



Amusement Ride-Related Injuries and Deaths in the United States: 2002 Update



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Mark S. Levenson, Ph.D.
U.S. Consumer Product Safety Commission
Directorate for Epidemiology
Division of Hazard Analysis
4330 East West Highway
Bethesda, MD 20814

Executive Summary

This report summarizes the most recent data from the U.S. Consumer Product Safety Commission (CPSC) on amusement ride injury and fatality incidents. The report contains hospital emergency room-treated injury estimates for the period from 1997 to 2001 and fatality data for the period from 1987 to July 2002. For comparison purposes, this report considers both fixed-site and mobile amusement rides. However, CPSC has jurisdiction over mobile rides only. As in previous reports, inflatable rides, such as slides and bounces, are considered separately.

Injuries

- In 2001, there were an estimated 8,313 non-occupational amusement ride injuries treated in hospital emergency rooms with a 95% confidence interval of (4,720 – 11,906).
- Fixed-site rides accounted for 6,704 of the injuries and mobile rides accounted for 1,609 of the injuries in 2001.
- The upward trend for fixed-site ride injuries over the period from 1997 to 2001 is marginally statistically significant. When adjusted for attendance, the trend for fixed-site ride injuries is not statistically significant.
- The upward trend for mobile ride injuries over the period from 1997 to 2001 is not statistically significant.
- In 2001, there were an estimated 1,993 non-occupational inflatable ride injuries treated in hospital emergency rooms with a 95% confidence interval of (734 – 3,252).
- The upward trend for inflatable ride injuries over the period from 1997 to 2001 is marginally statistically significant.

Fatalities

- CPSC has reports of 3 amusement ride fatalities in 2001, 1 in 2000, and 6 in 1999. From 1987 to 2000, there were an estimated 4.4 fatalities per year. Fatality reporting for 2000 and 2001 is incomplete at this time.

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Introduction

This report summarizes the most recent data from the U.S. Consumer Product Safety Commission (CPSC) on amusement ride injury and fatality incidents. The report contains injury estimates for the period from 1997 to 2001 and fatality estimates for the period from 1987 to July 2002. In addition, summaries are provided on recent in-depth investigations. This report updates previous CPSC reports [1,2,3,4,5,6] and makes use of past analyses.

Since the last report, several changes have occurred in methodology and the data source of the injury estimates. Recent reports have included injury estimates back to 1993. In 1997, the data source for the injury estimates underwent a periodic update. Presently, there are sufficient years since the update to evaluate trends based solely on the post-update estimates. The report also makes use of recent advances in methodology for evaluating trends in the injury estimates. Finally, as discussed in previous reports, a significant share of the estimated injuries was associated with a single hospital that was part of the data source of the injury estimates. Beginning in 2001, this hospital was no longer a part of the data source. These changes are discussed in more detail later in the report.

The Consumer Product Safety Act Section 3(a)(1) describes an *amusement ride* as

...any mechanical device which carries or conveys passengers along, around, or over a fixed or restricted route within a defined area for the purpose of giving its passengers amusement, which is customarily controlled or directed by an individual who is employed for that purpose and who is not a consumer with respect to that device, and which is not permanently fixed to a site.

This description includes so-called *mobile rides*, rides that are moved from location to location as part of fairs, carnivals, parties, or other events. It excludes so-called *fixed-site rides* found in amusement parks, theme parks, or otherwise fixed locations.

CPSC data sources do not distinguish between the two types of rides without additional analysis. This report includes analyses of fixed-site ride incidents, because they are readily available from the mobile ride analysis and they provide a useful comparison. In past reports, inflatable slides and jumping balloons, such as “moon bounces,” have been excluded or analyzed separately. They are often rented for public and private events. Because of the recent rise in injuries and current interest by CPSC staff, this report will summarize injuries from inflatable rides separately from the fixed-site and mobile rides. The report does not include occupational incidents, such as injuries and fatalities to operators and maintenance personnel.

Injuries

Methodology

Data on non-occupational amusement ride-related injuries were obtained from CPSC's National Electronic Injury Surveillance System (NEISS) [7]. NEISS consists of a stratified probability sample of hospitals with emergency rooms (with 6 or more beds) in the United States and its territories. Because the injury estimates are derived from NEISS, they reflect only those injuries that resulted in an emergency room visit.

The NEISS sample of hospitals was updated in 1997 to reflect changes in the distribution and size of emergency room hospitals in the U.S. since the previous sample update in 1990. Periodic updates are required for the sample of NEISS hospitals to accurately represent the population of hospitals with emergency rooms in the U.S. NEISS hospital coders identify injury incidents associated with amusement rides by using the NEISS product code for amusement rides (1293).

All NEISS records for the calendar years 1997 through 2001 containing the product code for amusement rides were reviewed. Based on information in the narrative comments of the records, coders classified each case into one of six mutually exclusive and exhaustive categories: *not a ride*, *fixed-site*, *mobile*, *unknown-site*, *unknown if ride*, and *inflatable*. Cases involving coin-operated rides or free-play attractions often found at restaurants or shopping centers, alpine and water slide amusements, wave machines, mechanical bulls, and playground equipment are examples of cases coded *not a ride*. Cases involving roller coasters or "whirling" rides are examples of cases coded *fixed-site*, *mobile*, or *unknown-site* rides. If the case narrative stated the name of an amusement park or that the incident occurred at a park, then the case was coded *fixed-site*. If the narrative stated that the incident occurred at a carnival, fair, or festival, then the case was coded *mobile*. If the narrative gave no site information, then the case was coded *unknown-site*. Cases involving inflatable rides, such as slides and "moon bounces," regardless of their mobility were coded as *inflatable*. Cases involving a "merry go round," with no indication of whether it was playground equipment or an amusement ride as defined by the Consumer Product Safety Act, are examples of cases coded *unknown if ride*.

