CPSC Staff Statement on Pacific Institute for Research and Evaluation (PIRE) Report: "Revised Incidence Estimates for Nonfatal, Non-Hospitalized Consumer Product Injuries Treated Outside Emergency Departments"[1]
July 2014

The report titled, "Revised Incidence Estimates for Nonfatal, Non-Hospitalized Consumer Product Injuries Treated Outside Emergency Department," presents the findings of research conducted by PIRE under Contract CPSC-D-09-003, Task Order 2. In 2013, CPSC staff issued this task order to PIRE to update the estimates of injuries treated in physicians' offices and clinics, company clinics, hospital outpatient departments, and ambulatory surgery centers. The attached report details the results of this work.

The U.S. Consumer Product Safety Commission's (CPSC's) National Electronic Injury Surveillance System (NEISS) is the nation's principal source of data about injuries related to consumer products. NEISS samples data on injury survivors treated in hospital emergency departments (EDs) and serves as the basis for generating statistically valid national estimates of the number and nature of nonfatal ED injuries.

However, injury survivors can be treated in other settings besides the ED, including doctors' offices, clinics, company clinics, hospital outpatient departments, and ambulatory surgery centers, among others. In addition, some injury survivors are admitted to the hospital directly, bypassing the ED. These injuries may be transferred from a clinic or doctor's office or triaged by emergency medical services. The total injury estimates from these four categories combined make up medically treated injuries.

The focus of the attached report is the estimation of injuries treated outside hospital EDs in doctors' offices, clinics, hospital outpatient departments, and other settings—injuries that are not admitted later to the hospital. The 2000 Injury Cost Model (ICM) (Miller et al., 2000) currently generates estimates of injuries treated in other settings, using ratios that relate treated-and-released-ED injuries to other treatment categories. Briefly, the ICM ratios are calculated from the total number of patients treated in all non-ED settings, compared to the number of patients treated and released from a hospital ED. The ICM ratios are specific to the NEISS diagnosis-body part combination and the age and sex of the injury survivor.

[1] This statement was prepared by CPSC staff, and the attached report was produced by PIRE for CPSC staff. The statement and report have not been reviewed or approved by, and do not necessarily represent the views of the Commission.

In sum, PIRE conducted a decision tree analysis on 12 years (1996 to 2007) of Medical Expenditure Panel Survey (MEPS) data compiled by the Agency for Healthcare Research and Quality (AHRQ) of the U.S. Department of Health and Human Services. Through this process, PIRE developed updated ratios of emergency department-treated injuries to injuries treated in non-ED settings.

Revised Incidence Estimates for Nonfatal, Non-Hospitalized Consumer Product Injuries Treated Outside Emergency Departments

Bruce A. Lawrence
Pacific Institute for Research & Evaluation

Draft Final Report to the U.S. Consumer Product Safety Commission
Task Order 2, Contract CPSC-D-09-0003

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This report is being posted on the CPSC website for public comment. The recommendations are those of the contractor and may not reflect the views of CPSC staff. CPSC staff will refine and complete its recommendations after reviewing the public comments.

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In fulfillment of Task Order 2, "Decision Tree Analysis," awarded under the contract "Benefit Assessment Support Services" (CPSC-D-09-0003), Pacific Institute for Research & Evaluation (PIRE) has produced revised estimates of the numbers of patients treated for nonfatal consumer product injuries in doctors' offices, clinics, and outpatient departments.

Background

The U.S. Consumer Product Safety Commission's (CPSC's) National Electronic Injury Surveillance System (NEISS) is the nation's principal source of data about injuries related to consumer products. NEISS monitors and provides statistically valid national estimates of the number and nature of nonfatal injuries treated in hospital emergency departments (EDs). The system uses surveillance data from about a hundred hospitals. Properly weighted, these data accurately represent the approximately 13 million consumer product injuries treated in EDs each year.

NEISS samples injury survivors treated in EDs or admitted as inpatients through the ED. However, injury survivors can be treated in many other settings, including physicians' offices and clinics, company clinics, hospital outpatient departments, ambulatory surgery centers, or poison control centers (telephone centers that triage victims and supervise home treatment). In addition, some injury survivors are admitted to the hospital directly, bypassing the ED (and NEISS). These survivors may be transferred from a walk-in clinic or doctor's office, or they may be triaged by emergency medical services to a specialty hospital that lacks an ED but directly admits victims of severe trauma. Conceptually, therefore, CPSC's Injury Cost Model (ICM) must generate incidence estimates for four groups of injury survivors:

1. Hospitalized survivors admitted through the ED.
2. Hospitalized survivors not admitted through the ED.
3. Survivors treated in the ED and released.
4. Survivors treated only in settings other than the above, including physicians' offices, clinics, hospital outpatient departments, and ambulatory surgery centers.

