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

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December 2015

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Executive Summary

In this report, U.S. Consumer Product Safety Commission ("CPSC" or "Commission") staff presents statistics based on the most recently available information regarding injuries and deaths associated with nursery products among children younger than the age of 5 years.

Emergency Department-Treated Injuries:

- In 2014, there were an estimated 69,300 emergency department-treated injuries associated with, but not necessarily caused by, nursery products among children younger than age 5 years.

- Cribs/mattresses, infant carriers, strollers/carriages, and high chairs were associated with about 66 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. A diagnosis of internal organ injury, contusion/abrasion, or laceration was associated with a majority of the injuries.

- Annual estimates of injuries associated with nursery products do not display a statistically significant trend over the 5-year period 2010–2014.

Fatalities:

- For the 3-year period 2010–2012, CPSC staff has reports of 311 deaths—an annual average of 104 deaths—associated with, but not necessarily caused by, nursery products among children younger than age 5. Reporting is ongoing, and the number of reported fatalities may change.

- Cribs/mattresses, bassinets/cradles, playpens/play yards, infant carriers, and baby baths/bath seats/bathinettes were associated with 86 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; 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 staff's briefing packages for notices of proposed rulemakings ("NPRs") and final rules that are required by the Danny Keysar Child Product Safety Notification Act, section 104 of the Consumer Product Safety Improvement Act ("CPSIA") of 2008. In calendar year 2015, the Commission issued NPRs for infant bath tubs, hook-on chairs, bouncer seats, high chairs, and children's folding chairs and issued a final rule establishing a new standard for frame child carriers. In addition, a new federal rule on strollers, as well as a removable bassinet-bed performance requirement, went into effect in 2015. Staff evaluations of voluntary standards for inclined sleepers, changing tables, stationary activity centers, gates/enclosures and booster seats are under way. Many of these evaluations contribute to the CPSC's Safe to Sleep® campaign, which, in coordination with the *Eunice Kennedy Shriver* National Institute of Child Health and Human Development and Health Resources and Services Administration, is aimed at helping parents and caregivers create the safest sleep environment possible for young children: www.CPSC.gov/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 2014,[2] as well as comparisons with historic injury estimates. Detailed information on deaths associated with nursery products that reportedly occurred during the 3-year period from 2010 to 2012, is also presented; reporting is ongoing, and the number of reported fatalities may change.

Nursery Product-Related Emergency Department-Treated Injury Estimates

There were an estimated 69,300 nursery product-related injuries among children younger than 5 years old that were treated in U.S. hospital emergency departments in 2014. Table 1 shows the estimated injuries for the latest 3 years, as well as the annual average for this 3-year period. The decrease in the injury estimate from 2013 to 2014 was not statistically significant. Staff did not observe a trend in injury estimates over the 2012 to 2014 period. The attached Appendix provides annual estimates for 2010 through 2014.

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 2014. Seventy percent of the total injuries involved the head and the face, which were the body parts injured most frequently. Internal organ injuries, contusions/abrasions, or lacerations were the diagnoses in 73 percent of the NEISS-reported injuries.

Table 1: Estimated Emergency Department-Treated Injuries to Children Younger than Age Five Associated with Nursery Products
2012–2014

Calendar Year	Estimated Emergency Department-Treated Injuries*
2012	77,900
2013	74,900
2014	69,300
2012–2014 Average	74,000

Source: NEISS, CPSC.
* Rounded to the nearest 100. The average calculation is based on unrounded injury estimates.

Table 2 shows the breakdown of injury estimates by different product categories for 2014, along with the injury estimates for 2013, for comparison purposes. As in 2013,[3] there were more than 30 product codes associated with the injury estimates in 2014. Similar to 2013, the associated products have been aggregated into 13 product categories that align with standards development activities. The top four categories, cribs/mattresses, infant carriers, strollers/carriages, and high chairs, were associated with about 66 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 enable 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 2014, http://www.cpsc.gov//Global/Research-and-Statistics/Injury-Statistics/Toys/Nursery-Products-Annual-Report-2014.pdf

Overall, there was a decrease in the total injury estimate from 2013 to 2014, but the decrease was not statistically significant. Among the observed changes in the emergency department-treated injury estimates in specific product categories between the 2 years were seven decreases and four increases. The largest decreases were in infant carriers (decreased from 13,700 to 11,800), changing tables (decreased from 5,300 to 3,500), strollers/carriages (decreased from 12,200 to 11,200), and baby gates/barriers (decreased from 3,800 to 2,800). None of these decreases was statistically significant. There were some increases as well; the largest one was in portable baby swings (increased from 1,700 to 3,200). This was the only increase that was statistically significant (p-value=0.0463).

