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Costs of Recreational Boating Injuries in the U.S., 2002

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Incidence Estimates

State by state, 2002 case counts from USCG's Boating Accident Report Database (BARD) were compared to 2002 counts of boating-related injuries from mortality and medical data sets: MCOD, HCUP-SID, and HCUP-SEDD.

The BARD counts were confirmed, supplemented, or replaced by those from the other data sets.

***The Incidence of Recreational Boating Injuries in the U.S., 2002*, presented in yesterday's poster session, shows the incidence estimation procedures in detail.**

Handout available upon request.

Three kinds of costs result from injuries:

- **Medical cost including rehab & nursing home**
- **Lost productivity (work loss)**
- **Lost quality of life (pain and suffering)**

Omits other resource costs including Coast Guard, police, & social services.

National costs were estimated separately for three severity levels & attached to corresponding data sets

- **Fatal – 1999-2002 MCOD**
- **Hospital-admitted – 2000 HCUP-NIS**
- **Non-admitted – 1996-1999 NAMCS/NHAMCS**

Costing methods were those of the CDC-sponsored *Burden of Injury* project, which are similar to methods used by NHTSA.

Recreational boating injuries were selected by external-cause-of-injury code

- For MCOD, ICD-10 codes for water transport accidents (V90-V94) with a fourth character of 3-9 (excludes commercial vessels).
- For HCUP and AMCS, ICD-9-CM codes for submersion while water-skiing (E910.0) and water-transport accidents (E830-E838) with a fifth character of 0, 1, 4, 5, 9 (excludes commercial activities).

Average costs were computed by BARD diagnosis group and age group, then merged onto the BARD data adjusted for under-reporting.

Fatal Injury Costs by BARD Injury Type (*2000 dollars*)

Injury Type	Medical	Work Loss	Quality of Life	Total
Drowning	$2,200	$1,156,000	$2,041,000	$3,199,000
Trauma	$6,900	$1,158,000	$2,102,000	$3,267,000
Other	$7,400	$1,210,000	$2,223,000	$3,440,000

Hospital-Admitted Injury Costs by BARD Injury Type (Selected Types, *2000 dollars*)

Injury Type	Medical	Work Loss	Quality of Life	Total
Head injury	$29,400	$51,000	$437,000	$517,000
Broken bones	$19,600	$60,000	$197,000	$277,000
Internal injury	$21,000	$14,000	$146,000	$181,000
Laceration	$8,300	$36,500	$94,000	$139,000
Burns	$15,500	$32,000	$67,000	$114,000
Back injury	$8,700	$34,000	$50,000	$93,000
Hypothermia	$22,300	$23,000	$42,000	$87,000
Contusion	$9,200	$10,000	$24,000	$43,000

