



U.S. CONSUMER PRODUCT SAFETY COMMISSION
4330 East West Highway, Bethesda MD 20814

February 12, 2018

TRANSMITTED VIA EMAIL

Mr. Len Morrissey
ASTM
100 Barr Harbor Dr.
West Conshohocken, PA 19428-2959

Re: CPSC Report to ASTM International F15.71 on Liquid Laundry Packet Injuries

Dear Mr. Morrissey:

This letter is the second in a series of reports by CPSC staff on hospital emergency room visits associated with liquid laundry packets.

Background

In 2012, injury incident reports associated with liquid laundry packets began to appear in the surveillance data maintained by the U.S. Consumer Product Safety Commission. The main hazards were ingestions which, in the worst case, can lead to fatalities and ocular injuries that require medical assistance. In 2013, CPSC requested voluntary action by industry. Within months, ASTM held a kickoff meeting to address the hazards associated with these products, resulting in the publication of the voluntary standard F3159-15e1 in October 2015. Manufacturers adopted a number of voluntary safety measures through ASTM to address these hazards, including the packaging, labeling, and taste/dissolution properties of liquid laundry packets. The current voluntary standard is ASTM F3159-15e1, *Standard Safety Specification for Liquid Laundry Packets*. By December 2016, these voluntary safety measures were fully implemented by industry (according to ASTM 15.71 participants), with nearly all of the products available for sale to consumers complying with the voluntary standards in ASTM F3159-15e1.

In evaluating the impact of these standards on safety, the ASTM data sub-team sought to monitor injuries associated with liquid laundry packets before, during, and after implementation of the standards, for which CPSC agreed to provide data reporting. In October 2017, CPSC prepared and presented its report to ASTM detailing the estimated injuries seen in emergency departments associated with liquid laundry packets in the pre-implementation period (defined by the ASTM data sub-team as July 2012 to June 2013)¹. This letter constitutes the second report, and examines the transition period (July 2013 to

¹ The report can be found at <https://cpsc.gov/s3fs-public/Liquid-Laundry-Packets-baseline.pdf>

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December 2016). Future reports will provide information from the post-implementation period, 2017 and later.

Method

The National Electronic Injury Surveillance System (NEISS) is a national stratified probability sample of hospitals in the United States and its territories. There are five strata in the NEISS: children's hospitals, small hospitals, medium hospitals, large hospitals, and very large hospitals. Within each stratum is a sample of hospitals that make up the primary sampling units (PSUs) of NEISS. For each hospital in the sample, every emergency-department visit associated with a consumer product is recorded. To facilitate injury estimates associated with a product or product group, each injury has a product code that identifies the type of product involved. Information recorded for each injury includes sex, age, diagnosis, disposition, body part, and a brief narrative description of the injury, among other information. The information on stratum, hospital, age, and sex of the patient is known for all observations in this study. You can find additional information about NEISS online at: <http://www.cpsc.gov/library/neiss.html>.

To identify emergency department-treated injuries associated with liquid laundry packets, CPSC staff searched the following product codes: 949 (Laundry soaps or detergents), 976 (Detergents, not specified), 983 (Soaps, excluding laundry soaps or detergents), and 934 (Dishwasher detergents). Although some of these codes would not appear relevant to liquid laundry packets, staff identified cases that indicated the involvement of liquid laundry packets upon review of the narrative description. The ASTM data sub-team determined that the focus of the analysis would be on children under age 6; although estimates for the population under age 5 are included here as well, because that is a population of particular concern to CPSC, and it is a critical threshold in the Poison Prevention Packaging Act.

Estimated Injury Department Visits by Children

Table 1 includes the estimated emergency department visits for children under age 5, children under age 6, and for all ages. The "N" refers to the number of cases used to produce the estimate, and the "C.V." refers to the coefficient of variation for the estimate. Most of the injuries occurred to children under age 5, which is why the three figures are so often similar, and at times, identical. To look at shorter periods than the initial baseline period, or the full transition period, 6-month periods are also provided so they can be viewed independently. Most of the injuries to children under age 5 and under age 6 resulted from ingestions. Only ingestion injuries occurred with sufficient frequency to produce semiannual estimates. We combined ocular injuries with ingestions to allow for both to be considered semiannually when evaluating the voluntary standards. The differences in injury estimates between semiannual periods were not statistically significant.

