injuries (E800-E929)	Total	19,756	1,528.76	17,559	1335.13	19,448	1,482.19	56,763	1,448.20
	Males	11,430	1,723.13	10,476	1553.69	13,559	2,018.32	35,465	1,764.97
	Females	8,326	1,323.77	7,083	1105.19	5,889	919.71	21,298	1,114.99
All motor and other road Vehicles (E810-E829)	Total	1,165	90.15	2,682	203.93	4,552	346.92	8,399	214.29
	Males	745	112.31	1,671	247.83	3,113	463.38	5,529	275.16
	Females	420	66.78	1,011	157.75	1,439	224.73	2,870	150.25
Motor vehicle occupants (E810-E825; .0, .1, .9)	Total	375	29.02	451	34.29	599	45.65	1,425	36.36
	Males	226	34.07	235	34.85	344	51.21	805	40.06
	Females	149	23.69	216	33.70	255	39.82	620	32.46
Pedestrians (E810-E825; .7 & E826-E829; .0)	Total	294	22.75	422	32.09	479	36.51	1,195	30.49
	Males	203	30.60	274	40.64	294	43.76	771	38.37
	Females	91	14.47	148	23.09	185	28.89	424	22.20
Bicycles (E810-E825; .6 & E826-E829; .0)	Total	313	24.22	1,270	96.57	2,108	160.66	3,691	94.17
	Males	209	31.51	868	128.73	1,682	250.37	2,759	137.31
	Females	104	16.54	402	62.73	426	66.53	932	48.79
Motor cycles (E810-E819; .2, .3 & E820-E825; .2, .3)	Total	44	3.40	200	15.21	669	50.99	913	23.29
	Males	28	4.22	149	22.10	591	87.97	768	38.22
	Females	16	2.54	51	7.96	78	12.18	145	7.59
Other transport (E800-807; E830-E838; E840-E845; E846- E848)	Total	60	4.64	108	8.21	271	20.65	439	11.20
	Males	36	5.43	59	8.75	217	32.30	312	15.53
	Females	24	3.82	49	7.65	54	8.43	127	6.65
Near Drowning (E910)	Total	266	20.58	57	4.33	36	2.74	359	9.16
	Males	166	25.03	41	6.08	27	4.02	234	11.65
	Females	100	15.90	16	2.50	9	1.41	125	6.54
Swimming pools (910; .5, .6)	Total	167	12.92	18	1.37	6	0.46	191	4.87
	Males	107	16.13	13	1.93	4	0.60	124	6.17
	Females	60	9.54	5	0.78	2	0.31	67	3.51
Poisoning (E850-E869)	Total	3,562	275.64	238	18.10	391	29.80	4,191	106.93
	Males	1,949	293.82	130	19.28	169	25.16	2,248	111.87
	Females	1,613	256.45	108	16.85	222	34.67	1,943	101.72
Falls (E880-E888)	Total	6,397	495.01	9,016	685.55	8,265	629.90	23,678	604.10
	Males	3,642	549.05	5,144	762.91	5,775	859.63	14,561	724.65
	Females	2,755	438.02	3,872	604.17	2,490	388.87	9,117	477.29
From playground equipment (E884.0)	Total	891	68.95	2,810	213.66	681	51.90	4,382	111.80
	Males	504	75.98	1,521	225.58	386	57.46	2,411	119.99
	Females	387	61.53	1,289	201.13	295	46.07	1,971	103.19

Appendix Table 5 cont. Hospital ADMISSIONS by cause, intent, age and gender, 0-14 year-old children, Australia, 1996/97.

Cause of injury (ICD-9)	Gender	Age group (years)							
		0-4		5-9		10-14		Total	
		N	Rate	N	Rate	N	Rate	N	Rate
Fire/ flames/scalds (E890-E899)	Total	1,215	94.02	230	17.49	291	22.18	1,736	44.29
	Males	743	112.01	148	21.95	228	33.94	1,119	55.69
	Females	472	75.04	82	12.79	63	9.84	617	32.30
Hot tap water (E924.0)	Total	437	33.82	39	2.97	41	3.12	517	13.19
	Males	255	38.44	14	2.08	31	4.61	300	14.93
	Females	182	28.94	35	5.46	10	1.56	217	11.36
Choking & suffocation (E911-E913)	Total	394	30.49	74	5.63	30	2.29	498	12.71
	Males	222	33.47	47	6.97	22	3.27	291	14.48
	Females	172	27.35	27	4.21	8	1.25	207	10.84
Hit/struck/crush (E916; E917; E918)	Total	2,131	164.90	1,721	130.86	2,172	165.54	6,024	153.69
	Males	1,272	191.76	1,150	170.56	1,676	249.48	4,098	203.94
	Females	859	136.57	571	89.10	496	77.46	1,926	100.83
Cutting/piercing (E920)	Total	1,211	93.71	1,288	97.94	1,214	92.52	3,713	94.73
	Males	790	119.10	828	122.80	859	127.87	2,477	123.27
	Females	421	66.94	460	71.78	355	55.44	1,236	64.71
Other unintentional	Total	3,355	259.62	2,145	163.10	2,226	169.65	7,726	197.11
	Males	1,865	281.16	1,258	186.57	1,473	219.26	4,596	228.73
	Females	1,490	236.90	887	138.40	753	117.60	3,130	163.86
Dog bite (E906.0)	Total	395	30.57	236	17.94	126	9.60	757	19.31
	Males	220	33.17	125	18.54	89	13.25	434	21.60
	Females	175	27.82	111	17.32	37	5.78	323	16.91
Foreign body (E914-E915)	Total	1,101	85.20	630	47.90	183	13.95	1,914	48.83
	Males	571	86.08	343	50.87	115	17.12	1,029	51.21
	Females	530	84.27	287	44.78	68	10.62	885	46.33
All intentional injury (E960-E999)	Total	313	24.22	112	8.52	748	57.01	1,173	29.93
	Males	172	25.93	77	11.42	369	54.93	618	30.76
	Females	141	22.42	35	5.46	379	59.19	555	29.06
Self-harm (E952-E959)	Total	5	0.39	6	0.46	364	27.74	375	9.57
	Males	2	0.30	3	0.44	68	10.12	73	3.63
	Females	3	0.48	3	0.47	296	46.23	302	15.81
Interpersonal violence (E960-E999)	Total	308	23.83	106	8.06	384	29.27	798	20.36
	Males	170	25.63	74	10.97	301	44.81	545	27.12
	Females	138	21.94	32	4.99	83	12.96	253	13.24
Undetermined Intent (E980-E989)	Total	25	1.93	15	1.14	28	2.13	68	1.73
	Males	14	2.11	7	1.04	16	2.38	37	1.84
	Females	11	1.75	8	1.25	12	1.87	31	1.62

Source : NISU, Flinders University, Adelaide.

Appendix Table 6 Non-hospitalised Emergency Department PRESENTATIONS (estimates) by cause of injury, intent, age and gender, 0-14 year-old children, Australia, 1996/97.

Cause of injury	Gender	Age group (years)							
		0-4		5-9		10-14		Total	
		N	Rate	N	Rate	N	Rate	N	Rate
All "true" injuries	Total	103,198	7,985.68	73,315	5,574.66	97,591	7,437.72	274,104	6,993.26
	Males	57,240	8,629.24	42,773	6,343.66	62,497	9,302.96	162,510	8,087.54
	Females	45,957	7,306.80	30,542	4,765.61	35,095	5,480.92	111,594	5,842.13
All unintentional injuries	Total	102,386	7,922.85	72,192	5,489.27	94,179	7,177.68	268,757	6,856.84
	Males	56,742	8,554.16	41,861	6,208.40	59,724	8,890.19	158,327	7,879.37
	Females	45,644	7,257.04	30,330	4,732.53	34,456	5,381.13	110,324	5,775.65
All motor and other road vehicles	Total	4,803	371.67	6,241	474.55	15,625	1,190.83	26,670	680.44
	Males	2,714	409.15	3,432	509.00	11,582	1,724.03	17,728	882.26
	Females	2,089	332.13	2,809	438.30	4,043	631.41	8,941	468.08
Other transport	Total	264	20.43	256	19.47	967	73.70	1,487	37.94
	Males	138	20.80	118	17.50	814	121.17	1,070	53.25
	Females	126	20.03	138	21.53	153	23.89	417	21.83
Near Drowning	Total	264	20.43	77	5.85	122	9.30	462	11.79
	Males	211	31.87	21	3.11	122	18.16	353	17.57
	Females	53	8.43	56	8.74	0	0.00	109	5.71
Poisoning	Total	15,874	1,228.36	1,176	89.42	1,354	103.19	18,964	483.83
	Males	7,625	1,149.57	1,095	162.40	737	109.71	9,456	470.59
	Females	8,249	1,311.53	642	100.17	617	96.36	9,508	497.76
Falls	Total	41,180	3,186.60	35,311	2,684.94	39,022	2,973.99	115,512	2,947.08
	Males	23,907	3,604.17	19,624	2,910.43	22,372	3,330.17	65,903	3,279.76
	Females	17,272	2,746.11	15,687	2,447.71	16,650	2,600.29	49,609	2,597.12
Fire/ burns/scalds	Total	4,000	309.53	1,680	127.74	1,697	129.33	7,378	188.24
	Males	2,077	313.12	980	145.34	933	138.88	3,990	198.57
	Females	1,923	305.74	701	109.38	764	119.32	3,387	177.32
Choking & suffocation	Total	364	28.17	287	21.82	122	9.30	666	16.99
	Males	194	29.25	80	11.86	18	2.68	291	14.48
	Females	170	27.03	153	23.87	52	8.12	375	19.63
Hit/struck/crush	Total	14,305	1,106.95	11,412	867.74	18,539	1,412.92	44,426	1,133.45
	Males	8,747	1,318.66	7,346	1,089.48	12,505	1,861.43	28,598	1,423.22
	Females	5,558	883.68	4,066	634.44	6,034	942.35	15,658	819.72
Cutting/piercing	Total	4,496	347.97	6,142	467.02	6,125	466.81	16,763	427.68
	Males	2,789	420.46	3,906	579.30	4,332	644.84	11,028	548.82
	Females	1,707	271.40	2,236	348.89	1,792	279.86	5,735	300.24
Other unintentional	Total	16,836	1,302.87	9,049	688.06	10,608	808.47	36,493	931.05
	Males	8,339	1,257.15	5,260	780.11	6,310	939.27	19,908	990.75
	Females	8,497	1,350.96	3,789	591.21	4,299	671.39	16,585	868.25

Appendix Table 6 cont. Non-hospitalised Emergency Department PRESENTATIONS (estimates) by cause of injury, intent, age and gender, 0-14 year-old children, Australia, 1997.

