



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

Memorandum

This document has been electronically approved and signed.

Date: January 25, 2021

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THROUGH : Risana Chowdhury, Director
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SUBJECT : Unintentional Pediatric Poisoning Injury Estimates for 2019

In 2019, there were an estimated 67,500 emergency department (ED)-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 2,450 cases involving unintentional pediatric poisonings in 2019 in the National Electronic Injury Surveillance System (NEISS). Based on these cases, staff computed a national estimate of 67,500 ED-treated injuries, with a coefficient of variance (C.V.) of 13.24 percent. The 95 percent confidence interval (C.I.) for this estimate was 50,000 to 85,000. A breakdown of the estimates by diagnosis is shown in Table 1.

¹ In October 2018, an upgrade was implemented for NEISS. An ED 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. Note the diagnosis categories are not mutually exclusive because it is possible for some incidents to have both poisoning and chemical burn diagnoses.

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: 2019 Emergency Department-Treated Unintentional Pediatric Poisoning Estimates by Diagnosis*

| Diagnosis (Code) | Estimate | Cases | C.V. | 95% C.I. |
|--------------------|----------|-------|--------|---------------|
| Poisoning (68) | 64,500 | 2,356 | 12.21% | 49,100-80,000 |
| Chemical Burn (49) | N/A** | 100 | 41.21% | N/A** |
| Total ³ | 67,500 | 2,450 | 13.24% | 50,000-85,000 |

Source: National Electronic Injury Surveillance System, June 2020

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

** Estimates are unstable as c.v. is above the threshold of 33%.

Table 2 gives a breakdown by year of the estimated ED-treated unintentional pediatric poisonings. The estimates decreased from 2017 to 2019, but the trend was not statistically significant (the lowest p-value for all trends was 0.25).

Table 2: 2017–2019 Emergency Department Treated Unintentional Pediatric Poisoning Estimates by Year*

| Diagnosis (Code) | 2017 | 2018 | 2019 | Average |
|--------------------|--------|--------|--------|---------|
| Poisoning (68) | 79,000 | 66,800 | 64,500 | 70,100 |
| Chemical Burn (49) | 4,100 | 4,200 | N/A** | N/A** |
| Total ³ | 83,200 | 70,900 | 67,500 | 73,800 |

Source: National Electronic Injury Surveillance System, June 2020

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

** Estimates are unstable as c.v. is above the threshold of 33%.

In 2019, an estimated 57,400 (85 percent of the total 67,500) ED-treated unintentional pediatric poisonings occurred at home. An estimated 9,100 (13 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 ED-treated unintentional pediatric poisonings from 2013 to 2019. The somewhat higher average estimate for chemical burns during 2013–2015 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 2013 to 2019*

| Diagnosis (Code) | Average (2013-2015) | Average (2014-2016) | Average (2015-2017) | Average (2016-2018) | Average (2017-2019) |
|--------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Poisoning (68) | 80,700 | 80,800 | 79,400 | 74,200 | 70,100 |
| Chemical Burn (49) | 3,900 | 3,700 | 3,600 | 3,700 | N/A** |
| Total ³ | 84,600 | 84,500 | 83,000 | 77,900 | 73,800 |

Source: National Electronic Injury Surveillance System, June 2020

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

** Estimates are unstable as c.v. is above the threshold of 33%.

³ Columns may not sum to totals due to rounding and the diagnosis categories are not mutually exclusive

