WHAT WE HAVE LEARNED:
10 YEARS OF PERTINENT FACTS ABOUT

Canadian Red Cross

Drownings and other water-related injuries in Canada

1991-2000

FOREWORD

In 1991, the Canadian Red Cross joined forces with the National Association of Coroners, the Canadian Coast Guard, and public health professionals to provide a sound research base for development and monitoring of new water safety programs across Canada.

This document presents the pertinent facts on risk factors and prevention from a study of nearly 6,000 unintentional drownings and other water-related deaths, as well as for over 3,000 hospitalizations for near drownings in Canada from 1991 to 2000. Since innovative research-based training and prevention programs were introduced across Canada during 1994-1995, trends in deaths before and after this intervention are described.

Note: Because of the time it takes to publish coroners' reports and to gather and record data, the statistics for these deaths are published two years after the latest year included in the study.

INTRODUCTION

According to data provided by Statistics Canada, **drowning was the 4th most common cause of death by unintentional injury in Canada** during 1991-2000, after highway deaths, falls and poisoning. **Drowning was the leading cause of death for recreational and sporting activities**. 5,900 individuals died and 3,289 were hospitalized for near drowning.

Incalculable are the suffering and long-term personal losses of the nearly 10,000 family tragedies represented by these statistics. Furthermore, economic costs to Canadians of these deaths exceed 10 billion dollars. Yet many of these incidents are preventable.

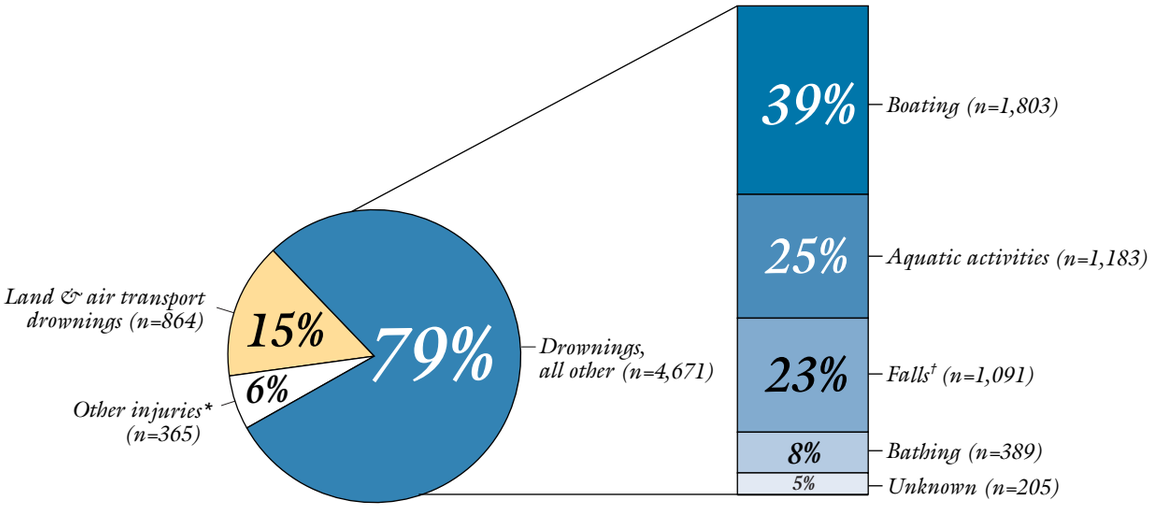
2003 release

OVERVIEW

During 1991-2000 there were 5,900 water-related deaths in Canada, most of which were drownings. In addition, there were 3,289 hospitalizations for near drownings, many of which resulted in brain damage.

Boating, swimming, and playing near unprotected water such as swimming pools were leading causes of drowning.

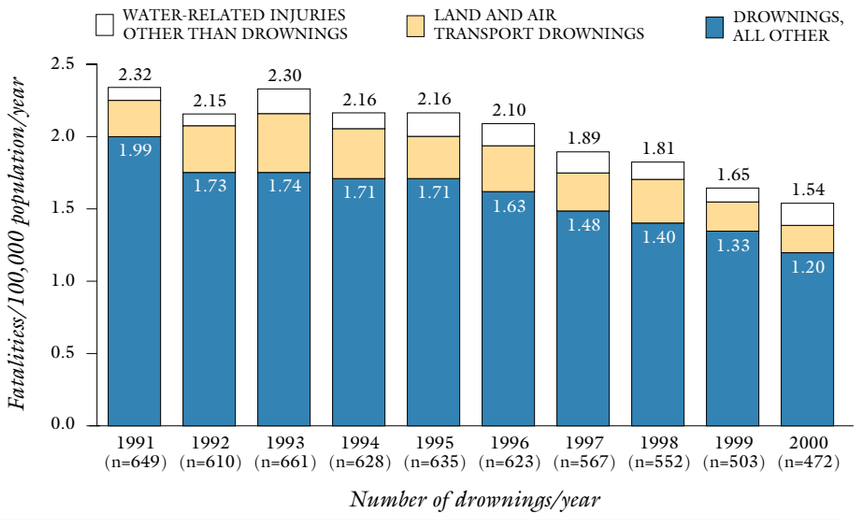
Figure 1 **WATER-RELATED DEATHS BY TYPE OF INJURY & ACTIVITY, CANADA 1991-2000 (n=5,900)**



** Includes all water-related injuries other than drownings*
† Falls into water during non-aquatic activities such as walking or playing near water or on ice

Source: The Canadian Red Cross Society & the Canadian Surveillance System for Water-Related Fatalities, 2003

Figure 2 **RATE AND NUMBER OF DROWNINGS AND OTHER WATER-RELATED FATALITIES, CANADA 1991-2000 (n=5,900)**



Water-related injuries other than drownings	24	23	40	31	50	49	41	35	32	40
Land & air transport drownings	68	96	122	100	83	91	81	94	66	63
Drownings, all other	557	491	499	497	502	483	445	423	405	369

Source: The Canadian Red Cross Society & the Canadian Surveillance System for Water-Related Fatalities, 2003

SIGNIFICANT DECREASE IN THE NUMBER OF WATER-RELATED DEATHS

The study shows that the death rate from drowning, excluding land and air transport drownings, was stable at an average of 1.8 deaths per 100,000 Canadians per year during 1991-1995 (Figure 2). Between 1996-2000, the drowning rate decreased steadily to an average of 1.4 deaths per 100,000, an improvement of 21%. This represented a decrease of about 100 water-related deaths per year. There was also a decrease in motor vehicle drownings.

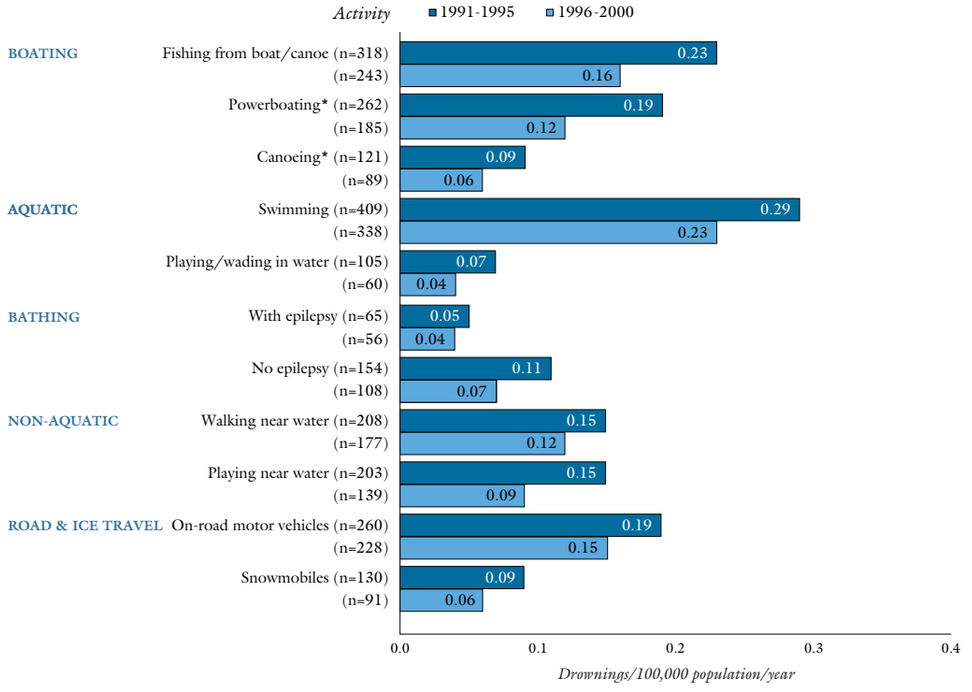
No improvement was seen for other types of water-related injuries, such as trauma from boating collisions and air embolism from scuba diving. For Canadians with epilepsy, there was little improvement in drowning rates, with 119 drownings in 1991-1995 and 109 in 1996-2000. No improvement was seen for foreign tourists, with 129 victims of water-related deaths in 1991-1995 and 133 in 1996-2000.

RELATIONSHIP BETWEEN ACTIVITY AND DROWNING

Boating was the leading cause of drowning in Canada. The most frequent boating activities were fishing, powerboating, and canoeing (Figure 3). Aquatic activities were the second leading cause of drowning; the most frequent activities were swimming and wading or playing in water. Third were motorized land transport activities; the most frequent were travel by road and snowmobiling. Fourth was bathing in a bathtub; the most frequent risk factor was a seizure from epilepsy. Assessment of the trends between 1991-1995 and 1996-2000 showed significant decreases in drowning rates for all activities.

