

### 3 Deaths of children by drowning in Western Australia

As discussed in Chapter 2, in 2005, the WHO adopted a definition of drowning, which incorporated both fatal and non-fatal drowning incidents.

It is widely acknowledged that the full impact of drowning is not limited to drowning deaths. An ongoing long-term Australian study shows:

...in about 20% of drowning with or without morbidity there is some form of long term behavioural and learning impairment and in 10% of cases there is severe neurological deficit.<sup>31</sup>

In 2010, Moran explored the inclusion of both fatal and non-fatal drowning incidents in the WHO definition of drowning, as follows:

Fatal and non[-]fatal drowning statistics are often used in drowning prevention advocacy as indicators of the magnitude of the problem and its cost to society ... It has been estimated that for each fatal drowning, between one and four non[-]fatal events are serious enough to warrant hospitalization...The true extent of submersion incidents that may precipitate or constitute a drowning episode is probably much higher than estimates based on mortality and morbidity alone.<sup>32</sup>

...

Little is known about those victims who experience a life-threatening incident yet are never reported as “public health” or “rescue” statistics.<sup>33</sup>

To illustrate this broader concept of drowning, Moran refers to the widely used ‘iceberg phenomenon’ model, developed by Schuman, Rowe, Glazer and Redding,<sup>34</sup> who:

... used the visual metaphor of an iceberg to explore just how many people are subjected to serious risk of drowning without necessarily experiencing submersion, aspiration, or hypoxia ... The illustration identifies mortality and morbidity as the visual tip of the iceberg above water, underpinned below the water surface by rescue statistics, and nonreported, no-morbidity drowning episodes that further define the extent of risk of drowning.<sup>35</sup>

Taking into account the definition of drowning adopted by the WHO and the broader concept of drowning illustrated by the ‘iceberg phenomenon’ (Figure 1), as part of the Investigation the Office collected and analysed information regarding both fatal and non-fatal drowning incidents. These are discussed immediately below and in the following Chapters of the report.

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<sup>31</sup> The Centre for Trauma Care, prevention Education and Research, and Kids Health, *The NSW Study of Drowning and Near Drowning in children (0-16)*. The Children’s Hospital at Westmead, 2015, p. 3.

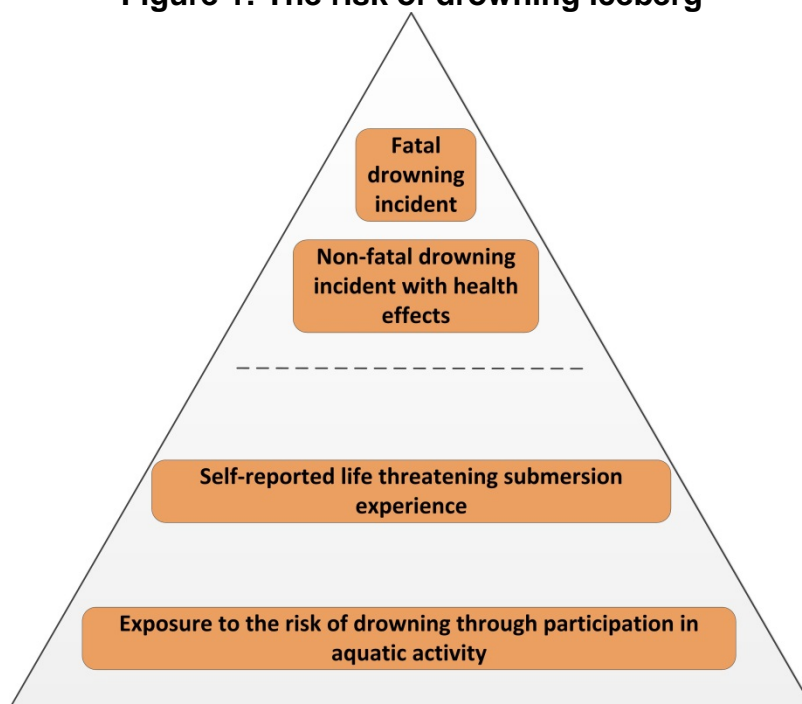
<sup>32</sup> Moran K, Risk of Drowning: The “Iceberg Phenomenon” Revisited, *International Journal of Aquatic Research and Education*, 2010, 4, p. 115, citing Meyer, R, Theodorou, A., & Berg, R, ‘Childhood drowning’, *Pediatrics in Review*, 27, 2006, pp. 163-169.

<sup>33</sup> Moran K, Risk of Drowning: The “Iceberg Phenomenon” Revisited, *International Journal of Aquatic Research and Education*, 2010, 4, p. 115.

<sup>34</sup> Schuman, S H, Rowe, J R, Glazer, H M and Redding, J S, ‘Risk of drowning: An iceberg phenomenon’, *Journal of the American College of Emergency Physicians*, 1977, 6, pp. 139-143.

<sup>35</sup> Moran K, Risk of Drowning: The “Iceberg Phenomenon” Revisited, *International Journal of Aquatic Research and Education*, 2010, 4, p. 116.

**Figure 1: The risk of drowning iceberg**



Source: Adapted by Ombudsman Western Australia from: Schuman, S, Rowe, J, Glazer, H and Redding, J.<sup>36</sup>

### 3.1 Prevalence and incidence of fatal and non-fatal drowning incidents in Western Australia

#### 3.1.1 Fatal and non-fatal drowning incidents in Western Australia

According to the Australian Bureau of Statistics (**ABS**), in 2015, one child died by drowning in Western Australia.<sup>37</sup>

The number of children who died by drowning in Western Australia between 2006 and 2015 ranged from one child to 11 children each year (Figure 2).<sup>38</sup>

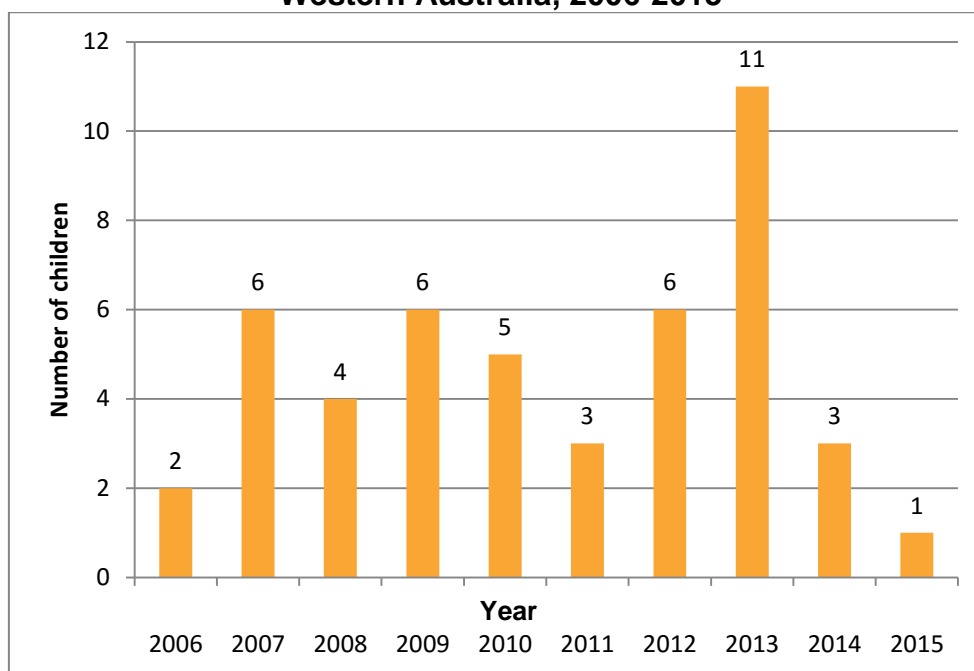
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<sup>36</sup> Schuman, S, Rowe, J, Glazer, H and Redding, J, 1977, 'Risk of drowning: An iceberg phenomenon', *Journal of American College of Emergency Physicians*, 19977, 6, p. 139-143.

<sup>37</sup> Australian Bureau of Statistics, *Causes of Death Data, Australia*, customised report, ABS, Canberra, 2017.

<sup>38</sup> Australian Bureau of Statistics, *Causes of Death Data, Australia*, customised report, ABS, Canberra, 2017.

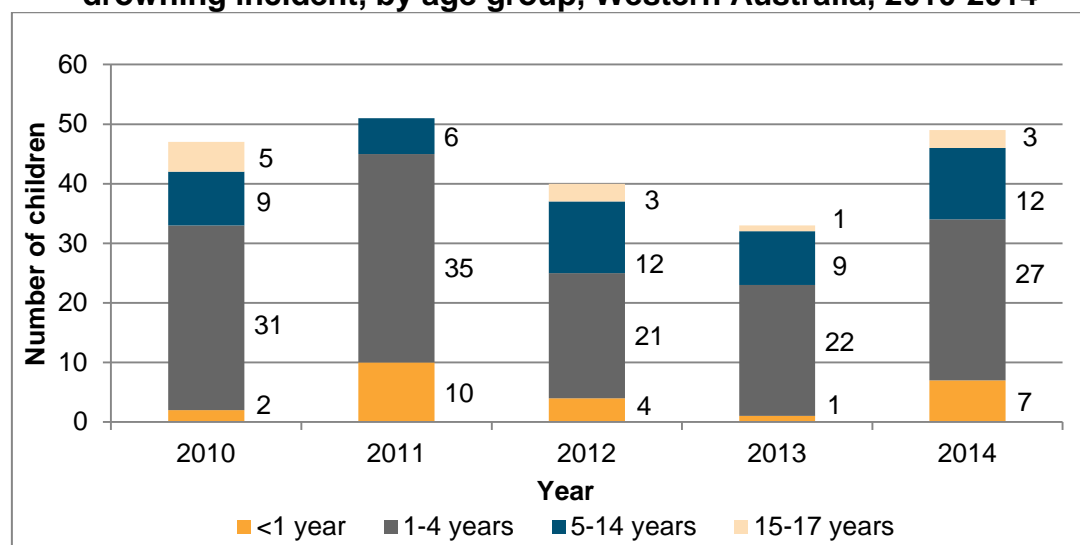
**Figure 2: Number of children who died by drowning, Western Australia, 2006-2015**



Source: Ombudsman Western Australia and Australian Bureau of Statistics

To more fully understand patterns and trends in drowning, the Office collected and analysed information regarding all children who were admitted to a hospital following a non-fatal drowning incident during the six-year investigation period. The Office found that in the calendar year 2014, in Western Australia, 49 children were admitted to a hospital following a non-fatal drowning incident. Thirty four of these 49 children were under the age of five years, which was more than double the number of children aged between five and 17 years who were admitted to a hospital in the same year (15 children).

Between 2010 and 2014, the number of children admitted to a hospital following a non-fatal drowning incident in Western Australia ranged from 33 children (in 2013) to 51 children (in 2011) (Figure 3).

