Injuries and Investigated Deaths Associated with Playground Equipment 2009 - 2014

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August 2016

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Overview

U.S. Consumer Product Safety Commission (CPSC) staff last performed an analysis of playground equipment fatalities in 2009.[1] This report presents an updated analysis of reports of injuries and deaths associated with playground equipment, to evaluate the location, nature and other information surrounding the injury or death.

This document contains sections on incidents reported to CPSC, deaths investigated by CPSC, and national estimates of emergency department-treated injuries. A summary of the findings contained in this report is provided in the next section. A description of the methodology appears in the Appendix. For guidelines for choosing the safest equipment, please see CPSC's Public Playground Safety Handbook[2].

Summary of Findings

In this report, CPSC staff presents the latest available statistics on injuries and deaths associated with playground equipment. It is important to note that the incidents covered by this report were associated with playground equipment, but not necessarily caused by the product.[3] This memorandum includes information about incidents reported to CPSC staff as well as emergency department treated injuries as collected through the National Electronic Injury Surveillance System (NEISS). While the incidents reported to CPSC and the emergency department-treated injuries are similar in scope and character, staff cautions against making comparisons between the two sets of data. As described in the Appendix, the incidents reported to CPSC constitute an anecdotal data set, which may not be representative of the incidents that actually occurred. The emergency department data are more representative, but the data are representative of a narrower range of injury severity. Note that 92% of the incidents reported to CPSC staff occurred at home or restaurant locations, while 60% of emergency department treated injuries occurred at places of recreation or schools. It is possible that consumers are less likely to report to CPSC about incidents in public playgrounds as compared to incidents occurring at home with a privately owned product.

Incidents Reported to CPSC Staff

From 2009 to 2014, there were 3,014 incidents associated with playground equipment reported to CPSC staff for all ages.

Location

- 2,758 (92 percent) occurred at home (66 percent) or restaurant locations (26 percent).

[1] O'Brien, C. *Injuries and Investigated Deaths Associated with Playground Equipment, 2001 - 2008*. U.S. Consumer Product Safety Commission. October 2009.
[2] *Public Playground Safety Handbook*. U.S. Consumer Product Safety Commission. December 2015
[3] Not all of these incidents are addressable by an action the CPSC could take; however, it was not the purpose of this report to evaluate the addressability of the incidents, but rather to update the estimates of emergency department-treated injuries and to analyze the injuries and deaths reported to CPSC staff.

Age

- Number of incidents reported with known age of victim: 1,165 incidents (39 percent)
  - 542 (47 percent) involved children under the age of five
  - 475 (41 percent) involved children ages five to nine years of age.

Injury Severity

- 1,597 (53 percent) of the reports indicated no injury.
- 855 (28 percent) reports had a severity that was not specified or unknown.
- 387 (13 percent) involved a minor injury not requiring hospitalization.

Injury Pattern

- 2,430 (81 percent) involved falls or equipment failure.
- 2,181 (72 percent) involved seesaws/teeter totters, swings, slides, or composite play structures. This may reflect availability or usage more than any danger inherent in these equipment types.

Deaths Investigated by CPSC Staff

From 2009 to 2014, CPSC staff investigated 34 deaths associated with playground equipment. Victim age ranged from 13 months to 52 years. The average age was 7 years, and the median age was 5 years. 33 of the victims (97 percent) were under 16.

Of the 34 investigated fatal incidents:

- 19 deaths were the result of hangings or other asphyxiations.
  - 12 involved a second product.
  - 5 were associated with slides
  - 5 occurred on swings
  - Average age of the victim was 5.
- 8 deaths were the result of head or neck impact injuries.

Emergency Department-Treated Injuries

From 2009 to 2014, an estimated 1,459,201 injuries associated with playground equipment were treated nationally in emergency departments.

- The annual average of emergency department-treated injuries associated with playground equipment from 2012 to 2014 is estimated to be 247,075 within the most recent 3 years in the period examined.
- Of the 1,459,201 estimated emergency department-treated injuries associated with playground equipment from 2009 to 2014:
  - An estimated 885,928 injuries (61 percent) occurred at schools or parks, an additional 203,551 injuries (14 percent) were in home locations.
  - An estimated 740,618 injuries (51 percent) occurred in the 5 to 9 years of age category, an additional 380,342 injuries (26 percent) were under 5 years of age.
  - An estimated 492,001 (34 percent) were fractures, followed by 251,699 contusions or abrasions (17 percent), 216,421 lacerations (15 percent), and 184,999 strains or sprains (13 percent).

Incidents Reported to CPSC Staff

From 2009 to 2014, CPSC staff is aware of 3,014 reports of incidents involving playground equipment.

CPSC staff classified each incident into one of six general hazard patterns. The distribution of the general hazard patterns is shown in Table 1.

Table 1: Reported Incidents Associated with Playground Equipment by General Hazard Pattern, 2009-2014

Hazard Pattern	Count	Percentage
Equipment-Related	1,907	63
Fall	523	17
Other	269	9
Incidental	109	4
Collision	109	4
Entrapment	97	3
Total	3,014	100

Source: CPSRMS, July 2015
Reporting is ongoing for 2013-2014

The general hazard patterns are equipment related (including breakage, tip over, poor design or assembly), falls (from, into, or onto the equipment), incidental (hazards around, but not related to, the equipment), collisions (with other children or the equipment), entrapments, and other. The two most common general hazard patterns are equipment-related hazards and falls, which together account for 81 percent of the reported incidents.