Figure 3

RECREATIONAL AND DAILY LIVING ACTIVITIES ASSOCIATED WITH THE GREATEST NUMBER OF DROWNINGS, CANADA 1991-2000



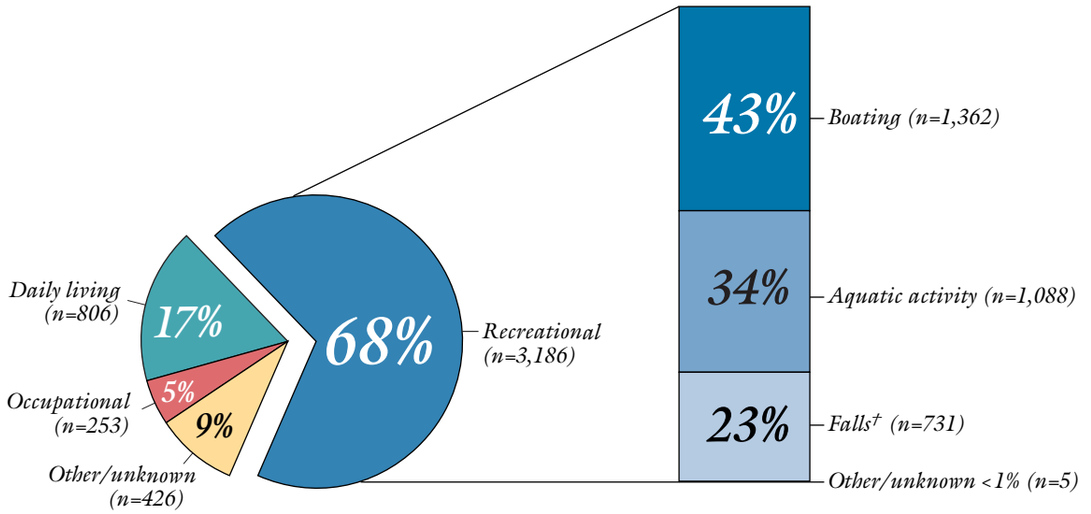
** Excludes fishing or hunting from boat or canoe*

Source: The Canadian Red Cross Society & the Canadian Surveillance System for Water-Related Fatalities, 2003

SIGNIFICANT RELATIONSHIP BETWEEN RECREATIONAL ACTIVITIES AND NUMBER OF DROWNINGS

More than two-thirds of drownings occurred during recreational activities. This was followed by activities of daily life such as bathing and subsistence hunting, fishing, and travel by First Nations and Inuit peoples (Figure 4). The most frequent occupational activity for drowning was commercial fishing.

Figure 4 **DROWNINGS BY ACTIVITY AND PURPOSE, CANADA 1991-2000 (n=4,671)***



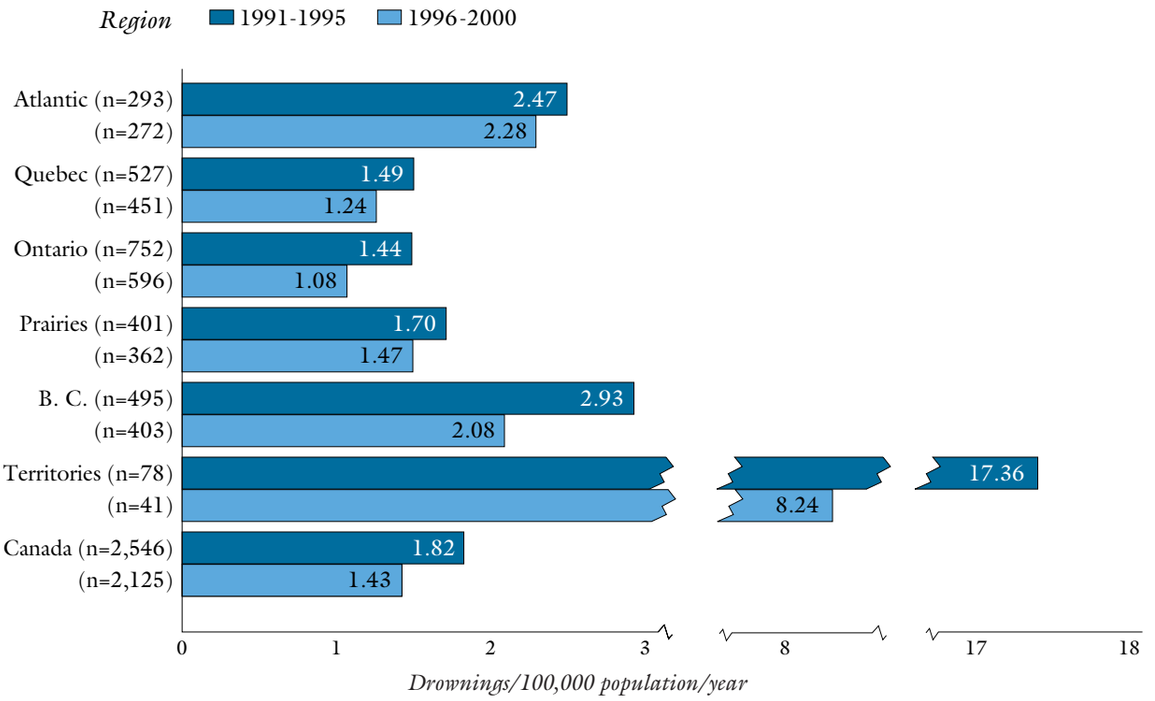
** Includes recreational, occupational & daily living drownings (E910, E830, E832); excludes land & air transport drownings*
† Falls into water during non-aquatic activities such as walking or playing near water or on ice

Source: The Canadian Red Cross Society & the Canadian Surveillance System for Water-Related Fatalities, 2003

CANADA AND THE REGIONS

The highest drowning rates in Canada occurred in the northern territories, followed by provinces on the east and west coasts (Figure 5). All regions showed improvement in drowning rates between 1991-1995 and 1996-2000, with an overall decrease of 21% for Canada. The greatest improvement, 53%, was seen in the territories, followed by British Columbia, 29%, and Ontario, 25%. Since so many people live in Ontario, the improvement there had the largest impact on the overall number of drownings in Canada.

Figure 5 **RATE OF DROWNING* BY REGION, CANADA 1991-2000 (n=4,671)**



** Includes recreational, occupational & daily living drownings (E910, E830, E832); excludes land & air transport drownings*
Source: The Canadian Red Cross Society & the Canadian Surveillance System for Water-Related Fatalities, 2003

ABORIGINAL PEOPLES

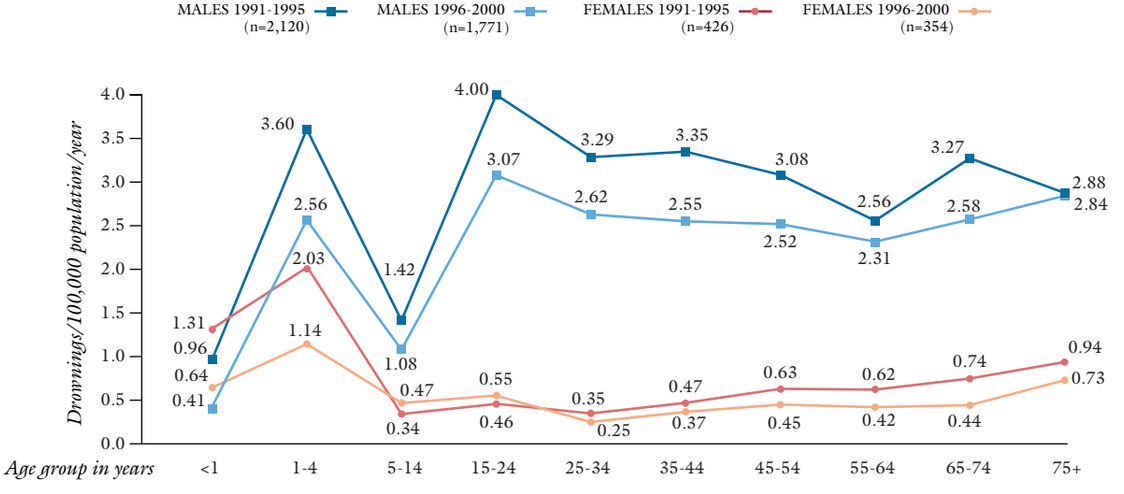
First Nations and Inuit peoples tend to have greater exposure to drowning hazards than the average Canadian, and their drowning rates were up to 10 times higher. Aboriginal peoples often travel by boat and snowmobile both as part of daily life and for recreation, and aboriginal adult males are at high risk of drowning during these activities. Not wearing a flotation device or hypothermia garment and alcohol were frequent risk factors for boating and snowmobile drownings.

Aboriginal toddlers (1-4 years old) are another high risk group, with a risk of drowning several times higher than for the average Canadian child. Aboriginals tend to live near natural bodies of water such as lakes and rivers, as well as other open collections of water. Lack of continuous supervision and construction of family homes close to open water were risk factors for such incidents.

ADULT MALES, YOUTH, AND SMALL CHILDREN ARE THE MOST VULNERABLE

Most drowning victims were males between the ages of 15 and 74 (Figure 6). Males in these age groups had the highest drowning rates, followed by children between 1 and 4. The risk profile by age changed during the 1990's. In the early 1990's, 1 to 4 year old toddlers had the highest drowning rates in Canada; however, the greatest improvements in drowning rates between 1991-1995 and 1996-2000 were among infants less than 1 year old, 53%, and toddlers, 34%. There was also significant improvement for males between the ages of 5 and 44, but less improvement for men 45 and older.

Figure 6 **RATE AND NUMBER OF DROWNINGS* BY AGE & SEX, CANADA 1991-2000 (n=4,671; 3,891 MALES, 780 FEMALES)†**



Number of drownings in age group

Males 1991-1995	10	143	139	411	422	375	234	153	141	71
1996-2000	4	104	111	316	314	319	238	145	124	79
Females 1991-1995	13	77	32	45	44	52	47	38	39	38
1996-2000	6	44	46	54	29	46	43	27	25	34

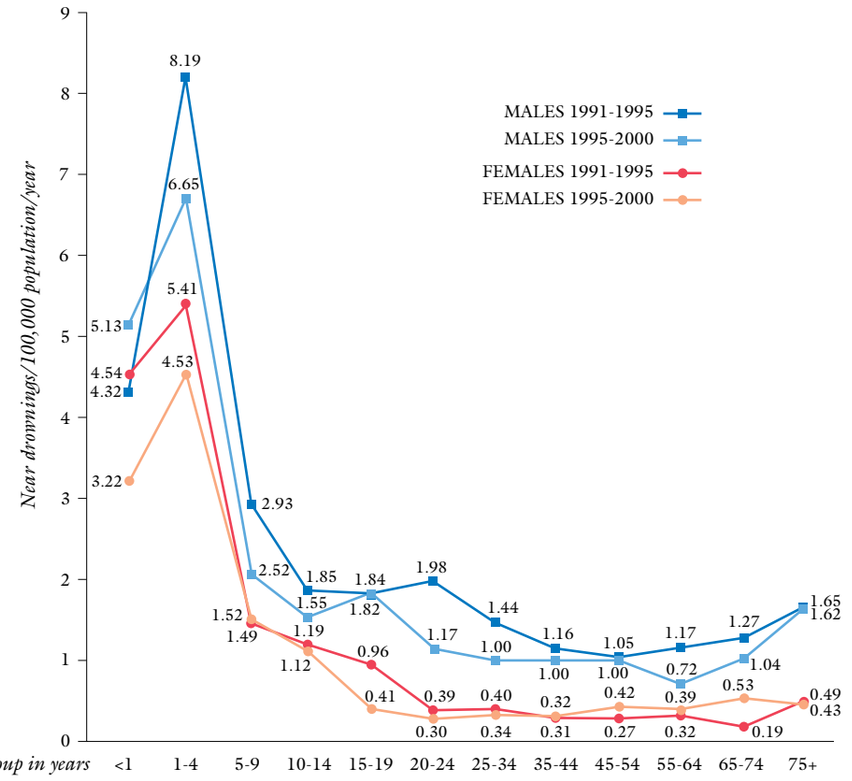
** Includes recreational, occupational & daily living drownings (E910, E830, E832); excludes land & air transport drownings*
† Age unknown for 39 victims; sex unknown for 9 victims, imputed male

Source: The Canadian Red Cross Society & the Canadian Surveillance System for Water-Related Fatalities, 2003

NEAR DROWNINGS: SMALL CHILDREN ARE THE MOST VULNERABLE

The highest rates of hospitalization for near drownings were seen in toddlers and infants (Figure 7). The data include only survivors of near drowning, some of whom sustained permanent brain damage from lack of oxygen while under water. For all ages combined, there were 0.8 survivors of hospitalization for near drowning for each fatal drowning; however, among 1-4 year old toddlers the ratio of survivors to fatalities was 2.6 and among infants 5.2. According to data from the Canadian Institute for Health Information and Statistics Canada, the trend for near drowning during the 1990's has not been as favourable as for drownings. More children may have been resuscitated with CPR during the period; however, lack of oxygen resulting from even a slight delay in resuscitation could result in varying degrees of brain damage.

