



Canadian Drowning Prevention Plan

First Edition: October 2017



Table of Contents

Foreword	iii
Acknowledgements	iv
Introduction	5
What this document contains	5
Section One: The Canadian Drowning Prevention Coalition	6
A framework for action	6
Coalition overview: Goals, scope, context	7
Aspirational goal.....	7
Taking a public health approach	7
Government and civil engagement	7
Moving forward	8
Section Two: The Drowning Issue in Canada	9
Canadian water-related fatality trends, 1991-2014.....	9
Age group and sex	9
Body of water	10
Province/territory	11
Type of activity	12
Fatal drowning in Canada: The current picture	14
Who is drowning?.....	14
When are they drowning?	15
Where are they drowning?.....	16
What were they doing?	17
Canadian drowning research: Gaps in the evidence	18
Section Three: Key Focus Targets	19
Children one to four years of age	20
Indigenous Peoples	20
Water transport related drowning	20
New Canadians	20
Drowning in supervised settings	21
Unintentional water entry	21
Northern Canada, rural areas and cold water immersion.....	21
Young adult males.....	21
Conclusions and Next Steps	22
References	23

Foreword

Drowning is a tragic public health issue that resulted in the death of more than 10,000 Canadians over the past 20 years. During this same period, non-fatal drowning events impacted more than 50,000 Canadians. This morbidity and mortality burden has devastating effects on families and communities. We can and must do more to prevent drowning in Canada.

Drowning mortality in Canada has declined over the past 20 years but not in all sectors and not in all regions. There remains a disproportionate burden among small children, young adults, and rural and Northern residents. Communities of lower socioeconomic status have an elevated drowning mortality risk. There is also a rising drowning mortality burden emerging in the elderly.

Canada needs a multisectoral drowning prevention plan to facilitate drowning burden reduction. This plan needs to identify actions that focus on high-risk communities as well as eliminating drowning among the most preventable targets. The Canadian Drowning Prevention Plan needs wide stakeholder engagement and support. The Plan needs to have

effective implementation within communities at risk and outcome data that enables evaluation and learning.

The Canadian Drowning Prevention Coalition formed to play a leadership role in the drowning prevention effort in Canada. The Coalition is a multisectoral stakeholder group. Government, industry, non-governmental organizations, and academic communities were invited to engage. Each of these sectors has representation in the Coalition and on its steering committee.

The Canadian Drowning Prevention Coalition aims to create recommendations and actions that reduce drowning, and would like the Government of Canada to be an active participant. We continue our effort to be inclusive and multisectoral in our creation of the Canadian Drowning Prevention Plan. The Coalition will focus on becoming a facilitator for action and impact. The Plan will serve as the tool that outlines the effort and expectations.



Stephen B Beerman
Co-Chair,
Canadian Drowning Prevention
Coalition

Acknowledgements

Editor

Tessa Clemens

Coalition steering committee

The Canadian Drowning Prevention Coalition would like to acknowledge the Coalition steering committee for providing content and helpful feedback.

Sara Anghel	National Marine Manufacturers Association
Stephen B. Beerman	University of British Columbia
Barbara Byers	Lifesaving Society Canada
Tessa Clemens	The Hospital for Sick Children
Shelley Dalke	Canadian Red Cross
Gordon	University of Manitoba
Giesbrecht	
Julie McIssac	Lifesaving Society Canada
Barbara McLintock	British Columbia Coroners Service
Dale Miller	Lifesaving Society British Columbia/Yukon
John Morrison	Government of Prince Edward Island
Clara Reinhardt	Canadian Red Cross
Chris Wagg	Ottawa Drowning Prevention Coalition
Chris Wilson	Swimming Canada
Robert Wood	Pool and Hot Tub Council of Canada

Fatal drowning data

The Canadian Drowning Prevention Coalition gratefully acknowledges the Canadian Red Cross for providing all information in *Section Two: Canadian water-related fatalities trends, 1991-2014*. All water-related fatality data in that subsection was obtained from the Canadian Red Cross Unintentional Water-Related Fatalities Database.

The Coalition kindly acknowledges the Lifesaving Society for providing all information in *Section Two: Fatal drowning in Canada, the current picture*. All water-related fatality data in that subsection was obtained from the Drowning Prevention Research Centre Canada Database.

Funding

Funding support, publication, and a project manager for the Canadian Drowning Prevention Coalition and Plan were provided by the Lifesaving Society Canada. Photographs for this report were provided by the Lifesaving Society Branches.

Translation services for this report were provided by the Canadian Red Cross.

Introduction

Drowning is a preventable public health problem. It is the third leading cause of unintentional injury death worldwide, and a substantial cause of morbidity and mortality in Canada. On average, approximately 500 people fatally drown in Canada each year, and even more suffer a non-fatal drowning incident; often resulting in long-term consequences.

In 2014, the World Health Organization released the *Global report on drowning: preventing a leading killer*. The goal of that report was to galvanize attention for the drowning issue by highlighting how preventable drowning is, and how collaboration across sectors can save lives¹.

The Canadian Drowning Prevention Coalition was formed in response to the call to action from the World Health Organization's report. Drowning is a multisectoral issue that requires partnership among all stakeholders. The purpose of the Canadian Drowning Prevention Coalition is to establish and implement a long-term multisectoral plan to reduce drowning in Canada.

Drowning threatens all populations, but the risks parallel many social determinants of health, disproportionately affecting Indigenous peoples, new immigrants, the elderly, and rural populations. Fatal and non-fatal drowning incidents impact not only the individual, but

families and entire communities. In 2010, drowning cost Canadians \$187 million.² This figure is the result of 369 deaths, 247 hospitalizations, 1,251 emergency room visits, 37 permanent partial disabilities, 4 total disabilities; and over \$175 million dollars in indirect costs.²