**Figure 3: Number of children admitted to a hospital following a non-fatal drowning incident, by age group, Western Australia, 2010-2014**

Source: Ombudsman Western Australia

### 3.1.2 Fatal and non-fatal drowning incidents in Australia

To enable the Western Australian figures to be considered in context, this section provides comparable figures for Australia as a whole, as well as those individual Australian states for which this information is reported.<sup>39</sup>

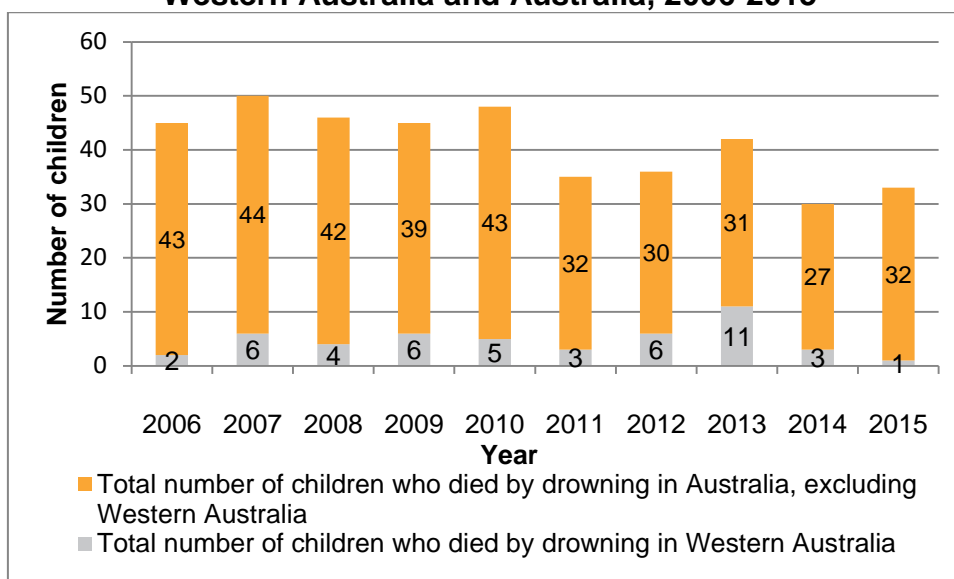
In 2015, in Australia, 33 children died by drowning. Twenty three of these 33 children were aged between zero and four years and nine were aged between five and 14 years.<sup>40</sup> The number of children who died by drowning in Australia between 2006 and 2015 is shown below (Figure 4).<sup>41</sup>

<sup>39</sup> The Australian Bureau of Statistics reports that data 'with very small counts may potentially result in an individual being identified'. In these instances, the Australian Bureau of Statistics randomly assigns 'small values to protect the confidentiality of individuals'. The Office has therefore excluded these states and territories from its reporting. Australian Bureau of Statistics, *Causes of Death Data, Australia*, customised report, ABS, Canberra, 2017.

<sup>40</sup> The Australian Bureau of Statistics reports that data 'with very small counts may potentially result in an individual being identified'. In these instances, the Australian Bureau of Statistics randomly assigns 'small values to protect the confidentiality of individuals'. The Office has therefore not reported on the number of children who died by drowning aged between 15 and 17 years. Australian Bureau of Statistics, *Causes of Death Data, Australia*, customised report, ABS, Canberra, 2017.

<sup>41</sup> Australian Bureau of Statistics, *Causes of Death Data, Australia*, customised report, ABS, Canberra, 2017.

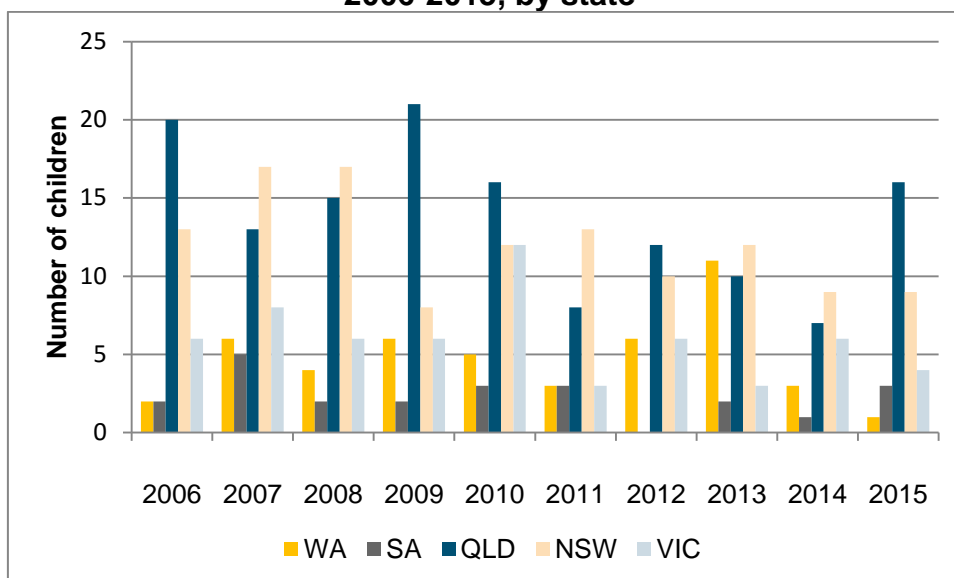
**Figure 4: Number of children who died by drowning, Western Australia and Australia, 2006-2015**



Source: Ombudsman Western Australia and Australian Bureau of Statistics

Figure 5 shows the number of children who died by drowning over the period 2006 to 2015, for Western Australia and some other Australian states.<sup>42</sup>

**Figure 5: Number of children who died by drowning, 2006-2015, by state**



Source: Ombudsman Western Australia and Australian Bureau of Statistics

<sup>42</sup> The Australian Bureau of Statistics reports that data 'with very small counts may potentially result in an individual being identified'. In these instances, the Australian Bureau of Statistics randomly assigns 'small values to protect the confidentiality of individuals'. The Office has therefore excluded these states and territories from its reporting. Australian Bureau of Statistics, *Causes of Death Data, Australia*, customised report, ABS, Canberra, 2017.

Information regarding the number of children admitted to a hospital following a non-fatal drowning incident for Australia as a whole and for other Australian states and territories was not publicly available.

### 3.2 Children involved in fatal and non-fatal drowning incidents during the six-year investigation period

Chapter 2 identifies that the Office analysed the 34 deaths in which a child had died by drowning during the six-year investigation period and that these children are referred to as **the 34 children who died by drowning**.

To better understand patterns and trends in drowning, bearing in mind the WHO's definition of drowning, the Office also collected and analysed information about children in Western Australia who, during the six-year investigation period, had:

- been admitted to a hospital as a result of a non-fatal drowning incident; or
- attended an emergency department at a hospital as a result of a non-fatal drowning incident.

During the six-year investigation period, 258 children were admitted to a hospital following a non-fatal drowning incident. In this report, these children are referred to as **the 258 children who were admitted to a hospital**.

In addition, during the six-year investigation period, 2,310 children attended an emergency department at a hospital following a non-fatal drowning incident. In this report, these children are referred to as **the 2,310 children who attended an emergency department at a hospital**.<sup>43</sup>

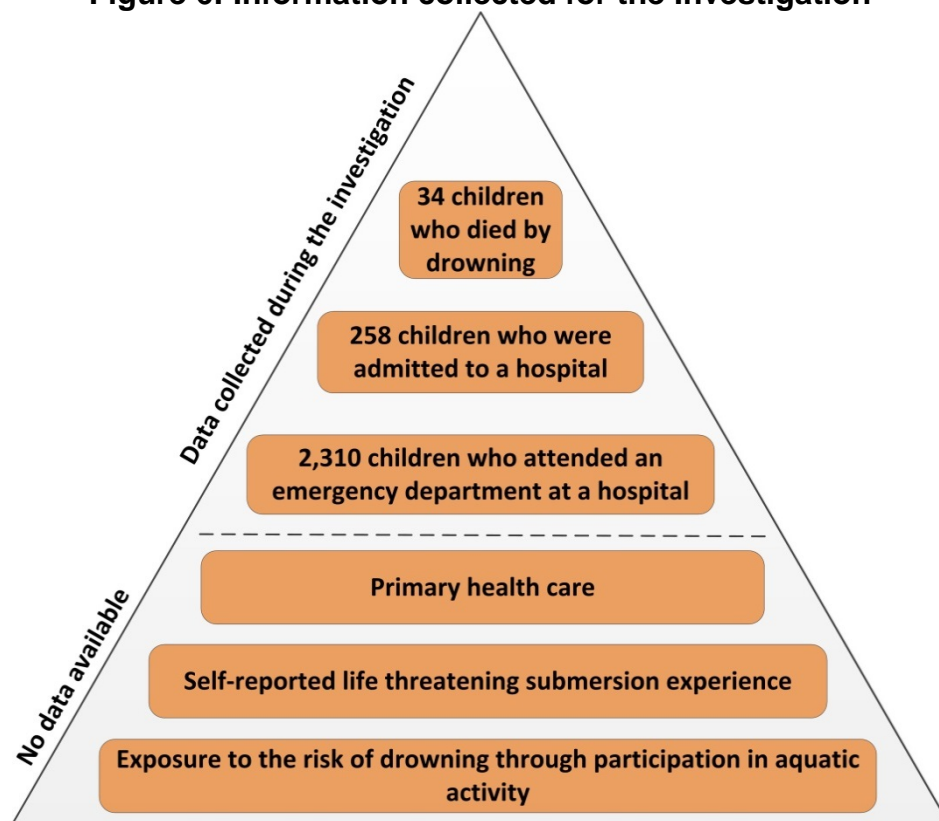
Where a child has been included as being admitted to a hospital following a non-fatal drowning incident, they have not also been included as attending an emergency department at a hospital, even if this also occurred. Similarly, where a child has been included as having died by drowning, they have not also been included as being admitted to a hospital or attending an emergency department at a hospital, even if this also occurred. This approach was chosen so as to focus the Office's analysis on the most serious consequence of the fatal or non-fatal drowning incident.

The information collected during the Investigation is depicted below using the Schuman et al. 'iceberg phenomenon' model of the risk of drowning (Figure 6).

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<sup>43</sup> Children may also have attended a non-hospital based health service such as a general practice or a nursing service following a non-fatal drowning incident.

**Figure 6: Information collected for the Investigation**



Source: Adapted by Ombudsman Western Australia from: Schuman, S, Rowe, J, Glazer, H and Redding, J.<sup>44</sup> Note: No data is available for self-reported life threatening submersion experiences however some of these experiences are reported to friends and family or reported through surveys of sample populations.

In summary, 34 children died by drowning, 258 children were admitted to a hospital and 2,130 children attended an emergency department at a hospital (but were not admitted) following a non-fatal drowning incident, during the six-year investigation period.