Figure 7 **RATE* AND NUMBER OF HOSPITALIZATIONS FOR NEAR DROWNINGS† BY AGE & SEX, CANADA 1991-2000 (n=3,289)‡**



Average number of near drownings in age group/year *Total*

Males	1991-1995	9	65	29	19	18	21	37	27	16	14	11	8	272
	1995-2000	10	54	26	16	19	12	24	25	19	9	10	9	231
Females	1991-1995	9	41	14	11	9	5	10	7	4	4	2	4	121
	1995-2000	6	35	15	11	4	3	8	8	8	5	6	4	112

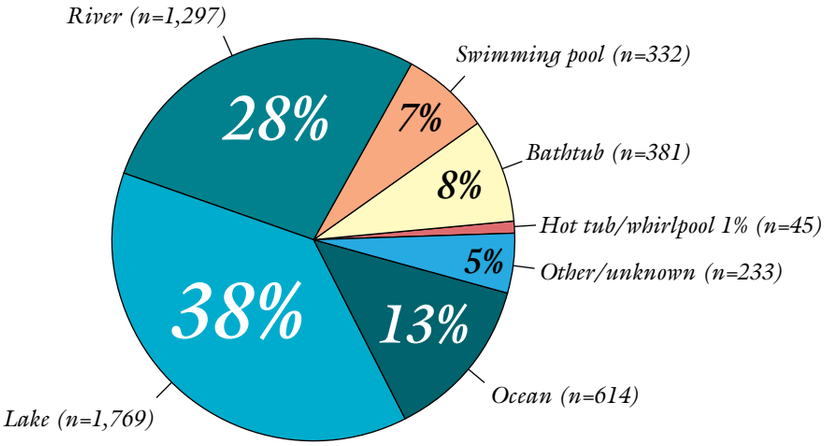
** Rates are an average for the 4-year and 5-year periods, population denominators from the 1996 census*
† Includes survivors but not in-hospital deaths, of which there were 61 in 1991-92, 45 in 1992-93, 60 in 1993-94, 51 in 1994-95, 35 in 1995-96, 53 in 1996-97, 33 in 1997-98, 45 in 1998-99 & 34 in 1999-2000
‡ Data are by fiscal year, April 1 to March 31

Source: Adapted from unpublished data provided by Statistics Canada and by the Canadian Institute for Health Information, 2003

DROWNINGS IN LARGE NATURAL BODIES OF WATER, BATHTUBS AND SWIMMING POOLS

Lakes, rivers, oceans, bathtubs and swimming pools were the most frequent locations for drownings (Figure 8). The pattern varied by region, with many drownings in lakes in Ontario and the Prairies, rivers in Quebec and British Columbia, swimming pools in Quebec and Ontario, and all natural bodies of water in the Atlantic region.

Figure 8 **DROWNINGS* BY TYPE OF BODY OF WATER,† CANADA 1991-2000 (n=4,671)**



** Includes recreational, occupational & daily living drownings (E910, E830, E832); excludes land & air transport drownings*
† "Lake" includes pond & reservoir

Source: The Canadian Red Cross Society & the Canadian Surveillance System for Water-Related Fatalities, 2003

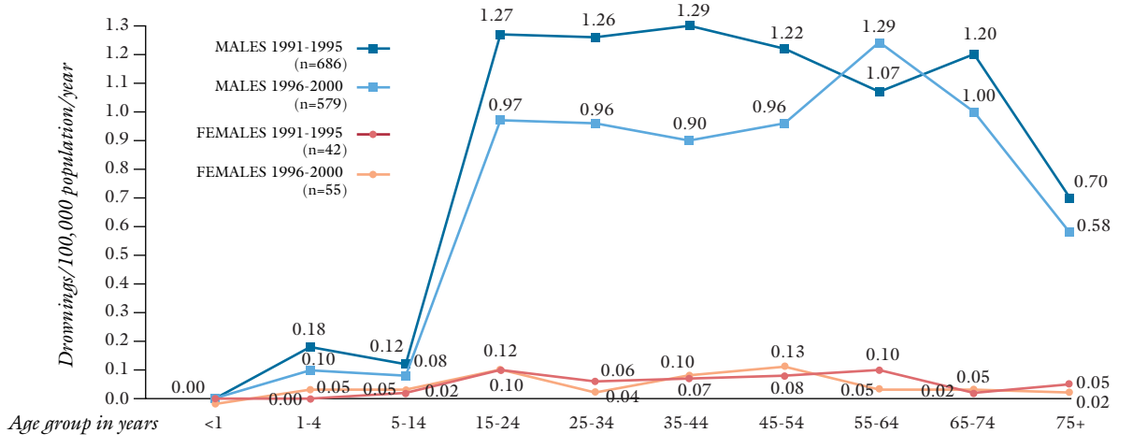
FEWER DROWNINGS FOR SOME ACTIVITIES AND TYPES OF BOATS, BUT THE SAME RISK FACTORS

Overall, there were 19% fewer boating drownings during 1996-2000 (806) than during 1991-1995 (997). Decreases were seen for common activities including fishing, powerboating, and canoeing, but drowning during hunting and sailing increased. Recreational boating accounted for 76% of boating drownings, occupational for 11%, and daily activities such as subsistence hunting, fishing, and travel by aboriginal peoples for 10%.

TYPICAL VICTIM PROFILE

An adult male is fishing from a small motorboat on a lake and wearing no flotation device or hypothermia protection garment (Figures 9, 10, 11, 12). Strong winds, large waves, cold water, and approaching darkness are often present (Figure 14). Capsized, falling overboard, or swamped, the victim finds himself struggling in the water. He is unable to retrieve his personal flotation device from the boat. Even if he does find it in the chaos and panic of a capsize, hypothermia and other adverse circumstances make it too difficult to put on and fasten up. As the muscles of the victim's hands weaken from the effects of hypothermia, he loses his grip on the submerged boat and sinks beneath the surface.

Figure 9 **RECREATIONAL BOATING DROWNINGS BY AGE AND SEX, CANADA 1991-2000 (n=1,362)***



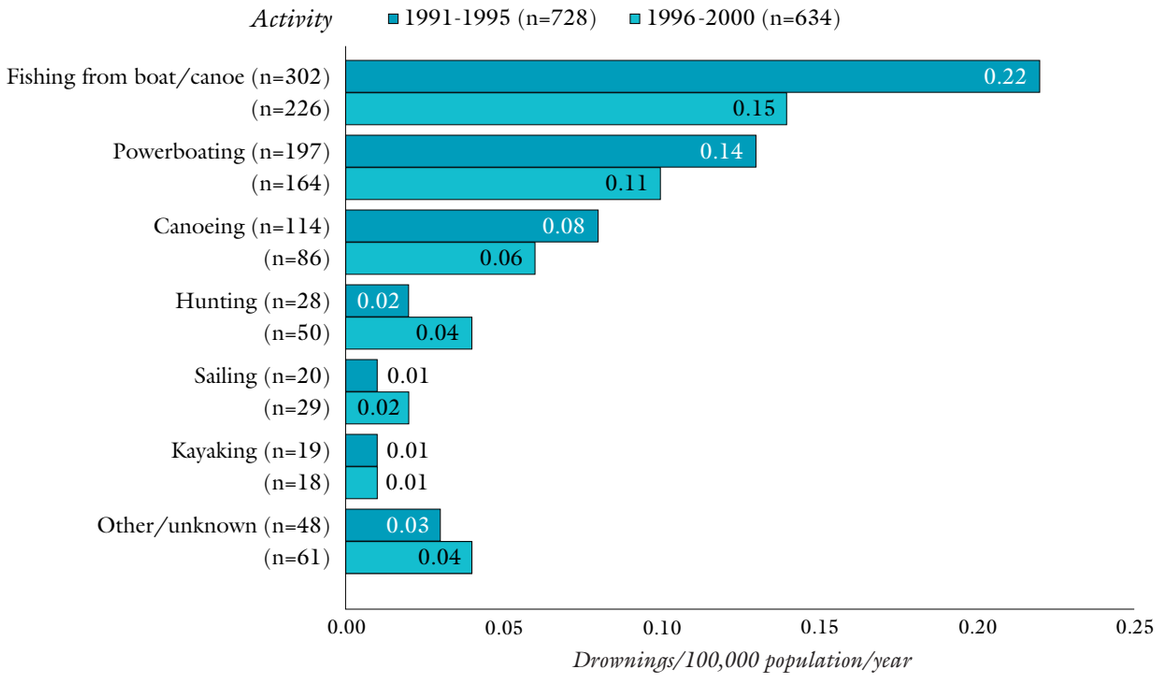
Number of drownings in age group

Males 1991-1995	0	7	12	130	162	145	93	64	52	17
1996-2000	0	4	8	100	115	112	91	81	48	16
Females 1991-1995	0	0	2	10	7	8	6	6	1	2
1996-2000	0	2	5	12	5	12	12	3	3	1

** 1991-1995: age unknown for 4 male victims; 1996-2000: age unknown for 3 male victims, sex unknown for 1 victim, imputed male, age & sex unknown for 1 victim*

Source: The Canadian Red Cross Society & the Canadian Surveillance System for Water-Related Fatalities, 2003