NEISS can supply direct estimates of injury incidence in categories 1 and 3 simply by computing weighted case counts. However, additional data are required to estimate injury incidence in categories 2 and 4. Therefore, the ICM uses data about the relative frequency of injuries treated in non-ED settings versus injuries treated in the ED.

This report focuses on category 4─nonfatal injuries that receive professional medical treatment only in non-ED settings. The report describes the estimation of ratios of the incidence of non-ED injuries to ED injuries and presents the resulting new estimates of non-ED injury incidence. These ratios were first estimated in 1980 by T&E (Technology & Economics, 1980), revised in 1997 by Pacific Institute for Research and Evaluation (PIRE), (draft report was not published), and by Schroeder in 1999.

Previous Estimates

For estimating the incidence of medically treated, non-admitted injury survivors treated only in non-ED settings, the ICM currently uses ratios based on data from the 1987–1996 National Health Interview Survey (NHIS) Centers for Disease Control and Prevention (CDC). Schroeder (1999) estimated these ratios by way of classification tree analysis on 5,359 medically treated, non-admitted NHIS cases. These replaced PIRE's original 1997 estimates, based on 3,692 cases from the 1987–1992 NHIS.) Schroeder's model categorized the data in four dimensions:

- age (0–9, 10–34, and 35+)
- sex (male, female)
- body part (head, trunk, arm, leg, other)
- injury diagnosis (fracture, dislocation, sprain/strain, open wound, superficial, contusion, burn, other).

The body parts and injury diagnoses were based on three-digit International Classification of Diseases, Ninth Revision (ICD-9) codes. The body part/injury diagnosis groupings produced by Schroeder's analysis can be listed as 22 groupings of multiple ICD-9 diagnoses—and are shown as such in Miller et al. (2000), Table 6. Schroeder's final classification tree had 21 terminal nodes. Each node's ratio of non-ED cases per ED case was then mapped from ICD-9 to NEISS. The ratios for some NEISS categories were weighted averages of ratios from multiple nodes, as necessitated by the many-to-many nature of the mapping.

PIRE twice produced updated estimates of these ratios under Contract CPSC-D-05-0006. Tasks 5 and 8 had the same objective as Task 2 but used slightly different data, different injury groupings, and (for Task 5) different statistical techniques. They were also more ambitious, in that both tasks sought to generate confidence intervals for the estimates. For Task 5, Zaloshnja and Lawrence (2008) selected the 1996–2004 Medical Expenditure Panel Survey (MEPS) Household Component, Agency for Healthcare Research and Quality (AHRQ), as the best data source for updated estimates. They retained the 22 ICD-9 diagnosis groupings from Schroeder's model, but they took advantage of the larger size of their sample to expand the number of age groups to five (0–9, 10–17, 18–34, 35–64, and 65+). For Task 8, Bhattacharya et al. (2010) again used MEPS, but this time, they performed a fresh classification tree analysis to group the cases by age, sex, and diagnosis. They produced two different models—one using ICD-9 diagnosis groupings and another using NEISS injury diagnosis and body part, which had been mapped onto the MEPS data. Apart from adding 2 more years of MEPS data, Bhattacharya et al., followed the case selection of Zaloshnja and Lawrence. As a preliminary step, they allowed the CART (classification and regression trees) routine to identify age groups, and CART chose 10 groups (0–9, 10–17, 18–23, 24–28, 29–38, 39–50, 51–66, 67–74, 75–82, 83+). They also pre-grouped some of the NEISS body part and injury diagnosis categories to obtain a small enough number of categories for CART to analyze. Their final model by age, sex, and NEISS body part and injury diagnosis contained 38 terminal nodes. The model does not include the NEISS diagnosis dermatitis/conjunctivitis, because there is no equivalent ICD-9 code.

Data

For the present iteration of this exercise, we again used MEPS as our data source. Unfortunately, we were able to add only another half-year's data to the sample used in Task 8 because MEPS

dropped most of the injury follow-up questions from its survey after panel 11 (2006–2007). Without the data from the injury follow-up questions, we could not comply with the project's requirement to eliminate motor vehicle-related injuries and occupational injuries. Therefore, we were restricted to MEPS data from panels 1–11 (1996–2007).

The MEPS data are configured in a complex way that required linking together multiple datasets to create cases for our analysis. The analysis unit of interest to CPSC is an injury episode. MEPS, however, is organized along two other axes—*events* and *conditions*. An *event* is a medical treatment—an inpatient stay, ER visit, outpatient visit, or doctor's office visit. (MEPS also records home health visits and prescriptions, but we did not include those events.) A *condition* is a medical diagnosis, recorded as a three-digit ICD-9 code. An event can be associated with up to four conditions. Conversely, a condition may be treated in any number of events. PIRE's task was to infer injury episodes from MEPS events and conditions, classifying each injury episode by its first-listed injury condition and its highest treatment level (according to this hierarchy, ranked from highest to lowest: inpatient, ER, outpatient, doctor's office). Thus, each record of our constructed MEPS dataset represents the earliest medical treatment event of the highest treatment level for the first-listed injury condition that resulted from a given injury episode.

