



CPSA 6(b)(1) CLEARED for PUBLIC

**NO MFRS/PRVTLBLS OR
PRODUCTS IDENTIFIED**

**EXCEPTED BY: PETITION
RULEMAKING ADMIN. PRCDG**

WITH PORTIONS REMOVED: _____

Jim
10/29/09

Injuries and Investigated Deaths Associated with Playground Equipment, 2001 - 2008

Craig W. O'Brien
Division of Hazard Analysis
Directorate for Epidemiology
U.S. Consumer Product Safety Commission
4330 East West Highway
Bethesda, MD 20814
October 2009

Table of Contents

Overview	4
Summary of Findings	4
Incidents Reported to CPSC Staff	5
Table 1: Reported Incidents Associated with Playground Equipment by General Hazard Pattern, 2001-2008.....	6
Table 2: Reported Thermal Burns Associated with Playground Equipment by Type of Equipment and Severity, 2001-2008.....	6
Table 3: Reported Incidents Associated with Playground Equipment by Type of Equipment, 2001-2008.....	7
Table 4: Reported Incidents Associated with Playground Equipment by Location, 2001-2008.....	10
Figure 1: Percentage of Reported Incidents Associated with Playground Equipment by Location, with and without Wisconsin, 2001-2008	11
Table 5: Reported Incidents Associated with Playground Equipment by Victim Age Category and Sex, 2001-2008.....	12
Figure 2: Reported Incidents Associated with Playground Equipment by Victim Age Category, 2001-2008.....	13
Figure 3: Reported Incidents Associated with Playground Equipment by Victim Sex, 2001-2008	13
Table 6: Incidents Associated with Playground Equipment by Disposition, 2001-2008.....	14
Deaths Investigated by CPSC Staff	14
Emergency Department-Treated Injuries	15
Table 7: Estimated Emergency Department-Treated Injuries Associated with Playground Equipment by Year, 2001-2008	15
Figure 4: Estimated Emergency Department-Treated Injuries Associated with Playground Equipment by Year, 2001-2008	16
Table 8: Estimated Emergency Department-Treated Injuries Associated with Playground Equipment by Diagnosis, 2001-2008.....	17
Table 9: Estimated Emergency Department-Treated Injuries Associated with Playground Equipment by Product Code, 2001-2008	18
Figure 5: Estimated Emergency Department-Treated Injuries Associated with Playground Equipment by Product Code, 2001-2008	18
Table 10: Estimated Emergency Department-Treated Injuries Associated with Playground Equipment by Location, 2001-2008.....	19
Figure 6: Estimated Emergency Department-Treated Injuries Associated with Playground Equipment by Location, 2001-2008.....	19
Table 11: Estimated Emergency Department-Treated Injuries Associa ted with Playground Equipment by Age and Sex, 2001-2008.....	20

Table 12: Estimated Emergency Department-Treated Injuries Associated with Playground Equipment by Disposition, 2001-2008.....	20
Appendix A: Specific Hazard Patterns for Reported Incidents	21
Table 13: Reported Incidents Associated with Playground Equipment by Hazard Pattern, 2001-2008	21
Appendix B: Methodology	23

Overview

U.S. Consumer Product Safety Commission (CPSC) staff last performed a broad analysis of playground equipment fatalities in 2000.¹ This report presents an updated analysis of reports of injuries and deaths associated with playground equipment, to account for any changes in the market, either in terms of the products available or how they are used or installed.

This report contains sections on incidents reported to CPSC staff, deaths investigated by CPSC staff, and estimated emergency department-treated injuries. There are also two appendices, one containing a more detailed analysis of injury types in reported incidents, and the other covering the methodology used in the report. A summary of the findings contained in this report is provided in the next section.

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.²

Incidents Reported to CPSC Staff

From 2001-2008, there were 2,691 incidents associated with playground equipment reported to CPSC staff for all ages.

- Of the 2,691 incidents reported to CPSC staff, 1,810 (67%) involved falls or equipment failure.
- Of the 2,691 incidents reported to CPSC staff, 1,548 (58%) involved swings, slides, climbers, or monkey bars. This may reflect popularity more than any danger inherent in these equipment types.
- Heavy reporting from Wisconsin day care centers skewed the distribution of incident locations in the data. Of the 1,680 non-Wisconsin incidents reported to CPSC staff, 1,132 (67%) occurred at home or restaurant location.
- Of the 1,574 incidents reported to CPSC staff in which the victim's age was known, 852 (54%) involved children under the age of five.
- Of the 2,691 incidents reported to CPSC staff, 1,976 (73%) involved a minor injury not requiring hospitalization.

Deaths Investigated by CPSC Staff

From 2001-2008, CPSC staff investigated 40 deaths associated with playground equipment. Of the 40 investigated fatal incidents:

¹ Tinsworth, D. and MacDonald, J. *Fatalities Related to Playground Equipment*. U.S. Consumer Product Safety Commission. October 2000.

² 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.

- Victim ages ranged from 14 months to 21 years. The average age was 6 years, and the median age was 4 years.
- 27 deaths were the result of hangings or other asphyxiations. Of the 27 hangings and other asphyxiations:
 - 12 were associated with slides; 9 occurred on swings.
 - 19 involved a second product.
 - Average age of the victim was 5.
- 7 deaths were the result of head or neck injuries.
- 6 deaths included two falls, two tip overs, one product breakage, and an all-terrain vehicle accident indirectly related to playground equipment.

