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Ten years on: toddler drowning in QLD 1992-2001

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QISU collects and analyses data from emergency department injury presentations on behalf of Queensland Health. Participating hospitals represent three distinct areas of Queensland.

QISU publications and data are available on request for research, prevention and education activities.

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Summary

- Q Drowning is the leading cause of death due to injury in children less than five years old.
- Q In Queensland 157 children under five have drowned since 1992. Almost half of these deaths occurred in domestic pools.
- Q Pool fencing has saved the lives of over 70 toddlers in Queensland in the last 10 years.
- Q The toddler pool drowning rate could be reduced further by full implementation of pool fencing with regular inspections focusing on improving compliance of gates and doors.
- Q Twenty-five children drowned in the bath in Queensland during the last 10 years.

Introduction

In the last ten years 157 children aged under five have drowned in Queensland. Last year alone 10 toddlers drowned in Queensland out of a national figure of 44.

Drowning accounts for a quarter of the paediatric injury deaths in this state and is the most common cause of traumatic death in children under five. Approximately half of the under five child drownings in Queensland occur in domestic swimming pools. The remainder occur in a wide variety of water hazards including dams and ponds, rivers and creeks, rural water hazards such as irrigation channels and the bathtub. These deaths are all potentially preventable.

After a long public health campaign pool fencing legislation was introduced in this state ten years ago. This legislation has prevented at least 70 toddler drowning deaths. Nonetheless since 1992 73 toddlers have drowned in domestic swimming pools in Queensland. Earlier QISU Bulletins have looked separately at both domestic pool and non-pool drowning. This report brings all the data together and summarises the last 10 years of toddler drowning in Queensland. We identify where our children are drowning, look at the impact of our pool fencing legislation and explore future drowning prevention interventions.

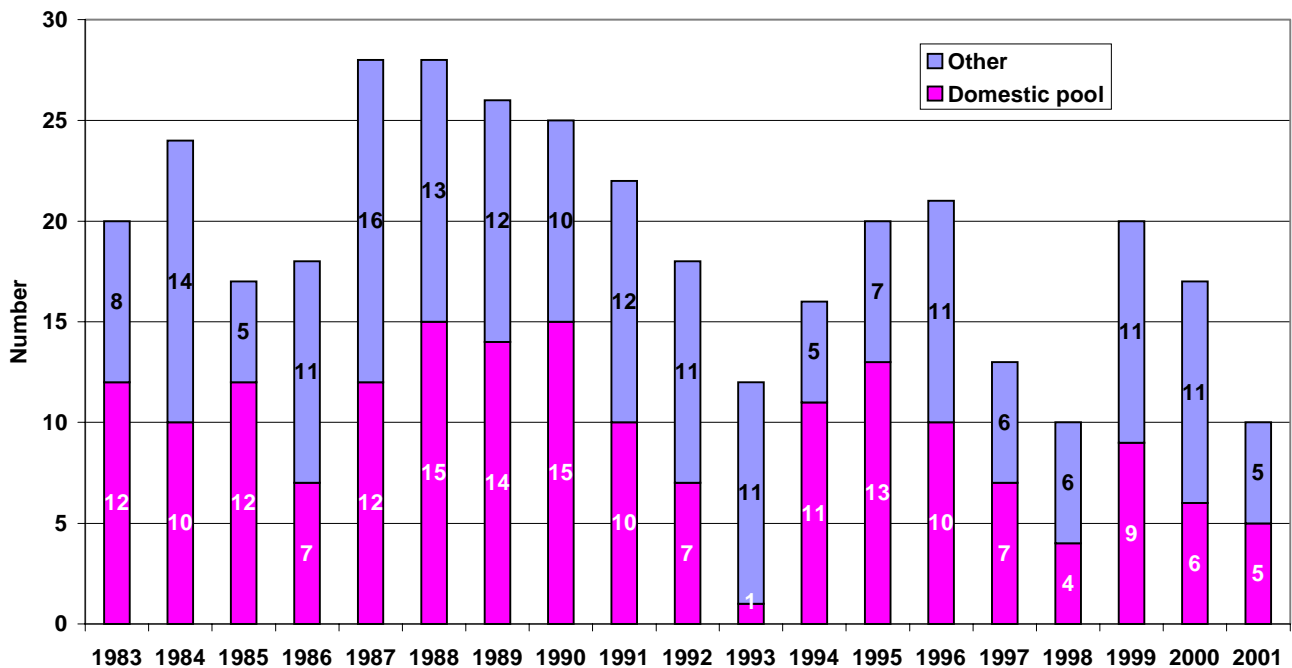


Figure 1 All Queensland drowning deaths, by year of immersion, children 0-4 years, 1983-2001
Pool fencing legislation was introduced in 1992

Results

The Queensland Injury Surveillance Unit (QISU) maintains a unique child drowning database for the State; integrating information from the Registrar-General's death data, police and coroners reports. Between 1992 and 2001 157 children under the age of five drowned in Queensland. The circumstances of each of these deaths were examined and categorised according to the setting.