Cause of injury	Gender	Age group (years)							
		0-4		5-9		10-14		Total	
		N	Rate	N	Rate	N	Rate	N	Rate
All intentional injury	Total	634	49.06	965	73.38	3,136	239.00	4,374	111.59
	Males	491	74.02	751	111.38	2,493	371.09	3,645	181.40
	Females	233	37.05	214	33.39	643	100.42	1,090	57.06
Self-harm	Total	46	3.56	90	6.84	472	35.97	608	15.51
	Males	20	3.02	60	8.90	266	39.60	346	17.22
	Females	26	4.13	30	4.68	206	32.17	262	13.72
Interpersonal violence	Total	588	45.50	875	66.53	2,664	203.03	4,127	105.29
	Males	380	57.29	691	102.48	2,227	331.50	3,298	164.13
	Females	208	33.07	184	28.71	437	68.25	829	43.40
Undetermined Intent	Total	178	13.77	213	16.20	328	25.00	719	18.34
	Males	97	14.62	161	23.88	280	41.68	538	26.77
	Females	80	12.72	52	8.11	48	7.50	180	9.42

US CPSC DATA TABLES (CHAPTER 5)

Appendix Table 7 Consumer products most frequently involved in injury: CHILDREN aged 0-4 years, USA, 1998 (CPSC)

Ranking	Type of Product	Rate per 100,000
1	Floors or flooring materials	848.45
2	Tables, not elsewhere classified	719.85
3	Beds, not specified	598.10
4	Stairs or steps	572.18
5	Doors, not specified	373.66
6	Chairs, not specified	327.87
7	Sofas, couches, davenports, divans, etc	266.78
8	Ceilings and walls (part of completed structure)	230.34
9	Bicycles and accessories (exc. Mountain	217.18
10	Toys, not elsewhere classified	202.84
11	Cabinets, racks, room dividers and shelving	169.51
12	Desks, chests, bureaux or buffets	151.51
13	Bathtubs or showers	149.05
14	Swings or swing sets	122.88
15	Grocery or shopping carts	111.70
16	Jewellery	108.57
17	Slides or sliding boards	103.24
18	Coins	103.13
19	Rugs or carpets, not specified	96.33
20	Porches, balconies, open-side floors	87.82
21	Bedsprings or bedframes	86.14
22	Tablet or capsule drugs	81.84
23	Nails, screws, tacks or bolts	77.94
24	Bunk beds	74.08
25	<5 poisoning - no other code	73.62
26	Counters or countertops	72.06
27	Metal containers	71.78
28	Windows or window glass, not specified	68.69
29	Baby strollers	67.50
30	Tableware and accessories	65.57
31	Baby walkers or jumpers	65.43
32	Televisions	65.41
33	Monkey bars or other playground climbing	62.26
34	Knives, not elsewhere classified	61.61
35	Fireplaces, not specified	57.47
36	Bottles or jars, not specified	56.70
37	Hot water	50.94
38	Other drugs or medications	50.46
39	Irons, not specified	48.83
40	Trampolines	48.08

Appendix Table 8 Consumer products most frequently involved in injury: FEMALES aged 0-4 years, USA, 1998 (CPSC)

Ranking	Type of product	Rate per 100,000
1	Floors or flooring materials	750.02
2	Tables, not elsewhere classified	545.30
3	Beds, not specified	518.58
4	Stairs or steps	497.89
5	Doors, not specified	348.88
6	Chairs, not specified	298.87
7	Sofas, couches, davenports, divans or studio couches	243.15
8	Ceilings and walls (part of completed structure)	155.58
9	Jewellery	151.57
10	Bicycles and accessories (exc. Mountain bikes)	150.02
11	Toys, not elsewhere classified	140.00
12	Desks, chests, bureaux or buffets	131.41
13	Swings or swing sets	120.91
14	Cabinets, racks, room dividers and shelves	119.00
15	Bathtubs or showers	117.66
16	Grocery or shopping carts	108.58
17	Coins	101.37
18	Rugs or carpets, not specified	85.71
19	Tablet or capsule drugs	84.12
20	Slides or sliding boards	78.28
21	<5 poisoning - no other code	76.96
22	Porches, balconies, open-side floors or floor openings	73.22
23	Baby strollers	68.67
24	Metal containers	65.23
25	Bedsprings or bedframes	65.13
26	Monkey bars or other playground climbing equipment	62.72
27	Nails, screws, tacks or bolts	62.71
28	Bunk beds	61.16
29	Tableware and accessories	59.21
30	Bottles or jars, not specified	52.94
31	Windows or window glass, not specified	52.79
32	Counters or countertops	52.24
33	Other drugs or medications	50.26
34	Knives, not elsewhere classified	49.94
35	Baby walkers or jumpers	49.25
36	Trampolines	48.64
37	Televisions	46.58
38	Hot water	46.38
39	Aspirin substitutes	45.64
40	Hair curlers, curling irons, clips & hair pins	45.49

Appendix Table 9 Consumer products most frequently involved in injury: MALES aged 0-4 years, USA, 1998 (CPSC).

Ranking	Type of product	Rate per 100,000
1	Floors or flooring materials	937.68
2	Tables, not elsewhere classified	882.44
3	Beds, not specified	670.67
4	Stairs or steps	639.90
5	Doors, not specified	395.24
6	Chairs, not specified	353.73
7	Ceilings and walls (part of completed structure)	300.41
8	Sofas, couches, davenports, divans or studio couches	287.84
9	Bicycles and accessories (exc. mountain bikes)	280.08
10	Toys, not elsewhere classified	261.68
11	Cabinets, racks, room dividers and shelves	216.78
12	Bathtubs or showers	178.18
13	Desks, chests, bureaux or buffets	169.85
14	Slides or sliding boards	126.49
15	Swings or swing sets	124.09
16	Grocery or shopping carts	114.06
17	Rugs or carpets, not specified	105.92
18	Bedsprings or bedframes	105.71
19	Coins	104.25
20	Porches, balconies, open-side floors or floor openings	101.27
21	Nails, screws, tacks or bolts	92.04
22	Counters or countertops	90.57
23	Bunk beds	85.99
24	Windows or window glass, not specified	83.49
25	Televisions	83.01
26	Baby walkers or jumpers	80.50
27	Tablet or capsule drugs	79.21
28	Metal containers	77.64
29	Fireplaces, not specified	74.64
30	Knives, not elsewhere classified	72.40
31	Tableware and accessories	71.29
32	<5 poisoning - no other code	70.02
33	Jewellery	66.93
34	Baby strollers	66.01
35	Fences or fence posts	64.34
36	Baseball (activity, apparel or equipment)	62.91
37	Monkey bars or other playground climbing equipment	61.48
38	Irons, not specified	60.11
39	Bottles or jars, not specified	59.97
40	Hot water	55.01

**Appendix Table 10 Consumer products most frequently involved in injury:
CHILDREN aged 5-9 years, USA, 1998 (CPSC).**

Ranking	Type of Product	Rate per 100,000
1	Bicycles and accessories (exc. Mountain	800.95
2	Floors or flooring materials	306.24
3	Monkey bars or other playground climbing	270.26
4	Stairs or steps	247.84
5	Doors, not specified	226.80
6	Tables, not elsewhere classified	202.86
7	Beds, not specified	187.37
8	Swings or swing sets	183.16
9	Baseball (activity, apparel or equipment	161.96
10	Ceilings and walls (part of completed structure)	158.88
11	Trampolines	151.39
12	Basketball (activity, apparel or equip.)	129.14
13	Fences or fence posts	128.77
14	Nails, screws, tacks or bolts	123.11
15	In-line skating (activity, apparel, equip.)	121.17
16	Football (activity, apparel or equip.)	116.95
17	Chairs, not specified	110.53
18	Slides or sliding boards	110.25
19	Knives, not elsewhere classified	99.25
20	Toys, not elsewhere classified	94.74
21	Desks, chests, bureaux or buffets	88.67
22	Bunk beds	82.08
23	Soccer (activity, apparel or equip.)	77.56
24	Bathtubs or showers	75.02
25	Sofas, couches, davenports, divans, etc.	72.96
26	Swimming pools, not specified	72.60
27	Roller skating (activity, apparel or equip.)	71.81
28	Cabinets, racks, room dividers and shelving	71.73
29	Porches, balconies, open-side floors	61.81
30	Jewellery	54.66
31	Windows or window glass, not specified	53.90
32	Poles	50.72
33	Swimming (activity, apparel or equipment	48.83
34	Playground equipment, not specified	48.46
35	Metal containers	47.45
36	Footwear	43.59
37	Gymnastics (activity, apparel or equip.)	43.57
38	Fishing (activity, apparel or equipment)	42.85
39	Bedsprings or bedframes	42.01
40	Ball sports (activity, apparel or equip)	41.01

**Appendix Table 11 Consumer products most frequently involved in injury:
FEMALES aged 5-9 years, USA, 1998 (CPSC).**

Ranking	Type of product	Rate per 100,000
1	Bicycles and accessories (exc. mountain bikes)	597.92
2	Floors or flooring materials	285.62
3	Monkey bars or other playground climbing equipment	265.63
4	Stairs or steps	219.71
5	Doors, not specified	197.59
6	Swings or swing sets	191.94
7	Trampolines	155.21
8	Tables, not elsewhere classified	145.17
9	Beds, not specified	131.45
10	In-line skating (activity, apparel, equipment)	125.09
11	Ceilings and walls (part of completed structure)	103.13
12	Chairs, not specified	102.16
13	Roller skating (activity, apparel or equipment)	100.33
14	Nails, screws, tacks or bolts	87.51
15	Slides or sliding boards	86.14
16	Fences or fence posts	82.41
17	Jewellery	82.13
18	Toys, not elsewhere classified	74.25
19	Desks, chests, bureaux or buffets	71.03
20	Gymnastics (activity, apparel or equip.)	70.28
21	Bathtubs or showers	66.35
22	Swimming pools, not specified	64.47
23	Bunk beds	64.25
24	Cabinets, racks, room dividers and shelves	61.51
25	Baseball (activity, apparel or equipment)	61.14
26	Basketball (activity, apparel or equip.)	58.67
27	Knives, not elsewhere classified	58.39
28	Sofas, couches, davenports, divans or studio couches	56.18
29	Soccer (activity, apparel or equip.)	55.23
30	Swimming (activity, apparel or equipment)	52.85
31	Porches, balconies, open-side floors or floor openings	52.10
32	Windows or window glass, not specified	41.40
33	Skating (activity, apparel or equipment)	40.87
34	Metal containers	37.72
35	Footwear	37.53
36	Playground equipment, not specified	36.90
37	Ice skating (activity, apparel or equipment)	35.31
38	Softball (activity, apparel or equipment)	35.31
39	Coins	33.92
40	Bedsprings or bedframes	33.19

Appendix Table 12 Consumer products most frequently involved in injury: MALES aged 5-9 years, USA, 1998 (CPSC).

Ranking	Type of product	Rate per 100,000
1	Bicycles and accessories (exc. Mountain bikes)	995.14
2	Floors or flooring materials	326.15
3	Monkey bars or other playground climbing equipment	274.91
4	Stairs or steps	274.86
5	Baseball (activity, apparel or equipment)	258.17
6	Tables, not elsewhere classified	258.00
7	Doors, not specified	254.84
8	Beds, not specified	240.81
9	Ceilings and walls (part of completed structure	212.14
10	Football (activity, apparel or equip.)	211.77
11	Basketball (activity, apparel or equip.)	196.40
12	Swings or swing sets	174.95
13	Fences or fence posts	173.07
14	Nails, screws, tacks or bolts	157.14
15	Trampolines	147.89
16	Knives, not elsewhere classified	138.29
17	Slides or sliding boards	133.33
18	Chairs, not specified	118.60
19	In-line skating (activity, apparel, equip.)	117.54
20	Toys, not elsewhere classified	114.34
21	Desks, chests, bureaux or buffets	105.57
22	Bunk beds	99.13
23	Soccer (activity, apparel or equip.)	98.90
24	Sofas, couches, davenports, divans or studio couches	89.03
25	Bathtubs or showers	83.35
26	Cabinets, racks, room dividers and shelves	81.54
27	Swimming pools, not specified	80.42
28	Poles	71.80
29	Porches, balconies, open-side floors or floor openings	71.12
30	Windows or window glass, not specified	65.85
31	Skateboards	61.96
32	Playground equipment, not specified	59.52
33	Fishing (activity, apparel or equipment)	58.63
34	Metal containers	56.76
35	Ball sports (activity, apparel or equipment)	53.96
36	Bedsprings or bedframes	50.45
37	Footwear	49.41
38	Golf (activity, apparel or equipment)	46.91
39	Ice skating (activity, apparel or equipment)	45.90
40	Swimming (activity, apparel or equipment)	45.04

