

National
**SAFE
KIDS**
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Campaign®

Clear Danger

A National Study of
Childhood Drowning and
Related Attitudes and Behaviors

April 2004



INTRODUCTION

While water recreation provides hours of enjoyment and exercise for children, water and children can be a deadly mix when an unsafe environment, inadequate supervision or improperly used safety gear is also present. Drowning remains the second leading cause of injury-related death among children ages 1 to 14, despite a 40 percent decline in the childhood drowning death rate from 1987 to 2001. In 2001, 859 children ages 14 and under died as a result of unintentional drowning and, in 2002, an estimated 2,700 children in this age group were treated in hospital emergency rooms for near-drowning.^{1,2}

Drowning can occur in a variety of circumstances – during water recreational activities (such as swimming and boating) or when a young child is left unsupervised for a short time in the bathtub or around the home with access to nearby pools and spas. Drowning, which can happen in as little as one inch of water, is usually quick and silent. A child will lose consciousness two minutes after submersion, with irreversible brain damage occurring within four to six minutes.^{3,4} The majority of children who survive without neurological consequences are discovered within two minutes of submersion, and most children who die are found after 10 minutes.⁵

For children who do survive, the consequences of near-drowning can be devastating. As many as 20 percent of near-drowning survivors suffer severe, permanent neurological disability,⁶ the effects of which often result in long-lasting psychological and emotional trauma for the child, his or her family and their community.⁷

Near-drownings also take a tremendous financial toll on affected families and society as a whole. Typical medical costs for a near-drowning victim can range from \$75,000 for initial treatment to \$180,000 a year for long-term care. The total cost of a single near-drowning that results in brain injury can be more than \$4.5 million.^{8,9,10} The total annual lifetime cost of drownings among children ages 14 and under is approximately \$6.8 billion, with children ages 4 and under accounting for \$3.4 billion, or half, of these costs.¹¹

Research shows there is no one device or solution that can prevent all childhood drownings. Instead, a multifaceted strategy, including *active supervision* by a designated adult, *safe water environments*, *proper gear* and *education*, is required to ensure children's safety in and around water.

SAFE KIDS' objectives in conducting this study were to examine the circumstances of drowning in children ages 14 and under and determine the knowledge, attitudes and behaviors of parents regarding water safety. As children approach adolescence, they are given more freedom and begin to take greater responsibility for their own safety. For this reason, SAFE KIDS also surveyed "tweens" (children ages 8 through 12) to assess their knowledge, attitudes and behaviors about these four important components of water safety: *active supervision* by a designated adult, *safe water environments*, *proper gear* and *education*.

Eighty-eight percent of children were under some form of supervision when they drowned.



METHODOLOGY

Child Death Review Data

Data for this analysis were obtained from Child Death Review teams in 17 states across the United States. In partnership with the National Maternal and Child Health Center for Child Death Review (funded by the Maternal and Child Health Bureau of the Health Resources and Services Administration), SAFE KIDS developed a survey instrument assessing up to 26 data elements of childhood drownings. The results presented in this study are based on reviews of 496 unintentional drowning-related deaths of children ages 14 and under from January 2000 to December 2001.

The surveys were completed locally, using records based on the comprehensive review of childhood and adolescent death by a panel of experts in the community where the death occurred. Experts represented public health, medicine, law enforcement, social services, state and local government and community groups. Most panels conducted retrospective reviews, after death certificates were filed and any law enforcement investigation or criminal prosecution was complete. Most reviews were completed within a year of the child's death, with the majority of reviews taking place within six months. Criteria for inclusion in reviews varied from state to state.

Completed surveys were forwarded to the National SAFE KIDS Campaign for compilation, review and analysis. For some variables, response categories were collapsed for ease of analysis and to make data more comparable across states. Results for each data element were calculated using only data from those states providing valid responses for that item. A table indicating the sample size of drownings for each data element can be found in Appendix A.

National drowning vital statistics data were obtained from WISQARTM (Web-based Injury Statistics Query and Reporting System), maintained by the U.S. Centers for Disease Control and Prevention.¹² This online system queries data on all injury deaths to U.S. residents, based on death certificates compiled by the National Center for Health Statistics.

Parent and Youth Survey Data

To learn more about the knowledge, attitudes and behaviors of parents concerning water safety, SAFE KIDS commissioned Harris Interactive to conduct an online survey of adults in January 2004. The results are based on responses from a nationally representative sample of 564 U.S. parents of children 14 years old and younger. Statistical representation was obtained for three subgroups: parents of 0 to 4 year olds, parents of 5 to 9 year olds, and parents of 10 to 14 year olds. "Tweens" (children ages 8 through 12) were also surveyed as part of a monthly omnibus online survey conducted by Harris Interactive in December 2003. Results are based on the responses of 564 children ages 8 to 12, weighted to be representative of all U.S. children in this age group.