Pool drowning

Since 1992, 73 children aged less than five years have drowned in domestic pools in Queensland. Seventy-three per cent of these deaths were males and two thirds of the victims were aged between one and two years (Figure 2). Three quarters of the deaths involved in-ground pools with 16 children drowning in above ground pools and three drowning in spas (Figure 4). Almost two thirds of drownings occurred in pools at the child's usual residence. Most of the remainder occurred while visiting the pool owner's property. In two cases the child wandered from their own home and drowned in a neighbour's pool. In the majority of toddler drownings the responsible adult had no idea the child was near the pool and often assumed the child was safe in the house. Therefore, the method whereby toddlers gain unintended access to the pool is crucial to preventing their drowning.

In 21% of toddler drownings the pool was unfenced. Toddlers who gained access to a fenced pool usually did so through a gate that was propped open or did not close automatically (46%), or via the house door (13%) in 3-sided fencing configurations permitted for pools approved prior to 1991. The method of pool access for 4% of children was unclear (Figure 3).

Cases were examined to see if the pool fence complied with the pool fencing legislation. Only eight (16%) of the in-ground pools involved were found to comply but of these, four had gates open at the time of the drowning and three involved children in a backyard with no fence between the house and the pool as permitted in pools installed prior to 1991. One child was thought to have accessed the pool by climbing the fence.

Of the 42 noncompliant in-ground pools 11 (26%) were unfenced, 18 (43%) had a non-compliant gate, ten (24%) had 3-sided fencing and access was gained from the residence and three (7%) had non-compliant fencing. Of the 16 above ground pools two were unfenced, in eight cases access was gained via a non-compliant gate and two children were thought to have climbed the side of the pool.

In addition 5 toddlers have drowned in public swimming pools in the last ten years.

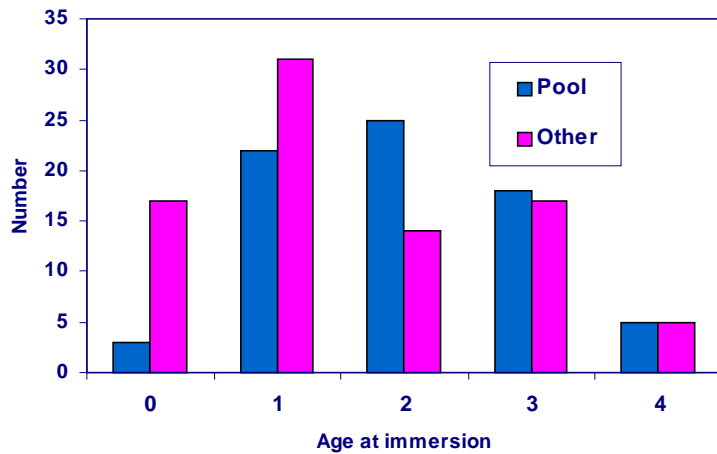


Figure 2 Queensland drowning deaths, children 0-4 years, 1992-2001, by age.