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	
	2014	2013
TOTAL	69,300	74,900
Cribs/Mattresses	11,900	12,400
Infant Carriers (Excludes Motor Vehicle Incidents)	11,800	13,700
Strollers/Carriages	11,200	12,200
High Chairs	11,000	10,900
Changing Tables	3,500	5,300
Baby Bouncer Seats	3,300	3,100
Portable Baby Swings	3,200	1,700
Baby Walkers/Jumpers/Exercisers	2,900	3,300
Baby Gates/Barriers	2,800	3,800
Playpens/Play Yards	2,600	2,200
Baby Bottles/Warmers/Sterilizers	1,400	1,500
Bassinets/Cradles	---[4]	1,300
Baby Baths/Bath Seats/Bathinettes	---[4]	---[4]
Other[5]	3,300	3,900

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 99 percent complete for each year in the period from 2010 through 2012. As done in the annual nursery product reports from earlier years, the deaths reported here are from 2010 through 2012, the latest 3-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 2013 and 2014, the "Other" category included: pacifiers/teething rings, diapers (excluding diaper rash cases), rattles, night lights, potty chairs/training seats, and safety pins. In 2014, the "Other" category also included diaper pails, diaper fasteners, baby scales, and crib mobiles.
[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 2010--2012 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 311 deaths—an annual average of 104 deaths—associated with nursery products during this time period. About 40 percent (123 total, or an annual average of 41) were associated with cribs/mattresses. Bassinets/cradles accounted for 19 percent (60 total, or an annual average of 20) of the reported deaths. Playpens/play yards were associated with 14 percent (a total of 44 or an annual average of 15) of the reported deaths while infant carriers were associated with eight percent (a total of 26 or an annual average of 9) of the reported deaths; and baby baths/bath seats/bathinettes accounted for five percent (a total of 14 or an annual average of five) of the reported deaths. The remaining 44 reported fatalities were associated with a range of products, including bouncer seats, baby gates/barriers, portable baby swings, strollers, and a variety of alternative sleep-products, such as inclined sleepers and nappers, travel beds, and other shared-sleep products.

For certain incident scenarios in which 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 to place the fatalities. 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 2010 through 2012, along with data previously reported for 2009 through 2011, for comparison purposes. Reporting is ongoing, and the number of reported fatalities may change. 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 drawing 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 86 percent of the reported fatalities.

Between 2010 and 2012, 123 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 11 percent of the 123 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 60 deaths reported in bassinets/cradles between 2010 and 2012, 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 44 deaths between 2010 and 2012. Most of the deaths were asphyxiations, in which the infant suffocated on a blanket/pillow/other soft bedding placed inside the play yard. The presence of a hazardous environment in or around the product, such as placing improvised covers on the play yard, providing easy access to cords from window coverings, and using ill-fitting mattresses and sofa cushions in the play yards, were associated with some of the deaths. A few of the fatalities involved faulty products as well.

There were 26 deaths identified during 2010 to 2012, which were associated with infant carriers. Hazardous placement of the infant in the carrier or hazardous placement of the carrier itself with the infant

in the carrier was the most common scenario. Examples include an unrestrained infant left unsupervised for an extended period of time, often on top of a blanket/pillow/other soft bedding, who subsequently got into a compromising position, which resulted in death; an infant positioned improperly in a carrier on the caregiver's body, which led to suffocation; and placing an occupied carrier on an elevated surface, which led to a fatal fall. A few fatalities resulted from infant carriers tipping over when placed on nonrigid surfaces, while some strangulation deaths resulted from infants becoming entangled in the restraint straps.

