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The characteristics of drowning among different types of international visitors to Australia and how this contributes to their drowning risk

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Abstract

Objective: Australia is a popular destination for international visitors. This study reviews international visitor drowning deaths in Australia and analyses drowning by visitor type.

Methods: A total population retrospective study exploring drowning deaths of international visitors was conducted between 2008 and 2018. Data were extracted from the Royal Life Saving National Fatal Drowning Database and categorised into four subgroups: overseas tourists, international students, working holiday makers and work-related visitors. Descriptive statistics, non-parametric tests and relative risk (RR) were calculated.

Results: In total, 201 international visitors drowned in Australia, 7% of all drowning deaths; a crude drowning rate of 0.27/100,000 visitors versus 0.95/100,000 for residents (RR=0.19 [95% CI: 0.16–0.22]). Most deaths were males (79%) and people aged 18–34 years (50%). Visitors frequently drowned at beaches (33%), and when swimming (41%). Thirty-five percent recorded a pre-existing medical condition. Overseas tourists on holiday were the most likely to drown compared to other subgroups.

Conclusion: International visitors represent a small but increasing proportion of people drowning in Australia. The circumstances of which visitors drown vary by travel purpose, age, country of origin, location of drowning and activity.

Implications for public health: International visitors have unique safety needs, requiring tailored prevention based on the purpose of travel and country of origin.

Key words: drowning, risk profile, injury prevention, epidemiology, tourists

Introduction

Prior to COVID-19 travel restrictions in 2020, approximately 9 million international visitors arrived in Australia annually.[1] Common reasons to visit Australia were for holiday/vacation (47%), visiting friends/relatives (30%), business (7%) and study (7%).[1] Over 70% of visitors go to beaches and engage in water-based activities.[2] International visitors are at higher risk of injury or death when travelling to unfamiliar areas,[3–5] with most travel-related morbidity and mortality among international visitors, being from injuries, such as road traffic crashes and water-related incidents.[4–8]

In Australia, an average of 274 people fatally drown per year and 555 are hospitalised due to a non-fatal drowning[9]; someone who survives a drowning incident either with or without morbidity.[10] In Australia, three non-fatal incidents occur for every fatal drowning.[11] Previous

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research has reported that international visitors represented 4% of drowning deaths in Australia[1] and were five times more likely than residents to experience a non-fatal drowning.[8] Furthermore, international tourists account for around 25% of diving and snorkelling deaths[13] and 4% of boating and watercraft-related drowning deaths,[14] and 16% of water-related deaths in national parks.[15,16]

Injury prevention strategies

Few public health or injury prevention strategies include visitors as a specific population for safety promotion, currently there is no comprehensive strategy focusing on visitor safety in Australia.[4] The Australian Water Safety Strategy 2030 aims to reduce drowning in Australia by 50% by 2030 with international visitors identified as one population requiring focused attention to achieve this goal.[17] Some safety campaigns have been developed for tourists, specifically road safety and drowning, including water safety videos being played on airlines,[18,19] and road safety information disseminated through car hire companies;[4] however, the effectiveness of these interventions is unknown and warrants further research. International visitors to Australia and New Zealand have reported low awareness and risk perception of dangers at aquatic locations, which may increase their injury and drowning risk around the water.[20–22]

A previous study presented the epidemiology of drowning among international visitors Australia between 2002 and 2012.[12] The current study extends on this research by providing current data of drowning among visitors to Australia and extends understanding of visitor drowning based on visitor type. A recent study of domestic and international tourists in Australia suggested that profiling visitor type can better target prevention strategies to reduce fatal and non-fatal injuries.[4]

This study aims to classify Australian international visitor drowning deaths by visitor categories and identify the circumstances in which they drown.

Methods

A total population retrospective epidemiological study of unintentional drowning deaths in Australia among international visitors between 1 July 2008 and 30 June 2018 was undertaken to capture visitor drowning deaths prior to the COVID-19 pandemic. Data were extracted from the Royal Life Saving Australia National Fatal Drowning Database (the "Database"); the original data source being the Australian National Coronial Information System (NCIS).

