



## Submersions Related to Non-Pool and Non-Spa Products, 2011 Report



April 2011

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**CPSC 6(b)(1) CLEARED for PUBLIC**

**NO MFRS/PRVTLBLRS OR  
PRODUCTS IDENTIFIED**

**EXCEPTED BY: PETITION  
RULEMAKING ADMIN. PRCDG**

**WITH PORTIONS REMOVED: \_\_\_\_\_**

*5/13/11*

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

## Executive Summary

This report characterizes non-pool and non-spa product-related submersion incidents reported to the U.S. Consumer Product Safety Commission (CPSC).<sup>1</sup> The incidents occurred from 2005 to 2009, and involve children younger than 5 years old.

Findings regarding the 660 non-pool and non-spa submersion incidents (2005–2009) for children younger than 5 years old include:

- Victims
  - Severity
    - 431 (65 percent) were fatalities;
    - 212 (32 percent) were injuries; and
    - 17 (3 percent) were incidents with no apparent injury or unknown injury.
  - Majority of the victims were younger than 2 years old (549 incidents, 83 percent).
  - Majority of the incidents occurred at a residence (607 incidents, 92 percent).
- Products
  - Majority of the incidents involved bath-/bathing-related products (547 incidents, 83 percent):
    - Full-size bathtubs (457 incidents, 69 percent); and
    - Bathing aid in a full-size bathtub (84 incidents, 13 percent);
  - Containers such as buckets and pails were associated with 60 (9 percent) incidents.
  - Remainder of the incidents (53 incidents, 8 percent) included a range of products:
    - Decorative water features such as ponds (33 incidents, 5 percent); and
    - Septic tanks (13 incidents, 2 percent).
- Hazard Scenarios for Fatalities (431 incidents)
  - Bath/bathing category (352 fatalities, 82 percent)
    - Victim left alone temporarily in bathtub in 134 (31 percent) deaths; and
    - Victim and another child were left alone temporarily in bathtub in 90 (21 percent) deaths.
  - Containers and miscellaneous categories (79 fatalities, 18 percent)
    - Victim found in product outside home in 37 (9 percent) deaths;
    - Victim found in product inside home in 12 (3 percent) deaths; and
    - Victim found in product containing cleaning solution in 12 (3 percent) deaths.

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<sup>1</sup> Pool or spa-related injuries and fatalities are presented in *Pool or Spa Submersion: Estimated Injuries and Reported Fatalities, 2010 Report, May 2010*.

## Reported Fatalities and Non-fatal Incidents

Submersion incidents associated with consumer products that are reported to CPSC staff can be divided into two categories. The majority of these incidents involve pools or spas, and the remaining incidents involve a variety of products usually found around homes. The annual pool and spa report covers the first category of incidents, and the remaining product-related incidents are covered in this report. This report differs from the pool and spa report in that national estimates of emergency department-treated submersion injuries cannot be given due to the small number of non-pool and non-spa submersion injuries in the National Electronic Injury Surveillance System (NEISS). In this report, injury and no apparent injury, or unknown severity incidents are reported as counts from the CPSC epidemiological databases (NEISS, Injury and Potential Injury Incidents (IPII), and In Depth Investigations (INDP)). The methods used to extract, review, and classify fatality counts are similar in this report and the pool and spa report. These fatality counts can be combined for their respective years and age group (younger than 5 year old) to give the total reported submersion fatalities for a given year for children younger than 5 years old associated with consumer products.

For 2005 through 2009, CPSC staff received reports of 660 non-pool and non-spa product-related submersion incidents<sup>2</sup> involving children younger than 5 years old.<sup>3</sup> The majority of the reported incidents were fatalities (431 incidents, 65 percent). Table 1 shows the total number of reports received by CPSC staff, by year, and provides a breakdown, by severity, for the reported incidents.

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<sup>2</sup> A “submersion incident” is defined as the submersion of the face, particularly the mouth and nose, into a liquid.

<sup>3</sup> Existing database updated from new reports extracted from the CPSC’s epidemiological databases on January 6, 2011.

