DROWNING DEATHS OF CHILDREN UNDER FIVE IN PRIVATE SWIMMING POOLS IN NSW: A 13 YEAR REVIEW
LEARNING TO SWIM IS GREAT

BUT YOU CAN’T DROWNPROOF A CHILD!

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Royal Life Saving is a public benevolent institution (PBI) dedicated to reducing drowning and turning everyday people into everyday community lifesavers. We achieve this through: advocacy, education, training, health promotion, aquatic risk management, community development, research, sport, leadership and participation and international networks.

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EXECUTIVE SUMMARY

Children under five are the age group most at risk of drowning and swimming pools are known to account for a large proportion of drowning deaths. An average of 30 children under the age of five have drowned in Australia each year for the past 10 years. The Royal Life Saving National Drowning Report 2015 reported a 30% increase in the number of drowning deaths recorded in children under five nationally, with 26 deaths, up on the 20 deaths recorded in the 2014 report. Of the deaths in children under five in 2015, over half occurred in swimming pools.

Most of the drowning incidents occurred in home swimming pools (91.6%), with a further 6.0% occurring in portable pools.

The leading LGAs based on drowning rate per 100,000 children under five were Broken Hill (13.93 drowning deaths per 100,000 children under five years, followed by Griffith (12.08) and Mid-Western Regional (9.71). The LGAs with the highest drowning rate per 1,000 registered swimming pools were Griffith and Broken Hill (each with a crude rate of 0.23 drowning deaths per 1,000 registered pools), followed by Mid-Western Regional (0.16).

Supervision was completely absent in 59.0% of cases. Supervision was left to siblings over 12 years in 1.2% of cases, siblings 12 years and under in 2.4% of cases and children of unknown age in 2.4% of cases. Mothers were most commonly responsible for supervision (28.6%), followed by fathers (14.3%) or grandparents (14.3%). The estimated time left unsupervised was only available for 32.5% of cases. Of these, 33.3% of the children who drowned were left unattended for a period of 5 to less than 10 minutes, with a further 29.6% left for 3 to less than 5 minutes. In over two thirds of cases, children drowned in the pool at their primary place of residence (70.9%).

Regarding fencing, 26.5% of pools were fenced, with another 26.5% unfenced and 34.7% fenced but faulty in some manner. Approximately 10% of pool fences were deemed non-compliant by investigators. Children most commonly gained access to the pool area through a faulty fence or gate (36.4%), a lack of fence (31.8%) or a gate which had been propped open (18.2%).

Unfortunately, data on children’s swimming ability and history of swimming lessons was unavailable in most cases. Whether or not the child could swim was unknown in 90.4% of cases. Of the remaining 9.6% of cases the child was known to be a non-swimmer. Similarly, children’s history of swimming lessons was unknown in 92.8% of cases.

Of the cases with resuscitation information available, CPR was enacted in 98.1% of drowning incidents. There was only one case where CPR was not enacted, however, this decision was made by emergency personnel. Among the cases where it was known who initiated CPR, parents were the most common first responders (63.3%). Emergency services were contacted in all cases where this information was made available.

Lapses in supervision were common, with supervisors temporarily distracted by everyday tasks and other people in the home environment. While supervisors were answering the door, conversing with another person, or attending to another child, the child who drowned was able to slip away unnoticed. There appeared to be confusion regarding the role of supervisor at social gatherings. Although multiple adults were present at such events, it was not clear who was responsible for supervising children in and around the pool. Similar situations arose in an everyday context when more than one adult was at home with the child, resulting in confusion as to whose responsibility it was to supervise.
In a number of cases supervision was completely absent for a length of time. Active supervision requires an adult’s full attention, all of the time when children are in or around water. Older siblings and other children do not have the necessary skills and experience to supervise children, nor should they be given this responsibility.

Non-existent or faulty fencing was a common issue, with many pools completely unfenced and others fenced by defective barriers. In some cases, fences were only temporary rather than permanent structures, while others were deemed non-compliant by investigators following a drowning death. Often portable pools, such as inflatable or blow up pools, were not fenced.

In many cases there were faults with pool gates, whereby they did not self-close or self-latch, or would only do so under certain conditions. Some pool owners had attempted to repair these defects using items such as padlocks, chains and rope to secure gates. These ‘quick fixes’ did not prevent children from entering the pool area and ultimately, failed in their attempt to restrict access. In order to prevent access to swimming pools, barriers need to be correctly installed and regularly maintained, including fitting gates which self-close and self-latch.

Another issue was pool gates being propped open to allow quick entry for family members or pets. In these cases, children were able to freely wander into pool areas having slipped away from carers. Gates should never be propped open as this practice allows easy access for curious young children. There were other cases where fences were in working order but climbable objects were left near the pool, such as outdoor furniture and buckets. Any object which could be used by a child to reach the pool gate or climb over the fence should be removed from the area.

