

DROWNING IN NSW WATERWAYS: MEN AGED 25 TO 34 YEARS

2005/06 TO 2014/15



EVERYONE CAN BE A LIFESAVER



Royal Life Saving

ROYAL LIFE SAVING SOCIETY - AUSTRALIA



ABOUT ROYAL LIFE SAVING

Royal Life Saving is focused on reducing drowning and promoting healthy, active and skilled communities through innovative, reliable, evidence based advocacy; strong and effective partnerships; quality programs, products and services; underpinned by a cohesive and sustainable national organisation.

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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Men aged 25-34 years drowned
between 1 July 2005 and 30 June 2015

TOP 3
LOCATIONS



30%
BEACH



25%
RIVER / CREEK
/ STREAM



18%
ROCKS

TOP 3
ACTIVITIES



30%
SWIMMING &
RECREATING



16%
ROCK
FISHING



12%
BOATING



Alcohol was known to be involved in 36% of cases,
with large amounts often consumed

Of these, 58% of cases were over the legal driving limit



Drugs were known to be involved in 23% of cases
Of these, 43% legal drugs, 36% illegal substances, 21% both

PREVENTION STRATEGIES



WEAR A
LIFEJACKET



AVOID ALCOHOL
AROUND WATER



DO NOT SWIM
OR TAKE A BOAT
OUT UNDER THE
INFLUENCE OF
DRUGS



BE PREPARED &
CHECK WEATHER
CONDITIONS



NEVER
GO ALONE



LEARN HOW TO
SAVE A LIFE

EVERYONE CAN BE A LIFESAVER



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YOUNG MEN AND DROWNING: AN ANALYSIS OF DROWNING DEATHS AMONG MEN AGED 25-34 YEARS

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DID YOU KNOW?

- Between 1 July 2005 and 30 June 2015 (a period of 10 financial years), 121 men aged 25-34 years drowned in NSW waterways
- Beaches were the leading location for drowning, accounting for 29.8% of deaths
- The most common activity being undertaken prior to drowning was swimming and recreating (29.8%)
- Over a third of drowning incidents occurred in major cities (47.1%), with three quarters of people who drowned not visitors to the location of the incident (74.4%)
- Drowning deaths most commonly occurred in summer (42.1%), with the highest number occurring in January (16.5%)
- Most people drowned on a Saturday (23.1%) or a Sunday (21.5%), with 43.8% drowning in the afternoon between midday and 6pm
- Visitors were more likely to drown at the beach compared to non-visitors (40.6% vs. 25.8%)
- Over a third of all drowning deaths were known to involve alcohol (36.4%)
- Of those drowning deaths which were known to involve alcohol, the amount of alcohol detected was deemed contributory in 58.1% of cases (BAC greater than or equal to 0.05)
- Alcohol was present in 75.0% of non-aquatic transport and 60.0% of boating drowning deaths
- Rivers, creeks and streams was the location with the highest number of men over the alcohol limit
- 60.0% of people considered visitors were over the alcohol limit
- Of the 23.1% of cases which were known to involve drugs, 42.9% were legal drugs, 35.7% were illegal substances and 21.4% of cases involved both legal and illegal drugs
- 57.5% of men with illegal drugs in their system drowned in inland waterways
- Among men who were boating and rock fishing, none were recorded to be wearing a lifejacket
- In 16.5% of cases, more than one person drowned during the incident, resulting in a multiple fatality event, with alcohol present in 40% of people involved in multiple fatality events

102

PEOPLE DROWN EACH YEAR IN NSW

EXECUTIVE SUMMARY

On average 102 people have drowned per year in New South Wales (NSW) over a period of 10 years, 79.1% male, with the highest proportion among the 45 – 55 years (14.7%) and 25 – 34 years age groups (13.9%). The Australian Water Safety Council has identified men aged between 25 – 64 years as a key demographic for drowning, along with reducing alcohol and drug related drowning deaths.

All unintentional drowning deaths among males aged 25 to 34 years, which occurred between 1 July 2005 and 30 June 2015 in NSW were included in this report. Information for this report has been collected from the National Coronial Information System (NCIS) and media reports. It has been collated and analysed by the Royal Life Saving Society – Australia. Royal Life Saving uses a media monitoring service all year round to identify drowning deaths in the media. The information is then corroborated with information from the NCIS, police and Royal Life Saving State and Territory Member Organisations before being included in this report. Data were analysed using SPSS Version 24. Descriptive statistics were utilised, as well as chi squared analysis. Statistical significance was deemed $p < 0.01$.

Over the past 10 financial years (1 July 2005 – 30 June 2015), 121 men aged 25 - 34 years drowned in NSW waterways. This represents 11.8% of all drowning deaths in NSW during this time period with a crude drowning rate of 2.38 per 100,000 men aged 25-34 years. In comparison, 20 females drowned during the same period, at a crude rate of 0.39 per 100,000 population.

The highest number of drowning deaths in this demographic were of males aged 25 years (15.7%) and 30 years (14.0%), with 47.1% occurring in major cities. The majority of people who drowned were local residents (i.e. not visitors) to the location of the drowning incident (74.4%). Nearly half had been born overseas (43.8%), of which 37.2% were from non-English speaking countries. Where information was known, 9.0% of men were in Australia on a student or working visa.

The highest number of deaths occurred in the summer months of January (16.5%), December (14.0%) and February (11.6%), almost half occurred on a Saturday (23.1%) or Sunday (21.5%). The afternoon hours (between 12:01pm and 6pm) were the most common time for drowning incidents to occur (43.8%).

Beaches were the leading location for drowning (29.8%), followed by rivers, creeks and streams (24.8%), and rocks (18.2%). The most common activity being undertaken prior to drowning was swimming and recreating (29.8%), followed by rock fishing (15.7%). Those born overseas were found to be 3.8 times more likely to drown at rocks than Australian born men (29.0% vs. 7.7%, $X^2 = 31.2$, $p < 0.05$).

Over a third of all drowning deaths were known to involve alcohol (36.4%). Men were more likely to consume alcohol than not, at inland waterways and ocean/harbour locations. Of those with alcohol present, most were swimming and recreating (31.8%) or boating (20.5%). Alcohol was present more often than not, in deaths related to non-aquatic transport (yes: 75.0%, no: 25.0%), boating (yes: 60.0%, no: 13.3%), an unknown activity (yes: 57.1%, no: 28.6%), an unexpected fall into water (yes: 44.4%, no: 33.3%), and whilst swimming and recreating (yes: 38.9%, no: 30.6%). 45.5% of alcohol related deaths occurred in the evening and early morning. Men that drowned in the early morning were 5 times more likely to have alcohol present than not (yes: 22.7%, no: 4.3%).

Of those with alcohol present, 58.1% were deemed to have a BAC ≥ 0.05 mg/L. Those that drowned in rivers, creeks and streams were most likely to be over the limit (44.0%). More men were found to be over the limit in all locations except for ocean/harbour locations (yes: 33.3%, no: 50.0%) and 'other' locations (no: 100%). Almost half of those over the limit had been swimming and recreating or boating (24.0% each).

Almost one quarter had drugs present (23.1%), including both legal and illegal substances. Rivers, creek and streams (32.1%) recorded the highest number of deaths involving drugs, whilst 28.6% were swimming and recreating. Where information was known, 57.1% had consumed illegal drugs and 42.9% had consumed legal drugs (e.g. medication). Of those with illegal substances present, 56.3% occurred at inner regional locations, and 62.5% at an inland waterway location. Interestingly, overseas-born men were significantly less likely to have consumed drugs (11.3% vs. 40.4%, $X^2 = 15.9$ $p < 0.05$) than those born in Australia.

A pre-existing medical condition was present in 15.7% of men. Common medical conditions identified included: cardiovascular disease, epilepsy, liver disease, depression and other mental health disorders. Of those with a pre-existing medical condition, 26.3% drowned at the beach and 21.1% were swimming and recreating.

Other risk factors included lack of lifejacket wearing when boating and rock fishing. No cases were found to be wearing a lifejacket at the time of death when doing either activity. In 16.5% of cases, more than one person drowned during the incident, resulting in a multiple fatality event (MFE). Of these, 40.0% drowned at a river, creek or stream, 30.0% occurred when using watercraft and 20.0% swimming and recreating. Alcohol was present in 40.0% of MFEs and three of the four cases involving drugs had illegal drugs recorded. A small proportion drowned in flooded waterways (3.3%).

This study reinforced certain risk factors for drowning among men aged 25-34 years such as alcohol and drug consumption during aquatic activity and more locals drowning than visitors. Specific issues have emerged among men in NSW, such as rock fishing and being of overseas born origin, and will be discussed in further detail. Further research is required to better understand the behaviour and decision making processes of young men when they are in, on and around the water, and how to best use this information to reduce drowning deaths among this high risk population.