Emergency-Department Treated Injuries

From 2001-2008, an estimated 1,786,008 injuries associated with playground equipment were treated nationally in emergency departments.

- The annual average number of emergency department-treated injuries associated with playground equipment from 2006-2008 is estimated to be 218,851.
- There is a statistically significant downward trend in the estimated injuries from 2001-2008 (p-value = 0.0251). However, only year to year comparisons including 2001 as a comparison year showed any significance.
- Of the 1,786,008 estimated emergency department-treated injuries associated with playground equipment from 2001-2008:
 - An estimated 1,026,539 injuries (57%) occurred at schools or parks.
 - An estimated 948,110 injuries (53%) occurred in the 5 to 9 years of age category.
- Other than in terms of location and age of victim, the emergency department-treated injuries were similar in nature to the incidents reported to CPSC staff.

Thermal Burns

Thermal burns associated with playground equipment were analyzed separately.

- Of the 29 reported injuries involving thermal burns, 14 (48%) involved playground surfacing materials.
- There were no deaths associated with thermal burns from playground equipment.
- The national estimate for the number of emergency department-treated injuries involving thermal burns from playground equipment is too small to report.

Incidents Reported to CPSC Staff

From 2001 through 2008, CPSC staff is aware of 2,691 reports of incidents involving playground equipment. The majority of the 2,691 reports involved an injury or a death, although 470 (17%) of the reports involved no injury or only a potential injury (Table 6, p. 14).

CPSC staff classified each incident into one of six general hazard patterns and one of 32 specific hazard patterns. The distribution of the general hazard patterns is shown in Table 1. A distribution and explanation of the specific hazard patterns is reported in Appendix A.

Table 1: Reported Incidents Associated with Playground Equipment by General Hazard Pattern, 2001-2008

Hazard Pattern	Count	Percentage
Fall	1,180	44%
Equipment-Related	630	23%
Other	297	11%
Incidental	221	8%
Collision	187	7%
Entrapment	176	7%
Total	2,691	100%

*Source: Injury and Potential Injury Incident (IPII) and Death Certificates Databases, March 2009
Reporting is ongoing for 2006-2008*

The general hazard patterns are falls (from, into, or onto the equipment), equipment related (including breakage, tip over, poor design or assembly), 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 falls and equipment-related hazards, which together account for 67% of the reported incidents.

Recently CPSC staff received several inquiries regarding thermal burns from playground equipment. Staff did a further analysis of the 29 injury reports from 2001 – 2008 that mentioned a thermal burn. Table 2 shows the counts of reported thermal burns by type of equipment and the degree of the reported burn. Four of the reports indicated that the child was hospitalized due to the severity of their injuries, including a three year-old boy who burned his feet on a metal foot bridge, a two year-old boy who burned his hands on a slide, and two toddlers who burned their feet on rubber playground surfaces.

Table 2: Reported Thermal Burns Associated with Playground Equipment by Type of Equipment and Severity, 2001-2008

Equipment Type	Burn Severity			Total
	2nd Degree	3rd Degree	Not Stated	
Climber	1	0	1	2
Pipe	1	0	0	1
Platform	1	0	1	2
Slide	6	0	1	7
Steps	1	0	0	1
Surface	9	2	3	14
Swing	1	0	0	1
Tube	1	0	0	1
Total	21	2	6	29

*Source: IPII and Death Certificates Databases, March 2009
Reporting is ongoing for 2006-2008*

Table 3: Incidents Associated with Playground Equipment by Type of Equipment, 2001-2008

Equipment Type	Count	Percentage
Swing	598	22%
Slide	469	17%
Climber	251	9%
Monkey Bars	230	9%
Steps	166	6%
Multiple Device Set	111	4%
Incidental	102	4%
Unknown/Not Specified	102	4%
Other	91	3%
Platform	86	3%
Sandbox	70	3%
Playground Surface	59	2%
Non-Play Structure	49	2%
Teeter Totter	44	2%
Jungle Gym	34	1%
Merry-Go-Round	33	1%
Safety Netting	29	1%
Glider Swing	28	1%
Tube, Horizontal	27	1%
Rope/Tire Swing	26	1%
Tube Slide	24	1%
Bars	23	1%
Zip Line	21	1%
Sliding Pole	18	1%
Total	2,691	100%

*Source: IPH and Death Certificates Databases, March 2009
Reporting is ongoing for 2006-2008*

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 3. The top four types of equipment involved were swings, slides, climbers, and monkey bars. Combined, these four types of equipment accounted for 1,548 reported incidents (58%). The type of equipment with the most reported breaks was swings, with 313 reported incidents accounting for 72% of all 432 reports of equipment breakage. 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 **unspecified fall**, with 12 reports (52%).

