



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

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Table of Contents

Executive Summary	3
Introduction	4
Nursery Product-Related Injury Estimates	4
Table 1: Estimated Injuries to Children under Age Five Associated with Nursery Products 2004-2006	4
Table 2: Estimated Injuries in 2006 among Children under Age Five by Type of Nursery Product..	5
Deaths Associated with Nursery Products	5
Table 3: Deaths among Children under Age Five by Type of Nursery Product	6
Appendix	8
Methodology	8
Historical data	9
Table: Nursery Product-Related Emergency Department Treated Injury Estimates 2002-2006.....	9
Figure: Nursery Product-Related Emergency Department Treated Injury Estimates 2002-2006.....	9

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.

- In 2006, there were an estimated 66,400 emergency department treated injuries associated with nursery products among children under age five.
- Infant carriers/car seats, cribs/mattresses, and strollers/carriages were associated with the most injuries. Falls were the leading cause of injury; the head was the most frequently injured body part.
- During the three-year period 2002-2004, CPSC staff has reports of 241 deaths - an annual average of 80 deaths - associated with nursery products among children under age five.
- Cribs, baby baths/bath seats, and playpens were associated with most of the deaths.

For nursery product-related injuries and deaths, it is important to note that many of the incidents were associated with a nursery product but not necessarily caused by the product.

Introduction

This report presents nursery product-related injury estimates for 2006¹, as well as comparison with historic injury estimates. Detailed information on deaths associated with nursery products that were reported to have occurred during the three-year period 2002-2004 is also presented.

Nursery Product-Related Injury Estimates

There were an estimated 66,400² nursery product-related injuries among children under the age of five that were treated in U.S. hospital emergency departments in 2006. Table 1 below shows the estimated injuries for the latest three years as well as the annual average for this three-year period. While there was no trend observed over the 2004-2006 period, there was a statistically significant increase in the estimated total injuries from 2005 to 2006 (p-value=0.0287). Annual estimates for 2002 through 2006 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 2006 was falls. About 42% 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
2004-2006**

Calendar Year	Estimated Injuries
2004	64,900
2005	59,800
2006	66,400
2004-2006 Average	63,700

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

Table 2 shows the breakdown of injury estimates by different product categories. In 2006, there were more than 30 product codes associated with the injury estimates. They were aggregated into 13 product categories after consultation with engineering (ES) staff at CPSC. The product categories align closely with voluntary standards development activities.

When compared with the 2005 injury estimates, the 2006 injury estimates show some increase in certain product categories such as high chairs, cribs, walkers, and changing tables. However, some of these product categories are not strictly comparable because of the new grouping protocol followed for 2006. For instance, crib mattresses are now included with cribs and baby exercisers are included with walkers and jumpers. In 2005, mattresses and exercisers were included in the "Other" category. The "Other" category in 2006 includes some new products (such as diaper pails and baby scales) that were not involved in 2005. It is important to note, however, that while nursery products were involved in these incidents, the incidents were not necessarily caused by failure of the products.

¹ 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.

² This estimate has been adjusted to exclude diaper rash from the diaper code.

Table 2: Estimated Injuries in 2006 among Children under Age Five by Type of Nursery Product

PRODUCT CATEGORY	ESTIMATED INJURIES CY 2006
TOTAL	66,400
Infant Carriers and Car Seats (Excludes Motor Vehicle Incidents)	14,200
Cribs and Mattresses	11,300
Strollers and Carriages	11,100
High Chairs	9,900
Baby Walkers, Jumpers, and Exercisers	4,000
Changing Tables	3,800
Baby Bouncer Seats	2,100
Baby Gates and Barriers	2,000
Portable Baby Swings	1,600
Playpens and Play Yards	1,100
Baby Baths, Bath Seats, and Bathinettes	--- ³
Bassinets and Cradles	--- ³
Other ⁴	5,300

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 90% complete for 2004 and earlier years. Hence, the deaths reported here are from 2002 through 2004⁵. There were a total of 241 deaths - an annual average of 80 deaths - associated with nursery products during this time period. About 40 percent (97 total or about 32 annually) were associated with cribs; baby baths and bath seats accounted for a total of 36 deaths (an annual average of 12 deaths) and playpens accounted for a total of 32 deaths (an annual average of 11 deaths). The remaining 76 fatalities were associated with a range of products including bassinets and cradles, infant carriers, strollers and carriages, and bouncer seats, among others.