Our programs scanned all four diagnosis (condition) fields of each event record and kept every record with at least one ICD-9 code in the injury diagnosis range (800–994). (This differs from Tasks 5 and 8, which considered only the first diagnosis field of each event record.) Each injury event was classified according to the first-listed injury diagnosis (unless that diagnosis was 958 or 959, in which case other injury diagnoses were given priority if present on the record). Using the link file, we merged on the matching record from the condition file. Because the condition file includes the number of events of each treatment level, the condition file allowed us to classify the condition—and presumably the precipitating injury episode—by its highest treatment level. After obtaining a unique record for each injury episode, we merged on demographic information and survey variables, including person weights, from the full-year consolidated file. After combining data from all 12 years, we merged on additional variables for multiyear variance estimation from the pooled linkage file.

The foregoing procedures resulted in a MEPS dataset of 41,100 medically treated injury cases. We then began the process of eliminating cases that were out of scope for this project. We first dropped 2,203 cases (5.4%) that had at least one hospital admission. Of the remaining 38,897 non-admitted cases, 5,850 (15.0%) were work-related (including 430 motor vehicle-related and 34 weapon-related cases); 3,568 (9.2%) were motor vehicle- and/or weapon-related; and 4 were apparent self-inflicted injuries—cases in which the first diagnosis was depression (311), and the injury diagnosis involved drug poisoning (960–979), or open wound of the wrist (881). We dropped all of these cases because they were outside CPSC's purview. We also dropped 47 cases whose only injury diagnosis was late effects of injury (905–909) or early complications of injury (958), ICD-9 diagnoses that do not correspond to any NEISS diagnoses. Finally, we dropped 1,508 injuries that were incurred more than a few days before the patient entered MEPS because MEPS had probably missed the initial treatment for these injuries.

After dropping all of these cases, we were left with 27,920 non-admitted, medically treated injury cases. Of these in-scope cases, 754 (2.7%) had person-weights of zero. Nothing in the

MEPS documentation explains the zero weights, and the fact that most of them had non-zero family-weights suggests they were not excluded because of any defects in the data. But our attempts to produce alternative weights came to dead ends, so we dropped these cases. Our final MEPS dataset, therefore, consisted of 27,166 records—28 percent fewer cases than were used in Task 8.

Diagnosis Mapping

For each MEPS case, we mapped the three-digit ICD-9 primary injury diagnosis to NEISS injury diagnosis and body part, using the same mapping file and methods that we used in Tasks 5 and 8. The mapping file was collapsed from the more complete mapping file that PIRE has used in past work for CPSC, which was designed to be applied to full, five-digit ICD-9-CM diagnoses. We collapsed all diagnosis codes to three digits and then dropped all redundant mappings. The five-digit file's 4,395 mappings were reduced to just 880 in the three-digit file. Some ICD-9 diagnoses are mapped to multiple NEISS diagnoses, which resulted in many MEPS cases being cloned by the mapping process. For such cases, the weight of the original MEPS case was divided evenly among the multiple cloned cases, thus preserving the total weight of the original case. From the original 27,166 raw MEPS cases, the mapping process created 310,128 NEISS-mapped records. In either version of the dataset, applying the weights results in 288,559,891 weighted cases.

Decision Tree Analysis

We used decision tree analysis to group cases by age, sex, and NEISS injury diagnosis and body part, largely following the methods that we developed for Task 8. We again used the CART (classification and regression trees) routine of Answer Tree™ 2.1. The dependent variable was a dichotomous variable categorizing the case according to its highest-level treatment—either an ER visit (1), or a visit to a doctor's office, clinic, or hospital outpatient department (0). The independent variables were age, sex, and NEISS injury diagnosis and body part. By recursively splitting the sample into relatively homogeneous groups with respect to the share of cases that were ER visits, CART created groups defined by age, diagnosis, and sometimes sex.

As in Task 8, values of both NEISS variables were pre-grouped to reduce the number of categories which CART was required to analyze. The six NEISS burn categories (46, 47, 48, 49, 51, 73) are practically identical (*i.e.*, they are largely based on the same MEPS cases), as are the three open wound categories (59, 63, 72). Accordingly, we grouped these as BN and OW, respectively. We also combined electric shock (67) and submersion (69) as EX; both fall in the same three-digit ICD-9 diagnosis (994), so they were based on the same MEPS cases. We also grouped some body parts together: shoulder (30) and upper arm (80); elbow (32) and lower arm (33); wrist (34) and hand (82); knee (35), lower leg (36), and ankle (37); head (75) and mouth (88); trunk (31, 79) and pubic region (38); and foot (83) and toe (93). In each case, the grouped body parts had very similar ED shares, in addition to being adjacent on the body. In some cases, the grouped body parts were even based partly on the same MEPS cases.