Finally, baby baths/bath seats/bathinettes were associated with 14 deaths between 2010 and 2012. All of the deaths occurred when parent or caregiver attention was diverted away from the infant. 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 although 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	
	2010-2012	2009-2011	2010-2012	2009-2011
TOTAL	311	336	104	112
Cribs/Mattresses	123	138	41	46
Bassinets/Cradles	60	65	20	22
Playpens/Play Yards	44	39	15	13
Infant Carriers (Excludes Motor Vehicle Incidents)	26	35	9	12
Baby Baths/Bath Seats/Bathinettes	14	15	5	5
Baby Bouncer Seats	10	10	3	3
Baby Gates/Barriers	4	6	1	2
Strollers/Carriages	4	4	1	1
Portable Baby Swings	4	2	1	1
High Chairs	1	2	<1	1
Changing Tables	0	1	0	<1
Baby Walkers/Jumpers/Exercisers	0	1	0	<1
Other[7]	21	18	7	6

Source: CPSC epidemiological databases: In-depth Investigations ("INDP"), Injury and Potential Injury Incidents ("IPII"), Death Certificates ("DTHS"), and NEISS from 2010 to 2012 for reported deaths.
Note: The average annual deaths do not add up to the total due to rounding.

[7] Of the 21 deaths in this category in 2010–2012, 17 deaths were associated with products used in the sleep environment that are not among the product categories listed in Table 3. Among the 17, two deaths involved a cloth-covered, shared-sleep product; two deaths involved a portable youth bedrail; three deaths involved a toddler bed (product code 4082), three deaths were in a collapsible, fabric travel bed; and seven deaths involved an inclined sleeper, most of them a foam sleep product which was being used inside a crib. Additionally, there were three drowning deaths when an infant was left unattended on a non-bathing baby seat (product code 4074) in a water-filled tub or shallow pool 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//Global/Research-and-Statistics/Injury-Statistics/Toys/Nursery-Products-Annual-Report-2014.pdf, p 7, for a list of products associated with deaths in the "Other" category in 2009–2011.

Appendix

Methodology

Injuries:

- Database: NEISS from 01/01/2014 through 12/31/2014.
- Product codes: 1500–1558, 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; however, if the official diagnosis indicated that no injury had been sustained, the case was excluded.
- After adding additional years of data (2010 through 2013), statistical tests were performed to determine if any trends exist. While there was a significant decrease from 2010 to 2011 (p-value=0.0091), there was no statistically significant trend observed over the 5-year period from 2010 to 2014 (p-value=0.9627).

Deaths:

- Databases: IPII, INDP, DTHS, and NEISS from 01/01/2010 through 12/31/2012.

  Information available from IPII, DTHS, and NEISS 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.
- 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 play yard 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 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, were included.

  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

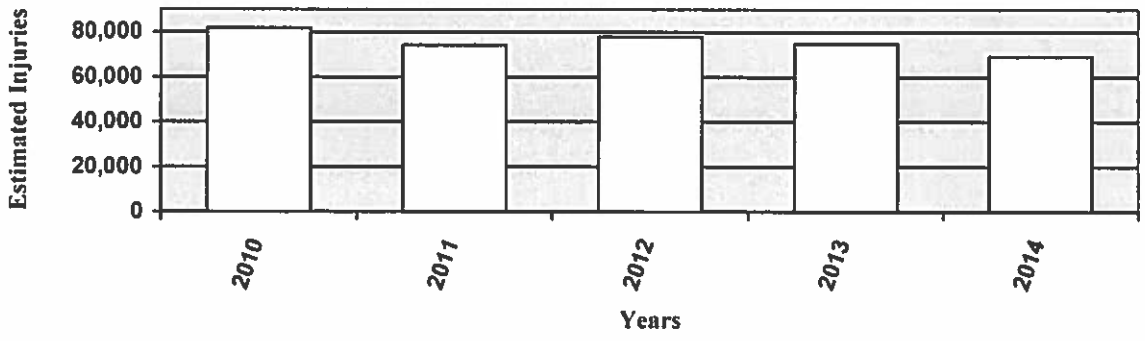
Injury estimates for the last five years, for which data is available, are presented in the table and chart below. Statistical tests indicate no significant trend in the data over the 5-year period 2010–2014 (p-value=0.9627).

Table 4: Nursery Product-Related Emergency Department-Treated Injury Estimates 2010–2014

Calendar Year	Estimated Injuries	95% Confidence Interval
2010	81,700	66,000–97,400
2011	74,100	58,300–90,000
2012	77,900	61,400–94,400
2013	74,900	57,100–92,600
2014	69,300	48,900–89,600

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

Figure 1: Nursery Product-Related Emergency Department-Treated Injury Estimates: 2010-2014



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