The *not a ride* and *unknown if ride* cases are removed from the analysis. For each year, the total sampling weight of the *unknown-site* cases is allocated to the *fixed-site* and *mobile* cases in proportion to the observed total sampling weights of the two categories of cases. National estimates and associated confidence intervals of the *fixed-site*, *mobile*, and *inflatable* rides are calculated based on the NEISS sampling design.

The statistical significance of trends is determined using a General Linear Model (GLM) that accounts for the variances and covariance of the yearly estimates [7,8]. It is possible to include other covariates in the GLM that may explain the trend. This approach is taken in evaluating the effect of attendance on the fixed-site trend. For each trend tested, the null hypothesis is that the number of injuries has remained the same or decreased, a one-sided hypothesis. The use of this null hypothesis enables the detection of upward trends only. CPSC staff uses the hypotheses here to best detect any increase in injuries.

In 2001, the hospital that accounted for the largest proportion of the national injury estimates in past years left the NEISS system. This change in the NEISS sample is likely to impact the year-to-year comparisons of the injury estimates. Appendix 2 presents a hospital-by-hospital analysis to show the effect of individual hospitals on the NEISS estimates.

Results: Fixed-Site and Mobile Rides

Annual Trends

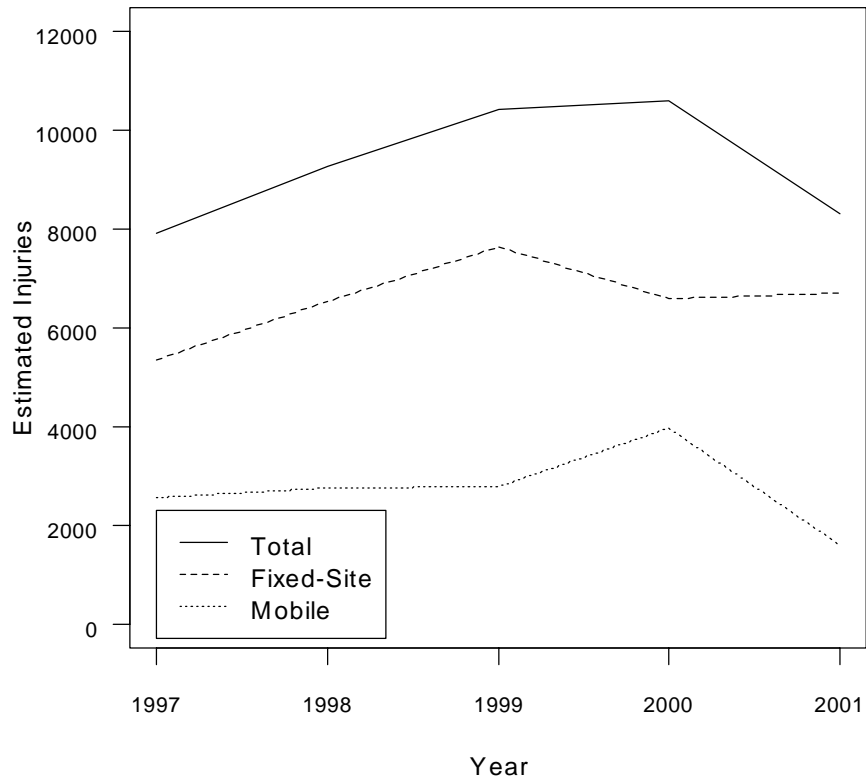
Table 1 and Figure 1 give the annual non-occupational injury estimates for fixed-site and mobile amusement rides for the years 1997 to 2001. In 2001, there were an estimated 8,313 non-occupational amusement ride injuries with a 95% confidence interval of (4,720 – 11,906). Of these injuries, 6,704 are from fixed-site rides and 1,609 are from mobile rides. The estimated total amusement ride injuries in 2001 represents a decrease from the previous year. The decrease resulted from a decrease in the estimated mobile-ride injuries. The upward trends for the years 1997 to 2001 are marginally statistically significant for total ride injuries (p-value 0.055) and for fixed-site ride injuries (p-value 0.075). The upward trend is not statistically significant for mobile ride injuries (p-value 0.124). Appendix 2 contains discussion on the effect of the hospital that accounted for the largest proportion of the national injury estimates leaving the NEISS system.

Table 1: Estimates of Non-Occupational Amusement Ride Injuries, 1997-2001.

Year	Fixed-Site	Mobile	Total	95% Confidence Interval of Total
1997	5,353	2,562	7,915	(2,327 – 13,503)
1998	6,523	2,751	9,274	(4,281 – 14,267)
1999	7,629	2,788	10,417	(3,773 – 17,061)
2000	6,595	3,985	10,580	(4,353 – 16,807)
2001	6,704	1,609	8,313	(4,720 – 11,906)

Source: U.S. Consumer Product Safety Commission, NEISS. The estimates may not sum to the totals due to rounding.

Figure 1: Estimates of Non-Occupational Amusement Ride Injuries, 1997-2001.



