

PART 6

SPECIAL HIGH-RISK ENVIRONMENTS & POPULATION SUBGROUPS FOR DROWNING

This part of the report focuses on selected high-risk environments for drownings, as well as on certain subgroups of the population at special risk. *High-risk environments* include home swimming pools. *High-risk subgroups* of the population who are considered include: toddlers 1-4 years old and youth 15-19 years old; persons with seizure disorders such as epilepsy; fishers; and aboriginal peoples.

Since *home swimming pools* are the most important environmental hazard for toddlers, there is overlap between the study of drownings by high-risk environments and a consideration of toddlers as a special risk group. This section integrates swimming pool data from both non-aquatic falls and aquatic recreation. The unprotected single-unit home pool is the most important environmental hazard for toddlers of 1-4 years of age. Above ground pools are at least as frequent as inground pools for such incidents.

Pool drownings occur during both non-aquatic and aquatic activities. Most drownings in single-unit home pools result when toddlers playing nearby fall in, while the remainder occur during wading or playing in the pool. In contrast, the majority of drownings in other types of pools occur during swimming.

It is of great concern that the vast majority of child pool drownings involve pools that are not fitted with a self-closing and self-latching gate. The lack of effective national, provincial, municipal, and industry norms, regulations, and enforcement for home swimming pool safety remained alarming throughout the 1990's. While most pool drownings occur during warmer months, unenclosed pools are a year-long hazard as indicated by occasional incidents during fall, winter, and spring.

Adult drownings in pools tend to be associated with alcohol consumption and poor swimming ability. Noteworthy is that the majority of both child and adult pool victims are alone at the time of the incident. Readers interested in greater detail on the prevention of toddler drownings in swimming pools should consult the *Special Research Report on Drownings Among 1 to 4 Year Old Children in Canada* (The Canadian Red Cross Society, 1994a) and the section on drowning from falls into water in Part 5 of this report.

Toddlers are at risk not only in swimming pools but also in other bodies of water such as lakes and rivers, especially when cottages are situated close to the water. Youth 15-19 years old are at high risk during swimming; incidents also occur during wading, canoeing, other boating, and bathing (epilepsy). Infants less than 1 year old are mainly at risk when left alone or with another child in an adult bathtub.

While persons with *epilepsy* are at particular risk in or near bathtubs due to the frequency of exposure to this hazard, they are also at risk in any activity in or near other bodies of water. Most victims with epilepsy are in their economically productive years, between 15 and 54. The reader may also wish to refer to Part 4 on drowning during bathing.

Fishers are at risk in boats, along the shore and docks, and on the ice. Nearly all fishers who drown in boats are 15 and older, ranging up to 75 years and older. As for other boaters, non-wearing of a flotation device is associated with nearly all deaths of fishers using boats. Small open powerboats are the main source of such deaths. Fishers who drown while wading, walking on ice, or who fall in are also rarely wearing a flotation device. Alcohol and cold are other risk factors. Many fishing drownings occur in the spring and fall, with hypothermia a complicating factor. Boating drowning is covered in greater detail in Part 2.

Drownings are among the leading two causes of injury death in many *aboriginal communities* in Canada. In some locations, the number of drownings exceeds road traffic deaths, especially when *snowmobile*

drownings are included with other drownings. Drowning rates among aboriginal peoples are as much as 10 times higher than among other Canadians, and the main victims are adult males and toddlers (Damestoy, 1994). Nevertheless, drowning rates of female aboriginals often exceed those for non-aboriginal males.

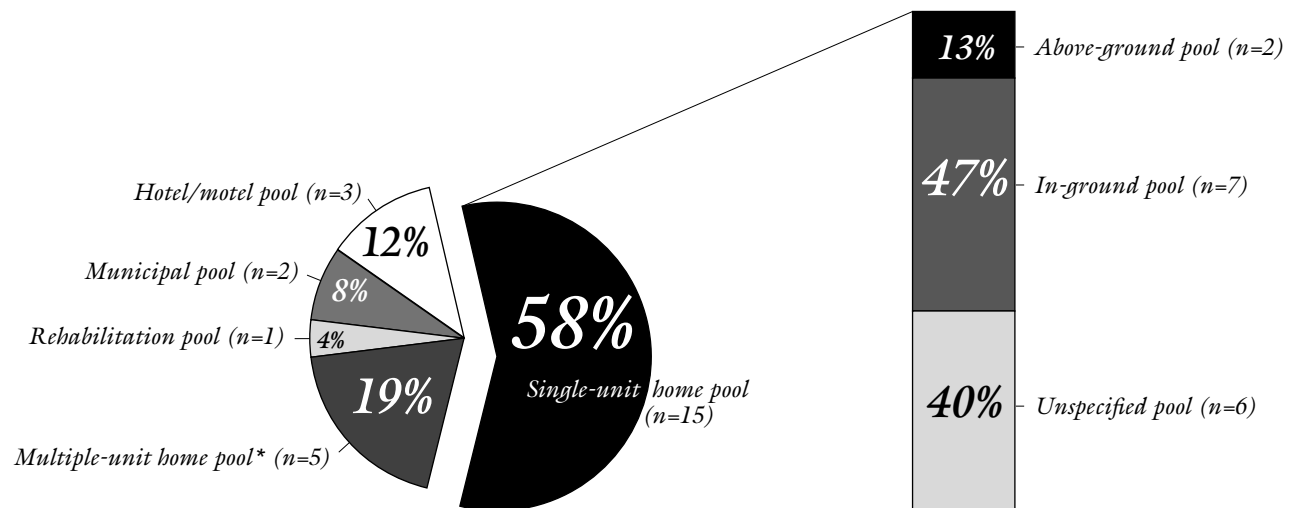
Adults are at risk while boating, snowmobiling, and while on the ice. Toddlers are at risk from falls into open bodies of water and in boats. Many aboriginal drownings still occur during subsistence activities, although recreational activities are becoming more frequent than subsistence in some communities. Alcohol tends to be involved in about 50% of aboriginal drownings of individuals 15 years and older; the concentration of alcohol in the blood in such incidents is often extremely high. While most incidents still occur in natural bodies of water such as rivers and lakes, other sites such as bathtubs and swimming pools are becoming more frequent in all adult groups.

Among many rural people, not only aboriginals, travel by boat and over ice and snow occurs throughout the year. When immersions do occur, hypothermia is a frequent complication. In rural regions, death rates from various injuries are often comparable between aboriginals and non-aboriginals. (Damestoy, 1994). Hazardous activities in hostile environments tend to be frequent in both ethnic groups.

Careful review of the circumstances of drownings among aboriginals reveals certain differences from the Canadian average. These differences should be considered in planning prevention strategies for aboriginal populations who live in remote northern environments. Nevertheless, the general principles of injury prevention are often similar, especially for populations who live in remote and/or northern locations. Since less than 5% of aboriginal drowning victims are found wearing a flotation device, it is evident that non-wearing of a flotation device is even more frequent among aboriginal boaters than in the general population; in most incidents no flotation devices are present even in the boat.

SWIMMING POOL DROWNINGS

Figure 6.1 SWIMMING POOL DROWNINGS BY TYPE OF POOL, CANADA 1999 (n=26)

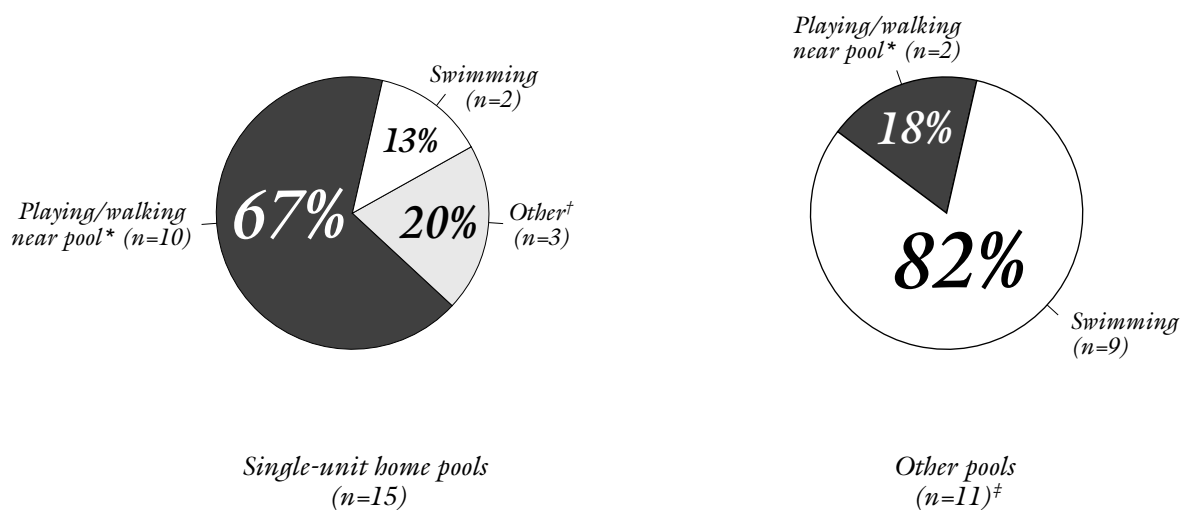


* Pool at an apartment building

Source: The Canadian Red Cross Society & the Canadian Surveillance System for Water-Related Fatalities, 2001

Figure 6.2

SWIMMING POOL DROWNINGS BY ACTIVITY & TYPE OF POOL, CANADA 1999 (n=26)