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 ED-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: 2019 Emergency Department Treated Unintentional Pediatric Poisoning Estimates by Top 10 Products^{5*}

| Product | Estimate ⁶ | C.V. | 95% C.I. |
|--|-----------------------|--------|-------------|
| Blood Pressure Medications | 7,400 | 17.08% | 4,900-9,900 |
| Acetaminophen | 5,700 | 13.56% | 4,200-7,200 |
| Bleach | 2,800 | 28.33% | 1,300-4,400 |
| Ibuprofen | 2,700 | 21.50% | 1,600-3,900 |
| Antidepressants | 2,600 | 17.28% | 1,700-3,500 |
| Attention Deficit Disorder Medications | 2,600 | 23.40% | 1,400-3,800 |
| Laundry Packets | 2,500 | 20.88% | 1,500-3,600 |
| Dietary Supplements | 2,400 | 20.51% | 1,500-3,400 |
| Diphenhydramine | 2,300 | 21.42% | 1,400-3,300 |
| Unknown | 3,700 | 18.74% | 2,300-5,000 |

Source: National Electronic Injury Surveillance System, June 2020

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

Table 5 shows that the ED-treated unintentional pediatric poisoning estimates decreased for Acetaminophen, bleach, Ibuprofen and laundry packets, increased for blood pressure medications, antidepressants and unknown medications, and remained unchanged for Diphenhydramine, from calendar year 2018 to 2019. Attention deficit disorder medications and dietary supplements moved into the top 10 in 2019. Narcotics medications and household cleaners dropped out of the top 10 in 2019.

Table 5: 2018–2019 Emergency Department-Treated Unintentional Pediatric Poisoning Estimates by Top 10 Products*

| 2018 | 2019 |
|------------------------------------|---|
| Blood Pressure Medications (6,300) | Blood Pressure Medications (7,400) |
| Acetaminophen (6,000) | Acetaminophen (5,700) |
| Bleach (3,900) | Bleach (2,800) |
| Ibuprofen (3,300) | Ibuprofen (2,700) |
| Laundry Packets (2,700) | Antidepressants (2,600) |
| Diphenhydramine (2,300) | Attention Deficit Disorder Meds (2,600) |
| Antidepressants (2,300) | Laundry Packets (2,500) |
| Narcotics Medications (2,000) | Dietary Supplements (2,400) |
| Household Cleaners (1,900) | Diphenhydramine (2,300) |
| Unknown (2,700) | Unknown (3,700) |

Source: National Electronic Injury Surveillance System, June 2020

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

⁵ Liquid nicotine poisoning injury did not appear in the top 10 products in 2019, 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).

⁶ Please refer to appendix for the estimates for prior years.

Methodology

NEISS is a probability sample of approximately 100 U.S. hospitals, each operating 24-hour EDs and providing more than six beds. Staff in each hospital input and code 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 ED visits (Kessler and Schroeder, 1999).

Hazard Analysis staff searched NEISS databases 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.