### 3.2.1 Age

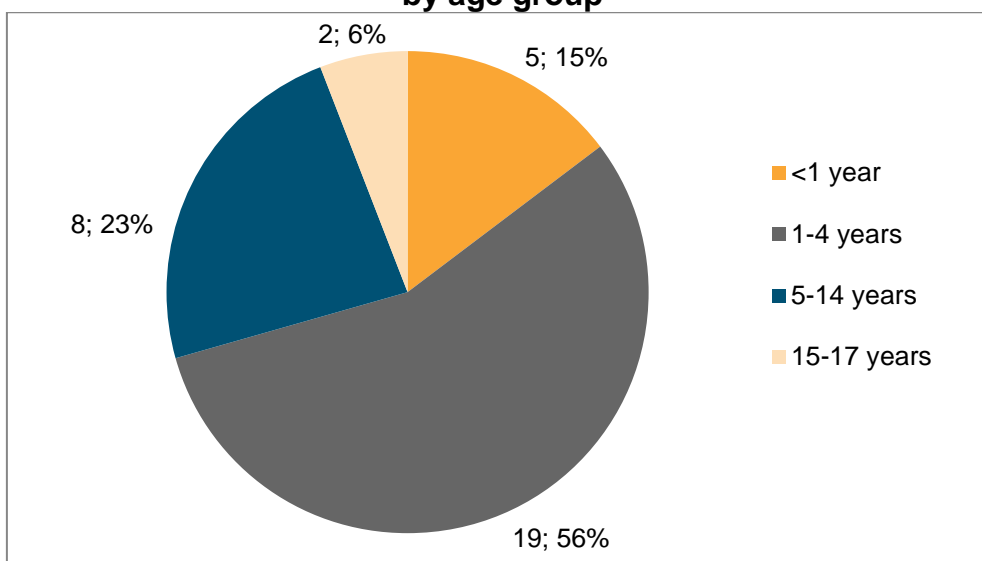
The Office found that the average age of the 34 children who died by drowning was four years and four months. Almost three quarters of the 34 children who died by drowning were aged under five years (24 children or 71 per cent). Five of the 34 children who died by drowning were aged less than one year, 19 were aged between one and four years, eight were aged between five and 14 years and two were aged between 15 and 17 years (Figure 7).

These findings are consistent with the research literature, which identifies that, in Australia '[c]hildren aged 0 – 4 years had the highest rate of drowning'.<sup>45</sup>

<sup>44</sup> Schuman, S, Rowe, J, Glazer, H and Redding, J, 1977, 'Risk of drowning: An iceberg phenomenon', *Journal of American College of Emergency Physicians*, 1997, 6, p139-143.

<sup>45</sup> Franklin, R, Scarr, J and Pearn, J, 'Reducing drowning deaths: the continued challenge of immersion fatalities in Australia', *Medical Journal of Australia*, 192, 3, 2010, pp. 123.

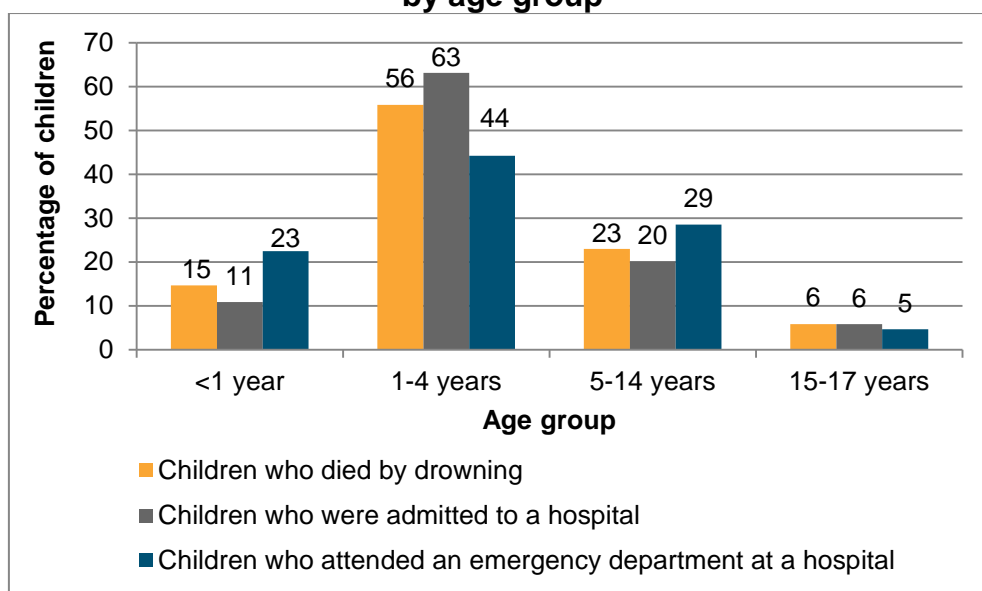
**Figure 7: Number of children who died by drowning, by age group**



Source: Ombudsman Western Australia

As shown in Figure 8, 74 per cent (or 191) of the 258 children who were admitted to a hospital and 67 per cent (or 1,542) of the 2,310 children who attended an emergency department at a hospital following a non-fatal drowning incident were aged under five years.

**Figure 8: Percentage of children who died by drowning, who were admitted to a hospital or who attended an emergency department at a hospital following a non-fatal drowning incident, by age group**



Source: Ombudsman Western Australia

Note: Percentages do not add to 100 due to rounding.

Overall, the Office found that almost three quarters of the children who died by drowning or were admitted to a hospital following a non-fatal drowning incident, and two thirds of children who attended an emergency department following a non-fatal drowning incident were aged under five years.



### 3.2.2 Sex

The Office found that, of the 34 children who died by drowning, 23 (68 per cent) were male and 11 (32 per cent) were female.

This finding is consistent with the research literature which has found that male children had a higher rate of death by drowning than female children and that this disparity increases with age, as follows:

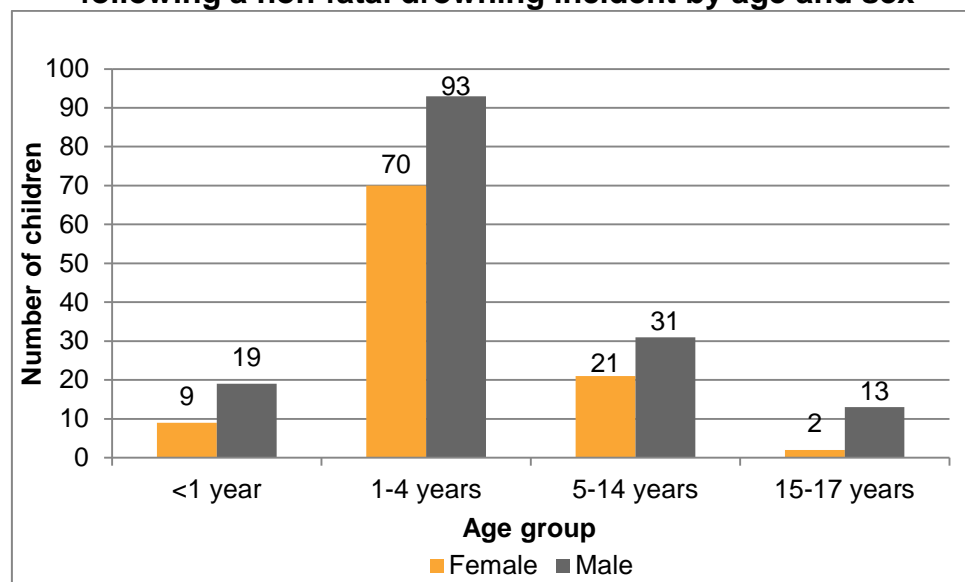
Between 2002 and 2012, males accounted for 77% of all drowning deaths in the 5–19 years age group compared to 63% of the drowning deaths in the 0-4 years age group ...

The predominance of males as drowning victims is even more evident in the late teen years (ages 15-19), as 87% of all drowning deaths in this age group involved males. This may be reflective of increased risk taking behaviour and exposure to drowning hazards in older boys that should be further explored.<sup>46</sup>

The Office also found that the disparity between the sexes increased with age.

Of the 258 children who were admitted to a hospital following a non-fatal drowning incident, 156 were male children (60 per cent) and 102 were female children (40 per cent). More male children were admitted to a hospital following a non-fatal drowning incident than female children across all age groups, as shown in Figure 9.

**Figure 9: Number of children who were admitted to a hospital, following a non-fatal drowning incident by age and sex**



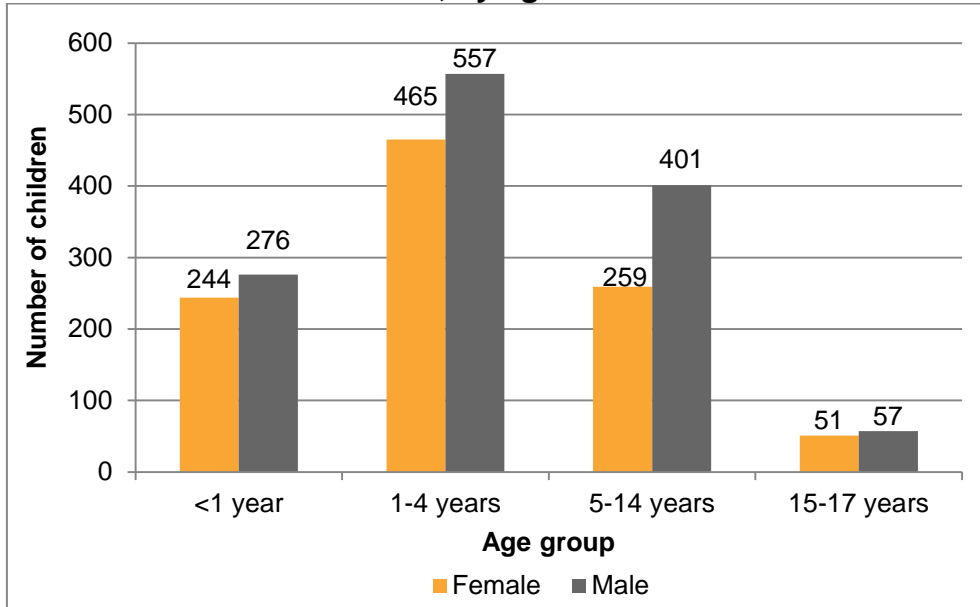
Source: Ombudsman Western Australia

Of the 2,310 children who attended an emergency department at a hospital following a non-fatal drowning incident, 1,291 were male children (56 per cent) and 1,019 were female children (44 per cent). More male children attended an emergency department at a

<sup>46</sup> Queiroga, AC and Peden, A, (2013), *A 10 year analysis of drowning in children and adolescents aged 5-19 years in Australia: The forgotten 50%*. Royal Life Saving Society Australia, Australia, Sydney, p. 6.

hospital following a non-fatal drowning incident than female children across all age groups, as shown in Figure 10.

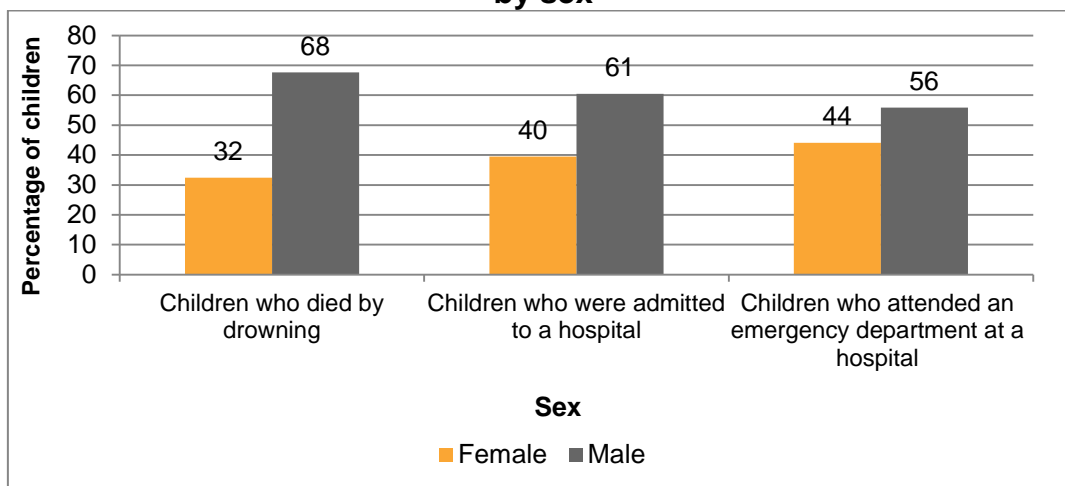
**Figure 10: Number of children who attended an emergency department at a hospital following a non-fatal drowning incident, by age and sex**



Source: Ombudsman Western Australia

Overall, the Office found that more male children than female children died by drowning, and more male children than female children were admitted to a hospital and attended an emergency department at a hospital following a non-fatal drowning incident (Figure 11).