NEXT STEPS

Policy, Programs and Advocacy

- Develop a campaign (including social media and advertising) in collaboration with key partners, communicating drowning prevention messages regarding alcohol consumption at key high risk areas for men aged 25-34 years, including those recreating:
 - At inland waterways, specifically river, creek and stream locations
 - At aquatic locations in the evening, often extending into the early morning hours
 - Whilst boating
 - At swimming pools (specifically home and hotel/resort swimming pools)
- Explore avenues for promotion of campaign and associated messages in sporting and local events across NSW, including the use of ambassadors appealing to those in the target demographic
- Evaluate impact of campaign to identify successes and inform future campaign development with this and similar target demographics
- Convey the potential for drowning incidents following alcohol consumption to end in a multiple fatality event with more than one life lost in a single incident
- Investigate partnerships with boating regulators to promote and strengthen existing boating safety legislation and highlight the legal ramifications to those who skipper a boat whilst under the influence of a contributory level of alcohol (BAC ≥ 0.05) and whilst under the influence of illegal drugs
- Explore opportunities to deliver targeted education to new arrivals or temporary visitors to Australia who are on student or work visas
- Continue to communicate the importance of checking local conditions and hazards at all aquatic locations, including familiar sites as conditions can change rapidly

Research Agenda

- Complement existing fatal drowning data by comparing with non-fatal drowning data to gain a more complete understanding of the full burden of drowning in this age group
- Explore the decision making processes of men in this age group through the use of behavioural research in order to gain a better understanding of why men engage in risky behaviours around water and the motivations behind this
- Examine the role of alcohol and drugs in drowning deaths across all age groups, including both legal and illegal substances
- Extend this study to include all men aged 25-64 years (as identified in the Australian Water Safety Strategy 2016-2020), focusing on the circumstances of the drowning death and relevant risk factors



BACKGROUND

On average, 282 people drown each year in Australia. Males are over-represented in the drowning statistics, accounting for 83% of all drowning deaths overall. The 10 year average drowning number in NSW is 102 people each year, of which 80 men compared to 22 females drown annually (1).

This report is based on a 10 year drowning study of men aged 25 – 34 years (1 July 2005 to 30 June 2015), and further analyses the NSW statistics over the same period (2).

The burden of drowning among men is well documented. Studies from other high income countries have previously reported similar rates of men drowning in New Zealand (3), Canada (4-5) and the United States (6), all reporting the drowning rate of males as being 80% or higher. Males have been found to be more at risk of drowning than females when swimming at the beach (7), when consuming alcohol and drugs around the water (8), (9) and during spells of hot weather (10).

The association between drowning and alcohol and men is a concern in Australia. Reducing drowning deaths involving alcohol and drugs has been identified as a key priority in the Australian Water Safety Strategy (11). Over the past 10 years (2004/05 – 2014/15), 1060 people drowned with alcohol or drugs in their system, of which 77% were males (11). A recent Australian study revealed that 40.8% of drowning deaths in river locations involved alcohol, of which 70.3% had a BAC of $\geq 0.05\text{mg/L}$, males reported a higher alcohol-related drowning rate than females, and 50.0% were aged 25 – 34 years (12). A NSW study of alcohol related drowning in 2009 reported that 29.0% of total drowning deaths involved alcohol, 81.2% were among men, with 15 – 29 years the highest age group with alcohol present (13).

Drug taking prior to or during aquatic activities is less known, however it appears to be becoming a trend among drowning cases in Australia, notably among males using boats and watercraft (14) and when around an inland waterways (12). A Swedish study of drowning deaths reported that psychoactive drugs were present in up to 40.0% of drowning deaths, with illicit drugs detected in almost 10% of the cases. Males and the mid to older age groups were most likely to have alcohol and drugs present compared to females and children (9). Whilst random drug testing for motor vehicles has commenced in NSW and across the country, it is unknown if the same strategy will be extended to boats.

Of particular relevance to NSW and reinforced in the findings of this report is the number of rock fishing deaths among males in NSW. Rock fishing deaths have been the subject of coronial inquests in NSW on three separate occasions, May 2011, June 2011 and most recently in July 2015 (15). The contributing factors in all inquests noted: incidents occurred at locations considered dangerous or high risk for drowning, no lifejackets, and most had been swept into the water by waves. Other factors noted included most having been born overseas and two were rescue attempts. Recommendations from the 2015 coronial findings included: *“In those circumstances the evidence informs us that the best precaution for a rock fisherman who is unexpectedly swept into the sea is a life-jacket that will keep them buoyant until assistance arrives”* (15). Much like wearing a lifejacket when boating, the chance of survival and a successful rescue of a rock fisher in the water increases dramatically when wearing lifejackets (15). Initiatives aiming to reduce rock fishing related deaths are currently being trialled in NSW and will be discussed later in the report. A drowning prevention program in New Zealand over a 5 year period has reported some success in fishers behaviour and attitudes with decreased rates of fishers never wearing lifejackets from 72.0% in 2006 to 34% in 2010. The research participants were mostly males aged 16 to 44 years of recent residency and 42% had english as a second language (16).

As noted in the rock fishing coronial inquests, an emerging challenge for drowning prevention is drowning deaths among those born outside of Australia. Whilst the true burden of drowning among people born overseas on a national scale is currently unknown, in Western Australia overseas born account for a quarter of all drowning deaths annually, mostly from non-english speaking countries (17). In Victoria, overseas born made up 18% of drowning deaths in 2015-16, of which most were males and aged between 25 and 44 years (18). Reducing drowning deaths among Culturally and Linguistically Diverse (CALD) communities has also been identified as a priority in the Australian Water Safety Strategy (11), with prevention programs being targeted to these populations. A study from New Zealand reported that new migrants were more likely to pursue aquatic activity when in New Zealand than when previously living in their home country (19).

This report will analyse the contributing risk factors of drowning among men aged 25 – 34 years in NSW over a 10 year period.

AIMS

This study aimed to:

- Gain an in-depth understanding of the burden of drowning among males aged 25-34 years across the last 10 financial years (1 July 2005 to 30 June 2015) in NSW, including the circumstances of drowning deaths and key risk factors
- Propose recommendations going forward, including future directions and prevention strategies targeting males aged 25-34 years specifically in relation to alcohol and drug use around water

METHODS

All unintentional drowning deaths among males aged 25 to 34 years, which occurred between 1 July 2005 and 30 June 2015 were included in this report.

Information for this report has been collected from State and Territory Coronial Offices, the National Coronial Information System (NCIS) and media reports. It has been collated and analysed by the Royal Life Saving Society – Australia.

Royal Life Saving uses a media monitoring service (both electronic and print media) all year round to identify drowning deaths in the media. The information is then corroborated with information from the NCIS, police and Royal Life Saving State and Territory Member Organisations before being included in this report.

All care is taken to ensure that the information is as accurate as possible. Please note that the figures from more recent financial years may change depending upon the outcomes of ongoing coronial investigations and findings. This report contains information correct as at 22 May 2017. As of this date, 87.3% of cases were closed (i.e. no longer under coronial investigation).

Exclusions from this data include: drowning deaths known to be as a result of suicide or homicide, deaths from natural causes, shark and crocodile attack, or hypothermia where known. All information presented is about drowning deaths or deaths where drowning was a factor.

The crude drowning rate was calculated using ten year Australian population figures for men aged 25-34 years between June 2006 and June 2015 from the Australian Bureau of Statistics (ABS).

Information on visa type was obtained directly from police reports or 'finding' documents within the NCIS. As such, the language used (regarding the type of visa) in the document was also used in this report. In cases where a visa was discussed, they fell into the categories of "student visa", "working visa", "tourist visa" or "student and working visa".

The remoteness classification was defined by the Australian Standard Geographical Classification – Remoteness Area (ASGC-RA) system. The distance between the incident and residential postcode was determined using Google Maps. A distance of less than 100km was considered 'not a visitor', more than 100km but within the same state was 'visitor - intrastate', a different state was 'visitor - interstate' and an overseas residential postcode as 'visitor – overseas'. In cases where the incident or resident postcode was unknown, this was entered as 'unknown'.

The time of drowning was coded into four bands: early morning (12:01am to 6am), morning (6:01am to 12pm), afternoon (12:01pm to 6pm) and evening (6:01pm to 12am).

Some locations and activities with only a small number of applicable cases were grouped for the purposes of reporting. The location of 'bathtub/spa bath' was grouped with 'other'. The activities of 'bathing', 'swept away' and 'swept in' were grouped with 'other'.

A Blood Alcohol Concentration (BAC) greater than or equal to 0.05 (0.05 grams of alcohol per 100 millilitres of blood) was considered relevant and contributory to the drowning death. Additionally, for the purposes of this report, all prescribed medications were considered to be legal. Illicit drugs, such as cannabis and methamphetamine, were considered illegal drugs.

Lifejacket use was considered in cases where a drowning death involved boating or rock fishing, with information on usage and suitability taken from the coronial finding or inquest finding and police reports on the NCIS.

Data were analysed using SPSS Version 24. Descriptive statistics were utilised, as well as chi squared analysis. Statistical significance was deemed $p < 0.01$. Chi squared analysis was conducted without the 'unknown' variable (e.g. the presence of alcohol was calculated using the 'yes' and 'no' variables only).