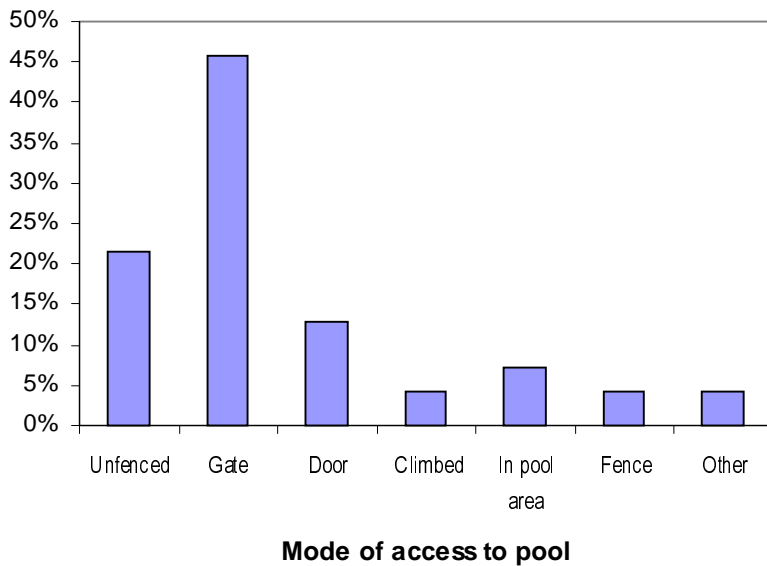


Figure 3 Queensland domestic pool drowning deaths, children 0-4 years, 1992-2001, by mode of access to pool.

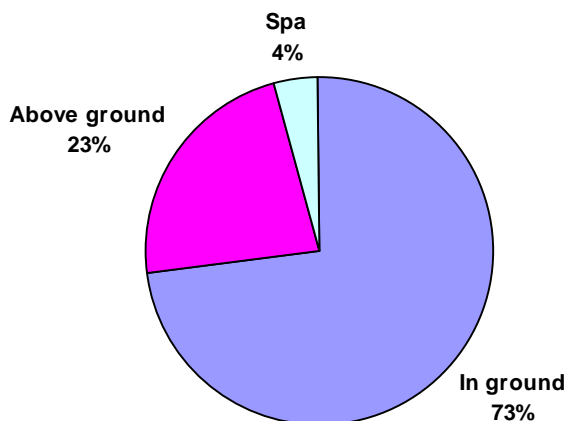


Figure 4 Queensland domestic pool drowning deaths, children 0-4 years, 1992-2001, by type of pool.

Non-pool drowning

In the last 10 years there have been 79 non pool toddler drownings in QLD. Four drownings were the result of motor vehicle crashes and the remainder are grouped below by type of hazard (Figure 5).

Static Inland waterways

Dams, ponds and lakes were associated with 30 deaths. This group of waterways accounted for the greatest number of fatalities after domestic pools. The median age was one year. The most common cited factor associated with the incidents was that the child had “wandered off”.

Dynamic Inland Waterways

Rivers and creeks were associated with 10 drowning fatalities. There were two canal drownings. The median age was three years. Factors associated with the incidents were recent flooding and the child “wandering off”.

Rural Water Hazards

Five children drowned in rural water hazards including irrigation channels and cattle dips. The median age was two years. The most commonly cited factors were recent flooding and the child “wandering off”.

Bathtub drowning

Twenty-five children drowned in the bath. The median age was 10 months. Unlike most other drowning categories where there is a male predominance bathtub drownings had an equal male to female ratio. The most commonly cited circumstance here was an interruption to supervision for example when the doorbell or telephone rang. Leaving the baby in the care of young siblings was another common scenario. One infant was drowned intentionally by a parent.

Containers

There were five fatalities in containers such as buckets. All of

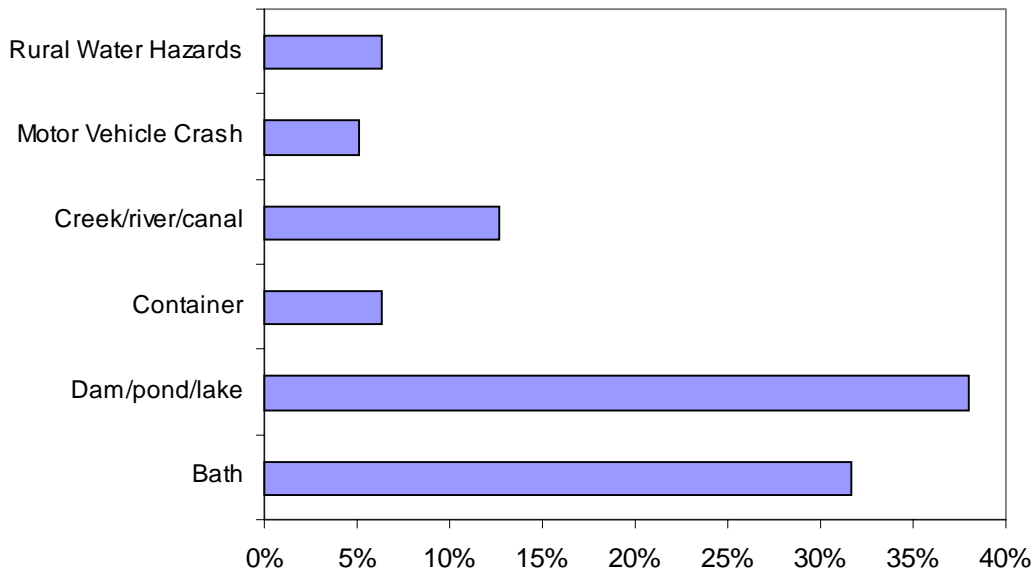


Figure 5 Queensland non-pool drowning deaths, children 0-4 years, 1992-2001, by type of hazard.

