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Sports-Related Emergency Department Visits and Hospital Inpatient Stays, 2013

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Introduction

With most Americans engaging in some type of sports or physical fitness activity each year,[1] it is important to understand the types of injuries that are most commonly seen in the hospital and emergency department (ED) and which sports account for those injuries. Prevention of sports-related injuries is part of the current research agenda of the Centers for Disease Control and Prevention.[2]

Sports and recreation-related injuries are a common type of injury seen in hospital EDs.[3] Sports-related ED visits are most common among older children and young adults and among males.[4] One recent study reported that, among children aged 5–18 years, the number of sports-related injuries seen in the ED across 21 selected sports increased annually between 2001 and 2013.[5] Of the four sports that accounted for three-fourths of these sports-related injuries, football and soccer showed a significant increase in injuries from 2001 to 2013 whereas basketball and baseball showed a significant decrease in injuries.[6]

Some sports-related injuries are severe enough to require hospitalization.[7] Certain types of sports-related injuries, such as concussions and traumatic brain injuries (TBIs), have received increasing national attention. Between 2001 and 2009, there was

Highlights

- The most common sports-related reasons for hospital use were bicycling, and walking, marching, and hiking. In 2013, bicycling accounted for 383,790 ED visits and 26,530 hospital stays. Walking, marching, and hiking resulted in 340,290 ED visits and 30,650 hospital stays.
- Other top-ranked reasons for sport-related hospital use were basketball, football, school recess and summer camp, running, roller skating and skateboarding, soccer (ED only), baseball (ED only), downhill skiing and snowboarding (inpatient only), and horseback riding (inpatient only).
- Among children, the most common sports-related reasons for hospital stays and ED visits included American tackle football (boys only), bicycle riding, and school recess and summer camp activities.
- Bicycle riding was the most common sports-related reason for hospital stays and ED visits among males aged 18–64 years and females aged 18–44 years (inpatient only). Walking, marching, and hiking was the most common sports-related reason among males aged 65+ years and females aged 18–44 years (ED only) and 45+ years.
- Sport-related hospital stays were primarily for fractures (59 percent of all sports-related stays) and intracranial injury (11 percent). Sports-related ED visits were for sprains (24 percent of all sports-related ED visits), fractures (21 percent), superficial injuries (18 percent), and open wounds (12 percent).

[1] Physical Activity Council. 2016 Participation Report: The Physical Activity Council's Annual Study Tracking Sports, Fitness, and Recreation Participation in the US. http://www.physicalactivitycouncil.com/PDFs/current.pdf. Accessed March 4, 2016.
[2] Centers for Disease Control and Prevention. CDC Injury Center Research Priorities. http://www.cdc.gov/injury/pdfs/researchpriorities/cdc-injury-research-priorities.pdf. Accessed March 11, 2016.
[3] Centers for Disease Control and Prevention. Nonfatal sports- and recreation-related injuries treated in emergency departments—United States, July 2000–June 2001. MMWR Weekly. 2002;51(33):736–40.
[4] Ibid.
[5] Bayt DR, Bell TM. Trends in paediatric sports-related injuries presenting to US emergency departments, 2001–2013. Injury Prevention. 23 December 2015. Epub ahead of print. doi:10.1136/injuryprev-2015-041757
[6] Ibid.
[7] Wier L, Miller A, Steiner C. Sports injuries in children requiring hospital emergency care, 2006. HCUP Statistical Brief #75. June 2009. Agency for Healthcare Research and Quality, Rockville, MD. https://www.hcup-us.ahrq.gov/reports/statbriefs/sb75.pdf. Accessed March 9, 2016.

an estimated 62 percent increase in sports-related TBI visits to the ED among children aged 19 years and under.[8]

This Healthcare Cost and Utilization Project (HCUP) Statistical Brief presents data on the most common sports activities associated with two types of hospital use in 2013: inpatient stays and ED visits that were discharged. We examine the most common sports-related ED and hospital inpatient use by patient sex and age. Finally, we present the types of injuries most frequently associated with sports-related ED visits and inpatient stays.