RESULTS

Between 1 July 2005 and 30 June 2015 (a period of 10 financial years), 121 men aged 25-34 years drowned in NSW waterways. This represents 11.8% of all drowning deaths in NSW during this time period with a crude drowning rate of 2.4 per 100, 000 men aged 25 to 34 years.

Drowning deaths occurred in all years of the study period, with a high of 14 deaths (11.6%) occurring 5 times over the 10 year period and a low of 6 deaths (5.0%) in 2007-08 (Figure 1). The average number of deaths per financial year was 12.

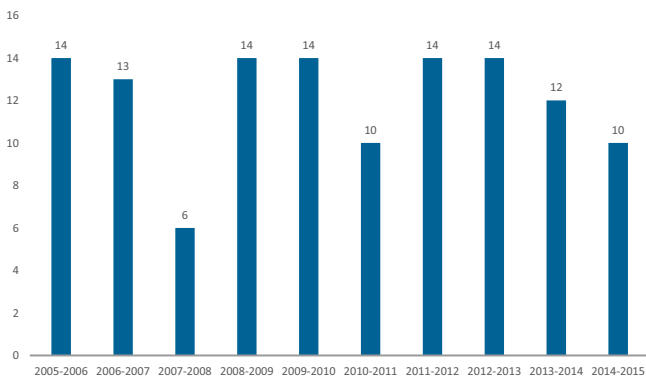


Figure 1: Drowning deaths among men aged 25 to 34 years in NSW by financial year

Overall demographic information

The highest number of drowning deaths occurred in males aged 25 (15.7%) or 30 years (14.0%), with the lowest number occurring in males aged 32 years (7.4%) (Figure 2).

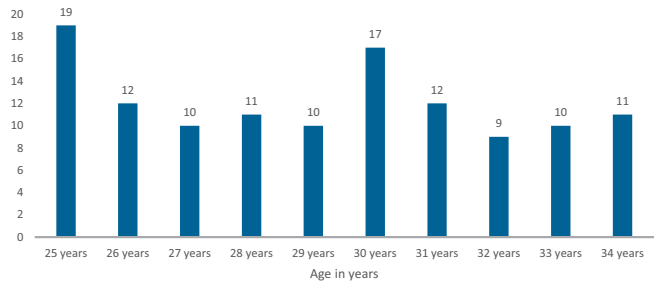


Figure 2: Drowning deaths among men aged 25 to 34 years in NSW by age in years

The majority of people who drowned did not identify as either Aboriginal or Torres Strait Islander (95.9%). The status of the remaining 4.1% was either unknown or the information was missing.

Of those men aged 25 – 34 who drowned in NSW over this period, slightly more were born in another country (43.8%) than in Australia (42.9%) (Figure 3). This information was unknown in 13.2% of cases. Of those born overseas, 37.2% were from Non-English speaking countries and 6.6% from English speaking countries including New Zealand, the United States, the United Kingdom and Canada.

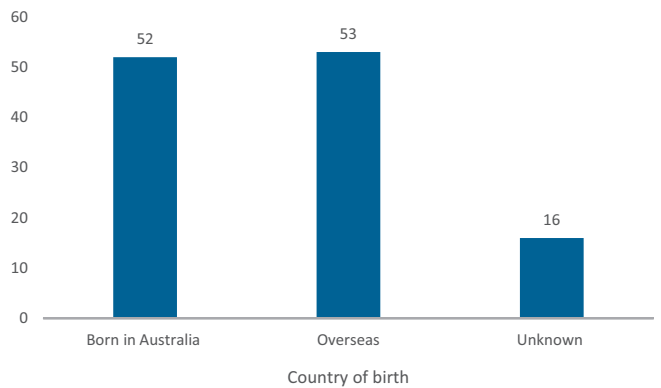


Figure 3: Drowning deaths among men aged 25 to 34 years in NSW by country of birth

A number of men in this age bracket were in Australia on either a student or working visa, with 4.9% of people on a student visa and 3.3% on a working visa. A further 0.8% were described as being on both a student and working visa (Figure 4).

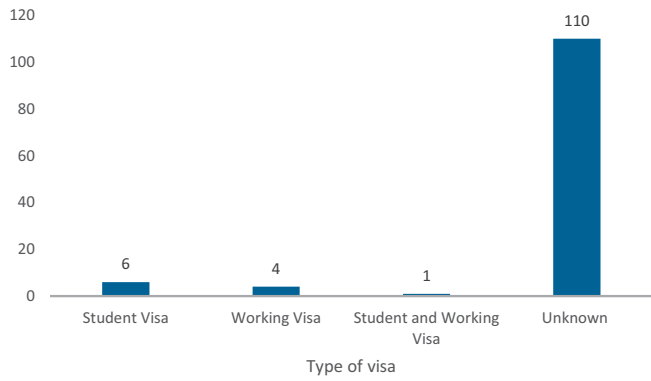


Figure 4: Drowning deaths among men aged 25 to 34 years in NSW by type of visa

Almost half of drowning incidents occurred in major cities (47.1%), with 38.0% occurring in inner regional areas and 9.9% in outer regional areas. A small proportion of incidents took place in remote (2.5%), very remote (0.8%) and offshore (0.8%) locations. The location was unknown in one case (Figure 5).

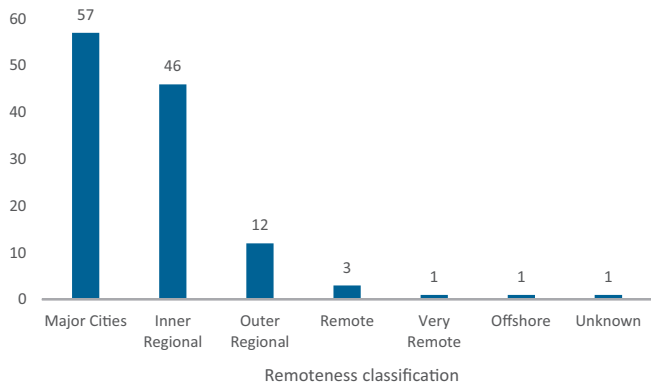


Figure 5: Drowning deaths among men aged 25 to 34 years in NSW by remoteness classification of incident

Three quarters of people who drowned were not visitors to the location where they drowned (74.4%). Intrastate visitors accounted for 10.7% of deaths, with 7.4% classified as interstate visitors and 5.0% overseas visitors. This information could not be obtained in the remaining 2.5% of cases (Figure 6).

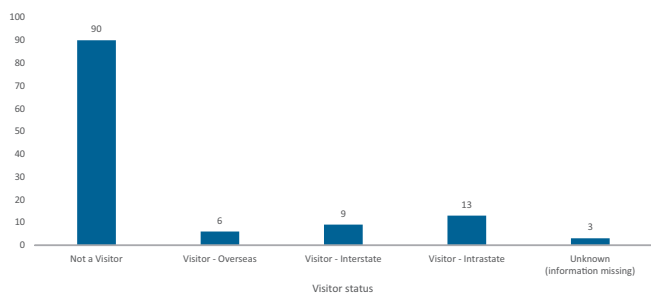


Figure 6: Drowning deaths among men aged 25 to 34 years in NSW by visitor status

Time of drowning deaths

Season

Drowning deaths occurred all year round, with the most occurring in summer (42.1%). Autumn was the second most common season for drowning incidents (23.1%), followed by spring (19.0%) and winter (15.7%) (Figure 7).

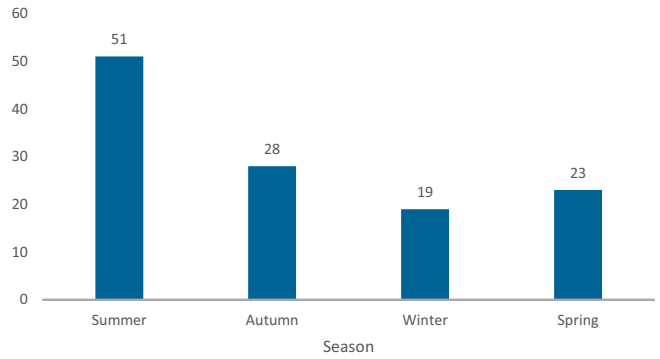


Figure 7: Drowning deaths among men aged 25 to 34 years in NSW by season of drowning incident

Month

Aligning with the seasonal trends for drowning, the highest number of deaths occurred in January (16.5%), December (14.0%) and February (11.6%). The lowest number of deaths occurred in June (3.3%) and August (4.1%) (Figure 8).



Figure 8: Drowning deaths among men aged 25 to 34 years in NSW by month

Day of the week

More people drowned on weekends than weekdays, with Saturdays accounting for 23.1% of deaths and Sunday accounting for 21.5%. The lowest number of deaths occurred on Thursday (7.4%) and Tuesday (9.9%) (Figure 9).

