



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

**Memorandum**

Date: January 30, 2019

TO : The File

THROUGH: Risana Chowdhury, Director  
Division of Hazard Analysis

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SUBJECT : Unintentional Pediatric Poisoning Injury Estimates for 2017

In 2017, there were an estimated 83,200 emergency department-treated injuries involving unintentional pediatric poisonings. Unintentional pediatric poisonings are poisonings and chemical burns<sup>1</sup> resulting from accidental access to a chemical 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 2,717 cases involving unintentional pediatric poisonings in 2017 in the National Electronic Injury Surveillance System (NEISS). Based on these cases, staff computed a national estimate of 83,200 emergency department-treated injuries, with a coefficient of variance (C.V.) of 13.04 percent. The 95 percent confidence interval (C.I.) for this estimate was 61,900 to 104,400. A breakdown of the estimate by diagnosis is shown in Table 1.

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<sup>1</sup> 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: 2017 Emergency Department-Treated Unintentional Pediatric Poisoning Estimates by Diagnosis\***

<b>Diagnosis (Code)</b>	<b>Estimate</b>	<b>Cases</b>	<b>C.V.</b>	<b>95% C.I.</b>
Poisoning (68)	79,000	2,599	12.71%	59,300-98,700
Chemical Burn (49)	4,100	118	24.77%	2,100-6,100
Total <sup>2</sup>	83,200	2,717	13.04%	61,900-104,400

*Source: National Electronic Injury Surveillance System, April 2018*

\* 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 0.30).

**Table 2: 2015–2017 Emergency Department-Treated Unintentional Pediatric Poisoning Estimates by Year\***

<b>Diagnosis (Code)</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>Average</b>
Poisoning (68)	82,300	76,800	79,000	79,400
Chemical Burn (49)	4,100	2,700	4,100	3,600
Total <sup>2</sup>	86,400	79,500	83,200	83,000

*Source: National Electronic Injury Surveillance System, April 2018*

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

In 2017, an estimated 68,100 (81.9 percent of the total 83,200) emergency department-treated unintentional pediatric poisonings occurred at home. An estimated 13,400 (16.1 percent) poisonings occurred at an unknown location. The remaining injuries occurred at other locations, such as streets, schools, playgrounds, and other public property.

Table 3 shows the rolling three-year average of the estimated emergency department-treated unintentional pediatric poisonings from 2011 to 2017. The increase in the chemical burn estimate in year 2013, 2014 and 2015 was mainly due to laundry packet chemical burn incidents. The change was not statistically significant.

**Table 3: Rolling 3-Year Average for Emergency Department-Treated Unintentional Pediatric Poisoning Estimates from 2011 to 2017\***

<b>Diagnosis (Code)</b>	<b>Average (2011-2013)</b>	<b>Average (2012-2014)</b>	<b>Average (2013-2015)</b>	<b>Average (2014-2016)</b>	<b>Average (2015-2017)</b>
Poisoning (68)	83,700	81,900	80,700	80,800	79,400
Chemical Burn (49)	2,800	3,400	3,900	3,700	3,600
Total	86,600	85,300	84,600	84,400	83,000

*Source: National Electronic Injury Surveillance System, April 2018*

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

<sup>2</sup> Columns may not sum to totals, and the averages in Table 2 may not correspond exactly to totals, due to rounding.

Table 4 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 incident.

**Table 4: 2017 Emergency Department-Treated Unintentional Pediatric Poisoning Estimates by Top 10 Products<sup>5\*</sup>**

<b>Product</b>	<b>Estimate<sup>6</sup></b>	<b>C.V.</b>	<b>95% C.I.</b>
Blood Pressure Medications	6,700	21.22%	3,900-9,400
Acetaminophen	6,400	14.21%	4,600-8,200
Bleach	3,500	21.98%	2,000-5,100
Ibuprofen	3,400	20.67%	2,000-4,700
Laundry Packets	3,300	21.62%	1,900-4,800
Antidepressants	3,100	25.80%	1,500-4,700
Vitamins	2,900	18.77%	1,900-4,000
Diphenhydramine	2,700	22.70%	1,500-3,900
Antiepileptics	2,400	26.21%	1,200-3,700
Unknown	3,500	17.64%	2,300-4,700