**Figure 11: Percentage of children who died by drowning, who were admitted to a hospital or who attended an emergency department at a hospital following a non-fatal drowning incident, by sex**



Source: Ombudsman Western Australia

Note: Percentages do not add to 100 due to rounding.

### 3.2.3 Region of residence

Using regions defined by the ABS,<sup>47</sup> the Office analysed the postcodes of the usual residence of the 34 children who died by drowning and found that:

- twenty-four children (71 per cent) resided in a major city or an inner regional area;
- eight children (24 per cent) resided in an outer regional area;
- no children resided in a remote region; and
- two children (six per cent) resided in a very remote region.<sup>48</sup>

The Office's findings are consistent with Royal Life Saving Society Australia's (RLSSA) report on all drowning deaths that occurred in 2014-2015, which identified that:

Sixty six percent of drowning deaths in 2014/15 took place in areas deemed to be Major Cities or Inner Regional.

...

Ten percent of all drowning deaths in 2014/15 occurred in areas deemed to be Remote or Very Remote.<sup>49</sup>

The Office also analysed the postcodes of the usual residence of the 258<sup>50</sup> children who were admitted to a hospital and the 2,310<sup>51</sup> children who attended an emergency department at a hospital following a non-fatal drowning incident. As shown in Figure 12, the Office found that the admission rates to a hospital of the children residing in very remote Western Australia were higher than the admission rates of those children residing elsewhere. In contrast, children residing in major cities of Western Australia had a higher rate of attendance at an emergency department at a hospital than children residing elsewhere. For comparative purposes, the Office's analysis also identifies the population of children in each region in 2011.<sup>52</sup>

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<sup>47</sup> For this purpose, the Office categorised the usual residence of the children into 'Remoteness Areas' as defined by the Australian Bureau of Statistics' Australian Statistical Geography Standard (ASGS). For more information see: Australian Bureau of Statistics, *Australian Statistical Geography Standard (ASGS): Volume 5 - Remoteness Structure*, cat. no. 1270.0.55.005, ABS, Canberra, July 2011.

<sup>48</sup> Note: Percentages do not add up to 100 due to rounding.

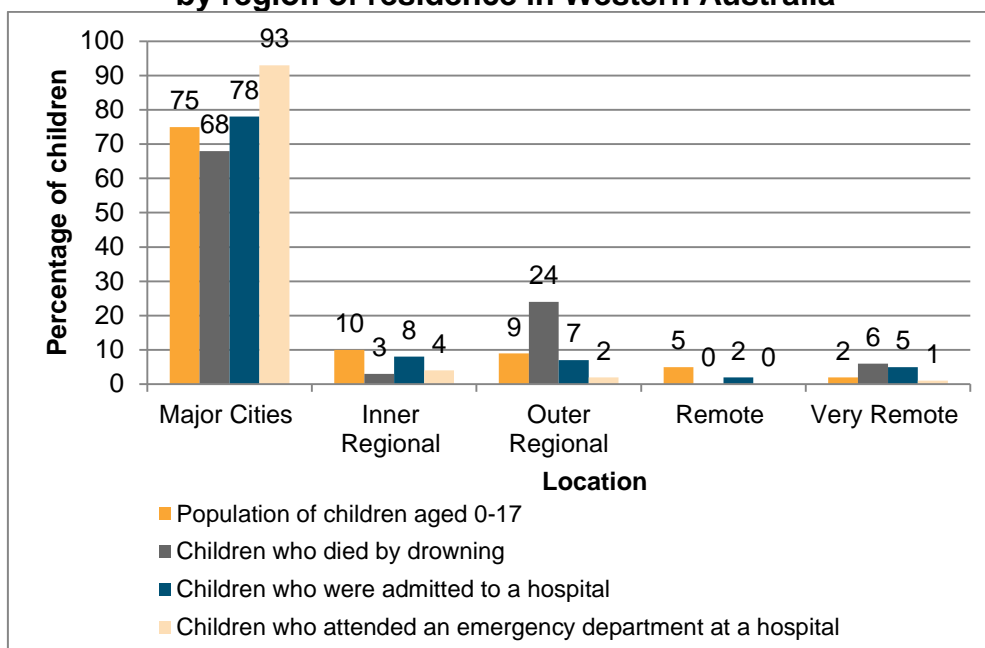
<sup>49</sup> Royal Life Saving Society Australia, *National Drowning Report 2015*, 2015, viewed 15 February 2016, [http://www.royallifesaving.com.au/\\_\\_data/assets/pdf\\_file/0006/14559/RLS\\_NDR2015\\_Report\\_LR.pdf](http://www.royallifesaving.com.au/__data/assets/pdf_file/0006/14559/RLS_NDR2015_Report_LR.pdf), p. 28,

<sup>50</sup> The postcodes for the residences of 17 children who were admitted to hospital included two or more ABS regions; a single region of residence for these children was therefore unascertainable and accordingly these 17 children were excluded from this analysis.

<sup>51</sup> The postcodes for the residences of 32 children who attended an emergency department included two or more ABS regions; a single region of residence for these children was therefore unascertainable and accordingly these 32 children were excluded from this analysis.

<sup>52</sup> To determine the population of children aged 0 to 17 in each 'Remoteness Area' the Office generated a customised table using the Australian Bureau of Statistics data '2011 Census – Usual Address and Internal Migration', *Census of Population and Housing 2011*.

**Figure 12: Percentage of children who died by drowning, who were admitted to a hospital, or who attended an emergency department at a hospital following a non-fatal drowning incident, by region of residence in Western Australia**



Source: Ombudsman Western Australia

### 3.2.4 Country of birth

The Office found that, of the 34 children who died by drowning, 32 (94 per cent) were born in Australia and two (6 per cent) were born outside Australia. For comparison, in 2011, children and young people who were born outside Australia made up 14 per cent of the population aged under 18 years in Western Australia.<sup>53</sup>

Information about country of birth was not available for the 258 children who were admitted to a hospital or the 2,310 children who attended an emergency department at a hospital following a non-fatal drowning incident.

The Office collected additional data regarding the place of birth of the parents of the children who died by drowning. Of the 32 children who died by drowning and who were born in Australia, eight children (25 per cent) had a parent or parents who were born outside Australia (in New Zealand, China, England, Germany and Kenya). For comparison, in 2011, 20 per cent of the population of Australia had at least one parent born outside Australia.<sup>54</sup>

Of these eight children:

- three children were born in Australia with both parents born outside Australia; and

<sup>53</sup> Australian Bureau of Statistics, *Migration, Australia, 2010-11, Estimated Resident Population: Customised Data Report*, Estimated Resident Population (ERP) 0-17 year olds and all ages, Western Australia, 30 June 2011, cat. no. 3412.0, ABS.

<sup>54</sup> Australian Bureau of Statistics, *Reflecting a Nation: Stories from the 2011 Census, 2012-2013*, cat. no. 2071.0, ABS, June 2012.

- five children were born in Australia with one parent born outside Australia. The research literature suggests that people born in some countries other than Australia are believed to be at a greater risk of drowning because:

Although the situation is improving, lifesaving systems are not as common in developing countries and even some high income countries, meaning that tourists and recently arrived migrants are at a greater risk of drowning due to lower levels of awareness and foundation aquatic skills.

...

This issue is worsened by an often heightened risk of drowning or injury due to a lack of knowledge about Australian aquatic conditions.<sup>55</sup>

Bearing in mind the relatively low numbers of deaths, it is not yet possible to determine whether this is the case in Western Australia.

Of the 10 children who died by drowning and who were either born outside Australia or had a parent born outside Australia:

- six children were aged between zero and four years; and
- four children were aged between five and 14 years.

### 3.2.5 Aboriginal and Torres Strait Islander children

The Office found that five (15 per cent) of the 34 children who died by drowning were recorded as being Aboriginal and no children were recorded as being Torres Strait Islander.<sup>56</sup>

For comparison, in 2011 Aboriginal and Torres Strait Islander children made up six per cent of children aged between zero and 17 years in Western Australia.<sup>57</sup>

Of the five Aboriginal children who died by drowning:

- two Aboriginal children (40 per cent) drowned in a private swimming pool; and
- three Aboriginal children (60 per cent) drowned in a river or dam.

The Office's findings are consistent with the research literature, which suggests that the risk of drowning for Aboriginal children:

... is three times higher than other Australian children aged 0–14 years and is ranked the second most common cause of injury death. A review of drowning

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<sup>55</sup> Australian Water Safety Council, *Australian Water Safety Strategy 2012-15*, Sydney, 2012, p. 34, citing the Australian Water Safety Council, *Australian National Water Safety Plan 2004-07*, Sydney, 2004.

<sup>56</sup> The Department of Health provided the Office with information about Aboriginal origin of the 34 children who died by drowning. In this respect, the Department of Health records 'Aboriginal not Torres Strait Islander origin,' 'Torres Strait Islander not Aboriginal origin,' 'Not-Aboriginal or Torres Strait Islander origin', 'Other' and 'Unknown'.

<sup>57</sup> Developed using the Australian Bureau of Statistics, '2011 Census Counts – Aboriginal and Torres Strait Islander Peoples', *Census of Population and Housing – Counts of Aboriginal and Torres Strait Islander Australians, 2011*, cat. no. 2075.0, ABS, Canberra, June 2012.