Table 1. Estimated Emergency-Department Visits Associated with Liquid Laundry Packets for Children Under Age 5 and Under Age 6 by Time Period and Injury Type

Injury and time period	Under Age 5			Under Age 6			All Ages		
	N	Est. ED Visits ⁺	C.V.	N	Est. ED Visits ⁺	C.V.	N	Est. ED Visits ⁺	C.V.
All Injuries 7/2012 - 6/2013	166	4,200	0.168	172	4,300	0.179	180	4,500	0.168
All Injuries 7/2013 - 12/2016	647	18,000	0.143	661	18,300	0.141	711	20,300	0.141
All Injuries 7/2012 - 12/2012	82	2,300	0.203	84	2,400	0.221	85	2,400	0.220
All Injuries 1/2013 - 6/2013	84	1,900	0.208	88	1,900	0.205	95	2,200	0.191
All Injuries 7/2013 - 12/2013	81	1,800	0.176	82	1,900	0.172	88	2,100	0.163
All Injuries 1/2014 - 6/2014	95	2,900	0.187	98	2,900	0.186	104	3,100	0.197
All Injuries 7/2014 - 12/2014	92	2,800	0.224	93	2,800	0.223	102	3,200	0.222
All Injuries 1/2015 - 6/2015	92	2,900	0.211	96	2,900	0.209	101	3,200	0.194
All Injuries 7/2015 - 12/2015	107	2,800	0.175	110	2,900	0.174	115	3,100	0.180
All Injuries 1/2016 - 6/2016	94	2,200	0.188	94	2,200	0.188	102	2,600	0.178
All Injuries 7/2016 - 12/2016	86	2,600	0.243	88	2,700	0.234	99	3,200	0.222
Ingestions 7/2012 - 6/2013	138	3,300	0.169	139	3,400	0.169	139	3,400	0.169
Ingestions 7/2013 - 12/2016	466	13,400	0.167	466	13,400	0.167	475	13,700	0.169
Ingestions 7/2012 - 12/2012	67	1,800	0.214	67	1,800	0.214	67	1,800	0.214
Ingestions 1/2013 - 6/2013	71	1,500	0.218	72	1,500	0.217	72	1,500	0.217
Ingestions 7/2013 - 12/2013	61	1,300	0.211	61	1,300	0.211	63	1,400	0.212
Ingestions 1/2014 - 6/2014	71	2,000	0.259	71	2,000	0.259	71	2,000	0.259
Ingestions 7/2014 - 12/2014	70	2,000	0.271	70	2,000	0.271	72	2,000	0.270

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Ingestions 1/2015 - 6/2015	74	2,500	0.220	74	2,500	0.220	75	2,600	0.222
Ingestions 7/2015 - 12/2015	73	2,000	0.180	73	2,000	0.180	74	2,100	0.177
Ingestions 1/2016 - 6/2016	65	1,500	0.209	65	1,500	0.209	66	1,600	0.220
Ingestions 7/2016 - 12/2016	52	2,000	0.291	52	2,000	0.291	54	2,000	0.289
Ocular 7/2012 - 6/2013	27	*	*	32	*	*	40	*	*
Ocular 7/2013 - 12/2016	164	4,200	0.131	178	4,500	0.130	208	5,600	0.138
Ingestions/Ocular 7/2012 - 6/2013	165	4,200	0.169	171	4,300	0.180	178	4,500	0.174
Ingestions/Ocular 7/2013 - 12/2016	631	17,600	0.151	645	17,900	0.149	684	19,400	0.150
Ingestions/Ocular 7/2012 - 12/2012	82	2,300	.204	84	2,400	0.222	85	2,400	0.220
Ingestions/Ocular 1/2013 - 6/2013	83	1,900	0.209	87	1,900	0.206	93	2,100	0.195
Ingestions/Ocular 7/2013 - 12/2013	79	1,800	0.179	80	1,900	0.174	85	2,100	0.166
Ingestions/Ocular 1/2014 - 6/2014	93	2,800	0.192	96	2,900	0.190	101	3,000	0.192
Ingestions/Ocular 7/2014 - 12/2014	88	2,700	0.237	89	2,700	0.236	97	3,000	0.238
Ingestions/Ocular 1/2015 - 6/2015	92	2,900	0.211	96	2,900	0.209	99	3,100	0.199
Ingestions/Ocular 7/2015 - 12/2015	104	2,700	0.183	107	2,700	0.182	110	2,900	0.189
Ingestions/Ocular 1/2016 - 6/2016	92	2,200	0.188	92	2,200	0.188	98	2,400	0.188
Ingestions/Ocular 7/2016 - 12/2016	83	2,500	0.244	85	2,600	0.235	94	3,000	0.231
Dermal 7/2012 - 6/2013	1	*	*	1	*	*	2	*	*
Dermal 7/2013 - 12/2016	15	*	*	15	*	*	26	*	*
Inhalation/Thermal burn/Phimosis 7/2013 - 12/2016	2	*	*	2	*	*	3	*	*

[†]Injury estimates are rounded to the nearest 100 and may not sum to totals due to rounding.