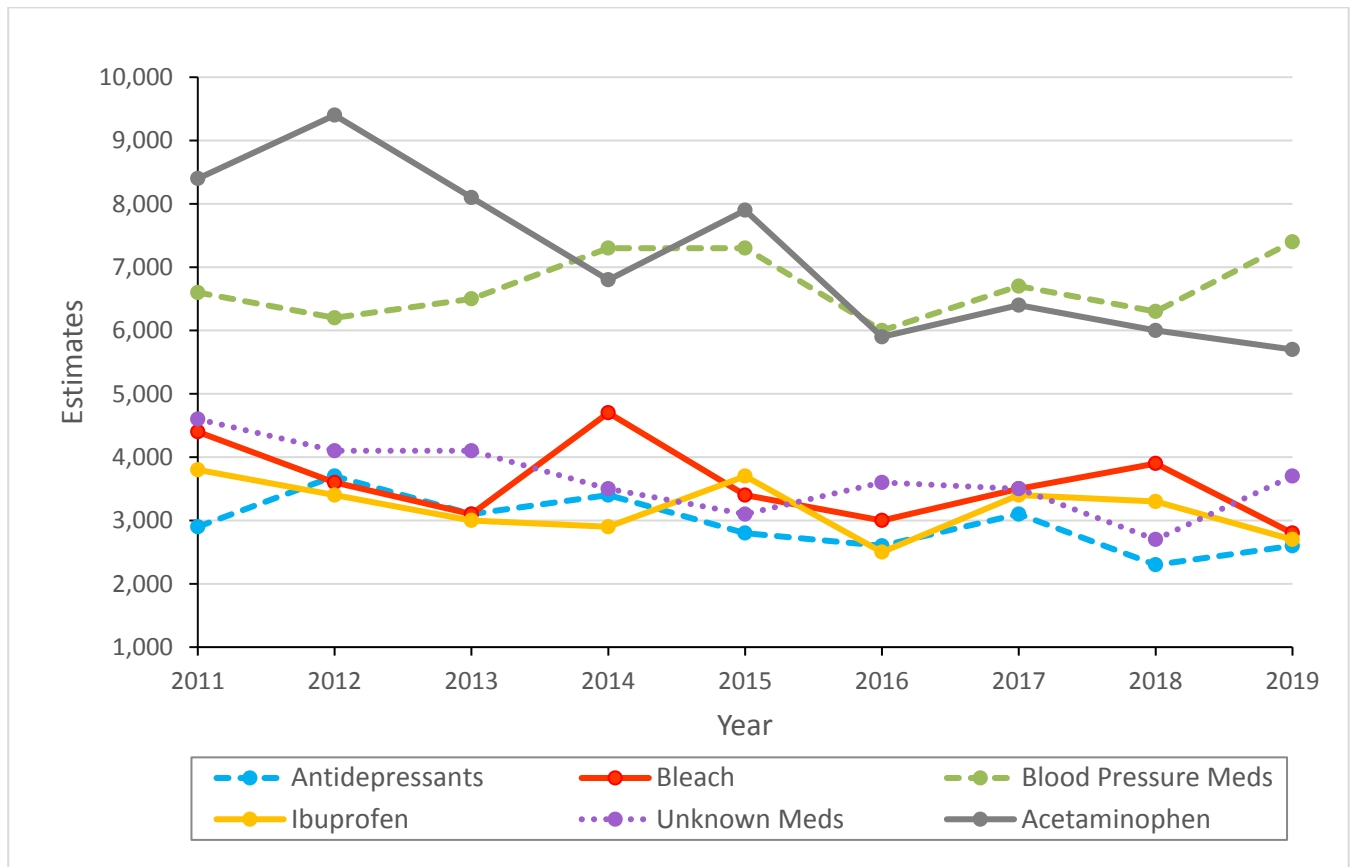
1. *Adverse Reactions*: This includes undesirable effects that occur with the proper use of a substance (e.g., drowsiness after administration of an antihistamine). Allergic, hypersensitivity, or idiosyncratic reactions to recommended doses of vaccines, antibiotics, or other medications are also included 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[®] 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 2019*