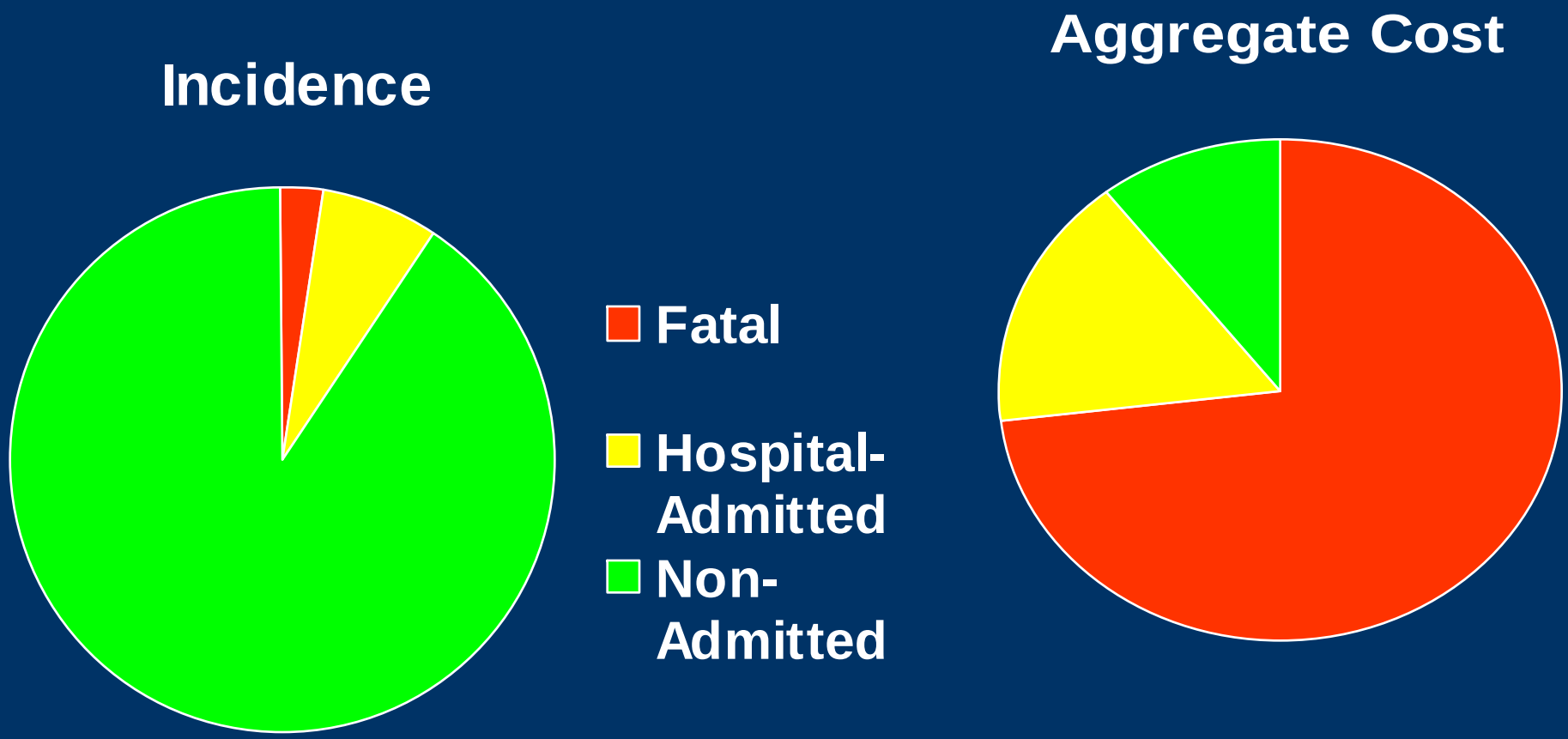
Non-Admitted Injury Costs by BARD Injury Type (Selected Types, *2000 dollars*)

Injury Type	Medical	Work Loss	Quality of Life	Total
Broken bones	$1,260	$6,800	$26,200	$34,000
Head injury	$810	$3,300	$12,900	$17,000
Sprain/strain	$910	$2,200	$1,850	$5,000
Back injury	$800	$3,500	$500	$4,800
Laceration	$740	$1,300	$900	$3,000
Hypothermia	$280	$1,750	$270	$2,300
Contusion	$830	$700	$150	$1,700