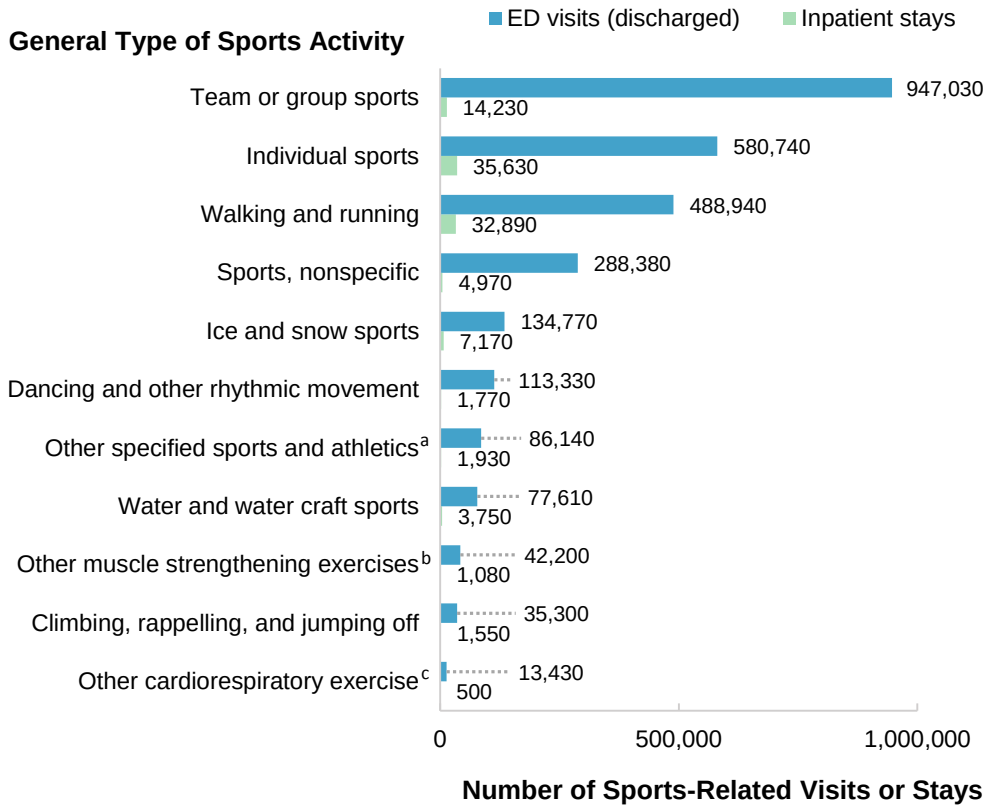
This Statistical Brief is based upon external cause of injury diagnosis codes ("E codes") from the International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) coding system used for hospital inpatient and ED discharge records. E codes provide supplemental information about the nature of the hospital stay or ED visit, but they are not mandatory for reporting in all instances.[9] Consequently, the counts in this Statistical Brief are likely lower than the actual volume of sports-related ED visits and inpatient stays. Analysis suggests that E codes are present for over 90 percent of HCUP inpatient and ED visit records with an injury diagnosis, although E codes for sports injuries in particular were not examined.[10] Nonetheless, we do not expect that any undercounting of sports E codes generally would affect the patterns reported here for the most common types of sports and injuries.

Findings

Frequency of sports-related emergency department and hospital inpatient use, 2013
Figure 1 presents sports-related ED and hospital inpatient use categorized by the general type of sports activity in 2013. Activities are sorted by the total number of sports-related ED visits (discharged) and inpatient stays combined. Appendix A lists the specific sports that constitute each general type of sports activity category; details on specific sports are described later in this report.

[8] Centers for Disease Control and Prevention. Nonfatal traumatic brain injuries related to sports and recreation activities among persons aged ≤ 19 years—United States 2001–2009. 2011;60(39):1337–42.
[9] Practice Management Information Corporation. International Classification of Diseases, 9th Revision, Clinical Modification, 6th ed. (ICD-9-CM), 2013. Hospital Edition, vols. 1, 2, and 3. Los Angeles, CA: Practice Management Information Corporation; 2012.
[10] Barrett M, Steiner C. Healthcare Cost and Utilization Project (HCUP) External Cause of Injury Code (E Code) Evaluation Report (Updated with 2012 Data). 2015. HCUP Methods Series Report #2015-03 ONLINE. March 3, 2015. Agency for Healthcare Research and Quality. http://www.hcup-us.ahrq.gov/reports/methods/2015-03.pdf. Accessed April 18, 2016.

