Injuries and Deaths Associated with Nursery Products Among Children Younger than Age Five

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Executive Summary

In this report, U.S. Consumer Product Safety Commission (CPSC or Commission) staff presents information regarding injuries and deaths associated with nursery products among children younger than the age of five years based on the most recently available statistics.

Emergency Department-Treated Injuries:

- In 2012, there were an estimated 77,900 emergency department-treated injuries associated with, but not necessarily caused by, nursery products among children younger than age five.

- Cribs/mattresses, high chairs, infant carriers/car seat carriers, and strollers/carriages were associated with about 67 percent of the injuries. Falls were the leading cause of injury, and the head, followed by the face, were the body parts injured most frequently. Internal organ injuries, contusions/abrasions, and lacerations accounted for 73 percent of the injuries.

- Annual estimates of injuries associated with nursery products do not display a statistically significant trend over the five-year period 2008–2012.

Fatalities:

- For the three-year period 2008–2010, CPSC staff has reports of 333 deaths—an annual average of 111 deaths—associated with, but not necessarily caused by, nursery products among children younger than age five. Reporting is ongoing, and the number of reported fatalities may change in the future.

- Cribs/mattresses, bassinets/cradles, playpens/play yards, infant carriers/car seat carriers, and baby baths/bath seats/bathinettes were associated with 89 percent of the fatalities reported.

- Causes of death included positional asphyxia, strangulation, and drowning, among others. In some instances, the fatalities were attributed to the product; while in other cases, the fatalities resulted from a hazardous environment in or around the product.[1]

For many durable infant and toddler products, CPSC staff has been evaluating the incidents characterized in the annual reports on nursery products, along with previously and subsequently reported incidents, to assess the efficacy of voluntary standards. These evaluations have supported the Commission's votes to issue notices of proposed rulemakings (NPRs) and final rules as required by the Danny Keysar Child Product Safety Notification Act, section 104 of the Consumer Product Safety Improvement Act (CPSIA) of 2008. In 2013, the Commission voted to issue NPRs for soft infant carriers and strollers; the agency also voted on a final rule establishing a new standard for bassinets, as well as an amendment to the play yard final rule. In addition, a new federal rule on portable infant swings went into effect on May 7, 2013. Staff evaluations of voluntary standards for bedside sleepers, soft infant carriers, slings, and frame carriers, are under way. Many of these evaluations contribute to the CPSC's Safe Sleep campaign, which is aimed at helping parents and caregivers create the safest sleep environment possible for young children: http://www.cpsc.gov/en/Safety-Education/Safety-Education-Centers/cribs/

[1] 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 2012,[2] as well as comparisons with historic injury estimates. Detailed information on deaths associated with nursery products that reportedly occurred during the three-year period from 2008 to 2010, is also presented; reporting is ongoing, and the number of reported fatalities may change in the future.

Nursery Product-Related Emergency Department-Treated Injury Estimates

There were an estimated 77,900 nursery product-related injuries among children younger than five years old that were treated in U.S. hospital emergency departments in 2012. Table 1 shows the estimated injuries for the latest three years, as well as the annual average for this three-year period. The increase in the injury estimate from 2011 to 2012 was not statistically significant. The trend in injury estimates observed over the 2010 to 2012 period was not statistically significant either. Annual estimates for 2008 through 2012 are presented in the attached Appendix.

As in previous years, falls were the leading cause of all nursery product-related injuries reported through the National Electronic Injury Surveillance System (NEISS) for 2012. Sixty-eight percent of the total injuries involved the head and the face, which were the body parts injured most frequently. Internal organ injuries, contusions/abrasions, and lacerations accounted for 73 percent of the NEISS-reported injuries.

Table 1: Estimated Emergency Department-Treated Injuries to Children Younger than Age Five Associated with Nursery Products 2010–2012

Calendar Year	Estimated Emergency Department-Treated Injuries
2010	81,700
2011	74,100
2012	77,900
2010–2012 Average	77,900*

Source: NEISS, U.S. Consumer Product Safety Commission (CPSC).
* The average calculation is based on unrounded injury estimates, with the result rounded to the nearest 100.

Table 2 shows the breakdown of injury estimates by different product categories for 2012, along with the comparable injury estimates for 2011, for comparison purposes. As in 2011,[3] there were more than 30 product codes associated with the injury estimates in 2012. Similar to 2011, the associated products have been aggregated into 13 product categories that align with voluntary standards development activities. The top four categories, cribs/mattresses, high chairs, infant carriers/car seat carriers, and strollers/carriages, were associated with about 67 percent of the injuries.