Source: U.S. Consumer Product Safety Commission, NEISS.

Table 2 gives estimates of risk for fixed-site rides based on attendance. The risk is defined as the number of injuries per million attendance. The attendance figures come from an industry source [9]. When injuries are adjusted for attendance, the upward trend from 1997 to 2001 is not statistically significant (p-values=0.152). Attendance data on mobile rides were not available.

Table 2: Risk of Non-Occupational Fixed-Site Amusement Ride Injuries, 1997-2001.

Year	Injuries	Attendance (Million)	Injuries Per Million Attendance
1997	5,353	300	17.8
1998	6,523	300	21.7
1999	7,629	309	24.7
2000	6,595	317	20.8
2001	6,704	319	21.0

Source: Injury estimates from U.S. Consumer Product Safety Commission, NEISS. Attendance estimates are for the U.S. amusement and theme park industry from the International Association of Amusement Parks and Attractions.

Seasonal Trends

Table 3 gives the non-occupational injury estimates for fixed-site and mobile amusement rides by calendar month for the years 1997 to 2001. There is a strong seasonal trend, with the greatest number of injuries from late spring to early fall for both fixed-site and mobile rides.

Table 3: Estimates of Non-Occupational Amusement Ride Injuries by Month, 1997-2001.

Month	Fixed-Site	Mobile	Total	% Total
January	36	54	90	0%
February	379	321	700	2%
March	936	710	1,645	4%
April	1,870	1,419	3,289	7%
May	3,477	1,993	5,470	12%
June	6,266	810	7,076	15%
July	6,638	1,940	8,579	18%
August	7,337	2,634	9,972	21%
September	3,542	2,573	6,114	13%
October	1,379	1,110	2,489	5%
November	678	132	810	2%
December	265	0	265	1%
Total	32,803	13,696	46,499	100%

Source: U.S. Consumer Product Safety Commission, NEISS. The estimates may not sum to the totals due to rounding.

Age and Sex

Table 4 gives the non-occupational injury estimates for fixed-site and mobile amusement rides by age group for the years 1997 to 2001. Injuries for both fixed-site and mobile rides occur over a range of ages with those between 5 and 44 accounting for the bulk of the injuries.

Table 4: Estimates of Non-Occupational Amusement Ride Injuries by Age, 1997-2001.

Age	Fixed-Site	Mobile	Total	% Total
0 to 4	1,534	974	2,509	5%
5 to 14	7,918	5,902	13,820	30%
15 to 24	7,573	3,049	10,622	23%
25 to 44	12,093	2,857	14,950	32%
45 to 64	3,023	914	3,937	8%
65 and Up	661	0	661	1%
Total	32,803	13,696	46,499	100%

Source: U.S. Consumer Product Safety Commission, NEISS. The estimates may not sum to the totals due to rounding.

Table 5 gives the non-occupational injury estimates for fixed-site and mobile amusement rides by sex for the years 1997 to 2001. Females accounted for a greater number of injuries for both fixed-site and mobile rides.

Table 5: Estimates of Non-Occupational Amusement Ride Injuries by Sex, 1997-2001.

Sex	Fixed-Site	Mobile	Total	% Total
Female	19,621	8,674	28,295	61%
Male	13,182	5,022	18,203	39%
Total	32,803	13,696	46,499	100%

Source: U.S. Consumer Product Safety Commission, NEISS. The estimates may not sum to the totals due to rounding.

Body Part, Diagnosis, and Disposition

Table 6 gives the non-occupational injury estimates for fixed-site and mobile amusement rides by the body part injured for 1997 to 2001. Injuries occur throughout the body with the largest number of injuries in the shoulder, arm, and hand regions for both fixed-site and mobile rides.

Table 6: Estimates of Non-Occupational Amusement Ride Injuries by Injured Body Part, 1997-2001.

Body Part	Fixed-Site	Mobile	Total	% Total
Eye	851	541	1,391	3%
Head/Face/Ear	6,334	2,931	9,265	20%
Leg/Foot	4,659	2,793	7,453	16%
Shoulder/Arm/Hand	13,821	4,702	18,522	40%
Trunk/Neck/Pubic	6,183	1,869	8,052	17%
> 25% Body	658	830	1,489	3%
Not Recorded	297	30	327	1%
Total	32,803	13,696	46,499	100%

Source: U.S. Consumer Product Safety Commission, NEISS. The estimates may not sum to the totals due to rounding.

Table 7 gives the non-occupational injury estimates for fixed-site and mobile amusement rides by diagnosis for 1997 to 2001. Strains, sprains, contusions, and abrasions are the most frequent diagnoses for both fixed-site and mobile rides.

Table 7: Estimates of Non-Occupational Amusement Ride Injuries by Diagnosis, 1997-2001.

Diagnosis	Fixed-Site	Mobile	Total	% Total
Concussion	834	363	1,198	3%
Contusion/Abrasion	7,978	3,951	11,929	26%
Dental Injury	59	66	124	0%
Foreign Body	441	504	945	2%
Fracture	2,200	547	2,747	6%
Hematoma	7	254	261	1%
Internal Organ	319	202	521	1%
Laceration	4,304	1,231	5,535	12%
Strain/Sprain	11,602	4,713	16,315	35%
Other	4,222	1,841	6,063	13%
Not Specified	837	23	859	2%
Total	32,803	13,696	46,499	100%

Source: U.S. Consumer Product Safety Commission, NEISS. The estimates may not sum to the totals due to rounding. The category "Other" includes avulsion, thermal burn, crushing, dermatitis/conjunctivitis, electric shock, hemorrhage, and puncture.