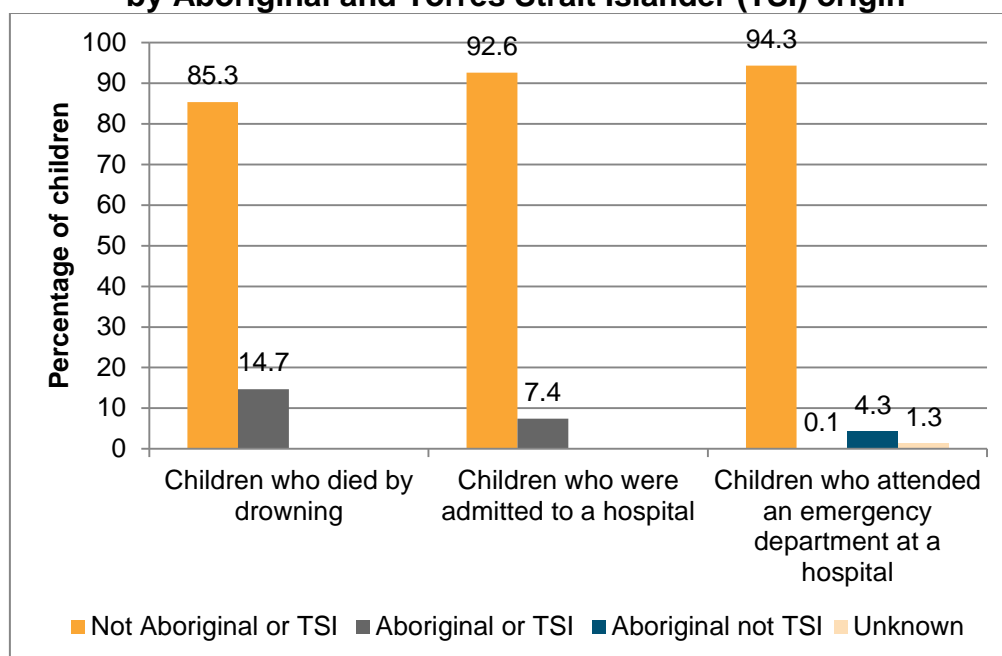
data indicates limited water safety awareness combined with alarmingly low participation levels in swimming and water safety programs as key factors.<sup>58</sup>

Of the 258 children who were admitted to a hospital, 19 children (7.4 per cent) were recorded as being Aboriginal and/or Torres Strait Islander (Figure 13).<sup>59</sup>

Of the 2,310 children who attended an emergency department at a hospital, 102 children (4.4 per cent) were recorded as being Aboriginal and/or Torres Strait Islander (Figure 13).<sup>60</sup>

Bearing in mind the relatively low numbers of deaths, Aboriginal children were twice as likely to die by drowning as non-Aboriginal children. Aboriginal children were as likely as non-Aboriginal children to be admitted to a hospital and less likely to attend an emergency department following a non-fatal drowning incident.

**Figure 13: Percentage of children who died by drowning, who were admitted to a hospital or who attended an emergency department at a hospital, following a non-fatal drowning incident, by Aboriginal and Torres Strait Islander (TSI) origin**



Source: Ombudsman Western Australia

<sup>58</sup> Royal Life Saving Society Western Australia, *Swim and survive: Indigenous participation*, viewed 22 July 2015, <<https://www.lifesavingwa.com.au/programs/swim-and-survive/accessandequity/participation/indigenous-participation>>.

<sup>59</sup> The Department of Health provided the Office with information about Aboriginal origin of the 258 children who were admitted to a hospital following a non-fatal drowning incident. In this respect, the Department of Health records 'Aboriginal or Torres Strait Islander origin,' and 'Not Aboriginal or Torres Strait Islander origin'.

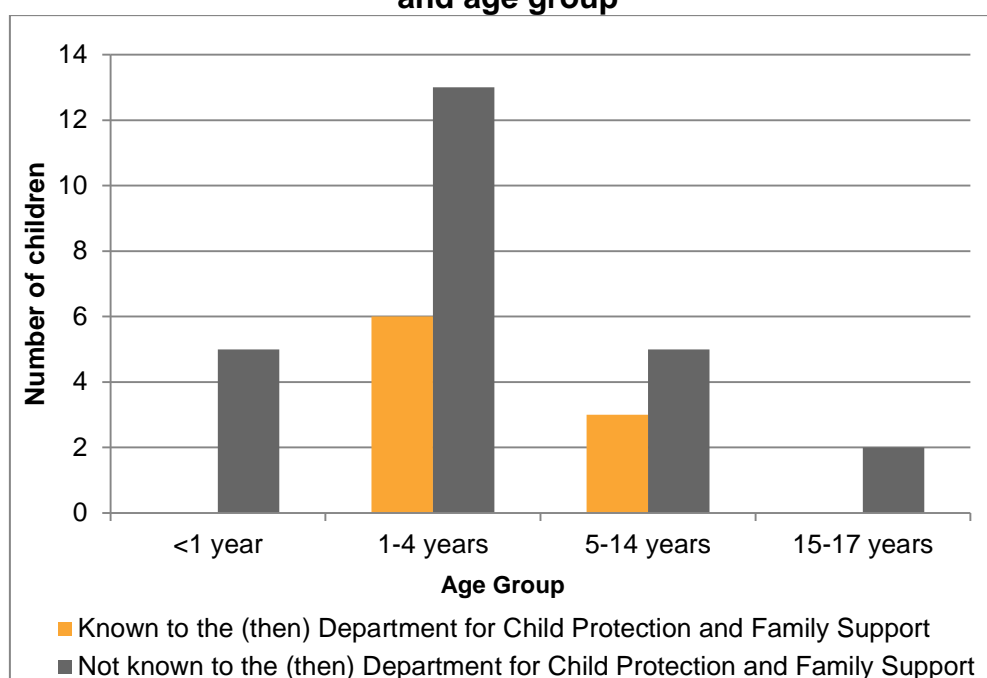
<sup>60</sup> The Department of Health provided the Office with information about Aboriginal origin of the 2,310 children who attended an emergency department at a hospital following a non-fatal drowning incident. In this respect, the Department of Health records 'Aboriginal not Torres Strait Islander origin,' 'Aboriginal or Torres Strait Islander origin,' 'Not Aboriginal or Torres Strait Islander origin' and 'Unknown'.

### 3.2.6 Children known to the (then) Department for Child Protection and Family Support

The Office found that nine (26 per cent) of the 34 children who died by drowning were known to the (then) Department for Child Protection and Family Support (DCPFS) (Figure 14). Reasons for the family to be known to DCPFS included:

- financial assistance;
- assistance with postnatal depression;
- family support;
- Best Beginnings program; and
- neglect and wellbeing concerns including family and domestic violence concerns.

**Figure 14: Number of children who died by drowning, by whether they were known to the (then) Department for Child Protection and Family Support and age group**



Source: Ombudsman Western Australia

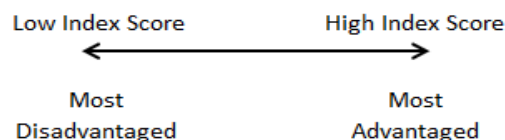
### 3.2.7 Socioeconomic status

The Office analysed the postcodes of the usual residence of the 34 children who died by drowning, the 258 children who were admitted to a hospital and the 2,310 children who attended an emergency department at a hospital<sup>61</sup> following a non-fatal drowning incident using the (state-based) Index of Relative Socio-economic Advantage and Disadvantage (IRSAD).

<sup>61</sup> Data was available for all of the 34 children who died by drowning. Of the 258 children who were admitted to a hospital: one child resided outside of Western Australia; and for one child, the suburb was not recorded. Of the 2,310 who attended an emergency department at a hospital: for 18 children, suburbs were not recorded; 10 children resided in suburbs that were not indexed; and 10 children resided outside of Western Australia.

The ABS describes the IRSAD as follows:

The Index of Relative Socio-economic Advantage and Disadvantage (IRSAD) summarises information about the economic and social conditions of people and households within an area, including both relative advantage and disadvantage measures.<sup>62</sup>



Based on its IRSAD score, the ABS assigns a 'decile' for each postcode area as follows:

... all areas are ordered from lowest to highest score, then the lowest 10% of areas are given a decile number of 1, the next lowest 10% of areas are given a decile number of 2 and so on, up to the highest 10% of areas which are given a decile number of 10. This means that areas are divided up into ten equal sized groups, depending on their score.<sup>63</sup>

The ABS further advises that '[a]s measures of socio-economic conditions, the indexes are best interpreted as ordinal measures that rank (order) areas ... we generally recommend using the index rankings and quantiles (e.g. deciles) for analysis, rather than using the index scores'.<sup>64</sup>

The Office also analysed ABS data regarding the usual resident population in each decile and identified that of Western Australia's usual resident population:

- 1.41 per cent resided in decile 1;
- 3.71 per cent resided in decile 2;
- 5.77 per cent resided in decile 3;
- 7.08 per cent resided in decile 4;
- 15.83 per cent resided in decile 5;
- 9.30 per cent resided in decile 6;
- 12.50 per cent resided in decile 7;
- 10.61 per cent resided in decile 8;
- 14.82 per cent resided in decile 9; and
- 18.96 per cent resided in decile 10.<sup>65</sup>

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<sup>62</sup> Australian Bureau of Statistics, *Census of Population and Housing: Socio-Economic Indexes for Areas (SEIFA), Australia, 2011*, IRSAD, ABS, Canberra, at March 2013, cat. No. 2033.0.55.001 - viewed 21 June 2016, <<http://www.abs.gov.au/ausstats/abs@.nsf/Lookup/2033.0.55.001main+features100042011>>.

<sup>63</sup> Australian Bureau of Statistics, *Census of Population and Housing: Socio-Economic Indexes for Areas (SEIFA), Australia, 2011*, IRSAD, ABS, Canberra, at March 2013, cat. No. 2033.0.55.001 - viewed 21 June 2016, <<http://www.abs.gov.au/ausstats/abs@.nsf/Lookup/2033.0.55.001main+features100042011>>.

<sup>64</sup> Australian Bureau of Statistics, *Technical Paper: Socio-Economic Indexes for Areas (SEIFA 2011)*, ABS, Canberra, March 2013, p. 5.

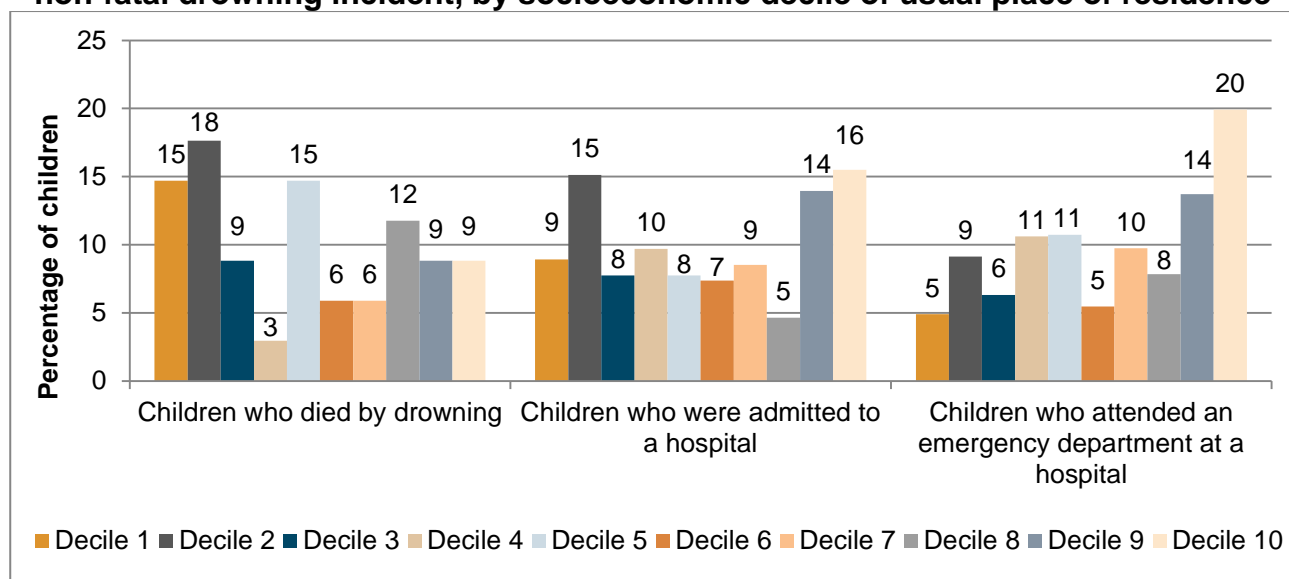
<sup>65</sup> Ombudsman Western Australia analysis based on Australian Bureau of Statistics, *Census of Population and Housing: Socio-Economic Indexes for Areas (SEIFA), Australia, 2011*, IRSAD, ABS, Canberra, at March 2013, cat. No. 2033.0.55.001 - viewed 21 June 2016, <<http://www.abs.gov.au/ausstats/abs@.nsf/Lookup/2033.0.55.001main+features100042011>>.