Inter-Modal Comparisons

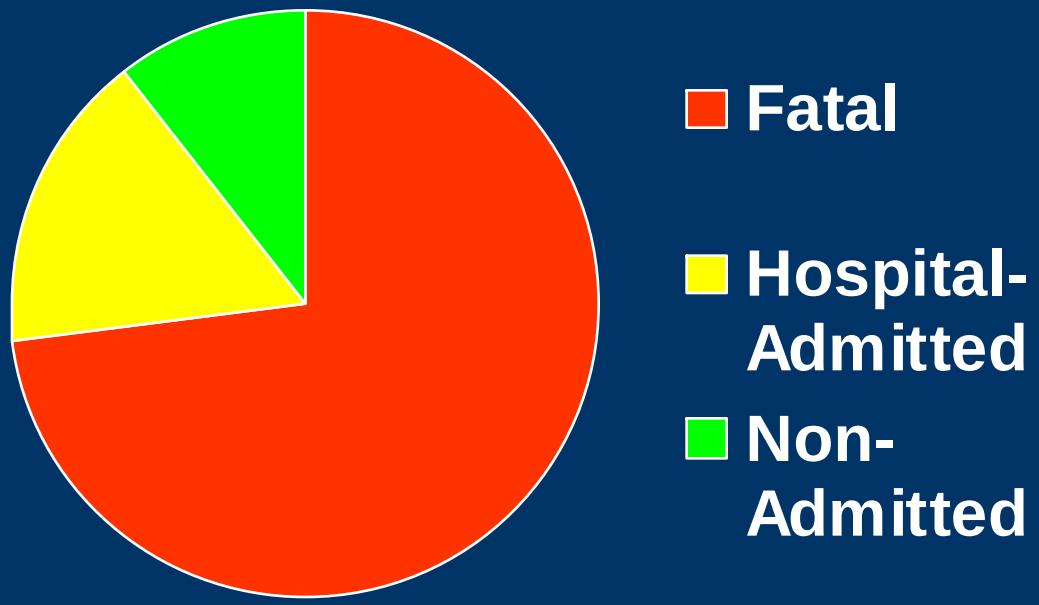
Transport Mode	Deaths / 1000 inj.	Admissions / 1000 inj.	$ per Case
Rec. Boating	24	69	$106,000
Pedestrian	30	147	$145,000
Motorcyclist	11	90	$77,000
M.V. Occupant	10	54	$59,000
Other Transport	3	36	$42,000
Pedal Cyclist	1	39	$40,000
All Injuries	4	37	$30,000

Shares of Incidence vs. Cost



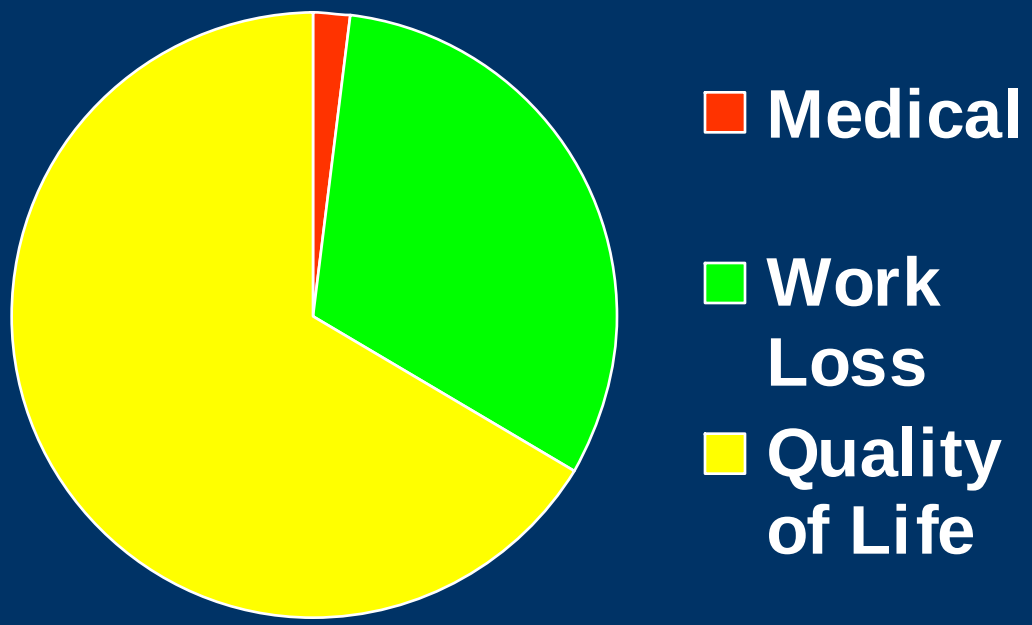
Aggregate Costs of Recreational Boating Injuries (*2002 dollars*)

- **Fatal $2,640 M**
- **Hospital Admit $590 M**
- **Non-Admitted $380 M**
- **Total Cost $3,600 M**



Aggregate Costs of Recreational Boating Injuries (*2002 dollars*)

