Supporting Statement for Collection of Information Follow-up Activities for Product-Related Injuries Part B

B. Collection of Information Employing Statistical Methods

1. The potential respondent universe includes patients treated in statistically selected hospitals participating in the NEISS to report emergency department-treated, product-related injuries and other injuries.

On an annual basis, CPSC purchases a hospital frame from the American Hospital Association's (AHA) Annual Survey Database.¹ This database is derived primarily from the AHA Annual Survey of Hospitals, which has been administered by AHA since 1946. The 2020 AHA frame purchased by CPSC is the frame that was used when selecting the current NEISS sample of hospitals. There were 4,723 eligible hospital emergency departments on the 2020 frame representing a total of 155,707,175 visits to the emergency department (emergency room visits or ERVs).

The current NEISS sample was drawn from the 2020 AHA as defined in the following table:

Stratum	Annual ERVs	Total Number of Hospitals on Frame	Total Number of Hospitals in NEISS
Children's	N/A	65	8
Small	1 - 33,280	2,984	43
Medium	33,281 - 56,995	860	26
Large	56,996 - 92,195	528	12
Very Large	92,196 +	286	11
TOTAL		4,723	100

Current NEISS Sample

¹ See https://www.ahadata.com/aha-annual-survey-database

Basic NEISS Weights

The "basic" weight for each NEISS hospital reflects the sample design and is equal to the inverse of the NEISS hospital's probability of selection from the 2020 hospital frame. The probability of selection for each hospital in the 2020 hospital frame can be expressed as the following proportion:

$$p_{hi} = \frac{n_h}{N}$$

where:

- p_{hi} = Probability that hospital i is selected in stratum h from the 2020 hospital frame
- n_h = Number of hospitals in the 2020 hospital frame selected for the NEISS sample in stratum h
- N_h = Number of hospitals assigned to stratum h in the 2020 hospital frame

By taking the inverse of the above proportion, the basic weight (W) of each NEISS hospital i in stratum h can be expressed as below:

$$W_{hi} = \frac{N_h}{n_h}$$

Ratio Adjustment Factor

In order to stabilize the NEISS estimates over time without taking a new NEISS sample and back-casting historical estimates, a ratio adjustment to the basic NEISS weight is calculated.

The hospital population does not remain static over time. Hospitals close, merge, and open as well as change in the volume of emergency department visits. A ratio adjustment takes advantage of knowledge about a highly correlated auxiliary variable, which is the total number of emergency department visits. The total number of emergency department visits is obtained by purchasing a complete hospital database on an annual or semiannual basis.

The ratio adjustment applied to the basic NEISS weight is the ratio of the known total number of emergency department visits in the population (from the frame) to the estimate of the total emergency department visits based on the sample of NEISS hospitals. For computing ratio adjustments, Westat has recommended combining the small and medium strata together and the large and very large strata together due to the relatively small number of NEISS hospitals in some of the larger strata.²

² Marker, David; Lo, Annie; Brick, Mike; Davis, Bill; Westat Inc., "Comparison of National Estimates from Different Samples and Different Sampling Frames of the National Electronic Injury Surveillance System (NEISS)." January 25, 1999.

Within each combined stratum, the ratio-adjusted weights, w^*_{hi} , are computed as:

$$w_{hi}^{i} = w_{hi} \left(\frac{ERV_{yr,h^{i}}}{\sum_{h \in h^{i}} \sum_{i}^{\square} w_{hi} erv_{yr,i}} \right) = w_{hi} * R_{h^{i}}$$
(Equation 1)

where:

 w_{hi} = NEISS basic weight $ERV_{\gamma r,h^*}$ = Total ERVs on 20yr (2020, 2021, etc.) file for combined stratum h* $erv_{\gamma r,i}$ = Number of ERVs from the 20yr (2020, 2021, etc.) file for NEISS hospital i R_{h^*} = Ratio adjustment for combined stratum h*

Adjustments for Non-Response

The NEISS adjusts for non-responding hospitals on a monthly basis, if necessary. When a hospital stops participating or falls behind in reporting, the statistical weight for that hospital is assigned to zero and the statistical weight for the other hospitals in the same stratum are weighted up by dividing the number of in-scope NEISS hospitals in the sample for a given stratum and month, by the number of hospitals actually participating in that stratum for that particular month.