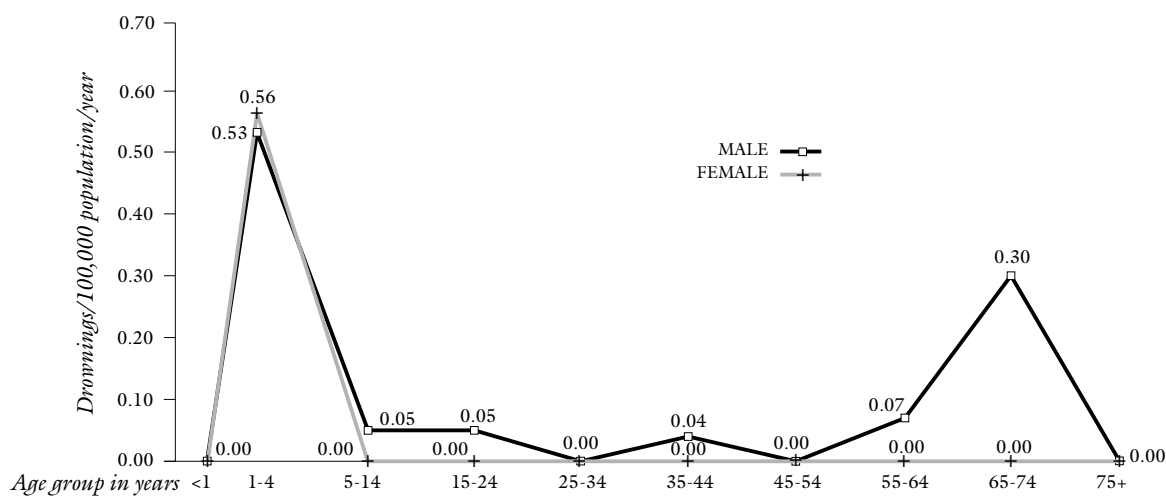
* Victims fell into pool † Including cleaning pool 2, cutting grass around pool 1

‡ Including multiple-unit home pool 5, hotel/motel pool 3, municipal pool 2, rehabilitation pool 1

Source: The Canadian Red Cross Society & the Canadian Surveillance System for Water-Related Fatalities, 2001

Figure 6.3

RATE AND NUMBER OF DROWNINGS IN SINGLE-UNIT HOME POOLS BY AGE & SEX, CANADA 1999 (n=15)

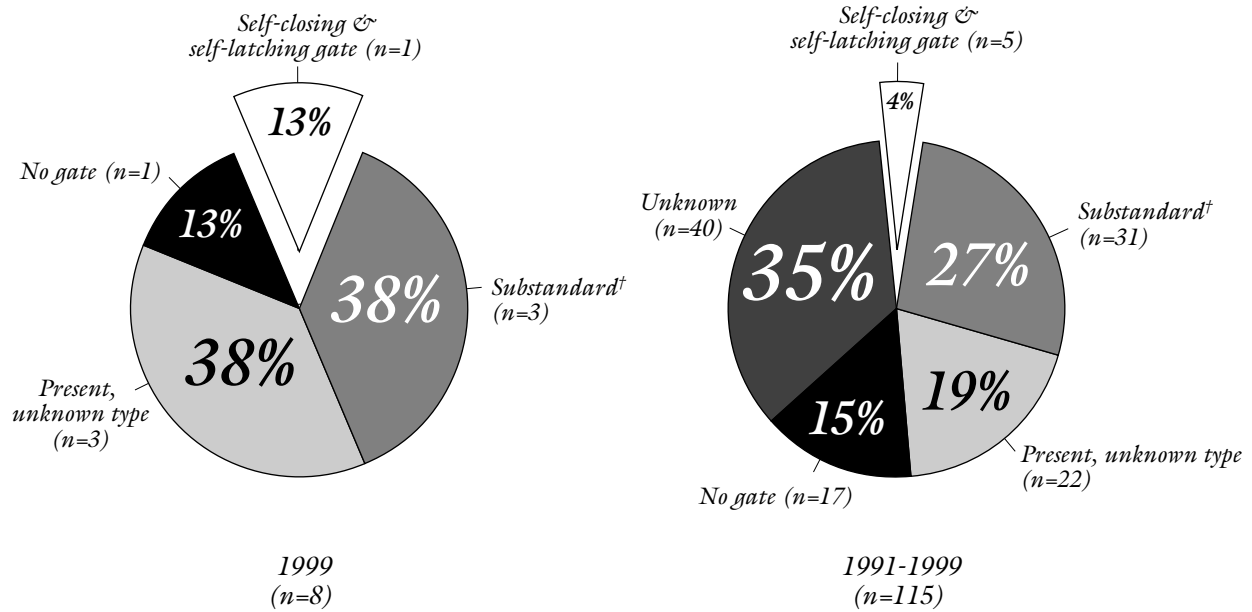


	<1	1-4	5-14	15-24	25-34	35-44	45-54	55-64	65-74	75+
Male	0	4	1	1	0	1	0	1	3	0
Female	0	4	0	0	0	0	0	0	0	0

Source: The Canadian Red Cross Society & the Canadian Surveillance System for Water-Related Fatalities, 2001

Figure 6.4

SINGLE-UNIT HOME SWIMMING POOL DROWNINGS OF TODDLERS* BY GATE, CANADA 1999 & 1991-1999

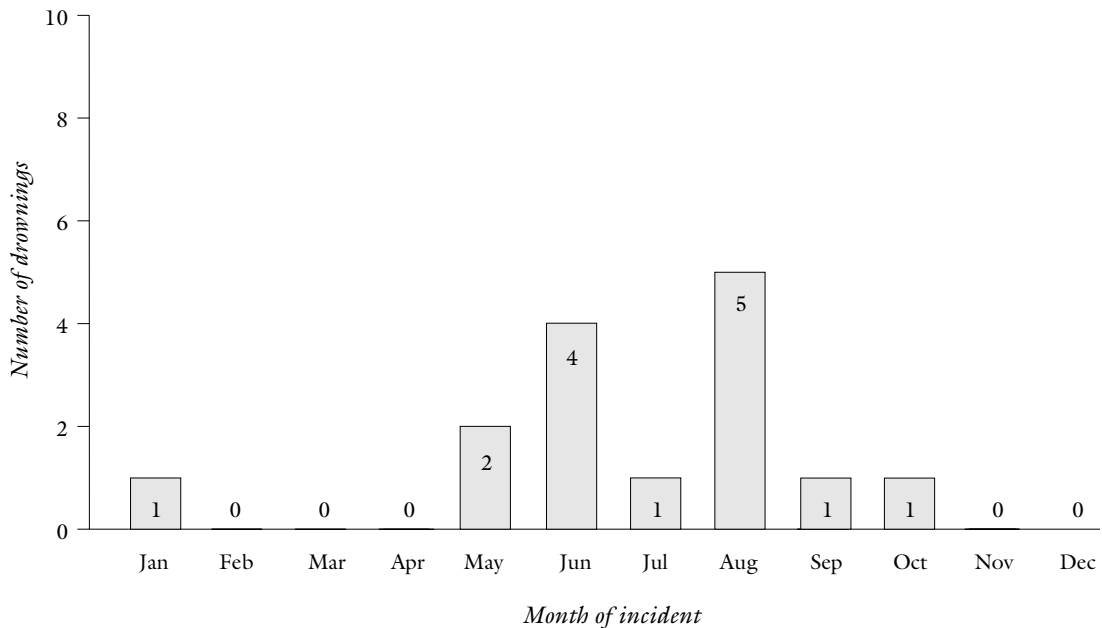


* Toddlers are 1-4 years old † Gates present, none were both self-closing & self-latching

Source: The Canadian Red Cross Society & the Canadian Surveillance System for Water-Related Fatalities, 2001

Figure 6.5

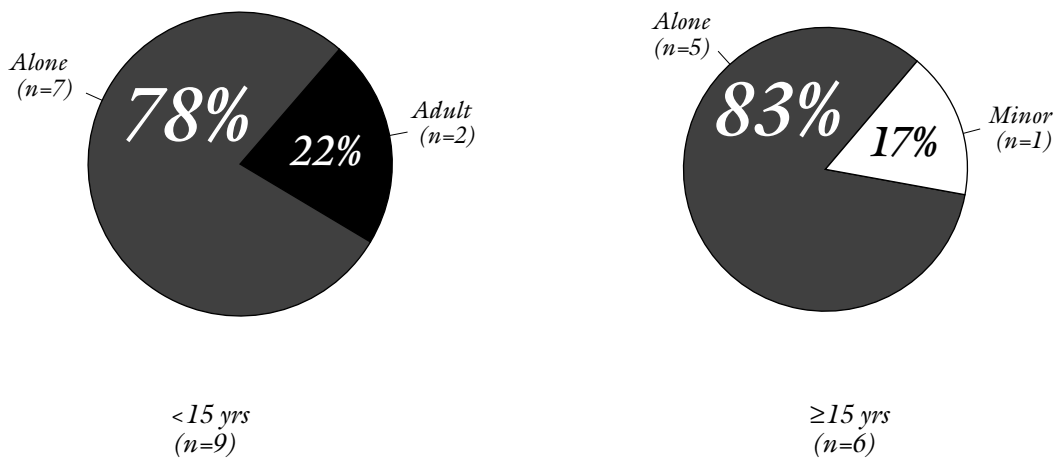
SINGLE-UNIT HOME SWIMMING POOL DROWNINGS BY MONTH OF INCIDENT, CANADA 1999 (n=15)



Source: The Canadian Red Cross Society & the Canadian Surveillance System for Water-Related Fatalities, 2001

Figure 6.6

SINGLE-UNIT HOME SWIMMING POOL DROWNINGS BY AGE OF VICTIMS & ACCOMPANYING PERSONS,* CANADA 1999 (n=15)

