In this edition of Hazard we report on a survey of local government building surveyors/inspectors from 35 Victorian councils to provide some insight into the amount and kind of enforcement of private swimming pool safety regulations currently occurring at local government level.

Local government enforcement of private swimming pool safety regulations – Survey of council building surveyors/inspectors

Naomi Paine*, Erin Cassell

Summary

Drowning is a major cause of death of young children in Victoria. Twenty-six of the 69 children aged 0-5 years who drowned in Victoria between July 1995 and May 2003 did so in private swimming pools and spas.

Australian research has shown that surrounding private swimming pools with suitable safety barriers that prevent unsupervised young children entering the pool area is an effective means of preventing childhood drowning and near drowning (Pitt & Balandra, 1991). The Victorian government introduced Building Regulations requiring safety barriers for new pools in 1991 and for existing (pre-1991) pools in 1994.

To be effective safety barriers must be fully maintained over time. An in-depth study that critically reviewed all completed Victorian coronial investigations of drowning deaths of toddlers aged 1-4 years in private swimming pools and spas for the period from 1 January 1992 to 31 December 1997 (n=33) found that more than half of the children studied (18/33) drowned in unfenced or incompletely fenced pools (Blum and Shield, 2000). In not one case did a child gain unaided access to a pool fitted with a fully functional gate and fence that met the Australian Standard.

The effectiveness of barriers in the prevention of drowning is dependent on full compliance with barrier safety regulations, including ongoing maintenance of self-closing and latching devices on access gates, windows and doors, enforced by timely inspection.

Councils are required under section 212 of the Building Act 1993 to administer and enforce current Building Regulations including provisions in relation to private swimming pool safety. Local councils are left to determine the level at which they will enforce the private pool safety regulations taking account of competing obligations and available resources.

This report describes the results of a telephone survey of 35 municipal building surveyors or inspectors from a random sample of Victorian metropolitan and rural councils. The survey investigated the extent of private swimming pool data collection by councils, council enforcement of regulations including their inspection processes, and barriers to enforcement.

This Hazard also includes a short report titled Assaultive cutting and piercing injury, held over from issue 52.

* Naomi Paine is a Victorian Public Health Trainee funded by the Department of Human Services on placement at MUARC for 4 months (February-June 2003)
Good practice in relation to administration and enforcement of swimming pool safety regulations at local government level was defined through four criteria: (1) having a database of pools detailing their compliance status, (2) having a routine (random or systematic) inspection and enforcement process, (3) having a written policy or procedure on pool safety enforcement to ensure sustainability, and (4) regular dissemination of information to pool owners.

Results
- Only 10 of the 35 surveyed councils (29%), eight of which were metropolitan, met all four ‘good practice’ criteria.
- 27 councils (77%) had established a private pool and spa database, but in most cases there were gaps in data.
- 10 councils (29%) conducted routine (random or systematic) inspections of pools for compliance with safety regulations.
- 18 councils (51%) had some sort of written policy and/or procedures guideline covering administration and enforcement of regulations.
- 32 councils (91%) disseminated information on safety regulations to pool owners.

According to survey respondents the main barrier to council enforcement of the private pool safety regulations was lack of resources (staff and funding).

Recommendations
- Standards Australia Committee CS/34 Safety of Private Swimming Pools to review current standard (formulated in 1993) including consideration of a requirement for 4-sided fencing for new pools, and a flexible and separate standard for existing pools.
- Victorian government and Building Commission to consider amending current Private Swimming Pool and Spa Safety regulations to require:
  - registration of all existing and new pools on a centralised or council-controlled database to assist council enforcement of regulations
  - regular (biennial) inspection by councils of new and existing pools to ensure ongoing compliance with safety regulations
  - 4-sided fencing for new pools
- Building Commission to fund an independent baseline audit of the compliance of private swimming pools in Victoria with safety regulations and periodic audits thereafter.
- Victorian Councils to agree a common universally applied target compliance level for inspected pools.
- Building Commission to investigate funding models to enable councils to adopt best practice in pool safety enforcement at the local level.
- All Victorian councils to adopt Victorian Municipal Building Surveyors Group (VMBSG) policy guideline for a proactive pool safety policy that includes routine inspections.
- Building Commission to investigate the feasibility of introducing a ‘pool safety certificate’ as a provision of the Sale of Land Act 1962 to improve compliance of existing pools to regulations.
- Building Commission, Department of Justice (Emergency Services) and councils to continue state-wide and local private pool safety awareness raising and education activities directed to pool and spa owners.
- Building Commission to develop a plain language brochure or, preferably, information in other visual media (CD, video etc.) in English and community languages to explain the pool safety regulations.
- Building Commission to investigate the amount and quality of information on pool safety regulations given to pool and spa customers at point of sale and provide training for salespersons to increase the dissemination of accurate information.

Guest editorial

Associate Professor Rob Pitt, Paediatric Emergency Director, Mater Children’s Hospital and Director, Queensland Injury Surveillance Unit.

The reduction in toddler pool drowning in Victoria and Australia is cause for some optimism but not complacency. No toddler died in a backyard pool prior to the late 20th century and no toddler should drown in a backyard pool in the 21st century. The backyard pool is an artificial hazard first introduced into the home environment thirty years ago but its enormous threat to the very young has only been seriously addressed over the last ten. Unfortunately, many people continue to misunderstand and underestimate the threat and many more toddlers will drown needlessly over the coming decades unless the messages in this Hazard are taken seriously at both state and national level.

Today, all Australian states and territories have a requirement for pool fencing but there are too many exceptions, loopholes and defaulters. Indeed, the 1993 Australian Standard has always been a compromise allowing less than optimal standards for pool fencing. The Australian Building Code is even weaker. Both these reference standards are in urgent need of revision but this won’t solve the compliance problems.

Compliance will always be a local issue requiring co-operation and involvement from local authorities. It will help if state and national regulating bodies can agree on target levels for both registration of swimming pools and pool fencing compliance so that local authorities have a benchmark against which to measure their performance.

The National Water Safety plan is currently being revised by the Australian Water Safety Council and could incorporate such performance benchmarks after they were agreed at a national level. Australian Standards is reconvening for ten year review of the pool fencing standard later this year which could result in an optimum standard. Even if this comes to pass, this issue of Hazard emphasises the practical implementation issues that will always need to be addressed at the local level. Each community will develop its own method for registering and inspecting pools and ensuring compliance. This is certainly part of becoming a Safe Community – a goal to which more and more communities are aspiring. Reducing the hazard posed by pools requires a challenging collaboration between big government, regulatory authorities, local politicians and the community at large.
Private swimming pool safety enforcement: Survey of council building surveyors/inspectors

Introduction

A computer-assisted telephone survey was carried out on a random sample of 50 metropolitan and rural councils to investigate the current level of enforcement of private pool safety regulations in Victoria at local government level, the effectiveness of the current legislation and to make recommendations for change, if necessary. The thirty-five respondents (response rate 70%) were municipal building surveyors or inspectors with major responsibility for council administration and enforcement of Section 5.13 of the Building Regulations 1994 that covers private swimming pool safety.