**Appendix Table 13 Consumer products most frequently involved in injury:
CHILDREN aged 10-14 years, USA, 1998 (CPSC).**

Ranking	Type of Product	Rate per 100,000
1	Basketball (activity, apparel or equip.)	899.18
2	Bicycles and accessories (exc. Mountain	820.63
3	Football (activity, apparel or equip.)	708.66
4	Soccer (activity, apparel or equip.)	322.70
5	Baseball (activity, apparel or equipment	305.67
6	Stairs or steps	294.50
7	Floors or flooring materials	247.32
8	In-line skating (activity, apparel, equip.)	225.88
9	Trampolines	187.71
10	Doors, not specified	177.58
11	Knives, not elsewhere classified	161.73
12	Ceilings and walls (part of completed structure)	158.24
13	Nails, screws, tacks or bolts	107.15
14	Softball (activity, apparel or equipment	107.11
15	Skateboards	104.84
16	Fences or fence posts	104.05
17	Roller skating (activity, apparel or equip.)	94.36
18	Gymnastics (activity, apparel or equip.)	81.18
19	Volleyball (activity, apparel or equip.)	79.11
20	Windows or window glass, not specified	78.80
21	Tables, not elsewhere classified	76.00
22	Ball sports (activity, apparel or equip.)	74.85
23	Chairs, not specified	74.07
24	Wrestling (activity, apparel or equip.)	72.39
25	Beds, not specified	70.90
26	Swings or swing sets	69.77
27	Exercise (activity or apparel, w/o equip	67.10
28	Swimming pools, not specified	64.87
29	Fishing (activity, apparel or equipment)	64.76
30	All-terrain vehicles, 4 wheels only	59.65
31	Footwear	57.37
32	Metal containers	57.08
33	Monkey bars or other playground climbing	55.35
34	Snowboarding (activity, apparel, equip.)	53.15
35	Hockey (activity, apparel or equipment),	53.14
36	Swimming (activity, apparel or equipment	51.95
37	Other ball sports (activity, apparel or	51.60
38	Skating (activity, apparel or equipment)	48.58
39	Horseback riding (activity, apparel, equip)	46.65
40	Porches, balconies, open-side floors or	45.94

**Appendix Table 14 Consumer products most frequently involved in injury:
FEMALES aged 10-14 years, USA, 1998 (CPSC).**

Ranking	Type of product	Rate per 100,000
1	Basketball (activity, apparel or equip.)	600.05
2	Bicycles and accessories (exc. Mountain bikes)	414.81
3	Stairs or steps	348.83
4	Soccer (activity, apparel or equip.)	314.12
5	Floors or flooring materials	236.37
6	Trampolines	191.25
7	In-line skating (activity, apparel, equip.)	188.16
8	Softball (activity, apparel or equipment)	188.10
9	Doors, not specified	182.03
10	Gymnastics (activity, apparel or equip.)	136.99
11	Roller skating (activity, apparel or equip.)	125.45
12	Volleyball (activity, apparel or equip.)	120.22
13	Ceilings and walls (part of completed structure)	105.23
14	Baseball (activity, apparel or equipment)	103.35
15	Knives, not elsewhere classified	93.82
16	Cheerleading (activity, apparel or equip.)	80.87
17	Football (activity, apparel or equip.)	78.28
18	Swings or swing sets	76.49
19	Chairs, not specified	74.94
20	Exercise (activity or apparel, w/o equip.)	73.99
21	Horseback riding (activity, apparel, equip.)	71.95
22	Beds, not specified	66.58
23	Nails, screws, tacks or bolts	63.72
24	Swimming pools, not specified	62.96
25	Tables, not elsewhere classified	61.40
26	Jewellery	60.80
27	Footwear	59.27
28	Windows or window glass, not specified	57.97
29	Ball sports (activity, apparel or equipment)	57.17
30	Fences or fence posts	56.87
31	Monkey bars or other playground climbing equipment	56.17
32	Skating (activity, apparel or equipment)	53.98
33	Swimming (activity, apparel or equipment)	53.86
34	Metal containers	47.50
35	Tableware and accessories	44.57
36	Dancing (activity, apparel or equipment)	44.53
37	Ice skating (activity, apparel or equipment)	43.10
38	Other ball sports (activity, apparel or equip.)	41.39
39	Drinking glasses	41.37
40	Desks, chests, bureaux or buffets	39.58

**Appendix Table 14A Consumer products most frequently involved in injury:
MALES aged 10-14 years, USA, 1998 (CPSC)**

Ranking	Type of product	Rate per 100,000
1	Football (activity, apparel or equip.)	1312.70
2	Bicycles and accessories (exc. Mountain bikes)	1211.64
3	Basketball (activity, apparel or equip.)	1189.14
4	Baseball (activity, apparel or equipment)	500.01
5	Soccer (activity, apparel or equip.)	332.76
6	In-line skating (activity, apparel, equip.)	263.11
7	Floors or flooring materials	259.19
8	Stairs or steps	244.54
9	Knives, not elsewhere classified	227.32
10	Ceilings and walls (part of completed structure)	209.63
11	Trampolines	185.45
12	Skateboards	181.44
13	Doors, not specified	174.40
14	Fences or fence posts	149.55
15	Nails, screws, tacks or bolts	149.10
16	Wrestling (activity, apparel or equipment)	131.75
17	Fishing (activity, apparel or equipment)	112.94
18	Windows or window glass, not specified	99.09
19	Ball sports (activity, apparel or equipment)	92.11
20	Tables, not elsewhere classified	90.35
21	Hockey (activity, apparel or equipment)	87.15
22	All-terrain vehicles, 4 wheels only	80.95
23	Snowboarding (activity, apparel, equip.)	80.64
24	Beds, not specified	75.44
25	Gas, air or spring-operated guns	74.64
26	Chairs, not specified	73.68
27	Swimming pools, not specified	67.07
28	Metal containers	66.53
29	Roller skating (activity, apparel or equip.)	65.34
30	Swings or swing sets	63.79
31	Other ball sports (activity, apparel or equip.)	61.63
32	Exercise (activity or apparel, w/o equip.)	60.94
33	Ice hockey (activity, apparel or equipment)	60.22
34	Two-wheeled, powered, off-road vehicles	59.04
35	Bb's or pellets	56.75
36	Poles	56.01
37	Footwear	55.90
38	Monkey bars or other playground climbing equipment	54.90
39	Porches, balconies, open-side floors or floor openings	52.33
40	Swimming (activity, apparel or equipment)	50.43

VICTORIAN DATA TABLES (CHAPTER 5)

VICTORIAN CORONERS
FACILTATION SYSTEM
DEATHS
PRODUCTS
BY AGE

All factors,
1989/90 – 1994/95

**Appendix Table 15 Products or agents associated with injury DEATHS : CHILDREN,
0-4 years, Victoria, July 1989 – June 1995.**

Product or agent	N	Case %
Water, not hot	52	27.08
Passenger car or station wagon	51	26.56
Built-in swimming pools	25	13.02
Flame, fire, smoke	21	10.94
Heavy truck utility or van >3 tonnes	13	6.77
Dam, pond	12	6.25
Farm tractors	8	4.17
Above-ground swimming pools	6	3.13
Bathtubs, showers, incl. fixtures & access	6	3.13
Lighter fluids	6	3.13
Rope or string	5	2.60
Whirlpools, hottubs or home spas	5	2.60
Creek, stream, river	4	2.08
Matches, not specified	4	2.08
Stick, branch, tree	4	2.08
Trailer/horsefloat	4	2.08
Alcohol (beverage)	3	1.56
Baby mattresses or pads	3	1.56
Bathtub or shower enclosures, not specified	3	1.56
Bicycles or accessories	3	1.56
Cots	3	1.56
Electrical wire or wiring system	3	1.56
Baby carriages & prams	2	1.04
Bus >20 seats	2	1.04
Ditches & potholes	2	1.04
Meat, poultry	2	1.04
Other electric lighting equipped	2	1.04
Poles, (exc. fence posts, fishing, pole vaults)	2	1.04
Small rocks & stones	2	1.04
Sofas, couches, lounges, divans	2	1.04
Stairs or steps	2	1.04
Train, tram	2	1.04
Wading pools	2	1.04
Window blinds, venetian blinds or indoor shutters	2	1.04
Baby gates or barriers	1	0.52
Beds, not specified	1	0.52
Bedspreads, throws or comforters	1	0.52
Blankets, not specified	1	0.52
Brick, stone or masonry chimneys	1	0.52
Cabinet or door hardware	1	0.52
Candles, candlesticks & other candle holders	1	0.52
Caravan	1	0.52
Cat	1	0.52
Cliff	1	0.52
Clothing accessories	1	0.52

**Appendix Table 15 cont. Products or agents associated with injury DEATHS :
CHILDREN, 0-4 years, Victoria, July 1989 – June 1995.**

Product or agent	N	Case %
Clothing, not specified	1	0.52
Cot extender rails or youth bed rails	1	0.52
Desks, chests, bureaux or buffets	1	0.52
Draperies, curtains, shower curtains	1	0.52
Drums, pulleys, sheaves	1	0.52
Electrical wire, not specified	1	0.52
Farm mowers	1	0.52
Fences or fence posts	1	0.52
Floors or flooring material	1	0.52
Fuel storage tanks	1	0.52
Gutters, kerbing (road), not incl. house, building	1	0.52
Handrails, railings or banisters	1	0.52
Horse	1	0.52
Hot water	1	0.52
Irrigation equipped	1	0.52
Leaves, flowers	1	0.52
Light truck utility or van <3 tonnes	1	0.52
Mattresses, not specified	1	0.52
Nonglass bathtub or shower enclosures	1	0.52
Other bedding	1	0.52
Other drugs or medications	1	0.52
Plastic bags	1	0.52
Portable electric heaters	1	0.52
Reptiles	1	0.52
Sheets or pillowcases	1	0.52
Tables, NEC	1	0.52
Tyres, not attached or under repair	1	0.52
Unspecified food	1	0.52
Waste containers, rubbish baskets and bins	1	0.52

Total cases = 192

**Appendix Table 15A Products or agents associated with unintentional injury
DEATHS: INFANTS, 0 years, Victoria, July 1989 – June 1995.**

Product or agent	N	Case %
Passenger car or station wagon	8	22.86
Water, not hot	6	17.14
Heavy truck utility or van >3 tonnes	5	14.29
Baby carriages & prams	2	5.71
Cots	2	5.71
Bathtub or shower enclosures, not specified	2	5.71
Meat, poultry	2	5.71
Nonglass bathtub or shower enclosures	1	2.86
Bathtubs, showers, incl. fixtures & access	1	2.86
Draperies, curtains, shower curtains	1	2.86
Bedspreads, throws or comforters	1	2.86
Blankets, not specified	1	2.86
Beds, not specified	1	2.86
Lighter fluids	1	2.86
Plastic bags	1	2.86
Baby mattresses or pads	1	2.86
Floors or flooring material	1	2.86
Stairs or steps	1	2.86
Poles, (excel. fence posts, fishing, pole vaults)	1	2.86
Alcohol (beverage)	1	2.86
Above-ground swimming pools	1	2.86
Built-in swimming pools	1	2.86
Mattresses, not specified	1	2.86
Sheets or pillowcases	1	2.86
Other bedding	1	2.86
Unspecified food	1	2.86
Flame, fire, smoke	1	2.86

Total cases = 35

**Appendix Table 15B Products or agents associated with unintentional injury
DEATHS: CHILDREN, 1-4 years, Victoria, July 1989 – June 1995.**

Product or agent	N	Case %
Water, not hot	46	29.30
Passenger car or station wagon	43	27.39
Built-in swimming pools	24	15.29
Flame, fire, smoke	20	12.74
Dam, pond	12	7.64
Farm tractors	8	5.10
Heavy truck utility or van >3 tonnes	8	5.10
Bathtubs, showers, incl. fixtures & access	5	3.18
Whirlpools, hottubs or home spas	5	3.18
Rope or string	5	3.18
Lighter fluids	5	3.18
Above-ground swimming pools	5	3.18
Matches, not specified	4	2.55
Trailer/horsefloat	4	2.55
Stick, branch, tree	4	2.55
Creek, stream, river	4	2.55
Electrical wire or wiring system	3	1.91
Bicycles or accessories	3	1.91
Window blinds, venetian blinds or indoor shutters	2	1.27
Sofas, couches, lounges, divans	2	1.27
Wading pools	2	1.27
Baby mattresses or pads	2	1.27
Alcohol (beverage)	2	1.27
Other electric lighting equipped	2	1.27
Bus >20 seats	2	1.27
Train, tram	2	1.27
Small rocks & stones	2	1.27
Ditches & potholes	2	1.27
Portable electric heaters	1	1.00
Brick, stone or masonry chimneys	1	1.00
Waste containers, rubbish baskets and bins	1	1.00
Candles, candlesticks & other candle holders	1	1.00
Desks, chests, bureaux or buffets	1	1.00
Electrical wire, not specified	1	1.00
Fuel storage tanks	1	1.00
Irrigation equipped	1	1.00
Farm mowers	1	1.00
Baby gates or barriers	1	1.00
Cot extender rails or youth bed rails	1	1.00
Cots	1	1.00
Clothing accessories	1	1.00
Clothing, not specified	1	1.00
Cabinet or door hardware	1	1.00
Handrails, railings or banisters	1	1.00
Stairs or steps	1	1.00
Gutters, kerbing (road), not incl. house, building	1	1.00
Poles, (excel. fence posts, fishing, pole vaults)	1	1.00

**Appendix Table 15B cont. Products or agents associated with unintentional injury
DEATHS : CHILDREN, 1-4 years, Victoria, July 1989 – June 1995.**

Product or agent	N	Case %
Fences or fence posts	1	1.00
Other drugs or medications	1	1.00
Hot water	1	1.00
Bathtub or shower enclosures, not specified	1	1.00
Tables, NEC	1	1.00
Light truck utility or van <3 tonnes	1	1.00
Caravan	1	1.00
Cat	1	1.00
Horse	1	1.00
Reptiles	1	1.00
Leaves, flowers	1	1.00
Cliff	1	1.00
Drums, pulleys, sheaves	1	1.00
Tyres, not attached or under repair	1	1.00

Total cases = 157

Appendix Table 16 Products or agents associated with injury DEATHS : CHILDREN, 5-9 years, Victoria, July 1989 – June 1995.