Table 2: Incidents Associated with Playground Equipment by Type of Equipment, 2009-2014

Equipment Type	Count	Percentage
**Seesaw/Teeter Totter	1,272	42
Swing	363	12
Slide	326	11
Composite Play Structure	220	7
Other	130	4
Steps	124	4
Platform	93	3
Unknown/Not Specified	60	2
Tube, Horizontal	52	2
Non-Play Structure	43	1
Monkey Bars	42	1
Tube Slide	41	1
Inflatable Bouncer	35	1
Playground Surface	35	1
Bars	29	1
Climber	28	1
Incidental	25	1
Rope/Tire Swing	22	1
Safety Netting	22	1
Zip Line	21	1
Glider Swing	16	1
Sandbox	15	*
Total	3,014	100

Source: CPSRMS, July 2015
Reporting is ongoing for 2013-2014
** Estimates less than 1 percent*
***These numbers include 1,239 reports associated with a single recalled product, Tables 3 and 4 exclude this product.*

CPSC staff also classified the reported incidents by the type of playground equipment involved. The counts of reported incidents by type of equipment are shown in Table 2. The top four types of equipment involved were seesaws/teeter totters, swings, slides, and composite play structures. Combined, these four types of equipment accounted for 2,181 reported incidents (72 percent). The type of equipment with the most reported equipment-related hazards were seesaws/teeter totters, with 1,270 reported incidents accounting for 67 percent of all 1,907 reports. The following section defines equipment type, the products included in the equipment type classification, and the most common hazard reported for each equipment type.

- **Bars**: The "bars" category includes chin-up bars, parallel bars, balance beams, and any other unspecified "bars." Monkey bars are reported separately. The most common hazard for bars was **fall**, with 23 reports (79 percent).

- **Climber**: A climbing toy, including unspecified "climbers," rope ladders, climbing walls, and climbing rings. The most common hazard for climbers was **fall**, with 16 reports (57 percent).
- **Glider Swing**: "Glider swings" typically refer to two different types of swings. One is a vertical pole that swings back and forth, having a horizontal attachment with two facing seats. The other is a porch swing with the swing mechanism below the seat instead of above it. Both types were put into this category because most of the reports merely referred to "glider swings" without any clear indication of which type was involved. The only reported hazards for glider swings were **equipment-related** hazards**,** with 16 reports.
- **Incidental**: Reports coded as "incidental" happened near playground equipment, but did not happen on the equipment, nor did they directly involve the equipment. The most common hazard for "incidental" cases was **fall**, with 13 reports (52 percent).
- **Inflatable Bouncer**: "Inflatable bouncers" includes bounce houses/castles, moon bounces, inflatable slides, and other inflatable bounce equipment. The most common hazards for inflatable bouncer were **equipment-related** and **other**, with 13 reports each (37 percent).
- **Monkey Bars**: Monkey bars are climbers that were identified by the report as "monkey bars." Typically they involve a horizontal ladder. The most common hazard for monkey bars was **equipment-related**, with 37 reports (88 percent).
- **Composite Play Structure**: A "composite play structure" is a single piece of playground equipment that incorporates several other pieces of playground equipment, such as an arched climbing station with a slide and a set of monkey bars attached to it. If an incident involving a composite play structure involved only one part of the set and was clear about which part of the set was involved in the incident, the incident was coded under that part. Otherwise, when multiple parts were involved the incident was coded as a composite play structure. The most common hazard for composite play structures was **equipment-related**, with 159 reports (72 percent).
- **Non-Play Structure**: A "non-play structure" is part of the support structure for the equipment that is not meant to be played on. Typically, these are poles that hold up or support the playground equipment. The most common hazard for non-play structures was **fall**, with 26 reports (60 percent).
- **Other**: Any playground equipment that was clearly specified, but did not fall into one of the other equipment type categories fits into the category of "other" playground equipment. This category includes merry-go-rounds, sliding poles, jungle gyms, ball pits, spring bouncers, cork screw poles, and a large variety of other products for which there were less than 10 reports. The most common hazard for "other" playground equipment was **fall**, with 63 reports (48 percent).
- **Platform**: A "platform" is any horizontal part of a piece of playground equipment, including a bridge between two parts of the equipment. Platforms are most common on composite play structures, but they are also found on slides and climbers. The most common hazard for platforms was **fall**, with 62 reports (67 percent).
- **Playground Surface**: "Playground surface" is the ground covering in an area containing the playground equipment. The surface was only coded as the type of playground equipment if it was indicated as part of the cause of the incident. Otherwise, the incident was coded as "incidental." For example, "tripped on rubber mat and fell" would be coded

as playground "surface," whereas, "tripped and fell on rubber mat" would be coded as "incidental." The most common hazards for playground surfaces were **fall** and **equipment-related**, with 12 cases each (34 percent).

