Hazard
(Edition No. 11)
June 1992

Victorian Injury
Surveillance System

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This edition of Hazard reviews one year of Victorian injury deaths from the State Coroner's Office database. VISS contributes to the Unnatural Deaths database by providing advice, coding autopsy data, and disseminating information from the database for the purpose of prevention.

Victorian Injury Deaths and the Potential for Prevention

Michael Henderson

The prevention and control of injury need programs that are based on good data. Causes of injury may remain hidden if each event is reviewed in isolation, separated in time and space from other similar ones. Collection and sorting of data can reveal patterns. This in turn can lead to measures which will break the chain of many causes that lead to a single injury.

Sometimes events that lead to death and injury are so dramatic, and so well reported, that their real importance becomes exaggerated. That can lead to false estimates of trends, to the expenditure of effort and resources that would be better applied elsewhere. Again, collection and organisation of good data can disclose which events are truly unusual and thus of passing interest only, as against those that highlight what might be a serious underlying problem.

Data on injury are gathered in all sorts of ways. Police collect facts on road crashes; so do expert researchers. Hospitals gather information on their patients, some for their own use, some for national or state data banks. And when death has occurred, coroners spend time on each case to determine exactly - or as exactly as possible what did happen.

Deaths, of course, are only the tip of the injury pyramid. Far more "accidents" result in injury that does not kill. Many injuries do not need hospital treatment, or even any treatment at all. Further, "accidental" events that do not result in injury may provide clues to the prevention of those that do. All these are important. But to the community, and to individual people, unexpected deaths from injury are devastating events. That is why they receive such detailed attention.

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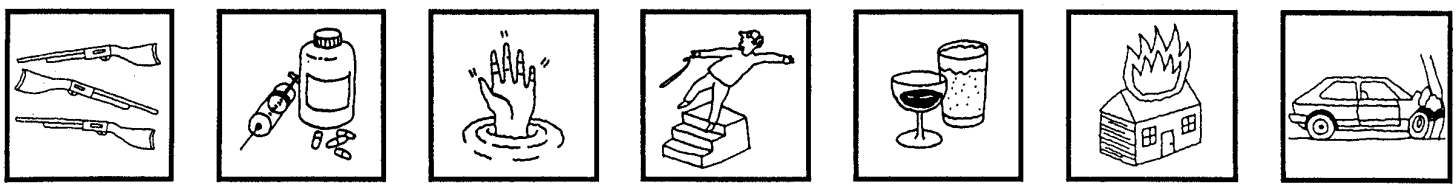


But information generated by coroners, however carefully it has been collected, has not in the past been well organised as a body of data. Computerised files of coroners' investigations are rare anywhere in the world. Under a pilot program in Victoria, however, data from coroners' inquests are now being coded in several ways for computer analysis. Under the Coroners' Facilitation System, information on "unnatural " deaths that occurred between 1 July 1989 and 30 June 1990 have been published in raw form by the State Coroner's Office (1991).

Under the Coroners Act 1985, Number 10257 of 1986, "reportable" deaths are defined as those that were unexpected, unnatural or violent, or which resulted from accident or injury or occurred during anaesthetic. This report from the State Coroner's Office includes coded information arising from the result of inquests held into such deaths.

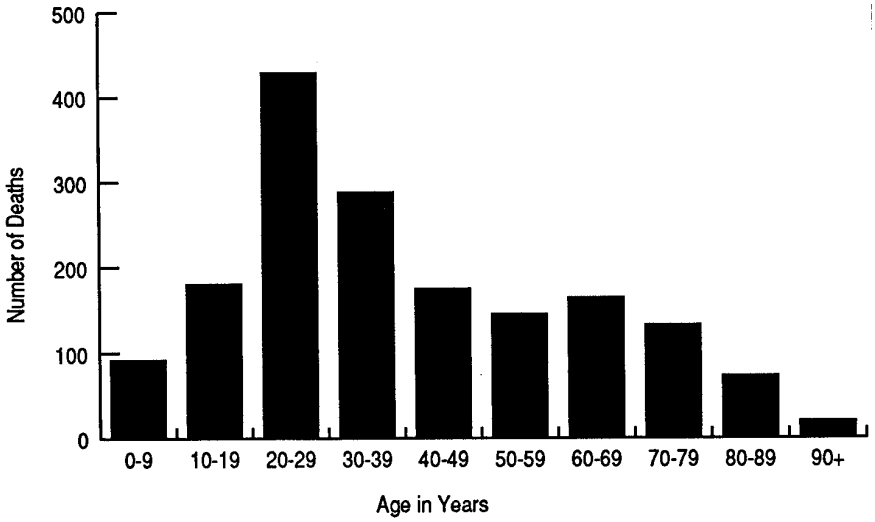
The reader will find some differences between the total numbers for some categories in this article and the summary data in the original Coroner's report. Appropriate grouping is the reason. A fall into a river, for example, might have been originally coded either as death by falling or as death by drowning, and so the codings for some individuals deaths have been changed in the present re-analysis.

The purpose of this article is to provide an overview of some of the most interesting and important data to be found in the Coroner's report. Within the data are buried many guidelines for efforts to be made to prevent such deaths and injuries in the future.

An Overview

Many of the base statistics (age, sex, manner of death and so on) making up the Victorian Coroner's Facilitation System database are enumerated in the State Coroner's Office report (1991). In this article we are primarily interested in interactions and the details of circumstances, and only the major groupings will therefore be outlined in this section. They will provide a guide to those aspects of fatal injury that may warrant priority attention.

Distribution of Unnatural Deaths by Age **Figure 1**

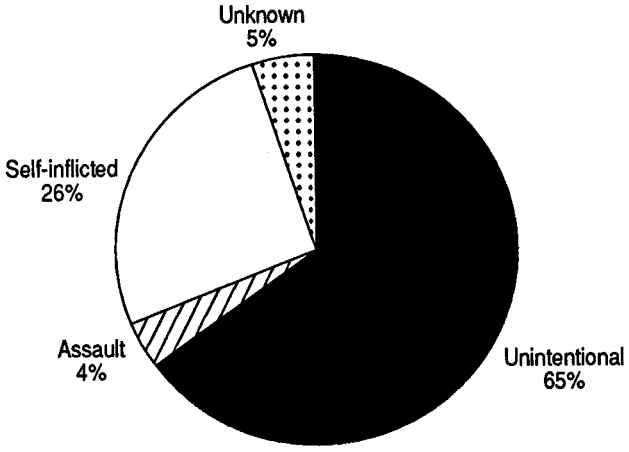


Source: State Coroner's Office Report (1991) Victoria
Data from 1.7.89 – 30.6.90 N = 1698

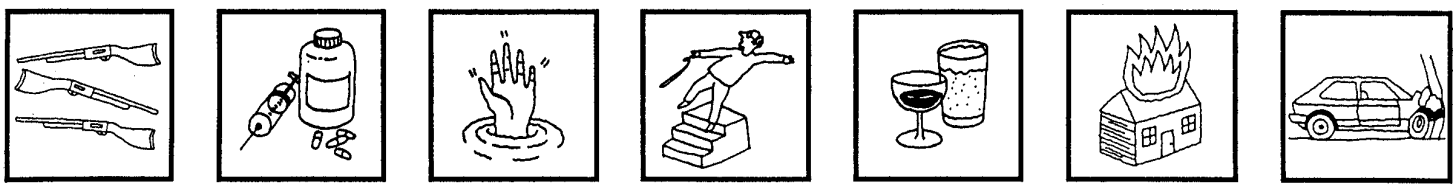
The database encompasses 1698 deaths in all. Of these, 1221 (72%) were males and 475 (28%) were females, with two unknown. The age breakdown is shown in Figure 1. A high proportion of those killed were in younger age groups, with over 42% being aged between 20 and 40 years. Violent death has for many years been recognised as a major killer of young people.