Product or agent	N	Case %
Passenger car or station wagon	41	49.40
Water, not hot	10	12.05
Train, tram	8	9.64
Flame, fire, smoke	8	9.64
Heavy truck utility or van >3 tonnes	7	8.43
Dam, pond	7	8.43
Bicycles or accessories	4	4.82
Rope or string	3	3.61
Drains, grates, grills (roads)	3	3.61
Stick, branch, tree	3	3.61
Creek, stream, river	3	3.61
Matches, not specified	2	2.41
Light truck utility or van <3 tonnes	2	2.41
Bus >20 seats	2	2.41
Trailer/horsefloat	2	2.41
Small rocks & stones	2	2.41
Portable electric heaters	1	1.20
Brick, stone or masonry chimneys	1	1.20
Candles, candlesticks & other candle holders	1	1.20
Electrical wire or wiring system	1	1.20
Farm tractors	1	1.20
Farm mowers	1	1.20
Silo loaders, augers	1	1.20
Containers, not specified	1	1.20
Cigarette or pipe lighters	1	1.20
Poles, (exc. fence posts, fishing, pole vaults)	1	1.20
Alcohol (beverage)	1	1.20
Built-in swimming pools	1	1.20
Boats, boat motors & access incl. sail boats & boards	1	1.20
Bathtub or shower enclosures, not specified	1	1.20
Other electric lighting equipment	1	1.20
Motorcycle <250 CC	1	1.20
Motorcycle, not specified	1	1.20
Dog	1	1.20
Cliff	1	1.20
Meat, poultry	1	1.20
Biscuits	1	1.20
Buildings, office, plant, residential etc	1	1.20

**Appendix Table 17 Products or agents associated with injury DEATHS : CHILDREN,
10-14 years, Victoria, July 1989 – June 1995.**

Product or agent	n	Col Response %
Passenger car or station wagon	46	54.76
Bicycles or accessories	17	20.24
Water, not hot	10	11.90
Flame, fire, smoke	6	7.14
Motorcycle, not specified	5	5.95
Creek, stream, river	5	5.95
Traffic control devices	4	4.76
Alcohol (beverage)	4	4.76
Heavy truck utility or van >3 tonnes	4	4.76
Train, tram	4	4.76
Sea, ocean, estuary	4	4.76
Other drugs or medications	3	3.57
Fuel-burning lighting equipment	3	3.57
Stick, branch, tree	3	3.57
Farm tractors	2	2.38
Fences or fence posts	2	2.38
Boats, boat motors & access incl. sail boats & boards	2	2.38
Motorcycle <250 CC	2	2.38
Three or more wheel motorcycle	2	2.38
Light truck utility or van <3 tonnes	2	2.38
Rope or string	1	1.19
Mountain climbing (activity, apparel or equipment)	1	1.19
Swimming pools, not specified	1	1.19
Footwear	1	1.19
Matches, not specified	1	1.19
Clotheslines, clothes drying racks or clothes horses	1	1.19
Poles, (exc. fence posts, fishing, pole vaults)	1	1.19
Built-in swimming pools	1	1.19
Swimming pool equipment (exc. diving board, slide, chemicals)	1	1.19
Swimming (activity, apparel or equipment)	1	1.19
Bathtub or shower enclosures, not specified	1	1.19
Bus >20 seats	1	1.19
Horse	1	1.19
Dam, pond	1	1.19
Small rocks & stones	1	1.19
Sun	1	1.19
Meat, poultry	1	1.19
Unspecified food	1	1.19
Chemical compounds (gaseous)	1	1.19

VICTORIAN INJURY SURVEILLANCE SYSTEM
HOSPITAL ADMISSIONS
PRODUCTS
BY AGE

Appendix Table 18 Product or agent GROUPINGS associated with injury ADMISSIONS : CHILDREN 0-4 years.

Product or agent GROUPING	N	Case %
Structures and parts thereof	1,827	28.08
Furniture & non-structural fittings	1,080	16.60
Drugs, medications, biological factors	913	14.03
Food and drink	746	11.47
Sports and recreation	613	9.42
Natural/environmental	490	7.53
Misc./unclassifiable	444	6.82
Vehicles - air/land	405	6.23
Animals	326	5.01
Kitchenware	280	4.30
Children nursery equipment	240	3.69
Yard and garden equipment	222	3.41
Personal use items	198	3.04
Misc. cleaning/maintenance consumables	186	2.86
Toys	144	2.21
Packaging materials/containers	130	2.00
Kitchen appliances	110	1.69
Industrial equipment	78	1.20
Space heating cooling ventilation	53	0.81
Laundry appliances	43	0.66
Craft and hobby equipment	39	0.60
Chemicals and compounds	38	0.58
Other household appliances	33	0.51
Fabrics drapery soft furnishing	30	0.46
Workshop tools	27	0.42
General housewares	19	0.29
Cosmetics and related preps	19	0.29
General utility appliances	16	0.25
Entertainment apparatus	13	0.20
Agricultural equipment	10	0.15
Security safety & protection	6	0.09
Commercial & business equipment	5	0.08
Medical equipment	4	0.06
Laundryware	4	0.06

**Appendix Table 18A Product or agent GROUPINGS associated with injury
ADMISSIONS : INFANTS 0 years.**

Product or agent GROUP	N	Case %
Structures or parts thereof	283	34%
Furniture & non-structural	153	19%
Food & drink	144	18%
Children's & child 's nursery equipment	118	14%
Drugs & medication	76	9%
Misc. & unclassifiable	53	6%
Natural/environmental	47	6%
Kitchenware	44	5%
Vehicles registered air or land	44	5%
Sports & recreation	31	4%
Personal use items	26	3%
Kitchen appliances	25	3%
Misc. cleaning	24	3%
Space heating & cooling	18	2%
Toys	15	2%
Yard & garden equipment	15	2%
Animals	15	2%
Packaging materials & containers	9	1%
Industrial or retail equipment	6	1%
Fabrics & drapery	5	1%
Laundry appliances	4	0%
Craft & hobby equipment	4	0%
Cosmetics & related preparations	4	0%
Other household appliances	3	0%
General housewares	3	0%
Entertainment apparatus	2	0%
Communications & business equipment	2	0%
Medical equipment	1	0%

Total cases = 822

**Appendix Table 18B Product or agent GROUPINGS associated with injury
ADMISSIONS : CHILDREN 1-4 years.**

Product or agent GROUPING	N	Case %
Structures & parts thereof	1,544	27%
Furniture and non-structural	927	16%
Drugs & medications	837	15%
Food & drink	602	11%
Sports & recreation	582	10%
Natural/ environmental factors	443	8%
Misc. & otherwise unclassifiable	391	7%
Vehicles registered air & land	361	6%
Animals	311	5%
Kitchenware	236	4%
Yard & garden equipment	207	4%
Personal use items	172	3%
Misc. cleaning	162	3%
Toys	129	2%
Children's & child's nursery equipment	122	2%
Packaging materials & containers	121	2%
Kitchen appliances	85	1%
Industrial & retail equipment	72	1%
Laundry appliances	39	1%
Chemicals & compounds	37	1%
Craft & hobby	36	1%
Space heating	35	1%
Other household appliances	30	1%
Workshop tools & appliances	27	0%
Fabrics drapery	25	0%
General utility	16	0%
General housewares	16	0%
Cosmetics	15	0%
Entertainment apparatus	11	0%
Agricultural equipment	11	0%
Security safety & protection	6	0%
Laundryware	4	0%
Communications & business equipment	4	0%
Medical equipment	3	0%
Highway & roadway furnishings	1	0%
School & educational equipment	0	0%

Total cases = 5,684

**Appendix Table 19 Products or agents associated with injury ADMISSIONS :
CHILDREN 0-4 years.**

Rank	Type of product	N	Case %
1	Floors or flooring material	479	7.36
2	Concrete & other man-made outdoor surfaces	393	6.04
3	Passenger car or station wagon	336	5.16
4	Doors, not specified	326	5.01
5	Hot water	318	4.89
6	Door sills or frames	311	4.78
7	Cabinets, racks, room dividers & shelves	256	3.93
8	Tea, coffee, other hot beverages	228	3.50
9	Dog	210	3.23
10	Tablet or capsule drug, NEC	163	2.51
11	Barbiturates, sedatives, tranquillisers	156	2.40
12	Liquid drugs (exc. Aspirin subs, iron preps, antihistamines)	152	2.34
13	Tableware and accessories	147	2.26
14	Other drugs or medications	140	2.15
15	Chairs, not specified	131	2.01
16	Beds, not specified	130	2.00
17	Bicycles or accessories	123	1.89
18	Tablet or capsule drug, NEC	123	1.89
19	Tables, NEC	123	1.89
20	Bathtubs, showers, incl. Fixtures & access	110	1.69
21	Stairs or steps	109	1.68
22	Paper money or coins	108	1.66
23	Ointments and topical medicines	107	1.64
24	Vehicle part other or not specified	84	1.29
25	Fences or fence posts	80	1.23
26	Slides and sliding boards	78	1.20
27	Swings and swing sets	73	1.12
28	Toys, not specified	68	1.05
29	Aspirin substitutes	63	0.97
30	Sofas, couches, lounges, divans	54	0.83
31	Structural tile (glazed or plain)	54	0.83
32	Nuts	53	0.81
33	Pesticides	52	0.80
34	Antihistamines	40	0.61
35	Cookware, not specified	39	0.60
36	Baby carriages & prams	39	0.60
37	Monkey bars and other playground climbing equipment	38	0.58
38	Bunk beds	37	0.57
39	Fruit & vegetables	36	0.55
40	Glass parts or pieces, origin unknown	35	0.54

Total cases = 6,506

**Appendix Table 19A Products or agents associated with injury ADMISSIONS :
INFANTS 0 years.**

Rank	Type of Product	N	Case %
1	Floors or flooring material	134	16.30
2	Hot water	67	8.15
3	Tea, coffee, other hot beverages	49	5.96
4	Concrete & other man-made outdoor surfaces	46	5.60
5	Passenger car or station wagon	44	5.35
6	Cabinets, racks, room dividers & shelves	36	4.38
7	Doors, not specified	34	4.14
8	Beds, not specified	33	4.01
9	Door sills or frames	32	3.89
10	Tableware and accessories	32	3.89
11	Tables, NEC	29	3.53
12	Baby carriages & prams	19	2.31
13	Baby walkers or jumpers	18	2.19
14	Stairs or steps	18	2.19
15	Structural tile (glazed or plain)	18	2.19
16	Bathtubs, showers, incl. Fixtures & access	17	2.07
17	Vehicle part other or not specified	17	2.07
18	Liquid drugs (excel. aspirin substitutes, iron preps, antihistamines)	15	1.82
19	Paper money or coins	15	1.82
20	Baby exercisers	14	1.70
21	Cigarettes, cigars, pipes or tobacco	14	1.70
22	Baby changing tables	12	1.46
23	Ointments and topical medicines	12	1.46
24	Baby strollers and pushers	11	1.34
25	Chairs, not specified	11	1.34
26	Toys, not specified	11	1.34
27	Electric kettles or hot pots	10	1.22
28	Dishwasher detergents	9	1.09
29	Fruit & vegetables	8	0.97
30	Liniments or rubbing compounds	8	0.97
31	Pesticides	8	0.97
32	Baby bottles or nipples	7	0.85
33	Bicycles or accessories	7	0.85
34	High chairs	7	0.85
35	Bassinets or cradles	6	0.73
36	Antihistamines	6	0.73
37	Aspirin substitutes	6	0.73
38	Cookware, not specified	6	0.73
39	Dog	6	0.73
40	Heaters or heating systems, not specified	6	0.73