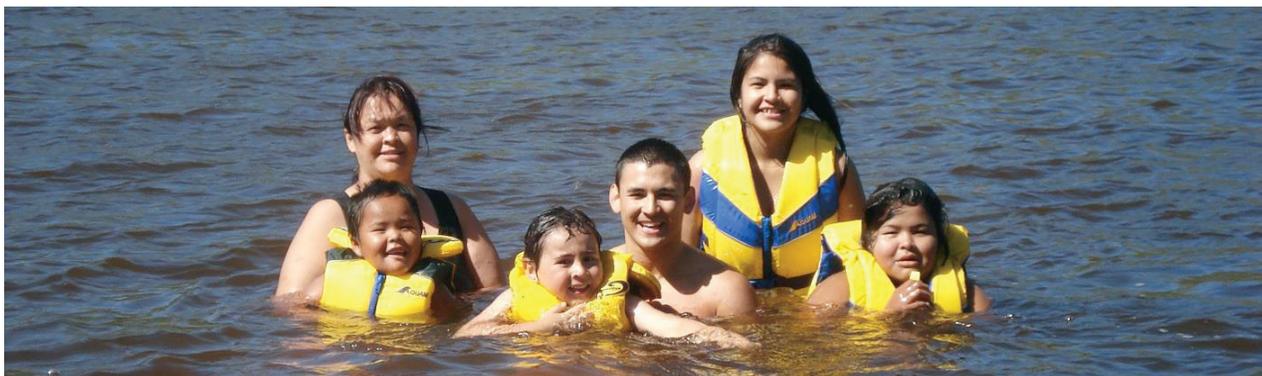
This document is the first edition of the Canadian Drowning Prevention Plan. The Plan is dynamic and will change as often as every six months to reflect the progress of data, actions, and outcomes.

What this document contains

Section 1 provides an overview of the structure of the Canadian Drowning Prevention Coalition and the context, scope, and vision of the Canadian Drowning Prevention Plan.

Section 2 provides a summary of the drowning issue in Canada based on existing drowning data. It includes a long-term analysis of water-related fatality trends in Canada as well as a summary of drowning characteristics from the most current available data.

Section 3 identifies eight key focus targets for drowning prevention in Canada.



Section One: The Canadian Drowning Prevention Coalition

A framework for action

The Canadian Drowning Prevention Coalition was formed in 2016 and brings together many stakeholders in the Canadian drowning prevention effort. A stakeholder matrix of over 100 groups, organizations, and individuals was created and all stakeholders were invited to join the Coalition. These include government agencies, non-governmental organizations, academics, industry, citizen engagement groups, media, and others to provide broad multisectoral input and leadership to drowning prevention in Canada. Coalition participants are varied and diverse in mandates, missions, and goals; represent many geographic areas, populations, and service providers; and, bring varying perspectives and experiences to the Canadian Drowning Prevention Coalition.

The Coalition is led by a steering committee. The steering committee appoints technical working group leaders for each key focus area

for drowning prevention in Canada. For more information on the key focus targets for the first edition of the Canadian Drowning Prevention Plan, please see Section Three of this report. The technical working group leaders form multisectoral working groups to create recommendations for high impact actions to reduce drowning in one of the key focus targets. Each technical working group reports on their key focus target. Their reports include a situational assessment, goals, and action steps.

The technical working groups utilize evidence-informed decision-making, which includes distilling and disseminating the best available evidence from research, practice and experience and using that evidence to inform and improve policy and action.³ Using this approach, knowledge regarding programs, best practices, and interventions will inform action steps to reduce drowning in each key focus area.

Figure 1 Canadian Drowning Prevention Coalition Structure



Coalition overview: Goals, scope, context

The Canadian Drowning Prevention Coalition formed in response to the World Health Organization's *Global report on drowning: preventing a leading killer*. The Coalition will assist in the effort to achieve the ten actions and four recommendations outlined in that report¹. The Canadian Drowning Prevention Coalition will be a partner in the leadership to: implement proven drowning prevention strategies, improve data about drowning, develop a drowning prevention plan, and facilitate Canadian participation in a global partnership for drowning prevention.

Aspirational goal

The aspirational long-term vision of the Canadian Drowning Prevention Coalition is zero mortality and morbidity from drowning. Short-term goals will be set by the technical working groups for each key focus target. Evidence suggests a significant association between setting quantified safety targets and fatality reduction.⁴ Moreover, ambitious targets have been associated with better performance than less ambitious targets.⁵

Government and civil engagement

Civil society in Canada has created awareness and policy for drowning risk reduction. Canadian legislation and enforcement exists for areas such as: marine shipping, water transport, infrastructure, and public swimming pools/waterparks. Policy and legislation are impactful drowning risk reduction interventions.

Government engagement in the drowning reduction effort has been helpful and impactful. These partnerships have been driven by civic engagement and non-governmental organization (NGO) leadership. Strong civic engagement in drowning risk reduction should be encouraged and continued. NGO leadership has been helpful in elevating the priority of the drowning burden

Taking a public health approach

A public health approach to drowning requires having an understanding of the burden, an understanding of the inequality of the burden, key focus targeting of interventions, and impact measurement. Designing interventions that engage the populations at-risk and have positive impact is essential. This approach requires careful planning based on existing evidence. Education, social innovations, persistence, resourcing, and effective implementation play key roles in successful drowning mortality and morbidity reduction.

to Canadians and the Government of Canada. The development of the Canadian Drowning Prevention Coalition to facilitate collaboration and bring a public health approach to this multisectoral challenge will be helpful. Government of Canada co-leadership of the Coalition would be welcome.

Canadians need to better appreciate provincial, territorial, and community differences in drowning risk and interventional opportunity. Areas for impact in drowning risk reduction and intervention largely exist at the community level. Civic engagement at the provincial, territorial, and community level is therefore needed and this engagement must be inclusive

and multisectoral. An expansion of the existing recreation-focused community networks to include drowning from all causes is needed. Provincial, territorial, and community-based drowning prevention coalitions may also be beneficial. Government agencies, NGOs, academics, industry, media, funding agencies, and other stakeholders should be included in community-based coalitions.

Canadians have effectively implemented a number of proven drowning prevention strategies tailored to Canadian circumstances and risk groups. For example, public education for adult supervision of infants and children is strong, broad in reach, and multicultural/multilingual. Survival swimming skills are being provided to many school-age children and this is being undertaken in a barrier-free and inclusive manner.



Moving forward

Canadians will continue to expect coordinated, high quality programs that address other key focus targets within the Canadian drowning burden. The Canadian Drowning Prevention Coalition and its stakeholders will continue their

effort to reduce and eliminate drowning. Much work remains to achieve the short-term and long-term goals, including the aspirational vision of zero morbidity and mortality from drowning.

