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## **Nursery Product-Related Injuries and Deaths Among Children under Age Five**

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

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## Executive Summary

In this report, the U.S. Consumer Product Safety Commission (CPSC) staff presents the latest available statistics on injuries and deaths associated with nursery products among children under age five.

### Emergency Department Treated Injuries:

- In 2008, there were an estimated 63,700 emergency department treated injuries associated with nursery products among children under age five.
- Strollers/carriages, infant carriers and car seat carriers, cribs/mattresses, and high chairs were associated with the most injuries. Falls were the leading cause of injury; the head was the most frequently injured body part.
- Annual injury estimates associated with nursery products do not display a statistically significant trend over the five-year period 2004-2008.

### Fatalities:

- During the three-year period 2004-2006, CPSC staff has reports of 247 deaths - an annual average of 82 deaths - associated with nursery products among children under age five.
- Cribs/mattresses, baby baths/bath seats/bathinettes, playpens/play yards, bassinets/cradles, and infant carriers and car seat carriers were associated with 88 percent of the fatalities reported.
- Causes of death ranged from positional asphyxia and strangulation to drowning. In some instances, the fatalities were attributed to the product while in other cases the fatality resulted from a hazardous environment in or around the product<sup>1</sup>.

### Note:

During 2009, for both bath seats and infant walkers, CPSC staff evaluated the incidents characterized in this report along with previously reported incidents to assess the efficacy of voluntary standards. These evaluations supported the Commission vote to issue notices of proposed rulemaking (NPRs) for bath seats and infant walkers as required in section 104 of the Consumer Product Safety Improvement Act (CPSIA) of 2008. Staff evaluations of standards for bassinets and toddler beds are underway and schedules have been established for evaluating the other durable nursery products as required by CPSIA.

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<sup>1</sup> Not all of these incidents are addressable by an action the CPSC could take; however, it was not the purpose of this report to evaluate the addressability of the incidents, but rather to update estimates of emergency department treated injuries and to quantify the number of fatalities reported to CPSC staff.

## Introduction

This report presents nursery product-related injury estimates for 2008<sup>2</sup>, as well as comparisons with historic injury estimates. Detailed information on deaths associated with nursery products that were reported to have occurred during the three-year period 2004-2006 is also presented.

## Nursery Product-Related Injury Estimates

There were an estimated 63,700<sup>3</sup> nursery product-related injuries among children under the age of five that were treated in U.S. hospital emergency departments in 2008. Table 1 below shows the estimated injuries for the latest three years as well as the annual average for this three-year period. There was no statistically significant change observed from year to year, nor any significant trend observed over the 2006-2008 period. Annual estimates for 2004 through 2008 are presented in the attached Appendix.

The leading cause of all nursery product-related injuries reported through the National Electronic Injury Surveillance System (NEISS) for 2008 was falls. About 48 percent of the total injuries involved the head, which was the most frequently injured body part.

**Table 1: Estimated Injuries to Children under Age Five Associated with Nursery Products  
2006-2008**

Calendar Year	Estimated Injuries
2006	66,400
2007	62,500
2008	63,700
2006-2008 Average	64,200

Source: NEISS, U.S. Consumer Product Safety Commission (CPSC).

Table 2 shows the breakdown of injury estimates by different product categories. As in 2007, there were more than 30 product codes associated with the injury estimates in 2008. Similar to 2007, the products have been aggregated into 13 product categories that align closely with voluntary standards development activities.

<sup>2</sup> The source of the injury estimates is the National Electronic Injury Surveillance System (NEISS), a statistically valid injury surveillance system. NEISS injury data are gathered from emergency departments of hospitals selected as a probability sample of all the U.S. hospitals with emergency departments. The surveillance data gathered from the sample hospitals enable the CPSC staff to make timely national estimates of the number of injuries associated with specific consumer products.

<sup>3</sup> This estimate has been adjusted to exclude diaper rash from the diaper code.