Parents, grandparents and anyone else supervising young children near water should ensure their CPR skills are up to date, as they were often called upon to respond in an emergency.

The actions of the Keep Watch program promote key safety messages to keep children safe in and around water. They are designed to work together to prevent child drowning, as none will work in isolation. If supervision fails, a pool barrier is the next line of defence but this is only effective if the fence and gate have been correctly installed and regularly maintained to ensure they are in working order. Support from the community and government is required to continue to reduce the number of children drowning in private swimming pools in NSW.

RECOMMENDATIONS

Data
- Improve data quality (e.g. supervision details, description of the pool fence and surroundings, swimming ability and history of lessons, CPR provision) by:
  - Liaising with the police to improve data collection at the scene of an incident
  - Working closely with NCIS to improve data quality (timeliness of closing off cases) and availability (electronic availability) of information
- Work closely with NSW Health to collect data on cases of non-fatal child drowning in private swimming pools in NSW to better understand the overall burden of drowning

Public Awareness and Education
- Elevate promotion of the concept of a ‘designated child supervisor’ to ensure a responsible adult is supervising children in and around the pool at all times, thereby minimising confusion in relation to who should be supervising
- Strongly encourage those with unfenced pools to be fenced. Optimal times for such installation/ upgrad es of barriers could be at times of major development work, sale and lease etc
- Encourage pool owners to regularly check their pool fences and gates and undertake any required maintenance as per the applicable standards
- Highlight the dangers of propping pool gates open, advising parents and pool owners that this is never safe to do for any reason
- Implement a best practice guide for private swimming pool safety that considers relevant key stakeholders and promotes compliance with applicable standards and pool owner safety obligations.

Portable Pools
- Target retailers and suppliers in an effort to provide safety information to consumers at the point of sale
- Continue to promote Royal Life Saving’s portable pool safety education campaign #MakeItSafe (www.royallifesaving.com.au/makeitsafe)

Further Research
- Conduct further research into the attitudes, beliefs and knowledge of parents of children aged under 5 years (using a nationally representative sample) regarding:
  - Understanding of supervision for young children, including knowledge of supervision requirements and attitudes towards constant, active supervision
  - Awareness of fencing requirements, specifically relevant legislation and applicability, as well as attitudes towards compliance and maintenance
  - Acceptability of water familiarisation classes and swimming lessons for young children, including the importance placed on different aquatic skills and water safety knowledge
  - Knowledge of CPR, including willingness to learn resuscitation and knowledge of infant CPR requirements
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BACKGROUND

Children under five are the age group most at risk of drowning 1 and swimming pools are known to account for a large proportion of drowning deaths 2-5. The Royal Life Saving National Drowning Report 2015 identified an average of 30 children under the age of 5 have drowned every year for the past 10 years. In 2014/15, 26 children under five drowned, a 30% increase on the 20 deaths recorded the previous year 6. Over half (53.8%) of these occurred in swimming pools 6.

Although there have been great achievements in the reduction of drowning in young children in this country, reducing from a high of 68 drowning deaths in 1995 and 1996 7, an unacceptably high number of children continue to drown.

Strategies for the prevention of child drowning are well understood and include active adult supervision, restricting a child’s access to water, commonly through correctly installed and regularly maintained pool fencing, water awareness and resuscitation 8. These interventions are supported by over 30 years of research into the epidemiology and risk factors for drowning of young children in private swimming pools 5 8-11.

Royal Life Saving Society - Australia’s Keep Watch program has been operating for over twenty years. Launched in 1994, the program urges parents to follow four key actions to prevent children from drowning 12. Firstly, the need to supervise children when in, on or around water, ensuring parents give their full attention, all of the time. Secondly, restricting access to water by installing and maintaining a barrier, such as a pool fence with a gate that self-closes and self-latches. Thirdly, familiarising children with water by enrolling them in water awareness classes and spending time with them in the water. Finally, encouraging parents to learn resuscitation skills so they know how to save a life.

Following on from a study into the causal factors of child drowning in New South Wales (NSW) in 2002 13, Royal Life Saving Society - Australia chose to conduct similar analysis into the causal factors leading to drowning among young children in private swimming pools in the state of NSW. This project will allow for discrete analysis into the causal factors for swimming pool drowning deaths for the first time on a large data set. The report will make recommendations aimed at preventing further drowning deaths in this age group.

