

Original Article

From the bush to the beach: water safety in rural and remote New South Wales

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Abstract

Objective: To describe the types of aquatic locations attended by residents of rural and remote New South Wales (NSW), to record self-reported water safety-related behaviour, and identify preferred communication mediums for water safety messages.

Methods: A stratified random telephone survey was conducted of 500 NSW residents aged greater than 15 years residing in moderately accessible, remote and very remote locations in NSW.

Results: Results indicate that around two-thirds of respondents had been in or on the water at a pool, beach, lake, river or dam in the past 6 months. The most common type of aquatic facilities used were rivers, creeks or streams (53.5%), beaches (45.7%), public pools (45.5%), private pools (40.7%), dams (40.6%) and lakes (27.0%). Time spent at each of these locations and time of day each location was visited varied. Overall, the majority of respondents reported practicing water-related safe behaviour. Preferred communication mediums for water safety messages included television, schools and newspapers.

Conclusions: Water safety education, especially in relation to beach conditions, remains just as important a topic for public health authorities and key water safety agencies in regional and remote NSW as it is in coastal suburbs. Responses from the survey, along with key stakeholder advice, will be used to inform the development of appropriate strategies aimed to reduce drowning deaths in rural and remote locations in NSW.

Introduction

In Australia, evidence indicates that individuals living in rural and remote regions have an increased incidence of injury-related hospitalisation and mortality compared to individuals living in urban centres.^{1–3}

In New South Wales (NSW) an estimated 71.1% of the population lives in major cities, 20.6% in accessible, inner regional locations and around 8.2% reside in moderately accessible, remote or very remote locations.⁴

While less than 10% of the NSW population resides in outer regional and remote NSW, an analysis of the patterns of surf-based rescues and drowning by location of residence have indicated that individuals from remote localities have a higher risk of utilising a surf rescue service⁵ and of drowning⁶ compared with individuals living in accessible, urban centres.

The incidence of both drowning and hospitalisation following a near-drowning event is highest among young children.^{3,6} A national study of all farm-related fatalities in Australia found that 48 children (41.7%) aged 14 years or less drowned during 1989–1992. Of these, 72.9% were children aged 0–4 years who drowned in farm dams.⁷

In 2000, there were around 80 individuals who drowned in NSW (1.2 per 100 000).³ In the following financial year, five children aged 7 years or less drowned in dams on rural properties during 2001/02.⁸

In order to develop appropriate water safety strategies for rural and regional communities in NSW, information was needed concerning the type of aquatic locations visited by residents of rural and remote NSW, how often and for what length of time individuals attended these locations, and preferred types of communication mediums for water safety messages. Also, little was known about this group's water safety-related behaviour or of the characteristics of rural properties relevant to water safety (e.g. number of dams and distance of closest dam to residence).

Methods

A stratified random sample of 500 NSW residents residing in moderately accessible (300 interviews), remote (100 interviews) and very remote (100 interviews) locations based on scores higher than 3.51 on the Accessibility/Remoteness Index of Australia (ARIA)⁹ were

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selected from the NSW white pages telephone directory during 26 March to 22 April 2002 and a further selection was made of persons aged over 15 years within each household, based upon the most recent birthday.

The survey asked respondents to identify the type of water-related locations they attended (e.g. dam, lake or beach) in the last 6 months, how often they attended these locations, and for what length of time. A 5-point Likert scale ranging from always to never was used to assess how often the respondent engaged in a range of both safe and unsafe behaviours, of which 10 were water safety-related behaviours. During analysis the scale was collapsed to mostly, sometimes, rarely and non-response.

A set number of questions were asked of residents who identified that they lived on a farm, farmlet or rural property, number of dams, and distance of closest dam to the residence.

Preferred communication mediums for the receipt of water safety information were also canvassed, along with access to the Internet and Internet usage.

Demographic details collected included sex, age group, number of people and number of children less than 5 years living in the household, postcode and highest level of education completed. Visitation to property by children less than 5 years of age in the past 3 months was also recorded.