The question of intent is depicted in Figure 2. Two-thirds of the deaths were unintentional, about one-quarter were as a result of self-inflicted injury (suicide), and the remainder were deaths from assault or unknown intent. To the extent that such a high proportion of deaths were unintentional, the scope for reducing their number by researching and introducing countermeasures against them is manifestly great.

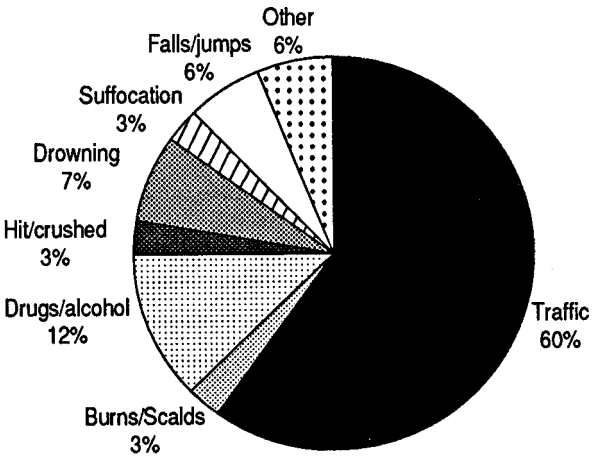
Intent **Figure 2**



Source: State Coroner's Office Report (1991) Victoria Table CRN 1.2, p.4
Data from 1.7.89 – 30.6.90 N = 1696
Excluded: missing data (n=2)

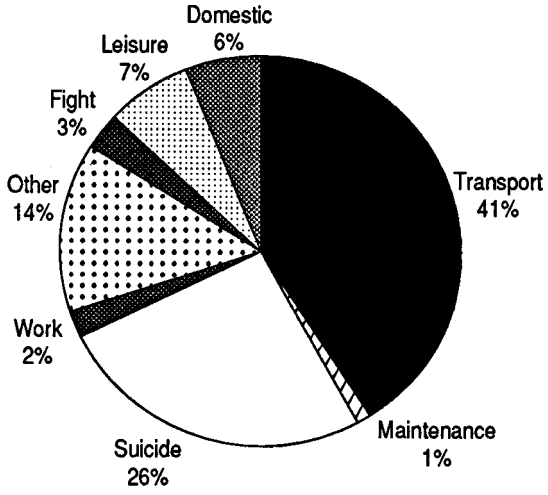


Manner of Unintentional Death — Figure 3



Source: State Coroner's Office Report (1991) Victoria
Category codes as defined by the NSW Bureau of Crime Statistics and Research
Data from 1.7.89 – 30.6.90 N = 1111

Activity at Time of Death — Figure 4



Source: State Coroner's Office Report (1991) Victoria Table CRN 1.8, p.32
Data from 1.7.89 – 30.6.90 N = 1698

The "manners" of unintentional death most frequently reported are depicted in Figure 3. (The coding for these categories is as defined by the NSW Bureau of Crime Statistics and Research; it is a simple system, which cannot grapple with the complexities of multiple causes). Death from traffic injury is by far the most common. A notably high number of unintentional deaths have followed the use of drugs and alcohol, with deaths by drowning, falls and suffocation being the other common categories.

Also highly relevant to preventive measures is the context of the injury that led to death: the activity being undertaken. The largest category (see Figure 4) was transport. We have already seen that suicide was the next largest category, and is followed by injuries received in leisure and sporting activities.

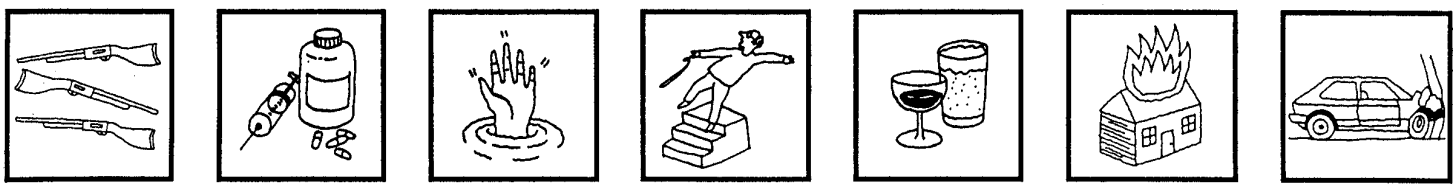
Deaths in Traffic

A striking feature of these coronial figures is the high proportion of deaths through traffic injury. They comprise easily the largest group within the 701 deaths that made up the transport category, leaving 11 who died in tractor and crane accidents and 3 in aircraft crashes. It is not surprising, therefore, that to date it is traffic injuries that have received the lion's share of research and attention.

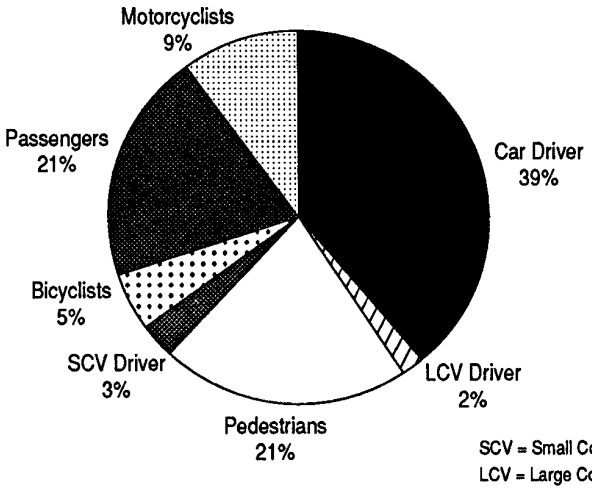
The importance of road crashes in Australia as a cause of trauma, both non-fatal and fatal, is already well documented (see for a summary example Attewell and Dowse, 1992). In this and other countries tremendous effort is now being directed towards preventive efforts, and it not the intention here to examine road crash data in any special detail. The broad picture, however, as it emerges from these coronial data, is worth painting.

The grouping, by percentage, of the 687 road deaths is shown in Figure 5. Nearly two-thirds (412) were deaths among the drivers and passengers of vehicles. It is worth stressing that out of the entire series of 1698 deceased people included in the State Coroner's database of unnatural deaths, some one in four died as the occupants of crashing motor vehicles. Taking the field of injury control as a whole, there is no single more important group - in terms of numbers - to be targeted by preventive measures.

One of the most influential factors determining the survival of vehicle occupants in crashes is the use of seat belts. Laws compelling their use were first introduced in Australia, and became one of the country's success stories in road safety. Yet a high proportion - up to 40% - of occupants killed in fatal crashes have been reported to be not wearing their seat belts. Of course, the seat belt is only part of the protective system in the modern passenger car. Since 1970, Australian governments have turned to legislation for safety features of new cars, aimed at setting minimum standards for the protection offered by a selection of design features.