**Table 2: Estimated Injuries in 2008 among Children under Age Five by Type of Nursery Product**

PRODUCT CATEGORY	ESTIMATED INJURIES CY 2008
TOTAL	63,700
Strollers/Carriages	12,400
Infant Carriers and Car Seat Carriers (Excludes Motor Vehicle Incidents)	11,700
Cribs/Mattresses	11,500
High Chairs	10,300
Baby Walkers/Jumpers/Exercisers	3,600
Changing Tables	3,300
Baby Gates/Barriers	2,200
Baby Bouncer Seats	2,200
Portable Baby Swings	1,600
Playpens/Play Yards	1,400
Bassinets/Cradles	--- <sup>4</sup>
Baby Baths/Bath Seats/Bathinettes	--- <sup>4</sup>
Other <sup>5</sup>	3,800

Source: NEISS, CPSC.

Note: The injury estimates may not add up to the total due to rounding and because two or more nursery products are sometimes associated with a single injury.

## Deaths Associated with Nursery Products

While all of the Commission's databases are used to identify nursery product-related deaths, the death certificates database is the major source. At the time of the writing of this report, the Commission's death certificates database was at least 98 percent complete for 2006 and earlier years. Hence, the deaths reported here are from 2004 through 2006<sup>6</sup>. CPSC staff is aware of a total of 247 deaths - an annual average of 82 deaths - associated with nursery products during this time period. About 38 percent (93 total or about 31 annually) were associated with cribs/mattresses; baby baths/bath seats/bathinettes accounted for a total of 35 deaths (an annual average of 12 deaths), and both playpens/play yards and bassinets/cradles accounted for a total of 33 deaths (an annual average of 11 deaths) respectively. The remaining 53 fatalities were associated with a range of products including infant carriers and car seat carriers, strollers/carriages, and walkers/jumpers, among others.

For certain incident scenarios where direct product involvement or failure was not evident, consultation with engineering staff was necessary to determine the most appropriate product category for the placement of the fatalities. Details of the methodology are provided in the attached Appendix.

Table 3 provides a summary of nursery product-related deaths (total and average annual) for 2004 through 2006, along with annual average deaths for 2003 through 2005 for comparison purposes.

<sup>4</sup> The injury estimates are not presented since they fail to meet standard reporting criteria for NEISS that the estimated number of injuries be 1,200 or higher, sample size be 20 or larger, and coefficient of variation be less than 33 percent.

<sup>5</sup> This category includes baby bottles/nipples, bottle warmers, pacifiers/teething rings, diapers excluding diaper-rash cases, diaper fasteners, infant shoelace fasteners, rattles, crib mobiles/gyms, night lights, potty chairs/training seats, baby scales, and safety pins.

<sup>6</sup> These deaths do not constitute a statistical sample of known probability and do not include all nursery product-related deaths that occurred during the 2004-2006 period. They do, however, provide a minimum figure for deaths associated with nursery products during that time.

**Table 3: Deaths among Children under Age Five by Type of Nursery Product**

PRODUCT CATEGORY	TOTAL DEATHS 2004-2006	AVERAGE ANNUAL DEATHS 2004-2006	AVERAGE ANNUAL DEATHS 2003-2005
TOTAL	247	82	79
Cribs/Mattresses	93	31	30
Baby Baths/Bath Seats/Bathinettes	35	12	13
Playpens/Play Yards	33	11	11
Bassinets/Cradles	33	11	8
Infant Carriers and Car Seat Carriers (Excludes Motor Vehicle Incidents)	24	8	7
Strollers/Carriages	8	3	3
Baby Walkers/Jumpers/Exercisers	5	2	1
Baby Bouncer Seats	4	1	1
Portable Baby Swings	2	< 1	1
Baby Gates/Barriers	2	< 1	1
High Chairs	2	< 1	< 1
Changing Tables	1	< 1	< 1
Other	5	2	2

Source: In-depth Investigation (INDP), Injury and Potential Injury Incident (IPII), Death Certificate (DTHS) and NEISS from 2004 to 2006 for reported deaths; CPSC.