Table 1  
Non-Pool & Non-Spa Product-Related Submersions Reported to CPSC Staff  
for Children Less than 5 Years Old by Year,<sup>4</sup> 2005–2009<sup>5</sup>

Year <sup>6</sup>	Fatal	Injury	No Apparent Injury or Unknown	Total Fatal, Injury, and No Apparent Injury or Unknown	Percent of Total (n = 660)
<b>2009</b>	89	62	3	154	23%
<b>2008</b>	74	49	4	127	19%
<b>2007</b>	92	36	4	132	20%
<b>2006</b>	90	36	1	127	19%
<b>2005</b>	86	29	5	120	18%
<b>Column Total</b>	431	212	17	<b>660</b>	
<b>Percent of Total (n = 660)</b>	65%	32%	3%		

Source: U.S. Consumer Product Safety Commission: National Electronic Injury Surveillance System (NEISS), DTHS (Deaths), IPII (Injury and Potential Injury Incidents), and INDP (In Depth Investigations). IPII, DTHS, and INDP are updated on an ongoing basis. Also note that NEISS data is being used in this report to count incidents and not to generate national estimates. There were too few NEISS incidents to generate annual national injury estimates.

Over the 5-year period, 53 percent of the total reported incidents involved males; 45 percent involved females; and for the remaining 2 percent, gender was not reported. Similar percentages for fatalities (54 percent male, 45 percent female) and injuries (53 percent male, 43 percent female) were observed.

Based upon examination of the reports, it was determined that most of the incidents (92 percent) occurred at a residence. Two percent occurred at public places, and the remaining 6 percent of records did not specify a location. The public places included hotels/motels, childcare centers, homeless shelters, and recreation facilities. Location patterns are similar for fatalities (94 percent residential, 1 percent public) and injuries (88 percent residential, 3 percent public).

Review of the reported incidents suggested three incident categories based on the scenario and type of product(s) involved. These categories are: bath/bathing, containers, and miscellaneous.

The bath/bathing category involved scenarios where the victim was being bathed or in a bath-type product(s). This category has the largest number of reported incidents (547 incidents, 83 percent). The largest number of fatalities (352 incidents, 82 percent) and injuries (181 incidents, 85 percent) are associated with bath/bathing. The bath/bathing incidents most frequently involved children less than 12 months old (300 incidents). An additional 167 incidents involved children between the ages of 12 months and 23 months old.

<sup>4</sup> Fatality counts are based on the year of death, which may not necessarily be the same year in which the submersion incident occurred.

<sup>5</sup> Percentages do not add up to 100 due to rounding.

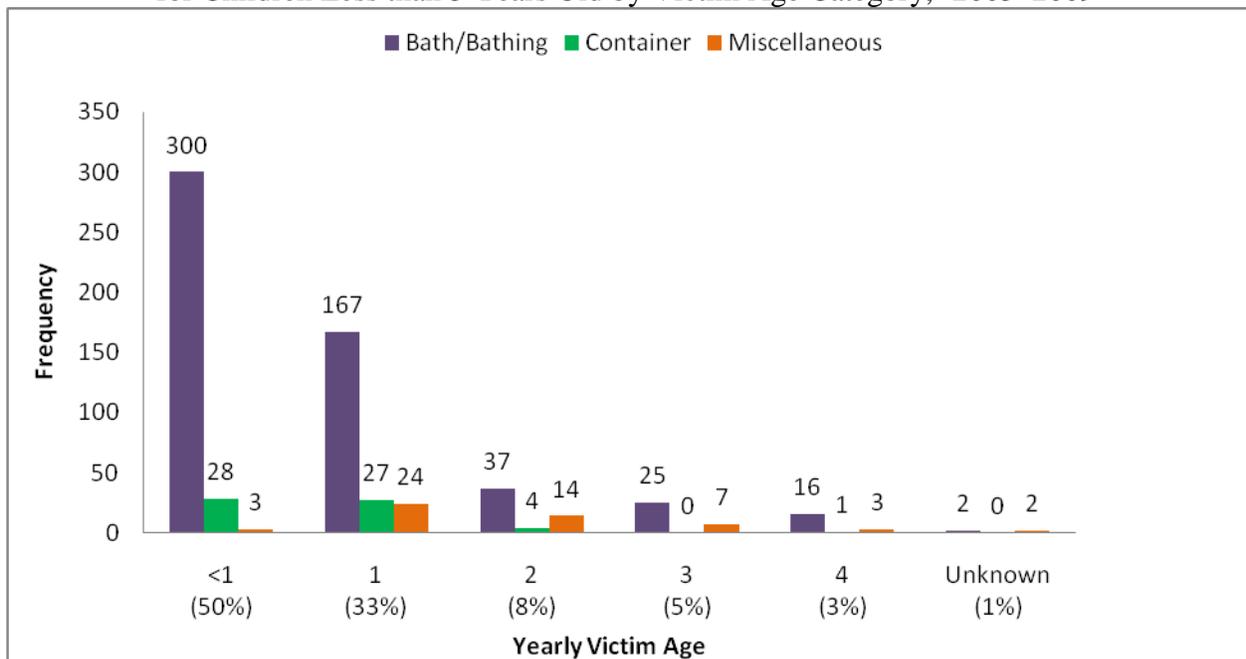
<sup>6</sup> Reporting is ongoing for 2009, 2008, and 2007.