Traffic Deaths by Road Users — Figure 5



Source: State Coroner's Office Report (1991) Victoria
Data from 1.7.89 – 30.6.90 N = 687

It's not as easy to identify "causes" and preventive measures as casual observers may think. In what the coroner described as a modern tragedy, a young women was struck down and killed by a fast-moving car. She had been one of a group that had tried to leave a restaurant without paying, and was running back across the street to help a friend struggling with restaurant staff. The striking car was a police vehicle responding promptly to a call for help at the scene. The girl's blood alcohol level was 0.218%. Many road "accidents" have a similarly intricate set of factors behind them.

Crash studies set the priorities for many of these design rules; and crash studies are now showing their deficiencies. A major study by the Monash University Accident Research Centre (Fildes et al, 1991), based not only on mass data but also on in-depth follow-up investigations of actual crashes, identified several aspects of the design of the modern vehicle for which attention could be justified. Seat belts were commonly found to provide limited protection, although they provide substantial net benefits overall. They were found still to allow injury producing impacts - particularly by the vulnerable head - against surrounding vehicle structures. Supplementary airbags would help to prevent many of these contacts, especially in frontal crashes (which account for the bulk of the injuries overall). In this respect, as in many others, the Australian Design Rules have long been overdue for the review that they are now, at last, receiving.

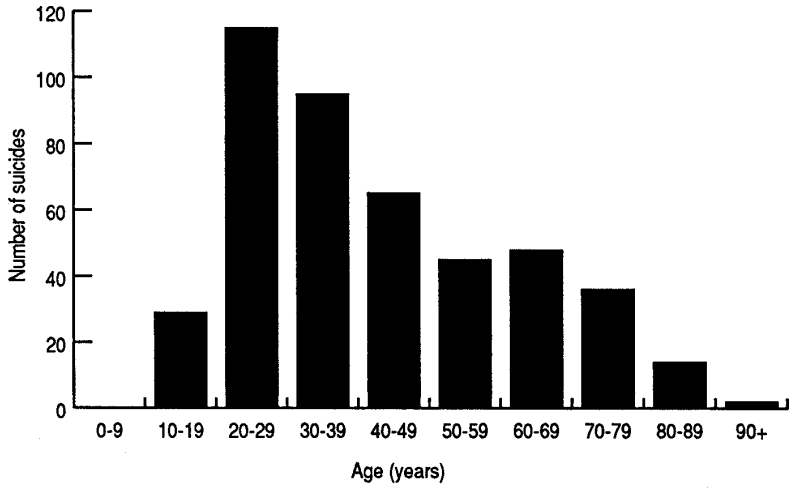
"Vulnerable" road users, including pedestrians, motorcyclists and bicyclists, make up the other third of road crash deaths. Many of the pedestrians are very young, very old, or heavily under the influence of alcohol. Pedestrian deaths are predominantly an urban problem, and the future of pedestrian protection lies in the way that our living space is planned, built and used.

Many motorcyclists are young and inexperienced, but are riding machines with the sensational performance of high-powered cars. Crash helmets have been shown to reduce the risk of death through head injury. Limiting the power of motorcycles is an intervention that is under trial in many administrations. Pedal cyclists are commonly children with poorly-developed road skills, and their protection depends on the use of protective helmets as well as on sensitive land use and traffic control.

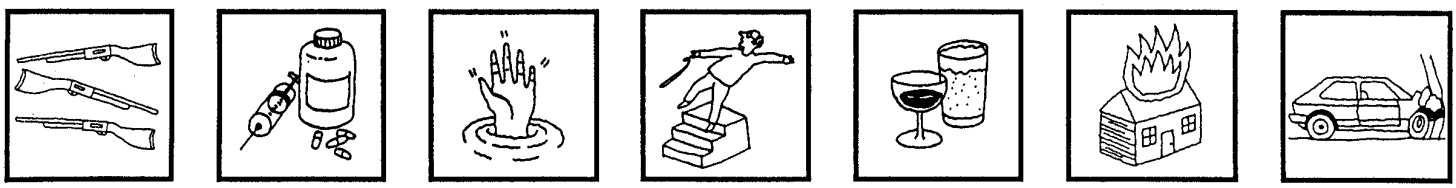
A hugely disparate array of counter-measures is in use, being researched or under consideration for all road users. Each group, each sub-group indeed, needs special attention, unique measures. As a result of the overall effort, the total returns in value to the community can be enormous.

A successful strategy for the prevention and control of traffic injury will have a broad base, and use both public and community resources to attack all aspects of road safety. We all know that there are no silver bullets; but following years of good research, there are now at least plenty of well-identified targets.

Distribution of Suicide Cases by Age — Figure 6



Source: State Coroner's Office Report (1991) Victoria
Data from 1.7.89 – 30.6.90 N = 449



Self-Inflicted Injury

The true incidence of suicide is almost certainly higher than the recorded incidence. This is always likely to be so, and the chances are that we will never know the "true" number of those who kill themselves. But we already know that suicide is an important cause of unnatural death, and that it strikes at some sections of our society more cruelly than others. The picture we can draw from the coroner's records gives us some ideas as to where preventive measures may most effectively be directed.

Eighty per cent of those who kill themselves are men. Their desperation often reaches a peak at weekends, when suicides are slightly more common than during the weekdays.

An especially tragic aspect of suicide is 'the toll it takes among the relatively young, at ages that for most are the prime of life. See Figure 6, which shows the high proportion - nearly half - of all known suicides that occur between the ages of 20 and 40 years. Indeed, over one-quarter of all known suicides occur among people in their twenties, and another one in five in their thirties. While suicide among the young has justifiably drawn public attention, in terms of the size of age groups in the population older males are also at a high risk of suicide.

Table 1 shows the manner of death for the 449 cases for whom intent was recorded as "self inflicted". Hanging, shooting, gassing by car exhaust and overdose by drugs, sometimes in association with alcohol, are the means by which most suicidal people end their lives. Because of the toll among young males, suicide is a potent cause of loss of potential years of life lost, just as are traffic crashes.

There is an interesting difference in the age distribution between the three most common means of suicide (see Figure 7). In all three cases - shooting, gassing by car exhaust, and hanging - there is the same peak in the twenties and thirties that we see for so many means of violent death. For hanging, however, in addition to that early peak, there is another peak in the years of the sixties. This means that among the elderly who seek to end their lives, hanging is the commonest method. This may be because of lack of access by old people to other means, such as guns and cars.

Whatever the reason, it has implications for the prevention of death by suicide among the elderly who have given an indication that they may seek to end their life that way.