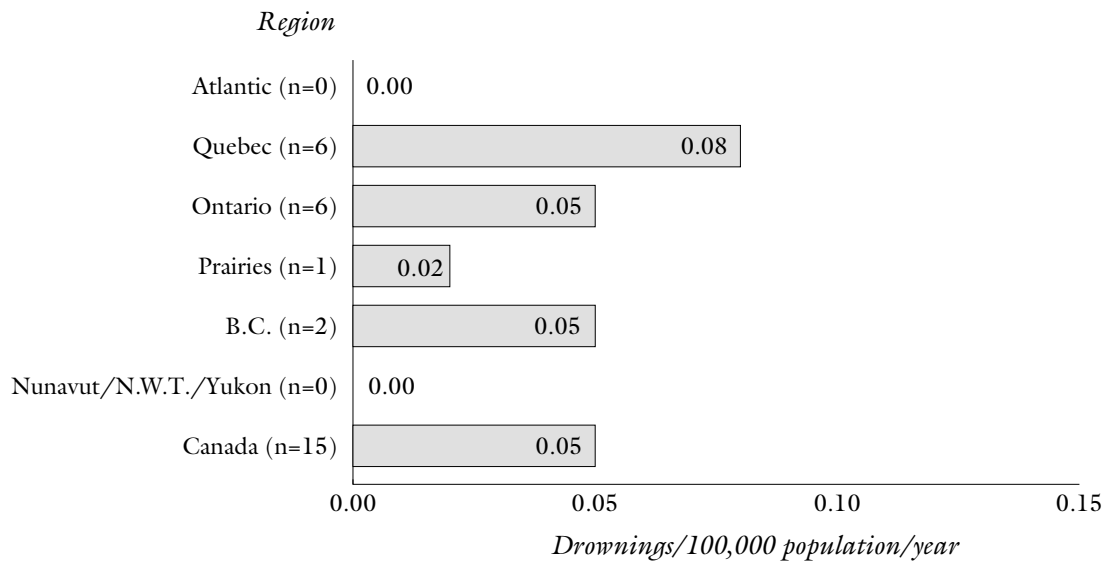


* "Adult" indicates that victim was accompanied by adult(s); does not exclude presence of minor(s) (<18 years);
 "Minor" indicates presence of minor(s) only

Source: The Canadian Red Cross Society & the Canadian Surveillance System for Water-Related Fatalities, 2001

Figure 6.7

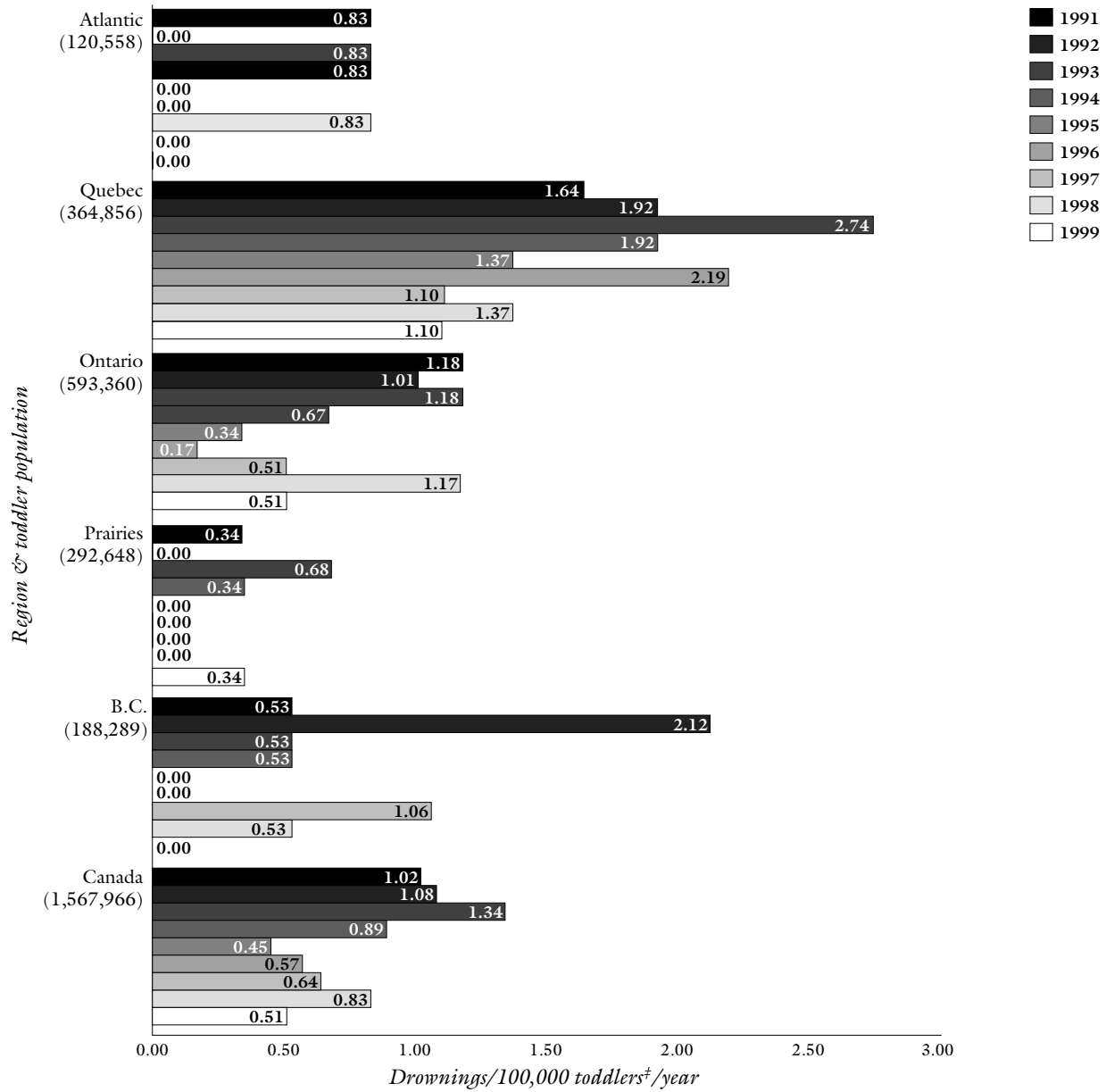
RATE OF SINGLE-UNIT HOME SWIMMING POOL DROWNINGS BY REGION, CANADA 1999 (n=15)



Source: The Canadian Red Cross Society & the Canadian Surveillance System for Water-Related Fatalities, 2001

INFANT, TODDLER, CHILD AND YOUTH DROWNINGS

Figure 6.8 **RATE AND NUMBER OF SINGLE-UNIT HOME SWIMMING POOL DROWNINGS OF TODDLERS* BY REGION† & YEAR, CANADA 1991-1999**



Number of drownings

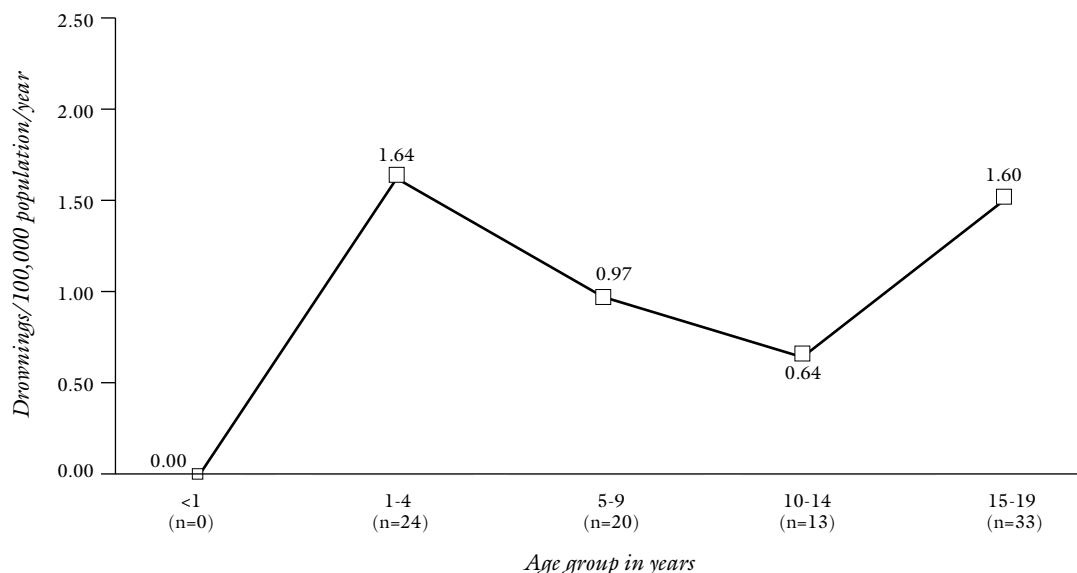
	Atlantic	%	Quebec	%	Ontario	%	Prairies	%	B.C.	%	Canada	%
1991	1	6	6	38	7	44	1	6	1	6	16	100
1992	0	0	7	41	6	35	0	0	4	24	17	100
1993	1	5	10	48	7	33	2	10	1	5	21	100
1994	1	7	7	50	4	29	1	7	1	7	14	100
1995	0	0	5	71	2	29	0	0	0	0	7	100
1996	0	0	8	89	1	11	0	0	0	0	9	100
1997	1	10	4	40	3	30	0	0	2	20	10	100
1998	0	0	5	38	7	54	0	0	1	8	13	100
1999	0	0	4	50	3	38	1	13	0	0	8	100
Total	4	3	56	49	40	35	5	4	10	9	115	100