The Office found that:

- While 1.41 per cent of the Western Australian population resided in decile 1 suburbs at the time of the 2011 Census, 15 per cent of children who died by drowning resided in decile 1 suburbs (relatively socioeconomically disadvantaged suburbs). That is, children who died by drowning and resided in decile 1 suburbs were overrepresented by a factor of 10.7. In contrast, while 18.96 per cent of the Western Australian population resided in decile 10 suburbs, 9 per cent of children who died by drowning resided in decile 10 suburbs (relatively socioeconomically advantaged suburbs). That is, children who died by drowning and resided in decile 10 suburbs were underrepresented by a factor of 0.5;
- While 1.41 per cent of the Western Australian population resided in decile 1 suburbs at the time of the 2011 Census, 9 per cent of children who were admitted to a hospital following a non-fatal drowning incident resided in decile 1 suburbs (relatively socioeconomically disadvantaged suburbs). That is, children who were admitted to a hospital following a non-fatal drowning incident and resided in decile 1 suburbs were overrepresented by a factor of 6.4. In contrast, while 18.96 per cent of the Western Australian population resided in decile 10 suburbs, 16 per cent of children who were admitted to a hospital following a non-fatal drowning incident resided in decile 10 suburbs (relatively socioeconomically advantaged suburbs). That is, children who were admitted to a hospital following a non-fatal drowning incident and resided in decile 10 suburbs were underrepresented by a factor of 0.8; and
- While 1.41 per cent of the Western Australian population resided in decile 1 suburbs at the time of the 2011 Census, 5 per cent of children who attended an emergency department at a hospital following a non-fatal drowning incident resided in decile 1 suburbs (relatively socioeconomically disadvantaged suburbs). That is, children who attended an emergency department at a hospital following a non-fatal drowning incident and resided in decile 1 suburbs were overrepresented by a factor of 3.6. In contrast, while 18.96 per cent of the Western Australian population resided in decile 10 suburbs, 20 per cent of children who attended an emergency department at a hospital following a non-fatal drowning incident resided in decile 10 suburbs (relatively socioeconomically advantaged suburbs). That is, children who attended an emergency department at a hospital following a non-fatal drowning incident and resided in decile 10 suburbs were approximately representative of the population (with a factor of 1.1) (Figure 15).

**Figure 15: Percentage of children who died by drowning, who were admitted to a hospital, or who attended an emergency department at a hospital, following a non-fatal drowning incident, by socioeconomic decile of usual place of residence**



Source: Ombudsman Western Australia

Note: Percentages do not add to 100 due to rounding.

These findings are consistent with the research literature, which suggests that socioeconomic status is a risk factor for drownings.<sup>66</sup> For example, Kidsafe WA observes that socioeconomic status is a risk factor in all causes of child injury and death, as follows:

The lower the socioeconomic status the higher the risk of injury and death due to injury. Education, income and employment influence the opportunities for knowledge about safety, access to care services, quality housing facilities and furniture, along with safety products. Children from poorer families are generally disposed to be more affected by injuries.<sup>67</sup>

### 3.3 Circumstances of fatal and non-fatal drowning incidents during the six-year investigation period

#### 3.3.1 Definition of swimming pool

The *National Construction Code 2016: Building Code of Australia* Volume One Part A1 (the **Building Code of Australia**) defines a swimming pool as follows:

**Swimming pool** means any excavation or structure containing water and principally used, or that is designed, manufactured or adapted to be principally used for swimming, wading, paddling, or the like, including a bathing or wading pool, or spa.<sup>68</sup>

<sup>66</sup> Royal Life Saving Society Australia, *National Drowning Report 2015*, 2015, viewed 15 February 2016, <[http://www.royallifesaving.com.au/\\_\\_data/assets/pdf\\_file/0006/14559/RLS\\_NDR2015\\_Report\\_LR.pdf](http://www.royallifesaving.com.au/__data/assets/pdf_file/0006/14559/RLS_NDR2015_Report_LR.pdf)>, p. 26.

<sup>67</sup> Richards, J and Leeds, M, *Child Injury Overview*, Kidsafe Western Australia, Child Accident Prevention Foundation of Australia, Perth, 2012, p. 6, citing Ballestas, T, Xiao, J, McEvoy, S & Somerford, P, *The Epidemiology of Injury in Western Australia, 2000-2008*, Department of Health WA, Perth, 2011.

<sup>68</sup> Australian Building Codes Board, *National Construction Code 2016: Volume One Building Code of Australia Class 2 to Class 9 Buildings*, February 2016, p. 32.

Regulation 3 of the *Building Regulations 2012* further defines a private swimming pool as follows:

**private swimming pool** means a swimming pool —

- (a) that is associated with —
  - (i) a Class 1a building; or
  - (ii) less than 30 sole-occupancy units in a Class 2 building; or
  - (iii) a Class 4 part of a building;
- and
- (b) which has the capacity to contain water that is more than 300 mm deep;
- ...

The Building Code of Australia defines the classes of buildings referred to in regulation 3 of the *Building Regulations 2012* as follows:

**Class 1:** One or more buildings which in association constitute-

Class 1a – a single dwelling being-

- (i) a detached house; or
- (ii) one of a group of two or more attached dwellings, each being a building, separated by a fire-resisting wall, including a row house, terrace house, town house or villa unit; or

...

**Class 2:** A building containing 2 or more sole-occupancy units each being a separate dwelling.

...

**Class 4:** A dwelling in a building that is Class 5 [an office building], 6 [a shop or other building for the sale of goods by retail or the supply of services direct to the public], 7 [a car park or for storage or display of goods or produce for sale by wholesale], 8 [a laboratory or a building involved in the production, repair or cleaning of goods], or 9 [public building] if it is the only dwelling in the building.<sup>69</sup>

In this report, the term **private swimming pool** is used to refer to both a private swimming pool and a private spa. Where it is not known whether the swimming pool or spa is a private swimming pool or spa, or is not a private swimming pool or spa, or this distinction is not relevant, the term **swimming pool** is used.

### 3.3.2 Location of drowning incidents

The Office found that, for 16 (47 per cent) of the 34 children who died by drowning, the fatal drowning incident occurred in a private swimming pool (Figure 16).

For 170 (66 per cent) of the 258 children who were admitted to a hospital following a non-fatal drowning incident, the incident occurred in a swimming pool. On the basis of the

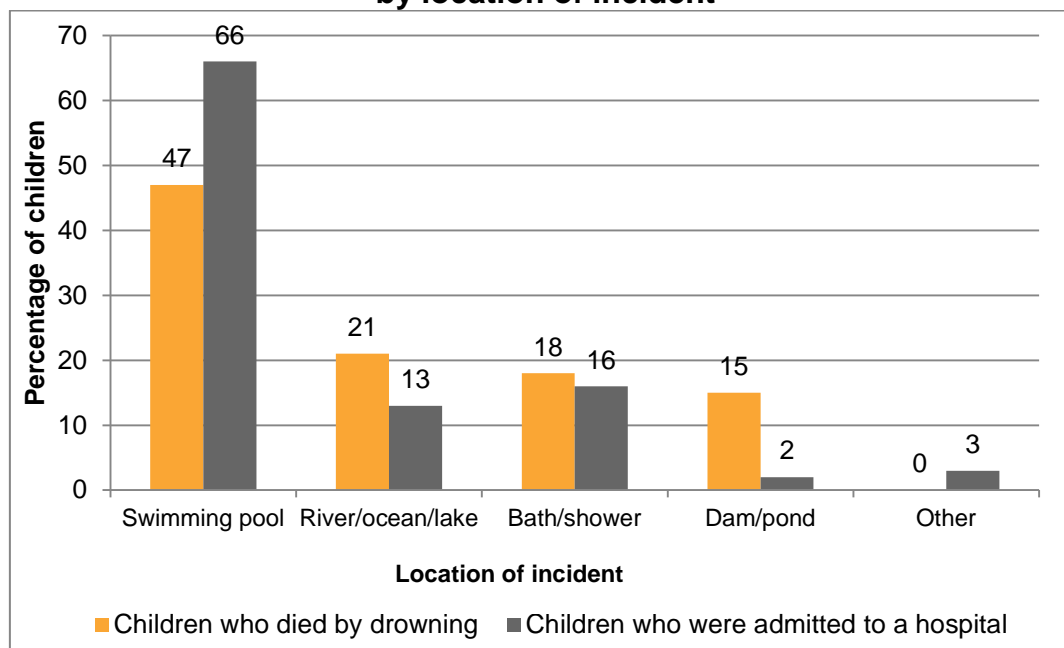
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<sup>69</sup> Australian Building Codes Board, *National Construction Code 2016: Volume One Building Code of Australia Class 2 to Class 9 Buildings*, February 2016, p. 37.

information collected by the Office,<sup>70</sup> it is estimated that 72 per cent of these incidents occurred in private swimming pools and 17 per cent occurred in swimming pools that were not private swimming pools. For 11 per cent of incidents, the location of the incident was not able to be classified from the information collected.

Data regarding the location of the incident was not available for the 2,310 children who attended an emergency department at a hospital following a non-fatal drowning incident.

**Figure 16: Percentage of children who died by drowning or who were admitted to a hospital following a non-fatal drowning incident, by location of incident**



Source: Ombudsman Western Australia

Note: Percentages do not add to 100 due to rounding.

The Office also found that, of the 34 children who died by drowning, 12 children died by drowning following an incident in a river, ocean, lake, dam or pond. The Office found that, of these 12 children, five children (42 per cent) died by drowning following an incident in a dam or river located in an outer regional or very remote region. Of these five children:

- three (60 per cent) children died by drowning following an incident in a dam; and
- two (40 per cent) children died by drowning following an incident in a river.

The Office's findings are consistent with the research literature, which highlights that dams and other water bodies on farms present a drowning risk, as follows:

An average of 5 to 6 children drown in farm dams and water bodies each year in Australia. Most are under five years of age and a third are visitors to the farm. The most common situation is that a toddler wanders away from supervision un-

<sup>70</sup> The Office reviewed the child's records relating to their admission to a hospital, including, for example, the location from which the child was conveyed via ambulance. This information did not routinely record whether the swimming pool was public or private, however, using the available information, the Office was able to categorise the majority of swimming pools as public or private (for example, if the location was recorded as 'backyard swimming pool' this was categorised as a private swimming pool).

noticed, finding their way into a farm dam. They may be noticed missing only after a few minutes. A securely fenced house yard, supported by active supervision, is one of the best ways to help prevent a toddler drowning ...<sup>71</sup>

In summary, the Office found that, for 16 (47 per cent) of the 34 children who died by drowning and 170 (66 per cent) of the 258 children who were admitted to a hospital following a non-fatal drowning incident, the incident occurred in a swimming pool.