*Source: National Electronic Injury Surveillance System, April 2018*

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

Table 5 shows that the emergency department-treated unintentional pediatric poisoning estimates increased from calendar year 2016 to 2017, for most of the top 10 products (blood pressure medications, Acetaminophen, bleach, Ibuprofen, antidepressants, and Diphenhydramine). Laundry packets and unknown medications decreased from calendar year 2016 to 2017. Vitamins and Antiepileptics moved into the top 10 in 2017. Sedatives and Antianxiety medications, and Narcotics medications dropped out of top 10 in 2017. No significant trend observed for the products from 2015 to 2017.

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<sup>3</sup> Benzodiazepines.

<sup>4</sup> 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.

<sup>5</sup> Liquid nicotine poisoning injury did not appear in the top 10 products in 2017 or any prior years. The Child Nicotine Poisoning Prevention Act of 2015 (CNPPA), requires any nicotine provided in a liquid nicotine container, sold, offered for sale, manufactured for sale, distributed in commerce, or imported into the United States shall be packaged in accordance with the standards of the Poison Prevention Packaging Act (PPPA).

<sup>6</sup> Please refer to appendix for the estimates for prior years.

**Table 5: 2016 and 2017 Top Ten Products and Estimates for Emergency Department-Treated Unintentional Pediatric Poisoning\***

2016	2017
Blood Pressure Medications (6,000)	Blood Pressure Medications (6,700)
Acetaminophen (5,900)	Acetaminophen (6,400)
Laundry Packets (3,600)	Bleach (3,500)
Bleach (3,000)	Ibuprofen (3,400)
Sedatives and Antianxiety Med <sup>3</sup> (2,800)	Laundry Packets (3,300)
Antidepressants (2,600)	Antidepressants (3,100)
Ibuprofen (2,500)	Vitamins (2,900)
Narcotic Medications <sup>4</sup> (2,400)	Diphenhydramine (2,700)
Diphenhydramine (2,400)	Antiepileptics (2,400)
Unknown (3,600)	Unknown (3,500)

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

## Methodology

NEISS is a probability sample of approximately 100 U.S. hospitals, each 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 poisoning diagnosis (code 68) or 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