Reported incidents related to containers (60 incidents, 9 percent) involved liquid, usually a water-based solution. Fifty-five of the incidents affected children younger than 2 years old. About half of these children (28 incidents) were younger than 12 months old. A typical scenario associated with a container incident, particularly buckets, involves a child leaning headfirst into the container and toppling forward, submerging at least their face. Compared to bath/bathing incidents, these types of submersions do not usually have the potential for a full-body submersion.

The remainder of the reported incidents (53 incidents, 8 percent) was associated with a range of products, including: decorative ponds/fountains, septic tanks, toilets, and washing machines. Most frequently, these scenarios involved children 12 months old to less than 24 months old (24 incidents) and victims 2 years old to less than 3 years old (14 incidents).

Graph 1 presents the number of reported incidents by victim age for each category.

Graph 1  
Non-Pool & Non-Spa Product-Related Submersions Reported to CPSC Staff  
for Children Less than 5 Years Old by Victim Age Category,<sup>7</sup> 2005–2009



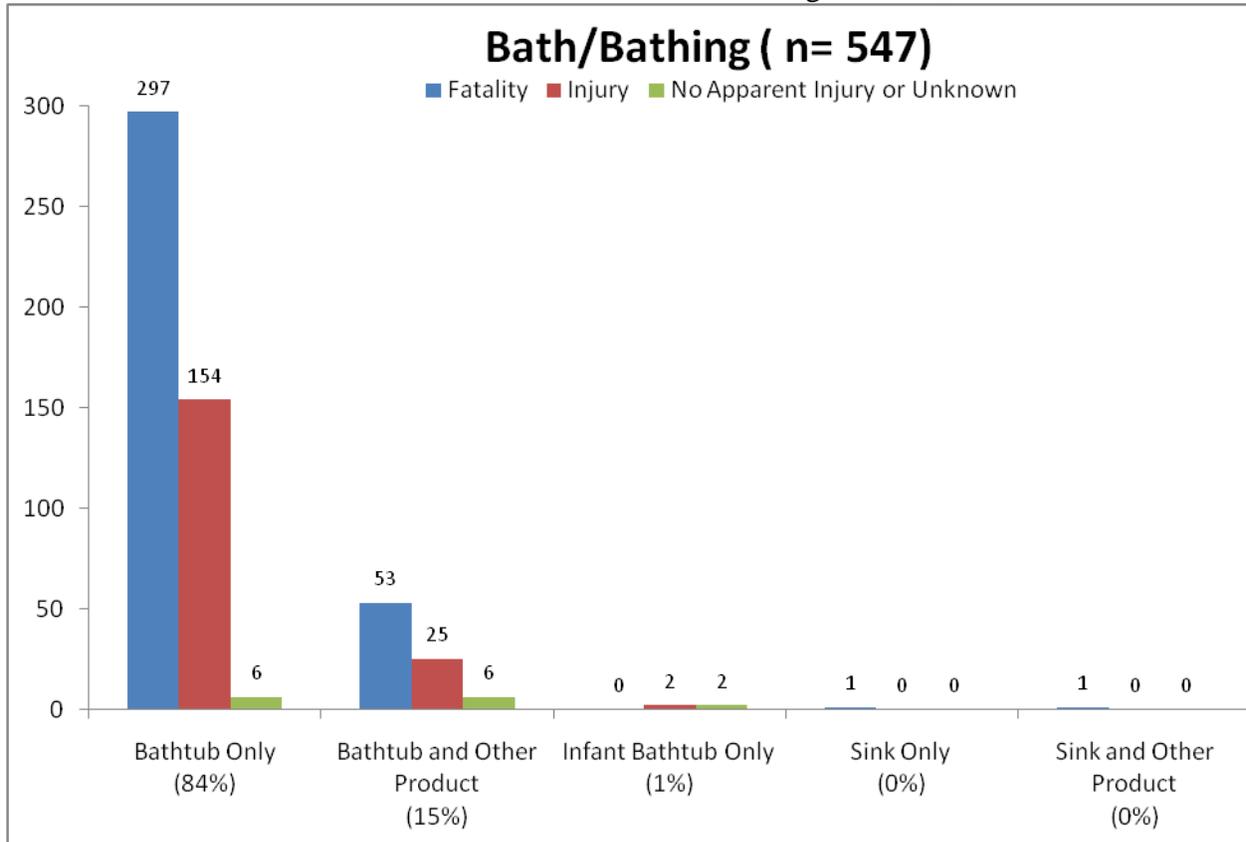
Source: U.S. Consumer Product Safety Commission: National Electronic Injury Surveillance System (NEISS), DTHS (Deaths), IPII (Injury and Potential Injury Incidents), and INDP (In Depth Investigations). IPII, DTHS, and INDP are updated on an ongoing basis. Also note that NEISS data is being used in this report to count incidents and not to generate national estimates. There were too few NEISS incidents to generate annual national injury estimates.