In Australia, all sudden and unexpected deaths are investigated by a coroner to determine the circumstances and cause of death and registered in a nationwide coronial database, the NCIS, which is the primary source of information for the Database.[23] Only deaths where unintentional drowning was determined as the primary or contributory cause of death are included in the Database;[24,25] therefore, people who died in the water by natural causes, suicide, homicide or injuries caused by animals and marine life are excluded. As of 1 September 2022, 3% of cases were still under coronial investigation. These cases were included as demographic data were available and provided a more accurate number of visitor drowning deaths over the study period.

Inclusion criteria

International visitors were defined as per the Australian Bureau of Statistics (ABS): "*A visitor is any traveller arriving to or departing from Australia who is not a resident. A visitor can be either short-term (less than 12 months) or long-term (12 months or more).*"[1] This includes people who intend to be in Australia for a temporary period and return to their country of origin, including someone on holiday, visiting family/friends, taking a working holiday and students.

Generally, tourists travel to Australia for the following purposes: holiday, visiting friends/relatives, business, education, or in transit.[2] Visitor subgroup delineation was based on information provided in the NCIS. Coronial documents generally record country of birth, how long they had been in the country and their purpose in Australia (e.g. tourist, education, worker). However, it was often difficult to separate out those on holiday, visiting friends/relatives, or for business/work purposes.

For the purposes of this study, all international visitors included this study were categorised into four subgroups for analysis: *overseas tourists, international students*, *work-related visitors (WRV),* and *working holiday makers (WHM),* based on the following definitions for each type of tourist category: ***Overseas tourists***: people arriving or departing from Australia who are not a resident; either short term (<12 months) or long term (≥12 months, but not permanently) including people visiting friends/relatives or on holiday.[1] ***International students***: non-citizens or permanent residents who undertake formal or non-formal study in Australia for a specific period, there is no specified age for international students.[26] ***WRV:*** people in Australia for short-term business reasons, including international vessel crews in Australian waters/ports. People can be in Australia for business reasons for up to 3 months over a 12-month period.[27] ***WHM***: people who come to Australia to work and travel, generally aged between 18 and 35 years old, including people who undertake short-term work in regional/rural locations as part of visa requirements.[28]

Variables analysed included: financial year of death, age group, sex, country of birth (noting that country of residence is not always recorded), aquatic drowning location, activity prior to drowning, presence of alcohol, drugs and a pre-existing medical condition(s). Remoteness classification of drowning location: major cities, inner regional, outer regional, remote and very remote.[29]

Aquatic locations of drowning were beach, lake/dam, ocean/harbour, river/creek, rocks, swimming pool and other. Activities included boating, diving (scuba diving, snorkelling, spearfishing), rock fishing, swimming (swimming, wading, playing, floating), fall (unintended entry into water) and non-aquatic transport (bicycle, vehicle that has gone into the water).[30,31] Swimming ability was coded into strong swimmer, competent swimmer, poor swimmer and non-swimmer. Swimming ability of the deceased was only recorded where it was mentioned in coronial documents, which may not be an accurate perception. Variables were coded according to the Royal Life Saving National Fatal Drowning Data and Coding Manual reported elsewhere.[30]

Alcohol and drug information were derived from NCIS toxicology reports. Alcohol is a risk factor for drowning.[10,32–34] A blood alcohol concentration ≥5 grams of alcohol per 100 millilitres of blood (BAC ≥0.05%) was considered contributory to drowning, due to the impacts on coordination, judgement and risk-taking behaviour.[32,35–37] A BAC ≥0.05% is often used in drowning literature being the upper

legal limit for driving a vehicle in Australia and the legal limit for operating a vessel or personal watercraft in most Australian states/territories.[14] Drugs were classified as legal (medication) and illegal (illicit substances, including toxic levels of drugs that were determined by the coroner as being contributory to death).

Data analysis was conducted using SPSS V27.[38] Descriptive statistics were utilised, as well as chi-square (χ^2) tests reported significance ($p<0.001$). A Bonferroni correction[39] was applied where multiple categories within the one variable were analysed (i.e. location and activity). Variables with "unknown" were excluded from chi-square tests. Data were analysed by the four visitor subgroups by country of birth. Numbers ≤5 are not presented (NP) due to ethical constraints.