Table 8 gives the non-occupational injury estimates for fixed-site and mobile amusement rides by disposition for 1997 to 2001. For both fixed-site and mobile rides, the vast majority of incidents resulted in the patient being treated and released.

Table 8: Estimates of Non-Occupational, Amusement Ride Injuries by Disposition 1997-2001.

Disposition	Fixed-Site	Mobile	Total	% Total
Treated/Released	32,143	13,639	45,782	98%
Hospitalized	569	56	625	1%
Treated/Transferred	91	0	91	0%
Total	32,803	13,696	46,499	100%

Source: U.S. Consumer Product Safety Commission, NEISS. The estimates may not sum to the totals due to rounding.

Results: Inflatable Rides

Annual Trends

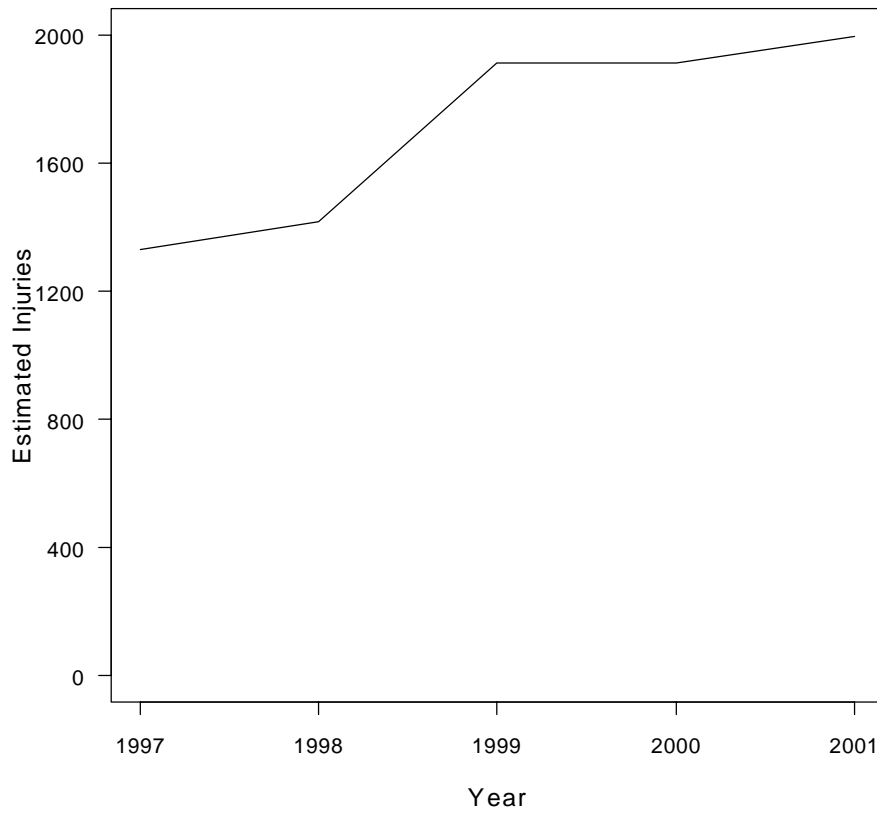
Table 9 and Figure 2 give the annual non-occupational injury estimates for inflatable rides for the years 1997 to 2001. In 2001, there were an estimated 1,993 non-occupational inflatable ride injuries with a 95% confidence interval of (734 – 3,252). The upward trend for the years 1997 to 2001 is marginally statistically significant (p-value 0.093).

Table 9: Estimates of Non-Occupational Inflatable Ride Injuries, 1997-2001.

Year	Total	95% Confidence Interval of Total
1997	1,331	(326 – 2,336)
1998	1,418	(484 – 2,352)
1999	1,912	(915 – 2,909)
2000	1,912	(714 – 3,110)
2001	1,993	(734 – 3,252)

Source: U.S. Consumer Product Safety Commission, NEISS.

Figure 2: Estimates of Non-Occupational Inflatable Ride Injuries 1997-2001.



Source: U.S. Consumer Product Safety Commission, NEISS.

Seasonal Trends

Table 10 gives the non-occupational injury estimates for inflatable rides by calendar month for the years 1997 to 2001. These injuries are spread more evenly throughout the calendar year than the injuries for the other amusement rides.

Table 10: Estimates of Non-Occupational, Inflatable Ride Injuries by Month 1997-2001.

Month	Total	% Total
January	369	4
February	37	0
March	1,177	14
April	771	9
May	826	10
June	987	12
July	865	10
August	1,290	15
September	793	9
October	656	8
November	335	4
December	460	5
Total	8,566	100

Source: U.S. Consumer Product Safety Commission, NEISS. The estimates may not sum to the totals due to rounding.

Age and Sex

Table 11 gives the non-occupational injury estimates for inflatable rides by age group for the years 1997 to 2001. Most of the injuries are for individuals younger than 15 years old.

Table 11: Estimates of Non-Occupational, Inflatable Ride Injuries by Age 1997-2001.

Age	Total	% Total
0 to 4	2,087	24
5 to 14	4,994	58
15 to 24	1,237	14
25 to 44	229	3
45 to 64	18	0
65 and Up	0	0
Total	8,566	100

Source: U.S. Consumer Product Safety Commission, NEISS. The estimates may not sum to the totals due to rounding.