- **Climber:** A climbing toy, including unspecified “climbers,” rope ladders, climbing walls, and climbing rings. The most common hazard for climbers was **unspecified fall**, with 83 reports (33%).
- **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 most common hazard for glider swings was **equipment breakage**, with 11 reports (39%).
- **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 hazards for incidental cases were **other** and **unspecified fall**, with 26 reports (25%).
- **Jungle Gym:** Jungle gyms are climbers that were identified by the report as “gyms” or “jungle gyms.” The most common hazard for jungle gyms was **unspecified fall**, with 11 reports (32%).
- **Merry-Go-Round:** Merry-go-rounds are horizontal spinners for riding on. The most common hazard for merry-go-rounds was **unspecified fall**, with 12 reports (36%).
- **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 **unspecified fall**, with 118 reports (51%).
- **Multiple Device Set:** A multiple device set is a single piece of playground equipment that incorporates several other pieces of playground equipment, such as a swing set with a slide and monkey bars attached to it. If an incident involving a multiple device set 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 it was coded as a multiple device set. The most common hazard for multiple device sets was **equipment breakage**, with 33 reports (30%).
- **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 are holding up the playground equipment. The most common hazard for non-play structures was **unspecified fall**, with 27 reports (55%).
- **Other:** Any playground equipment that was clearly specified but did not fall into one of the other equipment type categories. This category includes ball pits, inflatable bouncers, spring bouncers, cork screw poles, and a large variety of other products for which there were less than ten reports. The most common hazard for other playground equipment was **unspecified fall**, with 22 reports (24%).
- **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 multiple device sets, but are also found on slides and climbers. The most common hazard for platforms was **unspecified fall**, with 41 reports (48%).
- **Playground Surface:** This is the ground covering in an area containing the playground equipment. The surface was only coded as the type of 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, while

“tripped and fell on rubber mat” would be coded as incidental. The most common hazard for playground surfaces was **thermal burn**, with 14 cases (24%).

- **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 5 reports (19%).
- **Safety Netting:** Safety netting is used primarily for indoor multiple device sets in restaurant locations, to prevent falls to the ground or playground surfacing from the higher areas of the play structure. The most common hazard for safety netting was **equipment breakage**, with 9 reports (31%).
- **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 **poisonings**, with 18 reports (26%).
- **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 **unspecified fall**, with 109 reports (23%).
- **Sliding Pole:** A sliding pole is a vertical pole for sliding down, like a classic fireman’s pole. The most common hazards for sliding poles were **bad landing** and **unspecified fall**, with 4 reports each (22%).
- **Steps:** Steps leading up to a piece of playground equipment were treated separately from the equipment itself. The most common hazard for steps was **unspecified fall**, with 61 reports (37%).
- **Swing:** Swings excluded glider swings and rope swings. The most common hazard for swings was **equipment breakage**, with 313 reports (52%).
- **Teeter Totter:** A board on a pivot for rocking up and down on, including see saws. The most common hazard for teeter totters was **unspecified fall**, with 15 reports (34%).
- **Tube, Horizontal:** Horizontal tubes are for climbing or crawling in, including both plastic tubes in larger play structures and larger stand-alone tubes made of concrete or wood. The most common hazard for horizontal tubes was **unspecified fall**, with 6 reports (22%).
- **Tube Slide:** A tube slide is a slide which is fully enclosed on the sides and top. The most common hazard for tube slides was **unspecified fall**, with 7 reports (29%).
- **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 **unspecified fall**, with 32 reports (31%).
- **Zip Line:** A zip line is a horizontal rope or wire with a device for sliding along the rope or wire by hanging beneath it. The most common hazard for zip lines was **unspecified fall**, with 6 reports (29%).

CPSC staff also classified the reports of playground equipment incidents by location, as shown in Table 4 (next page). The state of Wisconsin forwards all reports of product-related injuries at day care centers to CPSC, but other states do not. There are 943 reports from Wisconsin day care centers alone, accounting for 35% of all reports received. To account for this, Table 4 reports the counts and percentages by location for all the data, and for the data excluding reports from Wisconsin.

With the Wisconsin data included, day care and home are the most frequent locations, with 1,804 reported incidents (67%). When Wisconsin data are excluded, 847 (or 50%) of the reported incidents occurred at day care or home locations. Without the Wisconsin data, home and restaurant are the most common locations, with 1,132 reported incidents (67% of the 1,680 non-Wisconsin reported incidents). Most non-day care locations were only slightly affected by the removal of the Wisconsin data, losing less than 5% of their reported incidents. However, the park location lost 15% (31) of its reported incidents with the removal of the Wisconsin data. Figure 1 (next page) provides a graphical depiction of the data in Table 4.

Table 4: Reported Incidents Associated with Playground Equipment by Location, 2001-2008

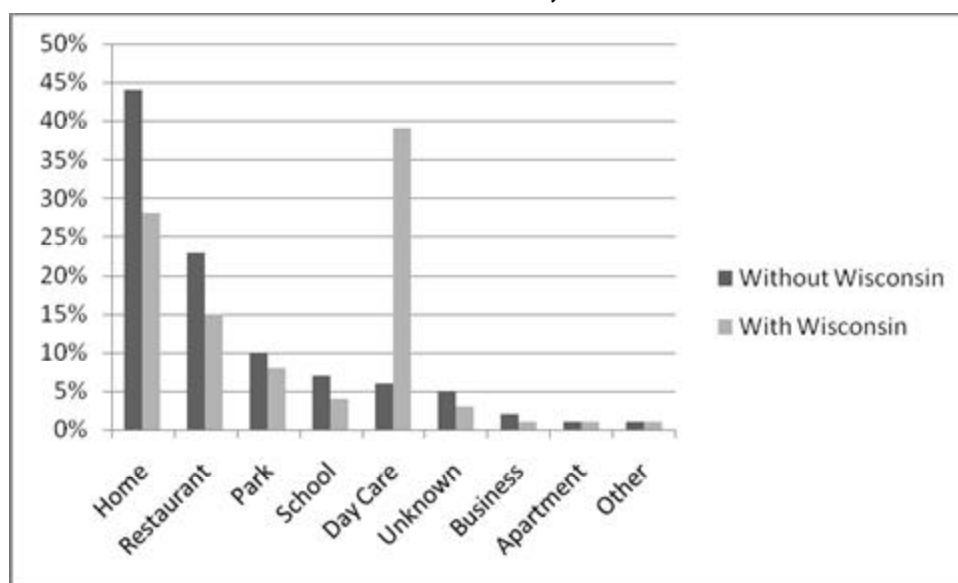
Location	Without Wisconsin		With Wisconsin	
	Count	Percentage	Count	Percentage
Home	740	44%	754	28%
Restaurant	392	23%	406	15%
Park	172	10%	203	8%
School	110	7%	114	4%
Day Care	107	6%	1,050	39%
Unknown	88	5%	92	3%
Business	28	2%	29	1%
Apartment	25	1%	25	1%
Other	18	1%	18	1%
Total	1,680	100%	2,691	100%