* Toddlers are 1-4 years old † There were no home pool toddler drownings in Nunavut, N.W.T. or Yukon (toddler population 8,256) in 1991-1999 ‡ Denominators used for rates were averages of 1991 & 1996 census data; Canadian toddler population was 1,551,560 in 1991 and 1,584,371 in 1996

Source: The Canadian Red Cross Society & the Canadian Surveillance System for Water-Related Fatalities, 2001

Figure 6.9

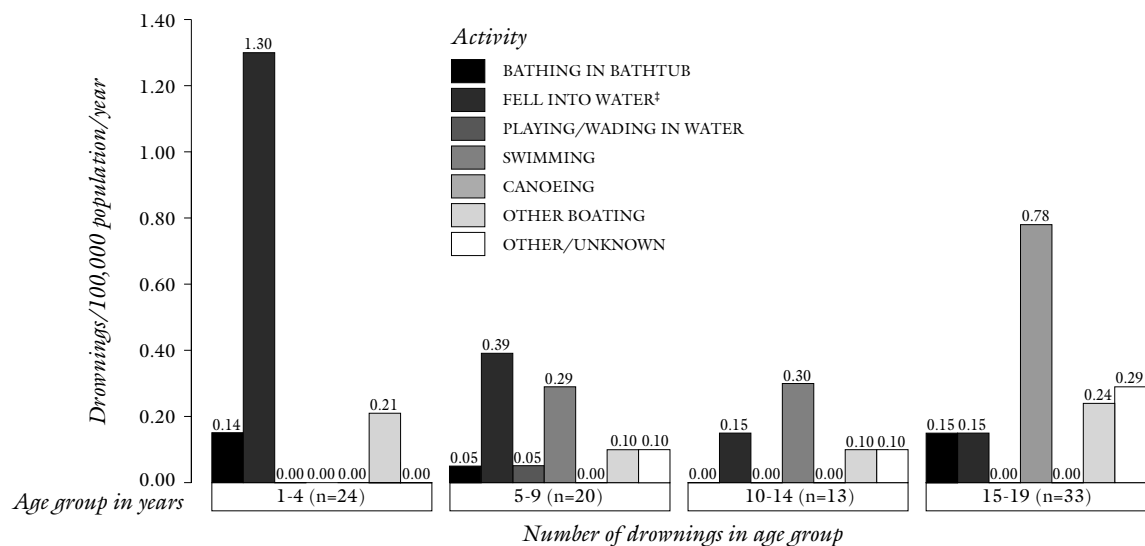
RATE OF CHILD AND YOUTH DROWNINGS* BY AGE, CANADA 1999 (n=90)



* 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, 2001

Figure 6.10

RATE AND NUMBER OF CHILD AND YOUTH DROWNINGS* BY AGE & ACTIVITY, CANADA 1999 (n=90)†

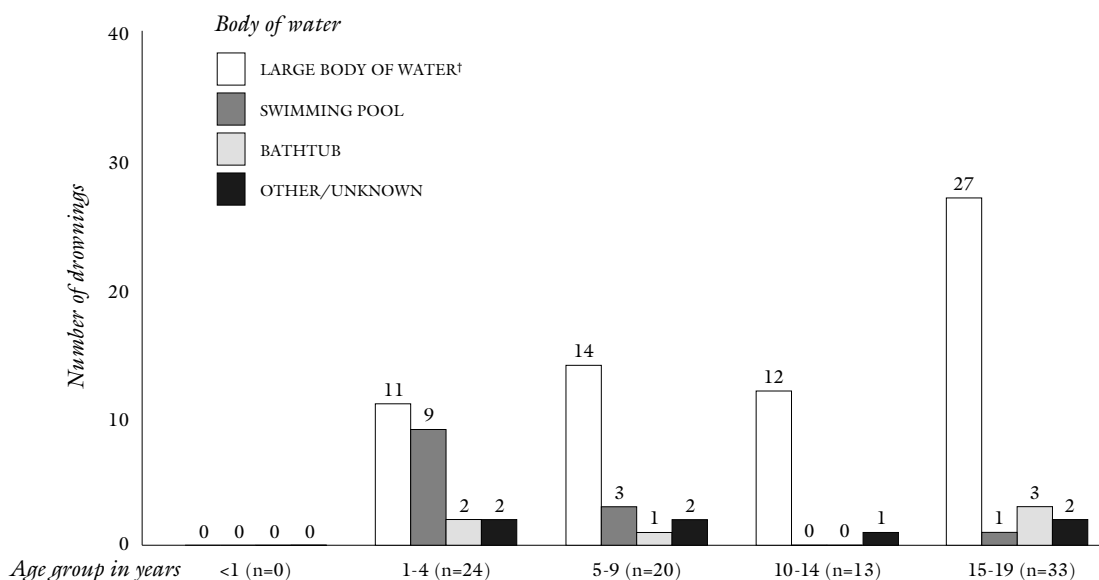


Activity	1-4 (n=24)	5-9 (n=20)	10-14 (n=13)	15-19 (n=33)
Bathing in bathtub	2	1	0	3
Fell into water	19	8	3	3
Playing/wading	0	1	0	0
Swimming	0	6	6	16
Canoeing	0	0	0	0
Other boating	3	2	2	5
Other/unknown	0	2	2	6

* Includes recreational, occupational & daily living drownings (E910, E830, E832); excludes land & air transport drownings
 † There were no infant (< 1 year old) drownings in 1999 ‡ Fell in while playing or walking near water
 Source: The Canadian Red Cross Society & the Canadian Surveillance System for Water-Related Fatalities, 2001

Figure 6.11

CHILD AND YOUTH DROWNINGS* BY AGE & TYPE OF BODY OF WATER, CANADA 1999 (n=90)

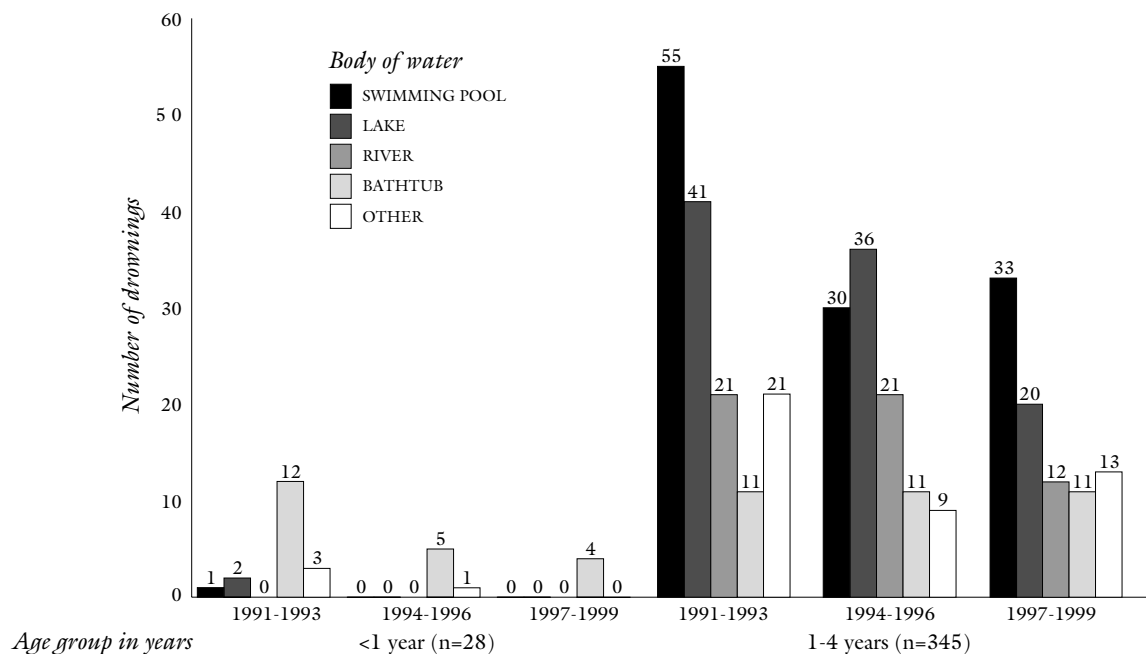


* Includes recreational, occupational & daily living drownings (E910, E830, E832); excludes land & air transport drownings
 † Includes ocean, river, lake, reservoir & pond

Source: The Canadian Red Cross Society & the Canadian Surveillance System for Water-Related Fatalities, 2001

Figure 6.12

INFANT AND TODDLER* DROWNINGS BY AGE GROUP AND BY TYPE OF BODY OF WATER, CANADA 1991-1999 (n=373)

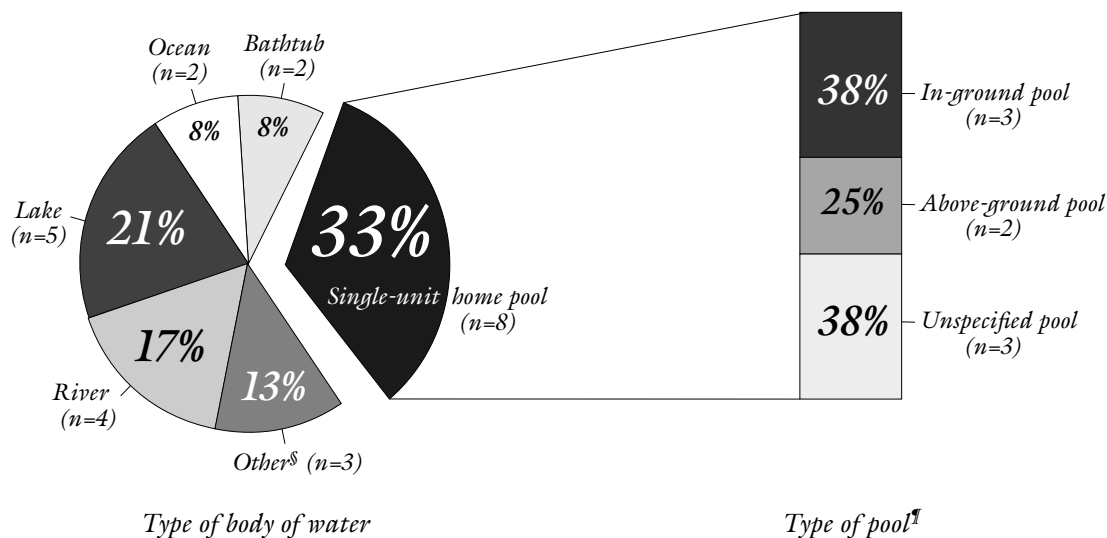


* Infant are <1 year old; toddlers are 1-4 years old

Source: The Canadian Red Cross Society & the Canadian Surveillance System for Water-Related Fatalities, 2001