*Does not meet NEISS criteria for publication, of an estimate of at least 1,200.

Estimates for the baseline reporting period are shaded in gray.

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Sales Data and Injury Rates

CPSC received aggregated point-of-sale data from Nielsen via the Rocky Mountain Poison and Drug Center. We needed the data to provide context to determine changes in injury risks. Table 2 shows the sales in both units (which is a single package sold that can include multiple laundry packets), and in total number of packets. The data are compiled in 4-week intervals, and thus, the data can be aggregated similarly (but not identically) to the periods of interest.

Table 2. Sales of Laundry Packets by Unit and Total Number of Packets by Time Period

Time Periods	Units (in millions)	Number of Packets (in millions)
6/24/2012 - 6/22/2013	58.075	2,051
6/23/2013 - 12/31/2016	340.080	12,462
6/24/2012 - 1/5/2013	30.054	1,044
1/6/2013 - 6/22/2013	28.021	1,007
6/23/2013 - 1/4/2014	35.059	1,329
1/5/2014 - 6/21/2014	36.754	1,381
6/22/2014 - 1/3/2015	49.872	1,789
1/4/2015 - 6/20/2015	44.272	1,638
6/21/2015 - 1/2/2016	54.298	1,981
1/3/2016 - 6/18/2016	53.310	1,918
6/19/2016 - 12/31/2016	66.514	2,426

Estimates for the baseline reporting period are shaded in gray.

Table 3 combines the unrounded emergency department-visit estimates used to produce Table 1 with the sales figures in Table 2 to produce emergency department-visit rates per million units sold, and per million packets sold. When sales are considered, the differences in ER visit rates per unit and per packet between the baseline period and the last two 6-month portions of the transition period were statistically significant for each age grouping. Figure 1 presents the estimated emergency department-visit rates per unit and per packet for each 6-month period for all ages for all types of injuries. Figure 2 presents the estimated emergency department rates per unit and per packet for each 6-month period for all ages for ingestions only.

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Table 3. Estimated Emergency Department-Visit Rates by Units and Total Number of Packets Sold

Injury and time period	Under Age 5		Under Age 6		All Ages	
	Est. ED Visits per 1 million units	Est. ED Visits per 1 million packets	Est. ED Visits per 1 million units	Est. ED Visits per 1 million packets	Est. ED Visits per 1 million units	Est. ED Visits per 1 million packets
All Injuries 7/2012 - 6/2013	72	2.0	74	2.1	78	2.2
All Injuries 7/2013 - 12/2016	53	1.4	54	1.5	60	1.6
All Injuries 7/2012 -12/2012	76	2.2	79	2.3	79	2.3
All Injuries 1/2013 - 6/2013	68	1.9	69	1.9	77	2.1
All Injuries 7/2013 - 12/2013	51	1.4	54	1.4	60	1.6
All Injuries 1/2014 - 6/2014	79	2.1	79	2.1	84	2.2
All Injuries 7/2014 - 12/2014	56	1.6	56	1.6	64	1.8
All Injuries 1/2015 - 6/2015	66	1.8	66	1.8	72	2.0
All Injuries 7/2015 - 12/2015	52	1.4	53	1.5	57	1.6
All Injuries 1/2016 - 6/2016	41*	1.1*	41*	1.1*	49*	1.4*
All Injuries 7/2016 - 12/2016	39*	1.1*	41*	1.1*	48*	1.3*
Ingestions 7/2012 - 6/2013	58	1.6	58	1.6	58	1.6
Ingestions 7/2013 - 12/2016	39	1.1	39	1.1	40	1.1
Ingestions 7/2012 - 12/2012	60	1.7	60	1.7	60	1.7
Ingestions 1/2013 - 6/2013	55	1.5	55	1.5	55	1.5
Ingestions 7/2013 - 12/2013	37	1.0	37	1.0	40	1.1
Ingestions 1/2014 - 6/2014	54	1.4	54	1.4	54	1.4
Ingestions 7/2014 - 12/2014	40	1.1	40	1.1	40	1.1
Ingestions 1/2015 - 6/2015	56	1.5	56	1.5	59	1.6
Ingestions 7/2015 - 12/2015	37	1.0	37	1.0	39	1.1
Ingestions 1/2016 - 6/2016	28*	0.8*	28*	0.8*	30*	0.8*
Ingestions 7/2016 - 12/2016	30*	0.8*	30*	0.8*	30*	0.8*
Ing./Ocular 7/2012 - 6/2013	72	2.0	74	2.1	77	2.1
Ing./Ocular 7/2013 - 12/2016	52	1.4	53	1.4	57	1.4
Ing./Ocular 7/2012 - 12/2012	76	2.2	79	2.3	79	2.3
Ing./Ocular 1/2013 - 6/2013	68	1.9	68	1.9	74	1.9
Ing./Ocular 7/2013 - 12/2013	51	1.3	53	1.4	59	1.4
Ing./Ocular 1/2014 - 6/2014	77	2.1	78	2.1	81	2.1
Ing./Ocular 7/2014 - 12/2014	54	1.5	54	1.5	59	1.5
Ing./Ocular 1/2015 - 6/2015	65	1.7	65	1.8	69	1.8
Ing./Ocular 7/2015 - 12/2015	50	1.4	50	1.4	54	1.4
Ing./Ocular 1/2016 - 6/2016	42*	1.2*	42*	1.2*	44*	1.2*
Ing./Ocular 7/2016 - 12/2016	38*	1.0*	40*	1.1*	46*	1.1*