Relative risk (RR) with a 95% confidence interval (CI) and drowning rates per 100,000 tourists were calculated using a 10-year average number of international visitors, based on all short-term international visitor arrivals data from ABS from June 2008 to July 2018[1] compared with the total number of tourist drowning deaths during the study period. This dataset was chosen as a proxy for the total number of international visitors, as the study focused on people who had intended on being in Australia temporarily (e.g. ≤ 12-months). Drowning rates by visitor country of origin were calculated using the same method, based on short-term international visitor arrivals data by country.[1]

Results

A total of 2,832 people drowned in Australia over the study period, 7.1% (N=201) were international visitors; an average of 20 visitors fatally drowned per year. The overall crude 10-year average drowning rate was 0.27 per 100,000 short-term visitor arrivals, compared to 0.95 per 100,000 Australian residents (RR 0.19, 95% CI: 0.16–0.22) (**Figure 1**).

Males (78.6%) and people aged 25–34 years (28.9%) most commonly drowned. The median age was 31.0 years (IQR 25–61). Children (<18 years) accounted for 2.5% of drowning deaths (Table 1).

Circumstances of visitor drowning

Almost half of all deaths occurred in Queensland (49.8%), followed by New South Wales (NSW) (21.4%) and 48.3% occurred in regional locations. Visitors most frequently drowned during the summer (34.3%), at beaches (33.3%) and while swimming (40.8%) (Table 1). Almost half (49.3%) recorded a pre-existing medical condition (Table 1); cardiac conditions were the most common type (64.1%). Alcohol was present (BAC ≥0.05%) in 10.9% of deaths. Prescription medication was recorded in 17.4% of deaths, and 6.0% recorded illegal drugs (Table 1). Overall, 16.9% of visitors were under the influence of alcohol (BAC ≥0.05%) and/or illegal substances. Swimming ability was recorded in 18.9% of cases; 63.1% were thought to be competent or strong swimmers.

Visitor country of origin

Based on country of birth, countries with the highest proportion of deaths were China (14.4%), the United Kingdom (11.0%) and the United States (9.5%) (Supplementary Table 1). China recorded the highest total *number* of drowning deaths (n=30, 0.36/100,000), and Taiwan recorded the highest *rates* of drowning (n=11, 0.91/100,000). The lowest drowning *rates* recorded were among those born in the United Kingdom (n=22, 0.32/100,000) and the United States (n=19, 0.33/100,000). Visitors from China, Germany and the United Kingdom most commonly drowned at beaches, compared to people from Taiwan and South Korea, who most frequently drowned at rivers/lakes (Supplementary Table 1).

Analysis by visitor subgroup

Tourists in this study were categorised into four subgroups based on their travel purpose. Overall, *overseas tourists* were more likely to drown compared to other tourists (64.2%, $p<0.001$). *International students* accounted for 17.4%, *WHM* 11.9%, and *WRV* 6.5% of visitor drowning deaths.

Half (50.4%) of all *overseas tourists* were aged ≥55 years, 57.1% of *international students* were aged 18–24 years, 75.0% of *WHM* were aged 25–34 years and 30.8% of *WRV* were aged 45–54 years. Over

Figure 1: Number and rate of drowning per 100,000 short-term international visitors in Australia by financial year (2008/09 to 2017/18).