Section Two: The Drowning Issue in Canada

Canadian water-related fatality trends, 1991 to 2014

The Canadian Red Cross designed, developed, and maintains the Canadian Red Cross Surveillance System for Unintentional Water-related Fatalities. Volunteers and staff annually collect provincial and territorial coroner and medical examiner data for each death by completing a structured questionnaire. This data is influential in determining public education strategies and community initiatives, as well as identifying key messages and skills that all Canadians need to help them stay safe in, on, and around water.

The drowning trend analyses in this subsection of the Plan focus on type of activity, age and sex, body of water, lifejacket use, and location by province/territory. As space is limited, the following variables have been excluded from this report: cause of death, purpose of activity, ethnicity, swimming ability, alcohol or drug involvement, acute or chronic conditions of the drowning person, autopsy findings, specific details on the type of activities, water conditions, weather conditions, supervision of minors, and type of rescue attempted.

Age group and sex

Age group	Male	Male rate per 100,000 persons	Female	Female rate per 100,000 persons	Unknown	Total	Percent	Overall rate per 100,000 persons
<1	41	0.9	33	0.8	0	74	1	0.8
1 to 4	430	2.3	210	1.2	3	643	5	1.8
5 to 14	484	1.0	166	0.4	1	651	5	0.7
15 to 24	1,867	3.5	316	0.6	2	2,185	18	2.1
25 to 34	1,741	3.1	219	0.4	0	1,960	16	1.8
35 to 44	1,659	2.8	281	0.5	4	1,944	16	1.6
45 to 54	1,446	2.7	302	0.6	0	1,748	14	1.6
55 to 64	1,084	2.7	212	0.5	0	1,296	11	1.6
65 to 74	792	3.0	184	0.6	0	976	8	1.8
75+	525	3.1	245	0.9	1	771	6	1.8
Unknown	77	n/a	4	n/a	3	84	1	n/a
Canada	10,146	2.7	2,172	0.6	14	12,332	100	1.6

Table 1 shows the frequency of water-related fatalities by age group and sex, as well as rates for males, females, and overall rates by age group per 100,000 persons*.

* All rates in this report were calculated using Statistics Canada Table 051-0001-Estimates of population, by age group and sex for Canada, provinces and territories, annual.

From 1991 to 2014, there were 12,332 water-related fatalities in Canada. This is an average of 514 water-related deaths each year over 24 years. The rate of water-related fatalities for all Canadians was 1.6 per 100,000 persons. Males accounted for 82% of water-related fatalities (n=10,146) (Table 1).

Table 1 shows that males 15 to 24 years of age were the most at risk for water-related fatalities, as this age group had the highest frequency of water-related deaths (18%, n=2,185), and the highest male fatality rate of 3.5 per 100,000 persons (n=1,867). For females, the age group with the highest rate was 1 to 4 year olds, with a female rate of 1.2 per 100,000 persons (Table 1).



Body of water

Body of water	Males	Females	Unknown	Total	Percent
Open inland waters*	7,567	1,171	8	8,746	71
Open ocean water	1,283	121	2	1,406	11
Bathtub	420	539	1	960	8
Private and public pools, hot tubs	665	284	3	952	8
Other	175	50	0	225	2
Unknown	36	7	0	43	0
Canada	10,146	2,172	14	12,332	100

*Open inland waters include: lake, pond, ditch/culvert, reservoir/artificial lake/dugout/retention pond, canal, lagoon, river/stream/creek/waterfall, dam/inlet/spillway, and quarry.

Water-related fatalities by body of water and sex from 1991 to 2014 are provided in Table 2. From 1991 to 2014, drownings most frequently occurred in open inland water (71%, n=8,746), open ocean water (11%, n=1,406), bathtubs (8%, n=960) and pools and hot tubs (8%, n=952) (Table 2).

Male victims were most commonly found in: open inland water (75%, n=7,567), open ocean water (13%, n=1,283), and private/public pools and hot tubs (7%, n=665). The most frequent locations that **female** victims were found included: open inland water (54%, n=1,171), bathtubs (25%, n=539), and private/public pools and hot tubs (13%, n=284) (Table 2).

Province/territory

Province or Territory	1991 to 1994 (n=2,587)	1995 to 1998 (n=2,373)	1999 to 2002 (n=1,892)	2003 to 2006 (n=1,802)	2007 to 2010 (n=1,871)	2011 to 2014 (n=1,807)	Total (n=12,332)	Percent (%)	Rate per 100,000 persons
Nfld & Labrador	102	120	85	85	81	62	535	4	4.2
Nova Scotia	131	112	83	41	75	49	491	4	2.2
Prince Edward Island	15	17	12	11	11	4	70	1	2.1
New Brunswick	93	63	48	63	48	40	355	3	2
Quebec	509	504	337	363	321	320	2,354	19	1.3
Ontario	729	651	598	585	652	614	3,829	31	1.3
Manitoba	138	115	92	89	99	104	637	5	2.3
Saskatchewan	99	109	78	57	68	104	515	4	2.1
Alberta	143	157	125	153	148	180	906	7	1.2
British Columbia	543	473	393	289	320	293	2,311	19	2.3
Northern Territories*	85	52	41	66	48	37	329	3	13.3
Canada	2,587	2,373	1,892	1,802	1,871	1,807	12,332	100	1.6

* Northern Territories include: Northwest Territories, Nunavut and Yukon Territory. Due to the small population, a small number of deaths can affect the rate.

Table 3, lists 24 years of water-related fatalities in 4-year increments, by province and territories. Ontario had the highest frequency of water-related deaths (31%, n=3,829) (Table 3). However, due to its large population, Ontario had a rate of 1.3 per 100,000 persons, which was less than the national rate of 1.6 per 100,000 persons.

Canada's Northern Territories had the second lowest number of water-related deaths (n=329 or 3%). However due to their small population, this

translates to the highest rate (13.3 per 100,000 persons), eight times the national rate (Table 3). Table 3, generally shows a decreasing trend from 1991 to 2014 in the number of water-related fatalities for Newfoundland and Labrador, Nova Scotia, Prince Edward Island, New Brunswick, Quebec, British Columbia, the Northern Territories, and Canada. A decreasing trend was identified if there was more than a 25% reduction during the interval 1991-1994 and 2011-2014.