*Indicates a statistically significant difference from the baseline July 2012 to June 2013 period.

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Figure 1. All Est. Emergency Department-Visit Rates by Unit and Total Number of Packets Sold

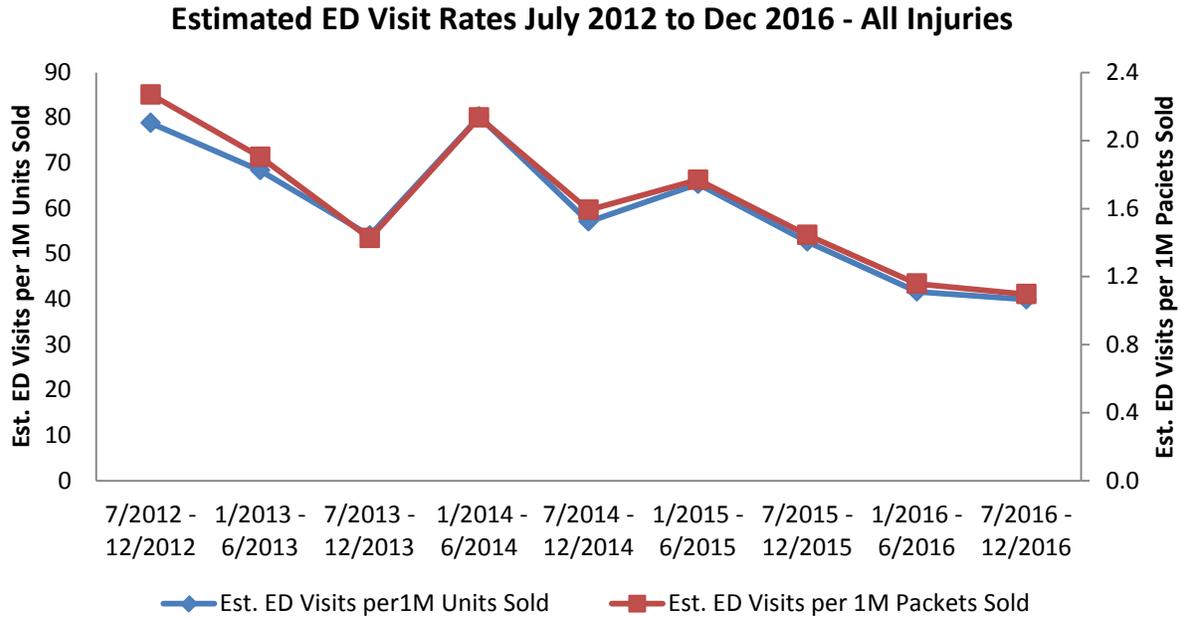
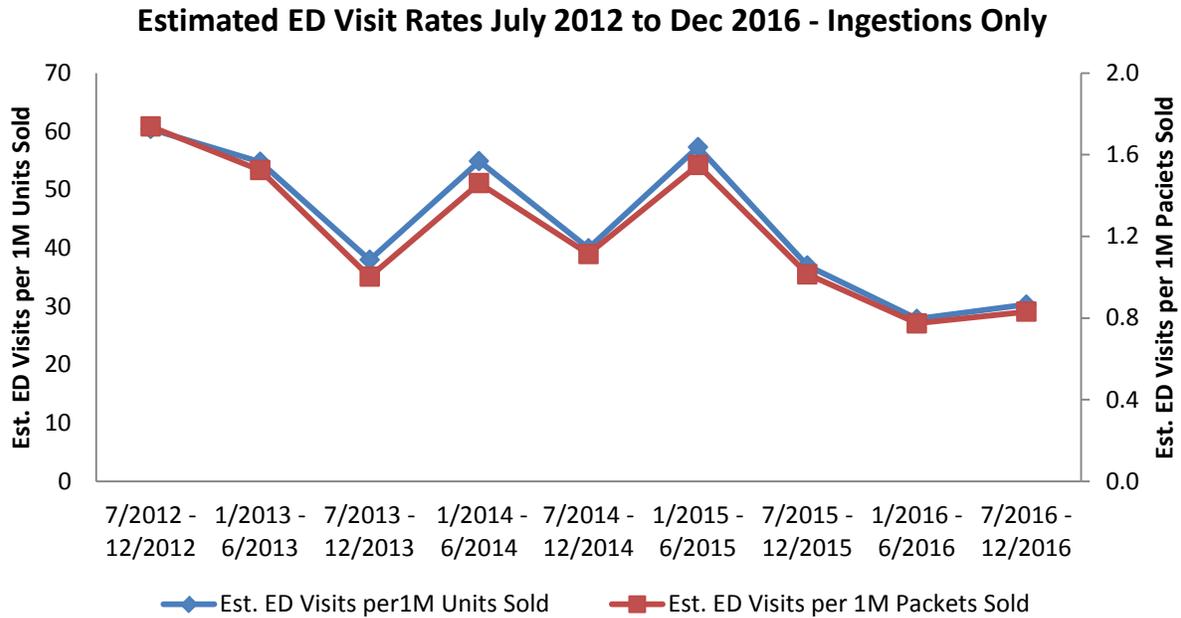