Source: IPII and Death Certificates Databases, March 2009

Percentages may not sum to 100 due to rounding

Reporting is ongoing for 2006-2008

Figure 1: Percentage of Reported Incidents Associated with Playground Equipment by Location, with and without Wisconsin, 2001-2008



*Source: IPII and Death Certificates Databases, March 2009
Percentages may not sum to 100 due to rounding
Reporting is ongoing for 2006-2008*

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 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 both 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 it 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 multiple device sets 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 5 shows the counts of reported incidents by victim age category and sex. There are 308 reports (11%) with both age and sex listed as unknown. However, many reports do not involve a specific individual, 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 1,117 (41%) of the reported incidents. For the reported incidents with known ages, the 0 to 4 age group accounts for 54% of the data, with 852 of 1,574 incidents. Only 5% (73) of the incidents with known age involve a person 15 years of age or older. Males account for 54% of the reported incidents where sex is known, with 1,281 of 2,352 incidents.

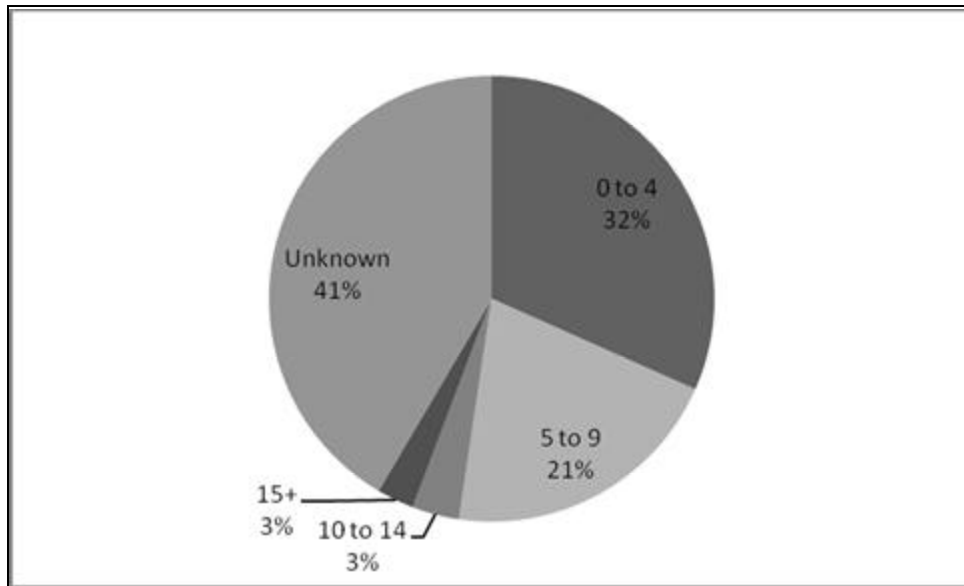
Table 5: Reported Incidents Associated with Playground Equipment by Victim Age Category and Sex, 2001-2008

Age Category	Total	Male	Female	Unknown
0 to 4	852	445	380	27
5 to 9	557	299	254	4
10 to 14	92	55	37	0
15+	73	34	39	0
Unknown	1,117	448	361	308
Total	2,691	1,281	1,071	339

*Source: IPII and Death Certificates Databases, March 2009
Reporting is ongoing for 2006-2008*