AIMS

Using coronial data on unintentional fatal drowning among children aged 0-4 years in NSW in private swimming pools, this study aims to:

- Identify the scale of drowning deaths in private swimming pools in NSW
- Examine causal factors with respect to supervision
- Examine causal factors with respect to barriers
- Examine causal factors with respect to the swimming ability of the child
- Examine causal factors with respect to the use of Cardio Pulmonary Resuscitation (CPR)
SUPERVISED
CHILDREN
NEVER DROWN

BE PREPARED
BE CLOSE
ALL OF YOUR ATTENTION

ALL OF THE TIME!
METHODS

Data inclusion
All cases of unintentional fatal drowning in a child under five in NSW in private swimming pools between 1 July 2002 and 30 June 2015 were included. Jurisdiction of drowning death (and therefore inclusion/exclusion from this research) was defined based on the incident location, regardless of where the child died. For example the case of a child who suffered an initial non-fatal drowning in NSW but was then transferred to a hospital in Queensland (QLD) where the child died was included, despite the coronial records for the child's death being held under the QLD jurisdiction.

Data collection, coding and analysis
The initial cases of child drowning in NSW were housed in Royal Life Saving’s National Fatal Drowning Database (the Database) 14 having been cross-referenced against the National Coronial Information System (NCIS) 15 through ethical access (JHREC - CF/13/19798). This report contains data that is correct as at 17 August 2015. All cases in the Database are checked against the NCIS on a regular basis and data is updated accordingly.

Data on causal factors leading to child drowning in private swimming pools was collected for each case (where available) by retrospectively accessing relevant case files in the NCIS. Data on causal factors was collected and coded in discrete variables within the Database. Information on causal factors was sourced from the coronial report (or finding if the case went to inquest), the police report and the narrative of circumstances in the autopsy report in descending order of priority.

Analysis was conducted in SPSS using descriptive statistics and chi squared analysis 16.

Ten year averages in this report were calculated using data from 2004/05 to 2014/15 inclusive. Drowning rates per 100,000 people are calculated using population data from the Australian Bureau of Statistics (ABS) publication ‘Australian Demographic Statistics (Cat 3101.0) 17. Drowning rates for Indigenous children were calculated using the ‘Estimates and Projections, Aboriginal and Torres Strait Islander Australians, 2001-2026 (Cat 3238.0) 18. Percentages and averages are presented to 1 decimal place. Drowning rates per 100,000 population are shown to two decimal places.

Remoteness classification of incident location was coded using the Australian Standard Geographical Classifications (ASGC) 19. The postcode of the incident location was coded to its remoteness classification using the Doctor Locator website 20. Visitor status was calculated by measuring the distance between the residential and incident postcodes using Google Maps 21. Those who resided within 100kms of where they drowned were not considered visitors. Those over 100kms away but within their home state were intrastate visitors. Those who drowned in a different state to the one they resided in are termed interstate visitors.

Calculations of crude drowning rates by local government area
Calculations of crude drowning rates for local government areas (LGA) for children under five were calculated using data on drowning deaths by LGA and population of children under five within that LGA. Crude rates were calculated by dividing the total number of deaths in the LGA for the 10 year period by the population of children under five for the LGA and multiplying the result by 100,000 to standardise the rates. The top 10 in Table 1 were ranked based on those LGAs that recorded 2 or more drowning deaths across the study period.

Crude drowning rates by number of registered pools within an LGA were also calculated. Crude rates were determined by dividing the total number of drowning deaths among children under five in the LGA by the total number of registered pools and multiplying the result by 1,000 to standardise the rate. The top 10 in Table 2 were ranked based on those LGAs that recorded 2 or more drowning deaths across the study period.

Definition of private swimming pool
For the purposes of this research and report, a private swimming pool has been defined as a residential pool (or backyard swimming pool) at stand-alone houses or apartment complexes, portable swimming pools and outdoor spas. This category for the purposes of this report, does not include public swimming pools or swimming pools at hotels or motels.

Causal factor variables
The causal factor variables that will be analysed and reported against are as follows:
• If supervision was absent
  - If yes, for how long was it estimated to be absent (if known)
  - Who was responsible for supervision at the time of the drowning death (if known)
• If fencing was in place
  - If no, was this in contravention of applicable legislation (if known)
• If yes, by whom? (if known)
  - If yes, was the fencing in contravention of applicable legislation (if known)
  - If yes, what was the child’s mean of access into the pool? (if known)
• If the child could swim or not
  - If yes, what type of swimmer (e.g. non-swimmer, poor swimmer, good swimmer) (if known)
  - If yes/no, if the child had been enrolled in swimming lessons or not (if known)
• If CPR was enacted?
  - If yes, by whom? (if known)
  - If yes/no, were emergency services called? (if known)
Determination and coding of casual factor variables

Variables listed above were determined in line with known causal factors for cases of child drowning in private swimming pools 13. They were also loosely grouped into four key areas that align with the four key actions of the Royal Life Saving Keep Watch program, namely supervision, restricting access to water, water awareness and resuscitation 12.

Supervision

Available information was used to determine the presence or absence of supervision. Supervision was coded as ‘yes’ (present), ‘no’ (absent) or ‘yes but with limiting factors such as a child supervised by siblings or other children. In this case, the age of the supervising sibling was recorded as ‘twelve and under’ or ‘over twelve’. If the age was not specified, the code ‘other children (no age specified)’ was used. In cases where no information was available on supervision this variable was coded as ‘unknown’, with a differentiation made between open and closed cases. In order to provide more detail, a description of the type of supervision was recoded in free text.