- **Rope Swing**: A "rope swing" is a swing involving a single piece of rope, which may be attached to a tire, disc, or ball at the bottom. The most common hazard for rope swings was **entrapment**, with 13 reports (59 percent).
- **Safety Netting**: Safety netting is used primarily for indoor composite play structures in restaurant locations to prevent falls to the ground or falls to playground surfacing from higher areas of the play structure. The most common hazard for safety netting was **fall**, with 11 reports (50 percent).
- **Sandbox**: "Sandbox" incidents include problems with the play sand itself, as well as problems with the structure containing the sand. The most common hazard pattern for sandboxes was **equipment-related**, with 10 reports (67 percent).
- **Seesaw/Teeter Totter**: A board on a pivot for rocking up and down. The most common hazard for seesaws/teeter totters was **equipment-related**, with 1,270 reports (nearly 100 percent). Some 1,239 (97 percent) of the seesaw/teeter totter reports were related to a single recalled product.
- **Slide**: A "slide" is a diagonal surface for sliding down that is open to the sides and/or top. This category excludes tube slides and sliding poles. The most common hazard for slides was **fall**, with 102 reports (31 percent).
- **Steps**: Steps leading up to a piece of playground equipment were treated separately from the equipment. The most common hazard for steps was **fall**, with 98 reports (79 percent).
- **Swing**: Swings excluded glider swings and rope swings. The most common hazard for swings was **equipment-related**, with 261 reports (72 percent).
- **Tube, Horizontal**: Horizontal tubes are for climbing or crawling in, including both plastic tubes in larger play structures and larger standalone tubes made of concrete or wood. The most common hazard for horizontal tubes was **fall**, with 28 reports (54 percent).
- **Tube Slide**: A "tube slide" is a slide that is fully enclosed on the sides and top. The most common hazard for tube slides was **equipment-related**, with 16 reports (39 percent).
- **Unknown or Not Specified**: This category includes all of the incidents where the report did not contain enough information to determine the type of playground equipment involved. The most common hazard pattern for "unknown" or "not specified" equipment was **fall**, with 22 reports (37 percent).
- **Zip Line**: A "zip line" is a horizontal rope, wire, or beam, with a mechanical bearing system, for sliding along the system by hanging beneath it. The most common hazard for zip lines was **equipment-related**, with 15 reports (71percent.

There were 1,239 incidents involving a specific brand of seesaw seats breaking, which posed a fall hazard and that were reported by a manufacturer. The distribution of hazard pattern and equipment type overall was skewed toward equipment-related and seesaw/teeter totters, respectively.. The product was recalled in 2012. With the seesaw seat manufacturer reports included, equipment-related was the most common hazard pattern, with 1,907 (63 percent) of reported incidents. Seesaws/teeter totters accounted for 1,272 (42 percent) of the playground equipment involved in all reports.

Without the seesaw seat manufacturer reports, equipment-related hazards were still the most common hazard pattern, but made up 38 percent of all reported hazards. The distribution of general hazard patterns without the seesaw seat data is shown in Table 3.

Table 3: Reported Incidents Associated with Playground Equipment by General Hazard Pattern, Without Seesaw Seat Data, 2009-2014

Hazard Pattern	Count	Percentage
Equipment-Related	668	38
Fall	523	29
Other	269	15
Incidental	109	6
Collision	109	6
Entrapment	97	5
Total	1,775	100

Source: CPSRMS, July 2015
Percentages may not sum to 100 due to rounding
Reporting is ongoing for 2013-2014

There were only 33 reported incidents (2 percent) of seesaws/teeter totters, 31 still fell under equipment-related hazards. Swings were the most frequently reported equipment at 20 percent. The type of equipment with the most reported equipment-related hazards were swings, with 261 reported incidents accounting for 39 percent of the 668 reports. The counts of reported incidents by type of equipment without the seesaw seat breakage data is shown in Table 4.

Table 4: Reported Incidents Associated with Playground Equipment by Type of Equipment, Without Seesaw Seat Data, 2009-2014

Equipment Type	Count	Percentage
Swing	363	20
Slide	326	18
Composite Play Structure	220	12
Other	130	7
Steps	124	7
Platform	93	5
Unknown/Not Specified	60	3
Tube, Horizontal	52	3
Non-Play Structure	43	2
Monkey Bars	42	2
Tube Slide	41	2
Inflatable Bouncer	35	2
Playground Surface	35	2
Seesaw/Teeter Totter	33	2
Bars	29	2
Climber	28	2
Incidental	25	1
Rope/Tire Swing	22	1
Safety Netting	22	1
Zip Line	21	1
Glider Swing	16	1
Sandbox	15	1
Total	1,775	100

Source: CPSRMS, July 2015
Percentages may not sum to 100 due to rounding
Reporting is ongoing for 2013-2014

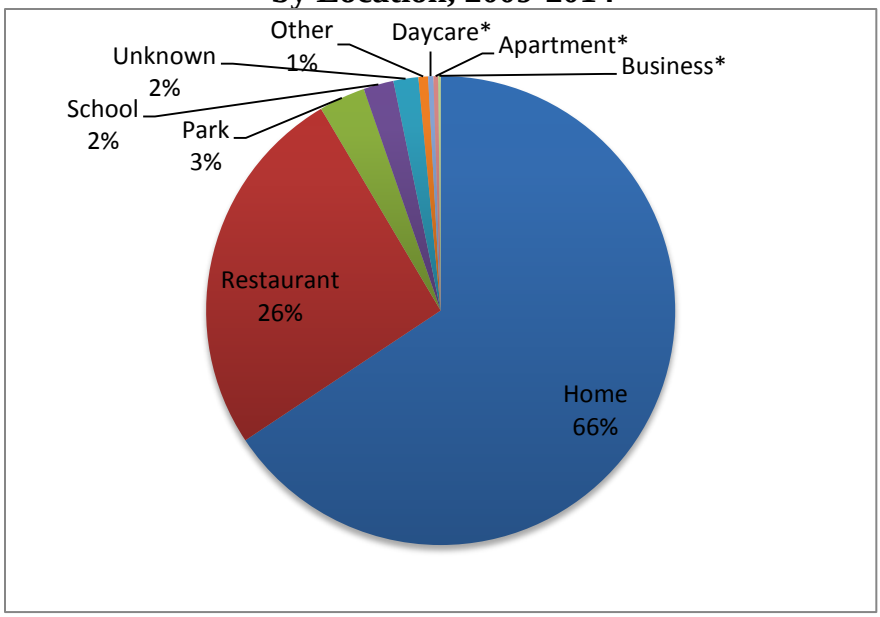
CPSC staff also classified the reports of playground equipment incidents by location, as shown in Table 5. Home and restaurant were the most frequent locations, with 2,758 reported incidents (92 percent). Figure 1 provides a graphical depiction of the data in Table 5.