Total cases = 822

**Appendix Table 19B Products or agents associated with injury, ADMISSIONS :
CHILDREN 1-4 years.**

Rank	Type of product	N	Case %
1	Concrete & other man-made outdoor surfaces	347	6.10
2	Floors or flooring material	345	6.07
3	Doors, not specified	292	5.14
4	Passenger car or station wagon	292	5.14
5	Door sills or frames	279	4.91
6	Hot water	251	4.42
7	Cabinets, racks, room dividers & shelves	220	3.87
8	Dog	204	3.59
9	Tea, coffee, other hot beverages	179	3.15
10	Tablet or capsule drug, NEC	158	2.78
11	Barbiturates, sedatives, tranquillisers	151	2.66
12	Liquid drugs (excl. aspirin substitutes, iron preps, antihistamines)	137	2.41
13	Other drugs or medications	137	2.41
14	Chairs, not specified	120	2.11
15	Bicycles or accessories	116	2.04
16	Tableware and accessories	115	2.02
17	Beds, not specified	97	1.71
18	Ointments and topical medicines	95	1.67
19	Tables, NEC	94	1.65
20	Bathtubs, showers, incl. Fixtures & access	93	1.64
21	Paper money or coins	93	1.64
22	Stairs or steps	91	1.60
23	Fences or fence posts	78	1.37
24	Slides and sliding boards	78	1.37
25	Swings and swing sets	73	1.28
26	Vehicle part other or not specified	67	1.18
27	Aspirin substitutes	57	1.00
28	Toys, not specified	57	1.00
29	Sofas, couches, lounges, divans	49	0.86
30	Nuts	48	0.84
31	Pesticides	44	0.77
32	Bunk beds	37	0.65
33	Monkey bars and other playground climbing equipment	36	0.63
34	Structural tile (glazed or plain)	36	0.63
35	Glass parts or pieces, origin unknown	35	0.62
36	Antihistamines	34	0.60
37	Cookware, not specified	33	0.58
38	Desks, chests, bureaux or buffets	33	0.58
39	Wood items, NEC	33	0.58
40	Exercise equipment	29	0.51

Total cases = 5,684

**Appendix Table 20 Product or agent GROUPINGS associated with injury
ADMISSIONS : CHILDREN 5-9 years.**

Product or agent GROUPING	N	Case %
Sports and recreation	1,496	37.86
Natural/environmental	1,075	27.21
Structures and parts thereof	1,050	26.58
Misc./unclassifiable	472	11.95
Vehicles - air/land	468	11.85
Furniture & non-structural fittings	245	6.20
Animals	180	4.56
Yard and garden equipment	159	4.02
Food and drink	84	2.13
Personal use items	78	1.97
Craft and hobby equipment	61	1.54
Industrial equipment	58	1.47
Toys	56	1.42
Kitchenware	45	1.14
Drugs, medications, biological factors	43	1.09
Packaging materials/containers	43	1.09
Misc. cleaning/maintenance consumables	36	0.91
Laundry appliances	19	0.48
Workshop tools	15	0.38
Space heating cooling ventilation	13	0.33
Kitchen appliances	12	0.30
Fabrics drapery soft furnishing	10	0.25
General housewares	9	0.23
General utility appliances	9	0.23
Medical equipment	7	0.18
Other household appliances	7	0.18
Agricultural equipment	7	0.18
Children nursery equipment	5	0.13
Cosmetics and related preps	4	0.10
Chemicals and compounds	4	0.10
Highway & other road furnishings	3	0.08
Entertainment apparatus	2	0.05

**Appendix Table 21 Products or agents associated with injury ADMISSIONS :
CHILDREN 5-9 years.**

Rank	Type of Product	N	Case %
1	Concrete & other man-made outdoor surfaces	527	13.34
2	Passenger car or station wagon	429	10.86
3	Monkey bars and other playground climbing equipment	325	8.23
4	Bicycles or accessories	324	8.20
5	Floors or flooring material	176	4.45
6	Slides and sliding boards	119	3.01
7	Mulch materials (man made)	112	2.83
8	Dog	91	2.30
9	Trampolines	82	2.08
10	Swings and swing sets	80	2.02
11	Doors, not specified	79	2.00
12	Fences or fence posts	78	1.97
13	Door sills or frames	77	1.95
14	Playground equipment, not specified	63	1.59
15	Other playground equipment	56	1.42
16	Vehicle part other or not specified	56	1.42
17	Pins and needles	50	1.27
18	Horse	42	1.06
19	Chairs, not specified	41	1.04
20	Bunk beds	40	1.01
21	Beds, not specified	38	0.96
22	Roller skating	38	0.96
23	Hot water	35	0.89
24	Ceilings & walls (part of completed structure)	33	0.84
25	Wood items, NEC	33	0.84
26	Stairs or steps	32	0.81
27	Flying fox	30	0.76
28	Horseback riding (activity, apparel or equipment)	28	0.71
29	Roofs	27	0.68
30	Paper money or coins	26	0.66
31	Logs	25	0.63
32	Glass parts or pieces, origin unknown	25	0.63
33	Bicycle parts NEC	25	0.63
34	Ball sports, not specified	24	0.61
35	Windows or window glass, not specified	24	0.61
36	Skateboards	23	0.58
37	Cabinets, racks, room dividers & shelves	23	0.58
38	Poles, (excel. fence posts, fishing, pole vaults)	22	0.56
39	Gates	20	0.51
40	Sofas, couches, lounges, divans	18	0.46

Total N = 3,951

Appendix Table 22 Product or agent GROUPING associated with injury ADMISSIONS :CHILDREN, 10-14 years.

Product or agent GROUPING	N	Case %
Sports and recreation	1,512	46.68
Structures and parts thereof	885	27.32
Natural/environmental	720	22.23
Vehicles - air/land	500	15.44
Misc./unclassifiable	327	10.10
Animals	193	5.96
Yard and garden equipment	116	3.58
Furniture & non-structural fittings	104	3.21
Drugs, medications, biological factors	67	2.07
Packaging materials/containers	54	1.67
Personal use items	47	1.45
Misc. cleaning/maintenance consumables	47	1.45
Food and drink	43	1.33
Kitchenware	43	1.33
Craft and hobby equipment	37	1.14
Industrial equipment	27	0.83
Workshop tools	23	0.71
Toys	18	0.56
Chemicals and compounds	17	0.52
General utility appliances	13	0.40
General housewares	10	0.31
Space heating cooling ventilation	7	0.22
Fabrics drapery soft furnishing	7	0.22
Security safety & protection	7	0.22
Entertainment apparatus	6	0.19
Kitchen appliances	5	0.15
Laundry appliances	5	0.15
Other household appliances	5	0.15
Cosmetics and related preps	4	0.12
Highway & roadway furnishings	3	0.09
Medical equipment	2	0.06
Agricultural equipment	2	0.06
Children nursery equipment	1	0.03

**Appendix Table 23 Products or agents associated with injury ADMISSIONS :
CHILDREN 10-14 years.**

Rank	Type of product	N	Case %
1	Concrete & other man-made outdoor surfaces	527	16.27
2	Bicycles or accessories	398	12.29
3	Passenger car or station wagon	368	11.36
4	Floors or flooring material	128	3.95
5	Horse	120	3.70
6	Horseback riding (activity, apparel or equipment)	111	3.43
7	Organised football	103	3.18
8	Roller skating	75	2.32
9	Motorcycle, not specified	65	2.01
10	Skateboards	59	1.82
11	Vehicle part other or not specified	54	1.67
12	Monkey bars and other playground climbing equipment	45	1.39
13	Fences or fence posts	43	1.33
14	Organised basketball	42	1.30
15	Football (activity, apparel or equipment) not specified	42	1.30
16	Dog	42	1.30
17	Ceilings & walls (part of completed structure)	37	1.14
18	Organised soccer	35	1.08
19	Trampolines	33	1.02
20	Petrol	31	0.96
21	Stairs or steps	31	0.96
22	Pins and needles	31	0.96
23	Basketball	30	0.93
24	Alcohol (beverage)	29	0.90
25	Organised gymnastics	28	0.86
26	Knives, NEC	27	0.83
27	Doors, not specified	27	0.83
28	Informal football	26	0.80
29	Roofs	26	0.80
30	Chairs, not specified	25	0.77
31	Bicycle parts NEC	25	0.77
32	Minibikes or trailbikes (not registered)	24	0.74
33	Motorcycle <250 CC	24	0.74
34	Playground equipment, not specified	23	0.71
35	Physical education at school	23	0.71
36	Light truck utility or van <3 tonnes	23	0.71
37	Windows or window glass, not specified	23	0.71
38	Ball sports, not specified	22	0.68
39	Poles, (excel. Fence posts, fishing, pole vaults)	22	0.68
40	Door sills or frames	21	0.65

Total N=3,239

VICTORIAN INJURY SURVEILLANCE SYSTEM
EMERGENCY DEPARTMENT
PRESENTATIONS
PRODUCTS
BY AGE

Appendix Table 24 Product or agent GROUPS associated with injury PRESENTATIONS : CHILDREN 0-4 years.

Product or agent GROUP	N	Case %
Structures and parts thereof	8,004	28.46
Furniture & non-structural fittings	4,381	15.58
Sports and recreation	2,547	9.06
Misc./unclassifiable	2,373	8.44
Natural/environmental	1,731	6.16
Animals	1,243	4.42
Drugs, medications, biological factors	1,216	4.32
Food and drink	1,156	4.11
Vehicles - air/land	1,085	3.86
Children nursery equipment	1,054	3.75
Toys	883	3.14
Kitchenware	649	2.31
Yard and garden equipment	636	2.26
Personal use items	633	2.25
Misc. cleaning/maintenance consumables	591	2.10
Packaging materials/containers	569	2.02
Space heating cooling ventilation	315	1.12
Industrial equipment	307	1.09
Fabrics drapery soft furnishing	214	0.76
Craft and hobby equipment	196	0.70
Kitchen appliances	191	0.68
General housewares	159	0.57
Entertainment apparatus	152	0.54
Laundry appliances	151	0.54
Medical equipment	138	0.49
Cosmetics and related preps	138	0.49
Workshop tools	116	0.41
Other household appliances	106	0.38
Chemicals and compounds	90	0.32
General utility appliances	34	0.12
Security safety & protection	29	0.10
Comm & business equipment	28	0.10
Laundryware	23	0.08
Agricultural equipment	7	0.02
Highway & roadway furnishings	2	0.01
School & educational equipment	1	0.00

Total cases = 28,121

Appendix Table 24A Product or agent GROUPS associated with injury PRESENTATIONS : INFANTS 0 years.

Product or agent GROUP	N	Case %
Structures & parts thereof	1,206	36%
Children's nursery equipment & consumables	561	17%
Furniture & non-structural fittings	513	15%
Food & drink	251	8%
Misc. & unclassifiable factors	241	7%
Vehicles registered air or land	146	4%
Natural/ environmental factors	131	4%
Sports & recreation	128	4%
Drugs medications & biological factors	110	3%
Kitchenware	104	3%
Animals	91	3%
Toys	77	2%
Packaging materials & containers	70	2%
Space heating cooling ventilation	67	2%
Misc. cleaning	57	2%
Personal use items excel cosmetics	55	2%
Yard & garden equipment	47	1%
Kitchen appliances	37	1%
Craft & hobby equipment	33	1%
Industrial or retail plant equipment	31	1%
Fabrics drapery & soft furnishings	21	1%
Cosmetics & related preparations	21	1%
General housewares	20	1%
Entertainment apparatus	18	1%
Other household appliances	17	1%
Laundry appliances	13	0%
Chemicals & compounds	10	0%
Workshop tools & appliances	9	0%
Medical equipment	8	0%
Laundryware	7	0%
Communications & business equipment	6	0%
General utility appliances	4	0%
Security safety & protection	1	0%

Total cases = 3,329

Appendix Table 24B Product or agent GROUPS associated with injury PRESENTATIONS : CHILDREN 1-4 years.