Background

The size of the problem

Frequency

Drowning is a major cause of death of young children aged 0 to 5 years in Victoria. Coronial data analysed by the Royal Life Saving Society Australia-Victoria (RLSSA-V) indicate there were 69 drowning fatalities in this age group in the 8-year period July 1995 to May 2003. Twenty-six of these (38%) occurred in private swimming pools and spas (personal communication, Frances Evans, RLSSA-V). In addition, there were 43 hospital admissions among 0-5 year olds for near drowning in home swimming pools recorded on the Victorian Admitted Episodes Dataset (VAED) over the 6-year period July 1996-June 2002. Home swimming pool near drowning hospital admissions data for 1995/6 are not disaggregated and data for 2002/3 are not yet released.

Further analysis of the child (0-5 years) private swimming pool drowning data obtained from RLSSA-V indicated that:

- Two-year-olds were involved in half of all child private swimming pool drowning (Figure 1)
- Seventy per cent of drowning occurred in inground pools
- No reliable information is available on whether the pools and spas involved in recent drowning cases complied with current pool fencing regulations.
- More than half the children studied (18/33) drowned in unfenced or incompletely fenced pools (Blum and Shield, 2000).

The study further revealed that the majority of children who gained access to fenced pools (14/33) did so through faulty or inadequate gates (8/14) or gates that were propped open (3/14). In not one case did a child gain unaided access to a pool fitted with a fully functional gate and fence that met the Australian Standard. Studies conducted in Queensland (Pitt and Balandra, 1998; Cunningham et al., 2002), New South Wales (Williamson, 2002) and Western Australia (Stevenson et al., 2003) also found that the majority of child drowning cases in private swimming pools occurred in unfenced pools or fenced pools where the fencing or gate was in disrepair or the gate was propped open.

Incidence and trend

The annual incidence of drowning in young children (aged 0-5 years) in private swimming pools in Victoria shows a statistically significant decreasing trend between 1990/1 and 2002/3 (Figure 2). Drowning incidence peaked in 1999/2000 (36 drowning fatalities/1,000,000 population). No drowning cases were recorded in the three-year period 2000/01 to 2002/03. The small number of drowning cases per year causes fluctuations in the fatality rate.

Prevention measures

Australian research indicates that surrounding pools with suitable barriers to prevent unsupervised small children entering the pool area is an effective method of preventing childhood drowning in private swimming pools and spas (Pitt & Balandra, 1991). The efficacy of child-resistant pool safety barriers is dependent on full compliance with safety barrier regulations, including ongoing maintenance of self-closing and latching devices on access gates, windows and doors, enforced by timely inspection (Queensland Health, 2002).
strategies such as better supervision techniques, teaching children to find the edge of the pool if they fall in and widespread training of pool owners and community members in cardiopulmonary resuscitation are best regarded as supplementary measures (Pitt and Cass 2001; Queensland Health, 2002).

Role of local government in enforcement of pool safety regulations

In Victoria, the enforcement of private swimming pool and spa safety regulations is the responsibility of the Building Commission and local government. There is no specific requirement of councils to carry out swimming pool inspections. However, councils are obliged under a general requirement of the Building Act 1993 (section 212) to administer and enforce all Building Regulations that include provisions in relation to private swimming pool safety. It is left to each council to determine the mechanisms of enforcement taking account of competing obligations and available resources. Building Regulation 1994 5.13 gives councils the power to issue fines and summons notices to pool owners who breach safety regulations and the authority to enter private dwellings to undertake inspections.

Pool fencing regulations in Victoria

The regulations governing private swimming pool safety in Victoria are not uniform. They differ according to the year in which the pool was built. In early 1991 the Victorian government adopted the Uniform Building Code of Australia (BCA) into legislation, which covered the safety of new private swimming pools built on or after April 8, 1991 (Table 1). The code requires that any pool deeper than 300mm must have ‘suitable barriers to restrict access by young children to the immediate pool surrounds’. Fences and access gates must comply with the Australian Standard (AS) 1926 ‘Fencing for swimming pools’. A building permit (that may be issued by a municipal or private building surveyor) is required for the construction of all new pools, including above ground pools. Interpretation of the Act and enforcement was left to the discretion of local councils.

Three years later, the Victorian government, through Building Regulations 1994, section 5.13, introduced a requirement for the installation of suitable child resistant barriers for all swimming pools and spas installed or approved before April 8, 1991 (Table 1). Safety barrier requirements for pools built or approved before April 8, 1991 were less stringent than for those built after that date.

Victorian regulations permit 3-sided fencing, whereby the wall of a building may form part of the fencing as long as doorsets and openable portions of windows are child-resistant and comply with AS 1926.1. Existing boundary fences (including palings fences if the palings are on the non-swimming pool side of the fence) may also form part of a barrier.

In December 2001, Building Regulation 1994, 5.13 was amended to require all remaining non-compliant private pools, including pools that had received an exemption prior to 21 December 2001, to be fenced (Table 1). The amendments also introduced owner responsibility for maintenance of compliant barriers and increased the maximum fine for non-compliance that can be imposed by the Magistrates Court from $1000 to $5000. Under pool safety regulations, councils can also issue a $200 on-the-spot fine for each breach of regulations.

The regulations also cover above ground and inflatable pools. The walls of an above ground swimming pools or spa only provide an acceptable barrier if they are at least 1.2m in height and the surrounds do not have a surface which enables a child to gain a foothold and climb into the swimming pool or spa. Inflatable swimming pools that can contain water to a depth greater than 300mm are required to have a safety barrier.

Exposure of children to non-compliant private swimming pools

There is currently no accurate data on the number of private swimming pools in...

The ABS Safety in the Home survey (1998) reported that the proportion of private swimming pools in Melbourne MSR with compliant safety features increased significantly in the period between 1992 and 1998 (Table 2). Based on householder self-report data, the proportion of private swimming pools that had self-closing and self-latching gate/s attached to a fence around the pool increased four-fold, from 18% of households in Melbourne MSR that had a swimming pool on their property in 1992 to 72% in 1998 (Table 2).

The ABS household survey data also suggest that compliance with pool safety barrier regulations is lower in rural areas. The 1998 survey showed that a greater proportion of private pools in households in Melbourne MSR had self-closing and self-latching gates attached to the fence around the pool, than did households with pools in the balance of Victorian SR (72% compared to 65%).

No independent swimming pool safety audits have been conducted in Victoria but reports from independent audits of conducted in WA (Stevenson et al., 2003), NSW (van Weerdenburg, 2002) and Queensland (Queensland Health, 2002) suggest that Victorian self-report data collected by the ABS overestimates pool safety compliance.