Table 5: Reported Incidents Associated with Playground Equipment by Location, 2009-2014

Location	Count	Percentage
**Home	1977	66
Restaurant	781	26
Park	96	3
School	64	2
**Unknown	50	2
Other	20	1
Daycare	11	*
Apartment	10	*
Business	5	*
Total	3,014	100

Source: CPSRMS, July 2015
Percentages may not sum to 100 due to rounding
Reporting is ongoing for 2013-2014
** Estimates less than 1 percent*
***1,232 of the recalled seesaw seats were reported to be in home locations and 7 were unknown*

Figure 1: Percentage of Reported Incidents Associated with Playground Equipment by Location, 2009-2014



Source: CPSRMS, July 2015
Percentages may not sum to 100 due to rounding
Reporting is ongoing for 2013-2014
** Estimates less than 1 percent*

The following definitions specify the locations that are included in each location category.

- **Apartment**: The apartment code refers not just to playground equipment at apartment complexes, but also to private playground equipment in any multi-family residential area. Therefore it also includes private playground equipment owned by homeowners' associations.
- **Business**: Business locations include dealers of playground equipment and other commercial enterprises that have playground equipment for the use of their customers. This category also includes products seen in stores, but not purchased.
- **Day Care**: Day care locations include all reports occurring at a "day care" or "child care" facility. If an incident occurred under the supervision of a day care provider, but not at the actual day care facility, the incident was coded based on the location where the incident occurred. For example, an incident where a day care provider took children to a city park and there was an injury on a slide would be coded as a "park" incident, not a "day care" incident.
- **Home**: The home location includes single-family residences. Many of the reports were vague about the actual location of the incident. If the report indicated that it was from the owner or purchaser of the playground equipment involved, it was assumed to be a "home" location.
- **Other**: The other location includes all locations not fitting one of the other categories. Examples of locations coded as "other" include churches, county fairs, hotels, summer camps, and government office buildings.
- **Park**: The park location includes any public playground equipment not associated with a school.
- **Restaurant**: The restaurant location mainly includes fast food restaurants. Many of these establishments have large composite play structures of playground equipment, often indoors.
- **School**: The school location includes playground equipment at schools.
- **Unknown**: The unknown location was used only if the report contained no information about the location or ownership of the playground equipment.

Table 6 shows the counts of reported incidents by victim age category and sex. There are 1,313 reports (44 percent) with both age and sex listed as unknown. However, many reports do not involve a specific individual (*e.g.*, where no injury occurred), and those reports are also coded as unknown age and sex.

Characterization of the largest age categories for reported incidents is complicated by the fact that the largest age category is unknown, with 1,849 (61 percent) of the reported incidents. For the reported incidents with known ages, the 0 to 4 age group accounts for 47 percent of the data, with 542 of 1,165 incidents. The 5 to 9 age group accounts for 41 percent of incidents with known ages or 475 of 1,165 incidents. Only 6 percent (71) of the incidents with known age involve a person 15 years of age or older. Males account for 51 percent of the reported incidents where sex is known, with 845 of 1,652 incidents.

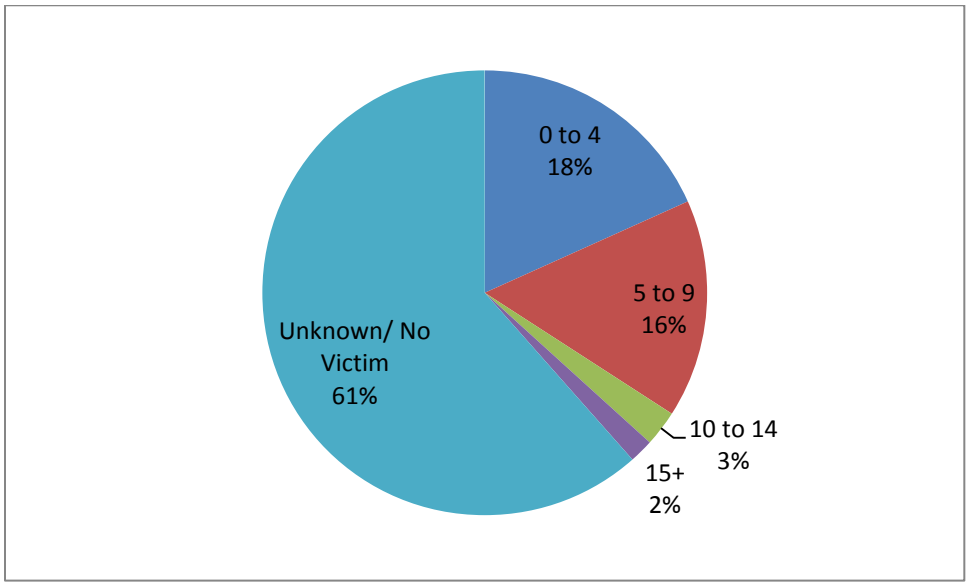
Table 6: Reported Incidents Associated with Playground Equipment by Victim Age Category and Sex, 2009-2014