Figure 6.13

**INFANT AND TODDLER DROWNINGS* BY TYPE OF BODY OF WATER,†
CANADA 1999 (n=24)‡**

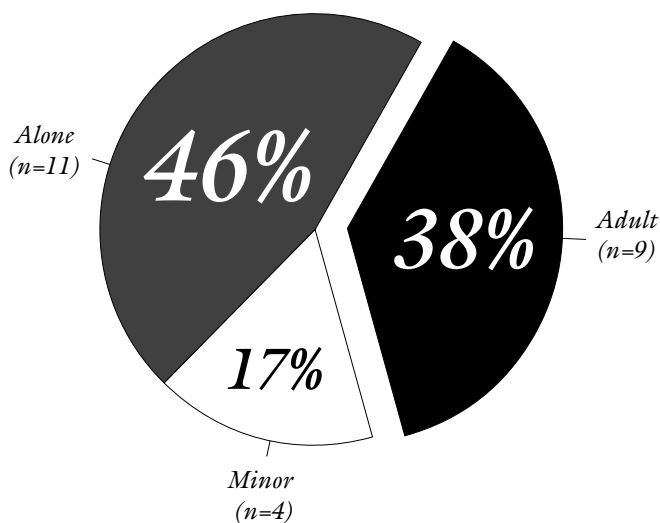


* Excludes land & air transport drownings † "Lake" includes pond & reservoir
 ‡ There were no infant (<1 year old) drownings in 1999; toddlers are 1-4 years old
 § Including 1 each of multiple-unit home pool, rut, cattle watering trough
 ¶ For information on gates, and pool drowning rates by region, see Figures 6.4 and 6.8

Source: The Canadian Red Cross Society & the Canadian Surveillance System for Water-Related Fatalities, 2001

Figure 6.14

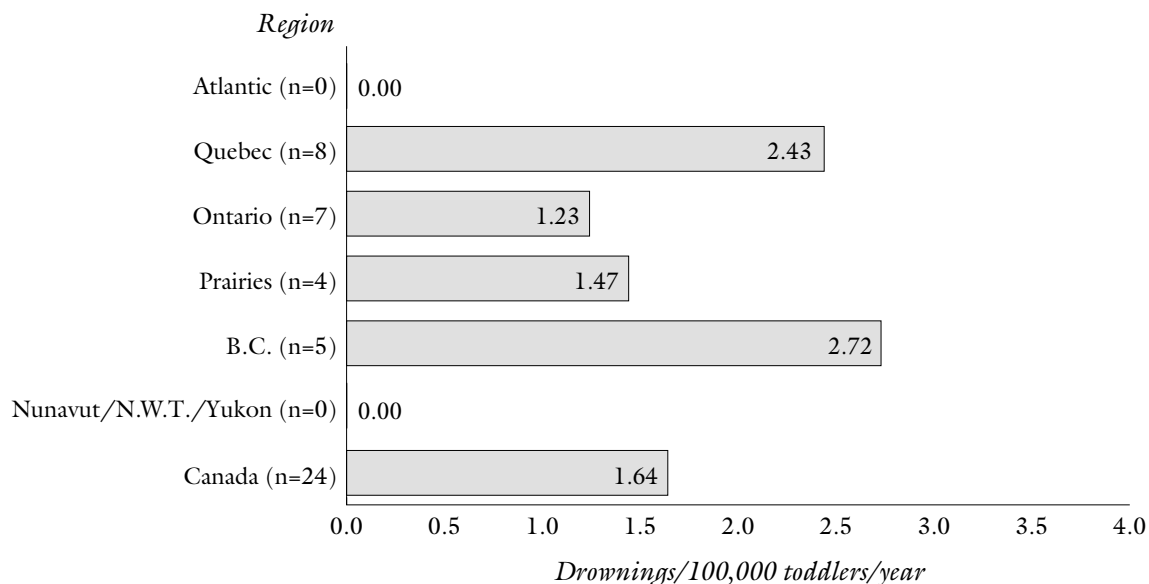
**INFANT AND TODDLER DROWNINGS* BY ACCOMPANYING PERSON(S),†
CANADA 1999 (n=24)‡**



* Excludes land & air transport drownings
 † "Adult" indicates that victim was accompanied by adult(s); does not exclude presence of minors (<18 years);
 "Minor" indicates presence of minor(s) only ‡ There were no infant (<1 year old) drownings in 1999; toddlers are 1-4 years old

Source: The Canadian Red Cross Society & the Canadian Surveillance System for Water-Related Fatalities, 2001

Figure 6.15 **RATE OF TODDLER* DROWNINGS† BY REGION, CANADA 1999 (n=24)**

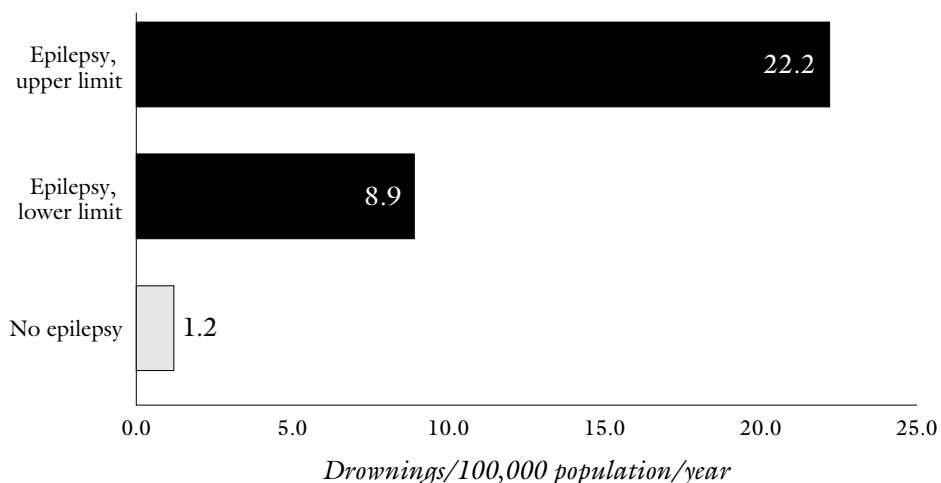


* Toddlers are 1-4 years old † Excludes land & air transport drownings

Source: The Canadian Red Cross Society & the Canadian Surveillance System for Water-Related Fatalities, 2001

DROWNINGS OF PERSONS WITH EPILEPSY

Figure 6.16 **ESTIMATED RATE* OF DROWNINGS† FOR PERSONS WITH & WITHOUT EPILEPSY, CANADA 1999 (n=405; 27 WITH EPILEPSY, 378 WITHOUT EPILEPSY)**

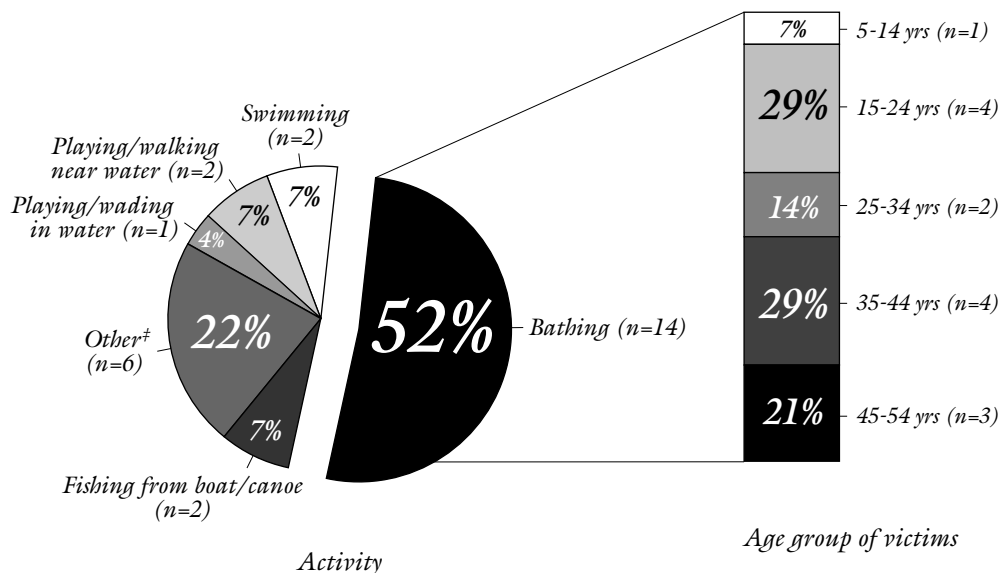


* Lower limit is based on a prevalence estimate for epilepsy of 400/100,000 population and upper limit on a prevalence of 1,000/100,000 population (prevalence estimates from Shorvon, Lancet 1990;336:93-96), thus population of Canadians with epilepsy is estimated to range between 122,000 and 305,000, and without epilepsy between 30.2 and 30.4 million † 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, 2001