Supervision was also coded into ‘none’, ‘indirect’, ‘direct’ and ‘unknown’. No supervision indicated the child was left completely unattended for a period of time, indirect supervision indicated that the supervising adult was in the vicinity of the child but not giving his or her full attention to the task of supervising and direct supervision indicated the supervising adult was giving the child their full attention (actively supervising).

The person responsible for supervising the child was also recorded. The available categories for this variable were ‘mother’, ‘father’, ‘grandparents’, ‘older sibling’, ‘other relatives’, ‘friends’, ‘parties-no designated supervisor’, ‘both parents’, ‘other, e.g. professional carers’, ‘other children’, ‘family’ and ‘unknown’. A large number of options were created for this variable as it was expected that a wide variety of people may be responsible for supervision under different circumstances. In cases where it could be viewed that more than one person was responsible for supervising the child, the person more closely related to the child was recorded, e.g. if a child’s father and grandparents were at home when the child drowned, ‘father’ was recorded.

To understand how long children may have been left unattended, the length of time that supervision was absent for was recorded as free text, as well as coded into time bands. These bands were ‘not absent’ (supervision was not absent), ‘0-59 seconds’, ‘1 minute to less than 3 minutes’, 3 minutes to less than 5 minutes’, 5 minutes to less than 10 minutes’, ‘10 minutes to less than 15 minutes’, ‘longer than 15 minutes’ or ‘unknown’.

Ownership of pool

Ownership of the pool where the drowning death occurred was recorded as ‘own home pool’, ‘relative’s pool’, ‘friend’s pool’, ‘neighbour’s pool’, ‘other’ and ‘unknown’. If a child drowned in the pool at their primary place of residence, this was coded as ‘own home pool’.

Barriers

Pool fencing was examined by recording details of the presence of a fence and the condition it was in. Fences were described as ‘yes fence’, ‘no fence’, ‘yes but not compliant’, ‘yes but faulty/not maintained’. If the presence or absence of a fence was not mentioned, it was coded as ‘unknown’. For apartment building complexes with a shared pool area, the code ‘secure access’ was used to denote a facility with swipe card access to the pool area without a traditional backyard pool fence. Fences were only coded as ‘not compliant’ if this was stated in official documents as determined by appropriate inspectors. In order to provide more detail, a description of the fence was also recoded in free text.

The method by which the child was able to gain access to the pool was investigated and recorded as ‘no fence’, ‘gate propped open’, ‘disrepair (faulty gate, climbed under loose panels etc)’, ‘child climbed over fence’, ‘already in pool area’ or ‘unknown’ if no information was available. Any fault which allowed a child to gain access to the pool was coded as ‘disrepair’, as was often the case with faulty gates which did not self-close or self-latch.

Water familiarisation

Information was collected on the swimming ability of the child and whether they had attended swimming lessons. Children were classed as ‘non-swimmers’, ‘poor/weak swimmers’ or ‘can swim’. In cases where this information was not available, ‘unknown’ was used. For children who had attended swimming lessons they were divided into ‘currently enrolled’ or ‘not currently enrolled’, while those who had not were simply described as ‘no’ for this variable. If no relevant information was available ‘unknown’ was used.

Cardio Pulmonary Resuscitation (CPR)

For all drowning deaths, the question of whether CPR was enacted was answered with ‘yes’, ‘no’ or ‘unknown’. For cases where CPR was enacted, the person who initiated it was recorded. The available categories for this variable were ‘parents’, ‘grandparents’, ‘siblings’, ‘neighbours’, ‘paramedics’, ‘other’ or ‘unknown’. Where CPR was enacted by two people, the person who enacted it first was the one who was used to code the first responder. Information on whether emergency services were called was also collected. Cases were coded as ‘yes’, ‘no’ or ‘unknown’.
RESULTS

Overall
In the 13 financial years between 1 July 2002 and 30 June 2015, there were a total of 128 drowning deaths in children under five years of age in NSW. Of these 83 (64.8%) occurred in private swimming pools as defined in this report.