Age Category	Total	Male	Female	Unknown/No Victim
0 to 4	542	259	241	42
5 to 9	475	247	222	6
10 to 14	77	40	36	1
15+	71	32	39	0
Unknown/No Victim	1,849	271	265	1,313
Total	3,014	849	803	1,362

Source: IPII and Death Certificates Databases, July 2015
Reporting is ongoing for 2013-2014

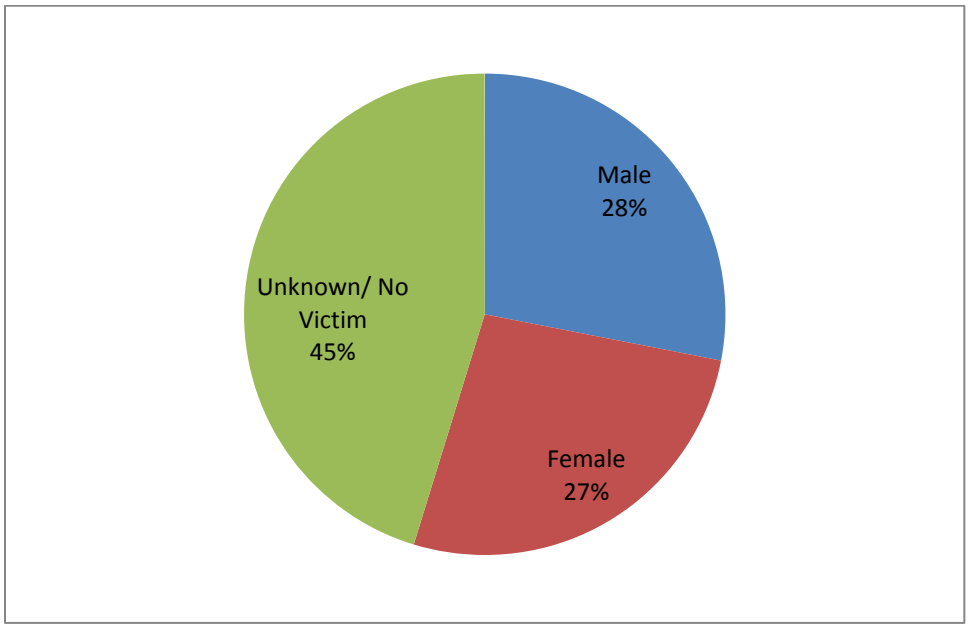
Figure 2 provides a graphical representation of the data from Table 6 regarding the victim age category. Figure 3 (next page) does the same regarding victim sex.

Figure 2: Reported Incidents Associated with Playground Equipment by Victim Age Category, 2009-2014



Source: IPII and Death Certificates Databases, July 2015
Reporting is ongoing for 2013-2014

Figure 3: Reported Incidents Associated with Playground Equipment by Victim Sex, 2009-2014



Source: IPII and Death Certificates Databases, July 2015
Reporting is ongoing for 2013-2014

Table 7 shows the counts of reported incidents by disposition. About 6 percent (175) of the reports indicated a serious injury requiring hospitalization or resulting in death. Fifty-three percent (1,597) of the reports indicated no injury (including the "No Incident" cases).

Table 7: Incidents Associated with Playground Equipment by Disposition, 2009-2014

Disposition	Count	Percentage
Incident, No Injury	1,585	53
Level of Care Unknown	792	26
Treated and Released	201	7
Seen by Medical Professional	137	5
Fatality	98	3
Hospitalized	77	3
Unspecified	63	2
First Aid by Non-Medical Professional	26	1
No First Aid/Medical Attention	23	1
No Incident	12	*
Total	3,014	100

Source: IPII and Death Certificates Databases, July 2015
Reporting is ongoing for 2013-2014
** Estimates less than 1 percent*

Deaths Investigated by CPSC Staff

From 2009 to 2014, CPSC staff completed investigations of 34 deaths associated with playground equipment from the larger set reported in Table 7. The age range of the victims was 13 months to 52 years of age, with an average of 7 years of age and a median of 5 years of age.

Of the 34 investigated deaths, 19 involved hangings and other asphyxiations. Five of the 19 hangings and asphyxiations occurred on slides, and another five occurred on swings, including two that occurred on a rope swing. Four deaths involved composite play structures, and two occurred during while using zip lines. No other type of equipment was associated with more than one hanging or asphyxiation. The other types of equipment associated with hangings and asphyxiations were monkey bars and an inflatable bouncer. One death involved a castle-shaped "playground structure." The average age of the hanging victims was 5 years, and the oldest was 15 years.

Of the 19 deaths involving hangings and other asphyxiations, 12 involved a second product. In three cases the second product was a jump rope, in four other cases the second product was a rope, and in two cases the second product was clothing with a drawstring. No other second product was associated with more than one hanging, and those second products were a helmet and baler twine. In one unique case, the decedent was operating a toy vehicle when he was crushed and asphyxiated by a swing set frame.