One of the important ways in which the present project differed from Task 8 was in the age groups. We replaced Task 8's CART-defined age groups with standard 5-year age groups (0–4,

5–9, 10–14, 15-19, . . ., 80–84, 85+). As in Task 8, we defined age group as an *ordinal* variable—a categorical variable in which the categories can be ordered or ranked. This constrained CART to keep adjacent age categories together when making a split by age, just as CART would do with a quantitative variable. Thus, CART was not permitted to split out a middle age group while combining younger and older ages.

Another important difference from Task 8 was the exclusion of work-related, motor vehicle-related, and (to the limited extent possible) intentional injuries. This created a dataset that was smaller and more homogeneous than the one used in Task 8.

The final model created with CART was up to eight levels deep and had 64 terminal nodes (see Table 1). Even though CART had fewer cases to work with than in Task 8, CART produced a model with more groupings. Perhaps the greater homogeneity of this dataset allowed CART to detect smaller variations. All 64 nodes were defined by NEISS injury diagnosis and body part, and 63 by age. But sex came into play in only 18 of the nodes.

Dividing the MEPS data into the 64 groups having data for one or more of the age/sex/diagnosis variables determined by the decision tree analysis, we then computed the weighted percentage of ER cases for each group. These are shown in the final column of Table 1. They range from 9.7 percent to 93.3 percent, with an average of 36.1 percent.

Results

Non-admitted, nonfatal cases (Disp=1 or 6) were selected from the 2010–2011 NEISS data. Cases were classified into the 64 groups by age, sex, and NEISS injury diagnosis and body part, and the MEPS-based ER percentages were merged on. Because ER percentages could not be estimated for **dermatitis/conjunctivitis** (74), we assigned this NEISS diagnosis the ER percentage of the NEISS diagnosis **other** (71). For a handful of cases where age or sex was required to determine the correct group assignment and it was lacking, we applied average ER percentages by NEISS injury diagnosis. We converted the ER percentages into ratios of doctor/clinic/outpatient (DCO) cases to ER cases using the formula

$$\text{Ratio} = (100 - \text{ERpctg}) / \text{ERpctg}$$

We then multiplied this ratio by the NEISS case weight, which yielded the estimated number of DCO cases per NEISS case. We computed similar weights from the ratios currently in use in the ICM to facilitate comparisons. Tables 2–5 show the results of these comparative estimates by NEISS injury diagnosis, NEISS body part, age group, and sex.

Overall, the new ratios result in 16 percent more estimated DCO visits than the old ratios. However, this is not distributed evenly across all diagnoses. The number of DCO-treated sprains/strains increases by 74 percent with the new ratios, from 13.4 million to 23.4 million. That increase of 9.9 million DCO-treated sprains/strains is greater than the 7.5-million increases in DCO cases. Other diagnoses with major increases in DCO cases are nerve damage (+202%), hemorrhage (+148%), submersion (+132%), electric shock (+74%), and radiation (+65%). Contusion/abrasion cases increase by only 28 percent, but that's 2.7 million extra visits. The diagnosis whose incidence falls the most is internal injury, with 2.1 million fewer DCO cases

(−67%). Ingestion (−67%) and concussion (−66%) see similar percentage declines, but substantially smaller absolute declines. Fractures (−24%) and lacerations (−27%) have smaller percentage decreases, but between them they account for 2.5 million fewer visits.

With respect to body parts, there are big increases in DCO cases for neck (+110%) and lower trunk (+70%), and big decreases for internal (−62%) and head (−47%). By age group, there are decreases for children 0–4 (−15%) and seniors 85 and older (−6%), and increases for adults 25–79. Age 30–34 (+68%) was an obvious outlier; this age group has disproportionately high numbers of sprains/strains and lower trunk injuries, which are the most prevalent injury diagnosis and body part, respectively, in NEISS—and both of which saw increases of more than 70% in DCO visits.) The increase for all DCO cases was higher for women (+21%) than that for men (+12%).

