



Shopping Cart Injuries to Children Younger than Five Years Old, 2008–2012

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Overview

To support work by the ASTM F15.56 Shopping Cart Subcommittee, in 2009, U.S. Consumer Product Safety Commission (CPSC) staff analyzed injuries to children younger than age 5 years associated with shopping carts.¹ This report updates that analysis using more recent data. From 2010 to 2012, the estimated annual average of emergency department-treated injuries associated with shopping carts to children younger than the age of 5 years was 21,600. Injury estimates from 2008 through 2012 are stable, with no statistically significant increasing or decreasing trend. The majority of the injuries are falls from the shopping carts, resulting in injuries to the head and face area.

CPSC staff is aware of 37 other reports of injuries to children younger than the age of 5 years associated with shopping carts from 2008 to 2012. These reports represent a different distribution of hazard patterns, with children getting stuck in shopping carts and shopping cart tip overs being more commonly reported. These incidents are discussed in more detail on p. 7. The reported incidents involve two fatal incidents that occurred between 2008 and 2012.

Emergency Department-Treated Injuries

From 2008 to 2012, there were an estimated 107,300 emergency department-treated injuries associated with shopping carts to children younger than the age of 5, as reported by the National Electronic Injury Surveillance System (NEISS). The 95 percent confidence interval for this estimate is 86,700 to 127,900 (C.V. = 0.10). From 2008 to 2012, the estimated annual average of emergency department-treated injuries associated with shopping carts to children younger than the age of 5 years was 21,500. From 2010 to 2012, the estimated annual average of emergency department-treated injuries associated with shopping carts to children younger than the age of 5 was 21,600.

Table 1 and Figure 1 give the yearly estimates for emergency department-treated injuries associated with shopping carts to children younger than the age of 5 for the years 2008 to 2012. An analysis of the data showed no statistically significant trend.

Table 1: Estimated Emergency Department-Treated Injuries Associated with Shopping Carts to Children Younger than Five, by Year, 2008-2012

Year	Observations	Estimate	C.V.
2008	744	19,600	0.11
2009	859	22,800	0.11
2010	826	23,300	0.12
2011	782	21,800	0.11
2012	712	19,800	0.10
Total	3923	107,300	0.10

Source: NEISS Database, September 2013

¹ O'Brien, Craig W. *Shopping Cart Injuries to Children Under Five, 2003-2008*. U.S. Consumer Product Safety Commission, 2009.

Figure 1: Estimated Emergency Department-Treated Injuries Associated with Shopping Carts to Children Younger than Five, by Year, 2008-2012

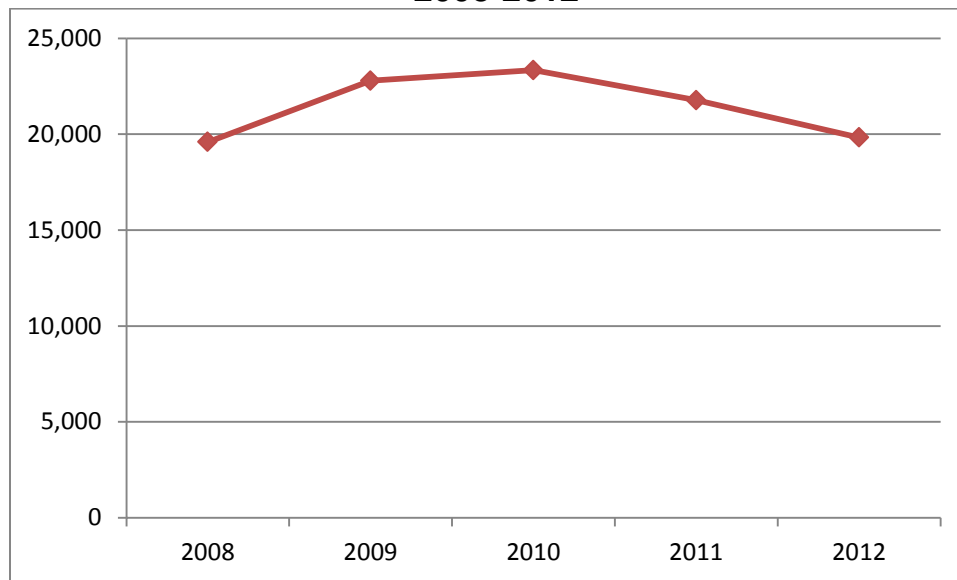


Table 2 presents the estimated emergency department-treated injuries associated with shopping carts to children younger than the age of 5 years. The majority of the incidents occurred to 1- and 2-year-old children, which accounted for a combined 60 percent of the estimated injuries. Males accounted for 54 percent of the estimated injuries, but this is not always consistent across age categories.