Suicide among the young poses special problems for those who would try to prevent it. Preventive measures have in the past been associated with the perception that suicide is a problem primarily for the older, the psychotically depressed, and the lonely. Yet the picture of most of those who have entered the coroner's records through

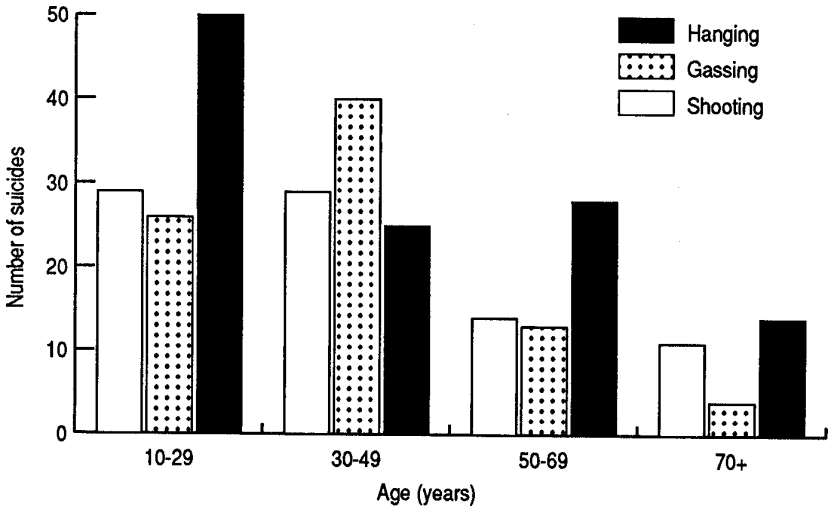
Manner of Suicide — Table 1

Suicide Manner	Number	%
Hanging	117	26
Shooting	83	18
Car Gassing	83	18
Drug Overdose	62	14
Drowning	17	4
Falls/jumps	15	3
Stabs/cutting	12	3
Drugs/alcohol	12	3
Suffocation	9	2
Train	9	2
Burns	8	2
Poison	7	2
Electrocution	6	1
Other	9	2
Total	**449**	**100**

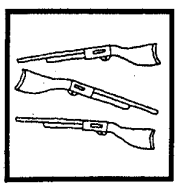
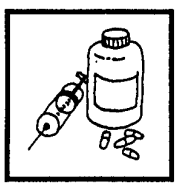
Source: State Coroner's Office Report (1991) Victoria
Data from 1.7.89 – 30.6.90

NB It is likely that alcohol and drugs are secondary factors in other methods of suicide

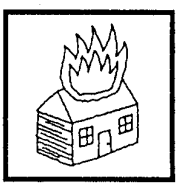
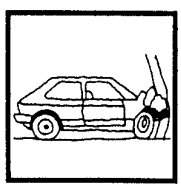
Distribution of Common Suicide Manner, by Age — Figure 7



Source: State Coroner's Office Report (1991) Victoria
Data from 1.7.89 – 30.6.90 N = 283



their death by self-inflicted injury is of a young person who cannot cope with the stresses of life, stresses that most of us encounter as we tackle existence in a complex world, but that most of us learn to manage.

"I don't want to see the sun shine no more. There's no tomorrow". The young man who spoke those poignant words drank heavily that night. In the morning, with a BAC of 0.184%, he climbed a tree, put a rope around his neck, and jumped.

The second peak in the incidence of suicides is among the elderly, and on an age-related basis they are also in a high-risk group. Sadly, suicide intervention programs for elderly, often lonely males, are few and far between. The high rates of suicide among elderly men raise issues of prevention that differ from those directed at the young. There is a need to develop - and, importantly to evaluate - interventions for this vulnerable group.

Alcohol is a risk factor for suicide, just as it is for so many other forms of violence. Alcohol is commonly consumed before both attempted and successful suicide, and may serve to reduce inhibitions and impair the judgement of those contemplating such a drastic end.

Firearms, the second most common means for suicide, are the most likely to be effective when the attempt is made. The widespread availability of firearms in the United States has had the result that they are used in nearly 60% of suicides. For all kinds of suicide, indeed, one of the main countermeasures is to reduce the availability of the means to it. It is now well known that when during the decade of the sixties in Britain there was a wholesale change from coal-based gas to natural gas from the North Sea, the carbon monoxide content of gas dropped from about 20% to zero. In 1960, half all those who killed themselves in Britain died from gas poisoning. Who has never a read a novel (especially by a British writer) whose character at some time thought of "putting my head in the oven"? Fortunately, people did not replace gas as a means of suicide by other, just as potent methods, hence in 1975 the overall suicide rate in Britain was 75% lower than in 1960.

Reducing the availability of guns and dangerous gas are only two of the more obvious options. Note also the high incidence in the Victorian Coroner's figures of gassing by car exhaust, where again the agent of death is carbon monoxide. Monitors are available that could automatically shut off a car's engine when interior levels of carbon monoxide reach a dangerous level. Other similarly mechanistic approaches to suicide prevention include placing barriers and nets at places where people may jump to their deaths, and tight restrictions on the availability of toxic drugs. The switch from toxic barbiturate sedatives to the far less toxic benzodiazepines drastically reduced the death rate from overdose of "sleeping pills".

Desperation is the trigger that is lightened by guns, drugs and alcohol Many communities have opened "Samaritan" telephone lines to lead despairing people away from their final act of self-destruction. Jumps, although comprising a comparatively small proportion of ail suicides, have been tackled in the United States by placing emergency call lines at the ends of the bridges most commonly chosen for the final act. The Westgate Bridge is one such site in the vicinity of Melbourne; four deaths were recorded as suicides after jumping from it. This intervention is one of many that could be trialed and monitored.

And finally, of course, other interventions involve the identification and treatment of those who are most at risk. Within some specific categories of manner of death, we will consider self-inflicted injuries when we come to them.

Drug Overdose

A major category of unnatural death is death through overdose of drugs, sometimes in conjunction with alcohol. In some cases, alcohol is the only drug taken. In the group of 255 overdose cases in the Victorian Coroner 's data, 172 (67%) were male. Death from overdose was unintentional in 51 %, self-inflicted in 29%, and unknown in 20%. Pharmaceutical products were the instrument of death in 47% of cases, illegal drugs in 27%, alcohol and drugs combined in 20%, and alcohol alone, 7%.

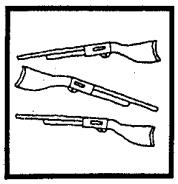
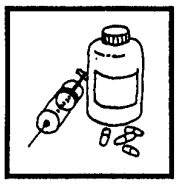
The age distribution of those who have died through overdose varies depending on whether illegal drugs or pharmaceuticals were used. In all, some two-thirds of all those who die through overdose were in their twenties or thirties. However, the vast majority of those dying as a result of illegal drug, overdose were under the age of 32 (mean, 29 years), whereas most of those dying from overdose of pharmaceutical products were over 30 (mean, 40 years).

Among those dying unintentionally from overdose of pharmaceuticals, women were much more likely to do so than men. This fact bears further examination and the determination of well-targeted interventions.

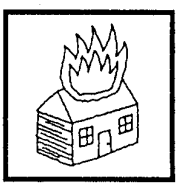
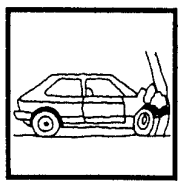
Illegal drugs were far more likely to be the cause of unintentional death than intentional, with 82% of deaths through illegal drug use being unintentional and another 15% unknown. The coroners concluded that only 3% had chosen to end their days in that way. In contrast, pharmaceutical products are far more likely to be used for suicide: 50% of deaths through pharmaceutical use were self inflicted, 23% unknown, and 32% being found to be unintentional.

In summary, therefore, research and intervention efforts in this group of deaths will vary widely. The two priority targets will be those dying unintentionally from overdose of illegal drug use while young, and the other group will have a high proportion of older suicides who have taken pharmaceutical products.

She often told her mother she wouldn't live beyond 30. She didn't. A troubled 29-year-old, depressed she said - by her lesbianism and by working with disadvantaged people, she was found dead on the floor of her kitchen, beside a spoon with traces of heroin and an empty syringe. Clearly at risk, she would be the target of any measure directed at such tormented souls.