Figure 2. Est. Emergency Dept-Visit Rates by Unit and Total Number of Packets Sold (Ingestions)



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Population Data and Injury Rates

Table 4 shows the average population counts from U.S. Census Bureau in millions corresponding most closely to the 6-month time periods².

Table 4. U.S. Resident Population by Age Category and Time Period (in millions)

Time Periods	Under Age 5	Under Age 6	All Ages
7/2012 - 6/2013	19.939	24.069	315.071
7/2013 - 12/2016	19.906	23.944	320.234
7/2012 - 12/2013	19.969	24.102	314.548
1/2013 - 06/2013	19.909	24.035	315.595
7/2013 - 12/2014	19.856	23.962	316.758
1/2014 - 6/2014	19.875	23.917	317.909
7/2014 - 12/2015	19.905	23.899	319.137
1/2015 - 6/2015	19.926	23.930	320.262
7/2015 - 12/2016	19.922	23.956	321.428
1/2016 - 6/2016	19.925	23.973	322.486
7/2016 - 12/2016	19.936	23.969	323.655

Estimates for the baseline reporting period are shaded in gray.

Table 5 combines the unrounded emergency department-visit estimates used to produce Table 1 with the population figures in Table 4 to produce emergency department-visit rates per million persons of each age group (under 5, under 6, and all ages). The differences in population-adjusted injury rates between semiannual periods were not statistically significant. The rates of emergency department visits were much higher for children under age 5 and under age 6 than for all ages.