Survey of Victorian council building surveyors and inspectors

This report describes the results of a telephone survey of 50 randomly selected Victorian councils. Respondents were municipal building surveyors or inspectors with major responsibility for the administration and enforcement of pool safety regulations at local government level. The main aim of the survey was to determine the amount and kind of enforcement in place at local government level in 2003.

Objectives of survey

To investigate:

• issues around the collection of accurate private swimming pool data by local councils including registration of private pools and their safety compliance status;
• current council inspection regimes (of new and existing pools) and the processes adopted to engender compliance to pool safety regulations;

<table>
<thead>
<tr>
<th>Date of regulation or amendment</th>
<th>Application</th>
<th>Provisions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1991</td>
<td>Introduction of regulation requiring swimming pool safety barriers for all pools built after April 1991</td>
<td>Safety barriers around private swimming pools and spa which are deeper than 300mm must comply with Australian Standards AS 1926</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Building permit required for new pool/fencing from private or council building surveyor</td>
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<td></td>
<td></td>
<td>Non-climbable fence (not less than 1.2 m in height)</td>
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<td></td>
<td></td>
<td>Self-closing and latching devices on gates and windows which open on to pool area</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Gates must swing outwards from pool</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Latching device must operate</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fence 1.2 metres (AS 1926.1-1993) or 1.5 metres if a palming or imperforate fence, measured above the ground level on the approach side.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Self locking/latching gates &amp; doors (Note: Self closes also required after 1/7/02)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Screens or locks on windows which open onto pool area</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Exemption for pools or spas located on land greater than 2 hectares in area and where access is restricted, to the satisfaction of the private or council building surveyor</td>
</tr>
<tr>
<td>December, 2001</td>
<td>Amendment of Building Regulation 1994 5.13 to require any existing non-compliant pool to have a safety barrier</td>
<td>Covers any remaining non-compliant pools including those that were formerly exempted by a building surveyor, local council and the Building Appeals Board</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Requires the fitting of a self-closing device in any gate or door opening to an area containing a pool and spa built before 1991, to take effect from 1/7/02</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Makes the owner and occupier (in some circumstances) of the house responsible for complying with the regulations including maintenance of barriers</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Maximum court fines increased from $1000 to $5000 for owners who fail to comply</td>
</tr>
<tr>
<td></td>
<td></td>
<td>On-the-spot fines ($200) may be issued by Councils for breaches of regulation</td>
</tr>
</tbody>
</table>

Source: Building Commission, Victoria
• the strategies that councils have used to inform pool owners of their responsibilities under the amended pool safety regulations (2001) and of council’s intention to enforce the regulations (including information exchange between the key stakeholders—the Building Commission, Local Government and pool owners);
• barriers to Council enforcement of pool fencing regulations; and
• adherence to best practice with regard to the safety management of private swimming pools.

Method
A random sample of 50 council-employed or contracted (in one case) Building Surveyors/Inspectors with responsibility for swimming pool safety at the local government level was surveyed by telephone using a semi-structured interview. Time constraints prevented the survey including informants from all 78 Victorian councils. LGAs were stratified into metropolitan and rural councils, then randomised. Approximately two-thirds of metropolitan (20/30 councils) and rural (30/48) councils were included. Randomisation was undertaken using the Internet site www.random.org.

The building surveyor/inspector with major responsibility for private pool safety from the randomly selected councils was invited to participate. Each respondent was provided with an informed consent form by fax.

The survey was carried out between mid-April and mid-May, 2003. Respondents who reported that their council conducted routine inspections in the initial interview were contacted again in late September/early October 2003 to confirm the accuracy of the data collected in the first survey on their council’s performance on the four good practice criteria.

The survey instrument was a modified and extended version of a previous survey of municipal building surveyors undertaken by MUARC in 1995 (reported in Hazard 34). The revised instrument was

### Table 2
Proportion of Melbourne and Victorian households with private swimming pool safety features

<table>
<thead>
<tr>
<th>Year</th>
<th>Swimming pools/1,000 households</th>
<th>Swimming pools with self-closing and self-latching gate/s to fence around pool /1,000 households</th>
<th>Proportion of swimming pools with self-closing and self-latching gate/s attached to fence around pool</th>
</tr>
</thead>
<tbody>
<tr>
<td>1992 (metro - Melbourne MSR)</td>
<td>91.9</td>
<td>16.2</td>
<td>18%</td>
</tr>
<tr>
<td>1998 (metro – Melbourne MSR)</td>
<td>84.0</td>
<td>60.5</td>
<td>72%</td>
</tr>
<tr>
<td>1998 (balance of Victoria SR)</td>
<td>28.0</td>
<td>18.1</td>
<td>65%</td>
</tr>
</tbody>
</table>


### Table 3
Summary of results of survey of Victorian Council Building Surveyors/Inspectors (n=35)

<table>
<thead>
<tr>
<th></th>
<th>Metropolitan (n=17)</th>
<th>Rural (n=18)</th>
<th>All (n=35)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pool data collection</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Database (register) of pools</td>
<td>15 (88%)</td>
<td>12 (67%)</td>
<td>27 (77%)</td>
</tr>
<tr>
<td>that recorded location and observed safety compliance of private pools in the municipality</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Used aerial surveillance to locate pools</td>
<td>13 (76%)</td>
<td>7 (39%)</td>
<td>20 (57%)</td>
</tr>
<tr>
<td>Estimated mean number of pools in municipalities</td>
<td>4122</td>
<td>942</td>
<td>2532.1</td>
</tr>
<tr>
<td></td>
<td>(95%CI 1302.1 – 376.2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Pool inspection system</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inspect pools</td>
<td>17 (100%)</td>
<td>17 (94%)</td>
<td>34 (97%)</td>
</tr>
<tr>
<td>POols inspected following complaints</td>
<td>17 (100%)</td>
<td>15 (83%)</td>
<td>32 (91%)</td>
</tr>
<tr>
<td>POols inspected at time of construction (covering pools installed or approved after April 8, 1991)</td>
<td>12 (71%)</td>
<td>15 (83%)</td>
<td>27 (77%)</td>
</tr>
<tr>
<td>Routine (systematic) inspection of pools</td>
<td>8 (47%)</td>
<td>2 (11%)</td>
<td>10 (29%)</td>
</tr>
<tr>
<td>Mean number of pool inspections in 2002 by council</td>
<td>177 (range: 25 to 750)</td>
<td>64 (range: 1 to 300)</td>
<td>113.1 (95%CI 61.1 – 165)</td>
</tr>
<tr>
<td><strong>Enforcement</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Issue of notices/fines</td>
<td>10 (59%)</td>
<td>2 (11%)</td>
<td>12 (34%)</td>
</tr>
<tr>
<td>Prosecution</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Pool safety policy</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Written policy/procedure on any aspect of pool safety</td>
<td>13 (76%)</td>
<td>5 (28%)</td>
<td>18 (51%)</td>
</tr>
<tr>
<td><strong>Overall safety enforcement performance</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meets good practice criteria</td>
<td>8 (47%)</td>
<td>2 (11%)</td>
<td>10 (29%)</td>
</tr>
</tbody>
</table>
(2) Undertaking routine inspection and enforcement processes to ensure ongoing compliance with regulations by pool owners.