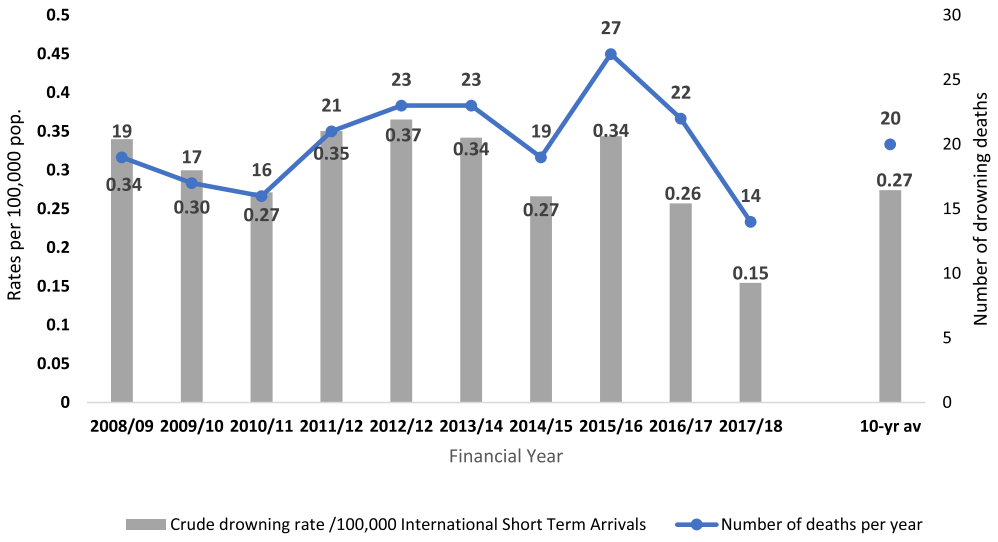


Table 1: International visitor drowning deaths in Australia between 1 July 2008 and 30 June 2018 by visitor subgroup and demographics (sex, age), and circumstances of drowning (location of drowning and activity prior to drowning, presence of alcohol, drugs and a pre-existing medical condition) (N=201).

	Total		Overseas tourist		International student		Work-related visitor		Working holiday maker		χ^2 (P-value)
	N	%	N	%	N	%	N	%	N	%	
Demographics											
Male	158	78.6	97	75.2	27	77.1	12	92.3	22	91.7	p=0.185
Female	43	21.4	32	24.8	8	22.9	NP	7.7	NP	8.3	
Age groups											
0–17 years*	5	2.5	NP	NP	NP	8.6	0	0.0	0	0.0	-
18–24 years	43	21.4	15	11.6	20	57.1	NP	15.4	6	25.0	**p<0.001**
25–34 years	58	28.9	26	20.0	11	31.4	NP	23.1	18	**75.0**	**p<0.001**
35–44 years	12	6.0	9	7.0	0	0.0	NP	23.1	0	0.0	p=0.013
45–54 years	16	8.0	12	9.3	0	0.0	NP	30.8	0	0.0	p=0.002
55–64 years	26	12.9	26	18.6	NP	NP	NP	7.7	0	0.0	p=0.007
65 years and over	41	20.4	41	31.0	0	0.0	0	0.0	0	0.0	**p<0.001**
Circumstance of drowning											
Remoteness of drowning location											
Major city	56	27.9	27	20.9	22	62.9	NP	38.5	NP	**8.3**	**p<0.001**
Inner and outer regional	97	48.3	72	55.8	10	28.6	NP	15.4	13	54.2	p=0.008
Remote and very remote	39	19.4	27	20.9	0	0.0	NP	23.1	9	37.5	p=0.002
Location											
Beach	67	33.3	49	39.2	10	28.6	NP	7.7	7	29.2	p=0.130
River/lake	45	22.4	15	11.6	13	37.1	0	15.4	15	62.5	**p<0.001**
Ocean/harbour	50	24.9	39	30.2	NP	8.6	8	61.5	0	0.0	**p<0.001**
Rocks	17	8.5	NP	NP	7	20.0	NP	NP	NP	8.3	p=0.056
Swimming pool	17	8.5	16	12.4	NP	0.0	0	0.0	0	0.0	p=0.059
Activity											
Boating/watercraft	21	10.5	12	9.4	NP	NP	6	46.2	NP	NP	**p<0.001**
Diving	53	26.4	46	35.7	NP	8.6	NP	7.7	NP	12.5	p=0.002
Fall	13	6.5	7	5.4	NP	8.6	NP	15.4	NP	NP	p=0.295
Fishing	8	4.0	NP	6.2	NP	NP	0	0.0	NP	8.3	p=0.537
Jumped in	7	3.5	NP	NP	NP	11.4	NP	NP	0	0.0	p=0.117
Swimming and recreating	82	40.8	49	38.0	17	48.6	NP	15.4	14	58.3	p=0.050
Other	17	8.3	7	5.4	NP	NP	NP	15.4	NP	8.3	p=0.146
Risk factors[a]											
Alcohol BAC<0.05	22	10.9	9	10.3	NP	20.0	NP	25.0	6	35.3	p=0.090
Drugs—medication	35	17.4	29	22.3	NP	9.0	NP	8.3	NP	12.5	p=0.243
Drugs—illegal	12	6.0	NP	NP	NP	9.0	NP	8.3	NP	12.5	-
Pre-existing medical condition present	72	49.3	61	46.9	6	18.2	NP	25.0	NP	8.3	p=0.002