Drowning deaths in children under five by aquatic location
The number of drowning deaths among children under five peaked in 2003/04 with 14 drowning deaths, with a low of 6 drowning deaths in 2011/12 and 2013/14 respectively. The burden of private swimming pools compared to all other drowning locations for children under five, was at its most pronounced in 2014/15 where 87.5% of all drowning deaths in children under five in NSW took place in private swimming pools. The burden was least pronounced in 2004/05 with 42.9% of drowning deaths in children under five occurring in private swimming pools. (Figure 1)

Number and rate of drowning deaths in private swimming pools
The number of drowning deaths in private swimming pools reached a high of 11 in 2003/04 with a low of 3 drowning deaths in 2004/05. The rate of drowning deaths per 100,000 people has reduced from a high of 2.57 in 2003/04 to a low of 0.70 in 2004/05. The 10 year average is 6 drowning deaths per year, with a fatal drowning rate of 1.36 drowning deaths per 100,000 people. (Figure 2)

Figure 1: Drowning deaths of children under five in private swimming pools, all other locations, NSW, 2002/03 to 2014/15
Figure 2: Drowning deaths and rate per 100,000 people, 10 year average, 2002/03 to 2014/15 [N=83]
Sex and age group

When examining drowning deaths by sex and age bands within the 0-4 years age group, almost two-thirds (65.1%) of those who drowned were males. The burden of male drowning was most pronounced in the older end of the 0-4 years age group, with 100% of the drowning deaths in private swimming pools in those aged 4 years to < 5 years being male. The male burden was least pronounced in the 3 to < 4 years age group with 55.6% of the fatal drownings in that age group being male.

With respect to age bands within the 0-4 years age group, the largest proportion of drowning deaths took place in the 1 year to < 2 years age group, with 47.0% of all drowning deaths in children under five occurring in this age group. This was followed by the 2 to < 3 years age group with 34.9% of all deaths in children under five in private swimming pools. (Figure 3)

Pre-existing medical condition

Just 3.6% of children under five who drowned in private swimming pools in NSW over the last 13 years had a known pre-existing medical condition. However, this is likely to be an underrepresentation with a further 22.9% of cases reporting an unknown for pre-existing medical condition.

Aboriginal and/or Torres Strait Islander

Of the 83 children under the age of five who drowned in private swimming pools in NSW over the last 13 years, Aboriginal and/or Torres Strait Islander children accounted for 9.6%. This equates to a 10 year average drowning rate per 100,000 people of 2.46 per 100,000 population, a rate that is 1.8 times higher than the general population.
Remoteness classification of incident location
When examining drowning deaths of children under five in private swimming pools in NSW, the largest proportion occurred in areas deemed to be Major Cities (60.2%), followed by Inner Regional locations (21.7%) and Outer Regional areas (14.5%). (Figure 5)

Visitor status
The majority of those who drowned in private swimming pools were not visitors to the location where they drowned (91.6%). Almost five percent (4.8%) of drowning victims were intrastate visitors, and a further 2.4% were interstate visitors. In one case (1.2%) the visitor status of the victim was not known.

Activity immediately prior to drowning
The vast majority of children in this report, drowned after falling into water (87.8%), followed by swimming and recreating (3.7%) and bathing (1.2%) (Figure 6). It should be noted, there was one case where activity prior to drowning was not known at the time of drafting this report.

Season of drowning incident
Drowning deaths in children under five in private swimming pools in New South Wales occur throughout the year. Over one third (36.1%) of drowning deaths in children under five in private swimming pools occurred in the Summer months. This was followed by 33.7% in Spring, 18.1% in Autumn and 12.0% in Winter. (Figure 7)

Figure 5: Drowning deaths of children under five in private swimming pools by remoteness classification of incident location (N=83)

Figure 6: Drowning deaths of children under five in private swimming pools by activity immediately prior to drowning (n=82)

Figure 7: Drowning deaths of children under five in private swimming pools by season of drowning incident (N=83)
Day of week of drowning incident
Drowning deaths in children under five in private swimming pools in New South Wales occurred on every day of the week. The day with the highest proportion of incidents was Monday (21.7%), followed by Saturday (20.5%) and Sunday (19.3%). The day with the lowest proportion of incidents was Wednesday (6.0%), followed by Tuesday (8.4%) and Thursday (9.6%). (Figure 8)

Time of day of drowning incident
Drowning deaths in children under five in private swimming pools in New South Wales occurred throughout the day. Almost half of all deaths occurred in the afternoon (44.6%), between 12:01pm and 6pm. A further 22.9% of incidents occurred in the morning (6:01am to 12pm) and 19.3% occurred in the evening (6:01pm to 12am). The time of day when the drowning occurred was unknown in 10.8% of cases. (Figure 9)

Type of swimming pool
Of the 83 drowning deaths among children under five in private swimming pools in New South Wales during the study period, 5 were known to have occurred in portable swimming pools. Most deaths occurred in home swimming pools (91.6%), with 6.0% occurring in portable swimming pools and a further 2.4% occurring in outdoor spas. (Figure 10)

Drowning deaths and crude drowning rates by local government area
By examining drowning deaths in children under five by the total population aged under five years, the top ten LGAs in New South Wales by rate of drowning deaths have been calculated for those LGAs that recorded two or more drowning deaths during the study period (Table 1). The LGA with the highest crude drowning rate per 100,000 children under five was Broken Hill (13.93 drowning deaths per 100,000 children under five years), followed by Griffith (12.08), Mid-Western Regional (9.71), Wollondilly (6.71), Port-Macquarie Hastings (5.42), Penrith (3.13), Camden (2.83), Campbelltown (2.62), Wyong (2.20) and Lake Macquarie (1.90).