Figure 6.17

DROWNINGS* OF PERSONS WITH EPILEPSY BY ACTIVITY, CANADA 1999 (n=27)†



* Includes recreational, occupational & daily living drownings (E910, E830, E832); excludes land & air transport drownings

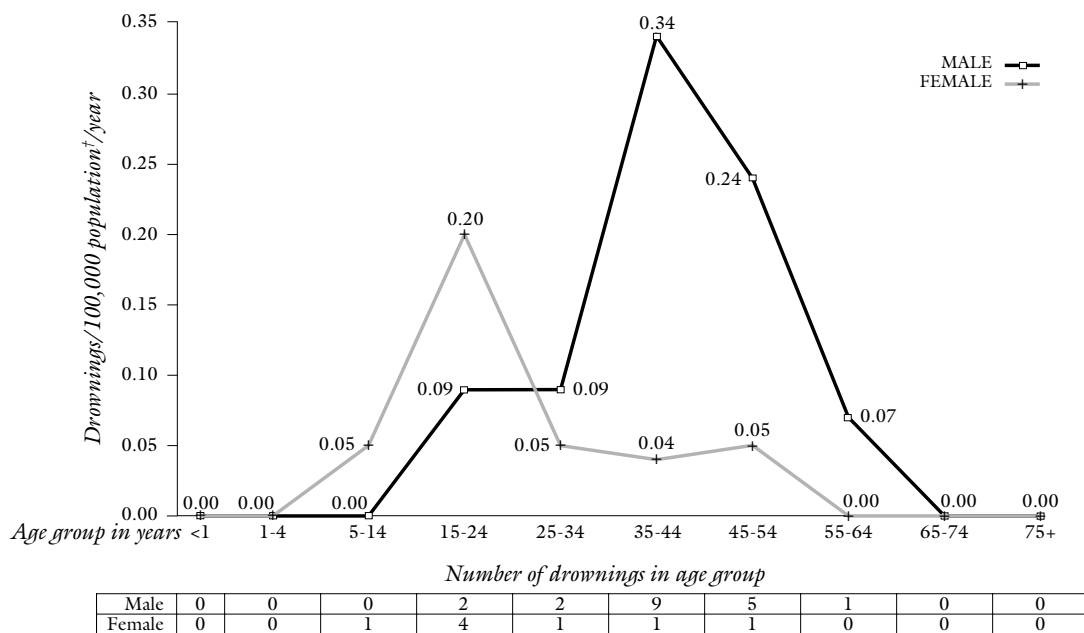
† At least 22 drownings occurred during seizures; seizure was not reported for the other 5

‡ Including 1 each of rowing, mowing lawn, hunting, cleaning a caribou, & unknown 2

Source: The Canadian Red Cross Society & the Canadian Surveillance System for Water-Related Fatalities, 2001

Figure 6.18

RATE AND NUMBER OF DROWNINGS* OF PERSONS WITH EPILEPSY BY AGE & SEX, CANADA 1999 (n=27)



* Includes recreational, occupational & daily living drownings (E910, E830, E832); excludes land & air transport drownings

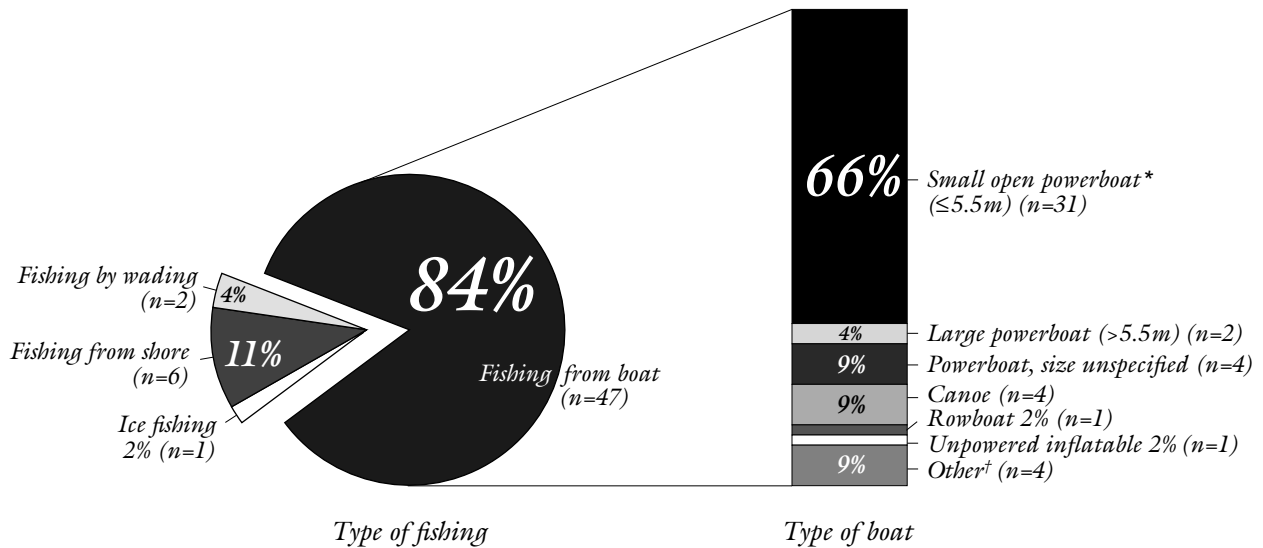
† Population includes all Canadians with and without epilepsy

Source: The Canadian Red Cross Society & the Canadian Surveillance System for Water-Related Fatalities, 2001

DROWNINGS OF RECREATIONAL FISHERS

Figure 6.19

RECREATIONAL FISHING DROWNINGS BY TYPE OF FISHING & TYPE OF BOAT, CANADA 1999 (n=56)



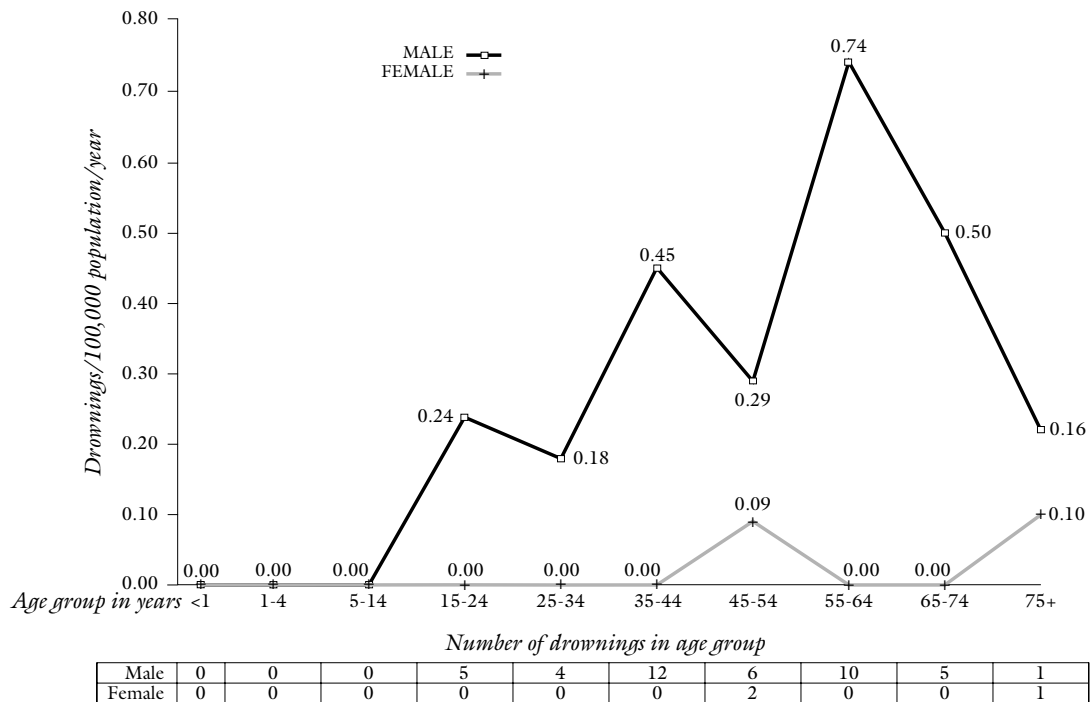
* Includes open outboard motor boats & other open powered boats such as inflatables; excludes personal watercraft

† Including unspecified aluminium boat 1, & unknown 3

Source: The Canadian Red Cross Society & the Canadian Surveillance System for Water-Related Fatalities, 2001