these children were aged one year. Two fatalities involved rubbish bins, one a nappy bucket and two other large buckets. In each case the container was easily accessible to the child.

Discussion

Toddler drowning remains a major public health issue in Queensland. For every toddler drowning death three or four others are admitted to hospital after an immersion incident¹. For these children there is up to a 20% risk of brain damage due to lack of oxygen. Important progress has been made in reducing the toddler drowning numbers but 10 young lives lost in preventable water incidents in 2001 is far too many. Toddlers do not understand the concept of danger or the risks of falling into water. They are top heavy and when leaning forward to look into water or reaching out for an object they can easily topple over and drown in just a few centimetres of water. The best way to prevent hazard exposure is to isolate it from the child's usual play and living environment.

Pool Drowning

To a toddler, the domestic pool is the most dangerous home hazard. Tragically most pool drownings occur when the parent is unaware the child is anywhere near the pool. Studies both in Australia and overseas have shown that fencing of domestic pools is highly effective in reducing child drownings^{2,3}. Since 1992, it has been mandatory for all pools in Queen-

sland to comply with the Australian Standard for Pool fencing (AS 1926). New pools are required to have four-sided fencing separating the pool from the house while three-sided fencing with direct access from the house is permitted for pools built prior to 1992. In Queensland in the five year period 1987-91 prior to the introduction of pool-fencing requirements, an average of 13 children under five drowned annually in domestic pools compared to a current five year average of between six to seven deaths per year. Within the same time frame the number of domestic pools in Queensland has more than doubled⁴. Pool fencing has saved the lives of at least seven toddlers each year in Queensland since 1992.

For pool fencing to save lives the barrier must be intact including a gate that closes and latches automatically. It is clear from the data that current pool drownings are due to inadequacies in the barrier (fencing), whether temporary or permanent, or in some cases non-existent⁵. The greatest number of toddlers who access a fenced pool do so through the designated pool entry point (gate or door). This happens through a gate that has been propped open or does not shut and latch automatically or via a house door in sub-optimal 3 sided configurations permitted for pools approved prior to 1991. In these cases, the doors and windows of the residence allowing access to the pool should comply with the Australian Standard but in reality this is difficult to achieve and maintain. Researchers in California (which has had a

persistently high rate of domestic pool toddler drowning despite pool fencing) have also noted the limitations of ordinances that do not require 4-sided fencing or other methods to limit pool access from the house⁶.

The most effective way to reduce toddler pool drowning is to ensure there is a child-resistant fence on all four sides and to improve compliance of gates and doors that provide access to the pool. In a survey of Queensland pool owners in Brisbane, Gold Coast and coastal towns during 1996 it was found that 50% of pools did not fully comply with fencing requirements⁷. It was also found that for 3-sided pools in Brisbane, which then made up 26% of pools, 62% had no self closing and latching door on the house access to the pool. A key recommendation of this report was that inspection and reinspection of new and existing pools offered the greatest potential to reduce toddler drowning. This recommendation has yet to be fully implemented.

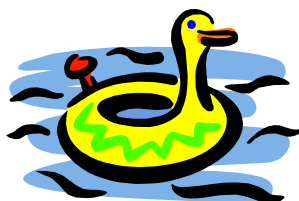
Hence although it has been a vital step forward, the pool fencing legislation by itself is not sufficient to ensure safety. It must be enforced to be effective. Currently there is a chain of responsibility for pool fencing compliance. Pool fencing legislation in Queensland is administered by Local Councils. It is the responsibility of the Council to ensure that all building applications for new pools comply with the pool fencing by-laws. During construction by a pool builder it is the landowner's responsibility to obtain final Council inspection of the pool and the fence. Once the pool is handed over it is the property owner's responsibility to ensure that their pool complies with the fencing requirements and to maintain compliance thereafter. It is the responsibility of the Local Councils to conduct the initial inspection and provide a reinspection process to ensure compliance is maintained. At present pool inspection in Queensland is variable and inconsistent.