Province or Territory	Boating (n=3,769)	Aquatic (n=2,829)	Non-aquatic (n=2,288)	Land, Ice & Air Transport (n=1,901)	Bathing (n=925)	Unknown (n=620)	Total (n=12,332)	Percent (%)	Rate per 100,000 persons
Nfld & Labrador	246	52	80	137	7	13	535	4	4.2
Nova Scotia	244	94	63	65	10	15	491	4	2.2
Prince Edward Island	31	15	6	7	2	9	70	1	2.1
New Brunswick	130	85	56	59	15	10	355	3	2
Quebec	647	579	484	347	199	98	2,354	19	1.3
Ontario	1,061	990	710	494	356	218	3,829	31	1.3
Manitoba	183	134	144	103	25	48	637	5	2.3
Saskatchewan	142	95	97	113	37	31	515	4	2.1
Alberta	196	229	189	109	127	56	906	7	1.2
British Columbia	726	520	423	393	140	109	2,311	19	2.3
Northern Territories*	163	36	36	74	7	13	329	3	13.3
Canada	3,769	2,829	2,288	1,901	925	620	12,332	100	1.6

* Northern Territories include: Northwest Territories, Nunavut and Yukon Territory

Table 4 shows the number of water-related fatalities by province/territory, and the type of activity, from 1991 to 2014. The largest frequency of water-related fatalities occurred during boating activities for all provinces and

territories, except Alberta. In Alberta, the largest number of water-related fatalities occurred during aquatic activities, with boating being a close second (Table 4).

Type of activity

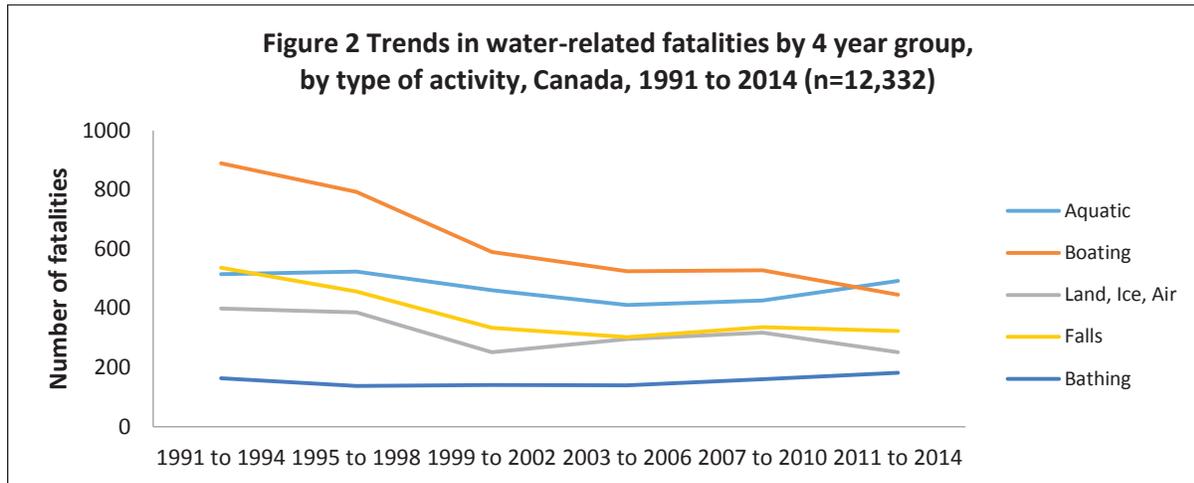


Figure 2 shows water-related fatality activity trends in 4-year increments from 1991 to 2014. From 1991 to 2010, the number of boating fatalities had consistently been higher than the number of aquatic fatalities, between 2011 and 2014, this trend changed and the number of aquatic deaths were higher than the number of boating deaths (Figure 2).



Boating related fatalities in Canada were examined in *Boating immersion and trauma deaths in Canada*⁶ prepared for Transport Canada’s Office of Boating Safety and used for education and media campaigns. Land, ice and air transport (LIAT) water-related fatalities have resulted in media campaigns to stop drinking and driving for all motorized modes of transportation. More research into the reduction in number of deaths from falls is required. There has been minimal change in the frequency of deaths from aquatic activities, and bathing deaths have increased over the 24-year period.

Figure 3 Water-related fatalities by type of activity and age group, Canada, 1991 to 2014 (n=12,332)

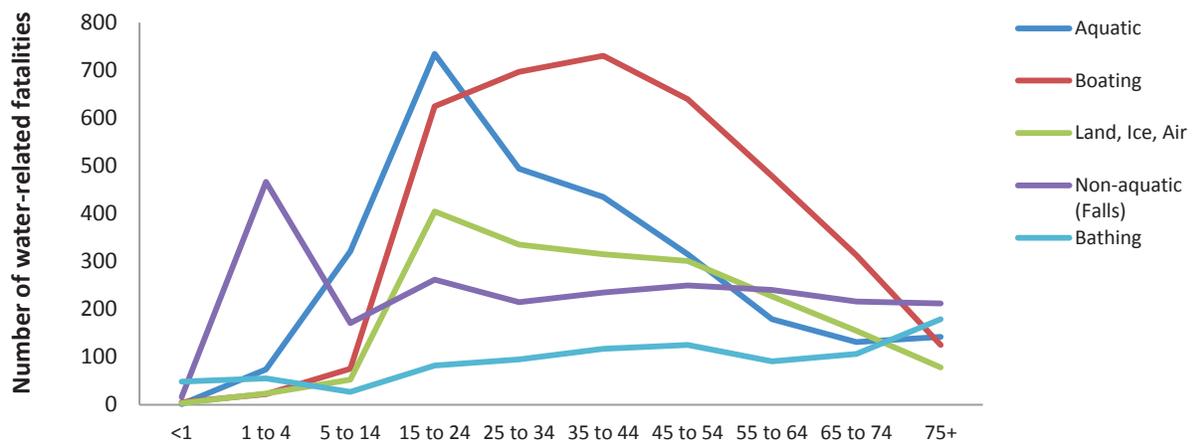


Figure 3 shows the number of water-related fatalities for each type of activity and age group. The largest frequency of deaths for non-aquatic activities (such as unintentional water entry) occurred among 1 to 4 year-olds (Figure 3). Looking at death rates for falls in water by age group and sex, the most at risk were 1 to 4 year-old males.