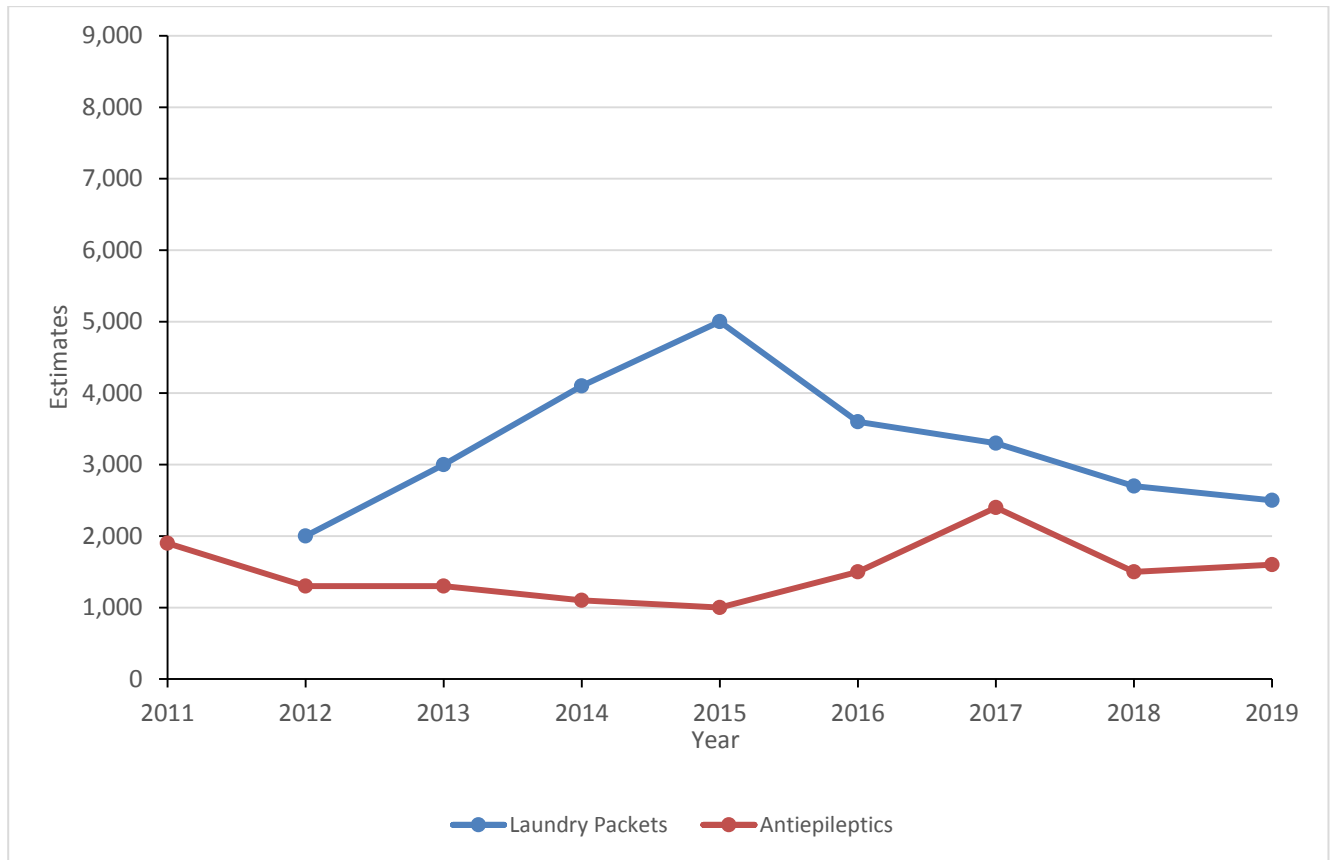


*Due to limited variance in the number of children under 5, the pattern remains the same when normalizing.

*There is a reduction in Acetaminophen since 2011, which may be due to several Acetaminophen child safety cap recalls

Source: National Electronic Injury Surveillance System

**Figure A.2: Estimates for Other Products (Laundry Packet and Antiepileptics)
From 2011 to 2019***



* *Laundry Packet was introduced in United States in 2012*

Source: National Electronic Injury Surveillance System

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 |

Source: National Electronic Injury Surveillance System

** 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 |

Source: National Electronic Injury Surveillance System

** 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 |

Source: National Electronic Injury Surveillance System

** 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 |

Source: National Electronic Injury Surveillance System

** 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 |

Source: National Electronic Injury Surveillance System

** 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 |

Source: National Electronic Injury Surveillance System

** 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 |

Source: National Electronic Injury Surveillance System

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

Table A.8: 2018 Emergency Department Treated Unintentional Pediatric Poisoning Estimates by Top 10 Products*

| Product | Estimate | 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 | 2,000 | 22.23% | 1,100-2,900 |
| Narcotics Medications | 1,900 | 18.55% | 1,200-2,600 |
| Unknown | 2,700 | 15.84% | 1,900-3,500 |

Source: National Electronic Injury Surveillance System

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