Appendix. List of Files Sent: Programs, Datasets, and Documentation

Condition.zip
- condition.sas
- condition.sas7bdat
- Contents.lst
- dups96.sas7bdat
- ReadMe.doc

MepsCpsc.zip
- mepsinj96.sas
- mepsinj97.sas
- mepsinj98.sas
- mepsinj99.sas
- mepsinj00.sas
- mepsinj01.sas
- mepsinj02.sas
- mepsinj03.sas
- mepsinj04.sas
- mepsinj05.sas
- mepsinj06.sas
- mepsinj07.sas
- allinj.sas
- begin.sas
- mepscpsc.sas7bdat
- Contents.lst
- ReadMe.doc

MepsZ.zip
- MapNeiss.sas
- icd3map.sd2
- mepsZ.sas7bdat
- Contents.lst
- ReadMe.doc

MepsNeiss.zip
- MapNeiss.sas
- EDPct.xls
- MepsNeiss.sas7bdat
- Contents2.lst
- ReadMe2.doc

Table 1. Results of Decision Tree Analysis

Node	Predictor Variables				Node Depth	Case Counts			Avg Pct ED	
	NEISS Injury Diagnosis	NEISS Body Part	Age	Sex		Original	Cloned	Weighted	Unwgted	Wgted
1	56;57;71	77;79;81;83;84;85;89;94	0-39		5	1,650.6	24,642	17,238,635	39.34	42.48
2	56;57;71	87	0-39		5	115.3	2,400	1,142,256	35.50	24.98
3	BN;OW;50;62	77	0-39		5	66.0	552	672,778	69.57	71.90
4	BN;OW;50;62	79;81;83;84;85;87;89;94	0-24		6	382.5	3,385	3,641,667	57.49	54.44
5	BN;OW;50;62	79;81;83;89	25-39		7	129.6	1,074	1,446,030	55.21	46.97
6	BN;OW;50;62	84;85;87;94	25-39		7	21.2	155	236,138	34.84	14.29
7	BN;OW;41;42;50;52;56;57;60;62;71	79;81;85;89	40-90		4	990.5	14,078	10,350,801	29.54	32.87
8	OW;56	77;83;84;87;94	40-69		6	273.0	1,027	3,162,157	24.73	22.46
9	OW;56	77;83;84;87;94	70-90		6	91.1	323	1,074,999	16.10	9.72
10	BN;57	77;83;84;87;94	40-49		7	159.7	333	1,751,719	45.65	38.60
11	50;62;71	77;83;84;87;94	40-49		7	74.0	2,578	830,660	27.62	23.65
12	57;71;BN;50;62	77;83;84;87;94	50-90		6	547.0	7,686	5,593,410	28.84	24.99
13	OW;41;50;52;60;62	00;30;32;34;36;75;76;92	0-14	M	6	736.0	8,442	6,988,854	69.21	66.95
14	OW;41;50;52;60;62	00;30;32;34;36;75;76;92	15-34	M	6	363.2	3,101	4,159,026	75.94	76.24
15	OW;41;50;52;60;62	00;30;32;34;36;75;76;92	0-34	F	5	628.5	6,354	6,241,957	67.86	64.32
16	OW;41;50;52;60;62	36	35-90		5	106.8	1,623	1,105,262	39.37	38.87
17	OW;41;50;52;60;62	34;92	35-49		8	169.3	930	1,984,474	67.20	68.97
18	OW;41;50;52;60;62	00;30;32;75;76	35-49		8	132.4	1,575	1,374,475	59.43	54.79
19	OW;41;50;52;60;62	00;30;32;34;75;76;92	50-74		7	320.9	2,546	3,597,045	49.10	51.37
20	OW;41;50;52;60;62	00;30;32;34;75;76;92	75-90	M	7	50.4	554	517,515	61.55	58.71
21	OW;41;50;52;60;62	30;32;34;92	75-90	F	8	35.2	331	399,856	54.68	64.63
22	OW;41;50;52;60;62	00;75;76	75-90	F	8	42.1	468	450,146	90.38	93.30
23	BN;56;57	30;32;75	0-44		6	830.8	6,438	8,381,007	62.22	63.45
24	BN;56;57	30;32;75	45-64		7	154.1	1,185	1,568,938	49.96	46.31
25	BN;56;57	30;32;75	65-90		7	120.0	768	1,185,783	62.37	64.73
26	56	92	0-59		8	162.7	739	1,757,217	62.11	60.17
27	56	92	60-90		8	36.5	152	414,085	46.71	40.69
28	BN;57	92			7	694.8	1,883	7,208,029	50.72	42.43
29	57	34;36;76	0-24		8	836.6	1,649	8,497,711	60.52	50.85
30	57	34;36;76	25-90		8	810.8	1,264	8,755,067	59.18	57.78
31	BN;56	34;36;76	0-34		8	404.0	5,149	4,034,208	57.95	52.64
32	BN;56	34;36;76	35-90		8	278.7	2,910	2,991,474	40.41	34.98