NP= not presented n <5 due to ethical constraints. Bold values signifies p<0.001 = statistically significant.
a - where known.

90% of drowning deaths among *WRV* and *WHM* were male; the highest proportion of female deaths were recorded among *overseas tourists* (24.8%).

Location and activity prior to drowning

Queensland and Western Australia recorded the highest proportion of *overseas tourist* deaths (72.0% and 70.3%), whereas Victoria recorded the highest proportions of *international students* (44.4%) and *WHM* (22.2%) deaths (Figure 2).

Overseas tourists most commonly drowned at beaches (39.2%), compared to rivers/lakes for *WHM* (62.5%) and *international students* (37.1%). *WRV* most frequently drowned at ocean/harbour locations. For all groups, swimming was the most frequent activity being undertaken prior to drowning except for *WRV* who most commonly drowned while using boats/watercraft (46.2%). For *overseas tourists*, a similar proportion drowned while swimming (38.0%) and diving (35.7%) (Table 1).

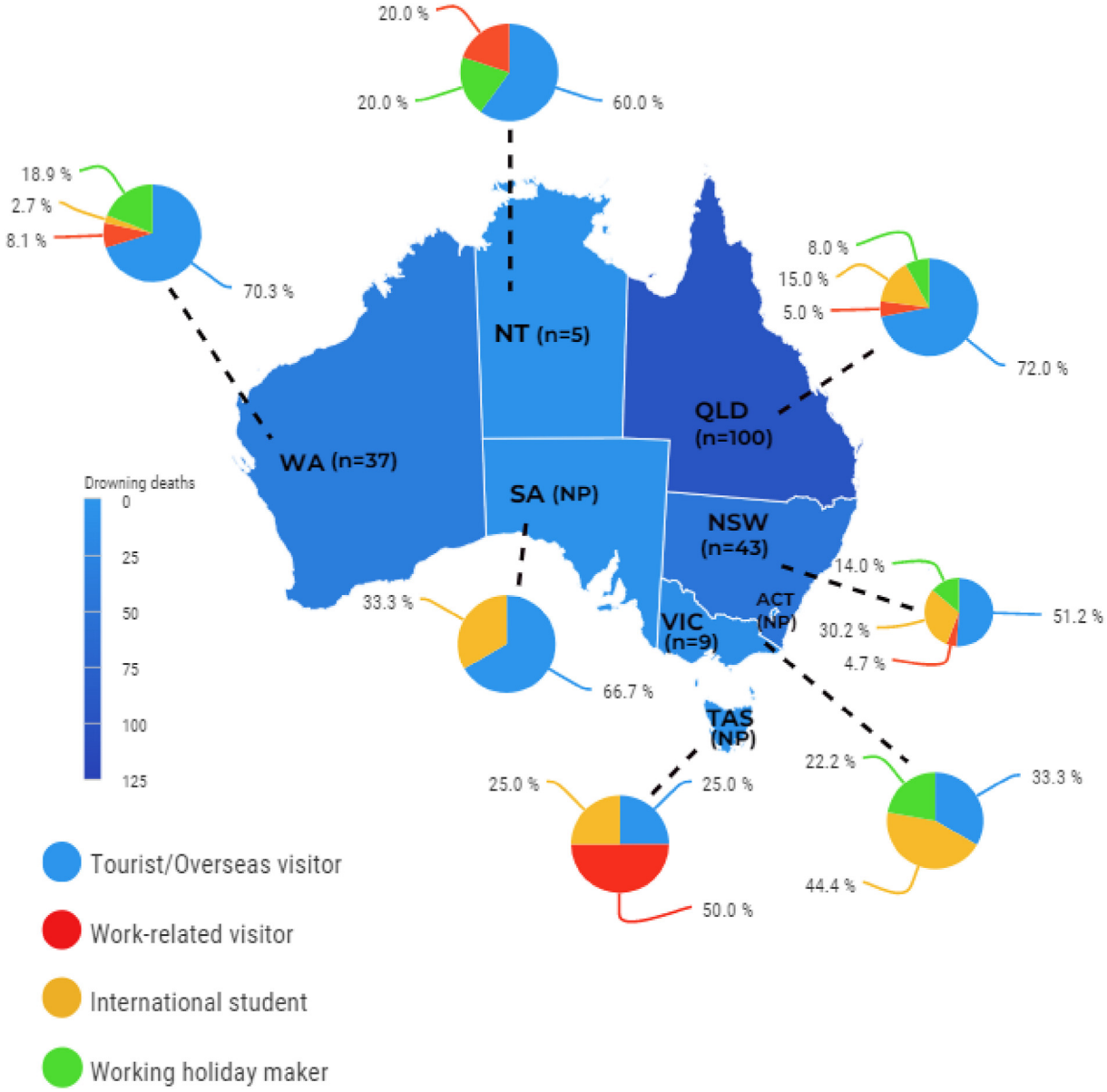
Risk factors

Overseas tourists were significantly more likely to have a pre-existing medical condition than other subgroups (49.3%, $p<0.001$). *WHM* recorded the highest proportion (25.0%) of alcohol (BAC≥0.05%).

Discussion

Drowning is a global public health issue, with key populations and risk factors identified for drowning prevention.[10] Tourists to Australia is a small but growing proportion of drowning deaths that warrant targeted public health interventions. This study identified drowning trends among international tourists consistent with drowning in Australia; males are overrepresented, most drowning occurs during summer and when swimming.[17] New findings from this study highlighted four types of visitors who drown in Australia: *overseas tourists*, *international students, WRV and WHM*. This can target future drowning prevention interventions for visitors based on purpose of

Figure 2: International visitor drowning deaths in Australia between 1 July 2008 and 30 June 2018 by visitor subgroup and state/territory.