(3) Having a written policy/procedure on private swimming pool safety enforcement.

(4) Undertaking education and awareness raising activities to ensure pool owners are aware of their responsibilities under the pool safety regulations.

**Survey response rate**

The overall response rate was 70% (35/50). The response rate was lower in rural than metropolitan councils (60% versus 85%). Non-respondents either refused to participate when initially contacted by telephone or did not respond to 3 phone messages or an initial fax inviting them to participate.

**Data entry and analysis**

Data was entered into the computer software program *EpiData* and analysed using *StataQuest*.

**Results**

The results of the survey are summarised in Tables 3 and 4.

**Private swimming pool data collection**

Seventy-seven per cent of respondents (27/35) reported that their council recorded the number and location of private swimming pools in their municipality on a register (database) that included data on building permits issued, building approvals and inspection details (if conducted). Rural councils were less likely than metropolitan councils to have a register (67% vs. 88%). Thirty-one respondents (89%) were able to give an estimate of the number of private swimming pools in their municipality. The number of private swimming pools ranged from 108 to 13,000. The mean number of pools in metropolitan municipalities was four times higher than in rural municipalities (4,122 pools/municipality compared to 942). The

**Definition of ‘Good Practice’**

Based on guidelines developed by Queensland Health (2002), good practice at local government level on the enforcement of private swimming pool and spa safety regulations was defined using four criteria:

(1) Having a database on which details of private swimming pools (new and existing) located in their municipality are recorded along with safety regulation compliance details.

(2) Undertaking routine inspection and enforcement processes to ensure ongoing compliance with regulations by pool owners.

(3) Having a written policy/procedure on private swimming pool safety enforcement.

(4) Undertaking education and awareness raising activities to ensure pool owners are aware of their responsibilities under the pool safety regulations.

**Ethics approval**

Ethics approval was obtained from Monash University Standing Committee on Ethics in Research on Humans.
majority of respondents reported that their council recorded and interrogated all data on pools built prior to April 8, 1991.

The most frequently reported barriers to the collection of accurate data by local councils on the number and safety compliance status of private swimming pools in their municipality were: lack of resources, both staff and time (n=10 responses); lack of data on swimming pools built before 1991 because these pools did not require a building permit (n=8 responses); and gaps in data on pools built since April 1991 because pool owners used private building surveyors who did not always forward certificates to council (n=8 responses).

A state and local government initiative instituted by the Victorian Pool and Spa Working Party in 2001 proposed the use of aerial surveillance (digital aerial photography) to collect data on the location of swimming pools in Victoria. This was seen as the first step towards the creation of a statewide database that would enable details of the location of pools in Victoria and their compliance with safety requirements to be recorded maintained and interrogated.

Fifty-seven percent of respondents (20/35) reported that their council had used aerial photography to assist in identifying the location of private swimming pools. Metropolitan councils were more likely to have used aerial surveillance than rural councils (76% compared to 39%). Over half the respondents from councils that had used aerial photography (11/20, 55%) held reservations about its usefulness. Six respondents mentioned clarity problems with the photos and two mentioned that the photo was only good for the day it was taken, due to the subsequent building and removal of pools.

‘Clarity of the aerial photo is an issue because it is difficult to distinguish between sheds and pools’.

‘Pools that are green in colour are difficult to see’.

‘Aerial surveillance cannot detect indoor pools’.

The main reasons given for the non-use of aerial photography were cost (9/15, 60%) and the fact that there were too few pools in their municipality to warrant the expense (3/15, 20%).

The most commonly suggested alternative methods of gathering data on pool ownership and location were door knocking of households in the municipality (n=11 responses) and voluntary or compulsory pool registration utilising rates notices to notify householders of the requirement to register and to record compliance status (n=6 responses). Other suggestions for opportunistic collection included seeking data from Water Boards on pool owners who had requested permission to refill their pools (which is a requirement in areas under stage one water restrictions), and instructing council officers to visually check for pools when doing other inspections.

More strategic suggestions included the introduction of regulations that mandated compliance checks when houses were being sold and reporting of compliance of pools for home contents insurance purposes. (The latter would entail the cooperation of the insurance industry.)

Two respondents suggested that the Form 10 required under section 32 of the Sale of Land Act, could be expanded to include a statement about the existence of a swimming pool and its compliance with safety regulations.

‘It is absurd that you can’t transfer car ownership without a road worthy certificate but for a house that arguably is worth a lot more, an owner can transfer ownership without any checks for safety. Pre purchase inspection could be mandatory. A mandatory house-worthy certificate may be a good bargaining tool to increase compliance to safety regulations as sellers wouldn’t be able to sell their property until they comply’.

Inspection process

All respondents reported that their council conducted or contracted at least one of the three types of private swimming pool inspections (complaints-driven, building permit-related and/or routine) that are designed to monitor compliance to pool safety regulations (Table 4). Council-employed surveyors/inspectors carried out inspections in all but one of the surveyed councils. One rural council contracted out all inspections to a private building surveyor.

The vast majority of councils (32/35, 91%) conducted swimming pool inspections in response to complaints. The inspection system operating in five of these councils was confined to complaints-driven inspections. Twenty-seven councils (77%) conducted inspections related to the issuing of pool building permits but, overall, it appeared that a high proportion of new pools were issued by council or private surveyors, often organised by pool building companies. Only 10 of the surveyed councils (29%) conducted routine inspections. Only 10 of the surveyed councils (29%) conducted routine inspections but, in several cases, the routine inspection program was small (1-3 pools per week). Nine councils conducted all three types of inspections. Respondents reported that complaints follow-up inspections accounted for the greatest workload (n=13 respondents).

The estimated number of pool inspections of any type undertaken in 2002 in the surveyed municipalities ranged from 1 to 750 (median 70, mean 113.1; 95%CI 61.1 to 165). Although rural councils undertook fewer inspections, on average, than metropolitan councils (rural mean: 64 inspections, metropolitan mean: 177 inspections), the data suggested that the average coverage of pools inspected in 2002 by metropolitan and rural councils was similar (16% versus 14%). The issue of fines for safety breaches was uncommon, with only 23% of respondents (8/35) reporting that their council had issued any fines in 2002. The number of fines issued by active councils ranged from 2 to 60, with 6 councils issuing...
fewer than 10 fines (mean 13; 95% CI –3.3 to 29.3). According to respondents, none of the surveyed councils had prosecuted an owner of a non-compliant pool in 2002.