Node	Predictor Variables				Node Depth	Case Counts			Avg Pct ED	
	NEISS Injury Diagnosis	NEISS Body Part	Age	Sex		Original	Cloned	Weighted	Unwgted	Wgted
33	42;71	00;30;32;34;36	0-24	M	7	251.4	8,829	2,404,110	46.61	51.50
34	42;71	00;30;32;34;36	0-24	F	7	164.1	5,850	1,598,196	41.13	39.32
35	42;71	75;76;92	0-24		6	351.3	9,191	3,471,601	51.89	57.35
36	42;71	00;92	25-90		6	176.6	2,977	1,965,145	34.50	51.66
37	42;71	30;32;34;36;75;76	25-84		7	749.3	29,966	8,024,424	28.78	31.16
38	42;71	30;32;34;36;75;76	85-90		7	37.7	1,573	394,674	56.13	56.06
39	58;70	36;79;81;84;87;89	0-4		5	70.1	2,798	672,397	56.25	52.50
40	58;70	36;79;81;84;87;89	5-29		5	434.4	15,772	4,454,260	38.20	34.24
41	55;61;64	79;81;84;89	0-29		6	656.4	2,190	7,664,691	23.79	16.95
42	53;54	79;81;84;89	0-29		6	207.2	1,832	2,005,191	36.35	30.14
43	53;54;55;61;64	36;87	0-29		5	1,035.7	3,658	11,007,634	33.11	28.22
44	58;68;70	30;32;83;85	0-29	M	7	466.1	7,657	4,575,735	43.06	41.96
45	58;68;70	30;32;83;85	0-29	F	7	392.9	5,554	3,940,029	38.01	31.96
46	53;64	30;83	0-29		7	972.3	3,434	10,230,110	36.05	31.98
47	53;64	32;85	0-29		7	142.2	706	1,462,049	30.45	20.87
48	53;58;64;70	34;75;76;77;92;94	0-4	M	7	121.4	1,923	1,226,237	60.48	57.34
49	53;58	34;75;76;77;92;94	0-4	F	8	60.5	409	576,315	36.67	24.13
50	64;70	34;75;76;77;92;94	0-4	F	8	34.7	936	327,557	56.29	54.96
51	53;58;64;70	34;75;76;77;92;94	5-29		6	1,066.2	14,371	11,168,388	39.85	38.13
52	54;55;61	32;75;85	0-29		5	89.7	123	926,767	70.73	70.48
53	54;55;61	30;34;76;83;92	0-29		5	146.0	218	1,801,120	52.29	53.28
54	53;58;66;70	30;36;79;81;84;87;89	30-90		4	1,338.4	36,269	14,327,096	27.43	24.54
55	54;55;61;64	30;36	30-39	M	7	213.5	419	2,490,369	19.33	15.15
56	54;55;61;64	30;36	30-39	F	7	224.2	524	2,372,635	32.63	27.84
57	54;55;61;64	30;36	40-90		6	1,537.2	3,020	16,905,722	16.72	13.90
58	54;55;61;64	79;81;84;87;89	30-90		5	1,913.9	6,637	21,959,799	11.90	10.52
58	55;58;65;68	32;34;75;76;77;83;85;92;94	30-90	M	5	327.2	975	3,730,335	32.41	37.74
60	55;58;65;68	32;34;75;92;94	30-90	F	6	69.2	708	757,448	41.24	41.22
61	55;58;65;68	76;77;83;85	30-90	F	6	441.7	1,300	4,628,058	28.92	26.91
62	EX;53;54;61;64;66;70	32;34;75;76;77;83;85;92;94	30-54		6	1,250.3	18,389	13,937,643	26.82	26.23
63	EX;53;54;61;64;66;70	32;34;75;76;77;83;85;92;94	55-79		6	667.8	12,086	7,266,416	25.72	20.63
64	EX;53;54;61;64;66;70	32;34;75;76;77;83;85;92;94	80-90		5	142.5	3,538	1,534,362	40.36	35.81
All						27,166.0	310,128	288,559,891	38.32	36.10

Table 2. Estimated Incidence of Emergency Department and Doctor's Office/Clinic/ Outpatient Injury Cases, by NEISS Injury Diagnosis, NEISS 2010-2011