travel and deliver messages in a way that is culturally appropriate and relevant across age groups.

Differences between visitor subgroups

When analysed by tourist type, differences in drowning were identified relating to age, sex, activity, location and other risk factors.

Males were over-represented across all groups, consistent with drowning worldwide.[10,40] Drowning among females is increasing among high-income countries.[41,42] This study found that one-fifth of visitor drowning deaths were females, higher than the annual proportion of female drowning in Australia (19%)[9]; the highest reported among *overseas visitors* (25%) and *international students* (23%). Many drowning prevention strategies focus on males, targeting risky behaviour around the water.[43–45] Safety interventions for tourists need to resonate with both male and females of all ages and backgrounds.

Overseas tourists recorded the highest proportion of drowning of all visitors, half were aged ≤55 years and were significantly more likely have a pre-existing medical condition compared to other visitors. Pre-existing medical conditions are a contributing risk factor for drowning, especially for diving-related deaths,[13] and among older people.[46]

International students and *WHM* represented the youngest age cohorts, most aged between 18 and 34 years. Both groups commonly drowned in rivers/lakes and when swimming. *International students* most frequently drowned at locations within a major city, whereas more *WHM* drowning deaths occurred in regional and remote locations, likely reflective of where this group is working, living and travelling during their stay in Australia, suggesting that safety interventions should target locations where visitors are drowning and reflect the languages of these visitors.

WRV were aged ≤35 years; drowning among this group was associated with boating in an ocean/harbour location. *WRV* recorded

over one-third of deaths with a BAC ≥0.05%, the most of any tourist subgroup compared to just 10% of *overseas tourists*. This suggests that *WRV* may need targeted water safety messages that highlight the risks of alcohol around water.