The highest frequency of deaths for boating activities occurred among 35 to 44 year-olds (Figure 3), however after considering age and sex, males 15 to 74 years of age were identified as most at risk. For boating-related fatalities, only 12% wore a lifejacket properly at the time of the incident. In 21% of cases, a lifejacket was present but not worn, and in 24% of cases a lifejacket was not present.

The highest frequency of deaths for aquatic activities occurred among 15 to 24 year-olds (Figure 3). Males 15 to 24 years of age also had the highest aquatic death rate. The highest frequency of deaths during aquatic activities in this group occurred during recreational swimming.

The highest frequency of deaths involving LIAT occurred among 15 to 24 year-olds (Figure 3). Males 15 to 24 years of age had the highest LIAT rate. The largest frequency of deaths while bathing occurred among individuals 75 years of age and older (Figure 3).

A reduction in drowning mortality can be observed in most provinces and in some activities. **Most Canadian drowning deaths are preventable. Renewed and refocused efforts are needed in the highest risk communities and activities to have the greatest impact.**

Fatal drowning in Canada: The current picture

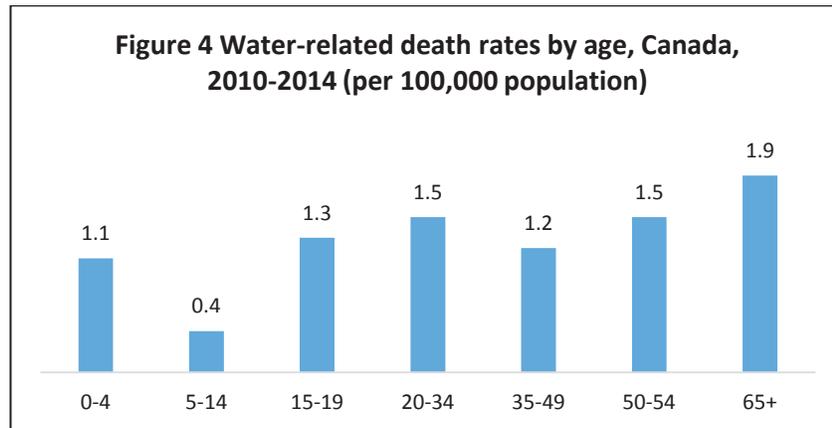
The previous section of this report summarized the drowning issue in Canada by describing water-related fatality trends over a 24-year period. While an overall reduction in drowning mortality was reported, there are still hundreds of fatal drowning incidents occurring in Canada each year. This subsection briefly summarizes the current characteristics of fatal drowning in Canada by focusing on the most recent five years of water-related fatality data available, 2010-2014.

The data for this section of the report was provided by the Lifesaving Society. The Lifesaving Society has been researching and reporting on drowning and preventable water-

related deaths in Ontario since 1989 - and since 1990, for each province and nationally. This research provides a comprehensive fact base on the drowning problem to guide the Society and others in developing drowning prevention solutions. An expanded version of the analysis provided here can be found in the *Canadian drowning report, 2017 edition*.⁷

According to the most recent data available from the Chief Coroners and Medical Examiners offices in Canada, an average of 464 people fatally drowned each year in the most current five-year period (2010-2014), corresponding to a death rate of 1.3 per 100,000 population each year.

Who is drowning?



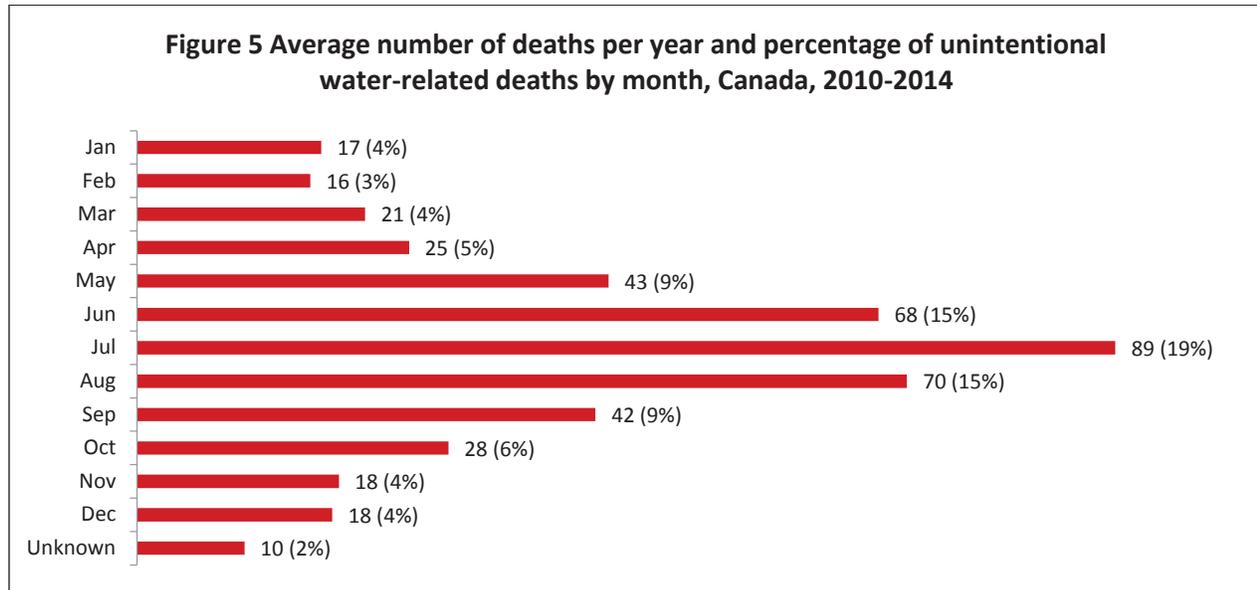
As Figure 4 illustrates, the highest water-related fatality rates in 2010-2014 occurred among seniors 65 years and older (1.9 per 100,000), young adults 20 to 34 (1.5 per 100,000) and older adults 50 to 64 years of age (1.5 per 100,000). The highest frequency of drowning occurred among 20 to 24 year-olds, an average of 43 fatalities each year.

Consistent with the long-term trend, the vast majority of victims in 2010-2014 were male (8 out of 10), with the greatest proportion of male water-related deaths occurring among young adults 20-34 years of age.