The 547 bath/bathing incidents occurred predominately in full-size bathtubs. Four hundred fifty-seven of these incidents (84 percent) involved full-size bathtubs and did not specify involvement of a bathing aid product. In 15 percent (84 incidents) of the incidents, a

<sup>7</sup> Cases where an age was not given, but the narrative used terms such as: “toddler,” “infant,” “baby,” or “preschooler” that indicated a young child were included.

bathing aid,<sup>8</sup> such as an infant bath seat or bath tub, was used in the full-size bathtub. Fatalities and injuries followed similar patterns for bathtubs (84 percent for fatalities, 85 percent for injuries) and bathtubs with bathing aid products (15 percent for fatalities, 14 percent for injuries). Graph 2 illustrates the number of reported incidents by products in the bath/bathing category.

Graph 2  
 Non-Pool & Non-Spa Product-Related Submersions Reported to CPSC Staff  
 for Children Less than 5 Years Old for Bath/Bathing Products, 2005–2009

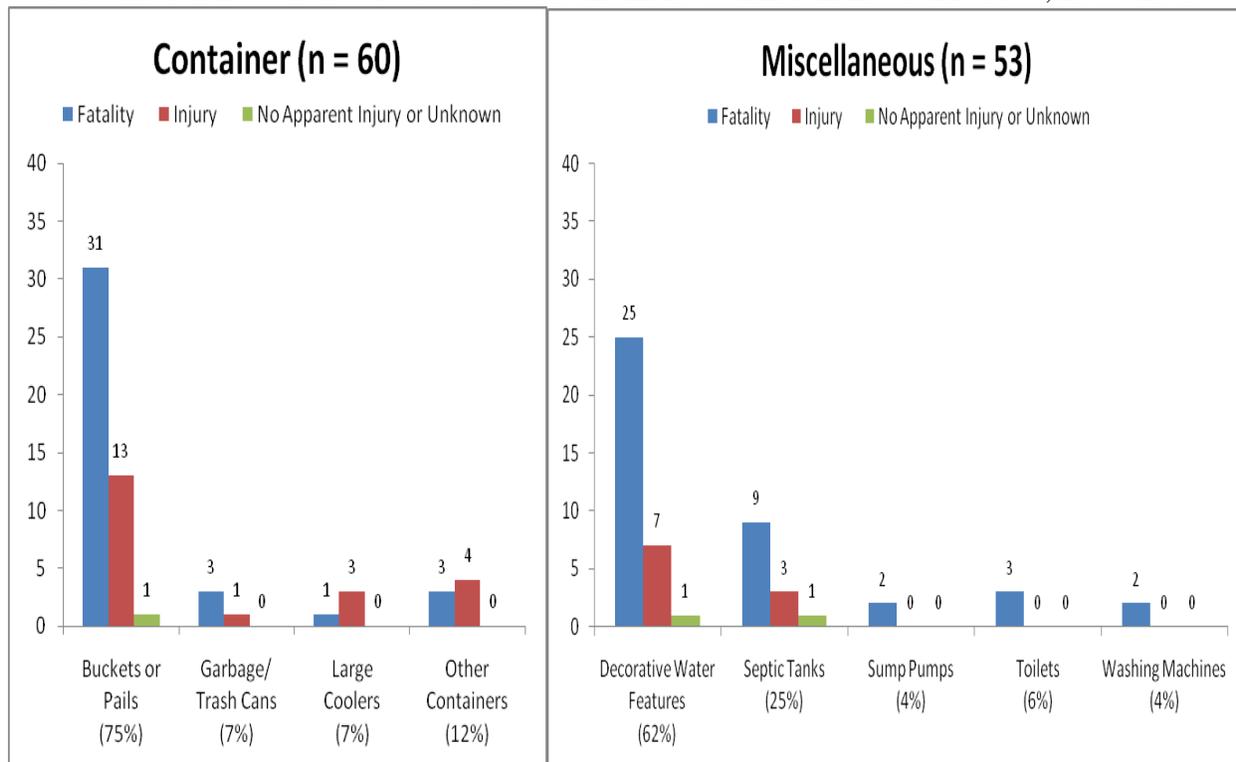


Source: U.S. Consumer Product Safety Commission: National Electronic Injury Surveillance System (NEISS), DTHS (Deaths), IPII (Injury and Potential Injury Incidents), and INDP (In Depth Investigations). IPII, DTHS, and INDP are updated on an ongoing basis. Also note that NEISS data is being used in this report to count incidents and not to generate national estimates. There were too few NEISS incidents to generate annual national injury estimates.

Graph 3 presents the number of container and miscellaneous product incidents by product type. The majority of incidents associated with containers involved buckets or pails (45 incidents, 75 percent). Decorative water features (33 incidents, 62 percent) such as ponds and septic tanks (13 incidents, 25 percent) comprised most of the products in the miscellaneous category.

<sup>8</sup> There were four incidents (2 fatalities and 2 injuries) where the product used in the full-size bathtub was not designed specifically for a bathing environment, such as a booster seat.