Drowning location and aquatic activities

Beaches were the most common location for drowning among *overseas visitors* from China, Germany, Japan and the United Kingdom, whereas inland waterways posed a greater risk for *international students*, *WHM* and visitors from South Korea and Taiwan. These findings suggest that safety information could be provided at specific locations targeted to the types of tourists who are visiting and drowning in those locations, for example, warning signage or information at visitor centres available in multiple languages.

Swimming and diving combined accounted for the highest number of visitor drowning deaths, especially among *overseas tourists*. Where swimming ability was recorded, two-thirds were considered as being strong or competent swimmers. Swimming ability is often overestimated, particularly among males.[47] Studies suggest that swimming skills and ability can be impacted by different environments and situations, even for competent and experienced swimmers,[48] and visitors should be aware of their limitations when swimming in different aquatic environmments.

Diving represented the highest proportion of drowning deaths after swimming, with *overseas tourists* recording the highest proportion of diving deaths compared to other groups, consistent with previous research.[13,49] Obesity, chronic health conditions, experience and environmental conditions are risk factors in diving-related fatalities,[13,49] with pre-existing health conditions prevalent among older people who drowned in this study. Industry guidelines for scuba diving and snorkelling have been developed in Queensland and Victoria[50,51]; however, these guidelines address diving safety for the general population and are not focused on tourists. More could be done to increase awareness of diving safety among visitors, specifically targeting older people and those with medical conditions.

Despite NSW being Australia's most visited state by international visitors,[2] the highest proportion of visitor drowning deaths occurred in Queensland, with the exception of *international students* who most frequently drowned in NSW. Queensland is known for aquatic attractions, notably the Great Barrier Reef and beaches, which may partly explain the higher numbers of drowning, although exposure information is unknown. Multipurpose drowning prevention efforts are needed to educate visitors about hazards and safe practice around all waterways in Queensland. Specific examples may include billboards at airports, printed information in multiple languages at accommodation providers, through tourism agencies, signage at popular aquatic locations and social media.

Challenges for visitor injury and drowning prevention

Public awareness campaigns are recommended as a strategy to provide safety information and influence behaviour[17,53]; however, the practicalities of reaching transient visitor populations and motivating them to alter their behaviour is difficult. A gap exists in drowning prevention literature on the effectiveness of prevention interventions, especially for adults and populations identified as being at higher risk of drowning like tourists.[52,53] Communicating with visitors in their own language, both at the right time and place, with culturally appropriate messages is a challenge among existing information fatigue and desensitisation.[54] Research is needed to determine the best timing to deliver safety messages to different types of tourists, whether pre-travel, upon arrival and or throughout their travel, to maximise effectiveness of interventions.

Risk-taking is well-known among visitors and some tourists may switch into "relaxation mode" when on holiday, with safe decisions being not front of mind, such as when alcohol is involved or when swimming in unsupervised and remote locations.[55–57] Safe decision-making around water may need to be the subject of future safety campaigns targeted to tourists and is an area for future research.

Prevention strategies and recommendations

Interventions related to international tourist safety do exist in Australia; however, most have been *ad hoc* and lack standardised approaches and dissemination despite water-based activities actively promoted through Australian tourism campaigns. Examples of water safety strategies implemented in Australia include beach safety education programs, information available at airports and accommodation providers and on selected in-bound flights to Australia.[18,58,59] This study supports the need for further research and evaluation on the effectiveness of prevention strategies tailored to different types of international visitors.

Water safety messages are relevant to all tourists; however, the differences in age, country of origin and language identified between visitor groups support the tailored delivery of messages rather than multiple messages that may cause confusion. For example, the use of technology or advertising via social media may be more effective for reaching younger visitors, whereas water safety information disseminated through tourism agencies may have a wider reach among older visitors. Signage in multiple languages may be helpful, although studies report that water safety signage at beaches is often misunderstood, even by Australian residents.[60,61]

Currently, local governments and some accommodation providers install safety signage, provide lifeguards and promote general water safety messages to visitors.[62] More could be done to raise awareness of water safety generally among international visitors, for example, providing water safety messages in-language either via printed materials, social media, radio, TV or billboards.