Table 2: Estimated Emergency Department-Treated Injuries Associated with Shopping Carts to Children Younger than Five, by Age and Sex, 2008-2012

Age	Male	Female	Total
<1	8,100	6,600	14,700
1	15,700	14,500	30,200
2	18,400	15,700	34,100
3	9,700	8,800	18,500
4	6,300	3,500	9,800
Total	58,200	49,100	107,300

Source: NEISS Database, September 2013

Table 3 presents the estimated emergency department-treated injuries associated with shopping carts to children younger than 5 by injured body part. The majority of the estimated injuries occurred to the head and/or face, accounting for 91,700 out of 107,300 estimated injuries (85%). A further examination of the head and face injuries shows that the majority of them were internal organ injuries (47,600 estimated injuries, 44% of all estimated injuries) and contusions or abrasions (25,300 estimated injuries, 24% of all estimated injuries).

Table 3: Estimated Emergency Department-Treated Injuries Associated with Shopping Carts to Children Younger than Five, by Injured Body Part, 2008-2012

Body Part	Estimate	Percentage
Head/Face	91,700	85%
Arm/Hand	7,800	7%
Leg/Foot	4,400	4%
Other/Unknown	2,200	2%
Torso	1,300	1%
Total	107,300	100%

*Source: NEISS Database, September 2013
Columns do not sum to totals due to rounding.*

Table 4 presents the estimated emergency department-treated injuries associated with shopping carts to children younger than 5 by diagnosis. The majority of the estimated injuries were either internal organ injuries or contusions and abrasions. Together, the two categories accounted for 78,100 of the estimated injuries (72% of all estimated injuries). All of the estimated internal organ injuries were head injuries. Most of the 15,600 non-head/face injuries were contusions or abrasions (5,200 estimated injuries, 34% of all non-head injuries) and fractures (2,800 estimated injuries, 18% of all non-head injuries). The non-head/face injury category includes the other/unknown category.

Table 4: Estimated Emergency Department-Treated Injuries Associated with Shopping Carts to Children Younger than Five by Diagnosis, 2008-2012

Diagnosis	Estimate	Percentage
Internal Organ Injury	47,600	44%
Contusion/Abrasion	30,500	28%
Laceration	8,000	7%
Other/Unknown	6,700	6%
Fracture	5,500	5%
Concussion	5,000	5%
Hematoma	2,800	3%
Avulsion	1,200	1%
Total	107,300	100%

*Source: NEISS Database, September 2013
Percentages do not sum to 100% due to rounding.*

Table 5 presents the estimated emergency department-treated injuries associated with shopping carts to children younger than 5 by disposition. The majority of the injured children were treated and released. Only 4 percent (4,200 estimated injuries) were hospitalized or held for observation. Most of the hospitalizations were for children with fractures (2,100 estimated

injuries, 50% of all hospitalizations) and internal organ injuries (1,700 estimated injuries, 41% of all hospitalizations).

Table 5: Estimated Emergency Department-Treated Injuries Associated with Shopping Carts to Children Younger than Five, by Disposition, 2008-2012

Disposition	Estimate	Percentage
Treated and Released	100,900	94%
Hospitalized/Held for Observation	4,200	4%
Left Without Being Seen	2,200	2%
Total	107,300	100%

Source: NEISS Database, September 2013

Table 6 shows that the majority of the incidents, 90,500 estimated emergency department-treated injuries, or 84 percent of the total estimate, were falls from shopping carts. Note that falls could also occur as part of another hazard pattern. For example, the cart could tip over and the child could fall from the cart while it was tipping over. Attempts were made to analyze the data by the location of the child before the fall, by age, and by whether the child was also in a child carrier or car seat, but the resulting estimates were too small to be considered reliable. The following definitions were used for the hazard patterns in Table 6:

- **Fall:** The child fell from the cart with no other hazard patterns involved. Typically this was just described in the data as “fell from cart,” but it also involved scenarios such as standing up and falling out of the cart or falling while climbing out of the cart.
- **Tip Over:** The shopping cart tipped over while the child was inside. Sometimes this also involved the child falling out of the shopping cart. Incidents where the shopping cart fell over onto the child were coded as collisions.
- **Collision:** The shopping cart was involved in a collision. Most often this was the shopping cart running into/over the child or the child running into the shopping cart. This also includes incidents where the cart collided with another object while the child was in the cart.
- **Contact:** The child was injured through general contact with the shopping cart. This includes general lacerations from the shopping cart, and the child “bumping” into the shopping cart while in the shopping cart. In some cases it was not clear if the child was in or out of the shopping cart when they bumped into it. Those cases were also coded as “contact.”
- **Entrapment:** The child got a limb or finger stuck in some part of the shopping cart. This includes getting fingers caught in the spokes of the shopping cart wheels.
- **Incidental:** The injury happened in or near a shopping cart, but did not directly involve the shopping cart. This includes falling and hitting a shopping cart, and being injured by another product while sitting in a shopping cart.

Table 6: Estimated Emergency Department-Treated Injuries Associated with Shopping Carts to Children Younger than Five, by Hazard Pattern, 2008-2012

Hazard Pattern	Estimate	Percentage
Fall	90,500	84%
Tip Over	4,600	4%
Collision	4,200	4%
Contact	3,600	3%
Entrapment	2,600	2%
Incidental	1,900	2%
Total	107,300	100%

*Source: NEISS Database, September 2013
Columns do not sum to totals due to rounding.*

Incidents Reported to CPSC Staff

From 2008 to 2012, CPSC staff is aware of 37 reports of incidents involved with shopping carts and children younger than the age of 5 years. These reports are received through the Injury and Potential Injury Incident (IPII) database, the In-Depth Investigation (INDP) database, and the Death Certificate (DTHS) database. The number of reports per year by date of incident is shown in Table 7. The average number of reported incidents per year from 2008 to 2012 is 7.

Table 7: Reported Incidents Associated with Shopping Carts to Children Younger than Five, by Incident Year, 2008-2012

Years	Reports	Percentage
2008	12	32%
2009	2	5%
2010	6	16%
2011	7	19%
2012	10	27%
Total	37	100%

*Source: IPII, INDP, and DTHS databases, September 2013
Percentages do not sum to 100 due to rounding.
Reporting is ongoing for 2010-2012.*

Table 8 shows that the majority of the reported incidents involved children under 2 years of age; they accounted for 25 out of 37 reported incidents, or 68 percent of all reported incidents.

Table 8: Reported Incidents Associated with Shopping Carts to Children Younger than Five, by Age and Sex, 2008-2012

Age	Male	Female	Total
<1	8	3	11
1	6	8	14
2	6	0	6
3	1	4	5
4	0	1	1
Total	21	16	37

*Source: IPII, INDP, and DTHS databases, September 2013
Reporting is ongoing for 2010-2012.*

A plurality of the reports involved injuries that did not require hospitalization, which includes 15 reported injuries or 41 percent of all reported incidents. All of the reported injuries that required hospitalization or resulted in fatality were head injuries.

Table 9: Reported Incidents Associated with Shopping Carts to Children Younger than Five, by Disposition, 2008-2012

Disposition	Reports	Percentage
No Injury	13	35%
Injury	15	41%
Hospitalized	2	5%
Fatality	2	5%
Unknown	5	14%
Total	37	100%

*Source: IPII, INDP, and DTHS databases, September 2013
Reporting is ongoing for 2010-2012.*

Most of the reported incidents were falls or entrapments. Falls and entrapments accounted for 22 of the 37 reported incidents (59%). The incidents for each hazard pattern are discussed in more detail below.

Falls

These are falls with no other hazard involved. Of the 12 incidents reported as falls, three involved a car seat with the child in it falling from the shopping cart; of these three incidents, one was a fatality and one involved a hospitalization. The fatality occurred when a 3-month-old boy fell while secured in a car seat that was not secured to the shopping cart after the cart was pushed over a speed bump in the parking lot. Nine of the fall incidents did not involve a car seat. In these incidents the child fell from the cart or in the cart. In one of these nine cases, the shopping cart's wheel detached, which appeared to cause the fall. In another of these nine cases, the

wheels locked up, presumably by design, to keep the victim’s mother from exiting the store with the cart.

Entrapments

These are children getting a limb or finger stuck in some part of the shopping cart. None of the 10 reported entrapment incidents involved car seats.