Experts from the National Institute of Child Health and Human Development, the American Academy of Pediatrics, the National MCH Center for Child Death Review, the American Red Cross, the National Center for Injury Prevention and Control (Centers for Disease Control and Prevention), and the U.S. Consumer Product Safety Commission served on the study's technical advisory committee and assisted with survey development and review.



SUMMARY OF RESULTS

Child Death Review Survey Results

Data from 496 unintentional childhood drowning deaths were submitted to the National SAFE KIDS Campaign. They represent 89 percent of all unintentional drowning deaths occurring in these 17 states from January 2000 to December 2001. Unintentional drownings made up 95 percent of all drowning deaths among children ages 14 and under reviewed by these states.

Sixty percent of the reviewed drowning deaths occurred among children ages 4 and under. This finding is consistent with the nearly 61 percent of all childhood drowning deaths that occur among this age group nationally. Twenty-three percent of reviewed deaths were among children ages 5 to 9, and 17 percent among children ages 10 to 14.

The majority of drowning victims in reviewed cases were male: 72 percent versus 28 percent female. This finding is consistent with past studies that have found male children have a drowning rate two to four times that of female children.^{13 14 15}

White children accounted for 69 percent of the reviewed drowning deaths and 73 percent of childhood drownings nationally. Nineteen percent of reviewed drowning deaths occurred among black children, and 20 percent were among Hispanic children. Nationally, black and American Indian children have drowning rates 50 to 70 percent higher than white children. Hispanic children have lower drowning rates than non-Hispanics, accounting for only 15 percent of U.S. childhood drownings.

Parent and Tween Survey Results

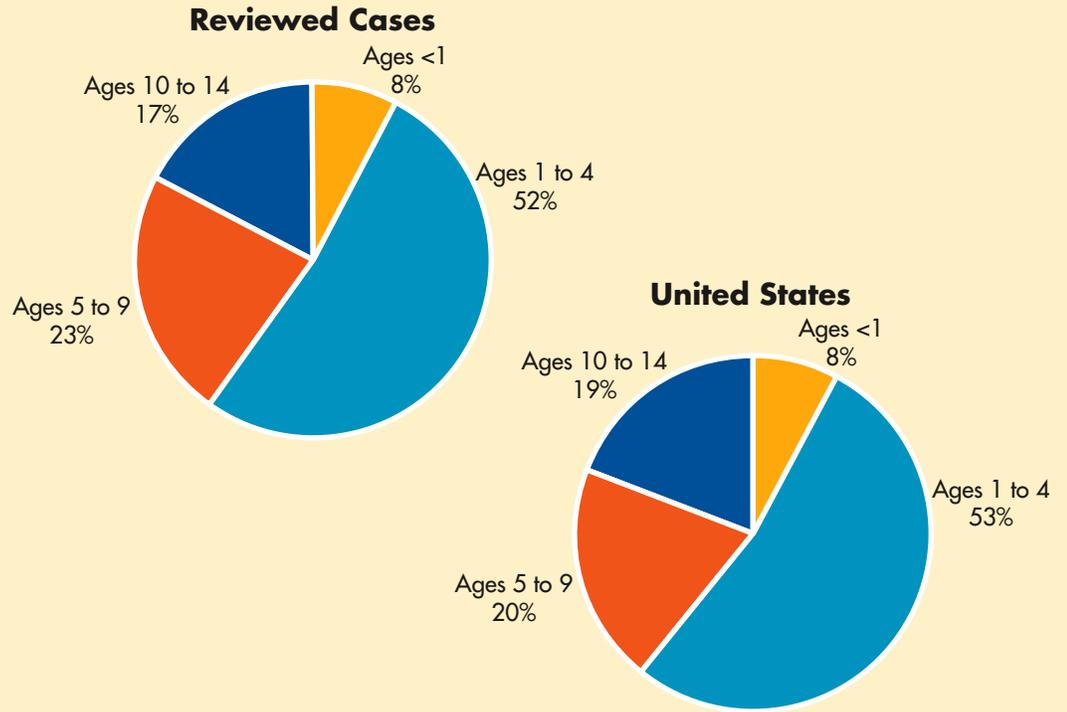
Parents and children report child participation in many types of water recreation. Almost all children (97 percent) ages 8 to 12 report that they have been swimming in the last year. Nearly two-thirds (61 percent) of parents report that their children ages 14 and under have ridden on boats, and 32 percent report that their child participates in water sports.

Despite this considerable exposure to water, parents do not feel that their children are especially vulnerable to water hazards. Though it is the second leading cause of injury-related death for children ages 1 to 14, more than half of parents (55 percent) reported that they do not worry very much or at all about their child drowning.