Figure 6.20

RATE AND NUMBER OF DROWNINGS FOR RECREATIONAL FISHING IN BOATS BY AGE & SEX, CANADA 1999 (n=47)*

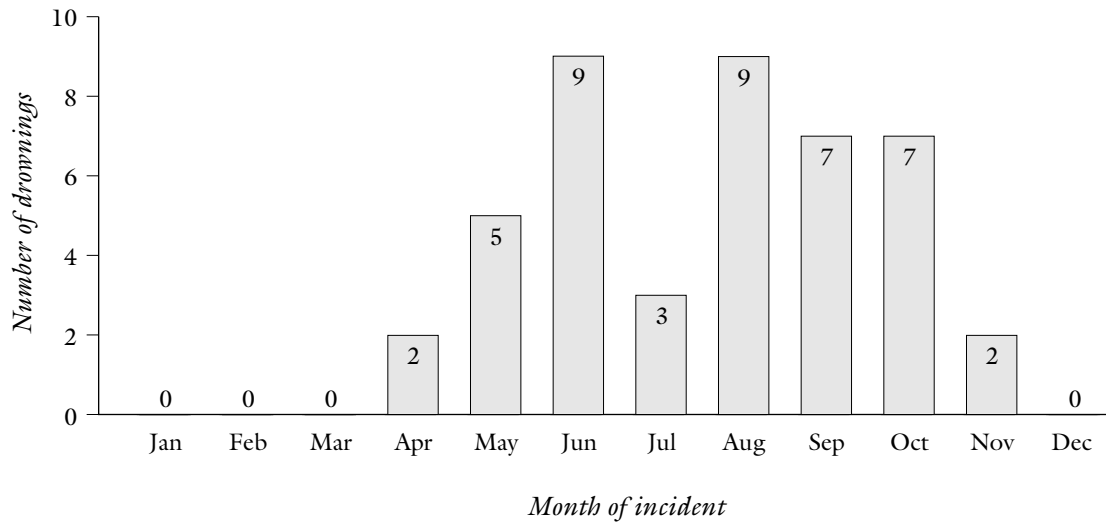


* Age unknown for 1 male victim, presumed adult

Source: The Canadian Red Cross Society & the Canadian Surveillance System for Water-Related Fatalities, 2001

Figure 6.21

RECREATIONAL FISHING DROWNINGS INVOLVING BOATING BY MONTH OF INCIDENT, CANADA 1999 (n=47)*

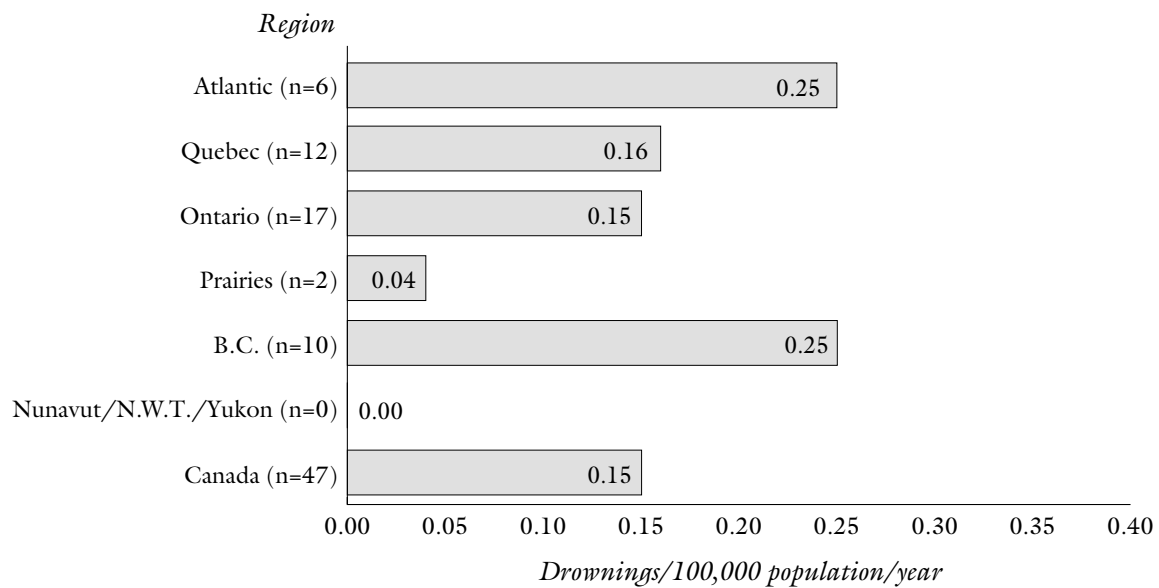


* Month unspecified for 3 drownings

Source: The Canadian Red Cross Society & the Canadian Surveillance System for Water-Related Fatalities, 2001

Figure 6.22

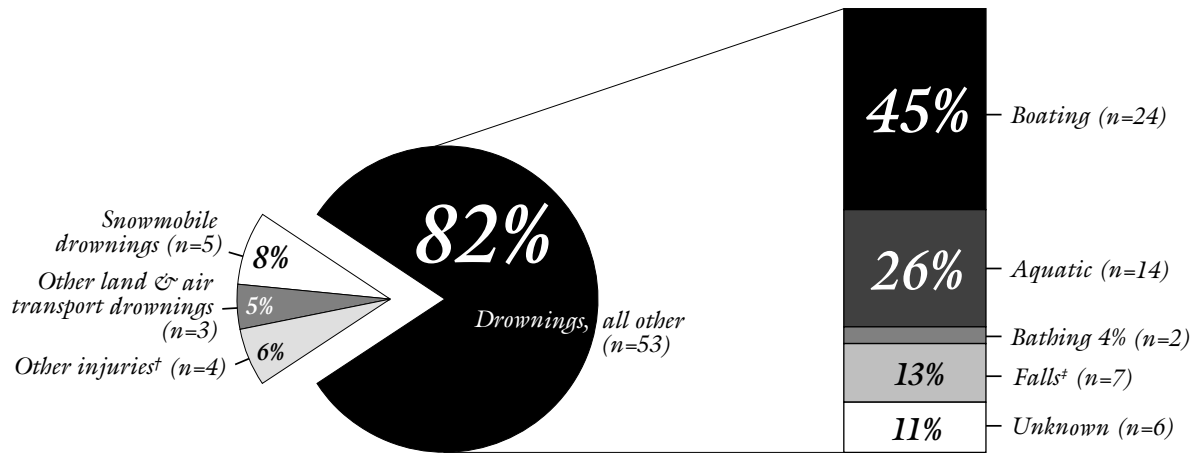
RATE OF DROWNINGS FOR RECREATIONAL FISHING IN BOATS BY REGION, CANADA 1999 (n=47)



Source: The Canadian Red Cross Society & the Canadian Surveillance System for Water-Related Fatalities, 2001

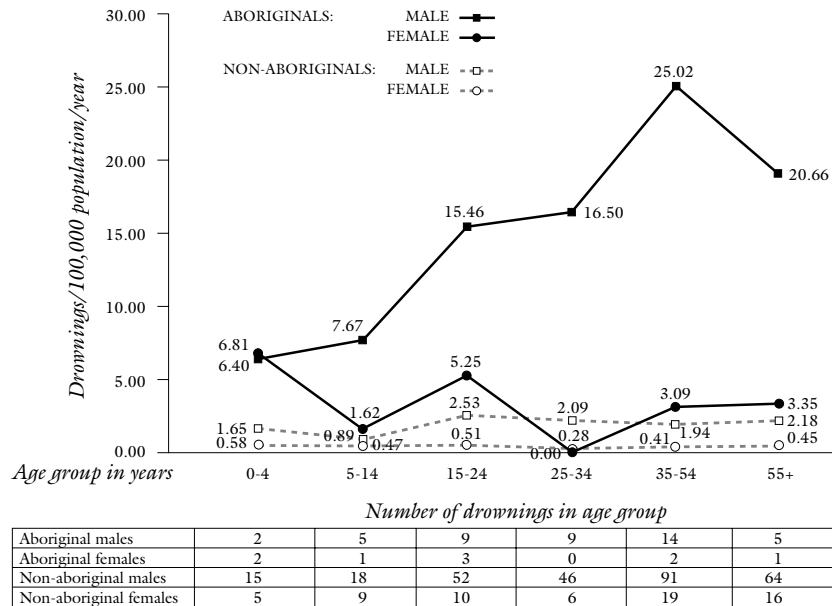
DROWNINGS OF ABORIGINALS

Figure 6.23 **WATER-RELATED DEATHS OF ABORIGINALS* BY TYPE OF INJURY & ACTIVITY, CANADA 1999 (n=65)**



* Includes definite & probable aboriginals (First Nations, Inuit & Metis)
 † Includes all 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, 2001

Figure 6.24 **RATE* OF DROWNINGS† FOR ABORIGINALS‡ AND NON-ABORIGINALS§ BY AGE & SEX, CANADA 1999 (n=405; 53 ABORIGINALS, 352 NON-ABORIGINALS)¶**

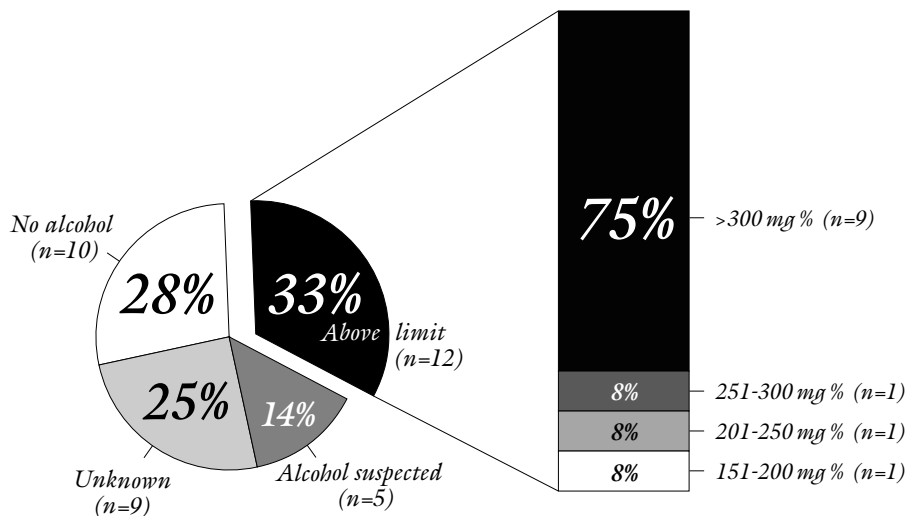


* Rates for aboriginals were calculated based on registered First Nations & Inuit populations and rates for non-aboriginals, on all others
 † Includes recreational, occupational & daily living drownings (E910, E830, E832); excludes land & air transport drownings
 ‡ Includes definite & probable aboriginals (First Nations, Inuit & Metis) § Non-aboriginals include those of unspecified ethnicity
 ¶ Age unknown for 1 non-aboriginal male; sex unknown for 2 non-aboriginal victims, imputed male