Note: The average annual deaths do not add up to the total due to rounding.

A closer look at the top five categories with the largest numbers of deaths provided some insight into the hazard patterns. These five product categories were associated with 88 percent of the reported fatalities.

Ninety-three deaths were associated with cribs/mattresses between 2004 and 2006. The majority of these deaths were attributed to the presence of bedding in the crib which often led to asphyxiation of the infant. Approximately 38 percent of the deaths resulted from a range of hazards such as incomplete assembly; missing, broken, or non-functioning components; or ineffective repairs made to the crib. Some of these incidents occurred on older, re-assembled, recalled, or second hand cribs. Presence of hazardous surroundings in and around the crib was the next most common cause of crib fatalities. Examples include wedging entrapments between extra mattresses/cushions and the crib frame, strangulations resulting from nearby cords or strings, suffocations in plastic bags present in close vicinity of the crib, among others.

Baby baths/bath seats/bathinettes were associated with 35 deaths between 2004 and 2006. All of the deaths occurred when parent or caregiver attention was diverted away from the infant while the infant was in a bath tub. In the vast majority of the incidents, the infant was left unattended in the tub, sometimes with an older sibling in the tub. Many of these incidents described infants having slipped out of bath seats, fallen out of baby tubs, or tipped forward or sideways into the water.

Thirty-three deaths were reported to have involved playpens/play yards between 2004 and 2006. The majority of the deaths were due to suffocation on bedding. Positional asphyxia from wedging between the mattress and the side of the product and strangulations or suffocations resulting from the presence of a hazardous environment in or around the product accounted for the next largest number of fatalities. More than half of the wedging incidents involved the modification of the sleep area through the addition of extra mattresses and/or cushions.

<sup>7</sup> This category consists of one death due to aspiration on a baby bottle nipple (product code 1509); two deaths due to positional asphyxia, one on a diaper bag (product code 1512) and one in a diaper pail (product code 1528); and two entrapment deaths, with the infant getting wedged between a mattress and portable youth bed rail (product code 4075) in both cases.

There were 33 deaths reported in bassinets/cribels between 2004 and 2006, the majority of which were attributed to bedding. More than half of the suffocation deaths on bedding involved pillows. Entrapment or wedging between the mattress and the bassinet frame was the next most common cause of bassinet-related deaths.

Finally, there were 24 deaths identified during 2004-2006 that were associated with infant carriers and car seat carriers. The majority of these were strangulation deaths resulting from infants becoming entangled in the restraint straps while the second most common scenario involved the carriers tipping over, many of which were placed on soft surfaces.

The hazard patterns above indicate that while a nursery product was involved, many of the fatalities were not directly caused by failures in the product.

## Appendix

### Methodology

#### Injuries:

- Database: National Electronic Injury Surveillance System (NEISS) from 01/01/2008 through 12/31/2008.
- Product codes: 1500-1599.
- Age of victim: 0 through 4 years.
- Screened to ensure that no motor vehicle incidents were included.
- All cases of diaper rash were excluded.
- All cases associated with in-scope product codes were included regardless of the severity of the injury.
- After adding additional years of data (2004 and 2005), statistical tests were performed to determine if any trends exist. While there was a significant increase from 2005 to 2006 (p-value=0.0310<sup>8</sup>), there was no statistically significant trend observed from 2004 to 2008 (p-value=0.7103).

#### Deaths:

- Databases: National Electronic Injury Surveillance System (NEISS), Injury or Potential Injury Incidents (IPII), In-Depth Investigations (INDP), and Death Certificates (DTHS) from 01/01/2004 through 12/31/2006.
- Product codes: 1500-1558; 4074 for *children's chairs* and 4075 for *portable youth bed rails*.
- Age of victim: 0 through 4 years.
- Screened to ensure no duplicates were included; all records of the same incident that were reported through different data sources were associated.
- Miscoded products were correctly recoded. A common example was a playpen miscoded as a crib.
- Careful screening was performed to determine if cases were in or out of scope. An example of an out of scope case would be an incident where no direct or circumstantial information was available to determine how the death occurred or if Sudden Infant Death Syndrome (SIDS) was mentioned in the official report.