Product or agent GROUP	N	Case %
Structures & parts thereof	6,798	27%
Furniture and non-structural	3,868	16%
Sports & recreation	2,419	10%
Misc. & otherwise unclassifiable	2,132	9%
Natural/ environmental factors	1,600	6%
Animals	1,152	5%
Drugs & medications	1,106	4%
Vehicles registered air & land	939	4%
Food & drink	905	4%
Toys	806	3%
Yard & garden equipment	590	2%
Personal use items	578	2%
Kitchenware	545	2%
Misc. cleaning	534	2%
Packaging materials & containers	499	2%
Children's & child's nursery equipment	493	2%
Industrial & retail equipment	285	1%
Space heating	248	1%
Fabrics drapery	193	1%
Kitchen appliances	154	1%
Craft & hobby	145	1%
General housewares	139	1%
Laundry appliances	138	1%
Entertainment apparatus	134	1%
Medical equipment	130	1%
Cosmetics	117	0%
Workshop tools & appliances	108	0%
Other household appliances	89	0%
Chemicals & compounds	80	0%
General utility	30	0%
Security safety & protection	28	0%
Communications & business equipment	23	0%
Laundryware	16	0%
Agricultural equipment	7	0%
Highway & roadway furnishings	2	0%
School & educational equipment	1	0%

Total cases = 24,792

**Appendix Table 25 Products or agents associated with injury PRESENTATIONS :
CHILDREN 0-4 years.**

Rank	Type of product	N	Case %
1	Floors or flooring material	2,635	9.37
2	Concrete & other man-made outdoor surfaces	1,662	5.91
3	Beds, not specified	948	3.37
4	Tables, NEC	928	3.30
5	Passenger car or station wagon	894	3.18
6	Chairs, not specified	845	3.00
7	Doors, not specified	817	2.91
8	Stairs or steps	722	2.57
9	Door sills or frames	683	2.43
10	Bicycles or accessories	592	2.11
11	Cabinets, racks, room dividers & shelves	522	1.86
12	Dog	462	1.64
13	Toys, not specified	417	1.48
14	Sofas, couches, lounges, divans	386	1.37
15	Ceilings & walls (part of completed structure)	379	1.35
16	Tea, coffee, other hot beverages	364	1.29
17	Slides and sliding boards	340	1.21
18	Hot water	330	1.17
19	Structural tile (glazed or plain)	293	1.04
20	Aspirin substitutes	292	1.04
21	Swings and swing sets	280	1.00
22	Tableware and accessories	256	0.91
23	Bedsprings or bedframes (excl. Bunk beds)	253	0.90
24	Fences or fence posts	237	0.84
25	Foreign body NEC	237	0.84
26	Paper money or coins	219	0.78
27	Bathtubs, showers, incl. Fixtures & access	213	0.76
28	Vehicle door	201	0.71
29	Baby carriages & prams	191	0.68
30	Vehicle part other or not specified	189	0.67
31	Trampolines	188	0.67
32	Liquid drugs (excluding aspirin substitutes, iron preps, ant	188	0.67
33	Tablet or capsule drug, NEC	187	0.66
34	Bunk beds	180	0.64
35	Glass parts or pieces, origin unknown	174	0.62
36	Bathtubs, showers, incl. Fixtures & access	172	0.61
37	Wood items, NEC	170	0.60
38	Pesticides	167	0.59
39	Nails, screws, tacks	163	0.58
40	High chairs	155	0.55

Total N=28,121

**Appendix Table 25A Products or agents associated with injury
PRESENTATIONS : INFANTS 0 years**

Rank	Type of Product	N	Case %
1	Floors or flooring material	626	18.80
2	Concrete & other man-made outdoor surfaces	242	7.27
3	Beds, not specified	177	5.32
4	Passenger car or station wagon	174	5.23
5	Baby walkers or jumpers	123	3.69
6	Stairs or steps	118	3.54
7	Baby carriages & prams	110	3.30
8	Hot water	98	2.94
9	Doors, not specified	89	2.67
10	Tables, NEC	83	2.49
11	Tea, coffee, other hot beverages	83	2.49
12	High chairs	70	2.10
13	Door sills or frames	69	2.07
14	Chairs, not specified	58	1.74
15	Sofas, couches, lounges, divans	57	1.71
16	Tableware and accessories	56	1.68
17	Baby changing tables	53	1.59
18	Cabinets, racks, room dividers & shelves	53	1.59
19	Structural tile (glazed or plain)	53	1.59
20	Toys, not specified	53	1.59
21	Baby strollers and pushers	41	1.23
22	Baby exercisers	39	1.17
23	Foreign body NEC	33	0.99
24	Aspirin substitutes	28	0.84
25	Dog	28	0.84
26	Bicycles or accessories	27	0.81
27	Heaters or heating systems, not specified	25	0.75
28	Cots	24	0.72
29	Pesticides	23	0.69
30	Ceilings & walls (part of completed structure)	21	0.63
31	Bathtubs, showers, incl. Fixtures & access	20	0.60
32	Cigarettes, cigars, pipes or tobacco	18	0.54
33	Grocery or shopping trolleys	18	0.54
34	Metal containers (excl. Aerosols, petrol cans)	18	0.54
35	Ointments and topical medicines	18	0.54
36	Aspirin substitutes	17	0.51
37	Ovens, not specified	17	0.51
38	Vehicle part other or not specified	17	0.51
39	Bassinets or cradles	16	0.48
40	Baby capsules	14	0.42

Total cases = 3,329

**Appendix Table 25B Products or agents associated with injury
PRESENTATIONS : CHILDREN 1-4 years.**

Rank	Type of Product	N	Case %
1	Floors or flooring material	1,938	7.82
2	Concrete & other man-made outdoor surfaces	1,371	5.53
3	Tables, NEC	812	3.28
4	Chairs, not specified	757	3.05
5	Beds, not specified	738	2.98
6	Doors, not specified	704	2.84
7	Passenger car or station wagon	701	2.83
8	Door sills or frames	606	2.44
9	Stairs or steps	572	2.31
10	Bicycles or accessories	534	2.15
11	Cabinets, racks, room dividers & shelves	460	1.86
12	Dog	410	1.65
13	Toys, not specified	344	1.39
14	Ceilings & walls (part of completed structure)	340	1.37
15	Slides and sliding boards	319	1.29
16	Sofas, couches, lounges, divans	318	1.28
17	Tea, coffee, other hot beverages	272	1.10
18	Aspirin substitutes	261	1.05
19	Swings and swing sets	259	1.04
20	Bedsprings or bedframes (exc. Bunkbeds)	241	0.97
21	Structural tile (glazed or plain)	238	0.96
22	Hot water	224	0.90
23	Fences or fence posts	223	0.90
24	Paper money or coins	205	0.83
25	Tableware and accessories	197	0.79
26	Foreign body NEC	195	0.79
27	Vehicle door	187	0.75
28	Bathtubs, showers, incl. Fixtures & access	184	0.74
29	Tablet or capsule drug, NEC	176	0.71
30	Trampolines	171	0.69
31	Bunk beds	166	0.67
32	Vehicle part other or not specified	165	0.67
33	Liquid drugs (excel. aspirin substitutes, iron preps, antihistamines)	163	0.66
34	Glass parts or pieces, origin unknown	157	0.63
35	Wood items, NEC	152	0.61
36	Nails, screws, tacks	144	0.58
37	Bricks or concrete blocks (not part of structure)	139	0.56
38	Vehicle door	138	0.56
39	Pesticides	136	0.55
40	Monkey bars/ other playground climbing equipment	128	0.52

Total cases = 24,792

Appendix Table 26 Product or agent GROUPINGS associated with injury PRESENTATIONS : CHILDREN 5-9 years.

Product or agent GROUP	N	Case %
Sports and recreation	6,606	33.74
Structures and parts thereof	5,071	25.90
Natural/environmental	3,778	19.30
Misc./unclassifiable	2,182	11.15
Furniture & non-structural fittings	1,286	6.57
Vehicles - air/land	1,084	5.54
Animals	958	4.89
Yard and garden equipment	633	3.23
Food and drink	339	1.73
Kitchenware	303	1.55
Personal use items	299	1.53
Toys	281	1.44
Industrial equipment	249	1.27
Packaging materials/containers	236	1.21
Misc. cleaning/maintenance consumables	226	1.15
Craft and hobby equipment	111	0.57
Space heating cooling ventilation	109	0.56
Workshop tools	93	0.48
Medical equipment	75	0.38
General housewares	70	0.36
Fabrics drapery soft furnishing	67	0.34
Drugs, medications, biological factors	56	0.29
Laundry appliances	51	0.26
Other household appliances	47	0.24
Kitchen appliances	38	0.19
Entertainment apparatus	36	0.18
Security safety & protection	36	0.18
General Utility Appliances	26	0.13
Children nursery equipment	20	0.10
Cosmetics and related preps	19	0.10
Agricultural equipment	12	0.06
Chemicals and compounds	10	0.05
Comm & business equipment	8	0.04
Highway & roadway furnishings	5	0.03
School & other educational equipment	2	0.01

Total cases =19,578

**Appendix Table 27 Products or agents associated with injury PRESENTATIONS :
CHILDREN 5-9 years.**

Rank	Type of product	N	Case %
1	Concrete & other man-made outdoor surfaces	2,322	11.86
2	Bicycles or accessories	1,303	6.66
3	Floors or flooring material	902	4.61
4	Monkey bars and other playground climbing equipment	898	4.59
5	Passenger car or station wagon	897	4.58
6	Dog	422	2.16
7	Fences or fence posts	351	1.79
8	Trampolines	340	1.74
9	Stairs or steps	335	1.71
10	Slides and sliding boards	323	1.65
11	Doors, not specified	295	1.51
12	Mulch materials (man made)	293	1.50
13	Swings and swing sets	290	1.48
14	Roller skating	281	1.44
15	Beds, not specified	248	1.27
16	Ceilings & walls (part of completed structure)	236	1.21
17	Playground equipment, not specified	229	1.17
18	Door sills or frames	203	1.04
19	Tables, NEC	196	1.00
20	Bunk beds	195	1.00
21	Glass parts or pieces, origin unknown	188	0.96
22	Chairs, not specified	183	0.93
23	Ball sports, not specified	170	0.87
24	Nails, screws, tacks	170	0.87
25	Wood items, NEC	166	0.85
26	Vehicle part other or not specified	163	0.83
27	Knives, NEC	159	0.81
28	Vehicle door	159	0.81
29	Cabinets, racks, room dividers & shelves	158	0.81
30	Informal football	157	0.80
31	Other playground equipment	155	0.79
32	Skateboards	144	0.74
33	Bricks or concrete blocks (not part of structure)	135	0.69
34	Foreign body NEC	129	0.66
35	Football (activity, apparel or equipment) not specified	128	0.65
36	Poles, (excel. Fence posts, fishing, pole vaults)	126	0.64
37	Bicycle parts NEC	122	0.62
38	Metal parts or pieces of unknown or unspecified origin	120	0.61
39	Hot water	112	0.57
40	Toys, not specified	100	0.51

Total cases = 19,578

Appendix Table 28 Product or agent GROUPINGS associated with injury PRESENTATIONS : CHILDREN 10-14 years.