A high proportion of Indigenous peoples drown relative to the Indigenous population. In the most recently available data, approximately 12% of all fatal drowning persons were identified as

Indigenous. Comparatively, approximately 4% of the Canadian population identifies as an Indigenous person.

When are they drowning?



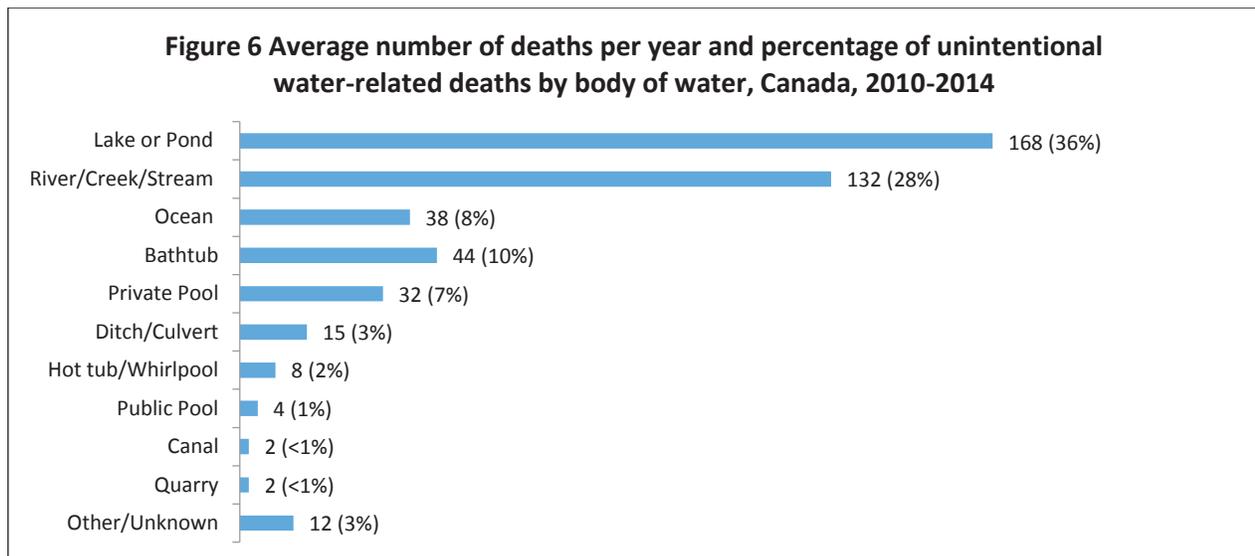
Drowning deaths occur throughout the year in Canada, with the largest number occurring in the warmer months (May through September). In

2010-2014, over two thirds (67%) of all water-related fatalities occurred in this timeframe (Figure 5).





Where are they drowning?



Consistent with the long-term trend, the majority of Canadian water-related fatalities in the most current data occurred in natural bodies of water (73%). The highest frequency of drowning deaths in 2010-2014 occurred in lakes and ponds (38%) followed by rivers, creeks, streams, and waterfalls (28%) (Figure 6).

Water-related fatalities in man-made settings were less common, but still accounted for an average of 163 deaths in 2010-2014. Bathtubs were the most common man-made setting where drowning deaths occurred (Figure 6).

What were they doing?

The majority of water-related fatalities in Canada occur during recreational activities. Between 2010 and 2014, an average of 282 deaths occurred each year while the person was participating in recreation activities in, on, or near the water, accounting for 61% of all unintentional water-related fatalities. The most common recreational activities were swimming or wading in water (28%), and walking, running, or playing near water or on ice (15%). Daily living activities (27%) accounted for the second highest number of drowning incidents in Canada. Between 2010 and 2014, an average of 123 people drowned in Canada each year while engaged in routine daily activities. The most common daily living activities engaged in prior to drowning were bathing (35%) and motor vehicle travel (31%).

By type of activity, the most current data indicates that water-related fatalities most commonly occur during aquatic activities and boating. In the 2010-2014 period, an average of 123 people each year (26%) drowned while participating in an aquatic activity (where they intended to be in the water but an unexpected circumstance occurred), and an average of 119 people each year (26%) drowned while engaging in powered or non-powered boating. Unintended water entry (such as an unexpected fall into water) during a nonaquatic activity also accounted for a high proportion of water-related fatalities (20%). An average of 91 people drowned each year as the result of unintentional water entry.

In summary

Analysis of the most recent available water-related fatality data reveals the current profile of drowning mortality in Canada:

- The highest rates are found among men, seniors 65 and older, young adults 20 to 34 years of age, and 50 to 64 year-olds.
- Water-related fatalities are most likely to occur during the summer, on weekends, and in natural bodies of water such as lakes and rivers.
- Fewer drowning deaths occur in man-made settings, but among these, bathtubs and private pools are most common.
- Almost two-thirds of all fatal unintentional drowning occurs during a recreational activity, and another quarter during daily living activities.
- Boating and aquatic activities such as swimming and wading are the most common.

The long-term progress that has been made in reducing death by drowning in Canada is encouraging, but on average there are still over 460 preventable, unintentional water-related fatalities occurring each year. This reinforces the need for continued drowning prevention efforts.

Canadian drowning research: Gaps in the evidence

Canada has had high quality drowning mortality data since the early 1990s. This data is achieved with the cooperation of Coroners and Medical Examiners offices across Canada, Statistics Canada, and the hard work of NGOs that are stakeholders in the drowning issue. Regular reporting to Canadians, stakeholders, and policy makers has been occurring for more than 20 years.



However, much remains unknown about the drowning problem in Canada. There is a scarcity of data on non-fatal drowning. A better understanding about the socioeconomic and social determinants of drowning mortality and morbidity is also needed. Further, the role of demographic features such as the number of children per family, as well as education levels and socioeconomic status of the families of persons who drown, is a weakness in our

understanding of the Canadian drowning problem.

It is probable that persons with disadvantages and reduced adaptiveness are at an increased risk of drowning. This would include those with medical conditions such as epilepsy, developmental delay, neurological impairment, mental illness, learning challenges, and autism spectrum disorder. This may also include persons who have features of learned helplessness in the Canadian social structure and within family networks. Research related to these risk factors is needed.