- **Medical Cost $73 M**
- **Work Loss $1,140 M**
- **Quality of Life $2,400 M**
- **Total $3,600 M**



Average total cost per registered boat was $250

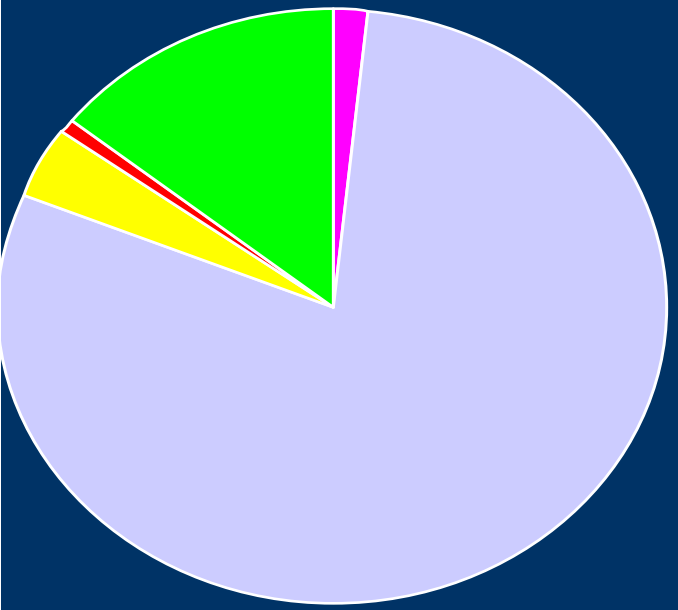
This ranged from $70 in Hawaii to $1,390 in Alaska

Aggregate Cost by BARD Injury Type (*millions of 2000 $*)

	Total
Drowning/ submersion	$1,670
Trauma	$1,470
Hypothermia	$80
Carbon monoxide	$20
Other/unknown	$140
Total	$3,400

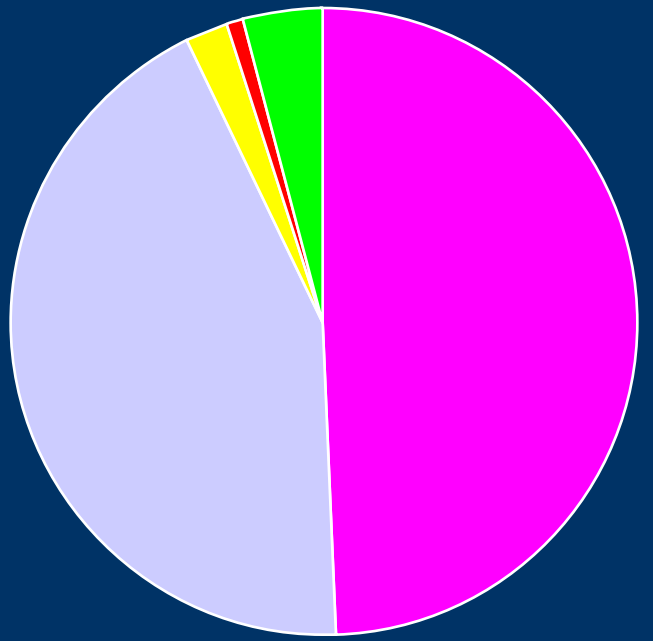
Shares of Incidence vs. Cost

Incidence



- Drowning/ submersion
- Trauma
- Hypo-thermia
- Carbon monoxide
- Other/ unknown

