



UNITED STATES  
CONSUMER PRODUCT SAFETY COMMISSION  
WASHINGTON, DC 20207

**Memorandum**

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SUBJECT : 2005 Annual Drowning Memorandum<sup>1</sup>

This memorandum contains information on drowning incidents of children under 5 years old involving swimming pools and products in and around the home. For swimming pools, an estimate of emergency room treated submersion incidents is presented along with a count of drowning deaths. A count of drowning deaths in and around the home is presented along with anecdotal information on at-home drowning deaths, as reported through CPSC. The submersion estimate is for the calendar year 2004, whereas all other data in this memorandum is for the calendar year 2002. Both are the most recent data available from the respective data sources.

**Methodology<sup>2</sup>**

Swimming Pool Injuries

The number of children under 5 years old involved in pool-related submersion incidents was estimated by the National Electronic Injury Surveillance System (NEISS). The database was searched for all submersion incidents (diagnosis code 69) and the swimming pool product codes (1284 – swimming pools, not specified; 3221 – above ground swimming pools; 3251 – built-in swimming pools) from January 1, 2004 through December 31, 2004. These data are not complete (all incidents have been entered, but have not been fully reviewed); any changes in the data upon completion should be minor and should not change the approximation of the estimate.

<sup>1</sup> This analysis was prepared by the CPSC staff, has not been reviewed or approved by, and may not necessarily reflect the views of, the Commission.

<sup>2</sup> For a more complete discussion of the methodology, reference "Methodology for Annual Drowning Memorandum," August 26, 2003, by Debra Sweet, U.S. Consumer Product Safety Commission.

## Swimming Pool Deaths

In years prior to 1999, pool drowning deaths were estimated using CPSC data and a statistical method referred to as capture-recapture. An estimate was necessary because the National Center for Health Statistics (NCHS) files did not contain a cause-of-death code specifically for pool drowning deaths, and therefore pool drowning deaths could not be separated from other drowning situations. In 1999, NCHS began differentiating pool drowning deaths from other drowning deaths through the ICD-10 codes, allowing for a count of the number of pool drowning deaths. The ICD-10 codes for pool drowning deaths are W67 (drowning and submersion while in pool) and W68 (drowning and submersion following fall into pool). From reviewing CPSC death certificate files, there is evidence that some pool drowning deaths are miscoded. In order to get a more accurate account of the number of deaths, these miscoded incidents need to be accounted for.

In order to account for the miscodes, staff reviewed the CPSC death certificate file for any pool drowning deaths erroneously coded as an "other specified drowning and submersion" (W73) or an "unspecified drowning and submersion" (W74) case. If such cases were found, the demographic and incident information was compared to the NCHS files to see if the incident was miscoded in NCHS or if it was correctly coded in NCHS as a pool drowning case. The miscoded incidents not corrected in NCHS were added to the total number of pool drowning deaths as reported through NCHS in codes W67 and W68. This is the number of children under 5 who drowned in a pool in a given year.

This adjustment for miscoded incidents only identifies those miscoded incidents reported to CPSC. Therefore, the number of pool drowning deaths reported in this memorandum will be a minimum, as there may be other pool drowning deaths miscoded into W73 or W74 that CPSC staff is unaware of.

## At-Home Drowning Deaths

In a similar manner as the swimming pool drowning deaths, non-pool drowning deaths were obtained through NCHS data with a specific set of ICD-10 codes for children under 5 years old. The ICD-10 codes are: W65 (drowning and submersion while in tub), W66 (drowning and submersion following fall into tub), W69 (drowning and submersion while in natural water), W70 (drowning and submersion following fall into natural water), W73 (other specified drowning and submersion), and W74 (unspecified drowning and submersion). To account for the adjustments made to the pool drowning deaths, similar adjustments were made within these codes. Within this resulting set of data, only those with the NCHS location code for home were counted as at-home drowning deaths (non-pool).

Because NCHS does not give incident summary information, CPSC data files were used to identify at-home drowning incidents to obtain information on the types of products involved and the circumstances associated with the incident. NEISS, the Death Certificate file (DTHS), the Injury and Potential Injury Incident file (IPII), and the In-Depth Investigation file (INDP) were searched for incidents involving children under 5 that occurred in the calendar year 2002. Diagnosis codes for submersion were used as well as disposition codes for fatalities. No product

codes were used during the search to avoid excluding any possible product involved in a drowning incident.

## Swimming Pools

### Swimming Pool Emergency Room-Treated Incidents

In 2004, approximately 2,300 children under 5 years old were treated in U.S. hospital emergency rooms following swimming pool submersion incidents. Table 1 gives the annual estimates of swimming pool submersion incidents to children under 5 for the past 10 years as well as the 10-year average.

Table 1. Estimated Number of Children Under 5 Treated in the E.R. for Swimming Pool Submersion, 1995 - 2004.

Year	Estimate
Average	2,400
1995	2,500
1996	2,600
1997	2,200
1998	2,400
1999	3,100
2000	3,200
2001	2,300
2002	1,600
2003	1,800
2004	2,300

Source: U.S. Consumer Product Safety Commission: National Electronic Injury Surveillance System.