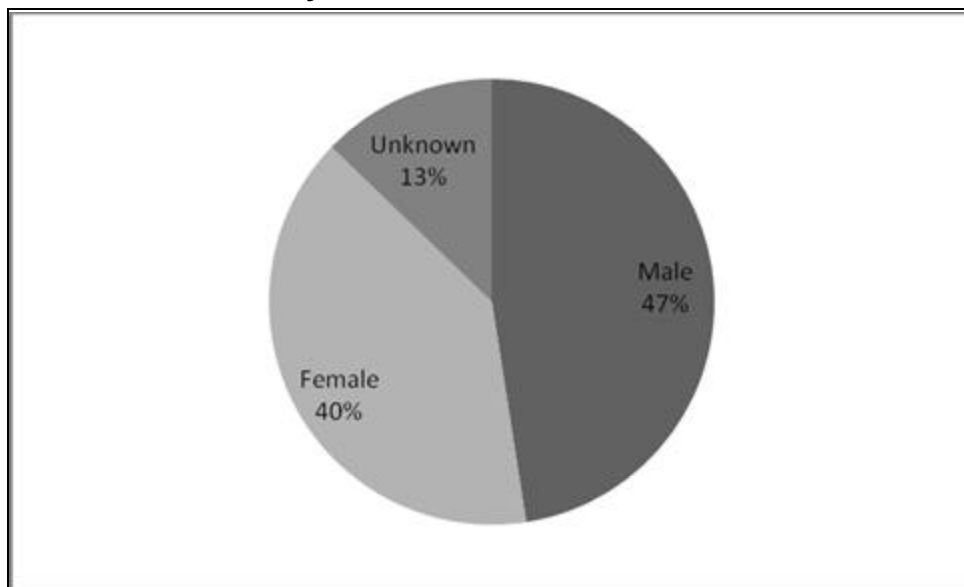
Figure 2 (next page) provides a graphical representation of the data from Table 5 with regards to victim age category. Figure 3 (next page) does the same with regards to victim sex.

Figure 2: Reported Incidents Associated with Playground Equipment by Victim Age Category, 2001-2008



*Source: IPII and Death Certificates Databases, March 2009
Reporting is ongoing for 2006-2008*

Figure 3: Reported Incidents Associated with Playground Equipment by Victim Sex, 2001-2008



*Source: IPII and Death Certificates Databases, March 2009
Reporting is ongoing for 2006-2008*

Table 6 shows the counts of reported incidents by disposition. About 6% (168) of the reports indicated a serious injury requiring hospitalization or resulting in death. Seventeen percent (470) of the reports indicated no injury.

Table 6: Incidents Associated with Playground Equipment by Disposition, 2001-2008

Disposition	Count	Percentage
No Injury	470	17%
Treated and Released	1,976	73%
Hospitalized	68	3%
Fatality	100	4%
Unknown	77	3%
Total	2,691	100%

*Source: IPII and Death Certificates Databases, March 2009
Reporting is ongoing for 2006-2008*

Deaths Investigated by CPSC Staff

From 2001 through 2008, CPSC staff investigated 40 deaths associated with playground equipment. The age range of the victims was 14 months to 21 years of age, with an average of 6 years of age and a median of 4 years of age.

Of the 40 investigated deaths, 27 involved hangings and other asphyxiations. Twelve of the 27 hangings and asphyxiations occurred on slides, and nine occurred on swings, including one on a rope swing. 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 trapeze bars, monkey bars, a raised platform, safety netting, a trap door, and a zip line. The average age of the hanging victims was a little over 5 years, and the oldest was 11 years. Based on the ages of the children and an examination of the investigation reports, staff does not believe any of the strangulations were intentional.

Of the 27 deaths involving hangings and other asphyxiations, 20 involved a second product. In six cases the second product was a jump rope, in five cases the second product was a rope, in three cases the second product was a dog leash, 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 belt, a bungee cord, a pipe, and an unidentified strap.

The next most common type of investigated death involved neck and head injuries. Of the 40 investigated deaths, seven involved head and neck injuries. Three of the head and neck deaths were on slides, two were on platforms, one was on monkey bars, and one was on the ladder leading up to a multiple-equipment play set. Six of the head and neck-related deaths involved falls, and one resulted from the victim hitting her head on the slide after landing on the ground.

There were two other investigated deaths related to falls. In one case a child fell from a jungle gym, but there was no sign of a traumatic injury that could have caused her death. In the other case, a child fell and hit her abdomen while climbing down a ladder, and lacerated her spleen.

There were two deaths involving swing sets that tipped over. In both cases the swing set tipped over and hit a child in the head or neck.

In one investigated death, the product broke. The top support beam of a homemade swing set broke and landed on the head of a child using the swing set.

The final death was not directly related to the playground equipment. A 21 year-old male who had just purchased an ATV hit a chin up bar in a back yard while riding the ATV for the first time. The victim then lost control of the ATV and ran into a tree.

Emergency Department-Treated Injuries

From 2001 through 2008 there were an estimated 1,786,008 emergency department-treated injuries associated with playground equipment. The 95% confidence interval for this estimate is 1,555,320 – 2,016,696 (C.V. = 0.0659). From 2001 to 2008 the estimated annual average of emergency department-treated injuries associated with playground equipment was 223,251. From 2006 to 2008 the estimated annual average of emergency department-treated injuries associated with playground equipment was 218,851. Table 7 and Figure 4 (next page) give the yearly estimates for emergency department-treated injuries associated with playground equipment. The overall downward trend is statistically significant ($p = 0.0251$). However, only year to year comparisons including 2001 as a comparison year showed any significance.

