



UNITED STATES
CONSUMER PRODUCT SAFETY COMMISSION
4330 EAST WEST HIGHWAY
BETHESDA, MD 20814

Memorandum

Date: December 19, 2017

TO : The File
THROUGH: Stephen Hanway, Director
Division of Hazard Analysis
FROM : Angie Qin, Mathematical Statistician
Division of Hazard Analysis

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SUBJECT : Unintentional Pediatric Poisoning Injury Estimates for 2016

In 2016, there were an estimated 79,500 emergency department-treated injuries involving unintentional pediatric poisonings. Unintentional pediatric poisonings are poisonings and chemical burns¹ resulting from accidental access to a substance by a child under the age of 5. Adverse reactions, therapeutic errors, and incidents that would not be affected by the Poison Prevention Packaging Act (PPPA), were not included in the estimates.

Results

Staff found 2,720 cases involving unintentional pediatric poisonings in 2016 in the National Electronic Injury Surveillance System (NEISS). Based on these cases, staff computed a national estimate of 79,500 emergency department-treated injuries, with a coefficient of variance (C.V.) of 11.49 percent. The 95 percent confidence interval (C.I) for this estimate is 61,600 to 97,400. A breakdown of the estimate by diagnosis is shown in Table 1.

CPSC 6(b)(1) CLEARED for PUBLIC

NO MFPS/PRIVILEGS OR
PRODUCTS IDENTIFIED

EXCEPTED BY: PETITION
RULEMAKING ADMIN. PROCG

WITH PORTIONS REMOVED: _____

Jan 2/2/18

¹ Chemical burns are included in this memorandum because many of the substances regulated by the Poison Prevention Packaging Act cause chemical burns. Examples of such substances include: tire cleaners, etching creams, drain cleaners, and oven cleaners.

*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.*

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Table 1: 2016 Emergency Department-Treated Unintentional Pediatric Poisoning Estimates by Diagnosis*

Diagnosis (Code)	Estimate	Cases	C.V.	95% C.I.
Poisoning (68)	76,800	2,639	11.41%	59,600–94,000
Chemical Burn (49)	2,700	81	23.53%	1,500–3,900
Total ²	79,500	2,720	11.49%	61,600–97,400

Source: National Electronic Injury Surveillance System, April 2017

* Adjusted to exclude adverse reactions, therapeutic errors, and exposures beyond the victim's control.

Table 2 gives a breakdown by year of the estimated emergency department-treated unintentional pediatric poisonings. Each diagnosis estimate and the total estimate were analyzed for a trend across years, but no statistically significant trend was found (the lowest p-value for all trends was 0.24). The directional year-to-year increases in chemical burns were not statistically significant. An increase in the number of laundry packet chemical burn incidents and a decrease in the number of incidents associated with other products, such as toilet cleaners, general cleaners and bleach were also not statistically significant.

Table 2: 2014–2016 Emergency Department-Treated Unintentional Pediatric Poisoning Estimates by Year*

Diagnosis (Code)	2014	2015	2016	Average
Poisoning (68)	83,100	82,300	76,800	80,800
Chemical Burn (49)	4,200	4,100	2,700	3,700
Total ²	87,400	86,400	79,500	84,400

Source: National Electronic Injury Surveillance System, April 2017

* Adjusted to exclude adverse reactions, therapeutic errors, and exposures beyond the victim's control.

In 2016, there were an estimated 67,100 emergency department-treated unintentional pediatric poisonings that occurred at home, or 84.4 percent of the total 79,500 emergency department-treated unintentional pediatric poisonings. An estimated 10,800 (13.6 percent) of the 2016 emergency department-treated unintentional pediatric poisonings occurred at an unknown location. The remaining injuries occurred at other locations, including streets, schools, playgrounds, and other public property.

Table 3 gives a breakdown, by the product involved, for the estimated emergency department-treated unintentional pediatric poisonings. Note that the product categories are not exclusive because it is possible for two different products to be associated with the same poisoning.

² Columns may not sum to totals, and average may not correspond exactly to totals, due to rounding.

Table 3: 2016 Emergency Department-Treated Unintentional Pediatric Poisoning Estimates by Top Ten Products*

Product	Estimate ⁵	C.V.	95% C.I.
Blood Pressure Medications	6,000	19.64%	3,700-8,300
Acetaminophen	5,900	16.21%	4,000-7,700
Laundry Packets	3,600	19.18%	2,200-4,900
Bleach	3,000	19.83%	1,800-4,200
Sedatives and Anti-Anxiety Medications ³	2,800	19.70%	1,700-3,900
Anti-Depressants	2,600	21.15%	1,500-3,600
Ibuprofen	2,500	24.52%	1,300-3,800
Narcotic Medications ⁴	2,400	22.93%	1,300-3,400
Diphenhydramine	2,400	21.32%	1,400-3,300
Unknown	3,600	18.85%	2,300-5,000

Source: National Electronic Injury Surveillance System, April 2017

* Adjusted to exclude adverse reactions, therapeutic errors, and exposures beyond the victim's control.