Product or agent GROUP	N	Case %
Sports and recreation	10,829	49.32
Persons	8,167	37.20
Structures and parts thereof	5,574	25.39
Natural/environmental	3,515	16.01
Misc./unclassifiable	2,130	9.70
Vehicles - air/land	1,305	5.94
Animals	901	4.10
Furniture & non-structural fittings	638	2.91
Yard and garden equipment	553	2.52
Kitchenware	333	1.52
Packaging materials/containers	267	1.22
Misc. cleaning/maintenance consumables	242	1.10
Personal use items	217	0.99
Industrial equipment	210	0.96
Food and drink	209	0.95
Craft and hobby equipment	136	0.62
Toys	132	0.60
Workshop tools	128	0.58
Drugs, medications, biological factors	53	0.24
General housewares	53	0.24
Fabrics drapery soft furnishing	52	0.24
Space heating cooling ventilation	39	0.18
Medical equipment	37	0.17
Other household appliances	35	0.16
Kitchen appliances	32	0.15
Entertainment apparatus	32	0.15
Security safety & protection	29	0.13
General Utility Appliances	18	0.08
Laundry appliances	16	0.07
Cosmetics and related preps	15	0.07
Chemicals and compounds	14	0.06
Agricultural equipment	13	0.06
Children nursery equipment	9	0.04
Comm & business equipment	7	0.03
Highway & roadway furnishings	6	0.03
Laundryware	3	0.01
School & educational equipment	3	0.01

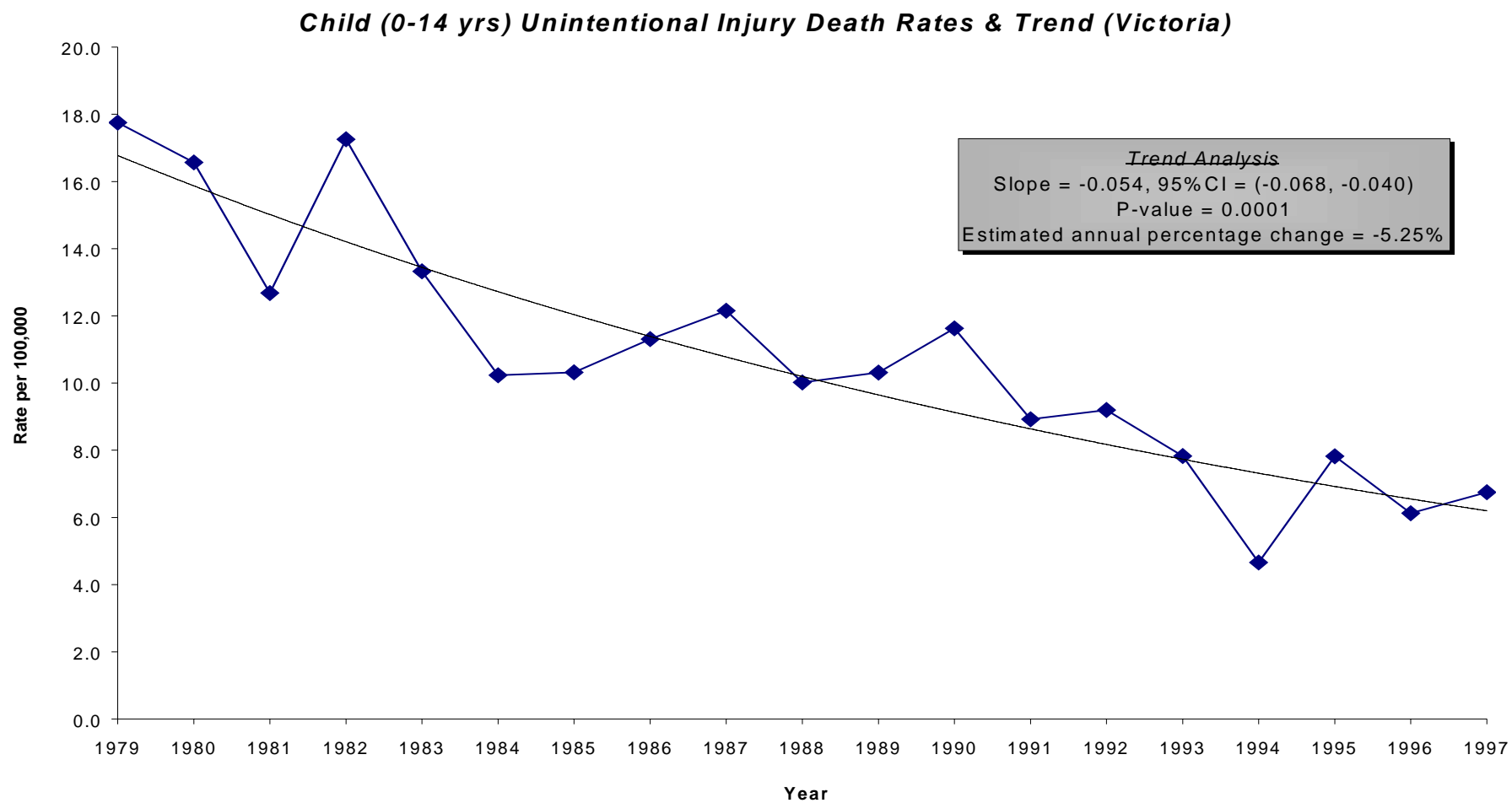
**Appendix Table 29 Products or agents associated with injury PRESENTATIONS :
CHILDREN 10-14 years.**

Rank	Type of product	N	Case %
1	Concrete & other man-made outdoor surfaces	2,918	13.29
2	Bicycles or accessories	1,817	8.28
3	Passenger car or station wagon	1,033	4.70
4	Organised football	1,019	4.64
5	Floors or flooring material	954	4.35
6	Organised basketball	572	2.61
7	Roller skating	528	2.40
8	Stairs or steps	470	2.14
9	Football (activity, apparel or equipment) not specified	444	2.02
10	Dog	374	1.70
11	Basketball	372	1.69
12	Organised soccer	368	1.68
13	Skateboards	356	1.62
14	Ceilings & walls (part of completed structure)	329	1.50
15	Informal football	321	1.46
16	Netball	310	1.41
17	Fences or fence posts	306	1.39
18	Soccer, not specified	303	1.38
19	Ball sports, not specified	273	1.24
20	Horse	256	1.17
21	Trampolines	232	1.06
22	Informal basketball	231	1.05
23	Knives, NEC	230	1.05
24	Physical education at school	225	1.02
25	Horseback riding (activity, apparel or equipment)	223	1.02
26	Doors, not specified	222	1.01
27	Nails, screws, tacks	208	0.95
28	Monkey bars and other playground climbing equipment	207	0.94
29	Vehicle part other or not specified	185	0.84
30	Glass parts or pieces, origin unknown	168	0.77
31	Informal soccer	163	0.74
32	Chairs, not specified	154	0.70
33	Motorcycle, not specified	153	0.70
34	Wood items, NEC	153	0.70
35	Poles, (excel. Fence posts, fishing, pole vaults)	148	0.67
36	Organised gymnastics	146	0.66
37	Informal outdoor cricket	146	0.66
38	Door sills or frames	144	0.66
39	Foreign body NEC	140	0.64
40	Cricket, organised outdoor (activity, apparel or equipment)	134	0.61

Total N=21,956

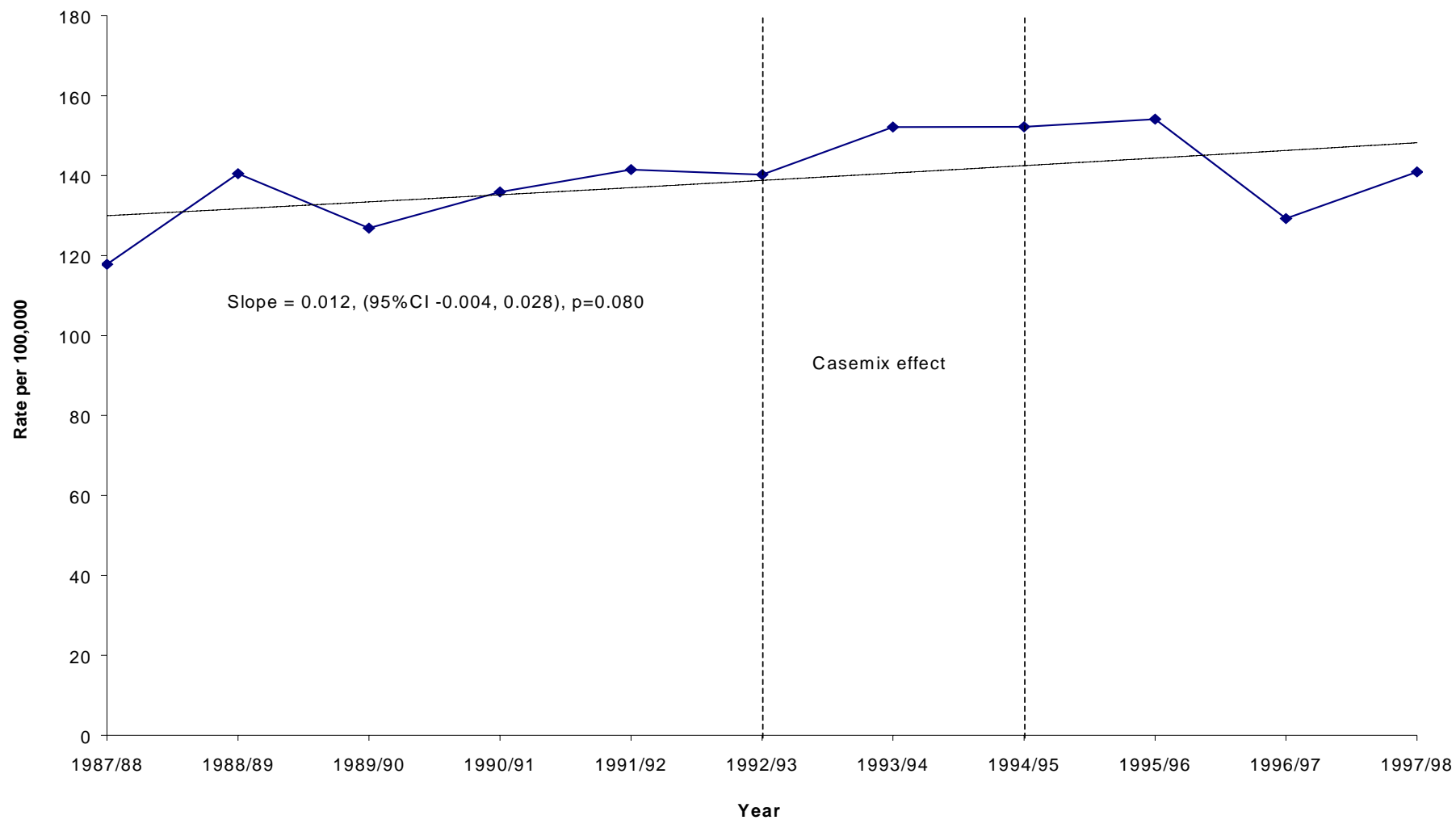
TREND DATA

Appendix Table 30 : Child (0-14 years) unintentional injury death rate and trend, Australia.