Recruitment of Replacement Hospitals

Although the NEISS adjusts the weights for non-responding hospitals, it is CPSC's goal and efforts are made to maintain the NEISS sample size and have full reporting. When a NEISS hospital drops off or chooses not to participate, CPSC staff recruit a replacement hospital. Replacement hospitals are selected based on size and proximity to the hospital that dropped. The closest hospital (based on geo-coordinates) in the same stratum is the primary target for recruitment. If this hospital declines participation, then the next closest hospital is recruited. This process is continued until a hospital agrees to join the NEISS.

Final NEISS Weights

The final NEISS weight calculated each month and used for national estimates can be written as:

$$NEISS_{wt_{hi}} = \frac{N_h}{n_h} * \frac{n_h}{r_h} * R_{h*i} \dot{c}$$

Where

(Equation 2)

- N_h = Number of hospitals in the 2020 sampling frame for stratum h
- n_h = Number of hospitals selected for the NEISS sample for stratum h
- n'_{h} = Number of in-scope hospitals in the NEISS sample for stratum h
- r_h = Number of NEISS hospitals participating in stratum h for the given month
- R_{h^*} = Ratio adjustment for combined stratum h*

Confidence Intervals Around National Estimates

Because the NEISS is a statistical sample of emergency room visits, there are corresponding confidence intervals around the national estimates. Listed below are national estimates and confidence intervals for a select group of consumer products from 2020 NEISS data:

Product	National Estimate	Number of Cases	CV*	95% CI Lower Bound	95% CI Upper Bound
Child Nursery Equipment & Supplies	90,039	3,242	0.14	65,154	114,924
General Household Appliances	148,696	3,713	0.09	122,882	174,511
Heating, Cooling, Ventilation Equipment	115,849	2,913	0.07	99,915	131,783
Home Communication, Entertainment & Hobby	235,780	5,576	0.09	194,321	277,240
Home Furnishings, Fixtures And Accessories	3,095,651	80,388	0.09	2,528,442	3,662,861
Home Maintenance	177,534	4,678	0.09	146,788	208,280
Home Structures & Construction Materials	3,865,472	101,577	0.08	3,243,981	4,486,963
Home Workshop Equipment	315,480	6,737	0.07	270,664	360,296
Housewares	680,936	16,674	0.07	583,334	778,539
Miscellaneous Products	307,228	8,857	0.07	262,128	352,328
Packaging & Containers, Household	394,456	10,315	0.08	333,769	455,143
Personal Use Items	773,170	21,066	0.09	642,145	904,196
Sports And Recreation Equipment	3,709,00	104,413	0.10	2,951,082	4,466,918
Toys	184,621	6,099	0.12	142,012	227,229

2023 NEISS National Estimates³

³ Consumer Product Safety Commission. National Electronic Injury Surveillance System 2004-2023 on NEISS Online Database, released April, 2024. Generated at https://www.cpsc.gov/cgibin/NEISSQuery/home.aspx.

	Yard And Garden 261	1,025 5,431	0.10	210,156	311,893
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*CV – coefficient of variation

2. The affiliated NEISS hospitals will report about 1.15 million emergency department visits annually using existing information extracted from hospital records. Of those reported visits, about 450,000 will be consumer product-related cases. Since hospital record data are limited, further information is frequently necessary, and about 7,000 of these cases are selected for further investigation. Of the 7,000 cases selected, 1,025 (15%) are successfully contacted and 750 (11%) of the investigations are completed.

The potential respondent universe also includes individuals involved with incidents recorded in newspaper articles, consumer complaints, death certificates, coroner's reports and any other injury sources that may be reported to the CPSC. These other data sources contribute more than 525,000 cases annually, of which about 4,000 are selected for further investigation. Of the 4,000 cases selected, 3,775 (94%) are successfully contacted and 2,950 (74%) of the investigations are completed.

3. Cases associated with categories of interest are selected daily from the hundreds of incident reports received each day by the CPSC. CPSC investigators call to interview or to arrange to visit the victim or others to determine specific details about the accident sequence. Information collected from the victim, family member, witness, or others is reported on an investigation form designed for this purpose.

When less than 100 percent of the surveillance cases are selected for investigation, the universe of cases is stratified by relevant factors, such as type of injury or consumer product involved, and a simple random sample of cases is selected.

- 4. About 44 percent of the victims involved in the selected incidents are successfully contacted. Of those contacted, about 77 percent agree to provide information voluntarily on the circumstances of the incident. For probability surveys, responses are weighted to account for non-responses. The results from probability surveys can be generalized to the universe studied.
- 5. No tests of procedures or methods will be undertaken.
- 6. Contact for collection and analysis of NEISS data:

Thomas Schroeder U.S. Consumer Product Safety Commission 4330 East West Highway Bethesda, MD 20814 tschroeder@cpsc.gov