The next most common type of investigated death involved neck and head injuries. Of the 34 investigated deaths, eight involved head and neck injuries. Three of the head and neck deaths were on swings, and two others involved composite play structures. No other type of equipment was associated with more than one head and neck injury. The other types of equipment involved were a platform, a teeter totter, and a football sled. Three of the head- and neck-related deaths involved falls and another three involved collisions, one resulting from a child attempting to flip from a swing set crossbeam onto a trampoline and striking the trampoline. Another death resulted from a cedar swing set tipping over onto the victim due to hammocks that were attached to the swing set. Another case involved the breakage of a zip line with an attached swing.

There were two investigated deaths related to drowning. In both cases, the child fell or slid down a non-pool slide into a swimming pool. Two other deaths were related to falls, one involving a slide and the other involving unspecified playground equipment.

Another death involved a swing that broke. In this incident, the frame of the swing set collapsed and landed on the victim.

The final death involved a rope course attraction in a mall. A 52-year-old male died when his harness became disconnected and he fell 30 feet onto the concrete floor.

Emergency Department-Treated Injuries

From 2009 to 2014, there was a total estimated 1,459,201 emergency department-treated injuries associated with playground equipment. The 95 percent confidence interval for this estimate is 1,201,226–1,717,176 (C.V. = 0.0902). From 2009 to 2014, the estimated annual average of emergency department-treated injuries associated with playground equipment was 243,200. From 2012 to 2014, the most recent 3 years in the examined period, the estimated annual average of emergency department-treated injuries associated with playground equipment was 247,075. Table 8 and Figure 4 give the yearly estimates for emergency department-treated injuries associated with playground equipment. No statistically significant trend exists over the 2009 to 2014 period. The 2012 estimate was statistically significantly higher than any other single year. It is not clear why that occurred.

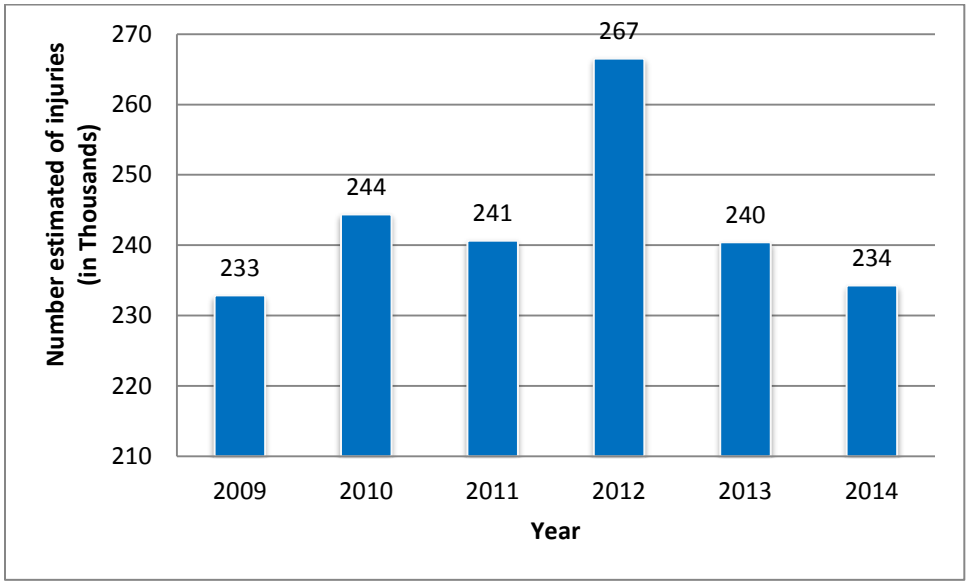
While the incidents reported to CPSC and the emergency department-treated injuries are similar in scope and character, staff cautions against making comparisons between the two sets of data. As described in the Appendix, the incidents reported to CPSC constitute an anecdotal data set, which may not be representative of the incidents that actually occurred. The emergency department data are more representative, but the data are representative of a narrower range of injury severity.

Table 8: Estimated Emergency Department-Treated Injuries Associated with Playground Equipment by Year, 2009-2014

Year	Observations	Estimate	C.V.
2009	8,260	232,906	0.0825
2010	8,698	244,405	0.0812
2011	8,449	240,665	0.0856
2012	9,173	266,524	0.0911
2013	7,917	240,414	0.1152
2014	7,878	234,287	0.1178
Total	50,375	1,459,201	0.0902

Source: National Electronic Injury Surveillance System (NEISS) Database, July 2015

Figure 4: Estimated Emergency Department-Treated Injuries Associated with Playground Equipment by Year, 2009-2014



Source: NEISS Database, July 2015

Table 9 presents the estimated emergency department-treated injuries by diagnosis. This is, at best, a rough equivalent to the hazard patterns coded for the reported incidents because the information only specifies the result of the injury, not how the injury occurred. The "Infrequent Diagnoses" line on Table 9 aggregates all diagnoses with estimates under 1,200 because such estimates are generally considered unreliable for calculating national estimates. The diagnoses with estimates below 1,200 were amputation, anoxia, aspiration of foreign object, crushing injury, ingestion of foreign object, nerve damage, poisoning, submersion, thermal burn and unspecified burn.

Table 9: Estimated Emergency Department-Treated Injuries Associated with Playground Equipment by Diagnosis, 2009-2014

Diagnosis	Estimate	Percentage
Fractures	492,001	34
Contusions and Abrasions	251,699	17
Lacerations	216,421	15
Strains and Sprains	184,999	13
Internal Organ Injuries	132,445	9
Other/Not Stated	90,611	6
Concussions	34,074	2
Dislocation	21,868	1
Dental Injuries	10,246	1
Hematomas	9,416	1
Foreign Body	5,325	*
Punctures	2,431	*
Avulsions	1,748	*
Hemorrhage	1,563	*
Dermatitis and Conjunctivitis	1,343	*
Infrequent Diagnoses	3,006	*

Source: NEISS Database, July 2015
Percentages may not sum to 100 due to rounding
** Estimates less than 1 percent*

The two most common diagnoses are fractures and contusions/abrasions, which together account for 51 percent of the data. Fractures alone account for more than one-third of the emergency department-treated injuries. The top four diagnoses, which also include lacerations and strains/sprains, account for 78 percent of the data.