Of the councils that carried out routine inspections, the reported non-compliance rate of pools at the first inspection ranged significantly, from 5-100% (average 64.5%, 95% CI 37.9 to 99.1). Six of these councils reported non-compliance rates at first inspection at or above 90%.

‘Only about 1 in 30 pools comply on first inspection. Post-1991 pools on inspection mostly lack maintenance of self closures on gates.’

‘Annual routine inspections have increased the percentage of compliant pools [in our municipality] to 100%’.

Enforcement of regulations

All survey respondents reported that their council had instituted some sort of procedure to ensure pool owners rectify non-compliant pools. In thirteen councils (37%), the enforcement process involved a sequence of three steps: (1) the pool owner was notified of the breach in writing and instructed to rectify the fault within a given time period; (2) owners who did not comply were issued with a building infringement notice, and (3) recalcitrant owners were issued with a fine or a court order.

The remaining councils implemented only one or two of these steps. Two respondents reported that their council had issued an emergency order, when no pool barrier was found on inspection. The order gave the owner 24 hours to either empty or cover the pool.

Ten respondents (29%) stated that they believed fines were an inappropriate initial strategy for rectifying non-compliant pools. They favoured a graduated process where passive persuasion was used initially, followed by formal warnings and fines.

‘Talking with the owner is the best strategy’.

‘I prefer people to spend money on rectifying the barrier rather than paying fines’.

Information exchange and dissemination

All respondents were aware of the changes to the pool safety building regulations that came into force in 2002 and correctly identified at least one of the changes. Twenty-nine respondents found out about the changes through the Building Commission, six through their membership of the Victorian Municipal Building Surveyors Group (VMBSG) and seven through membership of the Australian Institute of Building Surveyors.

All but three of the respondents (91%) reported that their council had informed residents of the recent changes to private swimming pool and spa safety regulations and of their obligations under the revised regulations. The most common mediums for informing residents were leaflets (n=24 responses) and advertisements in local papers (n=20 responses). Respondents suggested that advertising and point of sale information should be enhanced, to assist pool owners to find out about pool safety regulations and their ongoing responsibility for maintenance of the safety barrier.

‘Have a statewide advertising or education campaign’

‘Develop a simple English version of regulations with pictures’

‘Have information provided at point of sale (chemical shops, pool companies) which could include labelling of the product or a brochure referring to the regulations’

‘Introduce a code of conduct for spas or pool dealers so they have to inform owners of the regulations’

Barriers and issues faced by local government authorities in the effective management of private swimming pool safety compliance

As identified by the respondents, the main barriers to council enforcement of the private pool safety regulations were: lack of resources (staff and funding) (n= 17 responses), cost to pool owners of erecting compliant barriers (n= 5 responses), and lax community attitudes and pool owner lack of acceptance of the regulations (n= 10 responses).

‘It all comes down to funds and staff numbers. Our department has to be viable but council should take responsibility for safety enforcement. However, there’s no money to be made in policing.’

‘The government keeps piling things on a 2-man show in the middle of a building boom.’

‘We have one full-time and one part-time Building Inspector in an area that used to cover three municipalities.’

Eighty percent of respondents identified technical or practical problems with the current swimming pool safety regulations that hampered their enforcement at the local level. The most frequently cited problems were lack of clarity on the use of property boundaries as part of the safety barrier (n=10 responses), the different requirements for pools built before or after April 8, 1991 (n= 9 responses), and lack of consistency in the interpretation of regulations by building surveyors (n=6 responses). Four respondents also mentioned they had difficulties with the lack of clear guidance on inflatable pools.

‘Property barrier fencing is contentious because pool owners can’t control what their neighbours put up against their fence.’

‘People don’t fence these [inflatable pools] off mostly because they don’t think they have to.’

‘People have 6 months to complete a barrier, owners can deflate a pool in that time’
'Enforcement by private building surveyors is dodgy.'

'Private building surveyors are almost tied to certain pool builders, whereas we see our first duty is to protect the public. We have not had one toddler drowning in our municipality and we want to keep it that way.'

Policy making
According to respondents, one-half of the surveyed councils (18/35, 51%) had a written policy covering any aspect of private swimming pools safety. In three cases (8.6%), the council’s policy only covered awareness raising or education.

Overall performance based on good practice criteria
Based on four good practice criteria outlined in the methods section, only 10 of the 35 surveyed councils (29%) were assessed as implementing ‘good practice’ on swimming pool safety enforcement. Eight of the 10 councils that exemplified good practice were located in metropolitan Melbourne.

Discussion
Pool fencing is an effective method of preventing child pool drowning deaths (Pitt & Balanda, 1991). Since 1995, 26 young children (aged 0-5 years) have drowned in private swimming pools in Victoria. Reliable data on the safety barrier compliance status of all the pools involved in these drownings were unavailable. However, evidence from a Victorian study covering child pool drownings from 1992-7, and from similar research studies conducted in other states, suggest that there is a high likelihood that at least half the private pools involved in child drownings are non-compliant (Williamson et al., 2002; Cunningham et al., 2002; Stevenson et al., 2003).

To maximise the effectiveness of pool fencing, compliance to safety barrier regulations must be very high, and barriers must be maintained continuously over the life of the pool. A major weakness in Victoria’s current regulatory framework is that local government has been given major responsibility for the enforcement of pool fencing regulations but it is left to the discretion of individual councils to decide on the focus and resources allocated to the task of swimming pool registration, safety inspection and enforcement.

Data collection issues
Accurate and accessible data on the number, location and ongoing compliance status of swimming pools in private dwellings is a necessary prerequisite for the development of effective compliance and enforcement processes at the local and state-wide levels. Although our survey showed that most councils had established some kind of swimming pool register the data were incomplete. Their main weakness is gaps in registration, particularly of pools constructed prior to 1991 because they were not required to have a building permit.

A number of respondents did not believe that aerial photography was an effective and efficient method of accurately identifying the number, location and safety barrier status of swimming pools in a municipality. The major barriers to the use of aerial photography were the expense (especially for municipalities with a small number of pools), the lack of clarity of photographs and gaps in coverage (indoors, covered or shielded pools). Privacy legislation was also viewed as a constraint to use - the City of Boroondara recently discontinued aerial photography following the concerns about privacy raised at a public meeting of residents (Schulz, 2003).

In 2001, the Victorian Pool and Spa Working Party which is linked to the Victorian government Play it Safe by the Water campaign, initiated a pilot project to investigate the practicability, cost and acceptability of using digital aerial mapping to construct a centralised pool safety database, ‘owned’ by the Building Commission and local councils. The pilot project was also expected to investigate potential funding models for the maintenance and updating of the database by councils, predicated on the introduction of an associated pool and spa safety certification system. The report and recommendations from this study have not been released. If there are political or other barriers to the use of aerial photography and the introduction of a centralised database (and associated certification system) at this stage, it is imperative that all council-developed databases meet an agreed set of specifications so that future data aggregation is possible. A centralised system should remain the longer-term goal, but councils should be supported to adopt a co-ordinated approach and common system in the short term. The Building Commission is best placed to encourage, lead and support this endeavour.