### **Further investigation of drownings in dams and river systems**

The Office will undertake a separate investigation of the deaths of children who drowned in a dam or river. This investigation will build upon all of the relevant findings and recommendations in this report to determine whether it is appropriate for the Ombudsman to make recommendations about ways to prevent or reduce child deaths that are specific to drownings in dams and river systems, particularly in regional and remote Western Australia, including deaths of Aboriginal children.

#### *3.3.2.1 Location of drowning incident by age*

The Office found that, of the five children aged less than one year who died by drowning:

- four children died by drowning following an incident in a bath or shower; and
- one child died by drowning following an incident in a private swimming pool (Figure 17).

Of the 19 children aged one to four years who died by drowning:

- twelve children died by drowning following an incident in a private swimming pool;
- four children died by drowning following an incident in a dam or pond;
- two children died by drowning following an incident in a river, ocean or lake; and
- one child died by drowning following an incident in a bath or shower (Figure 17).

Considering these two age groups together, the Office's analysis shows that private swimming pools were the location of over half of the fatal drowning incidents. Of the 24 children aged under five years who died by drowning, 13 (54 per cent) died following an incident in a private swimming pool.

Of the 10 children aged five to 17 years who died by drowning:

- six children died by drowning following an incident in a river, ocean, lake, dam, or pond;
- three children died by drowning following an incident in a private swimming pool; and
- one child died by drowning following an incident in a bath or shower (Figure 17).

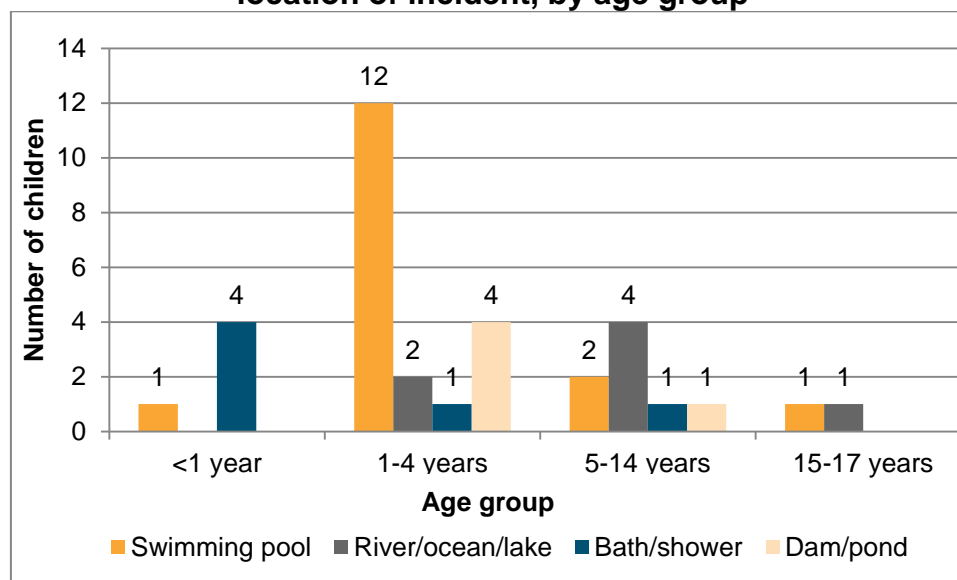
These findings are consistent with the research literature, which has found that, in Western Australia, for children aged between zero and 14 years, '63% of drowning deaths occurred at home pools'.<sup>72</sup>

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<sup>71</sup> Australian Centre for Agricultural Health and Safety, *Safe Play Areas on Farms*, viewed 12 April 2016, <<http://www.farmsafe.org.au/Safe-Play-Areas>>.

In summary, the Office found that for children under one who died by drowning, the incident more frequently occurred in a bath or shower, for children aged from one to four years the incident more frequently occurred in a private swimming pool and for children aged from five to 17 years the incident more frequently occurred in a river, ocean, lake dam or pond.

**Figure 17: Number of children who died by drowning, location of incident, by age group**



Source: Ombudsman Western Australia

The Office's findings are also consistent with further research literature, which suggests that the location of drowning deaths is age-dependent.

Research conducted by Royal Life Saving shows that between 1 July 2002 and 30 June 2011 there were 318 drowning deaths in children aged 0-4 years in Australia. Children under the age of five most commonly (51%) drown in home swimming pools.<sup>73</sup>

RLSSA also analysed activities prior to the drowning incident and found that as children aged, the locations of drowning deaths and associated activity transitioned from home environments (private swimming pools and bathtubs) to open waterways (rivers, creeks and streams), as follows:

An analysis of drowning deaths by activity immediately prior to drowning shows that the number of falls into water declines from 49% for 0 - 19 years old to 18% in the 5 - 19 age group. When looking at each main age group separately, a clear shift in activities immediately prior to drowning is observable. Falls and bathing are the main activities for children under 5, accounting for 77% and 14% of all drowning deaths, respectively. Swimming and recreating, falls and watercrafts were, in contrast, the main activities for children and adolescents aged 5 to 19 years old, accounting for 36%, 18% and 11%, respectively. Younger children of

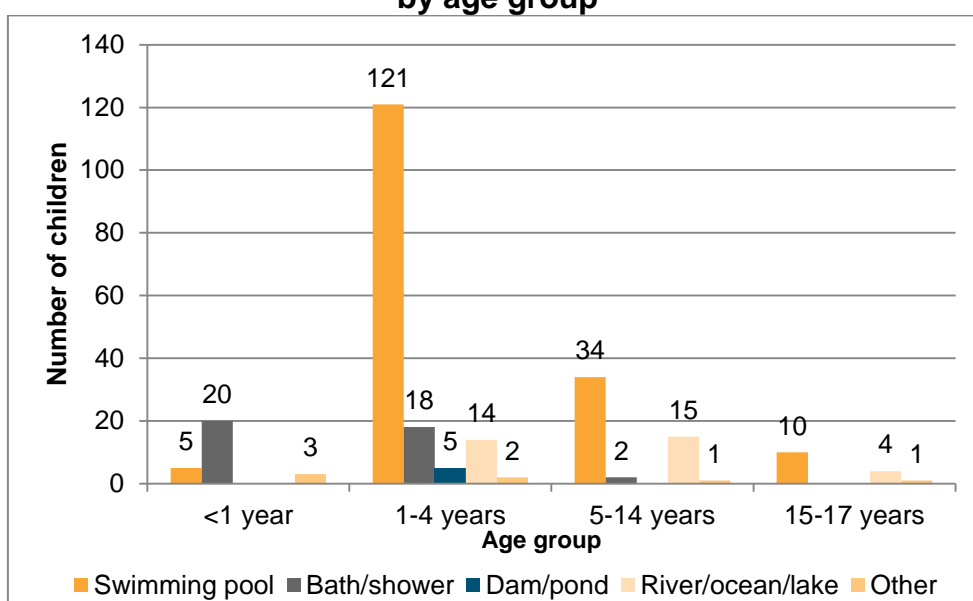
<sup>72</sup> Royal Life Saving Western Australia, *Drowning and Near-Drowning Report 2012*, 2013, viewed 12 April 2017, <[https://lifesavingwa.com.au/~media/files/rlsswa/research-and-reports/drowning-reports/drowning-report\\_2012](https://lifesavingwa.com.au/~media/files/rlsswa/research-and-reports/drowning-reports/drowning-report_2012)>, p. 3.

<sup>73</sup> The Australian Water Safety Council, *The Australian Water Safe Strategy 2012-15*, Sydney, 2012, viewed 19 January 2015, <[http://watersafety.com.au/Portals/0/AWSC%20Strategy%202012-15/AWSC\\_Strategy2012\\_Brochure%20-%20Lowres.pdf](http://watersafety.com.au/Portals/0/AWSC%20Strategy%202012-15/AWSC_Strategy2012_Brochure%20-%20Lowres.pdf)>, p. 14.

the latter age group (i.e., aged 5 to 9) were still mostly falling into the water prior to drowning (36%) and 25% of children aged 5 to 9 years drowned after swimming and recreating. In later childhood and adolescence (age group 10 - 19) swimming and recreating was the main activity immediately prior to drowning, accounting for 40% of all drowning deaths in that age group.<sup>74</sup>

The Office found that, of the 258 children who were admitted to a hospital following a non-fatal drowning incident, the majority of the children aged less than one year were admitted following an incident in a bath or shower. However, the majority of children across all other age groups were admitted following an incident in a swimming pool, as shown in Figure 18.

**Figure 18: Number of children who were admitted to a hospital following a non-fatal drowning incident, location of incident by age group**



Source: Ombudsman Western Australia

For the 2,310 children who attended an emergency department at a hospital following a non-fatal drowning incident, information regarding the location of the incident was not available.

### 3.3.2.2 Location of drowning incident for children who either were born outside Australia or whose parent/s were born outside Australia

The Office found that, of the 10 children who died by drowning who were either born outside Australia or whose parent/s were born outside Australia, five children died following an incident in a private swimming pool. In addition, of the 10 children who died by drowning who were either born outside Australia or whose parent or parents were born outside Australia, records indicated that two children's parents had limited English language skills so were unable to ask for assistance to search for the child who had gone missing around water.

<sup>74</sup> Queiroga, A and Peden, A, *A 10 year analysis of drowning in children and adolescents aged 5-19 years in Australia: The forgotten 50%*, Royal Life Saving Society Australia, Sydney, 2013, p. 12.

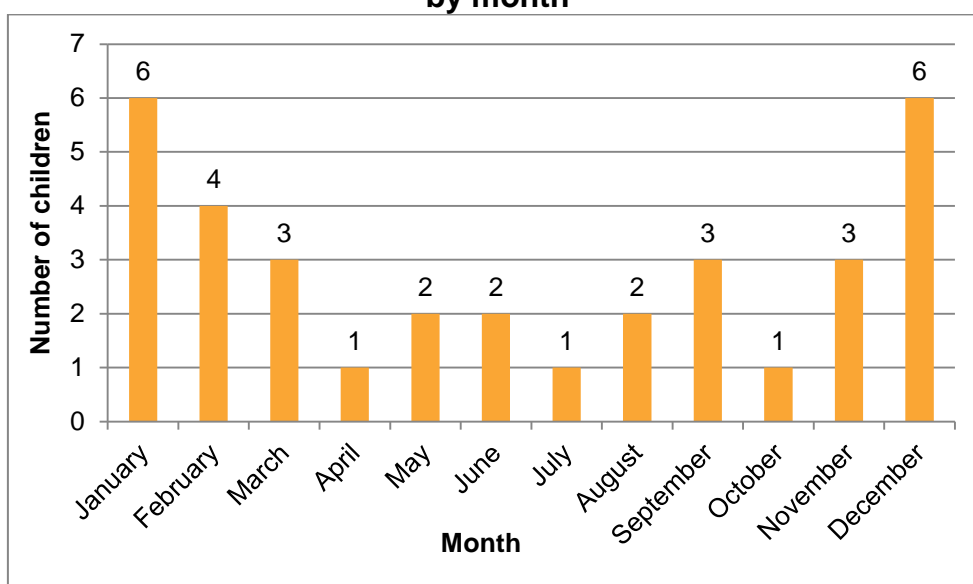
### 3.3.3 Month of drowning incidents

The Office found that the majority of the deaths of the 34 children who died by drowning occurred in the warmer months (three children in November, six children in December, six children in January and four children in February), as shown in Figure 19.