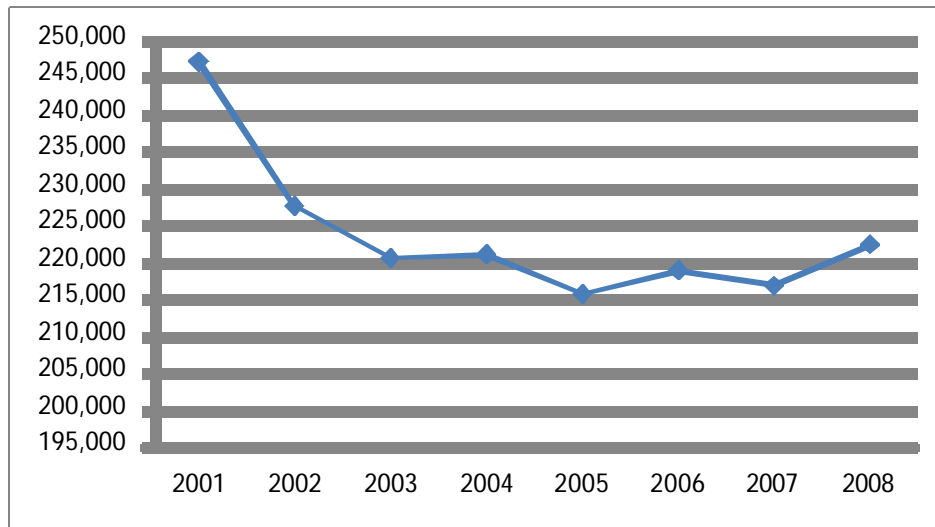
While the incidents reported to CPSC staff and the emergency department-treated injuries are similar in scope and character, staff cautions against making comparisons between the two sets of data. As described in the Methodology Appendix, the reported incidents constitute an anecdotal data set which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

Table 7: Estimated Emergency Department-Treated Injuries Associated with Playground Equipment by Year, 2001-2008

Year	Observations	Estimate	C.V.
2001	8,085	246,632	0.0586
2002	7,688	227,097	0.0701
2003	7,304	220,065	0.0804
2004	7,570	220,476	0.0815
2005	7,689	215,183	0.0754
2006	7,650	218,350	0.0760
2007	7,787	216,371	0.0726
2008	7,812	221,833	0.0725

Source: National Electronic Injury Surveillance System (NEISS) Database, May 2009

Figure 4: Estimated Emergency Department-Treated Injuries Associated with Playground Equipment by Year, 2001-2008



Source: NEISS Database, May 2009

Table 8 (next page) 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, as it only specifies the result of the injury, not how the injury occurred. The “Infrequent Diagnoses” line on Table 8 aggregates all diagnoses with estimates under 1,200, as such estimates are generally considered unreliable. The diagnoses with estimates below 1,200 were amputation, anoxia, aspirated foreign object, dermatitis/conjunctivitis, electric shock, ingested foreign object, nerve damage, poisoning, radiation burn, thermal burn and unspecified burn.

Table 8: Estimated Emergency Department-Treated Injuries Associated with Playground Equipment by Diagnosis, 2001-2008

Diagnosis	Estimate	Percentage
Fractures	644,843	36%
Contusions and Abrasions	349,569	20%
Lacerations	295,671	17%
Strains and Sprains	217,458	12%
Internal Organ Injuries	97,206	5%
Other/Not Stated	82,410	5%
Concussions	30,578	2%
Dislocation	22,602	1%
Dental Injuries	12,823	1%
Hematomas	10,160	1%
Foreign Body	8,132	*
Punctures	3,546	*
Avulsions	3,529	*
No Injury	1,789	*
Hemorrhage	1,699	*
Crushing Injuries	1,234	*
Infrequent Diagnoses	2,759	*

Source: NEISS Database, May 2009

Percentages may not sum to 100 due to rounding

** Estimates less than 1%*

The two most common diagnoses are fractures and contusions/abrasions, which together account for 56% 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 85% of the data.

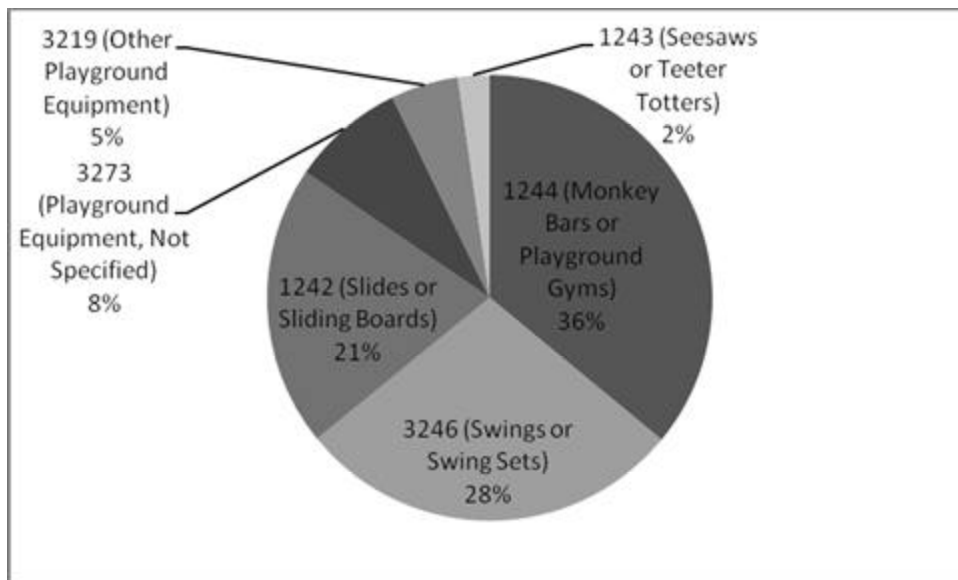
Table 9 and Figure 5 (next page) present the estimated emergency department-treated injuries by product code. Two product codes can be recorded for each emergency department visit. Incidents associated with two playground equipment product codes are counted twice in Table 9. The total from Table 9 is 1,792,695, which is only 6,687 more than the estimated injuries without duplication. Monkey bars and swings account for the majority (64%) of the total injuries, although slides also account for one-fifth of the injuries by themselves.