Note 1: 2004 NEISS data are expected to be complete in June 2005. Data for this report were run on March 14, 2005.

Note 2: NEISS information presented for 2003 in the May 2004 drowning memorandum was not complete at that time. The data have been reviewed and there are no changes to the NEISS information presented in that memorandum.

Of the approximately 2,300 children estimated to have been treated in an emergency room following a pool submersion incident, 25 percent were treated and released or left the emergency room without being seen, 70 percent were treated and transferred, treated and held for observation, or admitted for hospitalization, and 5 percent died in the emergency room or arrived having already died. The majority of the 2,300 incidents, 75 percent, occurred at a home. Another 10 percent of the incidents occurred in a public pool or at a recreational location. The location of the pools in the remaining 15 percent of the incidents was not recorded.

### Swimming Pool Drowning Deaths

There were, on average, 244 swimming pool-related drowning deaths to children under 5 years old each year from 2000 to 2002. The following table shows the number of pool-related drowning deaths each year as well as the three-year average.

Table 2. Swimming Pool-Related Drowning Deaths to Children Under 5 Years Old, 2000-2002.

Year	Deaths
2000	255
2001	230
2002	248
Average	244

Source: National Center for Health Statistics data, adjusted with CPSC data.

## At-Home Drowning Deaths

### NCHS Count of At-Home Drowning Deaths

There were, on average, 152 at-home drowning deaths to children under 5 years old each year from 2000 to 2002. The following table shows the number of at-home drowning deaths each year as well as the three-year average.

Table 3. At-Home Drowning Deaths to Children Under 5 Years Old, 2000-2002.

Year	Deaths
2000	170
2001	145
2002	142
Average	152

Source: National Center for Health Statistics data, adjusted with CPSC data.

### CPSC Reports of At-Home Drowning Deaths

CPSC has received reports of 96 incidents in which a child under 5 years old died from complications of submersion in products in and around the home environment in 2002. This is not a statistical estimate of the number of deaths during this time period, nor is it a complete count of deaths during this time period. It is a minimum count of the number of children under 5 years old who died as reported to CPSC. Table 4 is a breakdown of the 96 drowning deaths with respect to the product involved.

Table 4. CPSC Reported At-Home Drowning Deaths, 2002.

<b>Total of Consumer-Product Related Drowning Deaths</b>	<b>96</b>
Bathtubs	69
Spas and Hot Tubs	9
Wading Pools	4
5-Gallon Buckets	3
Toilets	2
Other Products	9

Source: CPSC Databases.

## BATHTUBS

The most frequent cause of drowning deaths of children in the home, as reported to CPSC, is submersion in the bathtub. CPSC has reports of 69 children who died in 2002 as a result of submersion in a home bathtub. Table 5 summarizes the 69 bathtub drowning incidents.

Table 5. Bathtub Drowning Deaths of Children Under 5 Years Old, 2002.

<b>Total Bathtub Drowning Deaths</b>		<b>69</b>
<b>Age</b>		
Birth to 11-months-old		33
12-months-old to 23-months-old		23
2-years-old		9
3-years-old		2
4-years-old		2
<b>Product Involved</b>		
No other product involved (explicitly stated)		35
Bath seat involved		6
Other product involved		5
Unknown/Not Stated		23
<b>Supervision of Child at Incident</b>		
Not supervised		58
Supervised		2
Unknown		9
<b>How Victim Got Into Bathtub and Sibling Involvement</b>		
Placed in bathtub by caregiver	Without another child	18
	With another child	27
	Unknown	1
Fell/crawled into bathtub or placed into bathtub by another child	Without another child	4
	With another child	5
	Unknown	2
Unknown how victim got into bathtub and unknown whether another child was involved		12

Source: CPSC Databases.

The age group most frequently involved in a fatal bathtub drowning incident is the under 1 year old age group. Thirty-three children under 1 year old died after submersion in a bathtub. The children in four of these incidents were placed in bath seats at the start of the bath and ranged in age from 6 months old to 10 months old. One 3-month-old child was placed in a wire framed infant carrier for the bath, one incident involved a 7-month-old child placed in an infant tub inside the larger bathtub, and three children ages 4 months to 8 months were placed in a bathinette inside the larger bathtub. For those victims over 1 year old, 23 were between 12 months old and 23 months old, nine children were 2 years old, two children were 3 years old, and two children were 4 years old. Two incidents involving children between 12 months and 23 months old involved bath seats. There were no bathing aids involved or stated to be involved in any of the remaining 58 incidents. Two children, age 2, suffered from cerebral palsy and were

left unattended in the bathtub. An additional two incidents involved sick children, ages 2 and 4, who were placed in the bathtub to help relieve the illness and were left unattended.

Information about whether the child was being supervised at the time of the incident was known in 60 incidents. In almost all of the cases, 58 incidents, the victim was not supervised when the drowning occurred. Two incidents occurred when the parent was physically with the child during the incident but was under the influence of a controlled substance at the time of the drowning. One of these incidents involved a 5-month-old child who was placed on his mother's chest in the bathtub and the mother fell asleep. Alcohol was a factor in this incident. In the second incident, a 15-month-old child was placed in the tub and the mother fell asleep next to the bathtub as a result of smoking marijuana. The supervision of the children involved in the remaining nine incidents is unknown.