For *overseas tourists*, tourism agencies can play a key role in providing information in multiple languages as part of their tour information (both before and during travel). Half of the overseas tourists who drowned recorded a pre-existing medical condition; medical professionals may also be an avenue to advise travellers about swimming and medical conditions prior to holidaying.

For *WHM,* who may be working in regional areas as per visa requirements, information could be provided either pre-travel or during their employment induction that addresses water safety in regional and remote locations.

International students may be the easiest group to direct information through their place of education. International students to Australia have reported inadequate levels of water safety awareness, knowledge and skills; despite participation in aquatic activities, studies recommend providing students with water safety information prior to travelling to Australia.[20,63,64] Some Australian universities deliver water safety education programs; these vary in terms of content, delivery and whether participation is mandatory.[63,64]

However, the impact of these interventions on water safety knoweldge, awareness and behaviour is largely unknown.

For *WRV*, work health and safety policies usually cover work-related injuries and deaths. More could be done to promote water safety among *WRV*, including awareness of alcohol consumption and pre-existing medical conditions when undertaking boating and swimming activities.

Strengths and limitations

This study represents a total population retrospective cohort study, and for the first time, has identified different types of international visitors drowning in Australia and analysed the circumstances of drowning between each group. There are several limitations to this study; the main one being the lack of exposure data available to provide a true picture of the absolute drowning risk among international visitors to Australia. In the absence of such data, crude tourist drowning rates were calculated using short-term visitor arrival data based on country of arrival over the 10-year study period. Therefore, the overall drowning rates of international tourists presented in this study may not reflect the true drowning rate and risk for international visitor and each visitor group. Other datasets on international tourists in Australia are available, however, these datasets did not have all the variables required for this study (e.g. longitudinal data to match the study period, country of arrival did not match the top countries represented in the drowning data). In future, length of stay may be one measure to determine risk exposure. Surveys indicate that going to aquatic environments and participating in water activities are popular among international visitors to Australia, however in reality, not all visitors will be exposed to water.[4] The lack of exposure data is a gap in drowning literature generally and is needed to determine drowning risk based on actual behaviour. The definition of an international visitor for this study was based on information sourced from coronial documents, as visa information was not available in all cases. The different visitor subgroups may also be under-represented due to the multiple definitions used by Government Departments and visa categories used to describe visitors to Australia.

The study only identified unintentional drowning deaths and cannot be directly compared to data on water-related fatalities and non-fatal injuries as the Database only records information on drowning deaths ruled as the cause of death by the coroner. Country of birth was sourced from the NCIS and may not reflect country of residence, which may limit targeting of visitors before travelling. Risk factors contributing to drowning, such as alcohol, drugs and swimming ability, were restricted to the information available in coronial documents and may be underrepresented in this cohort.

Conclusion

International visitors represent a small, but important population drowning in Australia, and as global travel resumes, there is an opportunity for innovative prevention strategies to be developed, tested and refined that best address the needs of different visitors, which can ultimately save lives. Visitors have unique safety needs, and a broad one-size-fits-all prevention approach may not be effective for reducing drowning among this diverse population. The challenge is how best to reach visitors who are transient, travel for different purposes and may speak a different language. A balance of safety awareness and enjoyment through messaging is required to make visitors to Australia feel safe when exploring and enjoying the many aquatic activities on offer.

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Ethics

Ethics approval was granted by the James Cook University Human Research Ethics Committee (H7693) and the Victorian Department of Justice and Community Safety Human Research Ethics Committee (CF/19/5301).

Author contributions

SWP, LM and RF developed the research study. SWP and RF accessed and verified the data. SWP cleaned, coded, and analysed the data. SWP, LM, RF and RB drafted the manuscript. Authors PL, AP and JW provided input into manuscript drafts. All authors reviewed and approved the final manuscript for submission and accept full responsibility for the content.

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Conflicts of interest

The authors have no competing interests to declare.

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Appendix A. Supplementary data

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