Drowning

The first thing to notice about unnatural deaths from drowning is that the distribution of age groups is quite unusual. There is a strikingly high proportion of these deaths that occur among children (see Figure 8). Twenty seven, or over one quarter, were aged under ten years. We will shortly look more closely at these childhood deaths, But first, where are all these people drowning? And why?

One hundred and one cases of drowning were identified in the Coroner's data. Seventy six were male, 25 female. Lakes, rivers and dams were the commonest locations for death by drowning, comprising nearly 40% of the total. The ocean and beach accounted for another 30%, with the home swimming pool (13%) and other locations accounting for the remainder. Over 40% of the deaths occurred to people playing or simply enjoying themselves in or around the water, and another 17% were out in small boats. Three-quarters of the deaths were unintentional, but another 18% deliberately went to their deaths by drowning. The others were of unknown intent, and one was the victim of an assault.

Among suicides, jumping from bridges into the water and swimming to their deaths into the ocean were relatively common. One person deliberately drove a car into the water and brought about drowning that way, and another suffering terminal cancer - apparently sought death in the home swimming pool.

Returning to unintended deaths, for the group as a whole drowning from small boats in lakes and rivers stands out as a group warranting attention. Especially for children, the home swimming pool represents a threat that also justifies a special search for countermeasures. We now look at these subgroups in more detail.

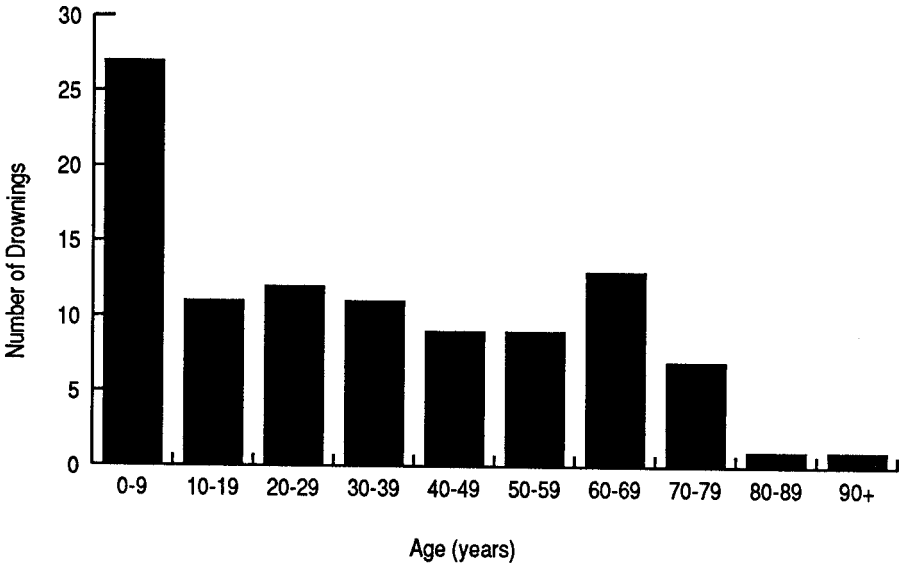
Small boats

The 18 deaths in association with boating all occurred to men, with an even distribution throughout all adult ages. The majority of boats were small outboard powered dinghies, and no deaths from drowning were officially reported from sailing boats. Among the unusual circumstances were the loss of three men in an 11.5 metre power boat in very heavy weather off south-east Australia (see box), and one who fell off the top of a houseboat and hit his head on a marina dock before entering the water. And in a tragic case, a father was taking his two children out when their canoe overturned. The children were saved, but he was drowned in very cold water, as was his wife who vainly tried to reach and rescue them by swimming from the shore.

Six cases of probable drowning, not included above, occurred when a yacht was lost in Bass Strait. Returning from Tasmania after a race, this lightweight vessel made to cross these notorious waters in extremely windy conditions.

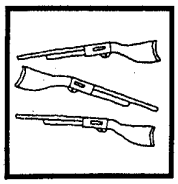
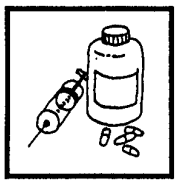
The coroner heard evidence that the crew were anxious to get back to Melbourne, and made the comment that it is the return trip that may be the more hazardous one for many racing yachts. Although it must carry secondary safety gear such as life rafts and lifejackets, any successful racing yacht is typically much lighter and thus more vulnerable to heavy seas, for a given size, than a cruising yacht - especially one that is not chasing deadlines.

Distribution of Drownings by Age **Figure 8**

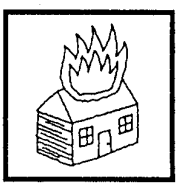
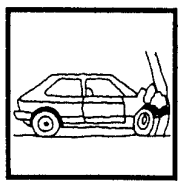


Source: State Coroner's Office Report (1991) Victoria
Data from 1.7.89 – 30.6.90 N = 101

An 11 metre fishing boat encountered heavy weather off south-east Australia. Rather than press on into the rising wind, she turned and ran before the gale. But a wall of water overtook the vessel and capsized her end over end. Two crew were never seen again. The captain and a remaining crewman surfaced, and clambered into a life raft. Flares attracted a nearby tanker, and the captain was able to climb a rope net to safety. But the injured crewman could not make it, and the heroic first officer of the tanker himself entered the raging sea to help. The tanker, tossing and plunging in the 50-knot gale, struck them from above. The crewman in desperation literally fought for his life and the officer's lifejacket before drifting away to his death. The relieved first officer was finally picked up by a lifeboat a mile from the ship. Fortunately for us all, some individuals will go to extraordinary lengths in trying to save the lives of others.



Many of the deaths from small dinghies occurred when they capsized or were spun around so sharply that the occupants were tossed out. This was commonly a direct result of rough handling of the motor's power and steering. Once in the water, some of those who had fallen out were then struck by their own craft. High levels of blood alcohol were a feature associated with many of these deaths. None of those who drowned from small boats were wearing lifejackets.

While overloading of small dinghies, the use of alcohol and the need for lifejackets - especially for non-swimmers and for all in cold water - are well recognised factors that may determine survival, rough handling of small vessels is not a feature that receives much attention through public education. Young people whizzing round in circles on the water are a common sight. But it is unexpectedly easy to turn these little boats over.

It is also unexpectedly difficult to climb back on a boat once having fallen overboard, as an experienced cray fisherman found at the cost of his life.

Swimming pools

The domestic swimming pool has received a great deal of political, public and media attention over recent years. It can be a hazardous feature of a homely scene. Like the family car, it needs careful attention at all times, and children can be in grave danger around it. Eleven of the 14 swimming-pool drownings were among children aged less than six years. Those who drown unintentionally in home swimming pools are overwhelmingly children, although in this series of the Coroner's cases there were a few elderly people. One was a diabetic with one leg amputated, swimming against the wishes of his doctor and family, and there was another diabetic who was also found drowned in the backyard pool.

Five of those who drowned in home pools were aged two years, three were aged three years, there were two one-year-olds, and one of five years. Nine of the eleven were little boys. All were reported as simply "playing". In all but two cases, the pool was at their own home.

At inquest, in several cases the coroners remarked upon the ease with which supervision by loving people, however "careful", can slip for an instant because humans act like humans. The stories wrench the heart. Perceptions of self-guilt are there forever. All that follows actually happened.