Tip Overs

There were four incidents involving the shopping cart tipping over while the child (or children) was (were) inside the cart. None of the incidents mentioned car seats. In one case (a fatality), the victim was strapped in and pulled the cart over when reaching for a product. In another, two children were seated in a cart designed to hold two children when the cart tipped backward.

Collisions

There were two collisions of the shopping cart with the child or with another object while the child was inside the shopping cart. In one case, the cart’s wheels locked up as the victim was exiting the store. This caused the adult pushing the cart to collide with the cart which, in turn, caused the 4-year-old passenger lying in the cart to injure her lower leg and neck. In another case, a 15-month-old’s teeth slammed into the shopping cart handle.

Other

There were nine incidents coded as “other,” covering a range of hazards. Five of the reports concerned failures or inadequacies of the restraints in the shopping cart seat (including one involving a car seat); none resulted in injuries. In one case, the ball bearings came out of a wheel and were picked up by a 1-year-old, presenting a choking hazard. A 5-year-old pulled up on the bar of the cart, causing the front end to rise. The cart came crashing down and broke the foot of the 5-year-old’s 22-month-old brother. In one case, a child pulled himself over the back rest and was hanging in the back of the cart. In another case, an 11-month-old was mouthing a rusty jagged edge on a cart and suffered a deep cut and puncture wound.

Table 10: Reported Incidents Associated with Shopping Carts to Children Younger than Five, by Hazard Pattern, 2008-2012

Hazard	Reports	Percentage
Fall	12	32%
Entrapment	10	27%
Tip Over	4	11%
Collision	2	5%
Other	9	24%
Total	37	100%

Source: IPH, INDP, and DTHS databases, September 2013

Percentages do not sum to 100 due to rounding.

Reporting is ongoing for 2010-2012.

Appendix: Methodology

The product code searched for this memo was 1679 (Grocery or shopping carts). The databases searched for reports were the Death Certificates Database, the Injury and Potential Injury Incident Database, and the In-Depth Investigation File.

Deaths

CPSC staff purchases death certificates from all 50 states, New York City, the District of Columbia, and some territories. Only those certificates in certain E-codes (based on the World Health Organization's International Classification of Diseases ICD-10 system) are purchased. These are then examined for product involvement before being entered into CPSC's death certificate database. The result is neither a statistical sample, nor a complete count of product-related deaths; nor does it constitute a national estimate. The database provides only counts for product-related deaths from a subset of E-codes. For this reason, these counts tend to be underestimates of the actual numbers of product-related deaths. Death certificate collection from the states also takes time. As of September 2013, the Death Certificates database was considered at least 95 percent complete for 2008; 94 percent complete for 2009; 92 percent complete for 2010; 76 percent complete for 2011; and 38 percent complete for 2012.

Injury or Potential Injury Incident Database (IPII)

IPII is a CPSC database containing reports of injuries or potential injuries made to the Commission. These reports come from news clips, consumer complaints received by mail or through CPSC's telephone hotline or website, Medical Examiners and Coroners Alert Program (MECAP) reports, letters from lawyers, and similar sources. While the IPII database does not constitute a statistical sample, this database can provide CPSC staff with guidance or direction in investigating potential hazards. Because cases in this database may come from a variety of sources, some cases may be listed multiple times. To obtain a more accurate count of the number of reported incidents associated with each product, the cases were reviewed to eliminate duplicates.

National Electronic Injury Surveillance System (NEISS)

The estimate of emergency department-treated injuries was derived from NEISS, which is a probability sample of approximately 100 U.S. hospitals having 24-hour emergency departments (EDs) and more than six beds. NEISS collects injury data from these hospitals. Coders in each hospital code the data from the ED record and the data is then transmitted electronically to CPSC. Because NEISS is a probability sample, each case collected represents a number of cases (the case's *weight*) of 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 (Schroeder and Ault, 2001).²

A coefficient of variation (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

² Schroeder T, Ault K. *The NEISS Sample (Design and Implementation)*. U.S. Consumer Product Safety Commission. 2001.

standard error of the estimate equals 0.1 times the estimate. Large C.V.s alert the reader that the estimate has considerable variability. This is often due to a small sample size.³ NEISS estimates and confidence intervals are usually not reported, unless the number of cases is 20 or more, the estimate is greater than 1,200, and the C.V. is less than 33 percent.

³ Ibid.