Our survey respondents suggested a number of alternative methods of accurately identifying private swimming pools and their compliance status in local government areas. These included mandatory registration of pools (as for dog registration) utilising the municipal rate notice system or door knocking every house in the municipality. Mandatory registration supplemented by opportunistic checking appears the more feasible and less expensive of these options. A systematic routine inspection process (that ensured pools were inspected at least triennially) could then be set up to evaluate ongoing compliance with regulations. It should be noted here that Western Australia, the only state to mandate inspection of swimming pool fencing, has recently shifted from inspections on a four-year to a two-year cycle, to improve safety compliance rates (Stevenson et al., 2003).

Other alternatives suggested by respondents were the introduction of a ‘pool safety certificate’ as a pre-requisite for home and contents insurance (but this would rely on the co-operation of all insurance companies) and/or as a provision under the Sale of Land Act 1962 which would stipulate that the spa or swimming pool barriers must comply with the regulations before the property is sold. The latter strategy is the more
attractive because it is under the direct control of government and would impact on the maintenance of private pool safety barrier compliance over the medium term.

Some of the building surveyors we interviewed offered an opinion that sparse council resources are better spent on providing education and advice to pool owners rather than on continuous safety surveillance.

**Compliance issues**

To be effective, pool safety barriers must be maintained and always in place. A study of 33 drowning deaths among 1-4 year olds reported to the Victorian coroner from 1992 –1997, found that over half the pools (18/33) implicated in the drowning fatalities lacked fencing of any kind. The study further reported that no child drowned in a pool fitted with a gate and fence that met the relevant standards or regulations, unless the child had aided access either because they were allowed in by parents or through gates that were propped open (Blum & Shield 2000). Similar results are reported from child drowning studies conducted in Queensland (Cunningham et al, 2002) New South Wales (Williamson, 2002) and Western Australia (Stevenson et al., 2003).

Only 10 councils covered by our survey conducted ‘routine’ inspections to ensure the ongoing maintenance of pool safety barriers. The variability between councils with respect to their enforcement of pool safety regulations reflects the weakness in the Building Regulations that gives councils discretion in this matter, the lack of commitment in some councils and lack of resources at the local level. It appears that some municipalities are more vigilant or more willing to inspect private swimming pools and enforce regulations than others, although the vast majority appeared to respond to complaints from residents in the form of undertaking an inspection (an added reason for community-wide education campaigns).

Regular compulsory inspections, effective since 1992, have been shown to increase compliance in Western Australia. Forty-five percent of pools in Western Australia were compliant with the legislation on first inspection, which increased to 80% on subsequent inspection (Stevenson et al 2003). Our survey indicated that, on average, only about one-third of pools included in routine inspections are compliant on first inspection. This figure is based on estimates supplied by building surveyors from our most active councils and indicates that the overall proportion of compliant pools In Victoria is certainly well below the rate reported from the 1998 Victorian Home Safety Survey. As previously noted, the Building Commission should investigate alternative funding models that enable councils to adopt best practice in pool safety surveillance and enforcement.

Our survey also showed that only a small number of councils had imposed fines on owners of non-compliant pools and no councils had prosecuted an owner. A number of building surveyors indicated their preference for a softer approach—personal education and encouragement—and reported that councils were able to achieve compliance without resorting to fines and legal action. The small number of fines issued by councils in our study may indicate that personal education by council officers supported by the threat of fines or court action is sufficient to ensure compliance among most pool owners. This soft approach, however, has not been shown to be effective in gaining widespread compliance to Victorian road safety rules (Cameron et al., 2003).

**Policy development**

Less than half of the respondents to our survey reported that their council had a written policy on private swimming pool safety, and there was no consistent approach in terms of content.

The Victorian Municipal Building Surveyors Group (VMBSG) recently released the Municipal Pool and Spa Safety Plan Guideline for councils, which will provide more consistency in local government’s approach to the administra-

tion and enforcement of the building regulations pertaining to the installation and maintenance of pool and spa safety barriers (personal communication, John Hoey, lawyer for VMBSG).

The VMBSG Guideline allows councils to choose from three policy options depending on their circumstances and the resources available. The advantages of having uniform Victorian policy options are that procedures across councils would be similar, and pool owners will receive consistent information. Another advantage is that councils that have not adopted a uniform procedure may be more vulnerable in coronial investigations, which may act as an additional incentive for council action on pool safety. A major disadvantage is that the presentation of graded policy options formalises the adoption of less than good practice in pool safety enforcement at local government level.

**Information dissemination**

The Victorian Building Commission is instrumental in providing information to councils on changes to private pool and spa safety regulations. Almost all the respondents in our survey had received information from the Building Commission and reported that their council had used the leaflets developed by the Building Commission to inform pool owners of their responsibilities and the recent changes to the regulations.

A major challenge for councils was the complexity of the regulations that affected pool owners’ understanding of their responsibilities and duty of care. Building surveyors suggested that the Building Commission develop a plain language brochure for pool owners in English and major community languages with clear illustrations of compliant features. Information in other, more visual, media (CD, video etc.) should also be produced for broad dissemination. Local councils could then take major responsibility for information dissemination, along with swimming pool and spa retailers, pool product sellers and private building surveyors.
Adequacy of current Victorian regulations

Two research studies have reported elevated risk associated with drowning in a swimming pool with 3-sided fencing (that allows direct access to the pool from the residence) versus 4-sided (isolation) fencing (Rodgers, 1989; Stevenson et al., 2003). The most recent of these, an observational study of childhood drowning in private swimming pools in Western Australia in the 12-year period 1998 to 2002, estimated that there was almost a 2-fold increased risk (incidence rate ratio: 1.78; 95% confidence interval: 1.40-1.79) of a child’s drowning in a swimming pool with 3-sided versus 4-sided fencing (Stevenson et al., 2003).

Under Victorian regulations, both property boundary fencing (including paling fencing) and the walls of the residence (3-sided fencing) may be used as part of a pool safety barrier. Three-sided fencing increases the risk of toddlers accessing the pool area due to lapses in the security of access doors and windows. Council surveyors also reported that unclear requirements on the use of property (boundary) fencing as part of a pool safety barrier present compliance issues for both councils and pool owners. Pool owners are unable to fulfil their duty of care on safety barrier maintenance because potential breaches on the neighbour’s side of the fence are out of their (and the council’s) control.

