



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

Memorandum

Date: January 24, 2020

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THROUGH : Risana Chowdhury, Director
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SUBJECT : Unintentional Pediatric Poisoning Injury Estimates for 2018

In 2018, there were an estimated 70,900 emergency department-treated injuries involving unintentional pediatric poisonings.¹ Unintentional pediatric poisonings are poisonings and chemical burns² resulting from accidental access to a chemical substance by a child under the age of 5 years old. Adverse reactions, therapeutic errors, and incidents that are not addressable through the Poison Prevention Packaging Act (PPPA) were not included in the estimates.

Results

Staff found 2,448 cases involving unintentional pediatric poisonings in 2018 in the National Electronic Injury Surveillance System (NEISS). Based on these cases, staff computed a national estimate of 70,900 emergency department-treated injuries, with a coefficient of variance (C.V.) of 13.07 percent. The 95 percent confidence interval (C.I.) for this estimate was 61,600 to 80,200. A breakdown of the estimate by diagnosis is shown in Table 1.

¹ In October 2018, an upgrade was implemented for NEISS. An emergency-department visit is allowed to contain up to two codes for the diagnoses. Data were extracted if either of the two codes listed poisoning or chemical burn.

² Chemical burns are included in this memorandum because many of the substances regulated by the PPPA 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: 2018 Emergency Department-Treated Unintentional Pediatric Poisoning Estimates by Diagnosis*

Diagnosis (Code)	Estimate	Cases	C.V.	95% C.I.
Poisoning (68)	66,800	2,318	12.32%	58,600-75,000
Chemical Burn (49)	4,200	130	29.69%	3,000-5,400
Total ³	70,900	2,448	13.07%	61,600-80,200

Source: National Electronic Injury Surveillance System, May 2019

* Adjusted to exclude adverse reactions, therapeutic errors, and exposures beyond the victim's control.⁴

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 0.39).

Table 2: 2016–2018 Emergency Department-Treated Unintentional Pediatric Poisoning Estimates by Year*

Diagnosis (Code)	2016	2017	2018	Average
Poisoning (68)	76,800	79,000	66,800	74,200
Chemical Burn (49)	2,700	4,100	4,200	3,700
Total ³	79,500	83,100	70,900	77,900

Source: National Electronic Injury Surveillance System, May 2019

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

In 2018, an estimated 60,800 (86 percent of the total 70,900) emergency department-treated unintentional pediatric poisonings occurred at home. An estimated 8,500 (12 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 3-year average of the estimated emergency department-treated unintentional pediatric poisonings from 2012 to 2018. The increase in the average chemical burn estimate for 2013–2015 was due mainly 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 2012 to 2018*

Diagnosis (Code)	Average (2012-2014)	Average (2013-2015)	Average (2014-2016)	Average (2015-2017)	Average (2016-2018)
Poisoning (68)	81,900	80,700	80,800	79,400	74,200
Chemical Burn (49)	3,400	3,900	3,700	3,600	3,700
Total ³	85,300	84,600	84,500	83,000	77,900

Source: National Electronic Injury Surveillance System, May 2019

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

³ Columns may not sum to totals, and the averages in Table 2 may not correspond exactly to totals, due to rounding.

⁴ See examples of the out-of-scope cases in Methodology section on page 4.

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 mutually exclusive because it is possible for two different products to be associated with the same poisoning incident.

Table 4: 2018 Emergency Department-Treated Unintentional Pediatric Poisoning Estimates by Top 10 Products^{5*}

Product	Estimate⁸	C.V.	95% C.I.
Blood Pressure Medications	6,300	16.69%	4,300-8,400
Acetaminophen	6,000	15.08%	4,200-7,700
Bleach	3,900	19.80%	2,400-5,400
Ibuprofen	3,300	17.78%	2,100-4,400
Laundry Packets	2,700	17.41%	1,800-3,600
Diphenhydramine	2,300	23.97%	1,200-3,400
Antidepressants	2,300	23.29%	1,300-3,400
Household Cleaners ⁶	2,000	22.23%	1,100-2,900
Narcotics Medications ⁷	1,900	18.55%	1,200-2,600
Unknown	2,700	15.84%	1,900-3,500

Source: National Electronic Injury Surveillance System, May 2019

** 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 decreased from calendar year 2017 to 2018, for most of the top 10 products (blood pressure medications, Acetaminophen, Ibuprofen, laundry packets, Antidepressants, Diphenhydramine, and unknown medications). Bleach increased from calendar year 2017 to 2018. Vitamins and Antiepileptics dropped out of the top 10 in 2018. Narcotics medications and household cleaners moved into the top 10 in 2018, which has happened in the past. For example, in 2016, there were an estimated 2,400 emergency department-treated visits by children under 5 due to poisoning or chemical burns from narcotics medications; and in 2012, there were an estimated 2,700 emergency department-treated visits from household cleaners.