Table 12 gives the non-occupational injury estimates for inflatable rides by sex for the years 1997 to 2001. The numbers of injuries for females and males are very similar.

Table 12: Estimates of Non-Occupational Inflatable Ride Injuries by Sex, 1997-2001.

Sex	Total	% Total
Female	4,181	49
Male	4,384	51
Total	8,566	100

Source: U.S. Consumer Product Safety Commission, NEISS. The estimates may not sum to the totals due to rounding.

Body Part, Diagnosis, and Disposition

Table 13 gives the non-occupational injury estimates for inflatable rides by the body part injured for 1997 to 2001. Injuries occur throughout the body.

Table 13: Estimates of Non-Occupational Inflatable Ride Injuries by Body Part, 1997-2001.

Body Part	Total	% Total
Eye	6	0
Head/Face/Ear	1,752	20
Leg/Foot	2,496	29
Shoulder/Arm/Hand	2,925	34
Trunk/Neck/Pubic	1,363	16
> 25% Body	24	0
Total	8,566	100

Source: U.S. Consumer Product Safety Commission, NEISS. The estimates may not sum to the totals due to rounding.

Table 14 gives the non-occupational injury estimates for inflatable rides by diagnosis for 1997 to 2001. In addition to the strains, sprains, contusions, and abrasions found in other amusement rides, fractures are frequent for inflatable rides.

Table 14: Estimates of Non-Occupational Inflatable Ride Injuries by Diagnosis, 1997-2001.

Diagnosis	Total	% Total
Concussion	47	1
Contusion/Abrasion	2,024	24
Dental Injury	29	0
Fracture	2,005	23
Hematoma	90	1
Internal Organ	585	7
Laceration	511	6
Strain/Sprain	2,224	26
Other	1,045	12
Not Specified	6	0
Total	8,566	100

Source: U.S. Consumer Product Safety Commission, NEISS. The estimates may not sum to the totals due to rounding.

Table 15 gives the non-occupational injury estimates for inflatable rides by disposition for 1997 to 2001. The vast majority of incidents resulted in the patient being treated and released.

Table 15: Estimates of Non-Occupational Inflatable Ride Injuries by Disposition 1997-2001.

Disposition	Total	% Total
Treated/Released	8,153	95
Held/Observation	17	0
Hospitalized	301	4
Not Recorded	94	1
Total	8,566	100

Source: U.S. Consumer Product Safety Commission, NEISS. The estimates may not sum to the totals due to rounding.

Fatalities

Methodology

CPSC maintains several casualty databases that contain incidents of amusement ride fatalities. These include the NEISS, the Death Certificate file (DTHS), and the Injury and Potential Injury Incident file (IPII) databases. NEISS has been described in the injury methodology section. The DTHS file contains coded death certificates purchased from states based on external cause codes that may indicate product involvement. The IPII file is made up of several sources, including newspaper articles, consumer hotline and internet entries, and medical examiner contributions. All records from these files for the period from January 1987 to July 2002 indicating a fatality and containing the product code for amusement rides were reviewed. The review ascertained which records were associated with the same fatality and coded incidents into fixed-site, mobile, and unknown-site ride incidents. From these databases, the number of documented fatalities was determined.

Because of the limits in obtaining evidence of fatalities, the number of documented fatalities may be an underestimate of the actual number of fatalities. Assuming that the databases represent statistically independent sources, a method known as *capture-recapture* was used to produce an estimate of the total number of fatalities [10]. Because of the delay in obtaining death certificates, the most recent years were excluded from the capture-recapture analysis. Thus, although the documented number of fatalities covers the period from 1987 to July 2002, the estimated number from the capture-recapture analysis covers only the period from 1987 to 2000.

Results

In the period from 1987 to 2000, there were an estimated 62 non-occupational deaths from amusement rides. This represents an average of 4.4 fatalities per year.

Table 16 gives the number of documented fatalities for fixed-site, mobile, and unknown-site rides (rides in which the mobility of the ride cannot be determined) for the period from 1987 to July 2002. The reporting for years 2000 through 2002 was incomplete at the time this report was prepared. There were 55 documented fatalities over this period: 38 from fixed-site rides, 10 from mobile rides, and 7 from unknown-site rides.

Table 16: Documented Non-Occupational Amusement Ride Fatalities, 1987-2002.

Year	Fixed-Site	Mobile	Unknown-Site	Total
1987	4	0	0	4
1988	3	1	3	7
1989	3	0	0	3
1990	0	0	0	0
1991	3	1	0	4
1992	0	2	0	2
1993	1	1	2	4
1994	2	0	0	2
1995	3	1	0	4
1996	2	1	0	3
1997	3	0	1	4
1998	4	2	1	7
1999	6	0	0	6
2000*	1	0	0	1
2001*	2	1	0	3
2002*	1	0	0	1
Total	38	10	7	55

Source: U.S. Consumer Product Safety Commission, DTHS and IPII.

*Reporting for these years is incomplete at this time.

Table 17 gives the number of documented fatalities for fixed-site, mobile, and unknown-site rides by age group for the years 1987 to 2002. There are fatalities in all age groups.

Table 17: Documented Non-Occupational Amusement Ride Fatalities by Age Group, 1987-2002.