Source: The Canadian Red Cross Society & the Canadian Surveillance System for Water-Related Fatalities, 2001

Figure 6.25

BLOOD ALCOHOL LEVELS* FOR DROWNINGS† OF ABORIGINALS,‡ CANADA 1999 (VICTIMS ≥15 YEARS OF AGE; n=43)§



* Legal limit is 80 mg % † Excludes snowmobile & other land and air transport drownings

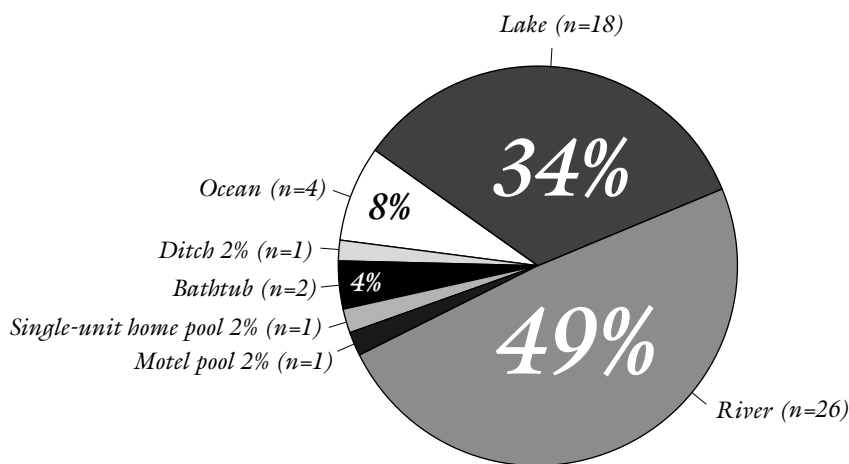
‡ Includes definite & probable aboriginals (First Nations, Inuit & Metis)

§ This figure excludes 7 victims; decomposition rendered blood alcohol unreliable

Source: The Canadian Red Cross Society & the Canadian Surveillance System for Water-Related Fatalities, 2001

Figure 6.26

DROWNINGS* OF ABORIGINALS† BY TYPE OF BODY OF WATER,‡ CANADA 1999 (n=53)



* Excludes snowmobile & other land and air transport drownings

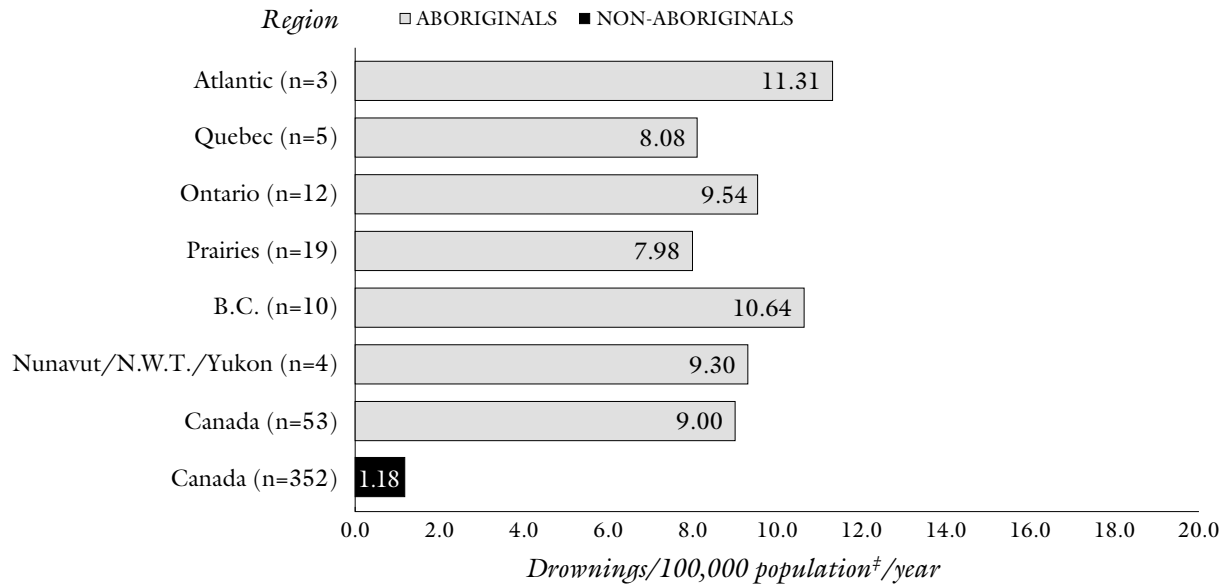
† Includes definite & probable aboriginals (First Nations, Inuit & Metis)

‡ "Lake" includes pond & reservoir

Source: The Canadian Red Cross Society & the Canadian Surveillance System for Water-Related Fatalities, 2001

Figure 6.27

RATE OF DROWNINGS* FOR ABORIGINALS† BY REGION, CANADA 1999 (n=53)



* Excludes snowmobile & other land & air transport drownings

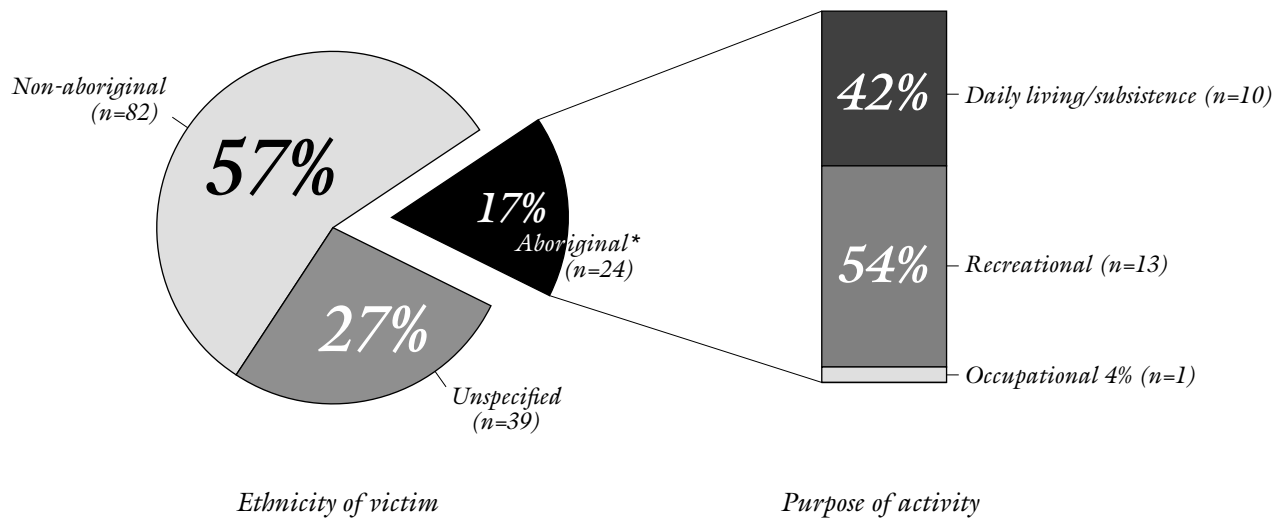
† Includes definite & probable aboriginals (First Nations, Inuit & Metis)

‡ Rates for aboriginals were calculated based on registered First Nations & Inuit populations and rates for non-aboriginals, on all others

Source: The Canadian Red Cross Society & the Canadian Surveillance System for Water-Related Fatalities, 2001

Figure 6.28

BOATING DROWNINGS BY ETHNICITY AND PURPOSE, CANADA 1999 (n=145)

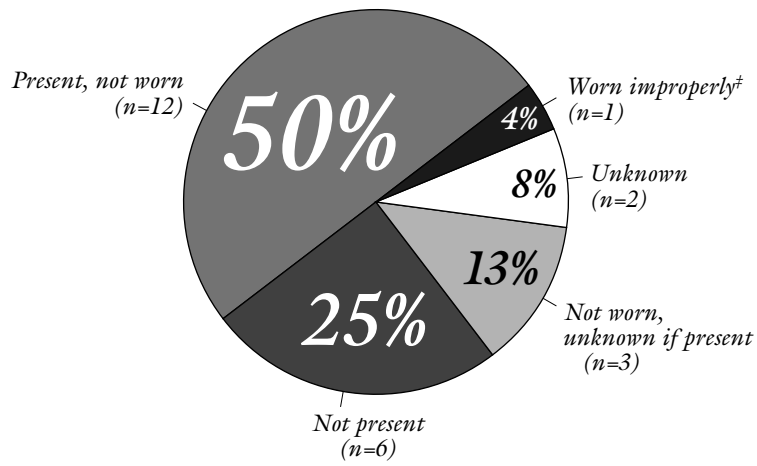


* Includes definite & probable aboriginals (First Nations, Inuit & Metis)

Source: The Canadian Red Cross Society & the Canadian Surveillance System for Water-Related Fatalities, 2001

Figure 6.29

**BOATING DROWNINGS OF ABORIGINALS* BY USE OF FLOTATION DEVICE,†
CANADA 1999 (n=24)**



* Includes definite & probable aboriginals (First Nations, Inuit & Metis)

† Personal flotation device or lifejacket ‡ Not fastened or inappropriate size

Source: The Canadian Red Cross Society & the Canadian Surveillance System for Water-Related Fatalities, 2001