Figure 10 **RECREATIONAL BOATING DROWNINGS BY ACTIVITY, CANADA 1991-2000 (n=1,362)**



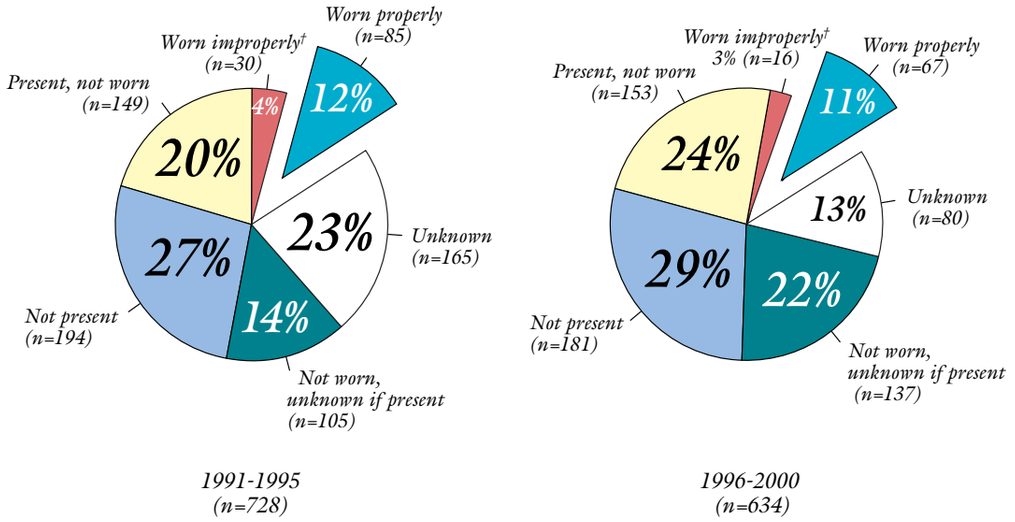
Source: The Canadian Red Cross Society & the Canadian Surveillance System for Water-Related Fatalities, 2003

MOST BOATERS ARE STILL NOT WEARING A PERSONAL FLOTATION DEVICE (PFD)

In spite of repeated public campaigns promoting the use of PFDs, a majority of boaters still ignore this basic precaution (Figure 11). **During 1991-1995 only 12% of recreational boating drowning victims were properly wearing a PFD, and in 1996-2000, the figure was 11%.** Surprisingly, the figure was no better for drowning victims who were non-swimmers or weak swimmers.

Although current regulations do not require wearing of a PFD by boaters, they do require that a PFD be present in the boat. In at least 28% of boating drownings, a PFD was not even present, let alone worn. And even when a PFD is present, it is impossible, or at the least very difficult, to find a PFD in the water and put it on properly after capsizing or falling into water, which are two of the most frequent incidents leading to boating drownings.

Figure 11 **RECREATIONAL BOATING DROWNINGS BY USE OF A PFD,* CANADA 1991-2000 (n=1,362)**



** Personal flotation device or lifejacket † Not fastened or inappropriate size*
Source: The Canadian Red Cross Society & the Canadian Surveillance System for Water-Related Fatalities, 2003

SMALL MOTORBOATS AND CANOES MOST FREQUENTLY INVOLVED

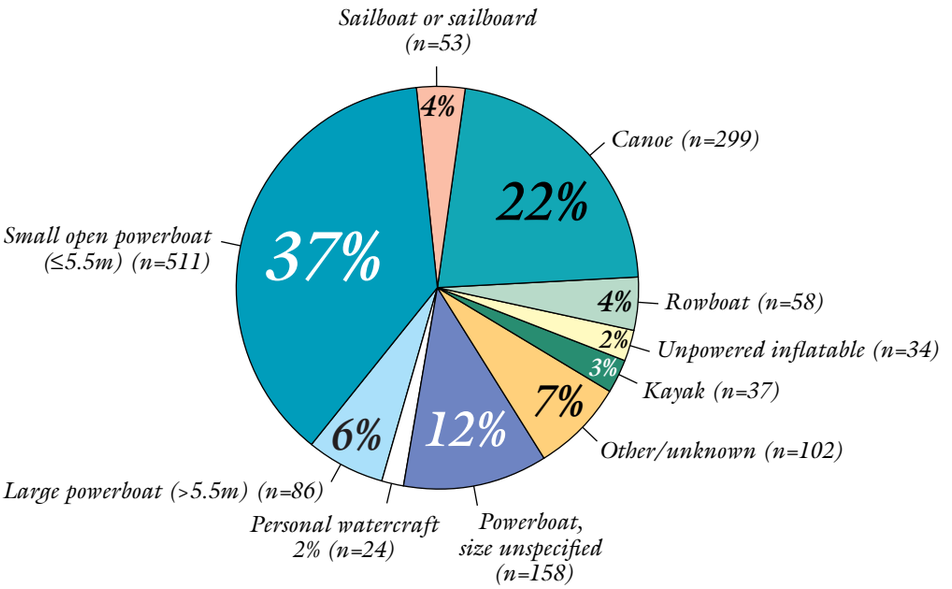
Small open boats, including motorboats and canoes, were predominant in recreational boating drowning incidents (Figure 12). There was a decrease in drownings involving small open motorboats and canoes between 1991-1995 and 1996-2000. **Most drownings of boaters occurred in lakes, 55%, followed by rivers, 21%.** For recreational boaters, 62% of drownings occurred in lakes, 24% in rivers.

TYPICAL VICTIM PROFILE: POWERBOATING
A few adult males in their 50's decide to go fishing in May in their small open motorboat. Ice is still present at the edge of the lake. Wind and waves come up rapidly in the afternoon as they are trying to return. It is already dusk when they take on water, swamp, and capsize. The victim is a good swimmer. However, since he is not wearing a flotation device, he is soon unable to hold onto the boat and sinks below the surface.

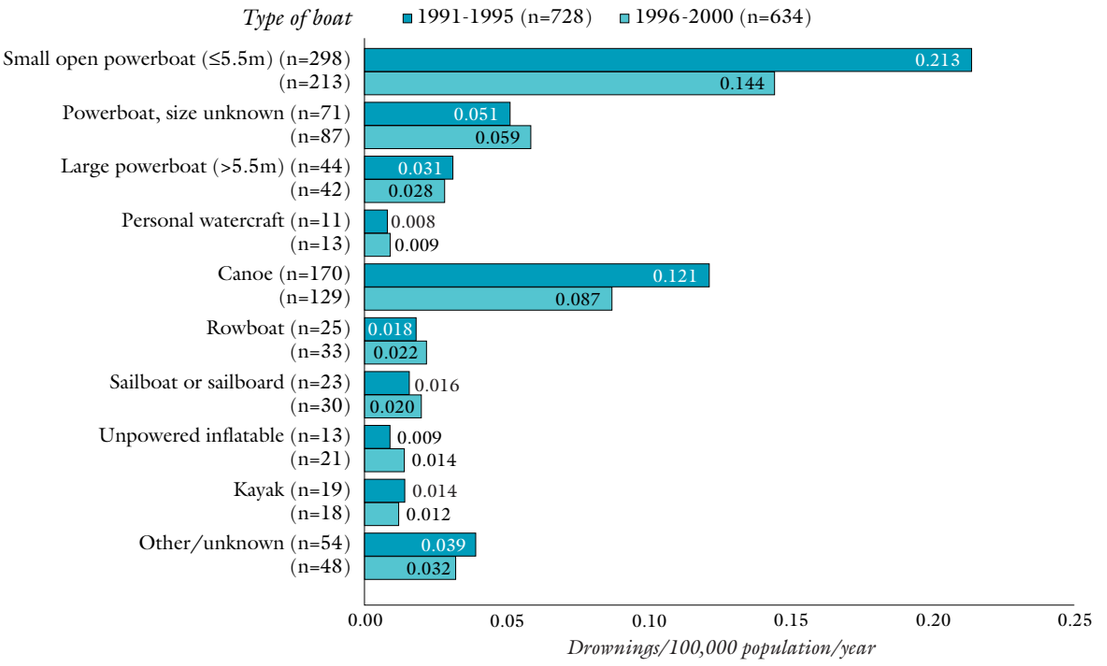
A TYPICAL SCENARIO *A 40-year-old male fisherman is travelling alone on a lake in his small open motorboat. He stands up and falls overboard. The boat continues on without him. His flotation device is in the boat on the seat. As he is a non-swimmer, he panics and drowns.*

TYPICAL VICTIM PROFILE: CANOEING
Two 18-year-old males go out in a canoe at a cottage on a lake after consuming alcohol. The canoe capsizes in the dark; the water is very cold. One makes it to shore and the other doesn't. The victim is a weak swimmer and is not wearing a personal flotation device.

Figure 12 **RECREATIONAL BOATING DROWNINGS BY TYPE OF BOAT, CANADA 1991-2000 (n=1,362)**



TRENDS

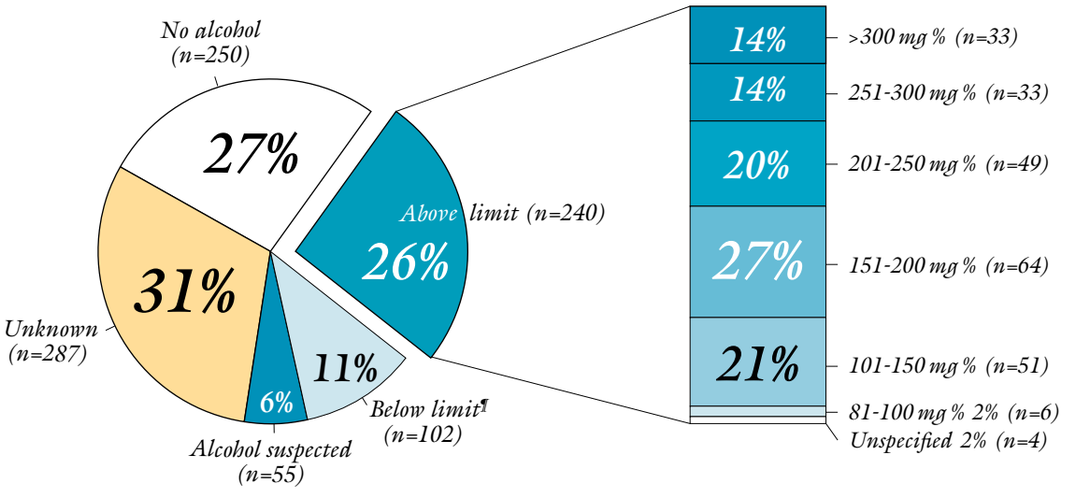


Source: The Canadian Red Cross Society & the Canadian Surveillance System for Water-Related Fatalities, 2003