[2] 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 the 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 enables CPSC staff to make timely national estimates of the number of injuries associated with specific consumer products.
[3] R. Chowdhury, "Injuries and Deaths Associated with Nursery products Among Children Younger than Age Five," CPSC, December 2012, http://www.cpsc.gov//PageFiles/136143/nursery11.pdf, p.4.

Overall, there was an increase in the total injury estimate from 2011 to 2012, but the increase was not statistically significant. Among the observed changes in the emergency department-treated injury estimates in specific product categories between the two years were seven increases and four decreases. The largest increases involved cribs/mattresses (increased from 12,200 to 14,100), high chairs (increased from 11,300 to 13,200), and changing tables (increased from 3,900 to 5,100). None of these increases was statistically significant. There was also a decrease in injuries in baby bouncer seats (decreased from 4,200 to 3,500); the change was not statistically significant either.

Table 2: Estimated Emergency Department-Treated Injuries to Children Younger than Age Five By Type of Nursery Product

PRODUCT CATEGORY	ESTIMATED EMERGENCY DEPARTMENT-TREATED INJURIES	
	2012	2011
TOTAL	77,900	74,100
Cribs/Mattresses	14,100	12,200
High Chairs	13,200	11,300
Infant Carriers/Car Seat Carriers (Excludes Motor Vehicle Incidents)	13,000	13,200
Strollers/Carriages	12,300	12,900
Changing Tables	5,100	3,900
Baby Bouncer Seats	3,500	4,200
Baby Walkers/Jumpers/Exercisers	2,900	3,300
Baby Gates/Barriers	2,900	2,800
Portable Baby Swings	2,500	2,100
Playpens/Play Yards	2,300	2,200
Baby Bottles/Warmers/Sterilizers	1,800	1,800
Bassinets/Cradles	---[4]	---[4]
Baby Baths/Bath Seats/Bathinettes	---[4]	---[4]
Other[5]	3,800	3,500

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

Although all of the Commission's databases are used to identify nursery product-related deaths, the death certificates database is the major source of information for this analysis. As this report was being written, the Commission's death certificates database was at least 92 percent complete for each year in the period from 2008 through 2010. As done in the annual nursery product reports from earlier years, the deaths reported here are from 2008 through 2010, the latest three-year time frame with sufficiently available information.[6]

[4] The injury estimates are not presented because they fail to meet standard reporting criteria for NEISS that the estimated number of injuries be 1,200 or higher, the sample size 20 or larger, and the coefficient of variation less than 33 percent.
[5] In both 2011 and 2012, the "Other" category included: pacifiers/teething rings, diapers (excluding diaper rash cases), diaper pails, rattles, night lights, crib mobiles, potty chairs/training seats, and safety pins.
[6] These deaths do not constitute a statistical sample of known probability and do not necessarily include all nursery product-related deaths that occurred during the 2008–2010 period. However, they do provide at least a minimum number for deaths associated with nursery products during that time.

CPSC staff has received reports of a total of 333 deaths—an annual average of 111 deaths—associated with nursery products during this time period. About 43 percent (144 total or an annual average of about 48) were associated with cribs/mattresses. Bassinets/cradles accounted for 18 percent (61 total, or an annual average of 20) of the reported deaths. Playpens/play yards were associated with 12 percent (a total of 41 or an annual average of 14) of the reported deaths while infant carriers/car seat carriers were associated with 11 percent (a total of 36 or an annual average of 12) of the reported deaths; and baby baths/bath seats/bathinettes accounted for five percent (a total of 15 or an annual average of five) of the reported deaths. The remaining 36 reported fatalities were associated with a range of products, including bouncer seats, portable swings, and baby gates/barriers, among others.

For certain incident scenarios where direct product involvement or failure was not evident, consultation with staff from the CPSC's Directorate for Engineering Sciences was necessary to determine the most appropriate product category for the placement of the fatalities. In addition, staff from the CPSC's Directorate for Health Sciences reviewed the hazard scenarios of fatalities involving cribs, play yards, and bassinets. Details of the methodology are provided in the attached Appendix.