While all of the children drowned while in the bathtub, not all of the children were placed in the bathtub with the intention of receiving a bath. Forty-six children were placed in the bathtub to receive a bath – 18 without another child in the bathtub, 27 with another child in the bathtub, and in one incident, the presence of another child is unknown. Eleven children, however, either climbed into the bathtub, fell into the bathtub, were placed in the tub by the caregiver without water, or were placed in the bathtub by another child. Three of the 11 children fell or climbed into a tub filled with water from a previous bath or in preparation for a bath and three children fell or climbed into the tub with no further details known about the incident. In the remaining five incidents, siblings were involved to some degree. In one incident the victim went into the bathroom while a sibling was bathing and ended up in the bathtub. In one incident, the victim and a sibling were placed in the tub without water while the mother left the home. It is believed that the sibling turned the water on and the victim drowned. In three incidents, the sibling ran the water in the tub while unsupervised and the victims either fell into the tub or were placed in by the siblings.

In six of the 69 incidents, parents or caregivers placed the children in the bathtub, left the drain open and the water running into the tub. However, in each of the six incidents, the parent or caregiver returned to the bathroom and the drain was closed or clogged, the water had filled the bathtub, and the child was found submerged. In an additional two incidents, the caregivers ran water in the bathtub and left the room while the water filled the bathtub for the bath. The children drowned in the rising water while unsupervised. In another two incidents, the parents finished bathing the children, opened the drain and left the bathroom. In both incidents, siblings plugged the drain with either toilet paper or their body and the victims drowned while the caregiver was out of the room. In the remaining bath-time incidents, the children drowned in the standing water in the bathtub.

## SPAS AND HOT TUBS

CPSC is aware of nine children under 5-years-old who died as a result of submersion in a residential spa or hot tub in 2002. Six children were between 12 months old and 23 months old, two were 2 years old, and one child was 4 years old.

Six of the nine incidents occurred in outdoor hot tubs or spas and the location of the remaining three hot tubs or spas is unknown. Two of the incidents with a known location occurred in the apartment complexes where the children lived. In four of the nine incidents, the children were in the vicinity of the hot tubs at the time of the incident: one child was left unattended while on the stair to the hot tub; one child got out of a pool and climbed into the adjoining hot tub; and two children were playing near the hot tub and either fell or climbed in. In an additional incident, the victim opened a sliding glass door and gained access to the hot tub. Due to limited information on these incidents, further information cannot be presented.

#### WADING POOLS

CPSC has reports of four children who drowned in wading pools in residential areas in 2002. Three children were between 12 and 23 months old and one child was 4 years old. While all four children were left unattended, three of the children were left unattended while in the wading pool. The fourth child was left unattended elsewhere and found in the wading pool. Two of the pools were inflatable pools, one measuring 14 to 18 inches deep and one measuring two feet deep.

#### 5-GALLON BUCKETS

In 2002, CPSC has reports of three drowning deaths to children under 5 years old associated with 5-gallon buckets. The children were between 10 months old and 12 months old. Limited information was available for these incidents; therefore, further information cannot be presented.

#### TOILETS

Two children were reported to have drowned in toilets in 2002, according to CPSC data. The children were 12 months old and 13 months old and both children were found face down in the toilets. CPSC has no further information about these incidents.

#### OTHER PRODUCTS

CPSC is aware of an additional nine incidents in 2002 involving drownings in other products in and around the home. Three children drowned in a bucket of size and shape other than a 5-gallon bucket. These children ranged in age from 10 months old to 14 months old. Two children, ages 10 months and 19 months, drowned in outdoor fish or landscape ponds. Neither of these ponds was noted as having protective barriers around them. Two children were reported to have drowned in fountains. A 19-month-old child drowned in a fountain being erected for a wedding in the yard of the home. And, a 3-year-old child fell into the decorative fountain at the apartment complex where she lived. One child, age 18 months, drowned in a plastic trash can used to disinfect soiled diapers. One child, age 12 months, drowned in a 16 inch tall water barrel.

## Summary Points

- In 2004, approximately 2,300 children under 5 years old were estimated to have been treated at U.S. hospital emergency rooms following a swimming pool submersion incident. The majority, 70 percent, were treated at the emergency room and transferred to another facility, treated and held at the hospital for observation, or admitted for hospitalization.
- There was an average of 244 swimming-pool related drowning deaths annually to children under 5 years old from 2000 to 2002 (NCHS data).
- There was an average of 152 at-home drowning deaths annually to children under 5 years old from 2000 to 2002, not including swimming pool drowning deaths (NCHS data).
- CPSC has received reports of 96 incidents in which a child under 5 years old died from complications of submersion in products in and around the home in 2002: 69 bathtub drowning deaths, 9 spa or hot tub drowning deaths, 4 wading pool deaths, 3 drowning deaths in 5-gallon buckets, 2 drowning deaths in toilets, and 9 deaths in other products (household buckets, landscape or fish ponds, fountains, a plastic trash can and a water barrel).