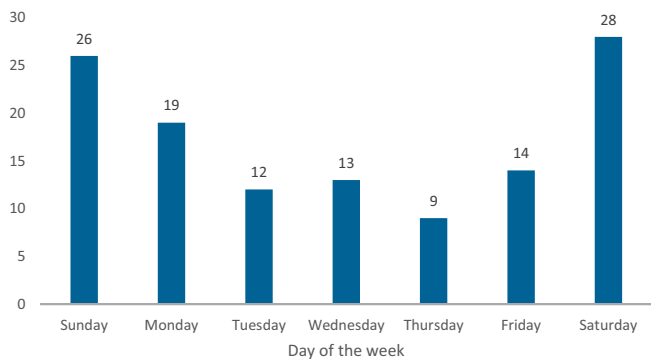


Figure 9: Drowning deaths among men aged 25 to 34 years in NSW by day of week

Time

The afternoon between 12:01pm and 6pm was the most common time for people to drown, with almost half (43.8%) of incidents occurring in this time band. A similar proportion of people drowned in the morning (17.4%) as the evening (17.4%), with a further 10.7% of incidents occurring in the hours of the early morning. The time of drowning was unknown in 10.7% of cases (Figure 10).

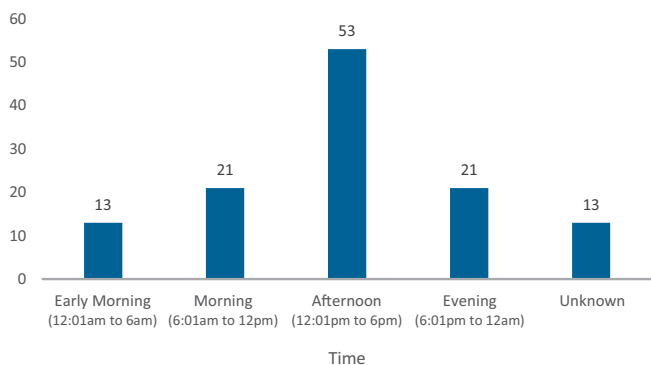


Figure 10: Drowning deaths among men aged 25 to 34 years in NSW by time band

Location and activity related to drowning deaths

Location

Beaches were the leading location for drowning, accounting for 29.8% of deaths. Rivers, creeks and streams accounted for the second highest number of deaths (24.8%), followed by rocks (18.2%). Other common locations for drowning included lakes, dams and lagoons (9.9%) and ocean / harbour locations (9.1%) (Figure 11). Among those who drowned at beaches, the leading activities were swimming and recreating (69.4%) and using watercraft (11.1%), followed by diving, performing a rescue and an unknown activity (all 5.6%). Among those who drowned at rivers, creeks and streams, most were boating (23.3%), swimming and recreating (20.0%) or fell into the water (20.0%). The majority of men who drowned at rocks were rock fishing (86.4%). Those born overseas were significantly more likely to drown at rocks than Australian born (29.0% vs. 7.7%, $X^2 = 31.2$, $p < 0.01$).

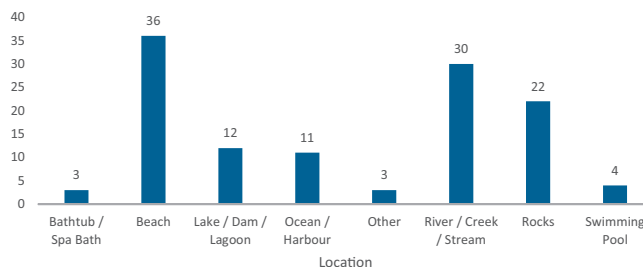


Figure 11: Drowning deaths among men aged 25 to 34 years in NSW by location

When analyzing by visitor status (yes and no), those considered visitors were most likely to drown at the beach (40.6%) compared to any other location, with most non-visitors likely to have drowned at a river, creek or stream (27.0%) or at the beach (25.8%) (Figure 12).

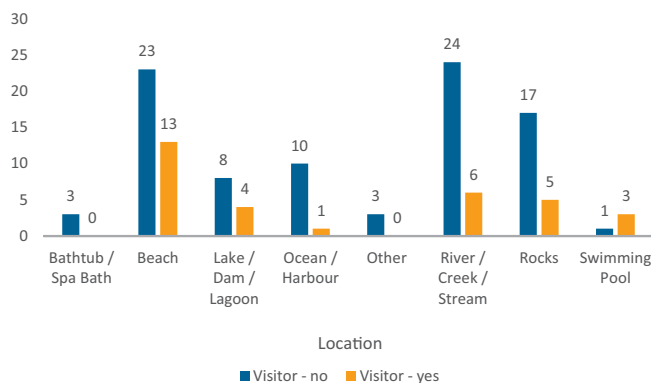


Figure 12: Drowning deaths among males aged 25 to 34 years in NSW by location and visitor status

Activity

The most common activity being undertaken prior to drowning was swimming and recreating (29.8%), followed by rock fishing (15.7%) and boating (12.4%). Other common activities included an unexpected fall into water (7.4%) and diving (5.0%). Activity was unknown in 5.8% of cases (Figure 13).

Of those who drowned while swimming and recreating, 69.4% were at the beach and 16.7% were at a river, creek or stream. For those who were boating, 46.7% were at river, creek or stream and 33.3% were at a lake, dam or lagoon. Of those who were involved in an unknown activity, almost half (42.9%) drowned at an ocean or harbour location.

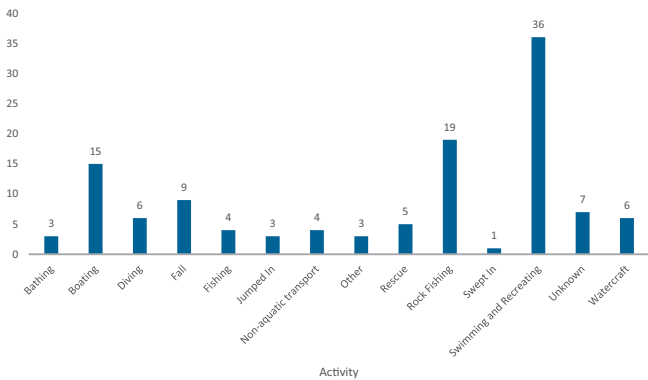


Figure 13: Drowning deaths among men aged 25 to 34 years in NSW by activity

Risk factors related to drowning deaths

Alcohol

Over a third of all drowning deaths were known to involve alcohol (36.4%). A similar proportion did not involve alcohol (38.0%). Information was unknown in one quarter of cases (25.6%) (Figure 14).

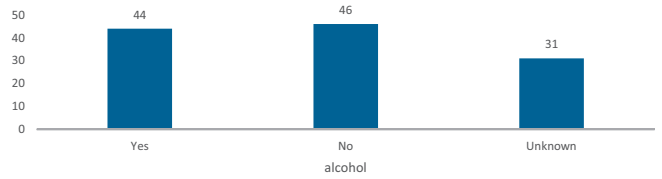


Figure 14: Drowning deaths among men aged 25 to 34 years in NSW by presence of alcohol

The presence of alcohol was examined in relation to a number of variables, including demographics. Alcohol was more often present than not, in men aged 25 years, 26 years, 31 years and 33 years (Figure 15). Of those with alcohol present, 11.4% had an underlying medical condition.

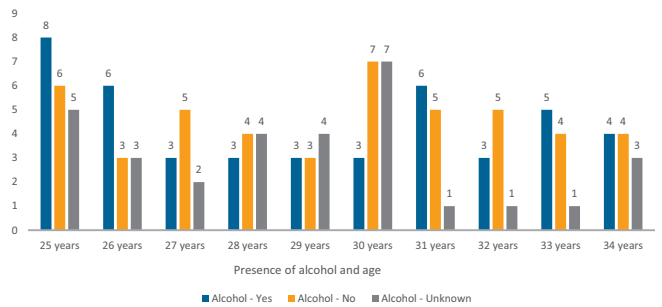


Figure 15: Drowning deaths among men aged 25 to 34 years in NSW by alcohol presence and age

The presence of alcohol was examined by different locations. Locations where people had consumed more alcohol than not occurred in: rivers, creeks and streams (yes 38.6%, no 15.2%); lakes, dams and lagoons (yes 13.6%, no 10.9%) and ocean / harbour locations (yes 13.6%, no 8.7%). In all other aquatic locations people were less likely to have alcohol present. Beaches (41.9%) and rocks (25.8%) both had a high proportion of unknowns (Figure 16). When analysed by alcohol and visitor status, 38.2% of non-visitors and 31.3% of visitors were found to have alcohol present.

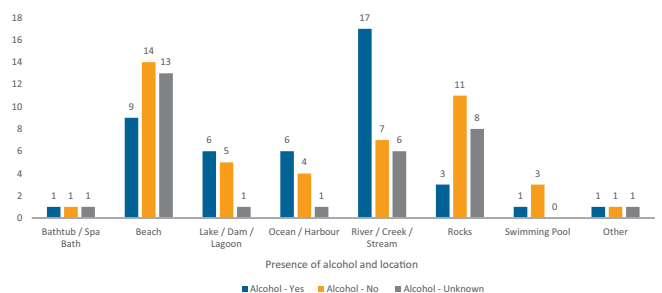


Figure 16: Drowning deaths among men aged 25 to 34 years in NSW by alcohol presence and location

Of those with alcohol present, 31.8% were swimming and recreating and 20.5% were boating (Figure 17). When analysing by type of activity and alcohol, alcohol was present in more cases than not in deaths related to non-aquatic transport (yes: 75.0%, no: 25.0%), boating (yes: 60.0%, no: 13.3%), unknown activity (yes: 57.1%, no: 28.6%), unexpected fall into water (yes: 44.4%, no: 33.3%), swimming and recreating (yes: 38.9%, no: 30.6%). Of those who were bathing, diving and other, an equal number of deaths did and did not involve alcohol.