Note in Table 4 that the emergency department-treated unintentional pediatric poisoning estimates decreased from calendar year 2015 to 2016, for most of the top 10 products (acetaminophen, blood pressure medications, laundry packets, Ibuprofen, bleach, antidepressants, and Diphenhydramine). Sedatives and antianxiety medications increased from the eighth leading cause of unintentional poisoning in 2015, to the fifth leading cause of unintentional poisonings in 2016.

Table 4: 2015 and 2016 Top Ten Products and Estimates for Emergency Department-Treated Unintentional Pediatric Poisoning*

2015	2016
Acetaminophen (7,900)	Blood Pressure Medications (6,000)
Blood Pressure Medications (7,300)	Acetaminophen (5,900)
Laundry Packets (5,000)	Laundry Packets (3,600)
Ibuprofen (3,700)	Bleach (3,000)
Bleach (3,400)	Sedatives and Anti-Anxiety Medications ³ (2,800)
Anti-Depressants (2,800)	Anti-Depressants (2,600)
Narcotic Medications ⁴ (2,700)	Ibuprofen (2,500)
Sedatives and Anti-Anxiety Medications ³ (2,600)	Narcotic Medications ⁴ (2,400)
Diphenhydramine (2,500)	Diphenhydramine (2,400)
Unknown (3,100)	Unknown (3,600)

* Adjusted to exclude adverse reactions, therapeutic errors, and exposures beyond the victim's control.

³ Benzodiazepines.

⁴ In previous reports (2011 and 2012), this category was referred to as anti-spasm medications, but according to Health Sciences staff, narcotic medications is a better description of this product class.

⁵ In previous reports, incidents with multiple product codes were counted multiple times, so the estimates were higher than the actual values. Please refer to appendix for the corrected estimates for prior years.

Methodology

NEISS is a probability sample of approximately 100 U.S. hospitals operating 24-hour emergency departments (EDs) and providing more than six beds. Staff in each hospital codes consumer product-related data from the ED record, and then the data are transmitted electronically to the CPSC. Because NEISS is a probability sample, each case collected represents a number of cases (the case's *weight*) in the total estimate of injuries in the United States. Different hospitals carry different weights, based on stratification by their annual number of emergency department visits (Kessler and Schroeder, 1999).

Hazard Analysis staff searched NEISS for all incidents with the poisoning diagnosis (code 68) or the chemical burn diagnosis (code 49) involving children under the age of 5. Health Sciences staff examined all incidents to identify cases that were not unintentional exposures, but were deemed generally associated with a prescribed therapeutic regimen, or an unforeseen incidental exposure from a situation beyond the victim's control. These types of cases, delineated below, are out-of-scope cases because they do not directly involve a child independently accessing a poison.

1. *Adverse Reactions*: This includes undesirable effects that occur with the proper use of a substance (*e.g.*, drowsiness after administration of an antihistamine). Allergic, hypersensitivity, or idiosyncratic reactions to recommended doses of vaccines, antibiotics, or other medications are also included in this category.

2. *Therapeutic Errors*: Unintentional mistakes made during a prescribed or recommended course of treatment, such as: (1) a caregiver administering the wrong substance or an overdose (*e.g.*, two tablespoons instead of two teaspoons) to the patient; (2) a pharmacist mislabeling the dosage instructions on a prescription; or (3) a caregiver giving medication to the wrong child.

3. *Incidental Exposures*: This category refers to exposures resulting from a situation beyond the control of the victim. Examples include exposures to: (1) chlorine fumes from a pool; (2) gas fumes while in a dwelling or an automobile; (3) gasoline while it is being pumped into an automobile; or (4) illicit drugs (*e.g.*, cocaine, methamphetamine, marijuana) while the caregiver is using or producing them.

Hazard Analysis staff used SAS[®] version 9.4 to manage and retrieve data and to compute estimates and the associated C.V. for the number of unintentional pediatric poisoning injuries. A C.V. is the ratio of the standard error of the estimate (*i.e.*, variability) to the estimate itself. This is generally expressed as a percent. A C.V. of 10 percent means the standard error of the estimate equals 0.1 times the estimate.

NEISS data do not typically identify all of the contributing factors to unintentional pediatric poisoning injuries. CPSC continues public outreach efforts to help manufacturers comply with the PPPA and to remind consumers about the need to keep products in their original child-resistant packaging and out of the reach of children.

