



## 2003 Fixed-Site Amusement Ride Injury Survey

The International Association of Amusement Parks and Attractions (IAAPA) sponsors an annual survey of establishments in its industry to estimate the number of injuries to patrons associated with fixed-site amusement rides in the U.S.

Based on the survey responses, it is estimated that there were 2,448 injuries associated with fixed-site amusement rides in the U.S. in 2003, or 6.9 injuries per million visitors. This is consistent with the estimated annual average for 2001-2002 of 2,486 injuries and a rate of 8.2 per million visitors.

### Summary of Estimated Fixed-Site Amusement Ride-Related Injuries, U.S., 2003

Characteristic	Estimated Number of Injuries	Percent	Injuries per Million Visitors
Total	2,448	100.0%	6.9
Amusement/Theme Parks	2,205	90.1	6.9
Tourist Attractions	36	1.5	0.6
Family Entertainment Centers	207	8.5	2.3
Total	2,448	100.0%	6.9
Children's Rides	349	14.2	1.1
Family and Adult Rides	1,571	64.2	3.7
Roller Coasters	529	21.6	2.1
Total	2,448	100.0%	6.9
Serious Injuries	162	6.6	0.3
Other Reportable Injuries	2,286	93.4	6.6

Source: National Safety Council estimates based on 2003 fixed-site amusement ride injury survey.

Note: Total may not equal sum of parts due to rounding.

**Method.** For the 2003 reference year, IAAPA engaged the National Safety Council and Heiden Associates to conduct the survey. Heiden Associates developed the master list of establishments. The Council developed the reporting forms, conducted the mailings, and analyzed the data.

While prior surveys were limited to current IAAPA members that had previously indicated the presence of rides, the master list of establishments for 2003 was expanded to include non-member facilities and more facilities outside of the main categories of interest – amusement/theme parks, family entertainment centers, and tourist attractions. In addition, a substantial amount of research effort was devoted to ensure that the presence or absence of fixed-site rides in specific facilities was reported accurately. This expanded and improved profile of the universe of potentially relevant amusement facilities and attractions was used for the survey mailings.

Three mailing cycles were conducted. The first to IAAPA members only, the second to others on the master list, and the third to all establishments that had not replied to the first two mailings. Each cycle consisted of a prenotification letter, a package of reporting information mailed one week later, and a follow-up postcard mailed one week after the reporting package. After the third mailing cycle, a sample of several hundred nonrespondents was contacted by telephone to obtain data or determine reasons for not responding. All survey materials stressed the importance of participation and the confidentiality of responses.

**Results.** Overall, 2,004 establishments were included on the survey master list, of which 1,483 were in the categories of interest (the remainder were included to verify presence or absence of rides). Of these, 222 provided usable data; 94 reported that they had no eligible rides; 80 were returned by the USPS as undeliverable; and 1,608 did not respond.

While only 15% of establishments in the categories of interest responded, 44 of the 48 U.S. parks in the “Top 50” reported and the 222 respondents represented about half of estimated total annual attendance and more than 60% of estimated total rides taken at all amusement facilities and attractions, making it likely that the respondents are representative of the industry.

More than 90% of the injuries occurred at amusement or theme parks. These parks had, on average, 29 rides each and about 1.7 million visitors annually per park. Based on limited information, tourist attractions had an average of 2 rides per facility and 0.2 million annual visitors. Family entertainment centers averaged 6 rides per center and 0.2 million annual visitors.

Family and adult rides accounted for almost two thirds of the injuries. There was an average of 12 family and adult rides in each facility with such rides compared to 7 for children’s rides and 4 for roller coasters.

About 93% of the injuries were “other reportable incidents” – incidents resulting in an injury that required medical treatment other than first aid. The remaining 7% of the injuries were “serious” – incidents resulting in fatality or immediate admission and hospitalization in excess of 24 hours for purposes other than medical observation.<sup>1</sup>

**Discussion.** The 2003 estimates presented here are consistent with the estimated annual average for 2001-2002, which was 2,486 injuries and a rate of 8.2 per million visitors.<sup>2</sup> The 2003 estimated injuries (2,448) and injury rate (6.9) are somewhat lower than for 2001-2002. The improvements in the master list of establishments and the more intensive survey efforts mean that the 2003 estimates are more likely to be representative of the industry.

National statistics on amusement ride injuries are also compiled by the U.S. Consumer Product Safety Commission through its National Electronic Injury Surveillance System (NEISS).<sup>3</sup> The NEISS estimates the number of injuries treated in emergency departments (EDs) through a statistical sample of hospitals. The NEISS differs from the Council’s survey of amusement ride injuries in several important ways, a few of which are mentioned here. The event being counted is different – emergency department visits versus “serious” and “other reportable” incidents. The reporting establishment is different – hospital EDs versus amusement establishments. The NEISS estimate is very sensitive to the geographical relationship between its sample hospitals and fixed-site amusement parks. The NEISS estimate may change depending on whether there are amusement parks within the areas served by hospitals entering or leaving the sample.

Given the differences in the systems, the NEISS estimate of fixed-site amusement ride injuries treated in hospital emergency departments in 2003 was 3,900 with a 95% confidence interval of 2,200 to 5,600. The Council’s estimate of 2,448 serious and other reportable injuries is lower than the NEISS estimate but falls within the confidence interval.

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<sup>1</sup> While fatalities were included in the “serious” definition, they were not identified separately on the reporting forms. Fatalities are such rare events that they cannot be estimated accurately from a sample survey; they must be enumerated by other means.

<sup>2</sup> Heiden, E.J., & McGonegal, S. (2003). 2001-2002 fixed-site amusement ride injury survey analysis. *Injury Insights*, June/July 2003, 1-2,7.

<sup>3</sup> Levenson, M.S. (2004). *Amusement ride-related injuries and deaths in the United States: 2004 update*. Bethesda, MD: US Consumer Product Safety Commission. (<http://www.cpsc.gov/LIBRARY/Amus2004.pdf> accessed 11/10/04.)