<table>
<thead>
<tr>
<th>Ranking</th>
<th>LGA</th>
<th>Crude rate of drowning deaths per 100,000 population under five years</th>
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<tbody>
<tr>
<td>1.</td>
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<td>2.</td>
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</tr>
<tr>
<td>3.</td>
<td>Mid-Western Regional</td>
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<td>4.</td>
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<td>7.</td>
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<tr>
<td>10.</td>
<td>Lake Macquarie</td>
<td>1.90</td>
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</table>

Table 1: Crude rate of drowning deaths per 100,000 children under five in New South Wales LGAs (Top 10)
Drowning deaths and crude drowning rates by pool ownership by local government area

By examining drowning deaths in children under five by the number of registered, private swimming pools, the top ten LGAs in New South Wales by crude rate of drowning deaths have been calculated for those LGAs that recorded two or more drowning deaths during the study period (Table 2). The LGA with the highest crude drowning rate per 1,000 registered pools was Griffith (0.23 drowning deaths per 1,000 registered pools), followed by Broken Hill (0.23), Mid-Western Regional (0.16), Wollondilly (0.06), Blacktown (0.05), Port Macquarie-Hastings (0.04), Fairfield (0.04), Penrith (0.04), Campbelltown (0.03), Parramatta (0.03), Camden (0.03) and Wyong (0.03).

<table>
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<th>LGA</th>
<th>Rate of drowning deaths per 1,000 registered pools</th>
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<td>=6.</td>
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<td>=6.</td>
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<td>Wyong</td>
<td>0.03</td>
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</table>

Table 2: Crude rate of drowning deaths per 1,000 registered swimming pools in New South Wales LGAs (Top 10)

Causal factors

This section of the report deals with the analysis of causal factors around supervision, barriers, water familiarisation and CPR.

Supervision

With respect to supervision, in well over half (59.0%) of all cases supervision was deemed to have been completely absent. In a further 2.4% of cases the child was supervised by siblings 12 years and under, with another 1.2% supervised by siblings over 12 years. In 2.4% of cases children were left with other children of unknown age. Information was unknown in 22.9% of closed cases, with 12.0% of cases unknown as they were still open. (Figure 11)

Figure 11: Drowning deaths of children under five in private swimming pools by status of supervision (N=83)

Of the 49 cases where supervision was noted to be absent, supervision was entirely absent in 69.4% of cases. Supervision was indirect in a further 26.5% of cases. Whether supervision was entirely non-existent or indirect was unknown in 4.1% of cases.

The authors examined who had responsibility for supervision, in the 49 cases where supervision was deemed to be absent prior to the child drowning. The results were quite varied with the mother being responsible for supervision in just over one quarter of all cases (28.6%). This was followed by the father or grandparents (14.3% respectively). In just over eight percent of all cases, the drowning occurred at a party. (Figure 12)

Figure 12: Drowning deaths of children under five in private swimming pools by person responsible for supervision (n=49)
When the time left unsupervised was examined, this was only mentioned in the case files of 27 drowning deaths (32.5%). In 33.3% of cases the witness estimated the child had been left unsupervised for a period of five to less than 10 minutes. The next highest proportion of cases was where a child had been left unsupervised for 3 to less than 5 minutes (29.6%). (Figure 13)

Ownership of pool
Information was also collected on the ownership of the pool where the drowning death occurred. In over two thirds of all cases (70.9%), the child drowned in the pool at their primary place of residence. The next most likely location was a relative’s pool (16.4%), followed by a friend’s pool (10.9%). (Figure 14)

Barriers
Another section of the causal factors analysis examined the barriers for the pools where children drowned. Of the 49 pools where information on fencing was available, just over a third (34.7%) were fenced but the fencing was faulty or not maintained. Numbers were evenly split between those pools which were fenced and not fenced (26.5% respectively). A further 10% were fenced but the fencing was deemed non-compliant by investigators. (Figure 15)
Water familiarisation

Data was also gathered on the child’s swimming ability. This detail was very rarely collected or made available to researchers in cases of fatal drowning. In 90.4% of cases the swimming ability of the child was unknown. However in 9.6% of cases the child was known to be a non-swimmer. (Figure 17)

Cardio Pulmonary Resuscitation (CPR)

Information was collected on the immediate response to the drowning incident, including whether CPR was enacted, if so, by whom and whether emergency services were contacted.