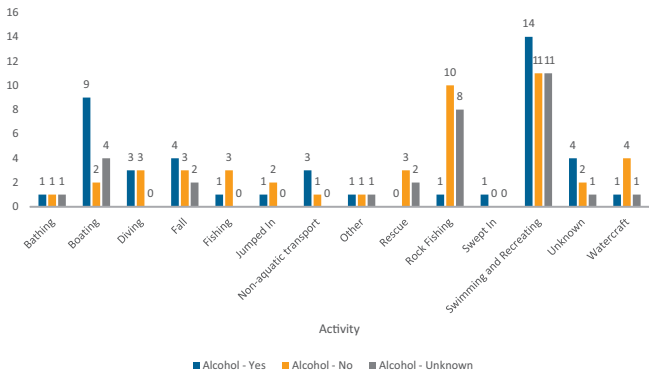


Figure 17: Drowning deaths among men aged 25 to 34 years in NSW by alcohol presence and activity

Where alcohol was present, almost half (47.7%) occurred during summer and 20.5% in spring. Winter had the least number of alcohol related deaths (13.6%). The highest number of alcohol related deaths occurred in January (28.0%), and the most frequent day of the week was a Saturday (27.3%) with deaths least likely on a Tuesday or Wednesday (6.8% each).

Alcohol was most likely to be involved in deaths occurring in the afternoon (31.8%). Nearly a quarter of alcohol related deaths occurred in the evening and early morning (22.7% each). Of those that drowned in the early morning, they were 5 times more likely to have alcohol present than not (yes: 22.7%, no: 4.3%) People were least likely to have consumed alcohol in the morning (9.1%) (Figure 18). Statistical significance was not evident among any of the variables when analysed by alcohol.

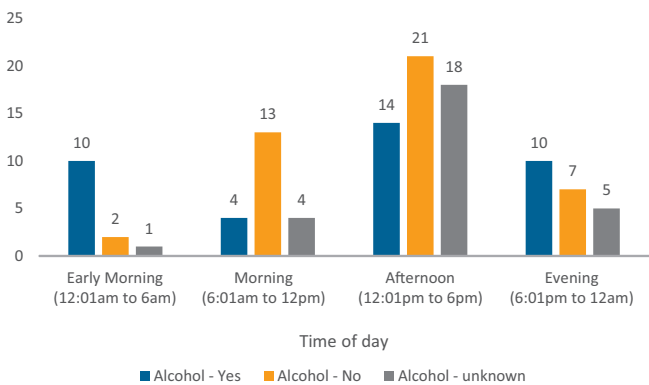


Figure 18: Drowning deaths among men aged 25 to 34 years in NSW analysed by alcohol and time of day

Alcohol Relevance

Of those drowning deaths in which alcohol was present (n = 44), the amount of alcohol detected was deemed relevant (BAC greater than or equal to 0.05) in 58.1% of those cases. Alcohol was deemed non-contributory in 37.2% of cases, with the remaining 4.7% of cases not offering enough information to determine whether or not the presence of alcohol was contributory to the drowning death (Figure 19).

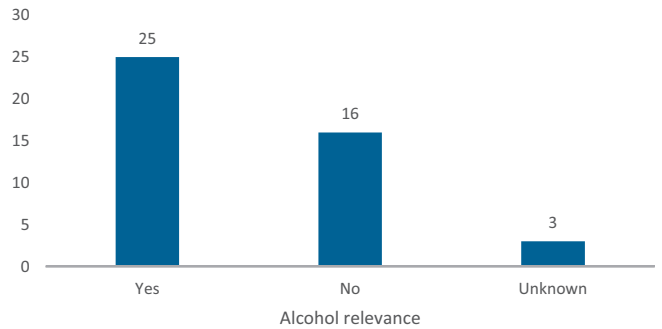


Figure 19: Drowning deaths among men aged 25 to 34 years in NSW by alcohol relevance

When analysed by location, rivers, creeks and streams had the highest frequency of men being over the limit (44.0%). The amount of alcohol detected was relevant more often than not for all locations except for ocean/harbour locations (yes: 33.3%, no: 50.0%) and 'other' locations (yes: 0.0%, no: 100%). Beaches had an equal number of people below and over the alcohol limit (50.0%). All alcohol related cases in swimming pools and bathtubs / spa baths were related to a relevant amount of alcohol (Figure 20).

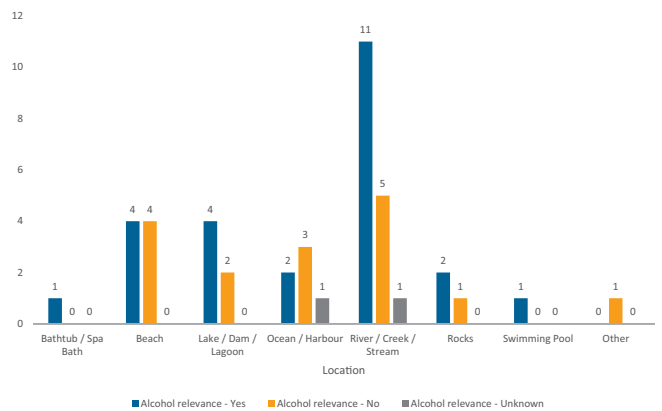


Figure 20: Drowning deaths among men aged 25 to 34 years in NSW by alcohol relevance and location

The activities where people were most likely to be over the alcohol limit were during swimming and recreating, and when boating (24.0% each), followed by an unexpected fall into water (12.0%) (Figure 21). Activities that had all cases of alcohol as being over the limit were: bathing, fishing, jumped in, and swept into the water.

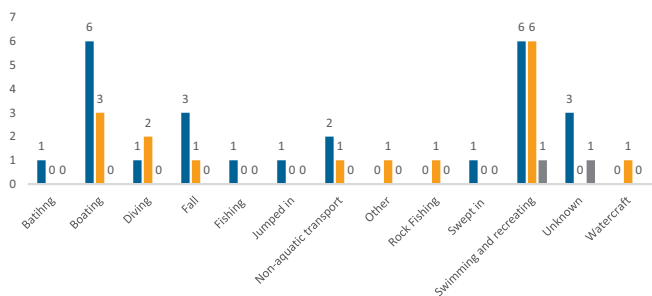


Figure 21: Drowning deaths among men aged 25 to 34 years in NSW by alcohol relevance and activity

Of those cases with a relevant amount of alcohol detected, the most occurred in the summer (44.0%), in January (28.0%) and on a Saturday (32.0%). The majority of cases with high alcohol content occurred in the afternoon and early morning (28.0% each). When analysed by visitor status, 60.0% of visitors with alcohol present and 57.6% of non-visitors with alcohol present were deemed to be over the alcohol limit.

Drugs

Almost one quarter of drowning deaths were known to involve drugs (23.1%), including both legal and illegal substances. Almost half of cases did not involve drugs (47.1%), while 29.8% of cases did not provide toxicology information (Figure 22).

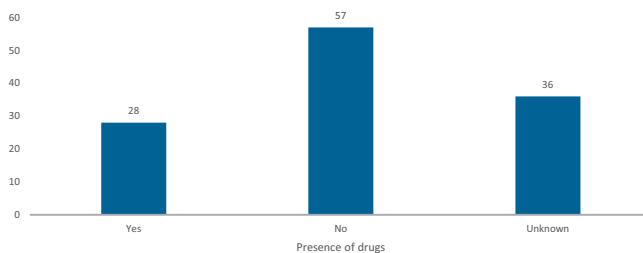


Figure 22: Drowning deaths among men aged 25 to 34 years in NSW by presence of drugs

When analysed by presence of drugs and age, those aged 28 years (yes: 36.4%, no: 27.3%) and 29 years (yes: 40.0%, no: 20.0%) had more cases involving drugs than not. Men aged 30 years had an equal number of cases with drugs present and not present and the highest number of unknown cases (Figure 23).

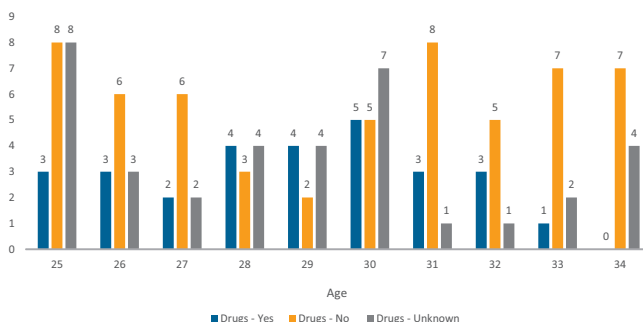


Figure 23: Drowning deaths among men aged 25 to 34 years in NSW by drugs and age

All aquatic locations recorded more cases not involving drugs than those which did apart from 'other' (7.1%) location. The highest proportion of drugs were found among drowning deaths at rivers, creek and streams (32.1%) and at beaches (25.0%). Beaches (38.9%) and rocks (25.0%) both had a high proportion of unknowns (Figure 24). When analysed by drugs and visitor status, nearly one quarter (24.7%) of non-visitors to the location had drugs present compared to 18.8% of visitors.