In some cases that were considered in scope, the death was not directly associated with the nursery product. However, hazards in the vicinity of the product, often inadvertently created by caregivers, led to the deaths. For instance, soft bedding inside the crib, cords hanging from window blinds or baby monitors, and curtain tie-backs within easy reach from the crib, have led to some deaths. These deaths have been included with crib deaths. Similarly, placement of toys and other soft clothing/bedding inside the playpen, alteration of the setup of the playpen for easy access to the child, or placement of objects on top of the playpen to keep the child inside, have led to some fatalities. These have been counted with playpen deaths. While these deaths were not strictly due to product failure, they highlight some common misconceptions and oversights in the usage of these products and were therefore included.

Any report to CPSC of a nursery product-related incident that occurred outside of the U.S.A. was excluded.

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<sup>8</sup> NEISS data updates performed in 2009 have affected some of the data from earlier years, including nursery product-related data from 2005-2006. As such, the p-value computations for comparing 2005 and 2006 estimates now yield a slightly different result compared to what was reported (p-value=0.0287) in earlier memos (R. Chowdhury, "Nursery Product-Related Injuries and Deaths among Children under Five," CPSC, February 2008, and R. Chowdhury, "Nursery Product-Related Injuries and Deaths among Children under Five," CPSC, February 2009).

- Deaths involving certain products were grouped together. For instance, baby baths and bathinettes were counted together with bath seats; exercisers were counted with baby walkers and jumpers; and as noted in the previous bullet, any soft-bedding-in-crib incidents were counted with cribs while soft-bedding-in-playpen incidents were counted with playpens.

### Historical Data

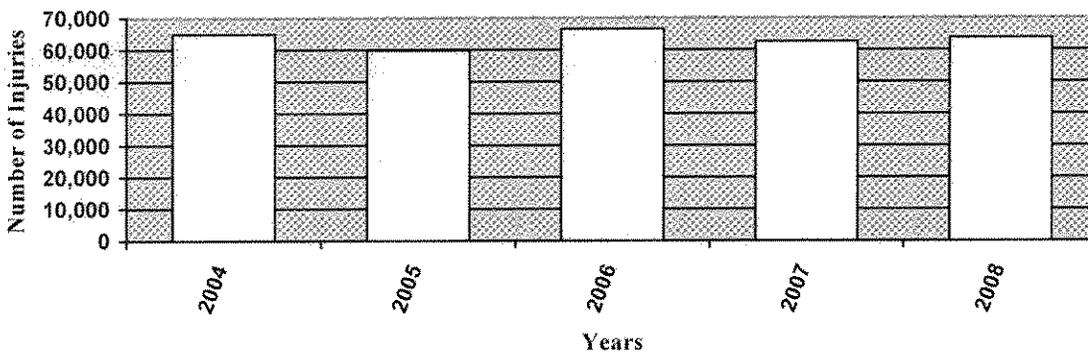
Injury estimates for the last five years for which data is available are presented in the table and chart below. Statistical tests indicate no significant trend in the data over the five year period 2004-2008 (p-value=0.7103).

**Nursery Product-Related Emergency Department Treated Injury Estimates: 2004-2008**

Calendar Year	Estimated Injuries	95% Confidence Interval
2004	64,900	52,000-77,800
2005	59,800	48,500-71,100
2006	66,400	53,000-79,800
2007	62,500	51,400-73,600
2008	63,700	50,000-77,400

Source: NEISS, CPSC. Estimates rounded to nearest 100.

**Nursery Product-Related Emergency Department Treated Injury Estimates: 2004-2008**



Source: NEISS, CPSC. Estimates rounded to nearest 100.