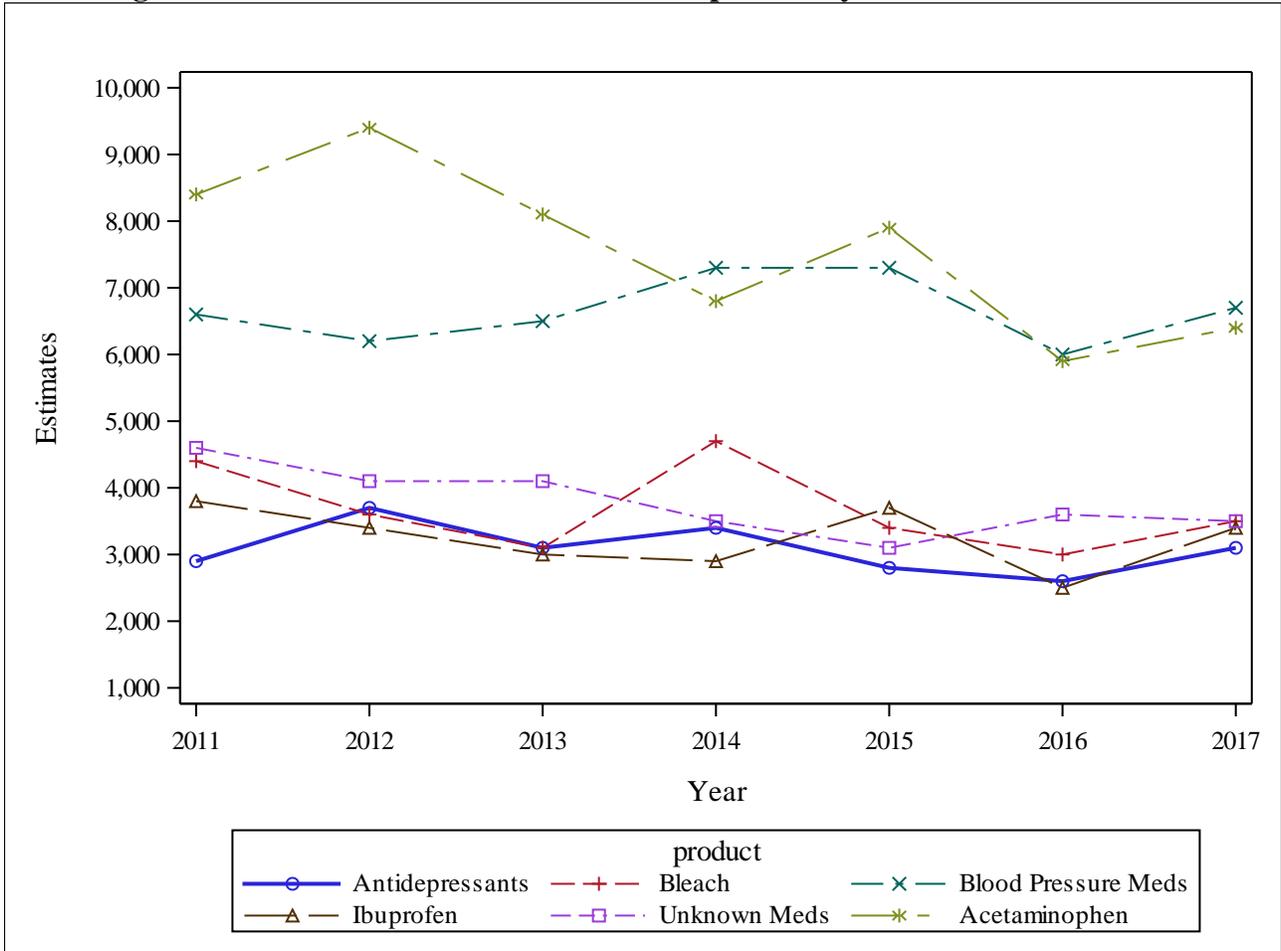
automobile; or (4) illicit drugs (*e.g.*, cocaine, methamphetamine, marijuana) while the caregiver is using or producing them.

Hazard Analysis staff used SAS<sup>®</sup> 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.