**Graph 3**  
**Non-Pool & Non-Spa Product-Related Submersions Reported to CPSC Staff**  
**for Children Less than 5 Years Old for Containers<sup>9</sup> & Miscellaneous Products, 2005–2009**



Source: U.S. Consumer Product Safety Commission: National Electronic Injury Surveillance System (NEISS), DTHS (Deaths), IPII (Injury and Potential Injury Incidents), and INDP (In Depth Investigations). IPII, DTHS, and INDP are updated on an ongoing basis. Also note that NEISS data is being used in this report to count incidents and not to generate national estimates. There were too few NEISS incidents to generate annual national injury estimates.

Analyzing the narratives of incident reports involving bathtubs and bathing-related products for reported deaths (352 incidents) during 2005 through 2009, allowed common scenarios to be classified:

- There was a lapse of supervision for a single child in a bathtub in 134 deaths (31 percent). Many of these incidents reportedly involved caregivers leaving the room temporarily for an activity, such as answering the phone or retrieving an item.
- The victim and another child were left alone temporarily in a bathtub in 90 deaths (21 percent).
- In 13 deaths (3 percent), the children managed to get into the bathtub on their own. Some of these cases involved a child finding their way into a bathtub that had standing water in it, while others managed to turn the water on themselves.
- For 13 deaths (3 percent), it appears that another child (typically older) assisted the victim entering the bath and/or turning on the water.

<sup>9</sup> The other containers were items such as plastic containers, clay pots, cisterns, and paint cans.

- In 16 deaths (4 percent), the scenario is known but does not fit into the categories above. These cases are unusual and do not represent any common hazard scenario. These incidents included cases where there was a lapse in supervision due to a caregiver slipping on the bathroom floor and being knocked unconscious, and where a caregiver in the bathroom was distracted temporarily and did not notice that the child was under water.
- For 86 deaths (20 percent), the submersion occurred in a bathtub, but little or no additional information was available.