Table 3 provides a summary of nursery product-related reported deaths (total and average annual) for 2008 through 2010, along with data previously reported for 2007 through 2009, for comparison purposes. Reporting is ongoing, and the number of reported fatalities may change in the future. Moreover, these reports are anecdotal and do not constitute a statistical sample or a complete count of nursery product-related deaths. As such, CPSC staff strongly discourages the drawing of any inferences based on the year-to-year increase or decrease shown in the reported data.

A closer look at the top five product categories with the largest numbers of reported deaths provides some insight into the hazard patterns. These five product categories were associated with 89 percent of the reported fatalities.

Between 2008 and 2010, 144 deaths were associated with cribs/mattresses. The majority of these deaths were attributed to the presence of extra bedding in the crib, which led to asphyxiation of the infant. Approximately 18 percent of the deaths resulted from a range of hazards associated with the crib, including incomplete assembly; missing, broken, or nonfunctioning components; or ineffective crib repairs. Some of these incidents occurred in, or on, older, reassembled, recalled, or secondhand cribs. The next most common cause of crib fatalities involved the presence of hazardous crib surroundings. Examples include: wedging entrapments between extra mattresses/cushions and the crib frame; strangulations resulting from nearby cords or strings; and suffocations from plastic bags located in close proximity to the crib.

There were 61 deaths reported in bassinets/cradles between 2008 and 2010, the majority of which were attributed to extra bedding. Many of the suffocation deaths from bedding involved pillows. A handful of bassinet-related deaths involved product failure and/or the presence of hazardous surroundings around the bassinet.

Playpens/play yards were associated with 41 deaths between 2008 and 2010. Most of the deaths were asphyxiations, where the infant suffocated on extra bedding placed inside the play yard. The next most common scenario was the presence of a hazardous environment in or around the product. These included the placement of improvised covers on the play yard; easy access to cords from window coverings; and the use of non-fitting mattresses and sofa cushions in the play yards. A few of the fatalities involved faulty products as well.

There were 36 deaths identified during 2008–2010 that were associated with infant carriers and car seat carriers. Strangulation deaths resulting from infants becoming entangled in the restraint straps was the most common scenario. Hazardous placement of the infant in the carrier or of the carrier itself with the infant in it was the next most common scenario. Examples include an unrestrained infant being left unsupervised for an extended period of time, who subsequently was able to get into a compromising position resulting in death; and placement of an occupied carrier on top of a stove that was turned on inadvertently. In addition, there were a few fatalities resulting from infant carriers tipping over when placed on nonrigid surfaces.

Finally, baby baths/bath seats/bathinettes were associated with 15 deaths between 2008 and 2010. All of the deaths occurred when parent or caregiver attention was diverted from the infant while the infant was in a bath tub. In the majority of these incidents, the infant was left unattended in the tub, sometimes with an older sibling in the tub. Many of these incidents were described as infants slipping out of bath seats, falling out of baby bath tubs, or tipping forward or sideways into the water.

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

Table 3: Reported Deaths among Children Younger than Age Five By Type of Nursery Product

PRODUCT CATEGORY	TOTAL DEATHS		AVERAGE ANNUAL DEATHS	
	2008-2010	2007-2009	2008-2010	2007-2009
TOTAL	333	341	111	114
Cribs/Mattresses	144	148	48	49
Bassinets/Cradles	61	61	20	20
Playpens/Play Yards	41	37	14	12
Infant Carriers/Car Seat Carriers (Excludes Motor Vehicle Incidents)	36	37	12	12
Baby Baths/Bath Seats/Bathinettes	15	22	5	7
Baby Bouncer Seats	5	5	2	2
Portable Baby Swings	5	4	2	1
Baby Gates/Barriers	4	4	1	1
High Chairs	3	4	1	1
Strollers/Carriages	3	3	1	1
Changing Tables	2	3	1	1
Baby Walkers/Jumpers/Exercisers	1	3	<1	1
Other[7]	13	10	4	3

Source: CPSC epidemiological databases: In-depth Investigations (INDP), Injury and Potential Injury Incidents (IPII), Death Certificates (DTHS), and NEISS from 2008 to 2010 for reported deaths.
Note: The average annual deaths do not add up to the total due to rounding.