Table 9: Estimated Emergency Department-Treated Injuries Associated with Playground Equipment by Product Code, 2001-2008

Product Code	Estimate	Percentage
1244 (Monkey Bars or Playground Gyms)	644,932	36%
3246 (Swings or Swing Sets)	504,334	28%
1242 (Slides or Sliding Boards)	366,189	21%
3273 (Playground Equipment, Not Specified)	148,111	8%
3219 (Other Playground Equipment)	88,034	5%
1243 (Seesaws or Teeter Totters)	41,094	2%

Source: NEISS Database, May 2009

Figure 5: Estimated Emergency Department-Treated Injuries Associated with Playground Equipment by Product Code, 2001-2008



Source: NEISS Database, May 2009

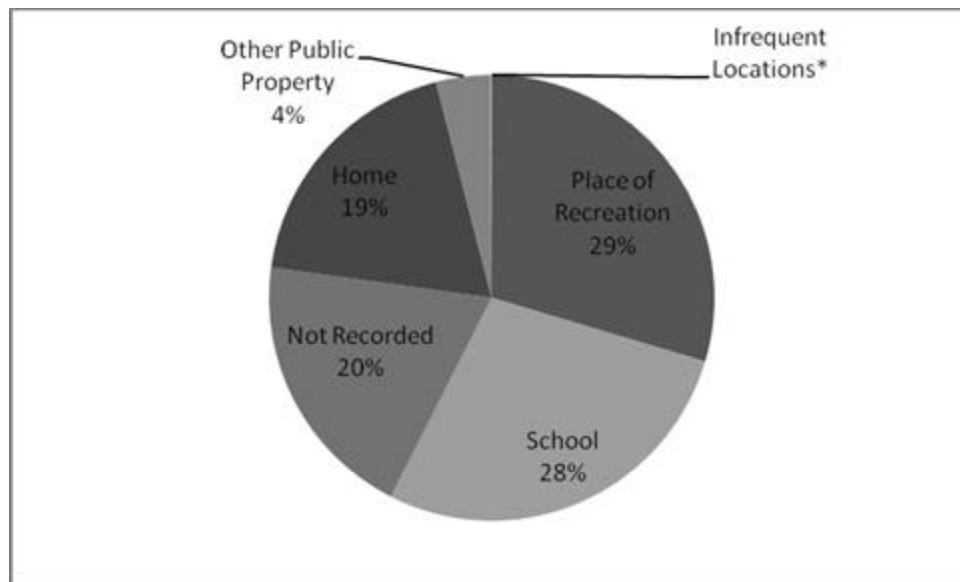
Table 10 and Figure 6 (next page) present the estimated emergency department-treated injuries by location of the playground equipment. The “Infrequent Locations” line on Table 10 includes locations with estimates less than 1,200, as estimates that low are not considered reliable. Locations with estimates less than 1,200 include streets and farms. The majority of the injuries occurred at a place of recreation or a school, with 57% of the emergency department-treated injuries reported to have occurred at one of those two locations.

Table 10: Estimated Emergency Department-Treated Injuries Associated with Playground Equipment by Location, 2001-2008

Location	Estimate	Percentage
Place of Recreation	528,959	29%
School	497,580	28%
Not Recorded	351,841	20%
Home	335,552	19%
Other Public Property	70,828	4%
Infrequent Locations	1,247	*

Source: NEISS Database, May 2009
Percentages may not sum to 100 due to rounding
** Estimate less than 1%*

Figure 6: Estimated Emergency Department-Treated Injuries Associated with Playground Equipment by Location, 2001-2008



Source: NEISS Database, May 2009
Percentages may not sum to 100 due to rounding
** Estimate less than 1%*

Table 11 (next page) presents the estimated emergency department-treated injuries by age and sex. Table 11 does not give estimates for unknown ages or sex, as all of those estimates are less than 1,200, and are therefore considered unreliable. The estimated emergency department-treated injuries associated with playgrounds from 2001-2008 where both age and sex were known is 1,785,484.

Table 11: Estimated Emergency Department-Treated Injuries Associated with Playground Equipment by Age and Sex, 2001-2008

Age	Male	Female	Total
0 to 4	254,658	193,246	447,904
5 to 9	500,700	447,410	948,110
10 to 11	145,457	128,261	273,718
15+	54,526	61,226	115,752
Total	955,341	830,143	1,785,484

Source: NEISS Database, May 2009

Most of the estimated emergency department-treated injuries are children in the 5 to 9 age category, which accounts for 53% of the data. Males accounted for 54% 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 57% of the estimated injuries. In the 15 and older age category, females accounted for the majority (53%) of the estimated injuries.

Table 12 presents the estimated emergency department-treated injuries by disposition. The estimates for fatalities and unknown dispositions were under 1,200, and are therefore considered unreliable and are not reported in Table 12.