Age	Fixed-Site	Mobile	Unknown-Site	Total
0 to 4	3	3	2	8
5 to 14	13	3	2	18
15 to 24	7	3	1	11
25 to 44	10	0	1	11
45 to 64	3	1	1	5
65 and Up	2	0	0	2
Total	38	10	7	55

Source: U.S. Consumer Product Safety Commission, DTHS and IPII.

Table 18 gives the number of documented fatalities for fixed-site, mobile, and unknown-site rides by sex for the years 1987 to 2002. The numbers of fatalities of females and males are similar.

Table 18: Documented Non-Occupational Amusement Ride Fatalities by Sex, 1987-2002.

Sex	Fixed-Site	Mobile	Unknown-Site	Total
Female	18	5	5	28
Male	20	5	2	27
Total	38	10	7	55

Source: U.S. Consumer Product Safety Commission, DTHS and IPII.

Table 19 gives the number of documented fatalities for fixed-site, mobile, and unknown-site rides by ride type for the years 1987 to 2002. Roller coasters account for the largest number of fatalities.

Table 19: Documented Non-Occupational Amusement Ride Fatalities by Ride Type, 1987-2002.

Ride Type	Fixed-Site	Mobile	Unknown-Site	Total
Roller Coaster	15	1	2	18
Water Ride	7	0	0	7
Whirling	4	4	3	11
Other	6	2	0	8
Unknown	6	3	2	11
Total	38	10	7	55

Source: U.S. Consumer Product Safety Commission, DTHS and IPII.

Table 20 gives the number of documented fatalities for fixed-site, mobile, and unknown-site rides by state for the years 1987 to 2002.

Table 20: Documented Non-Occupational Amusement Ride Fatalities by State, 1987-2002.

State	Fixed-Site	Mobile	Unknown-Site	Total
CA	6	1	0	6
CO	1	0	0	1
CT	1	0	0	1
FL	2	2	2	6
GA	1	0	0	1
IL	1	1	0	2
IN	1	0	0	1
MA	1	0	0	1
MD	0	0	1	1
MN	2	0	0	2
MO	1	0	0	1
NE	1	0	0	1
NJ	5	0	0	5
NM	0	1	0	1
NV	1	0	1	2
NY	4	1	0	5
OH	2	0	1	3
OK	0	0	1	1
PA	1	1	0	2
PR	0	1	0	1
SC	2	0	0	2
TN	0	0	1	1
TX	2	2	0	4
UT	2	0	0	2
VA	1	0	0	1
Total	38	10	7	55

Source: U.S. Consumer Product Safety Commission, DTHS and IPII.

In-Depth Investigations

From July 2001 to July 2002, CPSC conducted 18 in-depth investigations of amusement ride incidents. These investigations are not a random sample of incidents, but reflect agency interests. Since CPSC only has jurisdiction over mobile rides, most of the investigations are of mobile rides. In addition, CPSC is presently following up on inflatable-ride incidents. Appendix 1 provides short narratives of the 18 investigations. An analysis of past investigations is available in last year's report [6].

Appendix 1: Recent In-Depth Investigations

Task Number	State	Mobility	Narrative
010122CNE6084	FL	Mobile	A thirty-nine-year-old male suffered back and knee injuries when the riding tub he was seated in on a non-fixed amusement ride tipped over. He fell approximately twelve feet to the asphalt surface below. The victim who is undergoing continued treatment returned to work after missing one day.
010515CNE6365	NC	Mobile	A 2-year-old male suffered injuries while riding a merry-go-round at a traveling carnival. He was riding a rotary kiddie-ride when he got out of his seat and the succeeding car unit ran him over. The child was treated for cuts and abrasions and released from the hospital.
010731CCN0796	MI	Fixed	Thirty-one individuals suffered minor injuries when the fixed amusement ride they were on collapsed and crashed to the ground. It appears that there was a failure of the center hub connection to the bearing, although officials reported this incident is still under investigation. The individuals were transported to local hospitals where they were treated and released for minor abrasions and contusions.
010731CCN0797	IL	Mobile	A tilt-a-whirl carnival ride derailed because an undersized cotter key was used. Three children were in the tub at the time of the incident. They were badly shaken up but not injured.
010817CNE6656	NJ	Mobile	Eleven children, ranging in age from 6 years to 15 years, reported minor injuries when the steel ears on one of the sweep arms to the carnival ride securing four ride cars to the drive center sheared off. The four cars stopped on the platform and were struck by the trailing sweep of four cars. The steel ears sheared between weld points. The welds remained intact. Nine of the eleven children were taken to area hospitals and treated for bruises, aches and pains and then released.
010907CCC3420	ID	Mobile	A 14-year-old girl was riding an amusement park ride. After the ride, she was unconscious. It was later determined that she had a heart condition, which would cause her heart to beat in an irregular fashion when she became excited.
010917HNE6705	PA	Mobile	A 7-year-old victim was riding on a roller coaster at the York County Fair. The ride stopped suddenly, throwing the victim forward causing him to strike his abdominal region on the front of the car. The victim died in the operating room from a lacerated vena cava due to blunt force trauma.