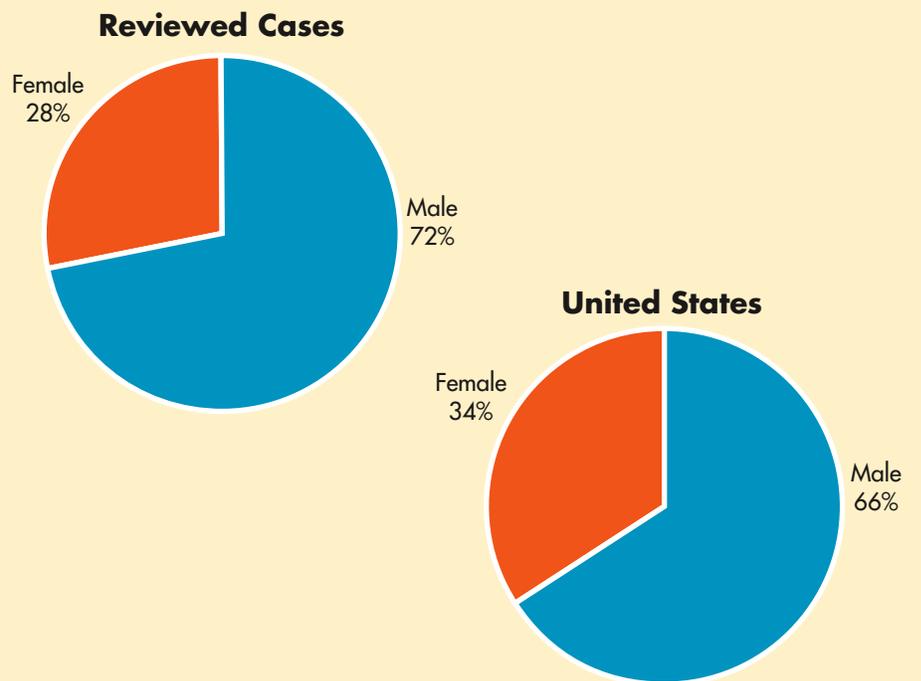




Unintentional Drownings by Age Group, Ages 14 and Under 2000 – 2001



Unintentional Drownings by Sex, Ages 14 and Under 2000 – 2001



SUPERVISION

Child Death Review Survey Results

Eighty-eight percent of children were under some form of supervision when they drowned. Forty-six percent of drowning victims in the reviewed deaths were in the care of a parent at the time of the incident. Twenty-six percent were in the care of a relative other than a parent, including 5 percent in the care of a sibling younger than 18 years of age and 6 percent in the care of a grandparent. Ten percent of the drowning victims were completely unsupervised at the time of the drowning and determined by reviewers to have required supervision. The majority (79 percent) of these unsupervised children were ages 5 to 14. These results are consistent with past studies indicating that childhood drownings and near-drownings typically occur when a child is left unattended or during a brief lapse in supervision.^{16 17}

Sixty-eight percent of children were in or near the water right before the drowning incident, and 32 percent were last known to be in another location in or around the home, most commonly playing outdoors (31 percent).

Of drowning deaths occurring away from home, only 6 percent of children drowned in the known presence of a lifeguard. Rescue was known to have been attempted in 60 percent of the reviewed drowning deaths, most commonly by a parent or other relative (66 percent).

Parent and Tween Survey Results

Nearly all parents (94 percent) report that they always actively supervise their children while swimming. However, deeper examination reveals that parents participate in a variety of distracting behaviors while supervising, including talking to others (38 percent), reading (18 percent), eating (17 percent) and talking on the phone (11 percent).

One in five parents (20 percent) believes that when lifeguards are present, the lifeguard is the main person responsible for supervising children in the water. However, the typical lifeguard-to-swimmer ratio at public swimming areas may be as great as 25 swimmers per lifeguard.¹⁸

Most parents (55 percent) felt there were some circumstances where it is okay for a child to swim without adult supervision, such as if the child swims with a buddy (31 percent), if the child is an excellent swimmer (29 percent) or if the child has had several years of swimming lessons (23 percent). Mothers were more likely than fathers to report that it was not acceptable for kids to swim without supervision in these circumstances – 57 percent versus 30 percent.

Four in 10 tweens (41 percent) said that they would feel safe swimming without a lifeguard or an adult watching them, and 31 percent reported they have gone swimming without any adult present. Older tweens (ages 10 to 12) were more likely to have swum without supervision (37 percent) than younger tweens (19 percent). Additionally, 39 percent of children ages 10 to 12 and 21 percent of children ages 8 to 9 reported that they have supervised a younger child while they were swimming.