Other demographic features have been linked to increased drowning risk. These include: rural and northern residents, Indigenous peoples, and new Canadians. It is unclear if these are independent risks or a reflection of social factors and socioeconomic status. Further research in this area would be helpful to develop targeted interventions.

Canadian fatal drowning data reporting has focused on unintentional water-related fatalities. An understanding of the full drowning burden would enable the Coalition to focus interventions in key areas. Intentional (suicidal and homicidal) water-related mortality and morbidity should be included and better understood. With a more complete knowledge and understanding of the drowning burden, more informed interventional targets could be achieved.

Section Three: Key Focus Targets

To achieve the overall vision of zero drowning deaths in Canada, the Canadian Drowning Prevention Coalition identified key focus targets for drowning reduction. Key focus targets refer to areas for action and impact that have been identified by the steering committee, the Coalition, and Canadians. These areas include high risk age groups, marginalized populations that are disproportionately affected by drowning, and high risk sectors or activities.

The Canadian Drowning Prevention Coalition, led by the steering committee, undertook an activity to prioritize the key focus areas for the Canadian Drowning Prevention Plan. Based on existing evidence from Canadian drowning surveillance data, global drowning literature, and expert input, the steering committee identified 13 potential key focus targets; (1) children 1 to 4 years of age; (2) young adult males; (3) senior citizens 65 years and older; (4) Indigenous peoples; (5) new Canadians; (6) people living in Northern Canada and rural areas; (7) natural disasters and climate change; (8) suicide and homicide by drowning; (9) people with medical conditions or other co-morbidities; (10) vocational or daily living activities; (11) water-transport related drowning; (12) unintentional falls into water; and (13) cold water immersion.

In an effort to encourage citizen engagement in the Canadian Drowning Prevention Plan, coalition participants and members of the Canadian public were asked to vote for up to five key focus targets they felt should be the top priority for the first edition of the Plan. The steering committee discussed the results of this voting activity and suggested that the following eight key focus targets be included in the first iteration of the Plan:

- Children 1 to 4 years of age
- Indigenous peoples
- Water transport related drowning
- New Canadians
- Drowning in supervised settings
- Unintentional water entry
- Northern Canada, rural areas, and cold water immersion
- Young adult males

Technical working groups are formed around each of the key focus targets and will provide recommended actions for drowning reduction in the area. At the time of this report, technical working groups are in place for four of these eight key focus targets. The Coalition steering committee is working to identify and secure appropriate leadership for the four remaining key focus targets. The steering committee takes a careful approach to the formation of technical working groups to maintain the long-term vision of the Coalition and the Canadian Drowning Prevention Plan.

In the remainder of this section, a brief summary of each key focus target is provided. The current status of each technical working group is indicated.

Children one to four years of age

Status: Currently identifying technical working group leader.

In Canada, drowning is a leading cause of unintentional injury death among children 1 to 4 years of age.⁸ Moreover, the burden of non-fatal drowning is among the highest in this age group; children under five are more likely to suffer a non-fatal drowning requiring an emergency department visit and/or hospitalization than a fatal drowning.⁹ Private backyard pools are the most common setting where children 1 to 4 years of age fatally drown in Canada.⁷

Indigenous peoples

Status: Currently identifying appropriate technical working group leadership from Indigenous communities.

Drowning in the Indigenous population has been reported to be 6 times higher than the Canadian average, and as much as 15 times higher in children.^{16,17} Indigenous peoples comprise about 4% of the Canadian population, but they account for approximately 26% of drowning cases that involve a snowmobile, 16% of drowning cases after a fall into water, 10% of recreational drowning fatalities, and 9% of boating related drowning deaths.¹⁶ Increased risk of drowning in Indigenous populations has been attributed to; proximity to open water, low use of personal flotation devices, and alcohol use.¹⁸

Water transport related drowning

Status: Currently identifying technical working group leader.

Water-related deaths in Canada are more frequently associated with boating than any other activity.⁶ The most common factor associated with boating deaths in the last two decades has been the non-wearing of personal flotation devices.⁶ The vast majority of boating related drowning deaths occur among males between 15 and 74 years of age.⁶

New Canadians

Status: Technical working group leadership identified, currently forming multisectoral working group and conducting situational assessment.

Technical working group leader: Barbara Byers, Lifesaving Society Canada

A study that examined the association between duration of residence in Canada and risk of unintentional injury among children and youth found that risk of drowning was highest in recent immigrants who had lived in Canada for fewer than five years.¹⁰

According to recent work conducted by the leaders of this technical working group, people who are new to Canada are four times more likely to be unable to swim than those who were born in Canada.¹¹ Further, youth aged 11 to 14 who were new to Canada were five times more likely to be unable to swim than their Canadian born classmates. Despite this, 93% of new Canadians of this age indicated that they participate in activities in, on, or around water. Results suggested that risk is higher for new Canadians aged 11 to 14 who have lived in Canada for less than five years.¹²

In another study conducted to further explore the influence of ethnicity on attitudes and behaviours surrounding water safety, many parents commented on the desire for their children to take part in the Canadian cultural experience of swimming. However, concerns were raised by Muslim parents about public swimming lessons that failed to address cultural and religious considerations such as appropriate swimming attire, and separation of male and female children.¹³

Drowning in supervised settings

Status: Technical working group leadership identified, currently forming multisectoral working group and conducting situational assessment.

Technical working group leader: Barbara McLintock, British Columbia Coroner Service

Approximately 6% of all unintentional water-related fatalities in Canada occur during occupational activities and approximately 1% occur under lifeguard or instructor supervision.⁷ Both cases represent seemingly safe environments where the number of drowning deaths should be zero. Protocols for critical incident debriefing and review to create recommendations for future prevention exist in some provinces but there is currently no national engagement on this issue.

Unintentional water entry

Status: Technical working group leadership identified, currently forming multisectoral working group and conducting situational assessment.

Technical working group leader: Clara Reinhardt, Canadian Red Cross

According to recent work by the technical working group leaders of this key focus area, over a 20-year period (1991-2010), 1951 people drowned in Canada as the result of an unexpected fall into water.¹⁴ Children and young men were at the highest risk of death from unintentional water entry. Children 1 to 4 years of age accounted for approximately 21% of fatalities related to unexpected falls into water. Among individuals 15 and over, alcohol consumption was a contributing factor in at least 38% of deaths from unintentional water entry.¹⁴

Northern Canada, rural areas and cold water immersion

Status: Multisectoral technical working group formed, currently conducting situational assessment and creating strategic plan.