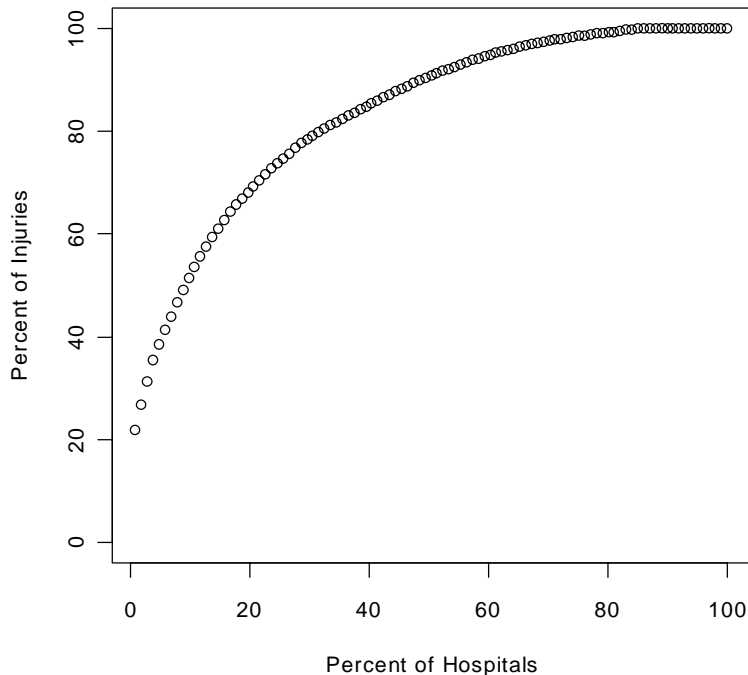
Task Number	State	Mobility	Narrative
011001HEP8213	OH	Fixed	The victim is an 8-month-old female who was injured at a zoo while on a carousel ride. She let go of the pole and fell to the wood floor, fracturing her skull. She was taken to the hospital, admitted, and treated for her injury. She was released the following day.
011029CCC1091	AL	Mobile	According to officials, a 15-year-old female sustained a broken neck while riding an amusement ride at a mobile fair. The victim was hospitalized and required surgery to remove one vertebra, but has since recuperated. No other injury reported.
020225CNE7196	FL	Mobile	A 12-year-old female got her head lodged next to or under a non-fixed, gyro-type mechanical, non-electric ride she was on at a festival. The incident occurred when she began slipping from her seat, although strapped in. She reportedly ignored instructions to grip the safety bar while the ride was in motion. The ride was stopped almost immediately by the attendant and no injury was sustained.
020326CCC3157	AZ	Mobile, Inflatable	Five people were on an inflatable amusement slide at a picnic in a city park. A gust of wind lifted the inflatable slide up into the air and the people on the slide were thrown off. Four of the people were treated at local hospitals.
020410CBB2398	KY	Mobile, Inflatable	One adult and four children were flipped off a 22-foot inflatable slide when a strong gust of wind hit the slide and subsequently ripped four 36-inch stakes from the ground. The slide then became airborne for approximately 310 feet. Three of the children and the one adult sustained injuries ranging from a broken wrist, contusions, a concussion, and a slight shoulder fracture.
020410CCC1455	NY	Mobile, Inflatable	An inflatable carnival slide tilted to one side during operation with between 5 and 10 children inside its enclosed climb up section. The children walked unassisted from the slide and were taken to a nearby hospital where they were treated with ice packs for contusion, swelling, or unspecified injuries. Shallow staking in an unstable soil base, coupled with gusty wind conditions, is believed to have contributed to the incident.
020416CCN0406	MO	Mobile	A 30-year-old female was riding an amusement ride with a friend when on the third or fourth rotation of the ride she was thrown to the ground. The ride was one of several rides that were in operation as part of a mobile amusement carnival show. The consumer was transported to a local hospital where she was admitted with multiple contusions. It is believed that a lap bar in the car/tub may not have been present at the time of the incident.

Task Number	State	Mobility	Narrative
020515CAA2459	NE	Mobile, Inflatable	A 32-foot-tall inflatable slide was rented for a post prom party. According to a witness, there were approximately 10 kids on the slide when it began to waver at the top and then tipped over. One 16-year-old female was injured from hitting her head on the floor when she fell from a height of about 5-10 feet. The mother states that she is now doing fine. The president of the company that rented out the slide states that there were too many kids on the slide and they were ignoring the warning sign which states, a maximum of 2 people on the slide or 250 pounds.
020611CCC2511	MO	Mobile, Inflatable	Five children were on an inflatable slide at a school carnival, when the inflatable slide began to deflate and collapse. At least two of the five children were injured as they fell. It should be noted that the owner of the ride indicated that several children were causing trouble in a booth that was next to the inflatable and they were thought to have pulled the plugs on the blowers that keep the slide inflated.
020613CAA3234	OR	Mobile	Two adults in their 20's were strapped into the seat of an amusement ride when one of two cables, each holding a bungee cord, snapped as the operators were moving the ride into position and getting ready to release the seat from a 15-foot arm. The seat was still attached to the arm when the cable broke. One rider received minor back bruises and sought medical attention. Otherwise, no one was injured.
020613HNE7361	NJ	Mobile	Seventeen people were on a carnival ride, when it suddenly came to a stop, leaving the passengers stranded upside down for 1 1/2 hrs. The victims suffered minor injuries. The malfunction occurred when several loose bolts fell into the mechanism.

Appendix 2: Hospital Analysis of NEISS Estimates

As discussed in previous reports [6,7], there has been a single NEISS hospital that has accounted for a significant share of the national estimate of amusement ride injuries. That hospital entered the NEISS system in the beginning of 1991 and left the system at the end of 2000. Figure 3 shows the percentage of the national estimate of amusement ride injuries from 1997 to 2001 accounted for by the percentage of NEISS hospitals. For example, the single largest hospital share accounts for around 20 percent of the injuries during this period. Except for this hospital, there does not appear to be an anomalous distribution of estimated injuries across the NEISS hospitals for amusement rides.