- *A telephone rings. A mother answers, keeping the child in view until he disappears, apparently safely. Two minutes later he is found dead in the water.*
- *A child visits his grandparents. They lose him. Later, he is found at the bottom of a murky pool.*
- *A father is renovating the back room. Also on his work list is isolation fencing for the pool, so he knows its danger and keeps a close eye on it. In the last moments of a short life, his two-year-old son still manages to slip quietly into the water and drown without a cry.*
- *Friends gather to talk. A visiting child is fascinated by the above ground pool, is warned about its dangers, is watched. But not all the time. She is found lifeless, face down in it.*

Public health studies rely on statistics, and the number of drownings in domestic pools described in this group are not large enough to "prove" the value of isolation fencing. The parents and families of the children who have drowned will no longer need such "proof'. The parents of little children can make a choice to fence or fill a backyard pool, quite irrespective of the existence of legislation.

Of the 27 under ten-year-olds who were unexpectedly drowned, 11 - as we have reviewed above - lost their lives in private swimming pools. Among all these young children, there is a preponderance of the tiny; 17 of them were aged under three years. Further, just as throughout later life maleness is associated with violent death, the same is true from the very year of birth: in the case of these drownings, 21 of the 27 were boys.

If there is a pattern to these deaths by drowning, it shows that - once again supervision is critical around water. Children slip quietly into irrigation dams and flooded postholes on farms, or into storm drains in the cities. Babies are left for moments in a bath, with nobody but perhaps another child to look after them. As the coroners have often shown, babies can and do drown in only a few inches of water. They make no scream; there is no warning.

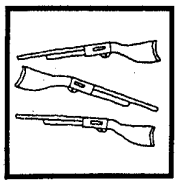
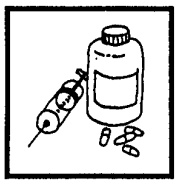
Deaths from Shooting

Deaths by shooting are quite widely distributed by age, and the mean age is somewhat older than for most causes of violent death, being just over 40 years. These deaths are again overwhelmingly among males, who comprise 87% of the total of 101 in the series. Most of these people were in paid employment at their death (61%), with some 14% unemployed or on benefits alone, and 11% retired. Nearly 70% of these shootings occurred in the person 's own home, and 11% in the home of another.

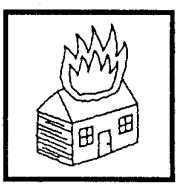
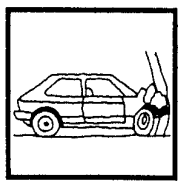
Sporting rifles (when specified, generally of .22 calibre) were used in 55 of the 101 cases, shotguns in 35, and handguns in nine. A crossbow was used in one instance, and the weapon in one case was unknown.

The vast majority (82%) of these fatal gunshot wounds were self-inflicted, and of the 83 people who shot themselves, 79 were men and only four were women. Four men were shot accidentally, two with a shotgun and one with a handgun. The last-mentioned was a pistol club member who was cleaning his weapon, which goes to show that training and experience are not vaccines against accidental shooting.

There were fourteen homicides. A feature of this group is the lack of Chicago style, gangland shoot-out stereotypes. These tragic deaths, arising in most cases from individual brutality and a complete breakdown in inter-personal relationships, were almost mundane by comparison. In seven of the homicides, a woman was shot by her husband, lover or son; and in three of those, the murderer then shot himself. In the only case that a woman wielded the weapon, she shot her lover. A man shot a man in four cases, two in a fight, one in a psychotic episode, and only one in association with drug dealing.



Guns are used in desperation. Whether the intent is murder or suicide, and when as so often happens, the event was fuelled by alcohol - the shot is often fatal because guns are so good in their role as killing devices. Before one of the murder-suicides, the anguished man even got a shooter's licence so that he could "legally" borrow a friend's rifle.

It may well be that legislation, in addition to education, will reduce the incidence of gun deaths by lowering the total number of guns in the community.

Falls and Jumps

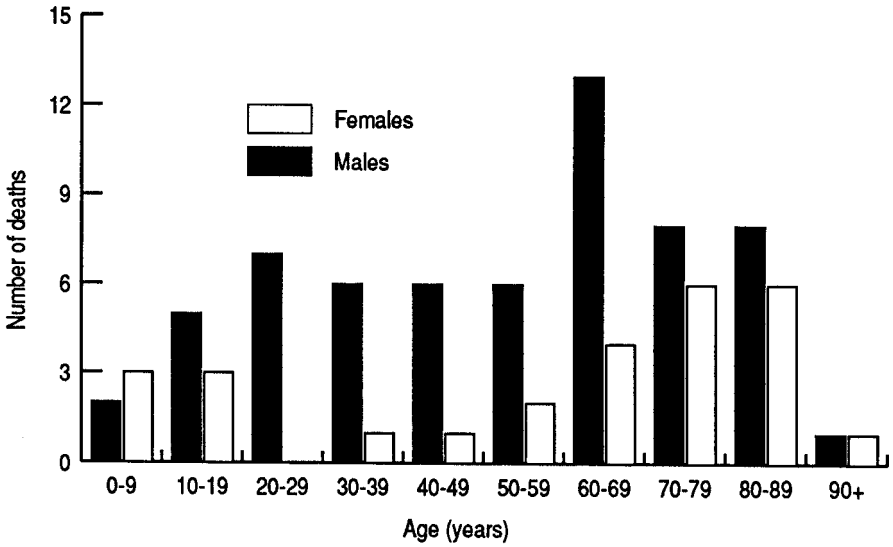
There is considerable scope for prevention of deaths and injuries through falls. Of the 112 deaths in this category in the present series, only 15 (13%) were deliberate, with another 8 (7%) unknown. All the others were sudden, unexpected, disastrous interactions with an unforgiving environment.

The age distribution of those dying in unintentional falls shows a higher average than for most other forms of violent death. This is particularly so for females. Figure 9 shows the unusual age distribution of these deaths among women, with a few occurring before the age of 20 years, and then a rising incidence through the years of the sixties, seventies and eighties. A fall is a common cause of death for an elderly female. Among men, it can be seen that there is also a high proportion dying when elderly, and there are numerically more of them than females, but their ages are more evenly distributed.

As a particularly vulnerable group, let us therefore take a closer look at unintentional deaths by falling among people aged 60 and over. There were 48 in the present series, 31 males and 17 females. Only seven were still in employment, and the remainder retired, on benefits, or patients in hospital or institutions. More than half died in their own homes.

A very high proportion of these deaths, over two-thirds, were associated with the condition of a surface such as the floor, nearly always in the home or an institution. Another 14% fell down stairs, steps or ladders, all in their own homes or the home of someone else. It is important to note that in most cases

Deaths from Unintentional Falls - Distribution by Age, Sex



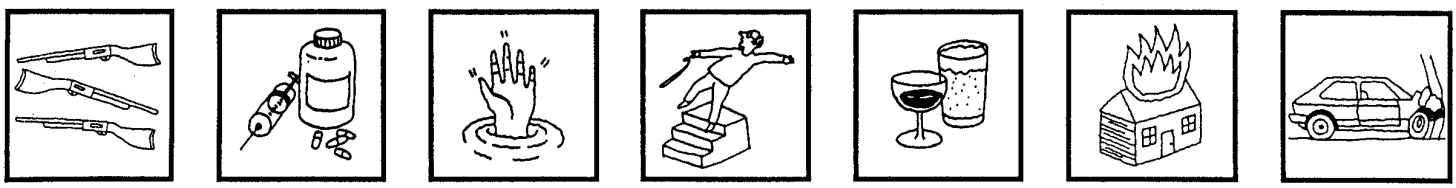
Source: State Coroner's Office Report (1991) Victoria
Data from 1.7.89 – 30.6.90 N = 89

nearly two-thirds - the actual impact was not very severe. Death was not immediate. The impact was, however, sufficient to crack aged bones, leading to hospital care and a delayed death from myriad of complications.