The survey was administered through a Computer Aided Telephone Interviewing (CATI) system. It took around 10 min to complete and was piloted before use. Up to six call-backs were conducted for each telephone number. If an answering machine was reached interviewers left a scripted message asking respondents to call a 1800 free-call telephone number.

The overall results were weighted by household size then by respondent age and sex based on the 1996 Census, to represent the overall study population. Data were analysed using SPSS version 10 and, where relevant, statistical analysis was conducted using Pearson's χ^2 and one-way analysis of variance (ANOVA).

Results

The response rate for the survey was 74.5%, with roughly equal numbers of males and females responding to the survey (51.3% and 48.7%, respectively). Just over one-third of respondents were aged between 26 and 45 years (38.4%), lived in a two-person household (36.6%) and indicated that their school certificate was the highest level of education completed (35.0%) (Table 1). The majority of respondents did not have a child aged less than 5 years in the household (85.5%). However, 82.1% of respondents on rural properties had had a child aged 5 years or less visit the property in the past 3 months.

Just over half of the respondents had been in or on the water at a pool, beach, lake, river or dam in the past

TABLE 1: *Demographics of respondents (per cent)*

Demographics	%
Sex	
Male	51.3
Female	48.7
Age group	
15–20 years	9.2
21–25 years	8.5
26–35 years	19.1
36–45 years	19.3
46–55 years	15.9
56–65 years	12.8
66 years and over	15.4
Number of people in household	
1	9.6
2	36.6
3	19.0
4	17.8
5	10.9
6 or more	5.9
Highest level of education completed	
Never attended school/some primary school	0.9
Completed primary school	2.4
Some high school	17.9
School certificate/intermediate/year 10/4th form	35.0
Higher School Certificate leaving/year 12/6th form	16.6
Tertiary certificate/diploma (e.g. Technical and Further Education)	13.3
University/other tertiary institution degree	12.4
Don't know/refused	1.0

6 months (59.4%), with respondents aged less than 45 years significantly more likely to have been in or on the water in the last 6 months than those who were older than 45 years ($\chi^2 = 101.5$, degrees of freedom (d.f.) = 6, $P < 0.000$).

The most common aquatic locations visited were rivers, creeks, or streams (53.5%), beaches (45.7%), public swimming pools (45.5%), private swimming pools (40.7%), dams (40.6%) and lakes (27.0%) (Table 2).

Frequency of use, time of day visited and time spent at each of the locations in the last 6 months varied (Table 2). Rivers, creeks, or streams (20.7%), public swimming pools (17.4%), and private swimming pools (17.0%) were the most frequently visited aquatic locations on at least 1 or more days a week. Beaches, dams, and lakes were more likely to be visited mid-morning prior to 12 pm and swimming pools, both public and private, in the late afternoon after 3 pm. While rivers, creeks or streams were equally likely to be visited throughout the day. Respondents reported usually

TABLE 2: Frequency, time of day, and usual length of stay at aquatic location (per cent)