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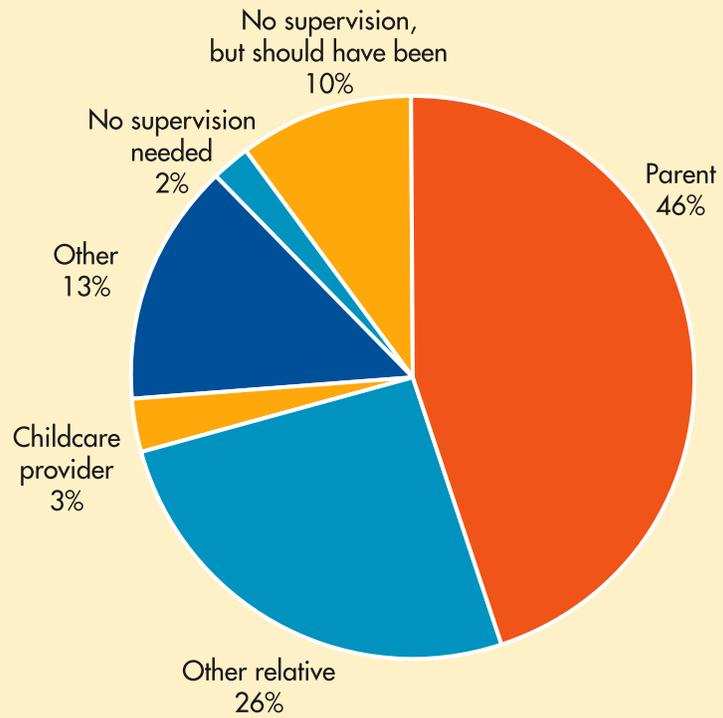
Recommendations

- Never leave a young child unsupervised in or around water, even for a moment.
- Never allow children to swim without adult supervision.
- Always designate a responsible adult to serve as the “water watcher” – a supervisor whose sole responsibility is to constantly observe children in or near the water.

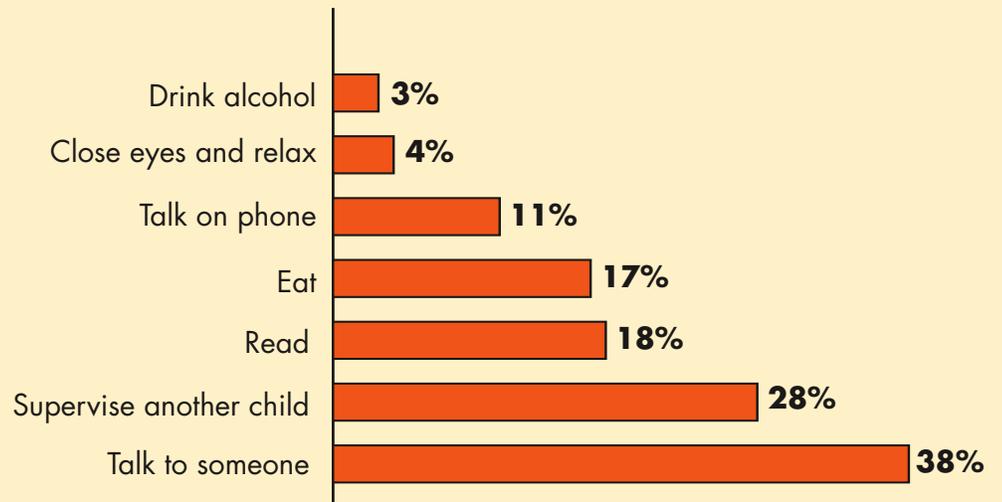


- Supervisors should maintain continuous visual and auditory contact with children in or near the water, and should stay in close proximity (waterside) so that they can effectively intervene if an emergency situation should arise.
- Supervisors should not engage in distracting behaviors such as talking on the phone, preparing a meal or reading.
- Supervisors should keep children who cannot swim within arm's reach at all times.
- While there is no specific recommended ratio of supervisors to child swimmers, the number of supervisors should increase when many children are swimming, younger or inexperienced swimmers are present, or the swimming area is large.

Reviewed Unintentional Drownings by Primary Supervisor at Time of Drowning



Self-Reported Activities of Parents While Supervising Their Child Swimming



ENVIRONMENT

Child Death Review Survey Results

Of all drownings reviewed, 39 percent occurred in pools (14 percent residential, 7 percent community and 18 percent of unknown type). Thirty-seven percent occurred in open bodies of water (such as lakes, rivers and ponds), and 18 percent occurred in and around the home, in places such as bathtubs, buckets and spas. Reviews determined that younger children (ages 4 and under) were most likely to drown in home settings (26 percent) and pools (44 percent), while drownings among children ages 5 to 14 occurred most often in open-water sites (51 percent). These findings are consistent with published national studies.^{19 20}

More than half (59 percent) of drowning victims intended to be in the water at the time of their death, by swimming or participating in other water recreation. This was more common among older children – 55 percent of victims ages 5 to 9 and 95 percent of victims ages 10 to 14 intended to be in the water at the time of their drowning, in contrast to only 32 percent of victims ages 4 and under.