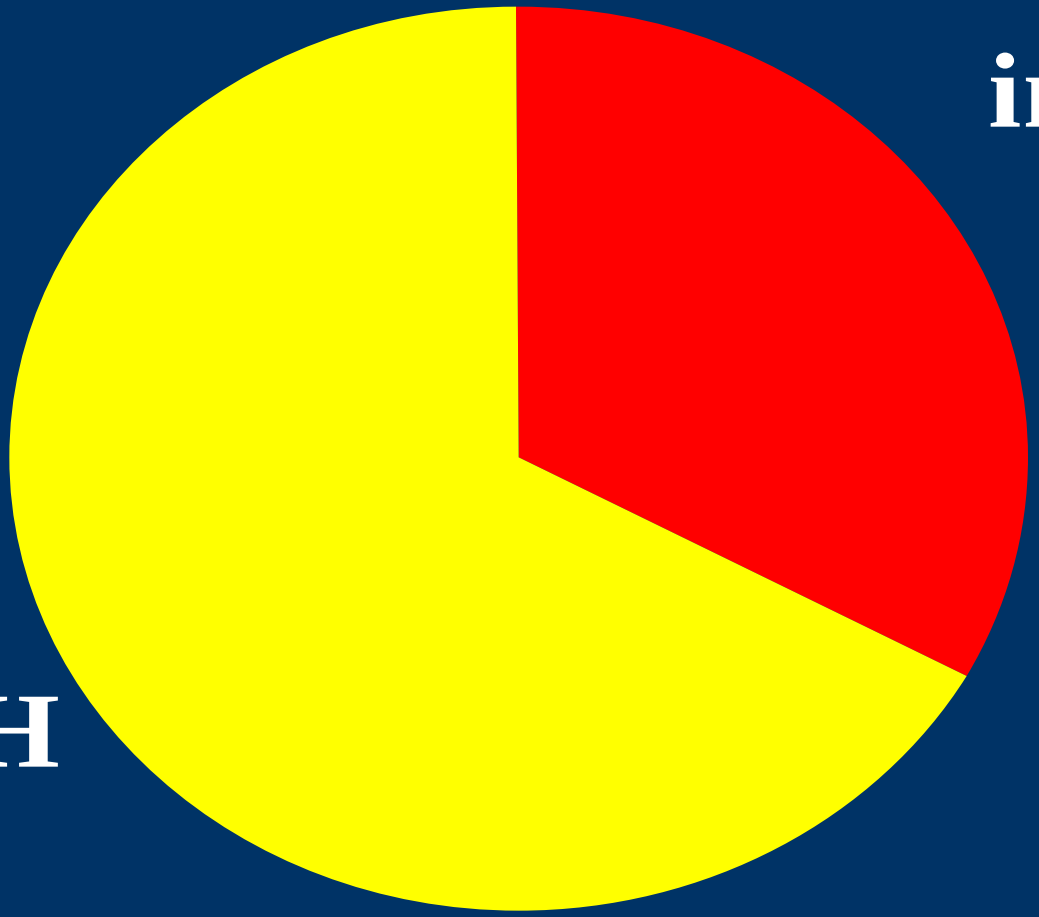
Aggregate Cost



Cost of Recreational Boating Injuries Compared with Broader Categories

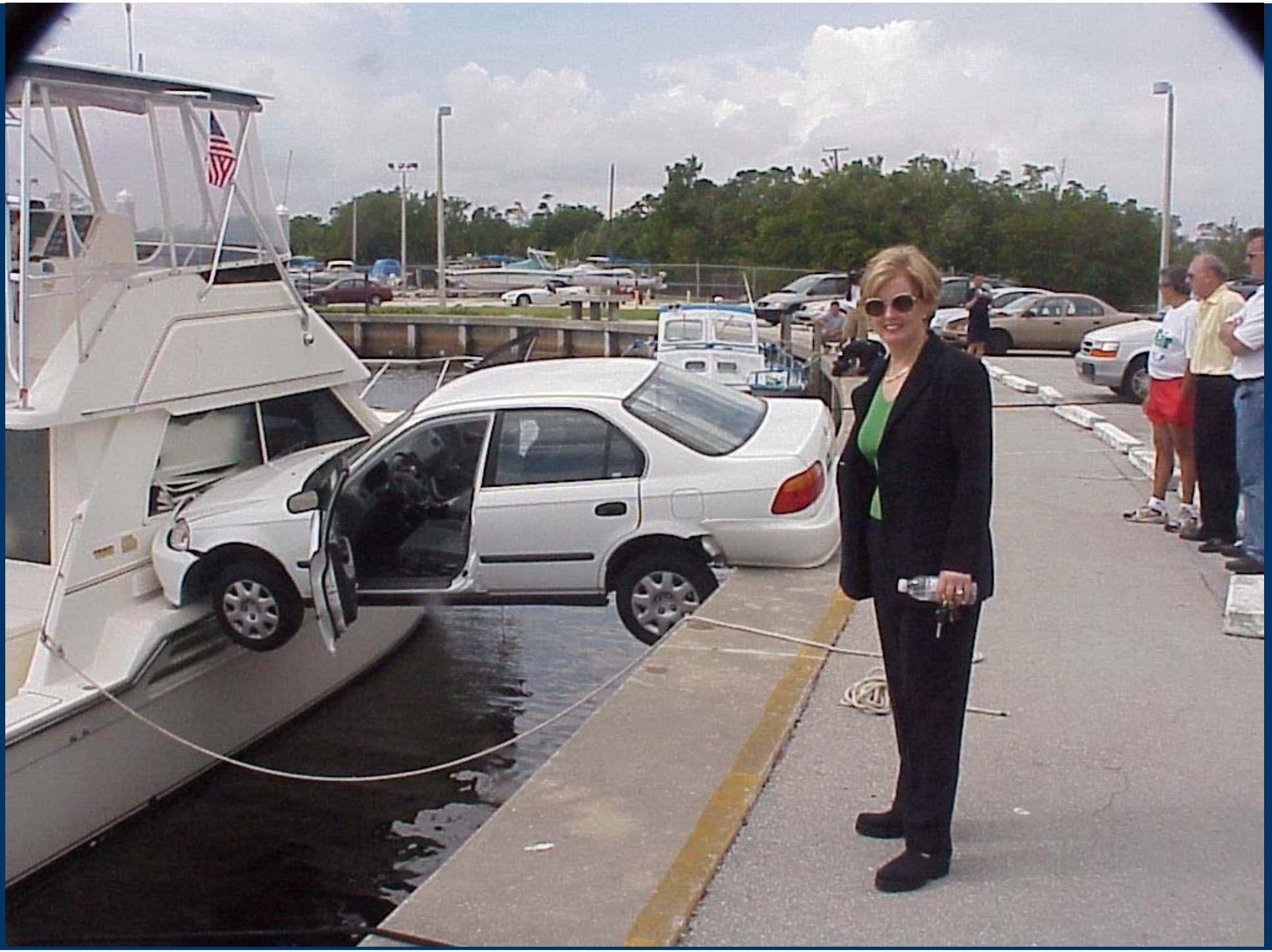
	Incidence	Aggregate cost (*million 2000 $*)
Recreational boating injuries	31,600	$3,350
Highway crash injuries	5,309,000	$320,000
Other transport injuries (air, train, bike, ATV)	760,000	$16,000
All injuries	50,127,000	$1,480,000

% Costs



Total Cost by Reported Alcohol Involvement

	% Alcohol-Involved
Non-Admitted	8.6%
Hospital-Admitted	13.6%
Fatal	40.8%
Total	32.9%



Conclusion

- Recreational boating injury cost $3.4 B in 2002
- $250/boat, but boats are used relatively few hours/year
- Boating injury costs are dominated by fatal & hospital-admitted cases
- Drowning & submersion, although rare, account for half the cost
- Impaired boating is a major factor

Alcohol Involvement: Incidence

	Total Injuries	Alcohol-Involved Injuries	Percent Alcohol-Involved
Non-Admitted	28,682	3,129	10.9%
Hospital-Admitted	2,181	271	12.4%
Fatal	763	297	38.9%
Total	31,626	3,697	11.7%

Incidence by BARD Injury Type

	Fatal	Hospital-Admitted	Non-Admitted	Total
Drowning/ submersion	533	6	0	539
Trauma	167	1,822	23,144	25,133
Hypothermia	19	122	1,068	1,209
Carbon monoxide	8	7	261	276
Other/unknown	36	223	4,209	4,468
Total	763	2,181	28,682	31,626