Figure 1. Number of sports-related emergency department visits (discharged) and hospital inpatient stays by general type of sports activity, 2013



Abbreviation: ED, emergency department

Note: For fewer than 1% of ED visits and inpatient stays, more than one sports activity was identified. In these cases, the visit or stay is counted separately for each identified sports activity.

[a] The "other specified sports and athletics" category includes boxing, wrestling, and martial arts.

[b] The "other muscle strengthening exercises" category includes exercise machines, free weights, and Pilates.

[c] The "other cardiorespiratory exercise" category includes calisthenics, aerobics, and circuit training.

Source: Agency for Healthcare Research and Quality (AHRQ), Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project (HCUP), National Inpatient Sample (NIS) and Nationwide Emergency Department Sample (NEDS), 2013

- **Sports-related ED visits (discharged) were far more common than sports-related inpatient stays.**

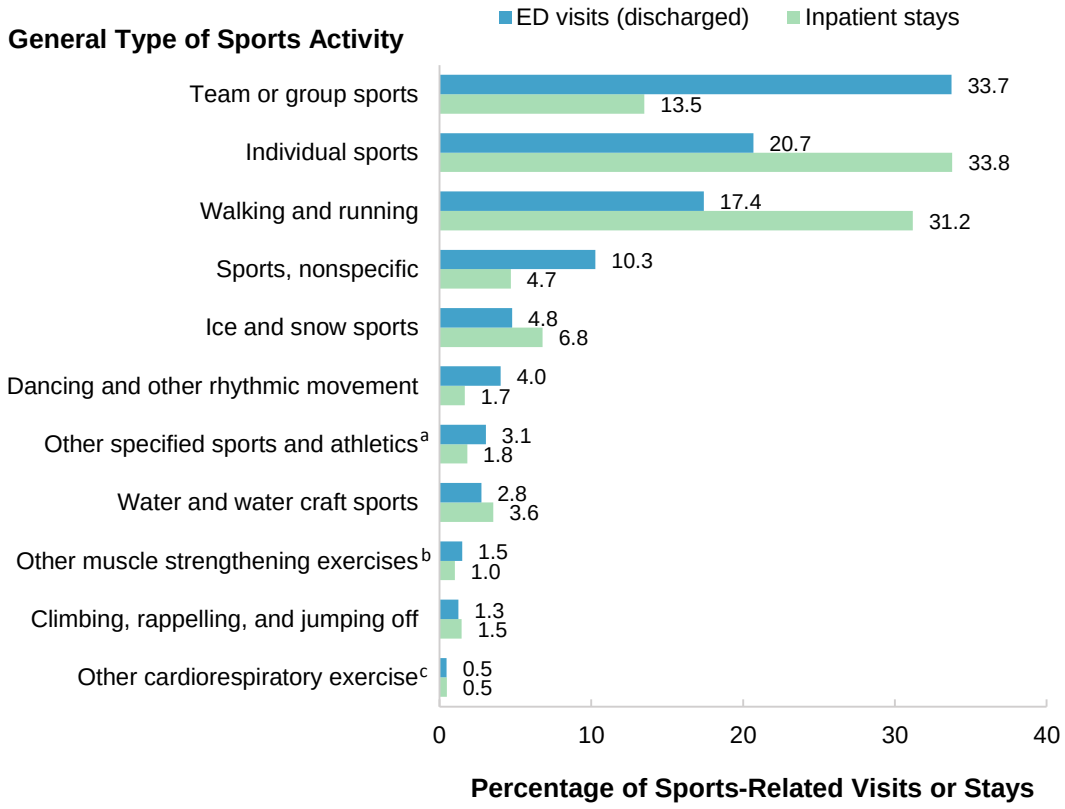
  In 2013 there were 2,807,880 ED visits and 105,490 hospital inpatient stays related to sports activities. Sports-related ED visits were 27 times more frequent than sports-related inpatient stays. In contrast, ED visits for any reason were only 3 times more common than inpatient stays for any reason (data not shown).