The remaining 79 non-pool and non-spa submersion fatalities (18 percent) for 2005 through 2009, which did not involve bathtubs or bathing-related products, also were classified by common scenarios. In 37 deaths (9 percent), the child was found in a product outside the home, such as decorative yard equipment or a bucket containing liquid. Twelve children (3 percent) were found inside the home in a bucket/container or trash basket that was being used for cleaning. Many of these cases involved some type of cleaning solution in the container. In an additional 12 deaths (3 percent), the child was found in another product inside the home, such as a toilet or container. For the remaining 18 deaths (4 percent), a child was found in the product, but there were few details available concerning the exact scenario.

## Appendix Methodology for Submersions Related to Non-Pool and Non-Spa Products

“Drowning” is defined as suffocation and death resulting from the filling of the lungs with water or other substances or fluid, so that gas exchange becomes impossible. A “near drowning” is survival for any length of time after submersion in water and temporary suffocation. “Submersion” is defined as the condition of being under the surface of a liquid.<sup>10</sup> Staff applies this term to incidents where, at a minimum, the nose and mouth are submerged. The term “submersion” best describes the various events that have occurred because a considerable number of children are injured, or do not die immediately.

All percentages in this report are rounded to the nearest integer.

Reported incidents were extracted on January 6, 2011, from the CPSC’s NEISS, IPII, DTHS, and INDP databases for submersions involving children younger than 5 years old or unknown age<sup>11</sup> for the years 2005 to 2009. This was compared against last year’s incidents, to remove incidents that had been reviewed already. Table 2 gives the product codes of interest used for incident identification.

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<sup>10</sup> *Dorland’s Illustrated Medical Dictionary*, 30<sup>th</sup> Edition, Saunders, 2003.

<sup>11</sup> Cases where an age was not given, but the narrative used terms such as: “toddler,” “infant,” “baby,” or “preschooler” that indicated a young child were included.

Table 2  
Product Codes of Interest for Potential Submersion

Product Code	Category	Description
611	Bathing	Bathtubs or showers
648	Bathing	Sinks
1544	Bathing	Baby baths or bathinettes
1557	Bathing	Baby bathtub seats or rings
4030	Bathing	Bathtub or shower enclosures, not specified
413	Container	Waste containers, trash baskets or refuse bins
1107	Container	Other containers
1123	Container	Plastic containers
1141	Container	Containers, not specified
1143	Container	Buckets or pails
1413	Container	Greenhouse or gardening supplies
1715	Container	Pet supplies
3250	Container	Portable food or beverage container
140	Miscellaneous	Washing machines, other or not specified
649	Miscellaneous	Toilets
1417	Miscellaneous	Decorative yard equipment
1466	Miscellaneous	Decorative water feature
1818	Miscellaneous	Cisterns, cesspools or septic tanks
1597	Unknown	Non-poisoning death of victim under age 5

For NEISS and INDP databases, the diagnosis of submersion (69) or the narrative containing the term “drown” or “submer” or the diagnosis of anoxia (65) or aspirated on foreign object (42) or other/not stated (71) in conjunction with any of the product codes in Table 5 were used to extract data. For IPII, the hazard type of submersion (C) or the narrative containing the term “drown” or “submer” or the hazard type of suffocation or strangulation (8) or falls (9) or other (F) or unknown (G) used in conjunction with any of the product codes in Table 5 were used to extract data. For the DTHS database, the International Classification of Diseases, 10<sup>th</sup> Edition (ICD10) codes related to submersion (W16, W29, W65, W66, W73, W74, Y21) or the narrative containing the term “drown” or “submer” or Table 5 product codes were used to extract data.

Each individual database (NEISS, INDP, IPII, and DTHS) was then merged into one database. Cases were screened to remove all pool and spa product codes (698, 1246, 1284, 3221, and 3251). Cases were marked as fatality, injury, or no apparent injury/unknown; and questionable cases were flagged for team review.<sup>12</sup> Records were then associated and duplicate records were removed. Cases were compared against existing databases from last year and merged to ensure all incidents had been captured for 2005 through 2009. Once the incident set was established, the incidents were examined to code the additional characteristics of the scenario.

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<sup>12</sup> The incident review team consisted of Kevin Gipson (Hazard Analysis) and Sandra Inkster, PhD (Health Sciences).