⁵ Liquid nicotine poisoning injury did not appear in the top 10 products in 2018, 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 PPPA.

⁶ The category included window cleaner, floor/carpet cleaners, furniture oil, all-purpose cleaners, and non-specified cleaners.

⁷ 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.

⁸ Please refer to appendix for the estimates for prior years.

Table 5: 2017 and 2018 Top Ten Products and Estimates for Emergency Department-Treated Unintentional Pediatric Poisoning*

2017	2018
Blood Pressure Medications (6,700)	Blood Pressure Medications (6,300)
Acetaminophen (6,400)	Acetaminophen (6,000)
Bleach (3,500)	Bleach (3,900)
Ibuprofen (3,400)	Ibuprofen (3,300)
Laundry Packets (3,300)	Laundry Packets (2,700)
Antidepressants (3,100)	Diphenhydramine (2,300)
Vitamins (2,900)	Antidepressants (2,300)
Diphenhydramine (2,700)	Narcotics Medications (2,000)
Antiepileptics (2,400)	Household Cleaners (1,900)
Unknown (3,500)	Unknown (2,700)

* 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 inputs and 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 the NEISS database for all incidents with poisoning diagnosis (code 68) or chemical burn diagnosis (code 49) that involved 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

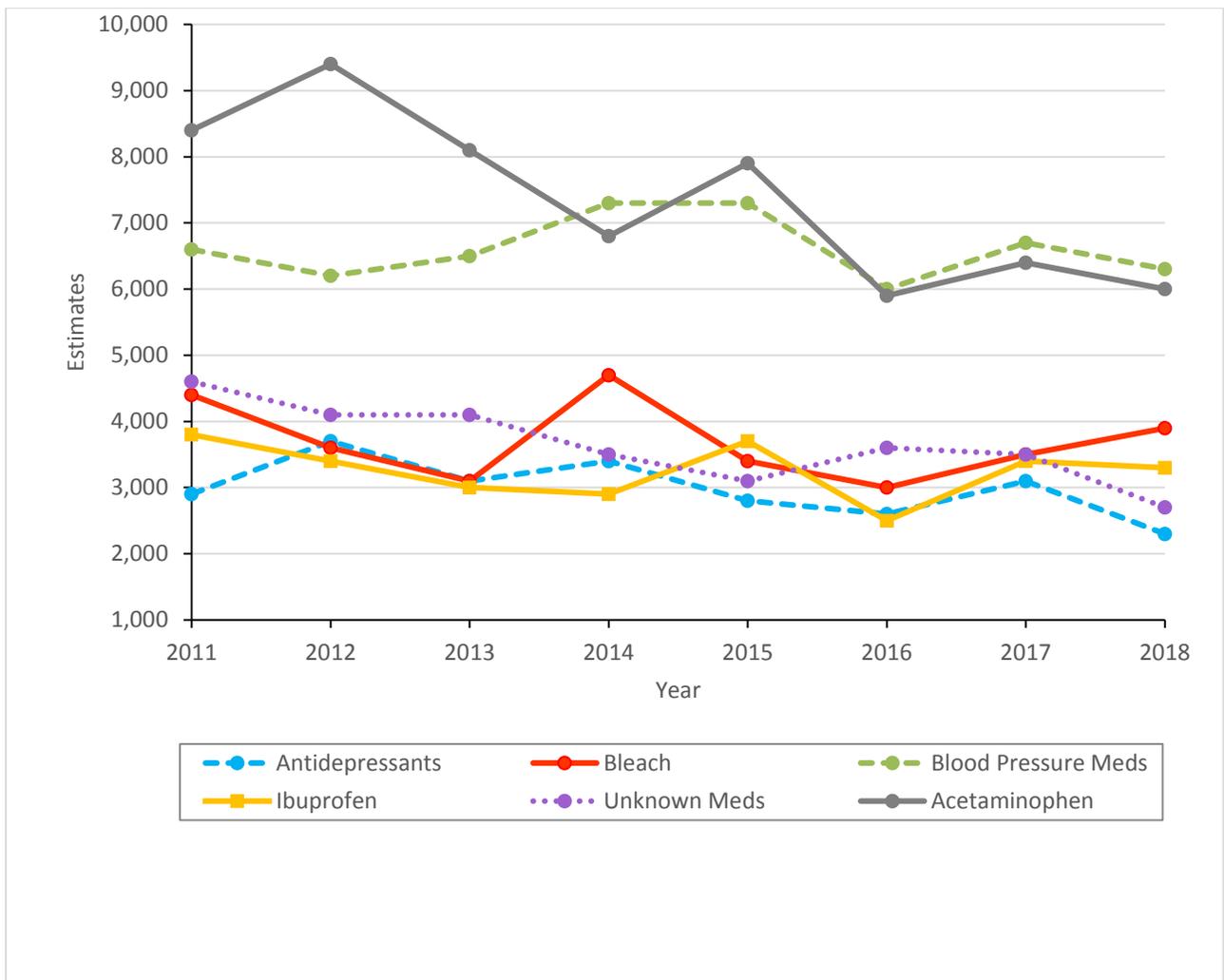
automobile; or (4) illicit drugs (*e.g.*, cocaine, methamphetamine, marijuana) while the caregiver is using or producing them.