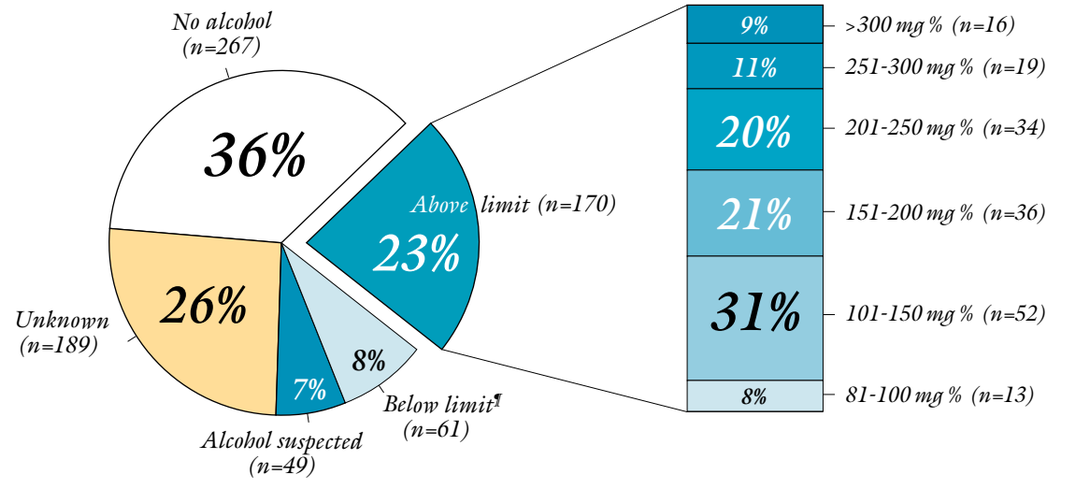
WATER AND ALCOHOL: A RISKY MIXTURE

Of all recreational boating drowning victims, 25% had an alcohol level above the legal limit of 80mg%, for 10% alcohol was present below the limit, and for another 6% alcohol was suspected. These are conservative statistics, since in 29% of cases, the presence or absence of alcohol was not reported. As seen in Figure 13, there was little improvement in the proportion of boating drownings involving alcohol between 1991-1995 and 1996-2000.

Figure 13 **BLOOD ALCOHOL LEVELS* FOR ALL BOATING DROWNINGS,† CANADA 1991-2000 (VICTIMS ≥15 YEARS OF AGE; n=1,748)‡§**



1991-1995 (n=934)



1996-2000 (n=736)

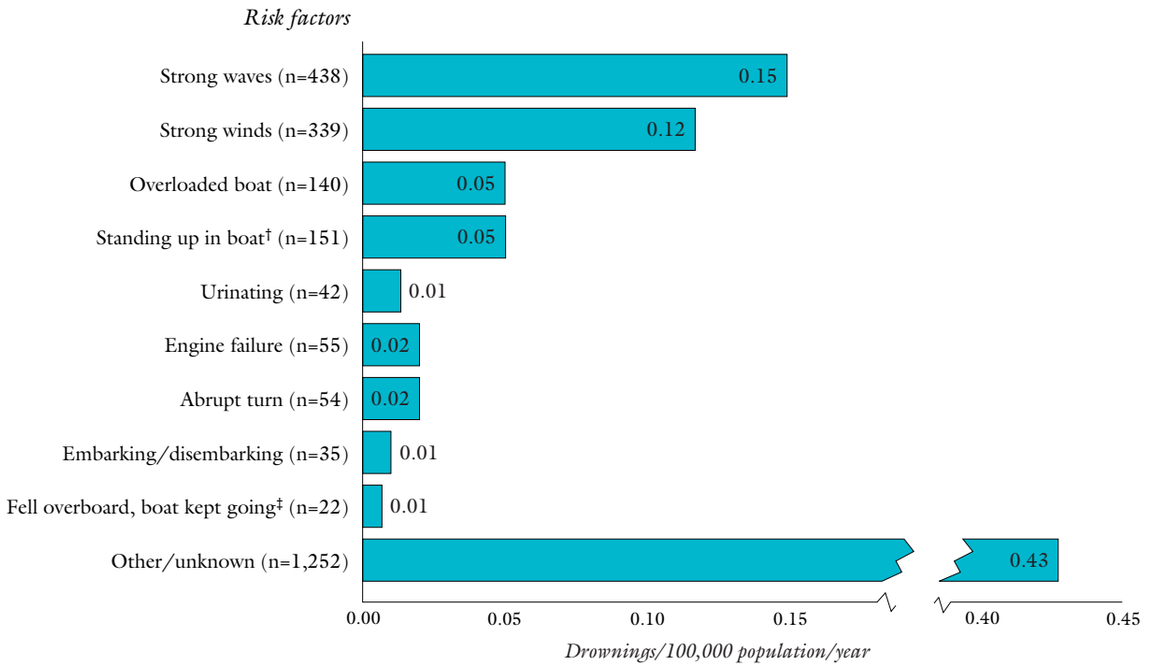
** Legal limit is 80 mg % † Includes recreational, occupational, daily living & other boating drownings (E830 & E832)*
‡ This figure excludes 78 victims (34 in 1991-1995, 44 in 1996-2000); decomposition rendered blood alcohol unreliable
§ Age unknown for 39 victims, presumed adult ¶87 at 1-49 mg % (56, 31), 62 at 50-80 mg % (34, 28), 14 unspecified (12, 2)

Source: The Canadian Red Cross Society & the Canadian Surveillance System for Water-Related Fatalities, 2003

BEWARE OF WIND, OVERLOADING, STANDING UP IN BOATS, AND COLD WATER!

Strong wind, large waves, overloading, and standing up in the boat can be lethal, especially in small boats. Although cold water may not contribute to the initial injury incident, cold greatly increases the risk of an immersion. Cold or extremely cold water were reported in 36% of recreational boating drownings; however, these data underestimate the importance of cold, since water temperature is often unreported. Cold is a special risk during fishing and hunting by boat in spring and fall. In large lakes, water temperature may still be below 10°C as late as June.

Figure 14 **BOATING DROWNINGS BY RISK FACTORS,* CANADA 1991-2000 (n=1,803)**



** There may be more than one risk factor per incident † Other than to urinate*
‡ This category did not appear in the questionnaire until 1998

Source: The Canadian Red Cross Society & the Canadian Surveillance System for Water-Related Fatalities, 2003

HYPOTHERMIA & COLD-WATER DROWNINGS

Boating was the main activity in and around the water to be frequently complicated by hypothermia. Hypothermia tends to be under-reported by coroners because the diagnosis is difficult to make when the victim is already dead. Nevertheless, hypothermia was mentioned as a contributing factor in 19% of boating drownings during 1991-2000, and was the principal cause of death in 34% of non-drowning boating deaths.

Although water temperature was unknown for 63% of recreational boating drownings during 1991-2000, for 283 boating drownings, 21% of the total, water temperature was described as extremely cold (less than 10°C). In 3% of boating drownings, ice was reportedly present.

Only 13% of boaters were reported to be wearing a flotation device when they died, and in these incidents cold water was usually implicated. Almost no drowned boaters were wearing a hypothermia protective garment.

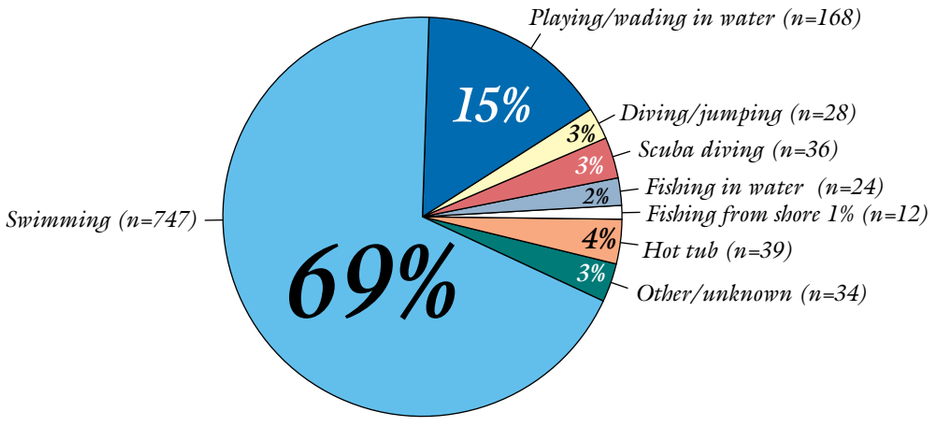
Measuring water temperature and wearing of flotation devices, and when appropriate other hypothermia protective garments, should be a reflex for boaters who venture out in spring and fall. It is difficult to put on a PFD in warm water and can be impossible in cold water, so wear your PFD!

YOUTH AND CURRENT, YOUNG MEN AND ALCOHOL

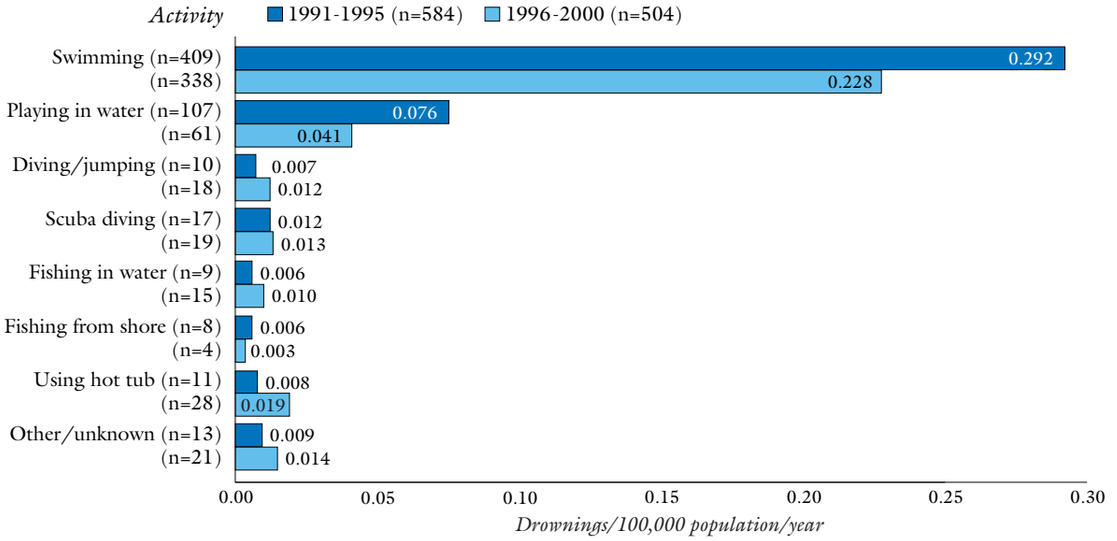
Swimming is a popular activity among Canadians, and accounted for 69% of recreational aquatic deaths (Figure 15). Playing or wading in water can result in drownings when non-swimmers or weak swimmers get caught by current in rivers or out of their depth in abrupt drop-offs. As seen in Figure 16, young men 15-24 years of age were most at risk during swimming, but 25-44 and 5-14 year olds were also at appreciable risk.