			Old Ratios (NHIS)		New Ratios (MEPS)		Change	
NEISS Injury Diagnosis	Raw Cases (NEISS)	Emgcy Room Est Cases	Doc/Clinic Est Cases	Doc/ED Ratio	Doc/Clinic Est Cases	Doc/ED Ratio	Number of Cases	Percent
41 Ingestion	5,320	146,900	238,131	1.621	78,356	0.533	-159,775	-67.1%
42 Aspiration	1,001	18,133	29,526	1.628	22,448	1.238	-7,078	-24.0%
46 Burn, Electric	202	6,228	7,007	1.125	7,254	1.165	247	3.5%
47 Burn, Not Spec	99	3,711	4,079	1.099	5,254	1.416	1,175	28.8%
48 Burn, Scald	3,970	122,469	134,807	1.101	148,860	1.215	14,053	10.4%
49 Burn, Chemical	878	34,303	29,159	0.850	41,707	1.216	12,548	43.0%
50 Amputation	1,158	39,746	39,165	0.985	26,734	0.673	-12,431	-31.7%
51 Burn, Thermal	6,287	221,025	239,344	1.083	254,910	1.153	15,566	6.5%
52 Concussion	13,494	427,141	668,485	1.565	225,995	0.529	-442,490	-66.2%
53 Contusn/Abrasn	129,005	4,873,802	9,626,544	1.975	12,334,107	2.531	2,707,563	28.1%
54 Crushing	1,711	76,828	153,854	2.003	132,224	1.721	-21,630	-14.1%
55 Dislocation	11,810	428,785	881,469	2.056	1,084,748	2.530	203,279	23.1%
56 Foreign Body	14,595	525,438	799,031	1.521	785,145	1.494	-13,886	-1.7%
57 Fracture	95,116	3,348,786	4,808,574	1.436	3,655,770	1.092	-1,152,804	-24.0%
58 Hematoma	5,406	175,765	294,699	1.677	341,230	1.941	46,531	15.8%
59 Laceration	153,801	5,493,539	5,010,622	0.912	3,674,768	0.669	-1,335,854	-26.7%
60 Dental Injury	3,832	78,686	63,517	0.807	41,066	0.522	-22,451	-35.3%
61 Nerve Damage	1,846	83,301	197,374	2.369	595,565	7.150	398,191	201.7%
62 Internal Injury	59,233	1,863,032	3,171,631	1.702	1,052,794	0.565	-2,118,837	-66.8%
63 Puncture	8,041	324,352	350,233	1.080	430,630	1.328	80,397	23.0%
64 Strain/Sprain	137,248	5,234,600	13,437,687	2.567	23,354,031	4.461	9,916,344	73.8%
65 Anoxia	2,022	74,052	152,655	2.061	231,234	3.123	78,579	51.5%
66 Hemorrhage	772	24,281	21,368	0.880	52,933	2.180	31,565	147.7%
67 Electric Shock	335	12,180	24,737	2.031	43,074	3.536	18,337	74.1%
68 Poisoning	7,370	257,114	389,734	1.516	475,374	1.849	85,640	22.0%
69 Submersion	199	6,608	10,720	1.622	24,883	3.766	14,163	132.1%
71 Other	69,843	2,613,065	5,257,849	2.012	4,427,803	1.694	-830,046	-15.8%
72 Avulsion	4,180	181,418	246,421	1.358	203,474	1.122	-42,947	-17.4%
73 Radiation	468	23,111	13,362	0.578	22,024	0.953	8,662	64.8%
74 Dermat/Conjunc	4,253	161,716	261,582	1.618	273,394	1.691	11,812	4.5%
Total	743,495	26,880,114	46,563,364	1.732	54,047,789	2.011	7,484,425	16.1%

Table 3. Estimated Incidence of Emergency Department and Doctor's Office/Clinic/ Outpatient Injury Cases, by NEISS Injury Diagnosis, NEISS 2010-2011

			Old Ratios (NHIS)		New Ratios (MEPS)		Change	
NEISS Body Part	Raw Cases (NEISS)	Emgcy Room Est Cases	Doc/Clinic Est Cases	Doc/ED Ratio	Doc/Clinic Est Cases	Doc/ED Ratio	Number of Cases	Percent
00 Internal	6,321	165,033	267,657	1.622	100,804	0.611	-166,853	-62.3%
30 Shoulder	31,384	1,218,768	2,429,219	1.993	3,340,890	2.741	911,671	37.5%
31 Upper Trunk	33,950	1,390,120	3,139,987	2.259	4,393,388	3.160	1,253,401	39.9%
32 Elbow	18,822	651,604	1,064,588	1.634	1,327,043	2.037	262,455	24.7%
33 Lower Arm	27,478	899,054	1,167,991	1.299	1,167,566	1.299	-425	0.0%
34 Wrist	27,543	1,056,357	1,643,172	1.556	1,544,756	1.462	-98,416	-6.0%
35 Knee	40,037	1,509,249	4,097,279	2.715	4,559,698	3.021	462,419	11.3%
36 Lower Leg	23,913	843,705	1,620,978	1.921	1,573,900	1.865	-47,078	-2.9%
37 Ankle	47,343	1,766,436	3,542,387	2.005	5,095,974	2.885	1,553,587	43.9%
38 Pubic Region	3,307	96,602	161,666	1.674	166,322	1.722	4,656	2.9%
75 Head	108,874	3,564,816	5,403,792	1.516	2,842,359	0.797	-2,561,433	-47.4%
76 Face	71,334	2,370,645	2,450,791	1.034	2,379,853	1.004	-70,938	-2.9%
77 Eyeball	10,181	386,625	661,459	1.711	819,086	2.119	157,627	23.8%
79 Lower Trunk	56,626	2,238,389	5,895,946	2.634	10,052,505	4.491	4,156,559	70.5%
80 Upper Arm	5,878	224,966	307,098	1.365	321,246	1.428	14,148	4.6%
81 Upper Leg	5,897	220,510	461,004	2.091	631,478	2.864	170,474	37.0%
82 Hand	40,663	1,581,745	2,148,767	1.358	1,859,167	1.175	-289,600	-13.5%
83 Foot	36,470	1,379,213	2,360,379	1.711	2,921,011	2.118	560,632	23.8%
84 25-50% of Body	8	343	392	1.143	1,156	3.370	764	194.9%
85 All Parts Body	14,474	517,430	832,924	1.610	1,047,029	2.024	214,105	25.7%
87 Unk/Not Stated	3,308	107,560	183,773	1.709	326,839	3.039	143,066	77.8%
88 Mouth	17,643	501,317	428,943	0.856	310,640	0.620	-118,303	-27.6%
89 Neck	12,719	470,289	1,224,966	2.605	2,577,082	5.480	1,352,116	110.4%
92 Finger	71,742	2,731,706	3,412,804	1.249	2,683,568	0.982	-729,236	-21.4%
93 Toe	16,576	622,835	1,151,205	1.848	1,299,893	2.087	148,688	12.9%
94 Ear	11,004	364,798	504,197	1.382	704,536	1.931	200,339	39.7%
Total	743,495	26,880,114	46,563,364	1.732	54,047,789	2.011	7,484,425	16.1%