Table 10 presents the estimated emergency department-treated injuries by the affected body part. The two most commonly affected body parts were the arm and head, which together accounted for 59 percent of all injuries. Of the 256,254 reported head injuries, 130,741 (51 percent) were diagnosed as internal organ injuries, and 34,079 (13 percent) were diagnosed as concussions. There were fewer than 1,200 internal injuries (a code used for aspirations and ingestions); thus, these do not appear in Table 10.

Table 10: Estimated Emergency Department-Treated Injuries Associated with Playground Equipment by Body Part Affected, 2009-2014

Body Part	Estimate	Percentage
Arm	599,509	41
Head	256,254	18
Leg	237,335	16
Face	215,464	15
Trunk/Pubic Region	122,068	8
Neck	24,380	2
Not Recorded	2,559	*
Multiple Parts of Body	1,599	*

Source: NEISS Database, July 2015
** Estimates less than 1 percent*

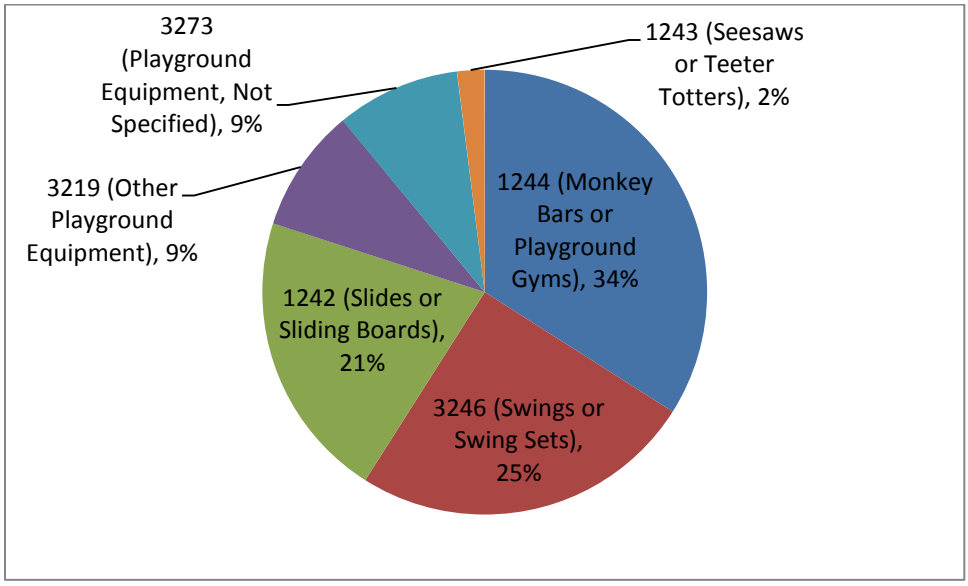
Table 11 and Figure 5 (next page) present the estimated emergency department-treated injuries by product code. Two product codes can be recorded for each emergency department visit. Incidents associated with two playground equipment product codes are counted twice in Table 11. The total from Table 11 is 1,464,291, which is only 5,090 more than the estimated injuries without duplication. Monkey bars and swings account for the majority (59percent) of the total injuries, although slides also account for one-fifth of the injuries by themselves.

Table 11: Estimated Emergency Department-Treated Injuries Associated with Playground Equipment by Product Code, 2009-2014

Product Code	Estimate	Percentage
1244 (Monkey Bars or Playground Gyms)	499,797	34
3246 (Swings or Swing Sets)	365,237	25
1242 (Slides or Sliding Boards)	310,198	21
3219 (Other Playground Equipment)	134,472	9
3273 (Playground Equipment, Not Specified)	128,990	9
1243 (Seesaws or Teeter Totters)	25,596	2

Source: NEISS Database, July 2015

Figure 5: Estimated Emergency Department-Treated Injuries Associated with Playground Equipment by Product Code, 2009-2014