	River, creek, stream (%)	Beach (%)	Public swimming pool (%)	Private swimming pool (%)	Lake (%)	Dam accessible to public (%)	Dam on private property (%)
Frequency of use							
Every day	2.4	3.9	2.0	4.6	1.3	1.1	1.5
3–6 days a week	6.7	6.3	5.8	5.5	2.3	1.7	1.0
1–2 days a week	11.6	3.8	9.6	6.9	3.7	1.0	3.0
1–2 times a month	9.9	9.5	9.9	7.6	6.2	3.8	7.0
1–3 times during summer	22.9	22.2	18.2	16.1	13.5	13.2	7.3
Not at all	44.5	52.7	53.4	57.8	71.1	77.8	78.4
Don't know	1.3	1.5	0.8	1.5	1.9	1.3	1.2
Refused	0.7	0.0	0.3	0.0	0.0	0.0	0.7
Time of day visited							
Before 09:00 hours	6.7	15.0	9.0	1.8	10.2	15.4	14.9
09:00–12:00 hours	23.8	35.0	24.5	11.6	35.6	31.4	21.9
12:01–15:00 hours	32.2	23.0	20.3	35.0	33.8	34.7	25.9
15:01–18:00 hours	27.3	26.5	43.1	41.5	13.3	12.5	26.9
After 18:00 hours	6.6	0.6	2.4	7.4	7.0	5.0	5.2
Don't know	3.4	0.0	0.0	2.8	0.0	1.1	5.2
Refused	0.0	0.0	0.6	0.0	0.0	0.0	0.0
Usual length of stay							
<30 min	6.8	2.4	2.6	13.2	1.6	1.7	8.7
30 min–1 h	15.5	25.8	28.0	37.4	8.1	5.1	17.7
1–2 h	29.2	37.7	47.8	27.8	28.0	11.1	45.1
2–4 h	20.3	26.3	18.7	13.7	26.7	24.8	15.1
>4 h	27.4	7.9	2.9	7.9	35.6	57.2	7.7
Don't know	0.8	0.0	0.0	0.0	0.0	0.0	5.6
Refused	0.0	0.0	0.0	0.0	0.0	0.0	0.0

staying for less than 2 h at swimming pools, beaches, and dams on private property, whereas respondents were more likely to stay at rivers, creeks or streams, lakes, and dams accessible to the public for longer time periods.

Self-reported water safety behaviour was generally high, with most respondents stating that they always or mostly ensured that young children were constantly supervised when they were in the water (84.3%), and kept a good eye out when others were in the water (83.0%). Around two-thirds of respondents reported that they always or mostly checked the depth of water before jumping or diving in (67.1%), checked for and were aware of strong currents in rivers or at the beach (67.0%), and checked for submerged objects in rivers, lakes or dams before diving in (62.0%). Around half of respondents indicated that they always or mostly swam between the flags when at the beach (52.7%), avoided swimming near board riders (48.7%) and swam at patrolled beaches (45.7%). Around two-thirds of respondents reported that they never or rarely swam alone (65.5%).

Overall, females were more likely to report practicing safe water behaviour than males, and individuals aged 15–20 years were less likely to report practicing safe behaviours around water than older respondents.

Just over half of the respondents (57.7%) stated that they preferred to receive water safety messages through the television. Other popular mediums for receiving water safety messages were through schools (19.7%), newspapers (5.3%), all media sources (5.0%), radio (3.9%) and television and schools combined (3.2%).

Almost two-thirds of respondents (62.2%) had personal access to the Internet, either at home or through another location. However, less than half of the respondents (47.6%) reported that they had actually accessed a Web page. Respondents who were older than 55 years were significantly less likely to have access to the Internet ($\chi^2 = 90.6$, d.f. = 6, $P < 0.000$), or to have personally accessed a Web page ($\chi^2 = 110.5$, d.f. = 6, $P < 0.000$) (Fig. 1).

Around one-third of respondents (34.6%) indicated that they lived on a farm, farmlet or rural property. Almost

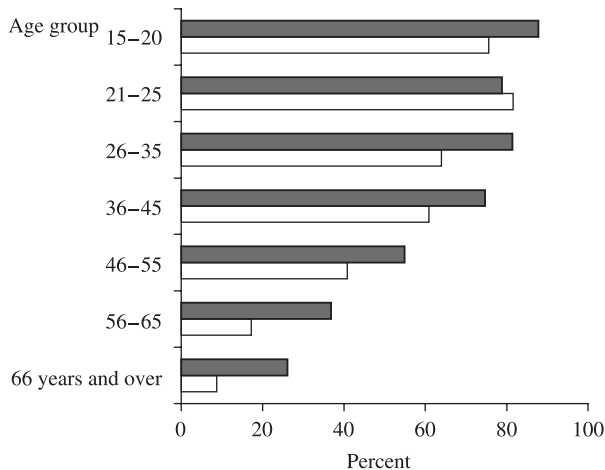


FIGURE 1: Internet access and usage by age group. ■, access; □, usage.

half of the rural properties (46.7%) had between 1 and 5 dams on the property. The average number of dams was 5.7 but, again, this varied significantly by ARIA region, with more remote areas having a greater number of dams on the property (5.4 dams in moderately accessible areas, 4.7 in remote areas, and 17.8 in very remote areas) ($P < 0.000$). The distance from the residence to the nearest dam was commonly between 0 and 1000 m (75.9%), with the average distance being 1037 m.