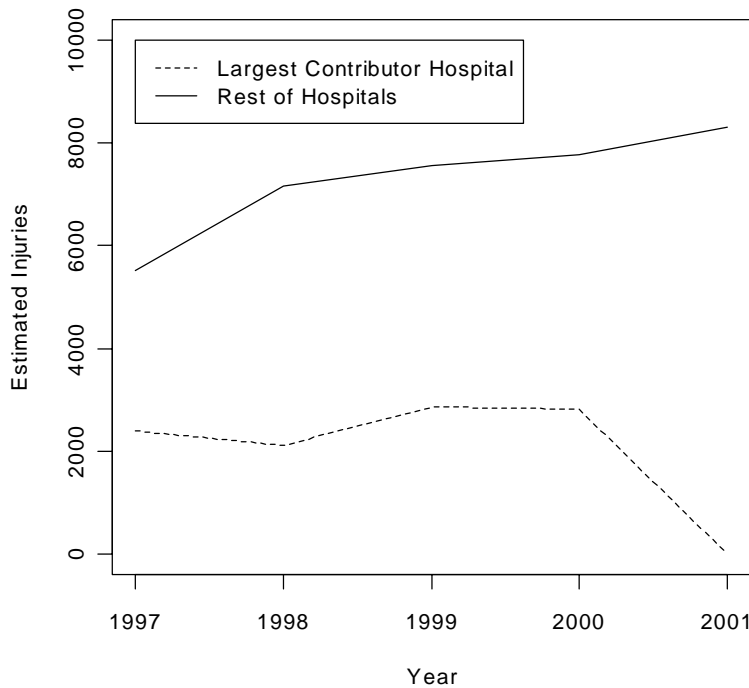
Figure 3: Percent of Total Amusement Ride Injuries by Percent of Hospitals for 1997 to 2001.



Source: U.S. Consumer Product Safety Commission, NEISS.

Figure 4 plots the portion of the national injury estimates from the hospital that contributes the largest share to the national estimate and the portion of the national injury estimate from all other NEISS hospitals. In the year 2001, the absence of the largest contributor hospital accounts for a drop of over 2,000 injuries. It is noteworthy that the incidents for this hospital are predominantly associated with fixed-site rides. However, the estimated fixed-site injuries did not decrease in 2001. For both the largest contributor and for all other hospitals there appears to be an upward trend in the injuries for the period.

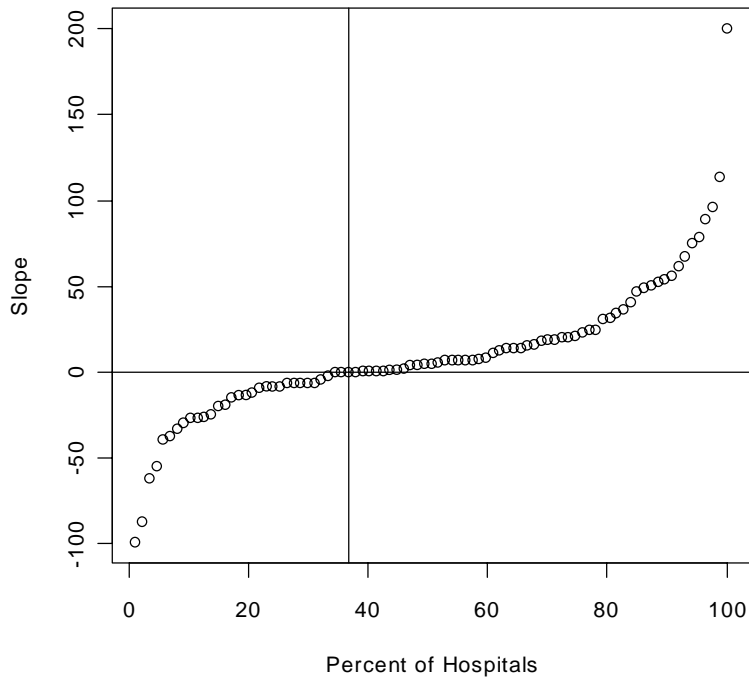
Figure 4: Trends in Total Amusement Ride Injuries for the Largest Contributor and Rest of Hospitals, 1997 to 2001.



Source: U.S. Consumer Product Safety Commission, NEISS.

Figure 5 displays the trend of each NEISS hospital for the period from 1997 to 2000. For each hospital, the trend is represented by the linear slope coefficient calculated from the portion of the national injury estimates accounted for by the individual hospital. Note that because of the abrupt decline for the largest contributor hospital in the year 2001, the analysis includes only up to the year 2000. The slopes are sorted from the most negative to the most positive. More than 60% of the hospitals have a positive slope for the period. The average NEISS hospital accounts for an additional 9.0 injuries/year in the national estimate. Summing all the hospitals gives an estimate of an additional 914 injuries/year (95% CI= (154 – 1,673)) on the national level. For comparison, the GLM approach described in the injury methodology section gives a national slope coefficient of an additional 920 injuries/year (95% CI= (136 – 1,704)).

Figure 5: Trends in Total Amusement Ride Injuries by NEISS Hospitals, 1997 to 2000.



Source: U.S. Consumer Product Safety Commission, NEISS.

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