Where barriers to pools were examined in connection with pool drownings, 38 percent occurred at pools known to have perimeter fencing and 28 percent occurred at pools known to have isolation fencing (a fence completely separating the pool area from the house and the rest of the property). Only 5 percent of cases occurred at pools known to be without any barriers at all.

Studies show that installation and proper use of four-sided isolation fencing could prevent 50 to 90 percent of childhood residential swimming pool drownings and near-drownings.^{21 22 23} In reviewed deaths where barriers were breached, 63 percent of victims entered through an open or unlocked gate. Among cases where it was known whether the child was unattended at the time he or she gained access to the pool area through a gate, 39 percent of victims were known to have been alone upon entry.

Parent and Tween Survey Results

Seventy-eight percent of all parents and 69 percent of pool-owning parents felt that multiple barriers around pools are necessary to prevent drowning. While 98 percent of pool- or spa-owning parents report that they have taken adequate steps to ensure children's safety, most report a lack of the actual environmental modifications required. Nearly two-thirds (61 percent) of pool- and spa-owning parents have no isolation fencing, and 43 percent have no self-closing and self-latching gate. Pool-owning parents are even less likely to have other important safety devices near their pool – 82 percent have no shepherd's hook, 73 percent have no posted CPR instructions and 64 percent have no phone with emergency numbers.

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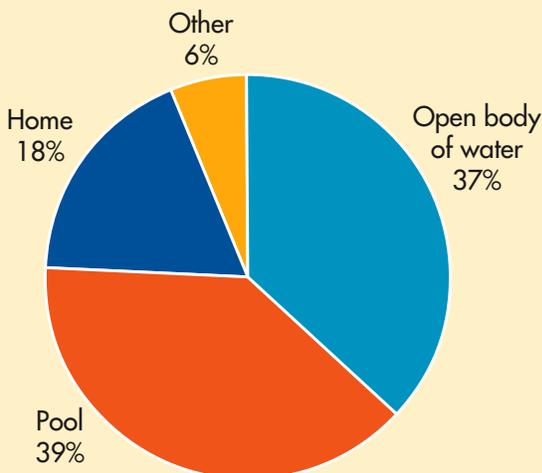
Recommendations

- Children should swim only in designated and supervised swimming areas.
- Four-sided isolation fencing, at least 5 feet high and equipped with self-closing and self-latching gates, should be installed around pools and spas to prevent direct access from a house or yard. Never prop open the gate to a pool barrier or leave toys that may attract young children in or around a pool.

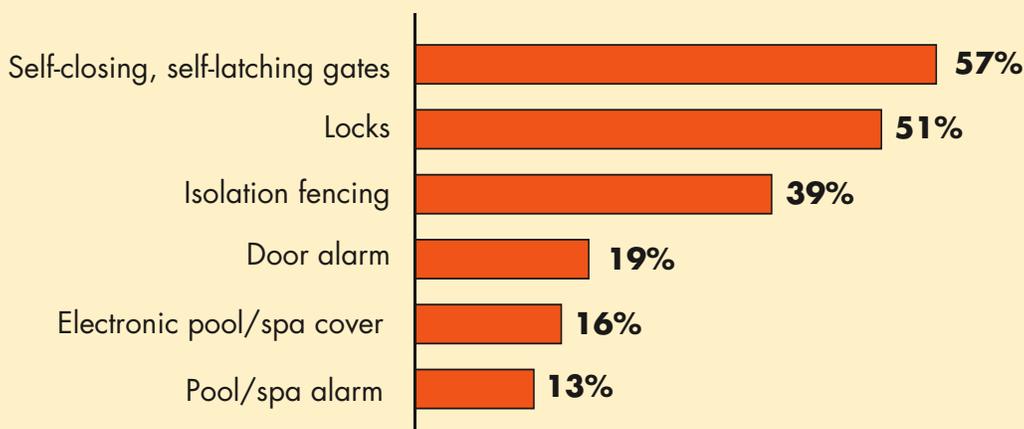


- Install barriers of protection around your home pool or spa in addition to the fencing, such as pool alarms, pool covers, door alarms or locks.
- Limit access to water sources in the home by installing and using appropriate safety devices (such as door locks and toilet latches) and by emptying and inverting buckets and wading pools immediately after use.