[7] Of the 13 deaths in this category in 2008–2010, nine were suffocations involving products used in the sleep environment. Among the nine, three deaths involved a cloth-covered, shared-sleep product; two deaths occurred in infant hammocks; two deaths involved an inclined, foam sleep product which was being used inside a crib; one death was in a collapsible, fabric travel bed; and one death resulted from a fall out of a toddler bed (product code 4082) onto soft bedding. Additionally, there were two drowning deaths when an infant was left unattended on a non-bathing baby seat (product code 4074) in a water-filled bathtub. There was one death from an infant choking on the nipple of a baby bottle (product code 1509) and one death due to a pacifier (product code 1525) getting lodged in the infant's mouth the wrong way. See: http://www.cpsc.gov//PageFiles/136143/nursery11.pdf, p. 6, for a list of deaths in the "Other" category in 2007–2009.

Appendix

Methodology

Injuries:

- Database: NEISS from 01/01/2012 through 12/31/2012.
- Product codes: 1500–1599, excluding 1550.
- 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 (2008 and 2009), statistical tests were performed to determine if any trends exist. While there was a significant change between consecutive years for some of the years (increase from 2008 to 2009: p-value=0.0003, decrease from 2010 to 2011: p-value=0.0091), there was no statistically significant trend observed from 2008 to 2012 (p-value=0.1044).

Deaths:

- Databases: NEISS, IPII, INDP, and DTHS from 01/01/2008 through 12/31/2010.

  Information available from NEISS, IPII, and DTHS on incidents that have not been investigated is often incomplete or provides insufficient information on the hazard scenario. If these incident reports are investigated at a later date, or as other associated reports come in, the initial information is corroborated or contradicted, and the fatality numbers reported may change.

- Product codes: 1500–1558 excluding 1550; 4074 for *children's chairs*, 4075 for *portable youth bed rails,* and 4082 for *toddler beds*.
- Age of victim: 0 through 4 years old.
- 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 recoded correctly. A common example was a playpen miscoded as a crib.
- Careful screening was performed to determine if cases were in scope 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 associated directly with the nursery product. However, hazards in the vicinity of the product, often created inadvertently by caregivers, led to the deaths. For instance, extra bedding inside the crib, cords from window coverings, which were within easy reach of the crib, have led to some deaths. These deaths have been included with crib deaths. Similarly, clutter and extra bedding inside the play yard or placement of objects on top of the play yard to keep the child inside have led to some fatalities. These have been counted with play yard deaths. While these deaths were not due strictly to product failure, they highlight some common misconceptions and oversights in the use of these products, and therefore, we included them.

Any report to the CPSC of a nursery product-related incident that occurred outside of the United States was excluded.

- 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 above, any extra-bedding-in-crib incidents were counted with cribs, while extra-bedding-in-play yard incidents were counted with play yards.

Historical Data

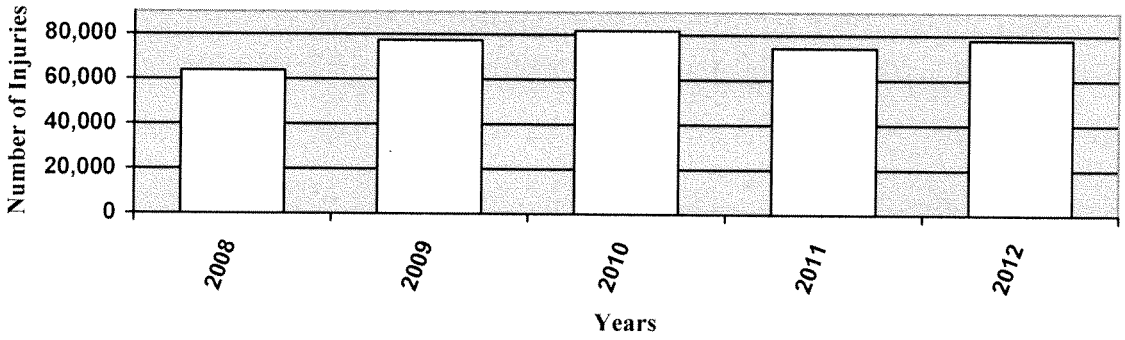
Injury estimates for the last five years, for which data is available, are presented in the table and chart below. Statistical tests indicate no significant trend in the data over the five year period 2008–2012 (p-value=0.1044).

Table 4: Nursery Product-Related Emergency Department-Treated Injury Estimates 2008–2012

Calendar Year	Estimated Injuries	95% Confidence Interval
2008	63,700	50,000–77,400
2009	77,300	60,100–94,500
2010	81,700	66,000–97,400
2011	74,100	58,300–90,000
2012	77,900	61,400–94,400

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

Figure 1: Nursery Product-Related Emergency Department-Treated Injury Estimates: 2008-2012



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