Hazard Analysis staff used SAS[®] software program 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.

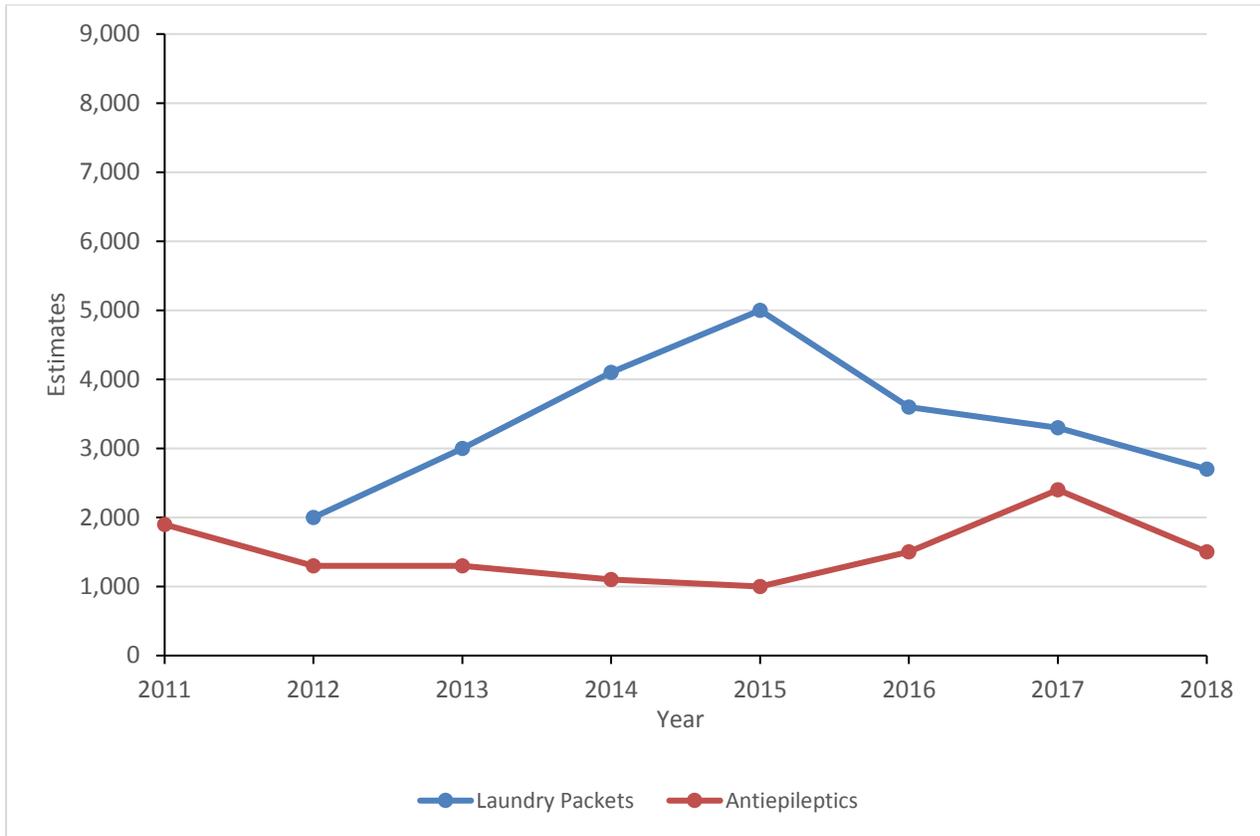
NEISS data do not typically identify all of the contributing factors to unintentional pediatric poisoning injuries. CPSC continues public outreach efforts to help manufacturers comply with the PPPA and to remind consumers about the need to keep products in their original child-resistant packaging and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

Appendix A

Figure A.1: Estimates for Products in the Top 10 Every Year from 2011 to 2018



**Figure A.2: Estimates for Other Products (Laundry Packet and Antiepileptics)
From 2011 to 2018***



* Laundry Packet was introduced in United States in 2012

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.

Table A.7: 2017 Emergency Department-Treated Unintentional Pediatric Poisoning Estimates by Top 10 Products*

Product	Estimate	C.V.	95% C.I.
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

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