There was a 22% decrease in the rate of swimming drownings and a 46% decrease in the rate of drownings during playing or wading in water between 1991-1995 and 1996-2000 (Figure 15). The improvement in swimming drownings was seen primarily in age groups from 5 to 44 (Figure 16). Hot tubs are a relatively new home hazard, and there was a 245% increase in such deaths. There was also a slight increase in recreational scuba and other diving deaths, with 17 in 1991-1995 and 19 in 1996-2000. Recreational incidents accounted for 80% of all diving deaths, while the others were occupational.

Figure 15 **RECREATIONAL AQUATIC DROWNINGS BY ACTIVITY, CANADA 1991-2000 (n=1,088)**



TRENDS



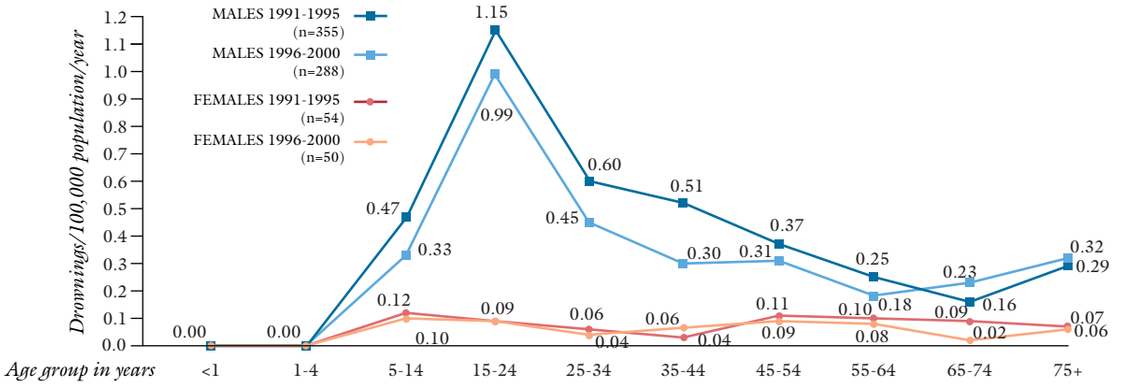
Source: The Canadian Red Cross Society & the Canadian Surveillance System for Water-Related Fatalities, 2003

MANY "SWIMMERS" DO NOT KNOW HOW TO SWIM SAFELY

Although strong swimmers sometimes take unwise risks and can be swept away in unfamiliar currents, at least 32% of swimming victims between 5 and 14 years old did not know how to swim or were weak swimmers. Swimming ability was not specified for another 26%. Of concern is that 42% of swimming victims in this age group were unaccompanied by an adult, and 27% of swimming victims 15 and older were alone when they drowned.

A TYPICAL SCENARIO *A 35-year-old male is partying with his friends in the evening. Although a weak swimmer, he decides to take a dip in the nearby river. Having underestimated the force of the current, he is swept downstream and drowns.*

Figure 16 **RATE AND NUMBER OF SWIMMING DROWNINGS BY AGE & SEX, CANADA 1991-2000 (n=747; 643 MALES, 104 FEMALES)**



Number of drownings in age group

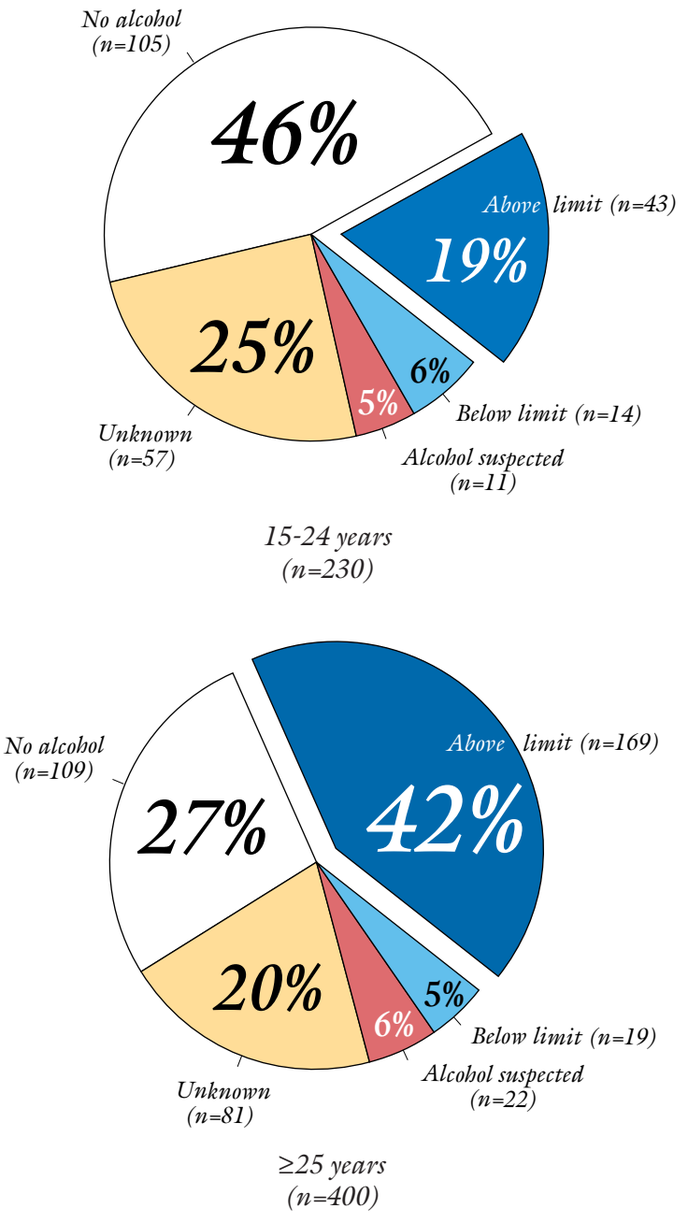
Males 1991-1995	0	0	46	118	77	57	28	15	7	7
1996-2000	0	0	34	102	54	38	29	11	11	9
Females 1991-1995	0	0	11	9	8	4	8	6	5	3
1996-2000	0	0	10	9	5	8	9	5	1	3

Source: The Canadian Red Cross Society & the Canadian Surveillance System for Water-Related Fatalities, 2003

WATER AND ALCOHOL: A RISKY MIXTURE

Even small amounts of alcohol adversely affect performance in swimming and diving. Alcohol and other intoxicating drugs also confuse some non-swimmers and weak swimmers into thinking they can swim. Perhaps surprisingly, alcohol was a factor in a much higher proportion of swimming drownings among victims 25 and older (53%) than among those 15-24 years old (30%), as seen in Figure 17.

Figure 17 **BLOOD ALCOHOL LEVELS* FOR SWIMMING DROWNINGS BY AGE GROUP, CANADA 1991-2000 (n=646)†**



** Legal limit is 80 mg %*
† This figure excludes 8 victims 15-24 years old and 8 victims ≥25 years old; decomposition rendered blood alcohol unreliable
Source: The Canadian Red Cross Society & the Canadian Surveillance System for Water-Related Fatalities, 2003

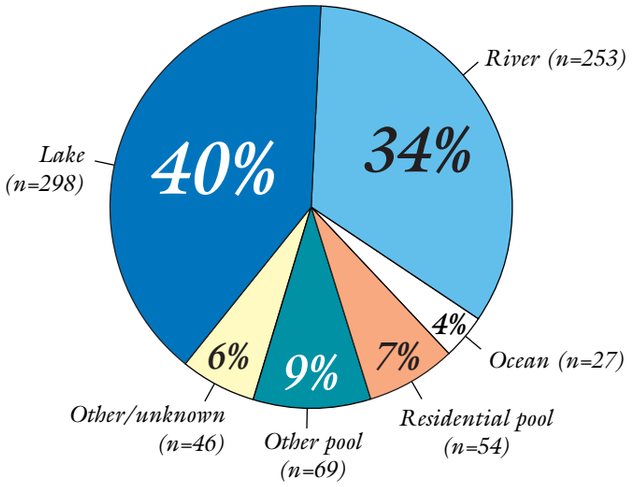
WATER CURRENT

The force of current in rivers is probably the most serious aquatic hazard for 15-24 year olds; 42% of swimming drownings in this age group occurred in rivers. At least 58% of drownings in rivers took place in fast current, rapids, white water, or waterfalls.

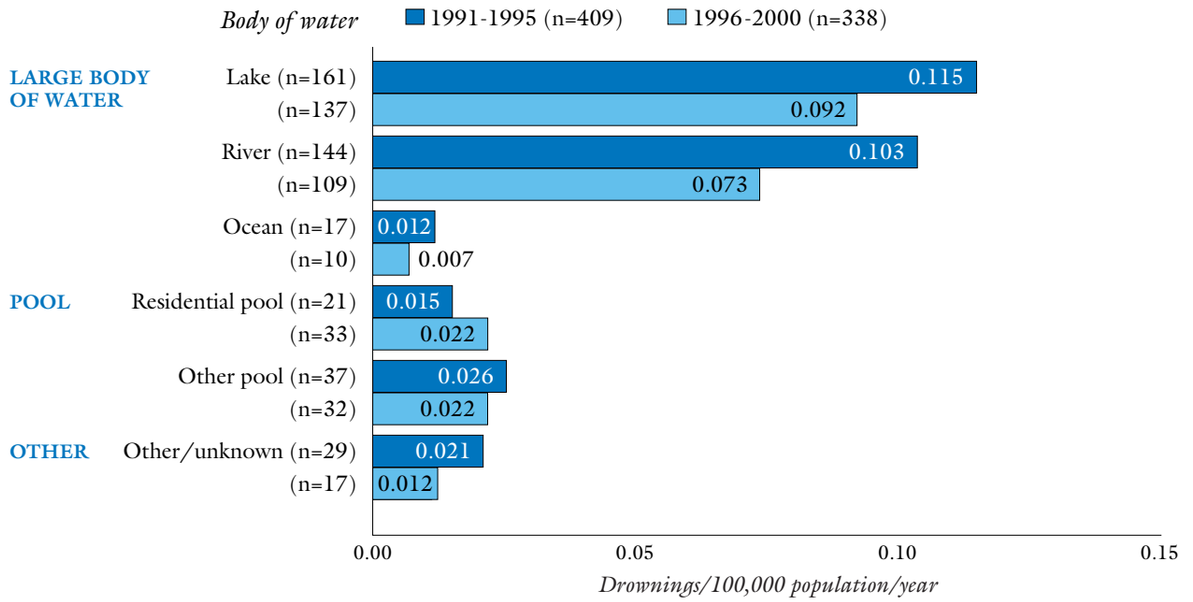
BODY OF WATER

There was a decline in swimming drownings in all bodies of water between 1991-1995 and 1996-2000, except home swimming pools where there was a 47% increase. The main risk group for swimming drownings in home pools was men 55 and over.