It is that first tumble that must be prevented. Elderly, shaky people and those who care for them should be very wary about ladders and steep stairs. As a result of deteriorating mental and physical abilities, sometimes in combination with the effects of medication, old people may simply be bad at detecting danger. In this series, footing was commonly lost while climbing a few familiar steps, such as up to the patio. Good handrails and a non-skid surface (wet or dry) may have prevented such seemingly trivial loss of footing. Young bodies bounce; old ones do not. Handrails for all stairs, non-skid treatments for floors, baths and showers, grabrails in the toilet - all such are simple, inexpensive countermeasures that are well appreciated in modern hospitals and residential institutions, but are not at all common around the home.

In the middle of Christmas Day, a lady of 80 years was returning home with friends after Christmas lunch. Climbing the few steps to her front porch she toppled backwards, her walking stick flailing uselessly. Her head smacked the ground. She died four days later in hospital.

Community-based and government inspection and approval schemes can identify points of hazard around homes and institutions that can reduce the danger of old folks' falling. Audits can be formally established, and the results of interventions monitored. People should not die simply because they lost their balance for the blink of an eye.



Burns and Scalds

There were 32 cases of death by fire, and another six caused by scalding hot water. In addition to those deaths found by the coroner to have been caused by fire, there were another eight deaths caused by an explosion or by asphyxiation in association with a fire, making a total of 46. Because the mechanism and preventive interventions will be very similar for these cases, they have been included in the following analysis.

The age distribution is biased towards the older groups, with a mean around 53 years and 22 (48%) being over 60 years of age. Twenty-eight (61 %) were retired or on benefits. The deaths predominantly occurred in the deceased's own home, which was in three cases a caravan and in one a converted railway carriage (in which a candle set the place alight).

In 36 of the 46 cases, the death was accidental. Among the suicides, six were male and two female; two of the men doused themselves in petrol before setting themselves alight.

Among the unintentional deaths, 23 were male and 13 female. For six of the men (one-quarter of all the male deaths), a cigarette was the primary cause of the fire, and in two of these cases the man was in a residential institution. Sleeping, or simply engaged in leisure activities around the home, were the predominant context of these deaths.

Misuse of petrol was a direct factor in two accidental deaths: in one, petrol was used to help light a fire in the lounge room (the deceased thought it was diesel fuel), and in the other case petrol was used to light an incinerator. Our casual daily use of petrol in the car lulls us into a complacent state about the highly dangerous nature of this explosive compound, yet it is perhaps one of the most hazardous chemicals that we use every day.

Heaters of all kinds were associated with six deaths, commonly when clothes ignited as a result of the prolonged, close proximity of a sleeping person.

There were four deaths among small children (aged five and under). Two of them, sisters, died together. Their mother had left them alone, asleep, and returned to find the house ablaze. A 11-month old toddler was bummed to death when her two-year-old brother set her mattress alight with a cigarette lighter. And a three-year-old girl was killed when the converted railway carriage that was her home was set aflame by a candle.

It is unlikely that the average caravan (or converted railway carriage) has a smoke detector. But on the basis of risk, it is just these types of dwellings that need them, in addition to the well equipped houses that are now having them fitted in increasing numbers. In institutions housing elderly smokers, sprinklers could also be lifesaving devices; they would have saved a few in this series, at least.

More discussion about deaths by fire can be found in an earlier review of these data (Ozanne-Smith and Watson, 1991).

The six deaths from scalding bear further mention. Two were epileptic, one was a blind sufferer from Alzheimer's disease, and two others needed help to shower at all. All, in various ways - while unattended - were scalded so badly they died later from their burns.

It is possible, and essential when people under care are disadvantaged in body or mind, to make sure by simple plumbing that the water from the hot tap cannot scald someone to death. Several States in the USA have recently introduced legislation that limits the temperature of water from hot taps. Such a measure is at least as justifiable as that which makes flame-resistant clothing mandatory for sale to children.

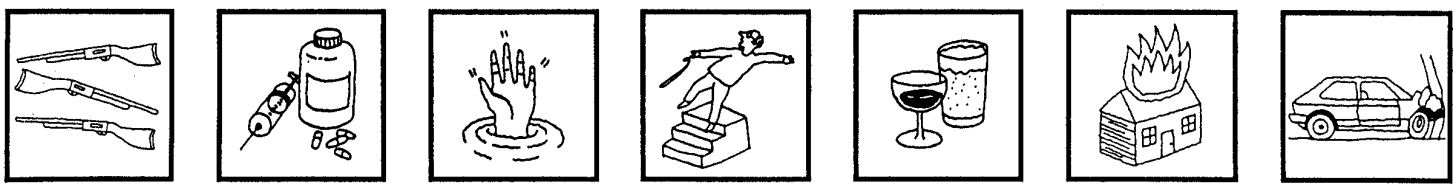
Other Causes of Preventable Deaths

There are only 14 cases of electrocution in the Coroner's database so far, but even though the numbers are as yet small, the individual cases can point to preventive interventions.

Nine of the 14 were in their twenties or thirties, and all but one were male. Five of the men and the only woman electrocuted themselves intentionally, two by pulling an electrical appliance into the bath, and three of the men had high blood alcohol levels at the time.

The men who electrocuted themselves accidentally were all being less than cautious about their work with electricity; three, indeed, were professionals who should have be well aware of the hazards. The others, amateur handymen, were using unsafe equipment and/or unsafe practices. It seems that appeals for safe behaviour will be lost on those who, for example, wire an extension lead with a male plug at each end (as one of the deceased did), and that only built-in emergency circuit breakers will prevent electrocution in these cases, as well as for those intending to kill themselves.

Another numerically quite small, but nevertheless significant and often preventable, cause of death is choking on food. No fewer than 20 people died as a result of inhaling either food (121 or vomitus (8), the latter usually in association with a high blood alcohol level. Two aspects need wide dissemination. One is that the trachea of an adult may be unblocked by the abdominal thrust of the Heimlich manoeuvre, combined with blows on the back. The other is that a person who is very drunk is at high risk of death through inspiring vomit. These people should be tended as if they were in coma (which, in several cases, they essentially are) and the coma position should be widely known.



Summary

The computer database covering unnatural deaths now being generated by the State Coroner 's Office in Victoria is a potentially rich source of data, over which it has only been possible to skim in this article. As the data build, they will increase the strength of conclusions that could lead to well-directed research and the development of appropriate countermeasures. Even as it is, the data have pointed again to the importance among this group of injuries of drug overdosage, drowning among children, falls among the old, and the widespread availability of guns. They have also highlighted some other sources of fatal injury that require specific attention from engineers and public health practitioners alike.