CC: George Borlase, EXHR; Jacqueline Ferrante, HS

Appendix

Table A.1: 2015 Emergency Department-Treated Unintentional Pediatric Poisoning Estimates by Top Ten Products*

Product	Estimate	C.V.	95% C.I.
Acetaminophen	7,900	14.49%	5,700-10,200
Blood Pressure Medications	7,300	16.22%	5,000-9,700
Laundry Packets	5,000	18.63%	3,100-6,800
Ibuprofen	3,700	16.82%	2,500-4,900
Bleach	3,400	19.04%	2,100-4,600
Anti-Depressants	2,800	18.14%	1,800-3,800
Narcotics Medications	2,700	21.01%	1,600-3,800
Sedatives and Anti-Anxiety Medications	2,600	17.76%	1,700-3,600
Diphenhydramine	2,500	18.67%	1,600-3,400
Unknown	3,100	15.23%	2,200-4,000

Source: National Electronic Injury Surveillance System, April 2016

** Adjusted to exclude adverse reactions, therapeutic errors, and exposures beyond the victim's control.*

Table A.2: 2014 Emergency Department-Treated Unintentional Pediatric Poisoning Estimates by Top Ten Products*

Product	Estimate	C.V.	95% C.I.
Blood Pressure Medications	7,300	17.67%	4,800-9,800
Acetaminophen	6,800	14.24%	4,900-8,600
Bleach	4,700	15.88%	3,300-6,200
Laundry Packets	4,100	20.96%	2,400-5,800
Anti-Depressants	3,400	16.01%	2,300-4,500
Diphenhydramine	3,200	20.50%	1,900-4,500
Narcotics Medications	3,200	25.45%	1,600-4,800
Opioid Antagonists	3,100	28.29%	1,400-4,800
Ibuprofen	2,900	19.61%	1,800-4,000
Unknown	3,500	18.05%	2,300-4,800

Source: National Electronic Injury Surveillance System, April 2015

** Adjusted to exclude adverse reactions, therapeutic errors, and exposures beyond the victim's control.*

Table A.3: 2013 Emergency Department-Treated Unintentional Pediatric Poisoning Estimates by Top Ten Products*

Product	Estimate	C.V.	95% C.I.
Acetaminophen	8,100	14.50%	5,800-10,400
Blood Pressure Medications	6,500	15.55%	4,500-8,500
Bleach	3,100	15.12%	2,200-4,100
Anti-Depressants	3,100	21.38%	1,800-4,400
Ibuprofen	3,000	17.42%	2,000-4,100
Laundry Packets	3,000	17.91%	1,900-4,000
Sedatives and Anti-Anxiety Medications	2,700	27.82%	1,200-4,100
Narcotics Medications	2,400	19.68%	1,500-3,300
Diphenhydramine	2,300	19.93%	1,400-3,100
Unknown	4,100	18.64%	2,600-5,500

Source: National Electronic Injury Surveillance System, April 2014

** Adjusted to exclude adverse reactions, therapeutic errors, and exposures beyond the victim's control.*

Table A.4: 2012 Emergency Department-Treated Unintentional Pediatric Poisoning Estimates by Top Ten Products*

Product	Estimate	C.V.	95% C.I.
Acetaminophen	9,400	14.05%	6,800-12,000
Blood Pressure Medications	6,200	15.13%	4,400-8,100
Sedatives and Anti-Anxiety Medications	4,100	17.86%	2,600-5,500
Anti-Depressants	3,700	20.18%	2,200-5,100
Narcotics Medications	3,700	15.80%	2,500-4,800
Bleach	3,600	18.82%	2,300-5,000
Ibuprofen	3,400	14.65%	2,400-4,400
Diphenhydramine	2,700	14.19%	2,000-3,500
Household Cleaners	2,700	14.26%	1,900-3,400
Unknown	4,100	14.84%	2,900-5,300

Source: National Electronic Injury Surveillance System, April 2013

** Adjusted to exclude adverse reactions, therapeutic errors, and exposures beyond the victim's control.*

Table A.5: 2011 Emergency Department-Treated Unintentional Pediatric Poisoning Estimates by Top Ten Products*

Product	Estimate	C.V.	95% C.I.
Acetaminophen	8,400	13.81%	6,100-10,700
Blood Pressure Medications	6,600	14.81%	4,700-8,600
Bleach	4,400	15.20%	3,100-5,700
Ibuprofen	3,800	14.37%	2,700-4,800
Sedatives and Anti-Anxiety Medications	3,600	18.61%	2,300-4,900
Vitamins	3,200	17.07%	2,100-4,300
Anti-Depressants	2,900	15.86%	2,000-3,900
Muscle relaxants	2,800	19.14%	1,800-3,900
Narcotics Medications	2,500	22.63%	1,400-3,700
Unknown	4,600	15.73%	3,200-6,000

Source: National Electronic Injury Surveillance System, April 2012

** Adjusted to exclude adverse reactions, therapeutic errors, and exposures beyond the victim's control.*