Technical working group leader: Gordon Giesbrecht, University of Manitoba

Drowning rates are highest in the Yukon, Northwest Territories, and Nunavut.⁷ Drowning risk in Northern Canada is increased by exposure to water and lower water temperatures.¹⁸ Rural residence has been associated with a higher risk of drowning.¹⁹ More drowning fatalities have been occurring in rural areas in recent years than in the past.¹⁵

Canada has an abundance of natural bodies of water, many of which sustain very cold temperatures year-round. Immersion death in cold water is frequent in northern countries such as Canada. On average, 200 people die as a result of cold water immersion each year.²⁰

Young adult males

Status: Currently identifying technical working group leader.

In Canada, young adults 20 to 34 years of age consistently have high unintentional water-related fatality rates relative to other age groups, (an annual average of 1.5 per 100,000 in 2010-2014). Within this age group 20-24 year-olds have the highest death rate (1.9 per 100,000).⁷ Approximately 1 of every 2 young adults who fatally drowned had consumed alcohol.¹⁵

Over 80% of drowning fatalities occur among men and the greatest proportion of male drowning deaths occurs among young adults 20 to 34 years of age (9 out of 10 drowning victims are male in this age group).⁷

Conclusions and Next Steps

This document is the first edition of the dynamic Canadian Drowning Prevention Plan that will change as often as every six months to reflect the progress of data, actions, and outcomes.

The Canadian Drowning Prevention Coalition, led by the steering committee will continue to form technical working groups around the identified key focus targets. The technical

working groups will utilize an evidence-informed approach to create recommendations and provide reports to the steering committee. The recommended high impact actions in these reports will be included in future editions of the Plan. The Coalition will work together to ensure recommended actions are implemented and evaluated.

Based on work to date, the Canadian Drowning Prevention Coalition recommends the following actions:

- The Government of Canada should increase their engagement with the Canadian Drowning Prevention Coalition and Plan.
- Multisectoral collaboration should increase in all areas of drowning prevention.
- Community-based coalitions and drowning reduction groups should be formed to increase the multisectoral nature of community level drowning prevention actions based on local data. Existing groups should expand their scope to include the prevention of all drowning mortality and morbidity.
- Canadian drowning data collection and research should expand to include a more in-depth understanding of socioeconomic risk factors and should progress on the inclusion of non-fatal and intentional drowning.

Drowning deaths are preventable. The Canadian Drowning Prevention Coalition will continue utilizing the framework outlined in this

document to achieve the vision of zero morbidity and mortality from drowning.



References

1. World Health Organization. Global report on drowning: preventing a leading killer. World Health Organization; 2014.
2. Parachute. The cost of injury in Canada. Parachute; 2015.
3. National Collaborating Centre for Methods and Tools, as cited in PHAC Canadian Best Practices Portal. Available from: <http://cbpp-pcpe.phac-aspc.gc.ca/resources/evidence-informed-decision-making/>
4. Wong SC, Sze NN, Yip HF, Loo BP, Hung WT, Lo HK. Association between setting quantified road safety targets and road fatality reduction. *Accident Analysis & Prevention*. 2006 Sep 30;38(5):997-1005.
5. SafetyNet. Quantitative road safety targets. SafetyNet; 2009. Available from: https://ec.europa.eu/transport/road_safety/sites/roadsafety/files/specialist/knowledge/pdf/quantitative_road_safety_targets.pdf.
6. Canadian Red Cross. Boating immersion and trauma deaths in Canada. Canadian Red Cross; 2011. Available from: http://www.redcross.ca/crc/documents/3-3-4_2011_boating_fnl.pdf
7. Lifesaving Society. Canadian drowning report: 2017 edition. Lifesaving Society; 2017. Available from: http://www.lifesavingsociety.com/media/264742/98cdndrowningreport_2017rev_web.pdf
8. Yanchar NL, Warda LJ, Fuselli P. Child and youth injury prevention: A public health approach. *Paediatrics & child health*. 2012 Nov 1;17(9):511.
9. Clemens T. Addressing Gaps in our Understanding of the Epidemiology of Drowning at the Global, National, and Local level [PhD Thesis]. York University; 2017.
10. Saunders NR, Macpherson A, Guan J, Sheng L, Guttman A. The shrinking health advantage: unintentional injuries among children and youth from immigrant families. *BMC public health*. 2017 Aug 1;18(1):73.
11. Lifesaving Society. The influence of ethnicity on aquatic participation and drowning in Canada. Toronto: Lifesaving Society; 2010.
12. Lifesaving Society. The influence of ethnicity on tweens' swimming and water safety in Canada. Toronto: Lifesaving Society; 2016.
13. Lifesaving Society. English and Mandarin focus group research. Toronto: Lifesaving Society; 2011.
14. Canadian Red Cross. Water-related fatality facts at a glance: Canada 1991-2010. 2014. Available from: <http://www.redcross.ca/crc/documents/What-We-Do/Swimming-Water-Safety/water-related-fatality-facts-at-a-glance-canada-1991-2010.pdf>
15. Clemens T, Tamim H, Rotondi M, Macpherson AK. A population based study of drowning in Canada. *BMC public health*. 2016 Jul 13;16(1):559.
16. Health Canada, First Nations and Inuit Health Branch. (2001). Unintentional and intentional injury profile for Aboriginal people in Canada 1990-1999.
17. The Canadian Red Cross Society. National drowning report. An analysis of water-related fatalities in Canada for 1998. Visual surveillance report: Edition 2000. Canadian Red Cross; 2000.
18. Pike I, Richmond S, Rothman L. & Macpherson A. (eds). Canadian injury prevention resource. Toronto: Parachute; 2015
19. Gallinger ZR, Fralick M, Hwang SW. Ethnic differences in drowning rates in Ontario, Canada. *Journal of immigrant and minority health*. 2015 Oct 1;17(5):1436-43.
20. Canadian Red Cross. Drownings and other water-related injuries in Canada 10 years of research. 2010. Available from: http://www.redcross.ca/crc/documents/3-3_4_ws_final_m2_english2006_04_19.pdf

Canadian Drowning Prevention Plan
First Edition: October 2017