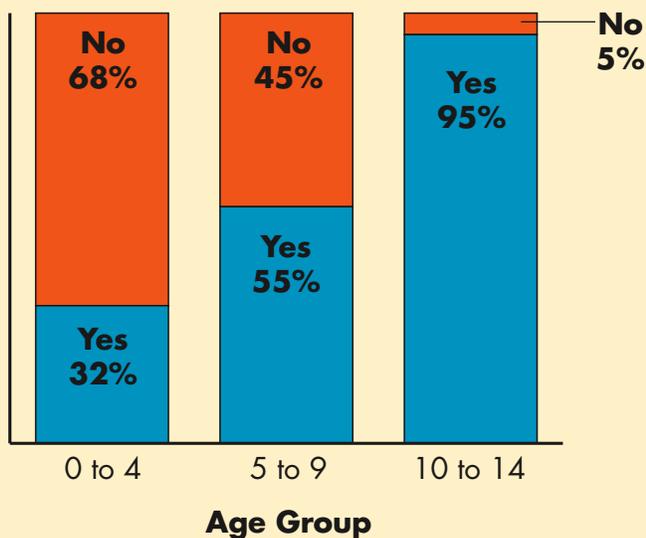
Reviewed Unintentional Drownings by Site



Environmental Modifications of Pools as Reported by Pool-Owning Parents



Reviewed Unintentional Drownings by Intent to be in the Water and Age Group



GEAR

Child Death Review Survey Results

Nearly all children (97 percent) in reviewed cases who drowned in pools or open bodies of water were not wearing a personal flotation device at the time of the drowning. Children should wear PFDs whenever they are in or around open water or participating in water sports, and PFD use is mandated for children on boats in at least 38 states. However, the U.S. Coast Guard reports that, in 2002, nearly 45 percent of the children ages 14 and under who drowned in reported boating-related incidents were not wearing PFDs.²⁴ It is estimated that 85 percent of boating-related drownings could have been prevented if the victim had been wearing a PFD.²⁵

Parent and Tween Survey Results

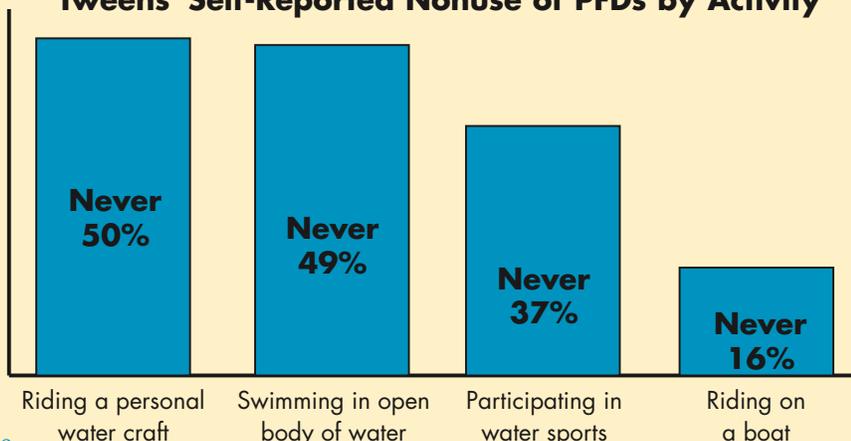
More than two-thirds (69 percent) of parents report that they have discussed wearing PFDs at appropriate times with their child ages 2 to 14. Large percentages of parents report that their child always wears a PFD when on a boat (89 percent), participating in water sports (92 percent) or riding a personal watercraft (93 percent). However, many tweens admit that they never wear a PFD when on a boat (16 percent), participating in water sports (37 percent) or riding a personal watercraft (50 percent).

Parents of children who do not always wear PFDs while on boats commonly cite reasons for non-use including their own proximity to the child, proximity to the PFD, and the child's swimming ability. Children reported that they did not wear PFDs because they could swim (29 percent), they could grab the PFD quickly if they needed it (27 percent) or there was no PFD available (18 percent).

Parents do not always model safe behavior for their children. While only 4 percent of parents of children who go on boats reported that their child rarely or never wear PFDs while on a boat, nearly a quarter (23 percent) report that they themselves do not wear PFDs when accompanying their child on a boat.

Some parents mistakenly believe that toys and swimming aids can protect their child from drowning: 19 percent believe that air-filled water wings can protect children, and 14 percent believe that air-filled inner tubes protect them. These items are not approved as safety devices to protect against drowning and should never be used as such.

Tweens' Self-Reported Nonuse of PFDs by Activity



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Recommendations

- Children should always wear appropriately sized U.S. Coast Guard-approved PFDs when on boats, in or near open bodies of water or participating in water sports. The PFD should fit snugly and not allow the child's chin or ears to slip through the neck opening.
- Air-filled swimming aids, such as "water wings" and inner tubes, are not safety devices and should never be used as a substitute for a PFD.
- Rescue equipment, a telephone and emergency phone numbers should be kept poolside.