For certain incident scenarios where direct product involvement or failure was not evident, consultation with the ES staff was necessary to determine the most appropriate product category for the placement of the fatalities. The convention followed was slightly different from that in an earlier memo titled "Nursery Product-Related Injuries and Deaths to Children under Age Five" by Joyce McDonald (EPHA) dated June 28, 2006. Details of the current methodology are provided in the attached Appendix.

Table 3 provides a summary of nursery product-related deaths (total and average annual) for 2002 through 2004, along with annual average deaths for 2001 through 2003. The deaths from the 2001-2003 period presented here were identified using the current methodology as well and are somewhat different from those reported in the 2006 EPHA nursery product memo. Reasons for the differences are explained in the Appendix.

³ The injury estimates are not presented since they are based on very small sample counts and associated with high coefficients of variation.

⁴ This category includes baby bottles/nipples, bottle warmers/sterilizers, pacifiers/teething rings, diapers and diaper pails, baby scales, rattles, youth chairs, youth bed rails, night lights, potty chairs/training seats, baby harnesses, infant shoelace fasteners, diaper fasteners, and safety pins.

⁵ These deaths do not constitute a statistical sample of known probability and do not include all nursery product-related deaths that occurred during the 2002-2004 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 2002-2004	AVERAGE ANNUAL DEATHS 2002-2004	AVERAGE ANNUAL DEATHS 2001-2003
TOTAL	241	81	80
Cribs and Mattresses	97	32	32
Baby Baths, Bath Seats, and Bathinettes	36	12	13
Playpens and Play Yards	32	11	11
Bassinets and Cradles	28	9	9
Infant Carriers and Car Seats (Excludes Motor Vehicle Incidents)	17	6	7
Strollers and Carriages	9	3	1
Baby Bouncer Seats	6	2	2
Portable Baby Swings	4	1	1
Baby Walkers, Jumpers, and Exercisers	3	1	1
High Chairs	2	1	2
Changing Tables	1	< 1	< 1
Baby Gates and Barriers	1	< 1	< 1
Other ⁶	5	2	1

Source: In-depth Investigation (INDP), Injury and Potential Injury Incident (IPII), Death Certificate (DTHS) and NEISS from 2002 to 2004 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.

Ninety-seven deaths were associated with cribs between 2002 and 2004. Of these, 46 deaths (47%) were attributed to soft bedding and, occasionally, sibling overlay. Another 13 incidents (13%) were attributed to other accessories situated in or around the crib. These included, but were not limited to, window blind cords, curtain tie backs, baby monitor cords, humidifier cords, and pacifier ribbons. Twenty-four deaths (25%) resulted from the use of cribs with broken or missing components, and another six deaths (6%) were results of infants getting wedged in small spaces like that between an ill-fitting mattress and the crib rail. There were three deaths where infants fell out of the crib and two deaths which resulted from alterations made to the cribs, contrary to manufacturers' suggested guidelines. The three remaining deaths occurred when children were trapped between the crib and another piece of furniture or the wall.

Baby baths and bath seats were associated with 36 deaths between 2002 and 2004. All of the deaths occurred when parents or caregivers left the infant 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.

There were 32 deaths reported in playpens or play yards between 2002 and 2004. Ten of the 32 deaths resulted from the use of soft bedding in playpens leading to asphyxiation or suffocation. Another death resulted from the use of a sleeping accessory that may have compromised the infant's ability to maneuver out of a position in which she suffocated. Six deaths from asphyxiation or suffocation resulted from incorrect or intentionally altered installation of playpens. One additional death resulted from the child managing to unlatch and collapse the playpen trapping himself inside. The use of ill-fitting mattresses or cushions led to infants getting wedged in the small space between the mattress and the side of the playpen

⁶ This category consists of portable youth bed rails, coded under product code 4074.

in six cases. There were six strangulation deaths resulting from non-playpen-related cords or ropes, such as window blind cords, electrical wires, or toy attachment cords situated in the vicinity of the playpen. One death resulted from an infant rolling into a small storage space that was located between the mattress and side webbing of the playpen. Another death resulted from the child getting entrapped between the top rail of the playpen and an adjacent piece of furniture.

The next product category is bassinets and cradles. There were 28 deaths in this category during 2002-2004, most (22 out of 28) of which were attributed to the use of soft bedding. There were three deaths from falls out of the bassinets and two deaths from infants becoming wedged between the mattress and the side of the bassinet. The last death occurred when a child was asphyxiated due to the collapse of the bassinet.