Table 4. Estimated Incidence of Emergency Department and Doctor's Office/Clinic/ Outpatient Injury Cases, by Age Group, NEISS 2010-2011

			Old Ratios (NHIS)		New Ratios (MEPS)		Change	
Age Group	Raw Cases (NEISS)	Emgcy Room Est Cases	Doc/Clinic Est Cases	Doc/ED Ratio	Doc/Clinic Est Cases	Doc/ED Ratio	Number of Cases	Percent
Unknown	14	399	436	1.093	648	1.624	212	48.6%
0-4	118,838	3,224,200	3,804,065	1.180	3,232,038	1.002	-572,027	-15.0%
5-9	77,419	2,216,922	2,703,688	1.220	2,675,563	1.207	-28,125	-1.0%
10-14	97,402	3,120,750	4,876,285	1.563	4,870,555	1.561	-5,730	-0.1%
15-19	79,656	2,914,507	4,645,203	1.594	4,579,958	1.571	-65,245	-1.4%
20-24	51,337	2,016,874	3,151,749	1.563	3,231,353	1.602	79,604	2.5%
25-29	44,510	1,774,497	2,844,372	1.603	3,206,480	1.807	362,108	12.7%
30-34	37,551	1,545,013	2,485,433	1.609	4,164,560	2.695	1,679,127	67.6%
35-39	32,360	1,354,915	3,112,273	2.297	3,728,356	2.752	616,083	19.8%
40-44	32,147	1,344,788	3,084,162	2.293	4,244,278	3.156	1,160,116	37.6%
45-49	32,139	1,340,197	3,049,121	2.275	4,103,467	3.062	1,054,346	34.6%
50-54	29,347	1,214,389	2,719,494	2.239	3,690,551	3.039	971,057	35.7%
55-59	23,208	974,625	2,110,776	2.166	2,876,060	2.951	765,284	36.3%
60-64	18,536	789,700	1,666,827	2.111	2,220,969	2.812	554,142	33.2%
65-69	14,705	645,839	1,354,671	2.098	1,759,913	2.725	405,242	29.9%
70-74	12,626	554,213	1,157,079	2.088	1,532,353	2.765	375,274	32.4%
75-79	11,594	506,777	1,059,487	2.091	1,268,814	2.504	209,327	19.8%
80-84	12,103	538,540	1,111,856	2.065	1,135,883	2.109	24,027	2.2%
>=85	18,003	802,968	1,626,389	2.025	1,525,990	1.900	-100,399	-6.2%
Total	743,495	26,880,114	46,563,364	1.732	54,047,789	2.011	7,484,425	16.1%

Table 5. Estimated Incidence of Emergency Department and Doctor's Office/Clinic/ Outpatient Injury Cases, by Sex, NEISS 2010-2011

			Old Ratios (NHIS)		New Ratios (MEPS)		Change	
Sex	Raw Cases (NEISS)	Emgcy Room Est Cases	Doc/Clinic Est Cases	Doc/ED Ratio	Doc/Clinic Est Cases	Doc/ED Ratio	Number of Cases	Percent
Female	328,173	12,149,140	22,088,755	1.818	26,687,170	2.197	4,598,415	20.8%
Male	415,314	14,730,657	24,473,997	1.661	27,360,069	1.857	2,886,072	11.8%
Unknown	8	317	612	1.931	550	1.735	-62	-10.1%
Total	743,495	26,880,114	46,563,364	1.732	54,047,789	2.011	7,484,425	16.1%

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