Information on whether CPR was enacted was available for 52 cases. In 98.1% of these cases CPR was enacted. (Figure 19)

Of the cases where CPR was enacted, information was available on who performed CPR in 49 cases. In the majority of cases the parents of the child performed CPR (63.3%). In the remaining cases CPR was performed by grandparents of the child (10.2%), neighbours (12.2%), paramedics (2.0%) or another person (12.2%). (Figure 20)
Information on whether emergency services were contacted was available in 54 cases. In all of these cases emergency services were called (100%). (Figure 21)

Figure 21: Drowning deaths of children under five in private swimming pools by whether or not emergency services were called (n=54)
DISCUSSION

Although drowning deaths among young children in private swimming pools have decreased over time, many fatalities are still occurring every year. Absent supervision and a lack of appropriate fencing were the main contributing factors, with data on water familiarisation difficult to obtain.

Overall

Almost two thirds of drowning deaths in children under five in New South Wales occurred in private swimming pools. Although, the burden of private swimming pool drowning incidents respective to other aquatic locations changed yearly, the proportion was consistently high, indicating home pool safety needs to be a continued focus in the child drowning prevention area.

Males accounted for almost two thirds of the drowning deaths in New South Wales. It is interesting to note that the burden of male drowning was most pronounced at the upper end of this age group (4 years to < 5 years), suggesting the trend for higher drowning rates among males 6 begins in childhood.

A large proportion of drowning deaths occurred within the 12-35 months life stage, a time when young children are rapidly becoming more mobile. Parents face new challenges during this time period, emphasising the importance of supervising active toddlers. The majority of drowning deaths among young children occurred as a result of a fall into water, further highlighting the importance of adult supervision around water.

Although drowning deaths peaked in seasons of warmer weather (Summer, Spring), they still occurred all year round. Similarly, there were days with a higher number of incidents than other days but drowning deaths occurred on every day of the week. Almost half of all deaths occurred in the afternoon, indicating this is a time when parents and other supervisors are more distracted and required to attend to multiple tasks which can divert their attention away from any children in their care.

Most drowning deaths in children under five occurred in home swimming pools. However, it should be noted that data collection on the type of swimming pool is often limited by the details present in the police report for a drowning case. A detailed description of the type of pool involved in the incident was not always available and as such, the number of fatalities which occurred in portable pools may have been higher as the nature of the pool was not consistently described in all cases.

Portable pools are a low cost, convenient option for many families. They are readily available but purchasers are often not aware of the legal requirements regarding fencing a portable pool, nor are they likely to be registered. As such, they warrant special consideration in the discussion around home pool safety.

Calculating drowning rates by population under five years and the number of registered swimming pools in LGAs allows the identification of high-risk areas, with the top ten LGAs calculated for each determinant (population and number of private swimming pools). In both cases, most of the listed LGAs are in regional, rather than metropolitan, areas. This has implications for drowning prevention work, suggesting areas which could be targeted in the future. However, these calculations are subject to the accuracy of the data used (population and number of registered swimming pools), noting that in particular, not all pools within an LGA will necessarily be registered.

Supervision

Lapses in supervision were common, often because the adult who was responsible for the child got distracted by another person or task. In many cases the child was in the vicinity of the adult responsible for supervising them but the adult was temporarily distracted by an everyday event, such as a conversation with another adult, answering the door or phone or attending to another child. In the time it took to attend to these other duties, the child was able to wander away unnoticed.

Drowning deaths at social gatherings, such as family get-togethers and parties, were another recurring theme. Although a number of adults were often present at these events, there was no designated supervisor who was responsible for supervising the children in and around the swimming pool. In these situations there were a large number of people, both adults and children present, however, it was no one person’s responsibility to supervise the children.

Similar situations arose when both parents were home with a child but it was unclear who was supervising the child at a particular time, with both parents believing the child was with the other parent. In one case, two professional carers were at home with a child, again without designating who was to be supervising the child at a particular time, only to have the child go missing.

In cases where more than one adult is present, it should be clear who is responsible for supervising any children at the home. If both parents of a child are home, it should be clearly communicated between both parents who is going to supervise the child. If a gathering is being held near a backyard swimming pool, there should be a designated child supervisor. If this person needs to leave the area for any reason, a replacement needs to be found. One way of effectively designating the supervisor is for them to wear a Keep Watch ‘Designated Child Supervisor’ hat, which is then passed onto another adult in the event the first supervisor needs to leave the pool area.
In a number of cases supervision was completely absent, with children left unattended for an extended period of time. Constant, active supervision is vital to keep young children safe around water. Parents need to give children their full attention, all of the time when they are in or around the water. While the child’s mother was the most common person responsible for supervision, grandparents, along with fathers, were also frequently responsible for supervision, making it crucial that they also understand the importance of active supervision at all times.

Another area of concern was supervision being left to the siblings of a young child, rather than a responsible adult. In a number of cases, children were left with older siblings who were given instructions to attend to the child, whether this was taking the child inside, putting them to bed or watching the child for a period of time. In some cases the child supervising was aged under twelve years. Children are not old enough to be able to recognise danger, nor are they able to respond in an emergency. Active supervision needs to be performed by an adult rather than an older sibling, who is not yet ready to assume that level of responsibility.