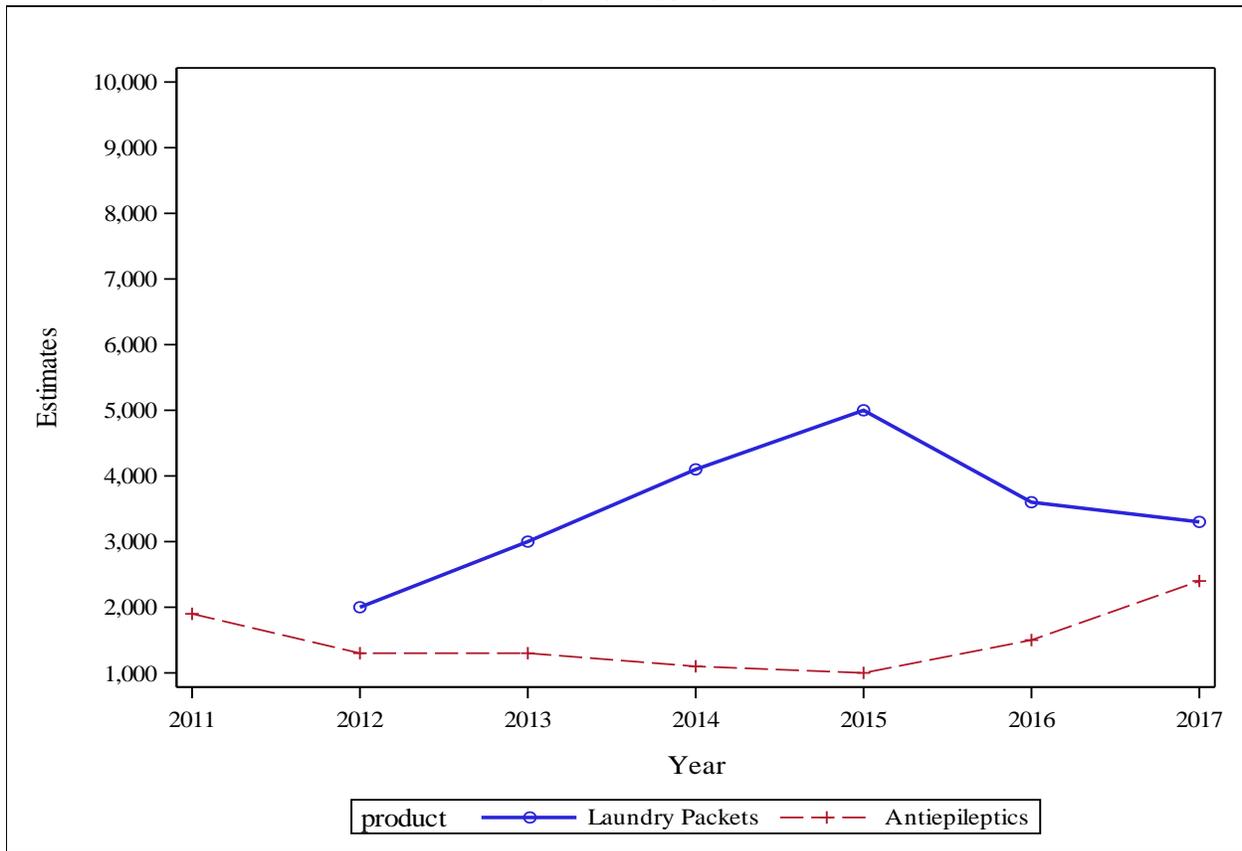
NEISS data do not typically identify all of the contributing factors to unintentional pediatric poisoning injuries. CPSC continues public outreach efforts to help manufacturers comply with the PPPA and to remind consumers about the need to keep products in their original child-resistant packaging and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

**Appendix**

**Figure A.1: Estimates for Products in the Top 10 Every Year from 2011 to 2017**



**Figure A.2: Estimates for Other Products (Laundry Packet and Antiepileptics)  
from 2011 to 2017**



\* Laundry Packet was introduced in United States in 2012; therefore, no data point exists for 2011.

**Table A.1: 2011 Emergency Department-Treated Unintentional Pediatric Poisoning Estimates by Top 10 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 Antianxiety Medications	3,600	18.61%	2,300-4,900
Vitamins	3,200	17.07%	2,100-4,300
Antidepressants	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

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

**Table A.2: 2012 Emergency Department-Treated Unintentional Pediatric Poisoning Estimates by Top 10 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 Antianxiety Medications	4,100	17.86%	2,600-5,500
Antidepressants	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

\* 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 10 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
Antidepressants	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 Antianxiety 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

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

**Table A.4: 2014 Emergency Department-Treated Unintentional Pediatric Poisoning Estimates by Top 10 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
Antidepressants	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

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

**Table A.5: 2015 Emergency Department-Treated Unintentional Pediatric Poisoning Estimates by Top 10 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
Antidepressants	2,800	18.14%	1,800-3,800
Narcotics Medications	2,700	21.01%	1,600-3,800
Sedatives and Antianxiety 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

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

**Table A.6: 2016 Emergency Department-Treated Unintentional Pediatric Poisoning Estimates by Top 10 Products\***

Product	Estimate	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 Antianxiety Medications	2,800	19.70%	1,700-3,900
Antidepressants	2,600	21.15%	1,500-3,600
Ibuprofen	2,500	24.52%	1,300-3,800
Narcotic Medications	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

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