Discussion

With around 6 in 10 residents of regional and remote NSW indicating they had visited an aquatic location in the last 6 months, issues of water safety continue to be an important injury prevention topic in regional communities. Water safety messages most relevant to respondents appear to be concerning rivers, creeks or streams, beaches, swimming pools and dams.

Considering the remote location of respondents, it is surprising that just less than half of respondents had visited a beach in the last 6 months, presumably while visiting a coastal region. In an earlier study, Short *et al.*⁵ found that of the individuals rescued by surf life savers in NSW during 1988/89–1990/91, 45.3% of rescues were of individuals who lived greater than 50 km from the coast. Considering that only 6% of all bathers visiting beaches were from areas more than 50 km from the coast this was an alarming statistic.⁵

Beach education remains just as important a topic for public health authorities and key water safety agencies in regional and remote NSW as it is in coastal suburbs. Programs, such as Surf Life Saving Australia's Beach to Bush Surf Safety program for school-aged children, are one method of delivering water safety messages to remote communities.¹⁰

Approximately one-third of respondents identified that they lived on a farm. There were an average of around 6 dams located on each property, with the number of dams increasing with increasing property size. Prior studies have found that dams are a common location of drowning for young children in rural Australia.^{7,11} Of concern is the proximity of the dam to the home dwelling, with 43.7% of respondents indicating that the closest dam was only 101–500 m from the home. While the majority of respondents (85.5%) did not indicate that children less than 5 years of age resided on the property, 82.1% did indicate that children of this age group had visited the property in the last 3 months. Visitation by young children to a property is often overlooked in arguments stating that safe play areas and swimming pool fencing are not needed at residences where young children do not reside.

The development of a national strategy for child safety on farms has identified strategies, such as creating fenced safe play areas on the property, to prevent unintentional injury to children.¹²

Overall the majority of respondents reported that they practiced safe water-related behaviour in the past 6 months. However, some safe behaviours were more likely to be practiced than others. Reporting of swimming between the flags when at the beach and swimming at patrolled beaches were low compared with other reported water safety behaviours. Fenner *et al.* found that 55% of resuscitations by surf lifesavers in Queensland were of individuals who were rescued from outside the flagged area of a beach.¹³ Along a similar vein, Short *et al.* found that the majority of rescues in NSW of individuals who lived greater than 50 km from the coast were at unpatrolled locations.⁵

There were also lower levels of concern with swimming alone as a risk factor that may increase the risk of drowning, with 15.6% stating that they always, mostly or sometimes swam alone in the surf, lake or river. These types of behaviours were more likely to be reported by males and young adults aged 15–20 years. Individual risk factors thought to be associated with the increased injury experience of young males include risk taking behaviour, a lack of experience, a perception of invulnerability, and alcohol consumption.¹⁴

The evidence for effective injury prevention strategies for adolescents and young adults lies largely in the areas of road, bicycle and sports safety.¹⁵ There is no evidence to support that education alone changes the behaviour of young adults and, therefore, the best opportunities to prevent injuries in young adults appear to be through legislation and policy directions, supported by enforcement and changes in the environment, accompanied by awareness raising strategies.¹⁴