**Barriers**

A large proportion of private swimming pools were either completely or partially unfenced, with others only having temporary fencing around the pool, rather than properly constructed, permanent fencing. Some of these cases occurred in portable pools, such as inflatable or blow up pools, which were not fenced. Of the pools which were fenced, some were not compliant, while others were not adequately maintained.

Among pools with barriers, faulty fences and gates were widespread. In situations where a child gained access to the pool, a large proportion were able to do so due to faulty barriers. Often it was the pool gate which was faulty, with common issues including gates which did not close or latch automatically. In some cases gates only closed or latched automatically under certain conditions, such as closing the gate from a fully open rather than half open position.

Another common occurrence was pool owners attempting to temporarily fix faulty barriers themselves to restrict children’s access. These do-it-yourself solutions included the use of padlocks, chains and rope to secure gates. Ultimately, these ‘quick fixes’ were not effective in preventing children gaining access to the pool area.

In addition, several gates required particular tricks in order for them to close and latch properly, such as needing to lift the gate to meet the latch. Although the adults of the house might be aware of such techniques, it is unrealistic to expect that children will be able to follow them, such as an older sibling using the pool gate, should be attended to immediately and fixed as per the applicable standards, rather than temporary ‘quick fixes’ which do not adequately resolve the problem, such as a rope to keep a gate closed.

In several cases the gate to the pool was propped open, either to allow entry to family members or pets. Under these circumstances, children were able to walk into the pool area unhindered, without being accompanied by an adult. Pool gates should never be propped open as young children can quickly wander away from others and enter the pool without being noticed.

Some children gained access to the pool area by climbing on nearby objects, including outdoor furniture, buckets or lattice. Although the fence and gates were in working order, children were still able to enter the pool by using an object to climb high enough to open the gate themselves. It is important to clear the area surrounding the pool of any objects which could be used by a child to climb the fence or reach the gate.

**Water familiarisation**

It was difficult to draw any conclusions from the data on water familiarisation, as only a minority of cases had any information on the child’s swimming ability or history of swimming lessons. Of those cases with recorded information verifying the child’s swimming ability, all were described as non-swimmers. Only a couple of children were currently enrolled in swimming lessons. However, with so few cases offering a complete picture, it is impossible to make any judgements from this information.

**Cardio Pulmonary Resuscitation (CPR)**

In almost all cases with relevant information, CPR was enacted which is encouraging. There was only one circumstance where CPR was not commenced and this decision was made by emergency personnel. Parents performed CPR in the majority of cases, highlighting the importance of all parents of young children learning CPR. Enrolling in a first aid or resuscitation course will ensure they have the necessary skills to respond in an emergency.
LIMITATIONS

• It should be noted that information on causal factors was not available in the instances of an open case (i.e. case still under investigation) or if documents containing the narrative of the circumstances are not attached to the case in the NCIS (e.g. Police Report or Coronal Finding / Inquest Report). It should be noted there may be a higher number of unknown variables in cases in regional / rural areas or more recent years where a larger proportion of cases may still be under investigation within the coronial system. Any case which is the subject of a coronial inquest that is currently underway will also not have information available. At the time of conducting analysis and writing this report, 88.0% of cases were closed.

• The findings of this study have also been limited by minimal or completely missing information within closed cases. It is difficult to gain a more complete understanding of child drowning in backyard swimming pools without more accurate and comprehensive data.

• Data collection regarding the type of swimming pool involved in a drowning death is dependent upon the quality of electronically available information within the NCIS. As such, this report may have underestimated the number of portable pools involved in drowning cases as this level of detail was not always present.

• Crude drowning rate calculations are subject to the accuracy of data on registered home swimming pools. If residents have not registered their pool, then this report may have underestimated the number of swimming pools within each LGA, affecting the presented crude drowning rates.

CONCLUSION

Despite widespread agreement on the strategies to prevent drowning deaths of young children and improvements to Australian Standards, strengthened pool fencing legislation and the introduction of inspection regimes in several states, an unacceptably high number of drowning deaths continue to occur. The most common reasons for this are a lack of adult supervision and defects with pool barriers, namely missing fences and faulty gates.

The Keep Watch program promotes four key actions to prevent child drowning but it cannot succeed without wider support from the community and government. It is clear that supervision can fail, resulting in young children slipping away from parents unnoticed. If parents get distracted, a barrier is the next line of defence in keeping children safe around water. However, pool fences and gates only function effectively if they are correctly installed and regularly maintained. Although potentially onerous at times, constant vigilance in this regard does save lives.
REFERENCES


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To ensure we stay in tune with the needs of the diverse communities that make up our aquatic facilities, Royal Life Saving maintains a network of offices throughout NSW.

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