A recent discussion paper, released by the Queensland Injury Surveillance Unit, reviewed the state of pool fencing in Queensland. The authors called for Standards Australia to reconvene the relevant committee to upgrade the current standard because it neither ‘specifies an adequate standard for new pools nor a flexible and separate standard for existing pools’ (Barker et al., 2003).

The authors reviewed and scored pool safety legislation and standards in each region of Australian on points in the legislative and regulatory requirements that were considered as important in preventing toddler access to pools. Victoria scored 17/30 on the potential effectiveness of its legislation for both new and existing pools.

The main factors adversely affecting the Victorian rating were a minimum standard of 3 sided pool fencing instead of 4 sided fencing and lack of requirement for:

(a) registration of new and existing pools;
(b) initial inspection and ongoing compliance for new and existing pools;
(c) certified inspection on the sale of any property with a pool; and
(d) regular inspection of pools on rental property.

Conclusion and recommendations

The major finding from our survey is that the administration and enforcement of the Victorian pool safety regulations by local government is currently ad-hoc and the degree of enforcement varies greatly between municipalities across the state. Only ten of the 35 councils that responded to our survey, eight of which were located in metropolitan Melbourne, met the good practice criteria for local government enforcement of pool safety regulations. Based on these results we conclude that young children remain very vulnerable to the risk of drowning in private swimming pools in Victoria.

Recommendations

• Standards Australia Committee CS/34 Safety of Private Swimming Pools to upgrade current standard (formulated in 1993) including consideration of a requirement for 4-sided fencing for new pools, and a flexible and separate standard for existing pools.
• Victorian government and Building Commission to consider amending current Private Swimming Pool and Spa Safety regulations to require:
  - complete and up-to-date registration of all existing and new pools on a centralised or council-controlled database to assist council enforcement of regulations
  - regular (biennial) inspection by councils of new and existing pools to ensure ongoing compliance with safety regulations
  - 4-sided fencing for new pools
  - Building Commission to fund an independent baseline audit of the compliance of private swimming pools in Victoria with safety regulations, and periodic audits thereafter
  - Victorian Councils to agree a common universally applied target compliance level for inspected pools
  - Building Commission to investigate funding models to enable councils to adopt best practice in pool safety enforcement at the local level
• All councils to adopt Victorian Municipal Building Surveyors Group (VMBSG) policy guidelines for a proactive pool safety policy that includes routine inspection and enforcement.
• Building Commission to investigate the feasibility of introducing a ‘pool safety certificate’ as a provision of the Sale of Land Act 1962 to improve compliance of existing pools to regulations.
• Building Commission, Department of Justice (Emergency Services) and councils should continue state-wide and local private pool safety awareness raising and education activities directed to pool and spa owners which explain their responsibilities and duty of care, with special attention to owners of above ground and inflatable pools
• Building Commission to develop a plain language brochure or, preferably, information in other visual media (CD, video etc.) in English and community languages to explain the pool safety regulations to pool owner in detail with illustrations, to be widely distributed by councils, private building surveyors, pool and spa retailers and pool product retailers.
• Building Commission to investigate the amount and quality of information given to pool and spa customers at
point of sale and provide training for salespersons to increase the dissemination of accurate information.

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Thompson DC, Rivara FP. Pool fencing for preventing drowning in children (Cochrane Review) at http://www.cochrane.org/cochrane/revabs/ab001047.htm

Other resources and contacts

Royal Life Saving Society Australia - Victoria. Website: www.rlssa.org.au
Victorian Municipal Building Surveyors’ Group for access to Draft Municipal Pool-Spa safety plan guidelines. Website: www.vmbsg.com.au

Fall Injury Prevention Resource Kits

• Facts on fall injury among skaters
• Facts on falls among seniors

Order kits and associated brochures from VISAR (Christine Chesterman) Phone 9905 1805 or email christine.chesterman@general.monash.edu.au

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Errata

Hazard 53 Injury to children aged 5-15 years at school
P7, column 1, dot point 1 should read:
• a higher proportion of females, than males, presented to ED with upper extremity injury…

Hazard 54 Injury profile, Victoria
P3, column 2, dot point 2, last sentence should read:
The death rate for transport decreased by 14% (Figure 2)
Assaultive cutting and piercing injury

*Erin Cassell, Angela Clapperton*

Assaultive injury by cutting and piercing is much less frequent than unintentional cutting and piercing injury. VISAR data showed that each year in Victoria there are 14 fatalities, 409 hospital admissions and at least 480 ED presentations (non-admissions) for cutting and piercing assaults. By comparison, hospital-treated unintentional cutting and piercing injuries are almost eleven times more frequent (see Hazard 52).

**Trends in death and hospital admission rates**

The all-ages death rate for assaultive cutting and piercing injury has declined in Victoria and Australia since 1990 (Figure 1). The annual death rate in Victoria has decreased from 0.75 deaths per 100,000 population in 1990 to 0.31 deaths per 100,000 in 2000 (Figure 1).

By contrast, a steady upward trend in rates is evident for all-ages (and for both genders) in admissions to public hospitals for assaultive cutting and piercing injury since 1987/8, with the admission rate approximately doubling over the last 13 years (Figure 2).

Rate data are not available for ED presentations.

**Assaultive cutting and piercing injury in detail**

**Deaths**

**Frequency**

ABS data indicate there were 45 cutting and piercing assaultive injury deaths in Victoria in the latest three-year period (1998-2000) for which data are available. There were eight deaths in 1998, 20 in 1999 and 17 in 2000.

**Gender and age**

Most cases were male (65%). Assaultive cutting and piercing deaths were concentrated in the 10-year age groups from 15-54 years (88%), peaking in 25-34 year olds (32% of all cases).

**Location of injury event**

Location (place of occurrence) data are only available for 1999 and 2000. Of the 51% of cases in which location was specified (n=22), the most common location was the home (59%, n=13), followed by trade or service area, including places of entertainment (14%, n=3), street or highway (9%, n=2), and residential institution (9%, n=2).

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**Rates of assaultive cutting and piercing deaths, Victoria and Australia**

*Figure 1*

**Rates of assaultive cutting and piercing hospital admissions, Victoria**

*Figure 2*
Mechanism and circumstances of injury
The ABS DURF file does not record information on either the mechanism of injury or the relationship of the victim to the perpetrator. The recently established National Coroners Information System (NCIS) has the capacity to provide detailed information on fatal assaults and will be the preferred source of data on these deaths in future years.

Hospital admissions

Frequency
There were 1,228 assaultive cutting and piercing injury admissions to public and private hospitals in the 3-year period 1998/99 to 2000/01, an annual average of 409 cases.

Place of occurrence
Information on place of occurrence (location) was only available for both public and private hospital admissions in 1998/9 and 2000/01. Location was specified in 61% of these cases (n=754). Of these, the most common locations were the home (37%), trade and service area, including places of entertainment (22%) and street or highway (21%).