Source: NEISS Database, July 2015

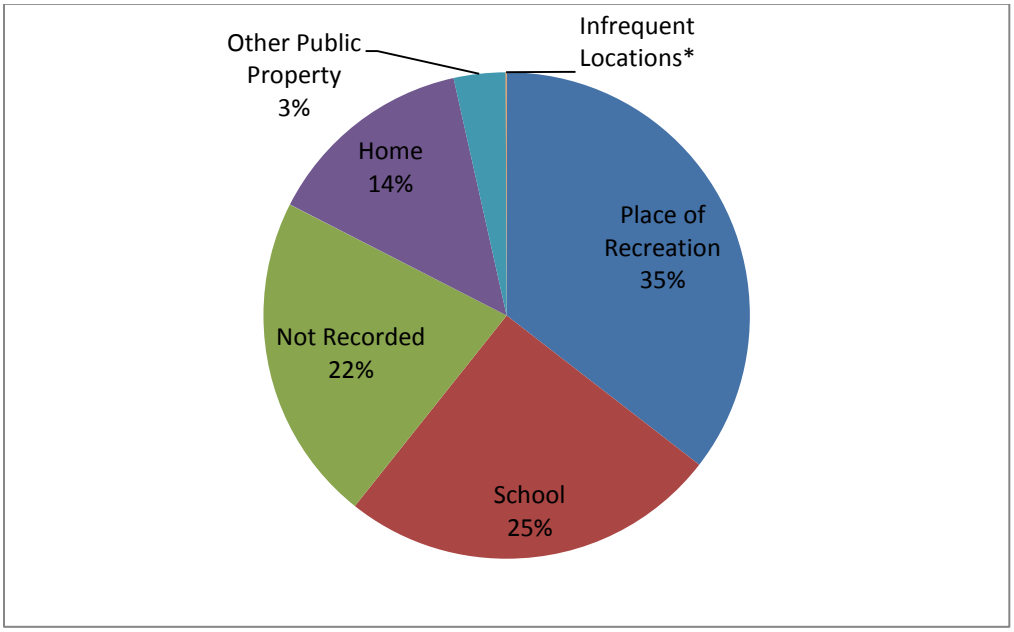
Table 12 and Figure 6 present the estimated emergency department-treated injuries by location of the playground equipment. The "Infrequent Locations" line on Table 12 includes locations with estimates less than 1,200. Estimates that low are not considered reliable for calculating national estimates. Locations with estimates less than 1,200 include streets, farms and mobile homes. The majority of the injuries occurred at a place of recreation or a school, with 61 percent of the emergency department-treated injuries reported to have occurred at one of those two locations.

Table 12: Estimated Emergency Department-Treated Injuries Associated with Playground Equipment by Location, 2009-2014

Location	Estimate	Percentage
Place of Recreation	517,964	35
School	367,964	25
Not Recorded	318,435	22
Home	203,551	14
Other Public Property	50,279	3
Infrequent Locations	*	*

Source: NEISS Database, July 2015
Percentages may not sum to 100 due to rounding
** Estimate less than 1 percent and below CPSC reporting guidelines*

Figure 6: Estimated Emergency Department-Treated Injuries Associated with Playground Equipment by Location, 2009-2014



Source: NEISS Database, July 2015
Percentages may not sum to 100 due to rounding
** Estimate less than 1 percent*

Table 13 presents the estimated emergency department-treated injuries by age and sex. Table 13 does not give estimates for unknown ages or sex because all of those estimates are less than 1,200, and are therefore considered unreliable for calculating national estimates.

Table 13: Estimated Emergency Department-Treated Injuries Associated with Playground Equipment by Age and Sex, 2009-2014

Age	Male	Female	Total (Known)
0 to 4	214,434	165,907	380,342
5 to 9	389,136	351,482	740,618
10 to 14	107,746	108,018	215,764
15+	53,745	68,693	122,438
Total (Known)	765,077	694,101	1,459,162

Source: NEISS Database, July 2015

Most of the estimated emergency department-treated injuries are children in the 5 to 9 age category, which accounts for 51 percent of the data. Males accounted for 52 percent of the estimated emergency department-treated injuries, although this is not consistent across age categories. In the 0 to 4 age category, males accounted for 56 percent of the estimated injuries. In the 15 and older age category, females accounted for the majority (56percent) of the estimated injuries.

Table 14 presents the estimated emergency department-treated injuries by disposition. The estimates for fatalities and unknown dispositions were under 1,200, and therefore, are considered unreliable for calculating national estimates and are not reported in Table 14.

Table 14: Estimated Emergency Department-Treated Injuries Associated with Playground Equipment by Disposition, 2009-2014

Disposition	Estimate	Percentage
Treated and Released	1,376,091	94
Hospitalized	46,205	3
Treated and Transferred to Another Hospital	20,634	1
Left Against Medical Advice	11,609	1
Held for Observation	4,571	*

Source: NEISS Database, July 2015
Percentages may not sum to 100 due to rounding
** Estimate less than 1 percent*

Appendix: Methodology

The product codes searched for this memorandum were 1242 (Slides or sliding boards, excluding swimming pool slides), 1243 (Seesaws or teeter totters), 1244 (Monkey bars, playground gyms, or other playground climbing apparatus), 3219 (Other playground equipment), 3246 (Swings or swing sets, excluding portable baby swings), and 3273 (Playground equipment, not specified). The databases searched for reports were the Death Certificates Database (DTHS), In Depth Investigation File (INDP) and the Injury and Potential Injury Database (IPII), which are contained within the Consumer Product Safety Risk Management System (CPSRMS).

Deaths (DTHS)

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 June 2015, the Death Certificates Database was considered 100 percent complete for 2009, 2010, and 2011, 99 percent complete for 2012, 89 percent complete for 2013, and 41 percent complete for 2014.

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 web site, Medical Examiners and Coroners Alert Program (MECAP) reports, letters from lawyers, and similar sources. While the IPII database does not constitute a statistical sample, it can provide CPSC staff with guidance or direction in investigating potential hazards. Since 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 NEISS 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 U.S. Different hospitals carry different weights, based on stratification by their annual number of emergency department visits (Schroeder and Ault, 2001).

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

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.[4] 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.

In Depth Investigations (INDP)

INDP contains cases reported to CPSC (typically via DTHS, INDP, or NEISS) that have been assigned for investigation. It allows CPSC to gain additional information about the product(s) involved, the hazard scenario, and the severity of any injury that occurred. The Deaths Investigated by CPSC staff are restricted to cases of reported fatality investigated by CPSC.

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