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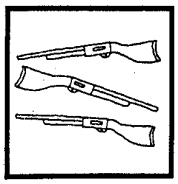
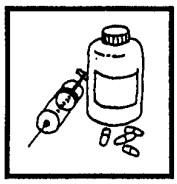
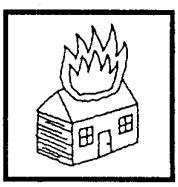
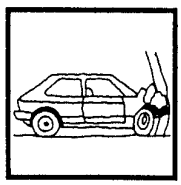





Selected Request Summaries

C.Hawkins

Children's Injuries from Bunk-beds vs Conventional beds

(Information requested by an Emergency Department nurse)

In a three year period (1989-1991) conventional beds accounted for 3.6 times the number of bunk-bed related injury cases presented to VISS hospitals. (This figure should not be interpreted as an indication of the relative risks associated with the different types of beds, as VISS does not have information regarding the prevalence of each bed type in the community.) Injuries from bunk beds are most prevalent among children aged from 5-9 years. The victims of conventional bed-related injuries are spread fairly evenly with regard to age. For conventional beds most children were playing when the injury occurred. Compared with conventional bed injuries, less children were playing and more sleeping for cases of injuries from bunk beds. There was a higher admission rate for bunk bed injuries (18%) than those from conventional beds (11%). The nature of the injuries sustained also differed with the more serious types of injury being more common for bunk-bed injury cases, as shown below.

Needlestick Injuries

(Information requested by a local government health administrator)

There are different types of circumstances in which injuries from needlesticks occur to children and adults.

Sixty-four cases of adult injuries were identified. For adults, the victims were principally females working in hospitals (mainly nurses), plus some cases involving garbage collectors. Most of the sites of injury were to the fingers and hands, and almost ail the injuries were punctures.

There were 46 children who were injured by needlesticks and presented to a VISS hospital in a three year period. The most common age of the victims was 4-9 years. Three quarters of them were male. Common locations were homes, beaches, parks, shops, and footpaths. Half the injuries were punctures. Other injury types were cuts and lacerations and penetrating wounds, with three children putting the syringe in their mouths. The most common sites of injury were the fingers, hands and feet.

Adult data: Two Victorian Hospitals Jan-Dec 1991, N=64

Child data: RCH, PANCH, WHF+S 1989-1991, N=46

Martial Arts Injuries

(Information requested by a State Government Youth Organisation)

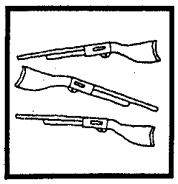
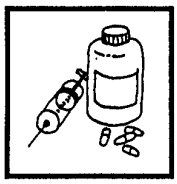
In a three year period, 81 children aged under 15 years presented to VISS hospitals with injuries from martial arts. Most of the injury victims were boys. The most common age range was 10-14 years. Eighty percent of the victims were engaged in formal competition or training when they sustained their injuries. Fractures and sprains/strains each accounted for around a quarter of the injuries, with bruising being another common injury type. The upper extremities sustained 62% of injured with wrists and fingers being particularly prone. Around a quarter of the injuries were to the lower extremities. Of the type of martial arts involved in the injury events, karate was the most common (40%), followed by judo (16%) and Tae Kwon Do (12%). In eight cases the form of martial art was not specified.

Data from 1989-1991, RCH, WHF+S, PANCH, <15 yrs N=81

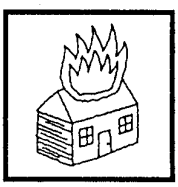
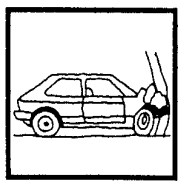
Distribution of Bed Related Injuries by Type **Table 2**

Injury type	Conventional beds (%)	Bunk beds (%)
Cuts and lacerations (often to the face)	35	19
Bruising (often to the face)	16	17
Fractures (mostly arms)	20	31
Concussion	6	14
Other	23	19
Total	**100**	**100**

Data from VISS 1989-1991, <15 years RCH, PANCH, WH
N (conventional)= 949
N (bunk) = 262



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How to Access VISS Data:

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

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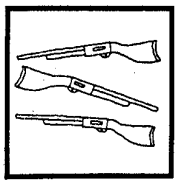
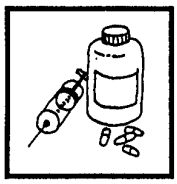
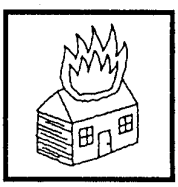
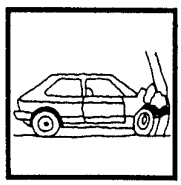





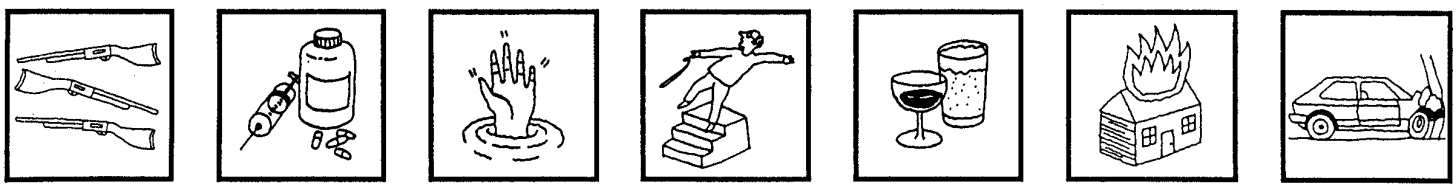



Hazard Directory

Note major articles in **bold** print.

Other VISS Publications

Injury Surveillance in the Latrobe Valley - an Overview
Injury Patterns for Children Aged Under 15 Years 1989-91
Injury Patterns Under 5 Years 1989-90
Western Hospital Footscray: Injuries to Adults 1991
Burns 1989-90 Under 15 years
Injuries In and Around the Home Under 15 Years 1989-91
Summer Injuries December 1989- February 1990



General Acknowledgements

Participating Hospitals

Royal Children's Hospital

Western Hospital
(Footscray and Sunshine)

Preston and Northcote
Community Hospital

Latrobe Regional Hospital
(Traralgon and Moe)

Royal Melbourne Hospital

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

Melbourne University Department of Paediatrics & Royal Children's Hospital

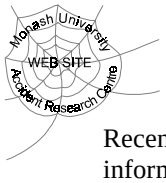
Office facilities, secretarial and infrastructure support.

Coronial Services

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

National Injury Surveillance Unit

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



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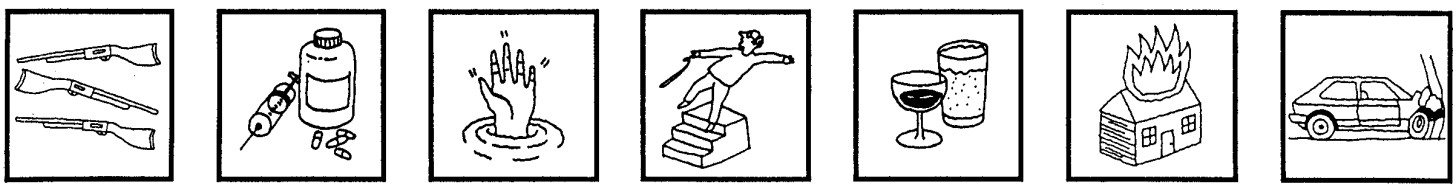
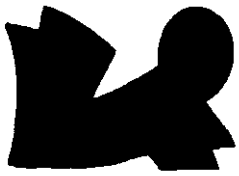
http://www.general.monash.edu.au/muarc



National Better Health Program

VISS is funded by the National Better Health Program

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



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

This .pdf issue reconstructed by Glenda Cairns