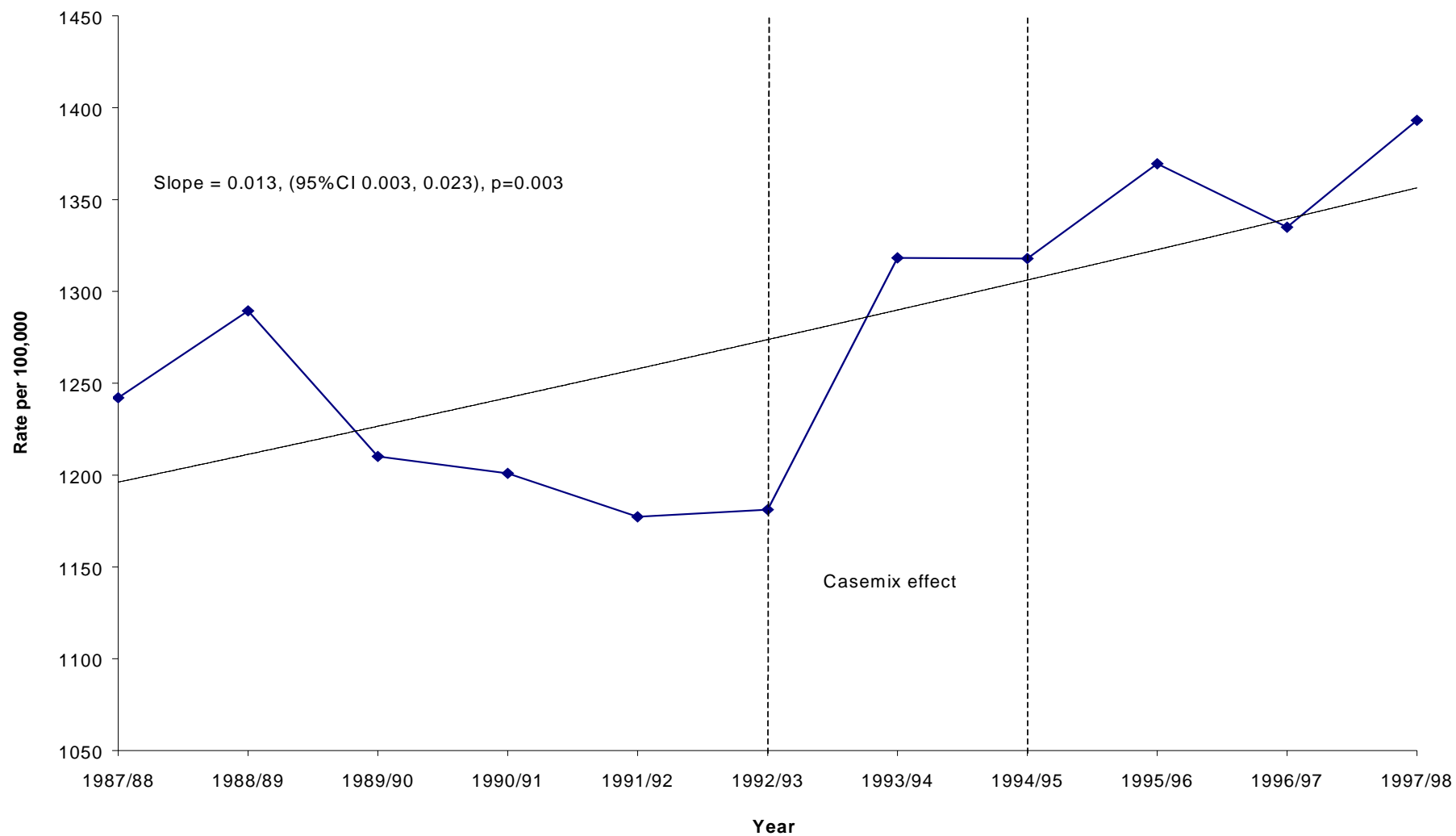
Sata source : NISU. Analysis : Voula Stathakis, MUARC.

Appendix Table 31 All injuries, 0-4 years, rates and trend, Public Hospital Admissions, Victoria, July 1987 to June 1998.



Source : Figure 35, Stathakis, 1999.

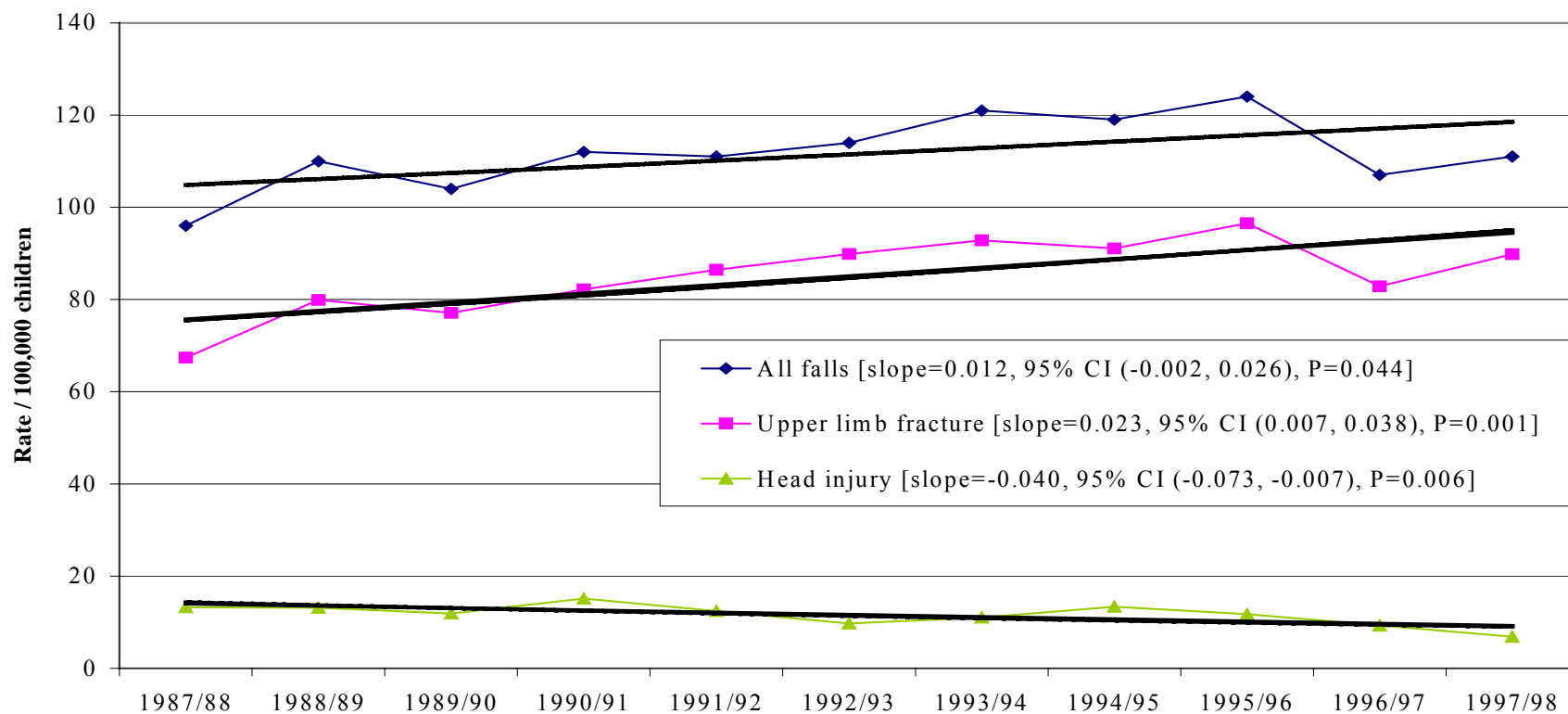
Appendix Table 32 All injuries, 5-14 years, rates and trend, Public Hospital Admissions, Victoria, July 1987 to June 1998.



Source : Figure 43, Stathakis, 1999.

Appendix Table 33 Playground fall injuries, 0-14 years, rates and trend, Public Hospital Admissions, Victoria, July 1987 to June 1998.

**Falls from playground equipment:
Rate of hospitalization for upper limb fracture and head injury**



Source : VIMD, Analysis by Voula Stathakis and Shauna Sherker, MUARC.

VICTORIAN INJURY SURVEILLANCE SYSTEM

PRODUCTS ASSOCIATED WITH SCALDS

PRODUCTS ASSOCIATED WITH POISONING

PRODUCTS ASSOCIATED WITH FALL INJURIES

HOSPITAL ADMISSIONS &
EMERGENCY DEPARTMENT
PRESENTATIONS

Appendix Table 34 Scald injuries to children aged under 5 years, Admissions.

Mechanism factor	N	%
Hot drinks – tea, coffee	241	42
Hot water – other	165	29
Hot tap water	107	19
Cooking oil, fat	17	3
Soup, gravy	13	2
Other	26	5
Total	569	100

Source : VISS, analysis of text narratives

Appendix Table 35 Most common poisoning agents involved in Emergency Department presentations by frequency and severity for children aged 0-4 years.

Agent	No. of presentations	No. of admissions	% of cases admitted
Paracetamol	455	115	25
Vaporiser solutions, essential oils	177	102	58
Asthma medication	146	91	62
Benzodiazepines	134	75	56
Cough/cold medicines (excel. paracetamol)	99	35	35
Antihistamines	76	41	54
Cardiac (excel. migraine, antihypertensives)	60	31	52
Anti-inflammatories	57	15	27
Anticonvulsants	50	38	76
Antibiotics	47	11	24
Tricyclic antidepressants	43	29	67
Contraceptive	43	8	19
Iron preparations	41	22	54
Antipsychotic	38	33	87
Migraine	38	17	50
Tobacco	30	16	53
Antispasmodic	30	15	50
Antinauseant	25	9	36
Antihypertensives	24	11	46
Antidiarrhoeal/laxatives	23	12	52
Diet medication	20	12	60
Hypoglycaemic	18	15	83
Aspirin	18	9	50
Alcohol	17	11	65
Other (NEC, NS)	266	122	49
Total*	1975	895	45

Source: Routley, Ozanne-Smith & Ashby, 1996, VISS - RCH, WH, PANCH 1989 to 1993, LRH July 1991 to June 1995. Analysis of text narratives.

**Mechanism factors, up to 2 factors can be noted per case.*

Appendix Table 36: Rank order of products related to fall injury hospital admissions for children under 15 years of age, Victorian Injury Surveillance System, 1989 - 1993

Rank	Product involved
1	Bicycles and bicycle accessories
2	Monkey bars and other climbing apparatus
3	Chairs and stools
4	Slides and sliding boards
5	Stairs and steps
6	Nursery furniture (aggregated)
7	Fences/fence posts/poles
8	Conventional beds
9	Skates and skateboards
10	Swings and swing sets

Source: Ozanne-Smith and Brumen, 1996

Appendix Table 37 : Rank order of products related to fall injury hospital admissions by 5-year age groups for children less than 15 years of age, Victorian Injury Surveillance System, 1989 - 1993

Rank	Product Involved		
	Age group 0-4 years	Age group 5-9 years	Age group 10-14 years
1	Chairs and stools	Monkey bars/climbing equipment	Bicycles or accessories
2	Conventional beds	Bicycles or accessories	Skates and skateboards
3	Stairs and steps	Slides or sliding boards	Horseback riding
4	Toys	Fences/fence posts/poles	Vehicles
5	Bathtubs and showers	Swings or swing sets	Football
6	Slides or sliding boards	Trampolines	Basketball
7	Tables/benches/countertops	Chairs and stools	Monkey bars/climbing equipment
8	Bicycles or accessories	Skates and skateboards	Soccer
9	Swings or swing sets	Bunk beds	Fences/fence posts/poles
10	Prams, carriages, strollers	Conventional beds	Stairs and steps

Source: Ozanne-Smith and Brumen, 1996

Appendix Table 38 Rank order of products most frequently implicated in non-admitted fall injuries for children under 15 years of age, Victorian Injury Surveillance System, 1989 - 1993.

Rank	Product Involved
1	Bicycles and bicycle accessories
2	Stairs and steps
3	Chairs and stools
4	Monkey bars and other climbing apparatus
5	Conventional beds
6	Skates and skateboards
7	Nursery furniture (aggregated)
8	Football
9	Fences/fence posts/poles
10	Slides and sliding boards

Source: Ozanne-Smith and Brumen, 1996

Appendix Table 39 Rank order of products most frequently implicated in non-admitted fall injuries, by 5-year age groups, for children under 15 years of age, Victorian Injury Surveillance System, 1989 - 1993.

Rank	Product Involved		
	Age group 0-4 years	Age group 5-9 years	Age group 10-14 years
1	Chairs and stools	Monkey bars/climbing equipment	Bicycles and accessories
2	Conventional beds	Bicycles and accessories	Skates, skateboards, roller skates
3	Stairs and steps	Skates, skateboards, roller skates	Football
4	Toys	Stairs and steps	Basketball
5	Sofas/couches/lounges	Fences/fence posts/poles	Stairs and steps
6	Bicycles and accessories	Slides and sliding boards	Soccer
7	Tables/ benches/ countertops	Swings or swing sets	Netball
8	Slides and sliding boards	Trampolines	Fences/fence posts/poles
9	Prams, carriers, strollers	Conventional beds	Monkey bars/climbing equipment
10	Bathtubs and showers	Bunk beds	Horseback riding

Source: Ozanne-Smith and Brumen, 1996