Figure 18 **SWIMMING DROWNINGS BY TYPE OF BODY OF WATER,* CANADA 1991-2000 (n=747)**



TRENDS



** "Lake" includes pond & reservoir*

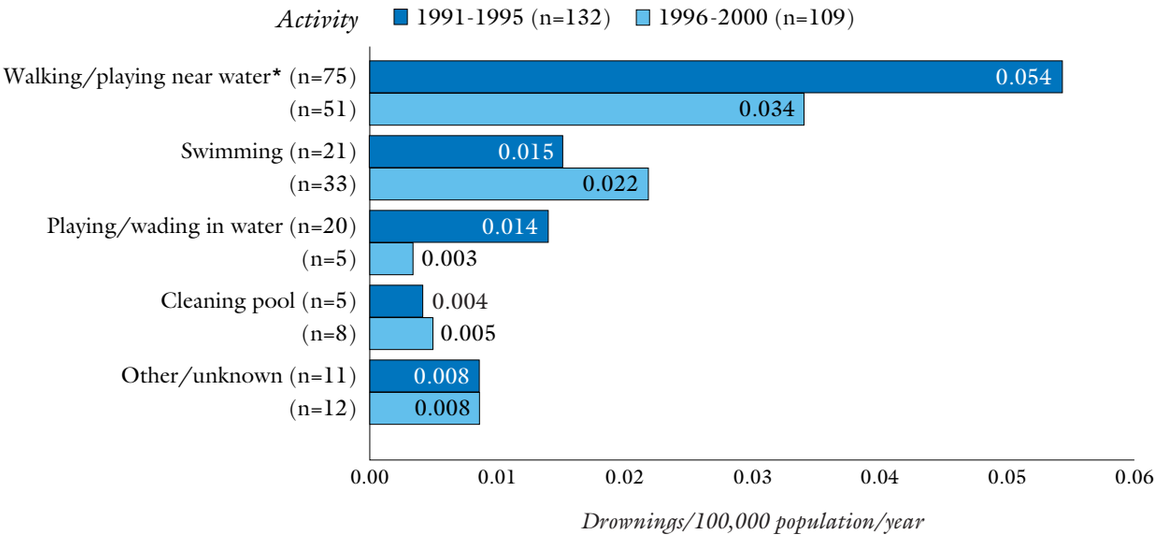
Source: The Canadian Red Cross Society & the Canadian Surveillance System for Water-Related Fatalities, 2003

EASILY ACCESSIBLE HOME POOLS WITHOUT AN AUTOMATIC GATE: A SERIOUS HAZARD FOR TODDLERS PLAYING OR LIVING NEARBY

Non-aquatic activities such as playing or walking near a home pool are the most frequent activities for pool drownings (Figure 19). These incidents mainly involved young children who gained access to a pool without a self-closing and self-latching gate. Only 6% of home pool drownings among 1-4 year olds in Canada occurred in pools equipped with such a gate. Most pool drownings of children occurred during the momentary absence of a caregiver.

While there was an improvement in drownings of children playing near pools, pool drownings associated with other activities showed no decrease. Such incidents frequently involved adult non-swimmers, who tend to overestimate their swimming ability when they are under the influence of alcohol. As well, about half of all home pool drownings of 1-4 year olds occurred in Quebec, which has about half of the nation's pools, especially above-ground pools with a patio joining them to the house (Figure 20). While there was a decrease in the pool drowning rate for children in Quebec, it was less in Ontario and British Columbia.

Figure 19 **SINGLE-FAMILY HOME SWIMMING POOL DROWNINGS BY ACTIVITY, CANADA 1991-2000 (n=241)**



** Fell into pool*

Source: The Canadian Red Cross Society & the Canadian Surveillance System for Water-Related Fatalities, 2003

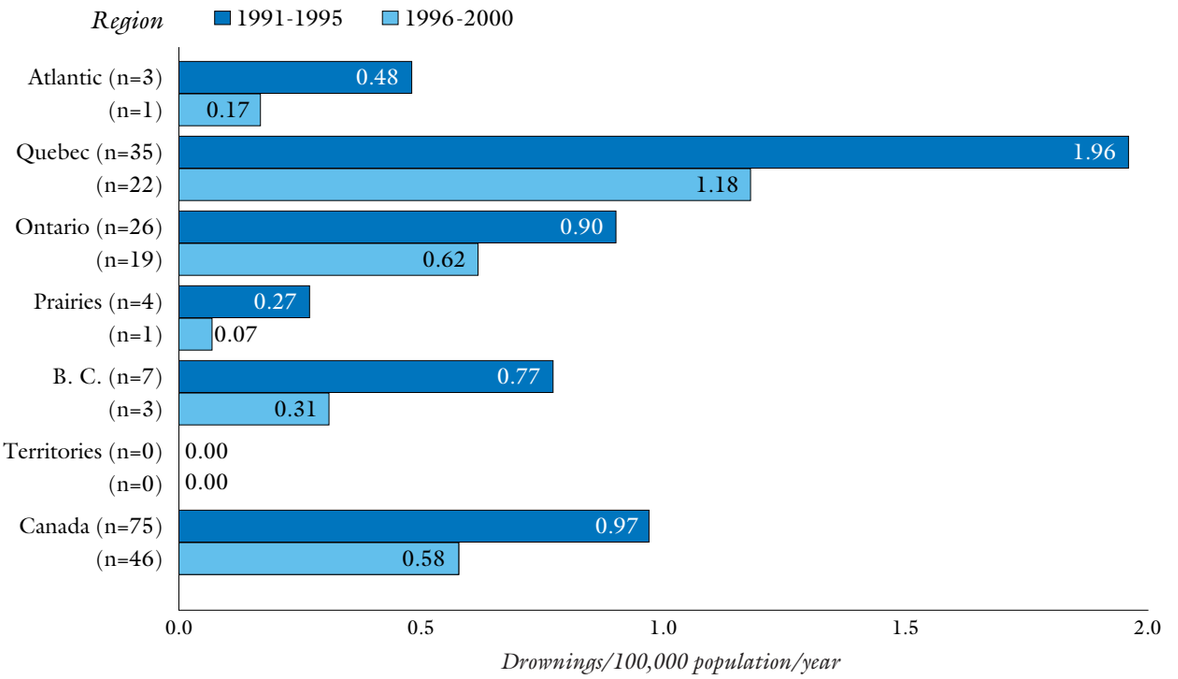
WHERE DID CHILDREN AND YOUTH DROWN MOST FREQUENTLY?

Infants and toddlers drowned mainly in bathtubs and pools, whereas older children and youth tended to drown in large bodies of water (Figure 21). Significant decreases were seen in drownings in bathtubs and pools for infants and toddlers, and in large bodies of water for 15-19 year old youth between 1991-1995 and 1996-2000.

TYPICAL VICTIM PROFILE *A three-year toddler escapes his mother's supervision momentarily while she is distracted caring for the new baby. The toddler quickly runs to the pool and falls in. Although he is only in the pool for a few moments, resuscitation is unsuccessful.*

Figure 20

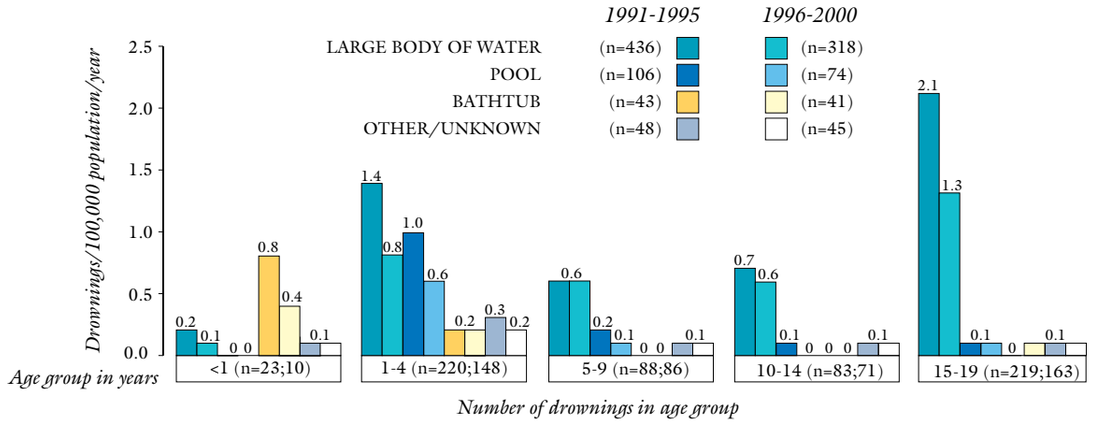
TODDLER DROWNINGS IN SINGLE-FAMILY HOME POOLS BY REGION, CANADA 1991-2000 (n=121)



Source: The Canadian Red Cross Society & the Canadian Surveillance System for Water-Related Fatalities, 2003

Figure 21

CHILD AND YOUTH DROWNINGS* BY AGE & TYPE OF BODY OF WATER,† CANADA 1991-2000 (n=1,111)



Large body of water 1991-1995 1996-2000	4 1	106 66	60 59	66 56	200 136
Pool 1991-1995 1996-2000	1 0	76 49	15 13	9 5	5 7
Bathtub 1991-1995 1996-2000	16 8	17 17	3 4	3 4	4 8
Other/unknown 1991-1995 1996-2000	2 1	21 16	10 10	5 6	10 12

** Includes recreational, occupational & daily living drownings (E910, E830, E832); excludes land & air transport drownings*
† Includes ocean, river, lake, reservoir & pond

Source: The Canadian Red Cross Society & the Canadian Surveillance System for Water-Related Fatalities, 2003

SNOWMOBILERS

During 1991-2000, 232 snowmobilers drowned in Canada. Nearly all snowmobile drownings occurred late in the day or at night. 57% of deaths occurred from January to March, when people might expect the ice to be strongest. **Alcohol was associated with at least 59% of snowmobile drownings**; of these cases, 64% of victims had a blood alcohol level above the legal limit of 80 mg %, 21% were below the limit, and 15% were suspected of having consumed alcohol.

Operating a snowmobile, especially at the high speeds that are now common, requires full possession of one's mental faculties. Darkness and/or blowing snow make it difficult to rapidly detect hazards such as thin ice or a hole covered with snow.