² The Monthly Postcensal Resident Population counts can be found at:
<https://www.census.gov/data/tables/2017/demo/popest/nation-detail.html>

Table 5. Estimated Emergency Department-Visit Population-Adjusted Injury Rates by Age and Time Period (Estimated ED Visits per 1 million population)

Injury and time period	Under Age 5	Under Age 6	All Ages
All Injuries 7/2012 - 6/2013	210.6	178.4	14.4
All Injuries 7/2013 - 12/2016	906.7	765.5	63.5
All Injuries 7/2012 -12/2012	114.9	98.3	7.6
All Injuries 1/2013 - 6/2013	95.1	79.8	6.8
All Injuries 7/2013 - 12/2013	91.4	79.1	6.6
All Injuries 1/2014 - 6/2014	147.1	123.3	9.8
All Injuries 7/2014 - 12/2014	142.3	119.2	10.0
All Injuries 1/2015 - 6/2015	143.8	121.1	10.0
All Injuries 7/2015 - 12/2015	142.3	119.4	9.6
All Injuries 1/2016 - 6/2016	111.5	92.7	8.1
All Injuries 7/2016 - 12/2016	128.4	110.9	9.9
Ingestions 7/2012 - 6/2013	165.5	139.2	10.6
Ingestions 7/2013 - 12/2016	672.7	559.3	42.7
Ingestions 7/2012 - 12/2012	90.1	75.3	5.8
Ingestions 1/2013 - 6/2013	75.3	63.9	4.9
Ingestions 7/2013 - 12/2013	67.1	55.6	4.3
Ingestions 1/2014 - 6/2014	101.5	84.3	6.3
Ingestions 7/2014 - 12/2014	100.1	83.4	6.3
Ingestions 1/2015 - 6/2015	127.4	106.1	8.0
Ingestions 7/2015 - 12/2015	100.8	83.9	6.5
Ingestions 1/2016 - 6/2016	74.5	61.9	4.9
Ingestions 7/2016 - 12/2016	101.2	84.2	6.3
Ing./Ocular 7/2012 - 6/2013	210.0	178.2	14.1
Ing./Ocular 7/2013 - 12/2016	886.6	748.9	60.5
Ing./Ocular 7/2012 - 12/2012	114.9	98.3	7.6
Ing./Ocular 1/2013 - 6/2013	95.1	79.8	6.6
Ing./Ocular 7/2013 - 12/2013	90.3	78.2	6.5
Ing./Ocular 1/2014 - 6/2014	142.7	119.7	9.4
Ing./Ocular 7/2014 - 12/2014	135.0	113.1	9.3
Ing./Ocular 1/2015 - 6/2015	143.8	121.1	9.6
Ing./Ocular 7/2015 - 12/2015	135.9	114.2	9.1
Ing./Ocular 1/2016 - 6/2016	111.1	92.3	7.3
Ing./Ocular 7/2016 - 12/2016	127.7	110.4	9.4

Estimates for the baseline reporting period are shaded in gray.

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Injury Severity

Table 6 shows the disposition for all of the injuries seen in the baseline period (July 2012 to June 2013). The treated-and-released category was the only one large enough to produce a publishable NEISS estimate. Therefore, only percentages are shown.

Table 6. Disposition of Estimated Emergency-Department Visits Associated with Liquid Laundry Packets for Children Under Age 5 and Under Age 6 July 2012 to June 2013

Disposition	Under Age 5	Under Age 6	All Ages ⁺
Treated and Released	82%	83%	84%
Admitted, Transferred	12%	11%	11%
Held for Observation	3%	3%	3%
Left Without Being Seen	3%	3%	3%

⁺Percentages may not round to totals due to rounding.

Table 7 shows the disposition for all of the injuries seen in the transition period (July 2013 to December 2016). The treated-and-released and admitted/transferred categories were the only ones large enough to produce a publishable NEISS estimate. Therefore, only percentages are shown. The changes between periods are not statistically significant.

Table 7. Disposition of Estimated Emergency-Department Visits Associated with Liquid Laundry Packets for Children Under Age 5 and Under Age 6 July 2013 to December 2016

Disposition	Under Age 5 ⁺	Under Age 6 ⁺	All Ages
Treated and Released	88%	88%	89%
Admitted, Transferred	8%	8%	8%
Held for Observation	2%	2%	2%
Left Without Being Seen	1%	1%	1%

⁺Percentages may not round to totals due to rounding.

Fatalities

CPSC is aware of one fatality in the baseline period of July 2012 to June 2013 (an elderly woman with Alzheimer's, who died after ingesting liquid laundry packets). CPSC is aware of seven additional fatalities in the United States between July 2013 and December 2016, including two involving children under 2 years of age and five adults. All of the victims had ingested at least one liquid laundry packet. The adult victims all suffered from Alzheimer's or dementia. The two children died in 2013, three adults died in 2014, one adult died in 2015, and another adult died in 2016.

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Sincerely,

Stephen Hanway
Director, Division of Hazard Analysis
Directorate for Epidemiology

Cc: Patricia L. Edwards, CPSC Voluntary Standards Coordinator