The Office's findings are broadly consistent with the research literature, which suggests that drowning is seasonal in Australia. On this point, the *RLSSA National Drowning Report 2016* observed that:

The highest number of drowning deaths occurred in summer (101 deaths), followed by spring (63 deaths), winter (59 deaths) and autumn (57 deaths) ... January was the month with the highest number of drowning deaths (40) ... <sup>75</sup>

**Figure 19: Number of children who died by drowning, by month**



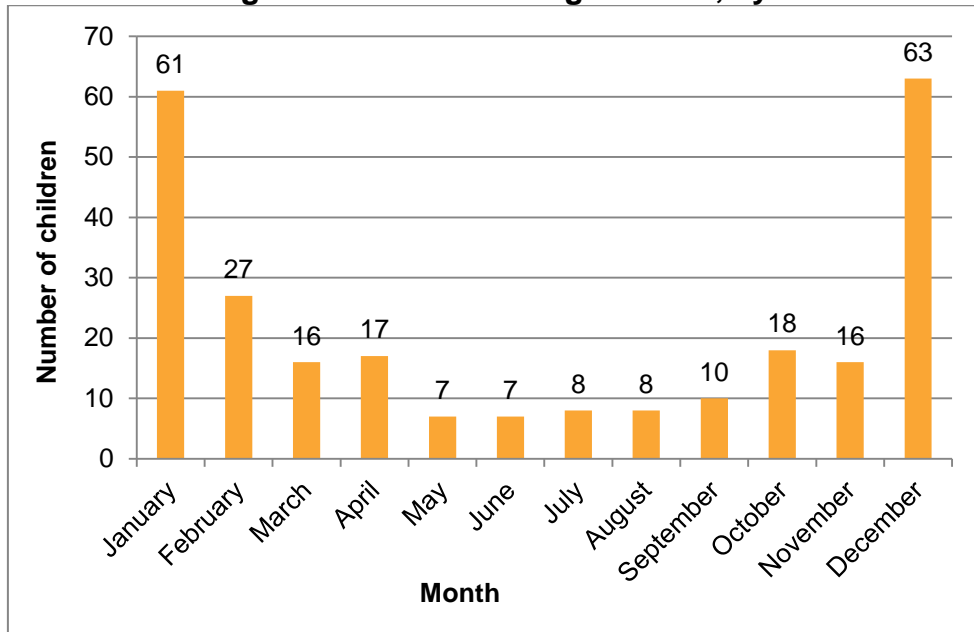
Source: Ombudsman Western Australia

Admissions to hospital and attendance at an emergency department at a hospital by children following a non-fatal drowning incident were also more frequent in the summer months, as shown in Figure 20 and Figure 21. For those children who were admitted to a hospital and those children who attended an emergency department at a hospital following a non-fatal drowning incident, December and January were the most common months for admissions and attendances.

<sup>75</sup> Royal Life Saving Society Australia, *National Drowning Report 2016*, 2015, viewed 21 February 2017, <[http://www.royallifesaving.com.au/\\_\\_data/assets/pdf\\_file/0004/18085/RLS\\_NDR2016\\_ReportLR.pdf](http://www.royallifesaving.com.au/__data/assets/pdf_file/0004/18085/RLS_NDR2016_ReportLR.pdf)>, p. 9.

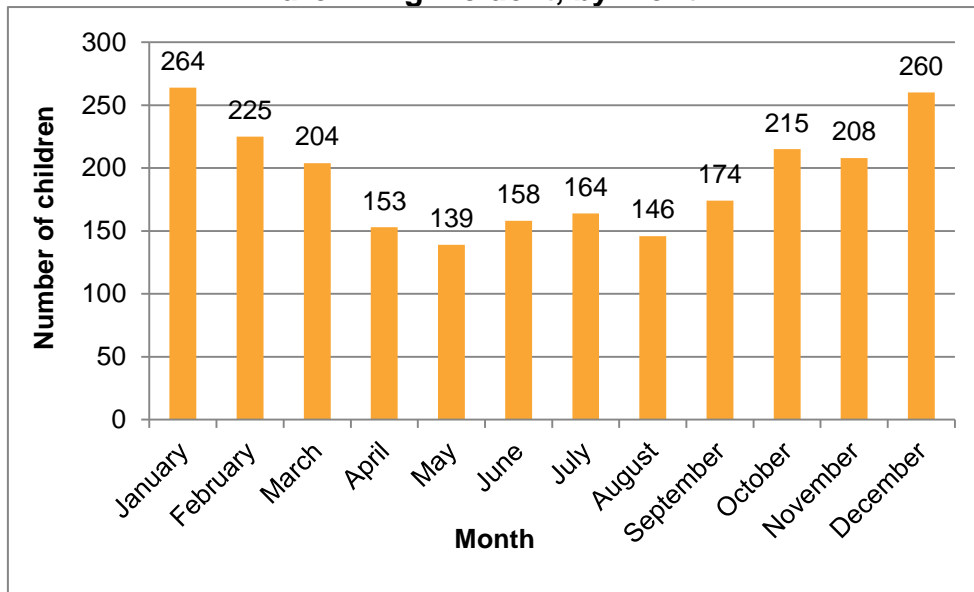


**Figure 20: Number of children who were admitted to a hospital following a non-fatal drowning incident, by month**



Source: Ombudsman Western Australia

**Figure 21: Number of children who attended an emergency department at a hospital following a non-fatal drowning incident, by month**

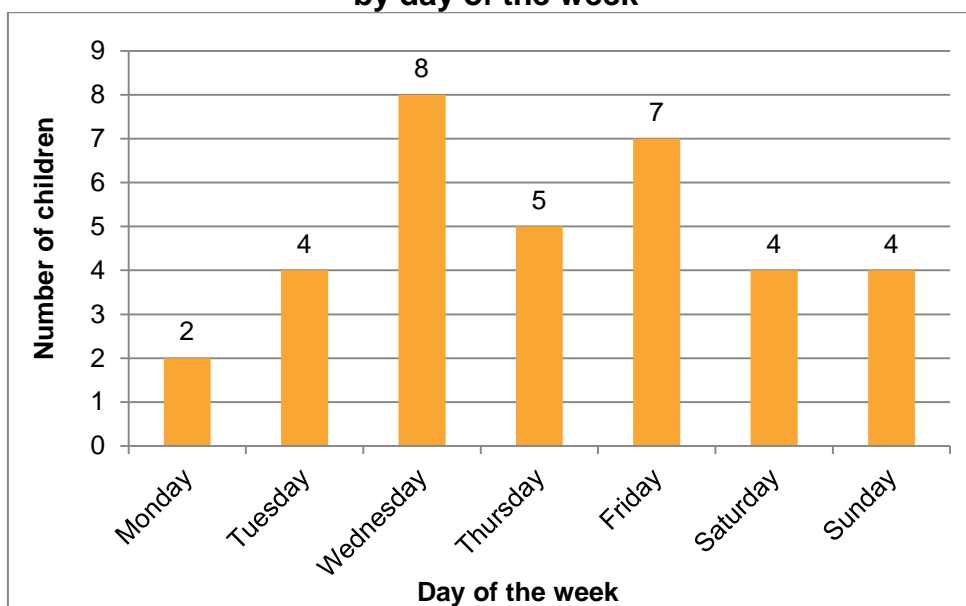


Source: Ombudsman Western Australia

### 3.3.4 Day of the week of drowning incidents

Bearing in mind the relatively low numbers of deaths, the Office found that the most common day of the week on which the deaths of the 34 children who died by drowning occurred was Wednesday (8 children, or 24 per cent), followed by Friday (7 children, or 21 per cent), as shown in Figure 22.

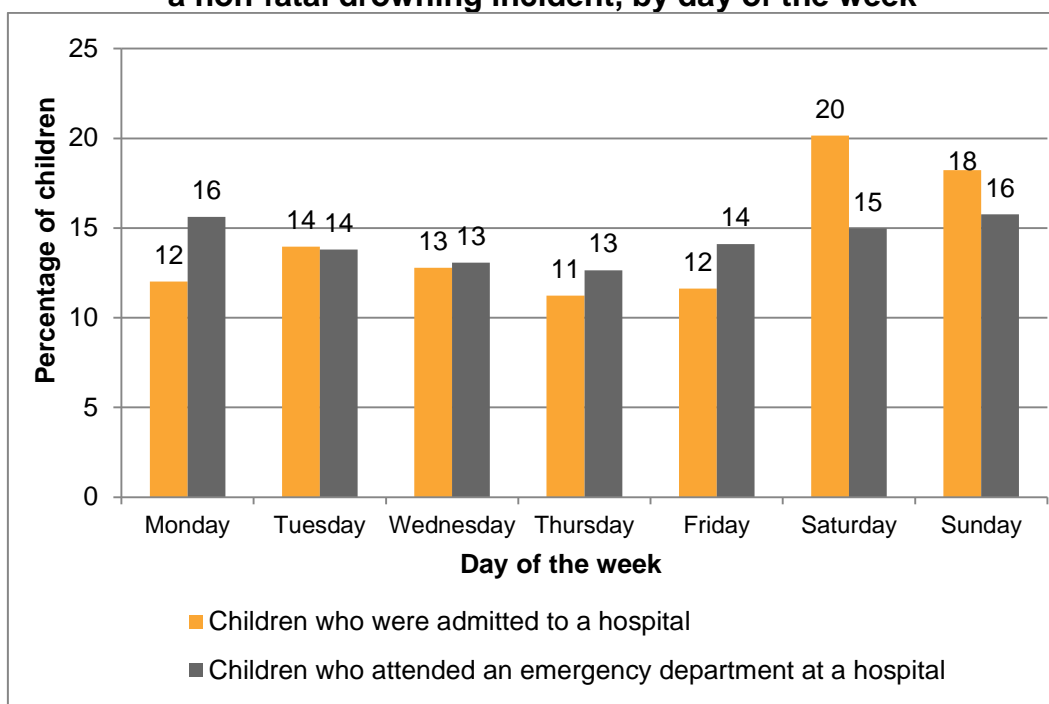
**Figure 22: Number of children who died by drowning, by day of the week**



Source: Ombudsman Western Australia

For the 258 children who were admitted to a hospital following a non-fatal drowning incident, the most common days for admissions were Saturday (52 children, or 20 per cent) and Sunday (47 children, or 18 per cent), as shown in Figure 23. For the 2,310 children who attended an emergency department at a hospital following a non-fatal drowning incident, the most common days for attendances were Sunday (364 children, or 16 per cent) and Monday (361 children, or 16 per cent), as also shown in Figure 23.

**Figure 23: Percentage of children who were admitted to a hospital or who attended an emergency department at a hospital following a non-fatal drowning incident, by day of the week**



Source: Ombudsman Western Australia

Note: percentages do not add to 100 per cent due to rounding.