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Recommendations

- Children should be enrolled in swimming lessons by age 8. Parents can check with their local department of parks and recreation or Red Cross chapter to find a certified instructor near them. Look for classes that include emergency water survival techniques training.
- Parents and caregivers should learn infant and child CPR.
- Educate children about the rules of water safety, including:
 - Always swim with a buddy and an adult present;
 - Never swim in an open body of water or participate in water sports without wearing a PFD;
 - Never dive into a river, lake or ocean; and
 - If someone is in trouble in the water, call for help and throw something that floats to the victim. A child should never enter the water to try to save someone.

EDUCATION

Child Death Review Survey Results

Nearly three-quarters (74 percent) of drowning victims in the reviewed deaths did not know how to swim. Seventy-three percent of victims ages 5 to 9 did not know how to swim, while only 30 percent of victims ages 10 to 14 did not know how to swim. None of the victims ages 4 and under knew how to swim.

While there is no conclusive evidence that drowning rates are higher for less experienced swimmers, swimming lessons often include survival skills training that may be useful in an emergency.

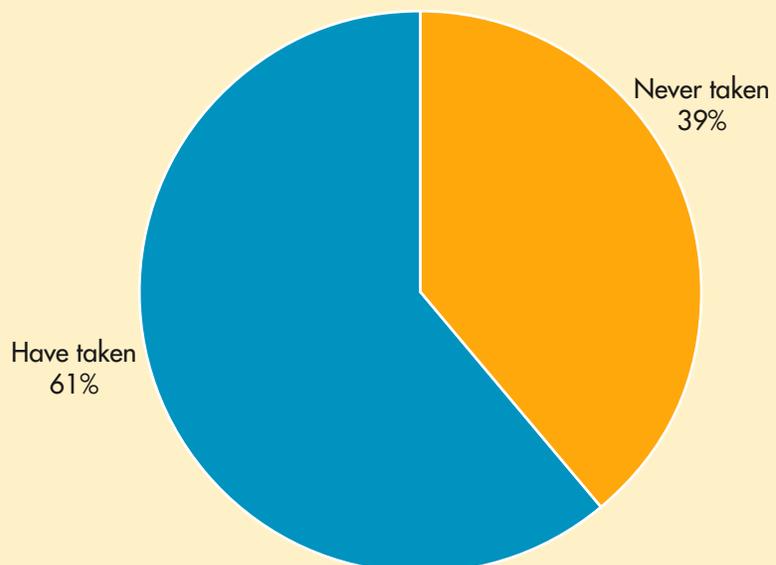
Parent and Tween Survey Results

Although 82 percent of parents agree that all children should take swimming lessons by age 8, nearly four in ten parents (37 percent) of children ages 5 to 14 report that their child has never taken lessons. In addition, 39 percent of tweens report that they have never taken swimming lessons. Twenty-four percent of parents of children ages 5 to 9 and 11 percent of parents of children ages 10 to 14 report that their child is a non-swimmer or a poor swimmer.

More than half of parents (54 percent) believe that swimming lessons can prevent children from drowning. Sixty-three percent of parents whose children have taken lessons and 65 percent of tweens who have taken lessons report that the instruction included some water survival skills training, such as treading water and survival floating. The American Academy of Pediatrics recommends that “children are generally not developmentally ready for formal swimming lessons until after their fourth birthday.”^{29,26}

Seventy percent of parents surveyed have been trained in infant and child CPR. Reasons for lack of training commonly cited include classes offered at inconvenient times and places (29 percent) or a lack of time to take classes (27 percent).

Tweens' Self-Reported Experience with Swimming Lessons



CONCLUSIONS

- ***Parents are overconfident about their children's safety and abilities around water.*** Although drowning is the second leading cause of injury-related death for children ages 1 to 14, more than half (55 percent) of parents say that they do not worry much or at all about their child drowning.
- ***Drownings most commonly occur in recreational settings, often pools and open bodies of water.*** In fact, national data suggest that more than 385 children ages 14 and under drown each year while participating in water recreation, such as swimming or boating. Nearly half of these recreational drowning deaths (49 percent) are among children ages 5 to 14.²⁷
- ***Adults must install multiple layers of protection around home pools and be consistent in using barriers that do exist.*** While 98 percent of pool- or spa-owning parents report they have taken adequate steps to ensure children's safety, most responses also reflect a lack of actual environmental modifications – nearly two-thirds (61 percent) of pool- and spa-owning parents have no isolation fencing, and 43 percent have no self-closing and self-latching gate.
- ***Adults must increase the quality of their supervision of children around water, as nearly 9 in 10 deaths reviewed occurred while the child was being supervised.*** While nearly all parents said they always actively supervise their children while swimming, parents also admit to participating in a variety of distracting behaviors while supervising.
- ***Caregivers need to enforce the consistent use of PFDs in potentially hazardous situations.*** Many tweens admit that they never wear a PFD when riding a personal watercraft (50 percent), participating in water sports (37 percent) or on a boat (16 percent). While parents recognize the importance of PFD use, they do not always require their children to wear PFDs or model safe behavior for their children.
- ***More children should be enrolled in swimming lessons taught by a certified swimming instructor.*** Although the majority of parents (82 percent) agree that all children should take swimming lessons by age 8, 37 percent of parents of children ages 5 to 14 report that their child has never taken swimming lessons.