Finally, there were 17 deaths identified during 2002-2004 that were associated with infant carriers and car seats. There were eight strangulation deaths from infants becoming entangled in the restraint straps. Two other deaths occurred when seats were placed on soft surfaces and they tipped sideways or backwards. These infants got caught either in the straps or in the gaps between different seat parts. There were two deaths caused by positional asphyxia; one resulted from the seat tipping over inside a playpen and the other resulted from the seat tipping sideways due to failure to secure it into the car seat base. One infant died of suffocation while being carried around in a sling-like carrier. One infant drowned when left unattended and unbuckled in a seat, in a bath tub with water running. One infant's seat that was placed on top of the stove caught on fire when the stove was inadvertently lit; the child died of smoke inhalation. The last two deaths were due to positional asphyxia but details of the circumstances were incomplete; one mentioned the seat tipping over and the other mentioned the infant being found in an upside down position in the seat.

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 01/01/2006 through 12/31/2006.
- 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 (2002 and 2003), statistical tests were performed to determine if any trends exist. While there was a significant increase from 2005 to 2006 (p-value=0.0287), there was no statistically significant trend observed from 2002 to 2006 (p-value=0.4414).

Deaths:

- Databases: National Electronic Injury Surveillance System (NEISS), Injury or Potential Injury Incidents (IPII), In-Depth Investigations (INDP), and Death Certificates (DTHS) from 01/01/2002 through 12/31/2004.
- Product codes: 1500-1599; 4074 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, or cords hanging from window blinds/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.

- 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. These groupings were different from those used in analyses of nursery product-related hazards in previous years.
- The deaths for 2001-2003 were recalculated using the steps above and presented in this report for comparison purposes. The recalculated death counts for 2001-2003 presented in Table 3 are

comparable to those for 2002-2004. However, when compared with the 2001-2003 death data presented in the 2006 EPHA memo, they differ substantially in some product categories. One reason for this is the difference in product groupings that have been used in the two methodologies. Another reason is the difference in the data extraction method used. Under the current methodology, to obtain the death counts for the 2001-2003 period, the data for 2001 and 2002 were extracted anew from the various CPSC databases rather than using data previously extracted for the 2000-2002 analysis. As such, many new records were identified that were not among the records included in the previous version of the 2001-2003 analysis.

Historical Data

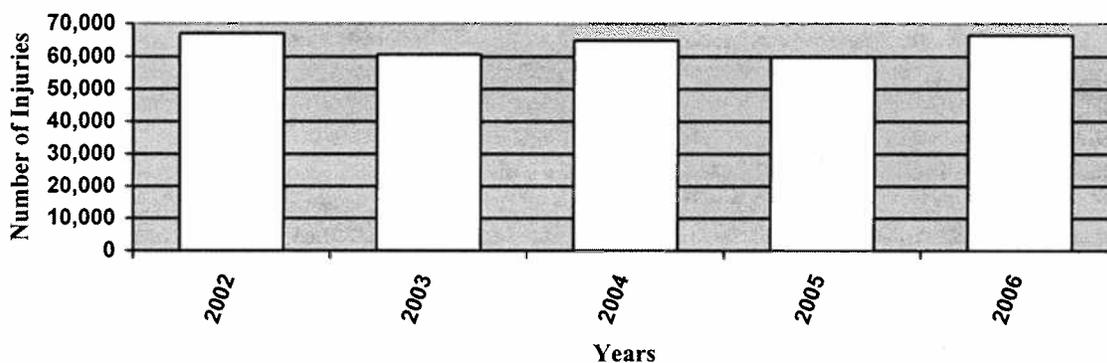
Injury estimates for the latest five available years are presented in the table and chart below. Statistical tests indicate no significant trend in the data over the five year period 2002-2006 (p-value=0.4414).

Nursery Product-Related Emergency Department Treated Injury Estimates; 2002 - 2006

Calendar Year	Estimated Injuries	95% Confidence Interval
2002	67,000	54,800-79,300
2003	60,700	50,500-70,900
2004	64,900	52,000-77,800
2005	59,800	48,500-71,100
2006	66,400	53,000-79,800

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

Nursery Product-Related Emergency Department Treated Injury Estimates; 2002 - 2006



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