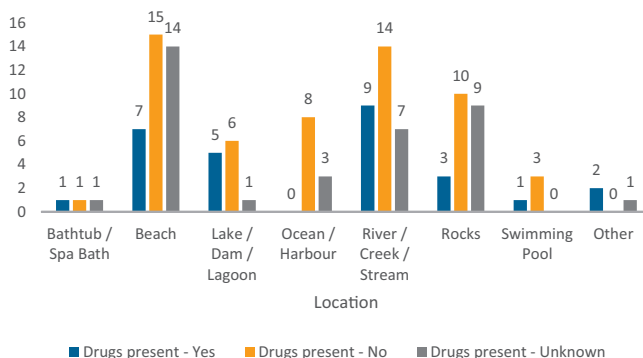


Figure 24: Drowning deaths among men aged 25 to 34 years in NSW by drugs and location

Of drug related deaths, 42.9% occurred in the summer, 28.6% were in January, and 39.3% occurred in the afternoon. Surprisingly, the highest number of deaths involving drugs occurred on a Monday (21.14%), however when combined, over half occurred on Friday, Saturday or a Sunday (17.9% each).

The highest proportion of drug related deaths occurred when the person was swimming and recreating (28.6%), followed by boating and an unexpected fall into water (10.7% each). Only those that had jumped into the water and been swept into the water had more drugs present than not, compared to all other activities. An equal number of cases had drugs present/not present when bathing, fishing, using non-aquatic transport and undertaking other activity (Figure 25).

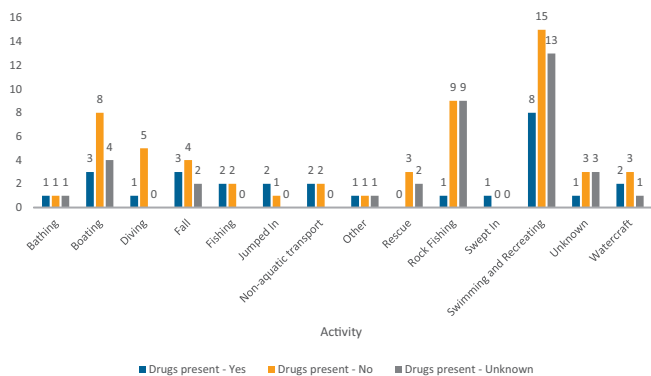


Figure 25: Drowning deaths among men aged 25 to 34 years in NSW by drugs and activity

Of those with drugs present, over a third had consumed solely illegal drugs (35.7%) and 21.4% had consumed both legal and illegal drugs (Figure 26).

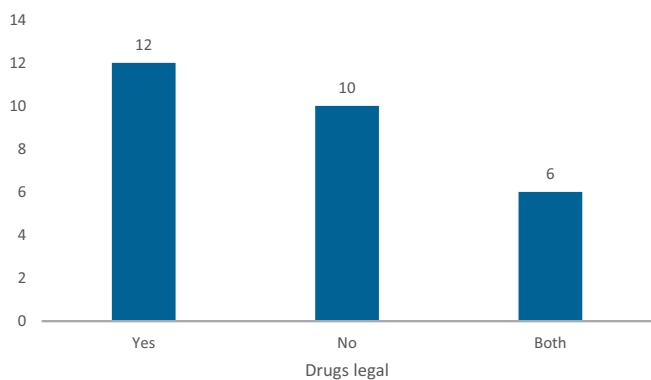


Figure 26: Drowning deaths among men aged 25 - 34 years in NSW by legality of drugs

When analysing by age and legality of drugs, overall men aged 30 years had the highest proportion of illegal drugs in their system (4/5 cases, 80.0%). Men of all ages had consumed both legal and illegal drugs, with exception of those aged 27 years found to only have had legal drugs (e.g. medication) (Figure 27). Overseas-born men were significantly less likely to have consumed drugs (11.3% vs. 40.4%, $X^2 = 15.9$ p < 0.01) than Australian born men.

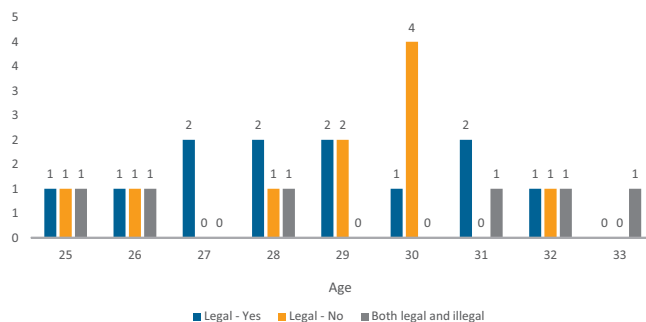


Figure 27: Drowning deaths among men aged 25 to 34 years in NSW by legality of drugs

In regards to cases recording the presence of illegal drugs, over half occurred in inner regional locations (56.3%), a quarter on a Sunday (25.0%), and 37.5% in the afternoon. In regards to location, 37.5% occurred at a river, creek or stream and a quarter (25.0%) at a lake, dam or lagoon (Figure 28). Of drowning deaths among non-visitors or locals, one quarter involved drugs, of which 59.1% recorded illegal drugs.

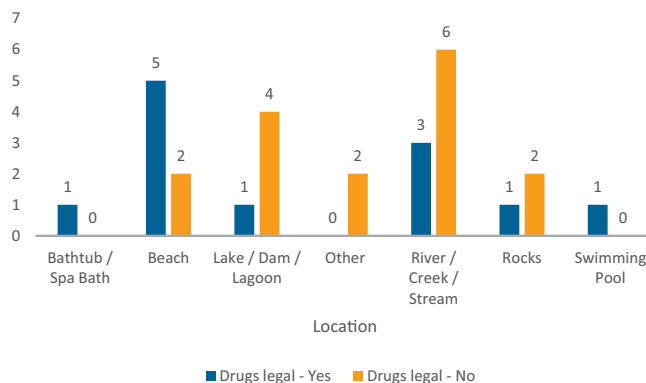


Figure 28: Drowning deaths among men aged 25 to 34 years in NSW by drug legality and location

When analysed by presence of drugs and activity, all cases of drugs were illegal when diving, fishing, being swept into the water, jumping into the water, an unexpected fall into the water, using non-aquatic transport and 'other' activity (Figure 29).

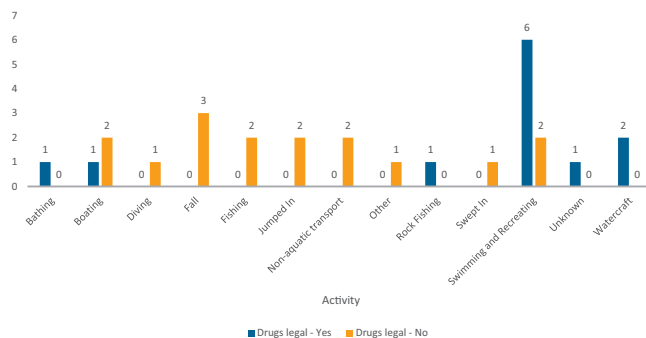


Figure 29: Drowning deaths among men aged 25 to 34 years in NSW by drugs and activity

Alcohol and drugs

When examining alcohol consumption by drug use, it was found that 12.4% of drowning deaths involved both alcohol and drugs, while 27.3% involved neither. In a further 19.8% of cases alcohol was known to be present but not drugs and in 10.7% of cases drugs were known to be present but not alcohol. In 25.6% of cases, toxicology information on both alcohol and drugs was missing (Figure 30).

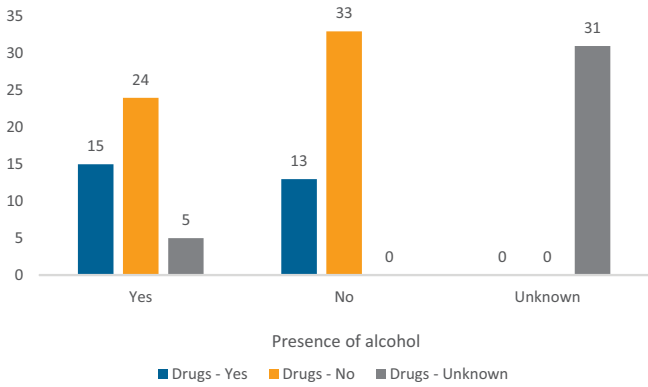


Figure 30: Drowning deaths among men aged 25 to 34 years in NSW by alcohol and/or drugs

Lifeguard usage

Lifeguard use was examined, with no case having reported to be wearing a lifejacket at the time of death. Lifeguard usage was also examined among men who drowned while rock fishing (n = 19), although this information was missing in over half of cases (57.9%). A lifejacket was not worn in any of the deaths which occurred when rock fishing (42.1%) (Figure 32).