Figure 3 depicts the trend in rates of assaultive cutting and piercing admissions (for public hospitals only) by location of injury event since 1987/8. Location data are poorly recorded on VAED up to 1992/3. Reporting also appears to be affected by the introduction of casemix funding into the hospital system in the early to mid 1990s (Figure 3). Since 1996/97, however, a general upward trend is evident in admission rates for assaultive cutting and piercing injury that occur in the home and in all other locations combined (Figure 3).

Gender and age
Eighty-seven per cent of assaultive cutting and piercing hospital admissions were male. Admissions were substantially more common among persons aged 15-34 years (70%). The frequency of cases was low in children and declined sharply among people 50 years and older.

Body site and nature of injury
The body sites injured most frequently were the trunk [37%, predominantly the chest (19% of all assaultive cutting and piercing cases) and abdomen/pelvis (16%)], the head and neck (29%) and the upper extremity (27%). Open wounds were the most common injury (58% of cases). Internal injuries (17%) and injury to the nerves/spinal cord (7%) were also relatively frequent.

Injury severity
Hospital stay (bed day counts) was used as a proxy for severity of injury. Sixty per cent of admissions were ‘short stays’ (1 day or less), 34% stayed for 2-7 days and 6% required 8 days or more. Patients with injuries to the abdomen/pelvis and...
The increase in the rate of hospital admissions over time is mostly explained by an increase in patients with less severe injuries as measured by hospital stay (Figure 5).

**Mechanism of injury**
Data on the weapon used and the relationship of the victim to the assailant will be available from VAED in future years (from July 2002) due to coding enhancements introduced in ICD-10-AM 3rd edition. Over the three-year period 1999-2001, VEMD recorded 558 admissions for assaultive cutting and piercing injury. Thirty-seven per cent of these admissions ($n=207$) provided information on the weapon used in the assault. The most frequently reported weapons were knife (56%), glass/bottle (20%) and razor/blade (6%).

**Circumstances of injury**
Details of any of the circumstances surrounding the injury event are not recorded on VAED. Collection of data on the relationship of the victim to the assailant only started in 2001/2.

**Emergency Department presentations (non-admissions) Frequency**
There were 1,441 assaultive cutting and piercing injury presentations (non-admissions) identified on VEMD in the three-year period January 1999 to December 2001, an average of 480 presentations a year. The VEMD underestimates the frequency of cases because case capture is not complete.

**Location**
The location of the injury event was specified in 84% of cases. Of these cases, the most frequently reported location was the home (34%), followed by road, street or highway (23%) and place for recreation (19%).

**Body site and nature of injury**
The most frequently injured body sites were the upper limb [34% of assaultive cutting and piercing ED presentations, predominantly hand/finger injuries (16%) and forearm injuries (9%)]; head/face/neck [35%, mostly face injuries (16%) and head injuries (10%)]; and trunk [16%, predominantly thorax (7%) and abdomen (6%)]. Three-quarters of injuries were open wounds and a further 10% were superficial injuries.

**Mechanism of injury**
The weapon used was identified in 44% of VEMD presentations. The most common weapons were knife (42%), glass/bottle (36%), punched/kicked/bitten (14%), window glass (7%), syringe (6%), and cleaver/machete/axe/tomahawk/sword (6%).

**Discussion**
Published reports estimate that less than half of violent crime is reported to police (Shepherd et al 1989; Hocking, 1989) therefore, VISAR hospital data provide a more complete and timely indication of the level of assaultive cutting and piercing injury in Victoria than police reports and crime statistics.

ABS data indicate that the rate of cutting and piercing assaultive injury deaths appears to have declined in Victoria over the past decade. This decline may represent a genuine reduction in potentially fatal assaults or, alternatively, improved retrieval and treatment of severe stabbing injury.

By contrast, the rate of assaultive cutting and piercing injury cases requiring hospital admission has nearly doubled since 1997/8, confirming trends in Victorian Police Offences data (Department of Justice, 2000). Short stay cases account for most of this increase.
Both VAED and VEMD data show that the primary location of assaultive cutting and piercing injury is the home, followed by roads/streets/highway (public spaces) and trade and service areas including places of entertainment. These findings indicate that the increase in the use of cutting and piercing implements in assaults is manifesting itself in both family and public settings. Evidence suggests that incidents of violence between family members are less likely to be reported to police (Crime Prevention Victoria, 2002).

Offences data recorded by Victoria Police show that the use of weapons other than firearms has increased since 1993/94, particularly the use, threat of use or display of knives and syringes mainly in robberies and assaults (Department of Justice, 2000). Cutting and piercing weapons categories that experienced a sizeable increase in usage in assaults in 2001/02 were bottle/glass (up 48% on the previous year) and knife (up 33%).

In response to the gradual escalation of weapons usage in assault offences and the carrying of non-firearm weapons by young people, the Victorian government has implemented a Weapons Community Education Campaign in concert with tougher laws on weapons carrying (Crime Prevention Victoria, 2002).

The community education campaign aims to discourage young people from carrying non-firearm weapons utilising a public relations and advertising campaign. Focus group research found that young people responded more positively to emotive rather than rational arguments on weapons carrying. The campaign ‘platform’ is focused, therefore, on the risk of being ostracised by peers for carrying weapons and the repercussions on their family, especially the effect on their mother, if they were involved in a serious weapons incident.

Weapons control regulations have also been strengthened. The primary objective of the stricter regulations is to further restrict the availability of non-firearm weapons within the community to help reduce the risks of injury involving these types of weapons (Department of Justice 2000). The new laws further restrict the sale, display, marketing and carriage of specified weapons (classified as prohibited, controlled or dangerous articles) and broaden police search powers.

Hospital data collections are important and unique sources of information about community violence. They should be used alongside crime statistics to evaluate the effectiveness of community initiatives to reduce violent assaults. Their relevance is illustrated in a study of assault victim attendance at the accident and emergency department of Glasgow Royal Infirmary before and after a Strathclyde Police-led initiative to curb knife carrying and tackle violent assaults (‘Operation Blade’) in Glasgow (Bleetman et al., 1997).

Operation Blade was implemented in February 1993. Police crime figures for 1993 indicated a reduction of 33% in the level of crimes of violence committed involving the use of a knife in comparison to 1992. By comparison, Glasgow hospital ED data indicated no significant difference in the number of patients presenting with penetrating injuries or the total number of assaults in the month before the start of Operation Blade (January 1993) and 12 months later (January 1994).

Hospital records did indicate, however, that Operation Blade successfully reduced the number of serious stabbing cases (those triaged to the resuscitation room) for a period of 10 months, but, in the subsequent two years, numbers surpassed those prevailing before its implementation. The authors recommend that such campaigns should combine public health and education initiatives with media and police campaigns and be repeated at regular intervals (Bleetman et al., 1997).

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

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The advice & technical support provided by NISU is of fundamental importance to VISAR.

How to access

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

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