Television was the most popular communication device reported to receive water safety messages over other

communication mechanisms like newspapers, radio and the Internet. While more and more information is being placed on the Internet for public access and, although two-thirds of respondents stated they had access to the Internet, less than half had actually accessed an Internet page: with this percentage highest among respondents older than 55 years. Australia wide, only around 48% of non-metropolitan-based households in 2000 had access to a home computer and around 40% of individuals aged 18 years and over in non-metropolitan areas had accessed the Internet.¹⁶ However, it appears that household computer and Internet access is on the rise, with around 60% of Australian households projected to have a computer and 50% to have home Internet access in 2001.¹⁶

There are known limitations with self-reported information, including bias as to precision and recall. While there can sometimes be a reluctance to self-report poor behaviour, it appears that during the assessment of safe and unsafe behaviour, respondents did report some negative behaviour.

Responses from this survey, along with key stakeholder advice from agencies on the NSW Water Safety Taskforce, will be used to inform the development of appropriate water safety strategies to reduce drowning deaths of residents from rural and remote locations in NSW.

Current strategies being considered by the NSW Water Safety Taskforce include those around preventing access to water for young children, the promotion of learn to swim and general water safety, the promotion of water safety messages through local community-based activities, the promotion of learning cardio-pulmonary resuscitation, and education and awareness raising strategies around the creation of child safe play areas to restrict access of young children to water hazards and general beach safety.

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References

- 1 Moller J. The spatial distribution of injury deaths in Australia: urban, rural and remote areas. *Australian Injury Prevention Bulletin* 1994; 8: 1–8.
- 2 Ashby K, Stathakis V, Day L. A profile of injuries to Victorian residents by broad geographic region. *Hazard* 2001; 46: 1–17.
- 3 Public Health Division. The health of the people of NSW – report of the Chief Health Officer. [Online; cited 10 September 2003]. Sydney: New South Wales Health Department, 2002. Available from URL: www.health.nsw.gov.au
- 4 ABS (Australian Bureau of Statistics). Australian Social Trends. ABS: Canberra, 2003.
- 5 Short A, May A, Hogan C. NSW beach safety programme: a three year study into the circumstances behind surf based rescues. Sydney: New South Wales Department of Sport, Recreation and Racing, Surf Life Saving Australia, University of Sydney, 1991.
- 6 New South Wales Injury Risk Management Research Centre. Analysis of drowning in Australia and pilot analysis of near-drowning in New South Wales. Sydney: Australian Water Safety Council, 2000.
- 7 Mitchell R, Franklin R, Driscoll T, Fragar L. Farm-related fatalities involving children in Australia, 1989–92. *Australian and New Zealand Journal of Public Health* 2001; 25: 307–314.
- 8 New South Wales Child Death Review Team. 2001–02 Report. Sydney: New South Wales Commission for Children and Young People, 2002.
- 9 Commonwealth Department of Health and Aged Care. Measuring remoteness: Accessibility/Remoteness Index of Australia (ARIA). Canberra: Commonwealth of Australia, 1999.
- 10 Surf Live Saving Australia. Beach to Bush Surf Safety Program. [Online; cited 9 September 2003]. Sydney: SLSA. Available from URL: www.slsa.asn.au/
- 11 Cass D, Ross F, Lam L. Childhood drowning in New South Wales 1990–95: a population-based study. *Medical Journal of Australia* 1996; 165: 610–612.
- 12 Farmsafe Australia. Child safety on farms: a framework for a national strategy. Moree (NSW): Farmsafe Australia, 1999.
- 13 Fenner P, Harrison S, Williamson J, Williamson B. Success of surf lifesaving resuscitations in Queensland, 1973–92. *Medical Journal of Australia* 1995; 163: 580–583.
- 14 National Health and Medical Research Council of Australia (NHMRC). Unintentional injury in young males 15–29 years. Canberra: Commonwealth of Australia, 1997.
- 15 Commonwealth Department of Health and Aged Care. National Injury Prevention Plan: Priorities for 2001–2003. Canberra: DHAC, 2001.
- 16 ABS (Australian Bureau of Statistics). Household use of information technology, Australia, 2000. Catalogue no. 8145.0. Canberra: ABS, 2001.