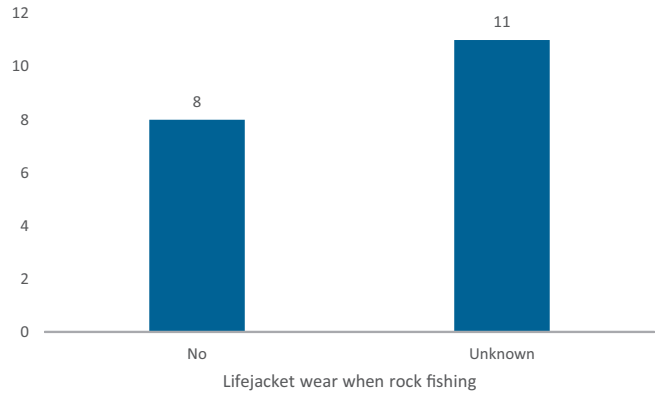


Figure 32: Drowning deaths among men aged 25 to 34 years in NSW by lifejacket wear while rock fishing

Medical conditions

A pre-existing medical condition was known to be present in 15.7% of deaths. There were no known medical conditions in 33.9% of cases, with medical history or autopsy results not available in 50.4% of cases (Figure 31). Men aged 27 and 33 years were most likely to have a medical condition (21.1% each). Common medical conditions identified included: cardiovascular disease, epilepsy, liver disease, depression and other mental health disorders. Of those that had a pre-existing medical condition, most drowned at the beach (26.3%) and were swimming and recreating (21.1%), followed by diving and using watercraft (15.8% each).

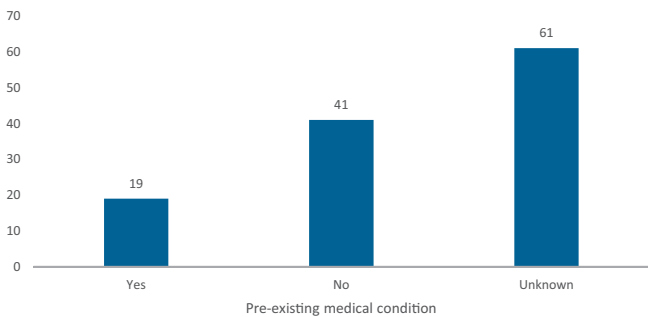


Figure 31: Drowning deaths among men aged 25 to 34 years in NSW by pre-existing medical condition

Other factors

Flood-related

Although the majority of drowning incidents were not flood-related, 3.3% of deaths did involve flooded waterways. In a further 9.9% of cases, it was not known whether the death was flood-related, commonly due to a lack of circumstantial detail (Figure 33). All flood related cases had alcohol present, of which 50.0% were found to be over the limit and three out of four cases involved drugs, of which all were considered legal (e.g. medication).

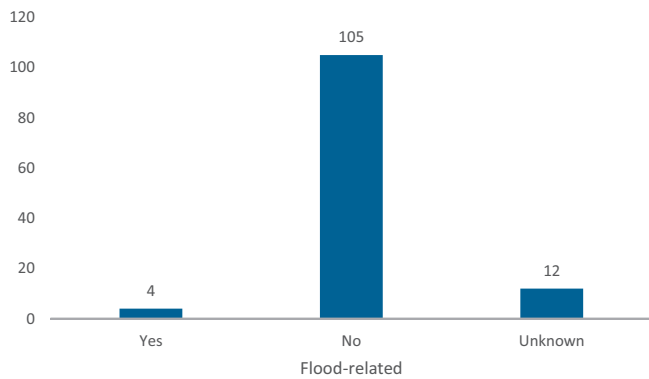


Figure 33: Drowning deaths among men aged 25 to 34 years in NSW by flooding

Multiple fatality event (MFE)

In 16.5% of cases, more than one person drowned during the incident, resulting in a MFE. In most cases (82.6%), the incident resulted in one fatality. However, this information was unknown in one instance (0.8%) (Figure 34). Men aged 25 years were most likely to be involved in a MFE (30.0%), followed by those aged 30 years (25.0%).

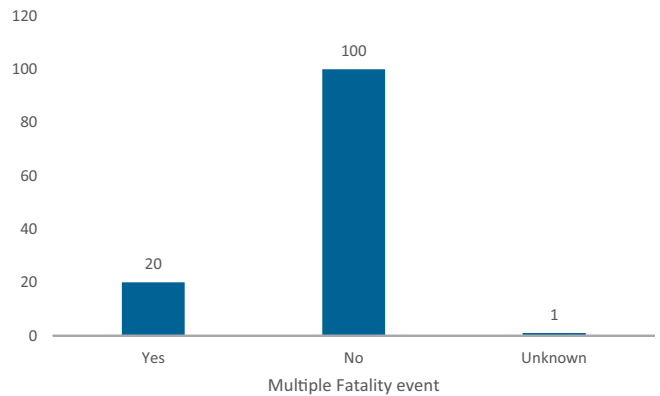


Figure 34: Drowning deaths among men aged 25 to 34 years in NSW by multiple fatality event

Of those involved in a MFE, 40.0% drowned at a river, creek or stream, followed by beaches, ocean / harbour locations and rocks (15.0% each). Multiple fatality events were most likely to occur when using watercraft (30.0%) or when swimming and recreating (20.0%) (Figure 35). When analysing by presence of alcohol, alcohol was present in 40.0% and drugs present in 20.0% of MFEs. Three of four cases with drugs present involved illegal drugs. Overall, 6.6% of men were involved in a MFE that also involved alcohol and 3.3% involved drugs.

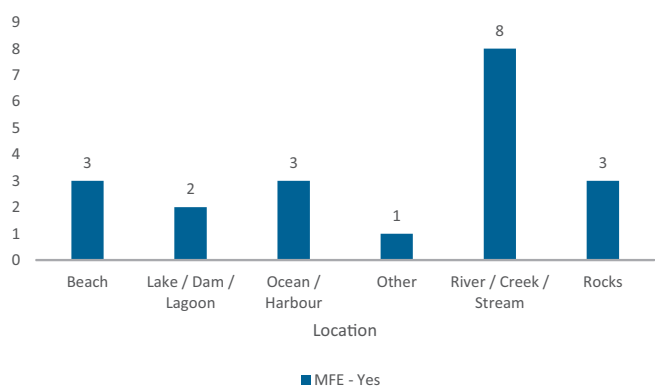


Figure 35: Drowning deaths among men aged 25 to 34 years in NSW by multiple fatality event and location

DISCUSSION

Men aged 25 to 34 years have previously been identified as being high risk for drowning in Australia. This report shows that the contributing factors for young men drowning in NSW are consistent with national trends relating to alcohol, drugs and lack of lifejacket wearing. This study elaborates further on issues specific to NSW including rock fishing and the number of overseas-born men who are drowning in NSW waterways.

In relation to age, men aged 25 years and 30 years were the most likely to drown among this age bracket. Men aged 25 years had more alcohol present than not, they made up the highest proportion of drowning deaths when rock fishing (21.1%) and when swimming and recreating (19.4%). They were also most likely to be involved in multiple fatality events (30.0%). Those aged 30 years had the highest proportion of illegal drugs compared to any other age.

Overall, beaches were the leading location for drowning deaths in NSW, with swimming and recreating found to be the most common activity undertaken prior to drowning, followed by rock fishing. A small proportion (5.8%) drowned following an unknown activity, suggesting they may have been alone at the time they drowned and the incident was unwitnessed. Undertaking any type of aquatic activity alone is dangerous, as assisted may be limited if a dangerous situation arises. All people, even otherwise fit and healthy men, should avoid swimming or recreating near water alone, especially at night.

Alcohol consumption and drug use are obvious risk factors for drowning among this demographic. The presence of alcohol was recorded in over a third of men who drowned, with more than half recording a BAC greater than or equal to 0.05mg/L. Just under a quarter were known to have consumed drugs prior to the incident, with nearly half of these involving illegal drugs, most commonly cannabis and methamphetamine. Two thirds of drowning deaths involving illegal drugs occurred in inland locations.

These results suggest that alcohol and drug use when around the water and when participating in aquatic activities is of the norm among this demographic. Regardless of whether the person had intended to be in the water, e.g. swimming, bathing or jumping, or unexpectedly, such as a fall or being swept into the water, the quantity of alcohol and drugs evident among this age group is extremely concerning. Consuming such a high level of alcohol and/or illegal drugs is known to impair judgement, affect coordination, perception and can increase risk taking behavior. Alcohol and drugs can significantly impact survival when in the water (13). It is worth noting that alcohol consumption and drug use do not appear to be contributing factors in rock fishing deaths, unlike many other activities.

In regards to location, drowning deaths involving alcohol were more likely to occur at rivers, creeks and streams and least likely to occur at a swimming pool, when bathing or in other locations. Inland waterways combined accounted for over half of all alcohol related drowning deaths, with 60% recording an alcohol reading equal to or greater than 0.05mg/L. Rivers, lakes and dams are often in isolated areas, where enforcement of alcohol restrictions are less likely to occur and can often take longer for emergency services to reach. Royal Life Saving's Respect the River campaign aims to increase awareness and knowledge of water safety in key rivers across Australia, with the most recent campaign addressing men and alcohol consumption in these locations.