Above ground pools continue to be a problem because they are easier to buy and install without reference to the local authority. Proportionally more children climb the side of an above ground pool than climb a fence to access an in-ground pool. There is a strong argument to strengthen current pool fencing legislation to require a fence and gate to protect the access

point to all above ground pools. Retailers should be obliged to notify authorities whenever an above ground pool is sold and manufacturers should provide an adequate warning regarding the need for fencing. Some of the larger inflatable wading pools have also been associated with toddler drownings and reinforce the fact that any large water filled container in the backyard is a potential drowning hazard.

Non-pool drowning

The number of toddler drownings in small property dams and lakes is exceeded only by domestic pool drownings. In the majority of cases the responsible parent is unaware the child has wandered off near a water hazard. This raises the issue of risk appreciation. Considerably fewer young children drowned around dynamic water hazards (rivers, creeks, sea and surf) compared to dams and lakes. This suggests that supervision is better around running water and parents have a higher risk appreciation of the dangers associated with



these hazards. Risk appreciation is greatest at the sea and no toddler has drowned in the surf in Queensland in the last 10 years. As it is impossible to fence off all water hazards in our environment, particularly in the country, the best

way to prevent these drownings is to raise in the minds of carers the risk appreciation of dams and farm water features to the level "gold standard" of risk – the sea. An effective strategy for the family farm is the "fence the farm" concept with the aim of creating a fenced "safe haven" where toddlers can play safely.

Heavy rain with flooding was a frequent feature in running water and rural water hazard drownings. Children are drawn to the fast flowing water, underestimate the power and can be sucked into drains and pipes. Special hazard warning information should be given when providing weather alerts on flooding and parents should be educated about the special hazards posed for children by flood run off.

The tragedy of 25 bathtub deaths reinforces the need for safe bathing practices. This means a competent adult staying by the bath. If bathing is interrupted, the child should be removed from the bathing environment before doing anything else. Under no circumstances should the infant be left in the care of a sibling who will never appreciate the true risk and can-

not be relied upon to deputise for the responsible adult. Baby bath seats have been associated with bathtub drownings in the US and should not be used. Health professionals should provide safe bathing advice as part of the postnatal follow-up with all new parents and their baby.

Role of Supervision

Young children are naturally curious and attracted to water and supervision is vital to prevent toddler drowning. Clearly the level of supervision required to keep children safe will vary depending on the age and developmental level of the child and also the nature of the water hazard. Supervision is not a scientific or measurable prevention and little has been published on the efficacy of improved supervision in preventing childhood injury⁸. In the context of toddler drowning, adequate supervision means keeping the child in direct line of sight whenever the toddler is in close proximity to a water hazard. This presumes the carer is aware of the proximity of the toddler and the hazard which is not the case for most toddler drowning. Direct line of sight supervision is only possible for brief periods of the day for hazard situations of which the parent is aware. Hence close supervision must be combined with other methods of reducing hazard exposure (four-sided pool fencing etc) to prevent further toddler drownings.

The last 10 years has shown a reduction in toddler drowning is possible. Pool fencing has been the most effective life saver. Further gains are possible with improved pool fence compliance, fenced play areas on farms and properties and awareness raising of water hazards, including the bath, to new parents.

Recommendations / Prevention

Pool fencing

- Regular local authority inspections, with an emphasis on improving compliance for gates and doors.
- Raise awareness of pool owners responsibility to maintain compliant pool fences and gates and to never prop open pool gates .
- Review legislation to improve standards for above ground pools and develop a system of notification of purchase.

Rural Properties

- Promote the provision of a "Child Safe Area" for toddlers to play on farms and properties.

Community Education

- Provide targeted health advice to parents of babies and toddlers at post-natal and immunisation visits regarding safe practices in bathing babies and direct supervision of toddlers in and around all water hazards. Under no circumstances should a child less than three years old be left alone in the bath or in the care of a sibling.
- Increase community awareness of the drowning dangers associated with flooding.
- Promote training in resuscitation techniques and promote display of poolside resuscitation posters.

Free Resuscitation posters may be obtained by phoning: Royal Life Saving Society of Australia (QLD) 07 38232823 or Queensland Health Publications 07 3234 1053 Or visit the Queensland Health Website where Pool Fencing brochures are also available : www.health.qld.gov.au/HealthyLiving/Injury_P.htm

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