CALL TO ACTION

To help kids stay safe in and around water, the National SAFE KIDS Campaign, its more than 600 coalitions and chapters, and Founding Sponsor Johnson & Johnson will launch a nationwide recreational water safety initiative – *Splash Into Safety* – for National SAFE KIDS Week 2004 (May 1–8).

Splash into Safety will focus on four “water safety wisdoms” for parents:

- SUPERVISION – Designate a responsible adult to actively supervise kids around water.
- ENVIRONMENT – Ensure safe swimming environments by installing multiple layers of protection around pools and equipping all water recreation sites with appropriate signage and emergency equipment.
- GEAR – Make sure the right safety gear is always used.
- EDUCATION – Teach children to swim and educate them about water safety.

The “wisdoms” will be delivered by members of SAFE KIDS coalitions with the help of local water safety groups, such as the American Red Cross, U.S. Power Squadrons and the U.S. Coast Guard Auxiliary, through outreach to schools, community groups and civic leaders.

During National SAFE KIDS Week and throughout the year, SAFE KIDS joins many other public health education and advocacy organizations in a multifaceted approach to reducing drowning and near-drowning, by:

- Increasing public education efforts around water safety.
- Educating parents and caregivers about how to actively supervise children in and around water.
- Teaching parents and caregivers about the importance of choosing the appropriate PFDs for their children and ensuring their consistent use.
- Inspiring parents, caregivers and older children to be role models by wearing PFDs and adopting safe behaviors, such as never swimming alone.
- Advocating for increased funding for lifeguarding services at community pools and public beaches.
- Continuing efforts to enact or enforce mandatory four-sided pool isolation fencing laws in all 50 states, the District of Columbia and all U.S. territories.
- Working to enforce the current mandatory child PFD use laws in applicable states and the U.S. Coast guard rule requiring all children under 13 years old to wear an approved PFD when under way on a recreational vessel.



APPENDIX A

Sample Size for Each Data Element Analyzed by Child Death Review Teams

DATA ELEMENT	BASE No.	VALID* No. (% of Base)	UNKNOWN** No. (% of Valid)	FINAL No.
Age Group	496	481 (96.9)	0	481
Gender	496	149 (30.0)	0	149
Race	496	474 (95.6)	1 (0.2)	473
Ethnicity	496	454 (91.5)	18 (4.0)	436
Primary supervisor	496	298 (60.1)	11 (3.7)	287
Child location before drowning	496	152 (30.6)	12 (7.9)	140
Activity at time of drowning	496	332 (66.9)	44 (13.3)	288
Presence of lifeguard	358†	109 (30.4)	39 (35.8)	109
Rescue attempted	496	151 (30.4)	36 (23.8)	151
Person attempting rescue	496	59 (11.9)	21 (35.6)	38
Place of drowning	496	432 (87.1)	2 (0.5)	430
Intent to be in water	496	167 (33.7)	45 (26.9)	122
Barriers present	169††	80 (47.3)	29 (36.3)	80
How were layers of protection breached	169††	30 (17.8)	0	30
Attended at time gained entered gate	169††	45 (26.6)	14 (3.1)	31
PFD use	358†	198 (55.3)	13 (6.6)	185
Swimming ability	358†	186 (52.0)	118 (63.4)	68

* Number of cases for which information was submitted by CDR teams

** Number of cases where “unknown” was the reported variable value

† Excludes bathtub, toilet and bucket drownings

†† Pool drownings only

CONTRIBUTING CHILD DEATH REVIEW TEAMS

Alabama
Arizona
Delaware
Georgia
Illinois
Michigan
Minnesota
Missouri
Montana
North Dakota

Nevada
Oklahoma
Pennsylvania
South Dakota
Utah
Washington
Wisconsin



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SAFE KIDS also wishes to thank the members of our expert advisory panel for their contributions to this study.

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Department of Health and Human Services

Deborah Tinsworth
U.S. Consumer Product Safety Commission

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ENDNOTES

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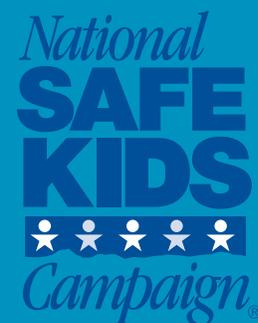
³ Committee on Injury and Poison Prevention. Physician's resource guide for water safety education. American Academy of Pediatrics, 1994 June.

⁴ Wintemute GJ. Childhood drowning and near-drowning in the United States. *Amer J Dis Child* 1990;144:663-669.

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