Nearly half of all drowning deaths involving alcohol occurred in the evening and early morning. This suggests alcohol consumption may be related to evening entertainment activities which can extend into the early hours of the morning, particularly in the summer when both the weather and water are at warmer temperatures. Targeted campaigns addressing alcohol consumption near aquatic environments and during aquatic activity should be carefully considered to maximize the impact of the messages.

Lifejacket usage was investigated for boating and rock fishing related deaths. No rock fishing related cases were recorded to have been wearing a lifejacket (although over half were unknown), nor was there mention of lifejackets being present (e.g. carried but not worn) in any of the boating incidents. Of those that drowned when rock fishing, 89.5% were recorded as not being born in Australia. This is of importance as recent coronial recommendations following rock fishing deaths have highlighted the need for education campaigns to target high risk groups, such as people from culturally and linguistically diverse (CALD) communities (15). Currently the NSW Government is trialing the mandatory wearing of lifejackets in the Randwick Council area of Sydney. Whilst anecdotal evidence from NSW Marine Area Command suggest an increase in the wearing of lifejackets among rock fishers in NSW since the introduction of the trial, evaluation is not yet available. Concentrated education efforts across a range of methods with key partners need to continue in order to make an impact in this area.

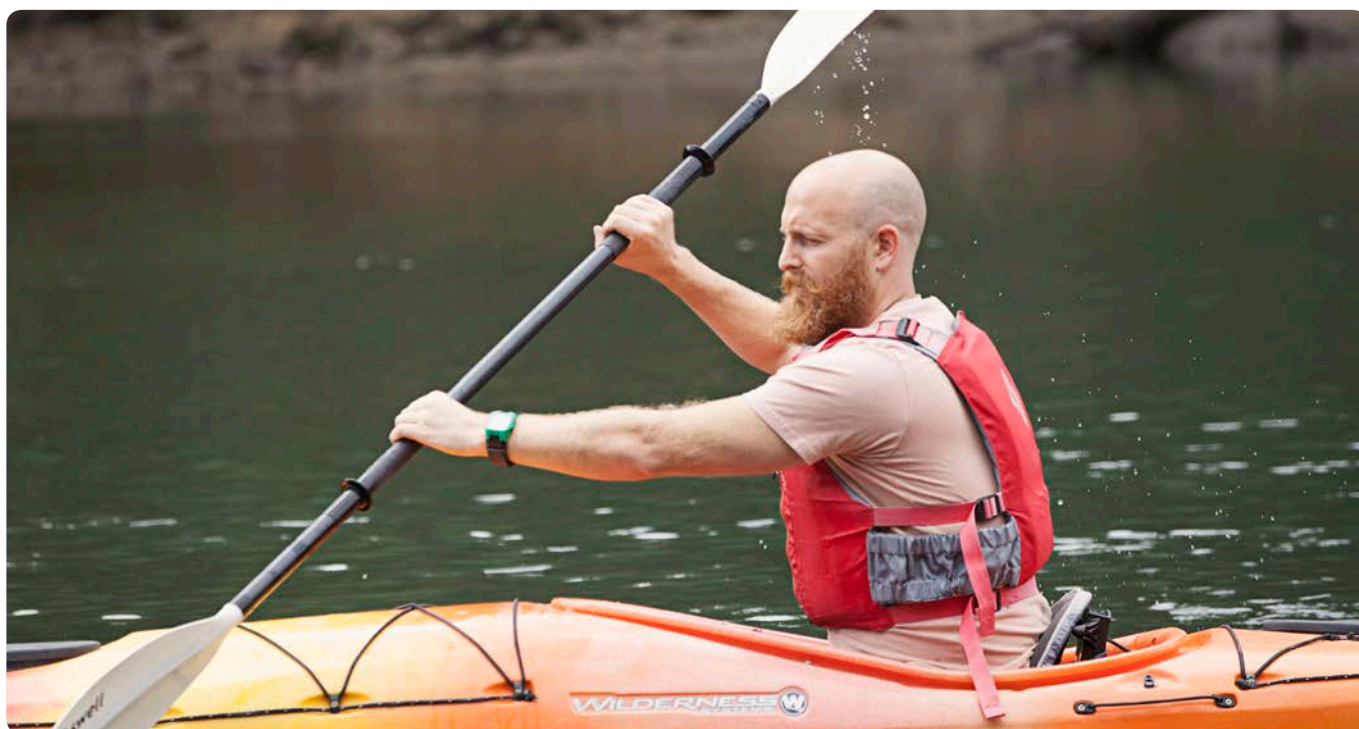
Royal Life Saving advocates for correctly fitted lifejackets to be worn by all people onboard a boat and when rock fishing. Regardless of experience, people participating in boating and fishing activity should always be prepared by wearing a lifejacket, taking the correct safety equipment, checking the marine weather and water conditions, and telling someone where they are going and when they intend to be back.

The majority of drowning deaths examined in this study occurred among local residents, or those not considered visitors to the location where they drowned. Non-visitors most frequently drowned at inland waterways, whilst visitors were more likely to drown at beaches. Non-visitors were more likely to take risks around the water such as drinking a large quantity of alcohol and consuming illegal drugs. Although local residents may have local knowledge and experience, this may lead to complacency in taking safety precautions, especially when alcohol and drugs are involved.

Although most people were classified as non-visitors, nearly half of these men were born overseas and may not be aware of the risks posed by Australian waterways. Just over a third of those born overseas were swimming and recreating and over a quarter were rock fishing. Interestingly, overseas-born men were significantly less likely to have consumed drugs (11.3% vs. 40.4%, $X^2 = 15.9$ $p < 0.01$) and less likely to have had alcohol (30.6% vs. 44.2%) than those born in Australia, although the difference in alcohol consumption between the two groups was not statistically significant. This suggests that overseas-born men may be more cautious around the water than those born in Australia. In contrast, those born overseas were 3.8 times more likely to drown at rocks than Australian born (29.0% vs. 7.7%, $X^2 = 31.2$, $p < 0.01$). Future research would benefit from improved data regarding country of birth, years in country and visa status to continue to target interventions to the appropriate audience. It is likely that those born overseas were in the country on student or work visas. Partnering with local universities or training institutes with large numbers of international students and with community agencies may be valuable to engage with these 'at-risk' populations before they start to visit aquatic locations and participate in activities.

Unsurprisingly, most drowning deaths occurred in the summer months during the peak summer holiday period (December and January) and during the weekends (44.6%). This is a time when people may be visiting locations for the first time or for an annual visit and may unfamiliar with the environment. During the summer months in NSW longer daylight hours, warmer air and water temperatures entice more people to the water. Studies from Canada report an increased risk of men drowning in temperatures over 30 degrees celcius and a 69% increased risk of drowning in an outdoor setting (10). Drowning deaths during the summer months may be due to a combination of factors, therefore campaigns leading up to and during this period targeting men may be useful. Summer drowning messages tend to emphasise children and family water safety rather than the older demographic that are more likely to drown over this period.

Another recurring theme was the issue of weather and wave conditions leading to the person being in the water. Weather and waves were commonly cited in reference to rock fishing 'this person drowned as a result of being washed off the rocks by waves when rock fishing' (15). Additionally, rip currents were cited in a number of swimming and surfing deaths and when attempting a rescue. Strong winds and big swells were often recorded in boating incidents. Weather was also a factor in non-aquatic transport incidents. This reinforces the importance of checking the marine weather and being prepared; it is clear many of these men simply did not take the right precautions regardless of whether they were under the influence of alcohol and drugs or not.



LIMITATIONS

- A proportion of cases within this report were open (ie. case still under investigation) and as such, a number of variables remain unknown until the case is closed following the completion of any coronial investigation. It should be noted there may be a higher number of unknown variables among cases in regional / rural areas or more recent years where a larger proportion of cases may still be under investigation.
- Amongst cases which were closed, some were still missing information, either because the information was unknown or it was not made available electronically. In such cases, variables were entered as 'unknown', limiting the completeness of the data.

CONCLUSION

Drowning deaths of males aged 25-34 years occurred throughout the year, with beaches and rivers, creeks and streams being the leading location for drowning among this demographic. A number of key risk factors emerged, including alcohol and drug use. Although risky alcohol consumption is relevant to all aquatic locations, it was significantly more likely in river, creek and stream drowning deaths. Similarly, there was an association between alcohol consumption and fatalities related to non-aquatic transport and boating incidents. By examining risk factors, evidence-based prevention strategies can be developed to target excessive alcohol consumption around water, including high risk areas (rivers, creeks and streams), activities (boating) and populations (Indigenous Australians).

Drowning deaths as a result of unsafe boating practices were also a common occurrence, with poor conditions, a lack of planning and absent or deficient safety equipment all contributing to a number of deaths. Promotion of lifejacket usage is an important strategy to decrease not only deaths related to boating but also rock fishing. Any successful strategy in this area will need to be multi-faceted and inclusive, in order to bring about meaningful change.

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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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