Table 12: Estimated Emergency Department-Treated Injuries Associated with Playground Equipment by Disposition, 2001-2008

Disposition	Estimate	Percentage
Treated and Released	1,695,887	95%
Hospitalized	79,609	4%
Left Against Medical Advice	10,332	1%

Source: NEISS Database, May 2009

Appendix A: Specific Hazard Patterns for Reported Incidents

Table 13: Reported Incidents Associated with Playground Equipment by Hazard Pattern, 2001-2008

Hazard Pattern	Count	Percentage
Fall, Unspecified	675	25.08%
Equipment Broke	432	16.05%
Fall, Slip	205	7.62%
Fall, Jump	130	4.83%
Entrapment	102	3.79%
Collision, Non-Use	102	3.79%
Unknown	91	3.38%
Fall, Trip	87	3.23%
Other	76	2.82%
Collision, with Person	74	2.75%
Collision, with Equipment	63	2.34%
Collision, Intentional	58	2.16%
Sharp Edge or Protrusion	56	2.08%
Entrapment, Two Product	51	1.90%
Collision, Moving Equipment	50	1.86%
Equipment Tipped Over	40	1.49%
Bad Landing	38	1.41%
Fall, Loss of Balance	36	1.34%
Poisoning	35	1.30%
Limb Twist, Friction	32	1.19%
Fall, Grip Loss	30	1.11%
Design Failure	30	1.11%
Thermal Burn	29	1.08%
Fall, Missed Equipment	23	0.85%
Entrapment, Moving Equipment	23	0.85%
Assembly Problems	23	0.85%
Splinter	20	0.74%
Fire	19	0.71%
Foreign Object	17	0.63%
Fall, Moving Equipment	17	0.63%
Multiple Reported Hazards	14	0.52%
Limb Twist, Unspecified	13	0.48%

Source: IPII and Death Certificates Databases, March 2009

Percentages may not sum to 100 due to rounding

Reporting is ongoing for 2006-2008

- **Assembly Problems:** There was an injury due to incorrect assembly of the equipment, or the equipment could not be assembled correctly.

- **Bad Landing:** An injury resulted from a bad landing after normal use of sliding equipment.
- **Collision, Intentional:** One individual intentionally collided with another, such as one child pushing another off a slide.
- **Collision, Moving Equipment:** A moving part of the equipment collided with the individual.
- **Collision, Non-Use:** The individual ran into or fell into the playground equipment while not using it, typically while playing near the equipment.
- **Collision, with Equipment:** The individual collided with a part of the equipment while using it.
- **Collision, with Person:** Two or more individuals collided while using the same piece of playground equipment.
- **Design Failure:** These are reports of concerns about the poor design of the equipment, typically in terms of not meeting CPSC guidelines.
- **Entrapment:** A limb or other body part got stuck in the equipment. This includes strangulations involving playground equipment but no other product.
- **Entrapment, Moving Equipment:** A limb or other body part got stuck in a moving part of the equipment and was pinched or crushed.
- **Entrapment, Two Product:** A limb or other body part got stuck in a combination of the playground equipment and another product. This includes strangulations involving jump ropes and leashes tied to playground equipment.
- **Equipment Broke:** The incident involved the playground equipment breaking.
- **Equipment Tipped Over:** The equipment tipped over. This includes cases where the equipment was not in use at the time, and cases where consumers felt the equipment swayed excessively.
- **Fall, Grip Loss:** The individual lost his/her grip on the playground equipment and fell.
- **Fall, Jump:** The individual fell from or on the product, but the fall was intentional in some way. Typically, this involved the individual jumping from the product.
- **Fall, Loss of Balance:** The individual lost his/her balance and fell from or on the product.
- **Fall, Missed Equipment:** The individual reached or jumped for part of the equipment, but missed and subsequently fell.
- **Fall, Moving Equipment:** The individual fell after the playground equipment made an unexpected motion.
- **Fall, Slip:** The individual fell from or on the product, with an indication of a slip or slippery surface.
- **Fall, Trip:** The individual fell from or on the product, with an indication of the individual tripping.
- **Fall, Unspecified:** The individual fell from or on the product, but no cause of the fall was specified.
- **Fire:** The playground equipment caught fire.
- **Foreign Object:** The individual got a foreign object in the eye or ear, typically play sand.
- **Limb Twist, Friction:** A limb was twisted, sprained, or broken due to friction with the playground equipment. Often this is caused by rubber soled shoes on slides.

- **Limb Twist, Unspecified:** A limb was twisted or sprained with no indication of how the injury occurred.
- **Multiple Reported Hazards:** More than one hazard was reported for the equipment. Often this is due to old equipment in disrepair.
- **Other:** Unique or rare hazard patterns not fitting into any of the other categories.
- **Poisoning:** There was a poisoning or concern about poisoning from the playground equipment, typically from silica in play sand or arsenic in pressure treated wood.
- **Sharp Edge or Protrusion:** The individual suffered a laceration from a sharp or protruding part of the equipment.
- **Splinter:** The individual received a splinter from a piece of wood or nylon rope.
- **Thermal Burn:** The individual received a burn injury from physical contact with the equipment or playground surfacing.
- **Unknown:** An injury was reported as associated with playground equipment, but no details were reported as to how the injury occurred.

Appendix B: Methodology

The product codes searched for this memo 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 and the Injury and Potential Injury Database.

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 February 2009, the Death Certificates Database was considered 99% complete for 2005, 95% complete for 2006, 58% complete for 2007, and 17% complete for 2008.

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% 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.³ 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%.

³ Schroeder T, Ault K. *The NEISS Sample (Design and Implementation)*. U.S. Consumer Product Safety Commission. 2001.