Because of the presence of moving water beneath the ice, **no river or outflow of lakes can ever be considered fully safe for ice travel**. 59% of snowmobiling drownings occurred on lakes, 26% on rivers, 12% in the ocean, and 2% in other locations. The northern territories had a rate of snowmobile drownings more than 20 times the Canadian average, the Atlantic region twice the Canadian average. However, the greatest number of snowmobile drownings occurred in Ontario, followed by Quebec and the Atlantic region, and then the Prairies. Snowmobile drownings are rare in British Columbia.

Snowmobilers seldom think of preparing for a cold-water immersion. An instructive scenario happened to one northern family. *The men set out with no flotation garments. For some reason, the mother put a boating PFD on her small boy, who was a passenger on one of the snowmobiles. When the group went through the ice, the boy survived, the men died. Special hypothermia flotation suits are even better, but will not be protective in all situations, so basic safety precautions must always be taken.*

TYPICAL VICTIM PROFILE *A weekend excursion during February of men in their 20's and 30's. High-powered snowmobiles moving at tremendous speed, early dusk and low visibility, a return home on ice over lake and river, alcohol blurring alertness to danger, machine outrunning its headlamp. Suddenly — hidden current, a hole in the ice, seen too late or not at all. An intoxicated male in ice cold water, no flotation device or hypothermia protective garment — death by hypothermia and drowning.*

A TYPICAL SCENARIO *A 30-year-old male is travelling home by snowmobile across a river after a party at a lake. Visibility is poor due to darkness and blowing snow. The victim has consumed alcohol. He hits a hole in the ice and his machine quickly sinks to the bottom. Since he is not wearing a hypothermia flotation suit, he struggles for a period of time to stay afloat but is soon incapable of moving his fingers and arms and sinks below the surface.*

PLAYING, WALKING AND FISHING ON ICE

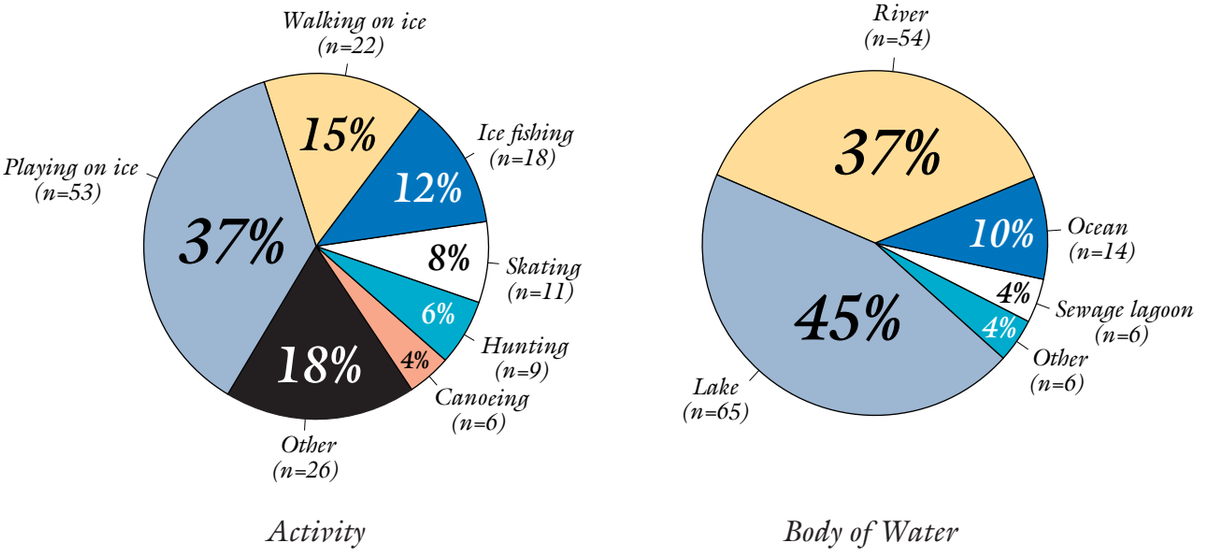
Canada being a northern country, Canadians are at risk of drowning as a result of falling through ice. During 1991-2000, there were 218 such victims. Of these, 67% drowned during recreational activities such as playing, walking, and fishing, while 25% drowned during occupational and subsistence or other daily living activities; the remaining 8% drowned during other (e.g. attempted rescue) or unknown activities.

Young children are at high risk of ice drowning, and require the same degree of constant supervision when playing on or near ice as they do around water. During 1991-2000, 33 toddlers 1-4 years old and 34 children 5-14 years old drowned when they fell through ice. Toddlers accounted for 15% of all ice victims, 5-14 year olds for 16%. The rate of ice drowning for toddlers was almost 3 times the average rate for adults.

ICE AND CURRENT

Never trust a river, inflow, or outflow of lakes and reservoirs. While lakes and reservoirs combined were the most frequent sites for ice drownings, rivers are especially treacherous due to hidden current with unexpected openings or weakness of ice. Ice on reservoirs may be more hazardous than on lakes, since reservoirs accounted for 19% of all ice drowning on lakes, ponds, and reservoirs. Reservoirs may also be closer to towns and more accessible for play and walking.

Figure 22 **DROWNINGS DURING RECREATIONAL ACTIVITIES* ON ICE BY ACTIVITY & TYPE OF BODY OF WATER,† CANADA 1991-2000 (n=145)**



** Excludes snowmobiling and other motorized transport † "Lake" includes pond & reservoir*
Source: The Canadian Red Cross Society & the Canadian Surveillance System for Water-Related Fatalities, 2003

The research tells us that the most frequent activities leading to drowning were boating, swimming or wading, playing or walking near water, snowmobile and car travel, and bathing in a bathtub. The most frequent risk factors were failure to wear a flotation device during boating and use of alcohol during boating, swimming, and travel by snowmobile or car.

Knowing how people drown is the first step in prevention. With your safety in mind, and with ten years of research backing us, Canadian Red Cross offers the following tips to protect you and your family from water-related injuries. By taking a few simple precautions, you can prepare and stay safe while enjoying water activities.

BOAT SMART!

- **Always wear your lifejacket or PFD.** Having your lifejacket *close by isn't close enough.* It is extremely difficult to put on a lifejacket once in the water, so wear your lifejacket on every trip, for the *whole* trip.
- **Research shows that comfort and ventilation are key to boaters wearing their PFD.** Be sure to buy a PFD that is comfortable to wear during even the most vigorous phases of your preferred boating activity.
- **Avoid alcohol.** Since most boating drownings result from capsizing or falling overboard, this means no alcohol for boat operators or passengers. Boating and alcohol don't mix.
- **Verify weather** before leaving, including wind, waves, and water temperature. Head for shore before weather turns bad.
- **Wear a hypothermia-protective flotation garment** in spring, fall, and when caught in other adverse conditions of wind, waves, and cold.
- **Learn the basic rules of navigation.** Make sure you meet the legally required proof of competency and age requirements before operating a motorboat.

MAKE YOUR HOME CHILD-SAFE AND SUPERVISE CHILDREN

- If you have a home pool, ensure that the gate is fitted with tension-adjustable self-closing hinges and a childproof self-latching mechanism. The home should not open directly into the pool area.
- If you head to a cottage by a lake or even your local pool, constant adult supervision is essential for children — even those who can swim.
- When bathing toddlers and infants, remain with them the whole time. Infants should be bathed in a small infant tub. Older children and adults with epilepsy should shower, and never bathe alone in a bathtub.

SWIM AND DIVE SAFELY

- Be cautious about swimming in currents, and know what to do if caught in a current.
- Never swim at the base of dams, however small.
- Be aware that diving in headfirst can result in head or spinal injury. If in doubt, lower yourself in, wade in, or jump. Avoid diving in home pools; most are not deep enough or long enough for safe diving. The presence of a diving board does not guarantee that a pool is safe for diving; lifetime paralysis has occurred.
- Avoid even small amounts of alcohol when swimming or diving.
- Make sure that everyone in your family has had Red Cross or other swimming and water safety training.

STAY SAFE ON ICE

- When snowmobiling or walking on ice, keep away from rivers and outflows of lakes and reservoirs. Avoid travelling on ice at night and in other conditions of limited visibility. Avoid alcohol.
- On ice, think cold water! When snowmobiling, wear outdoor gear that will protect you from cold water and keep you afloat if you fall through ice.
- When playing on or around ice, including ice skating, fishing, and walking, know the ice thickness. Thickness can vary from one spot to another, so be sure of the safety of the ice before proceeding.

UPGRADE YOUR TRAINING AND WATER SAFETY SKILLS

- Take training at your local pool or waterfront to upgrade your boating, swimming, and water safety skills. Be sure that any training you take is based on sound research. Research is the basis for training provided by the Canadian Red Cross. Training will help you stay safe in, on and around the water, whether you're an avid swimmer, boating enthusiast, or a snowmobiler who crosses ice.
- Emergencies happen to all of us — knowing how to respond is critical. Red Cross First Aid and CPR courses teach lifesaving skills you need to make a difference.

MAKE YOUR COMMUNITY WATER-SAFE

- Identify the water-related hazards in your community, and where possible work to eliminate them. If this is not possible, then teach your family to avoid the hazards.
- Support local groups — swimming pools, recreation groups, fire and other rescue groups in water safety education and drowning prevention.
- Encourage national and local municipal decision-makers to support legislation and enforcement that encourage water safe practices. This includes ensuring that all boaters wear an appropriate flotation device and that all home pools are fitted with a self-closing, self-latching/locking automatic mechanism. Regulations should support practices that discourage use of alcohol in, on, or near the water.

Acknowledgments

The Canadian Red Cross initiated and has supported the Canadian Surveillance System for Water-Related Fatalities since 1991, in conjunction with the Lifesaving Society, Canadian Coast Guard, and the National Association of Coroners. Dr. Peter Barss of the Department of Epidemiology and Biostatistics of McGill University developed the annual reports for the Canadian Red Cross on which this 10-year summary is based. Rosemary Hong of The Canadian Red Cross Society coordinated the production. The Research Institute of the McGill University Health Centre helped to administer the project. Sophie Lapointe did the data analysis. Cait Beattie of Résolutique Globale provided design, layout and editing. Funding for this special 10-year summary report came from the New Initiatives Fund of the National Search and Rescue Secretariat of Canada.

Fisheries and Oceans Canada / Pêches et Océans Canada — Coast Guard / Garde côtière

McGill University

McGill University Health Centre

Canadian Red Cross

For more information, please contact:

Canadian Red Cross

Water Safety Services, 170 Metcalfe Street, Suite 300

Ottawa, Ontario, Canada K2P 2P2

(613) 740-1900 Fax: (613) 740-1911 www.redcross.ca

Ce rapport est aussi publié en français.

Canada

ISBN: 1-55104-301-7