- **Team or group sports, individual sports, and walking and running constituted the majority of sports-related ED visits (discharged) and inpatient stays in 2013.**

  In 2013, 71.8 percent of sports-related ED visits and 78.5 percent of sports-related inpatient stays were associated with one of three general types of sports activities: team or group sports (such as football, baseball, basketball, and soccer), individual sports (such as bicycle riding, roller skating, horseback riding, and golf), and walking and running.

Figure 2 ranks these general activities by the percentage of sports-related ED visits and hospital inpatient stays that each sport constitutes.

Figure 2. Percentage of sports-related emergency department visits (discharged) and hospital inpatient stays by general type of sports activity, 2013



Abbreviation: ED, emergency department

Note: For fewer than 1% of ED visits and inpatient stays, more than one sports activity was identified. In these cases, the visit or stay is counted separately for each identified sports activity.

[a] The "other specified sports and athletics" category includes boxing, wrestling, and martial arts.

[b] The "other muscle strengthening exercises" category includes exercise machines, free weights, and Pilates.

[c] The "other cardiorespiratory exercise" category includes calisthenics, aerobics, and circuit training.

Source: Agency for Healthcare Research and Quality (AHRQ), Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project (HCUP), National Inpatient Sample (NIS) and Nationwide Emergency Department Sample (NEDS), 2013

- **In 2013, about one-third of sports-related ED visits (discharged) involved team or group sports, whereas individual sports, and walking and running each constituted about one-third of sports-related inpatient stays.**

  Team or group sports—such as football, basketball, and soccer—constituted one-third (33.7 percent) of all sports-related ED visits but only 13.5 percent of sports-related inpatient stays. The reverse was true for individual sports—such as bicycle riding and roller skating—and walking and running. Individual sports accounted for 33.8 percent of sports-related inpatient stays but only 20.7 percent of sports-related ED visits. Walking and running constituted 31.2 percent of sports-related inpatient stays but only 17.4 percent of sports-related ED visits.

Most common specific sports activities associated with ED and hospital inpatient use, 2013
Table 1 presents the 10 most common specific sports activities associated with ED visits (discharged) and hospital inpatient stays in 2013.

Table 1. Top 10 specific sports activities associated with emergency department visits (discharged) and hospital inpatient stays, 2013

Specific sports activity	ED visits (discharged)			Inpatient stays		
	Rank	n	% of all sports-related visits	Rank	n	% of all sports-related stays
All sports activities		**2,807,880**	100.0		**105,490**	100.0
Bicycle riding	1	383,790	13.7	2	26,530	25.1
Walking, marching, and hiking	2	340,290	12.1	1	30,650	29.1
Other unspecified sports activity[a]	3	288,380	10.3	5	4,970	4.7
Basketball	4	268,580	9.6	10	2,020	1.9
American tackle football	5	211,220	7.5	7	2,830	2.7
School recess and summer camp[b]	6	150,150	5.3	4	5,140	4.9
Running	7	148,650	5.3	8	2,240	2.1
Roller skating and skateboarding	8	143,780	5.1	6	4,600	4.4
Soccer	9	128,950	4.6			
Baseball	10	113,420	4.0			
Downhill skiing and snowboarding[c]				3	5,320	5.0
Horseback riding				9	2,220	2.1

Abbreviation: ED, emergency department

Note: For fewer than 1% of ED visits and inpatient stays, more than one sports activity was identified. In these cases, the visit or stay is counted separately for each identified sports activity.

[a] More specific information about the sports activity is not available in the ICD-9-CM diagnosis codes in this category.

[b] Physical games generally associated with school recess, summer camp, and children.

[c] Snow (alpine) (downhill) skiing, snowboarding, sledding, tobogganing, and snow tubing.

Source: Agency for Healthcare Research and Quality (AHRQ), Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project (HCUP), National Inpatient Sample (NIS) and Nationwide Emergency Department Sample (NEDS), 2013

- **Bicycle riding and walking, marching, and hiking were the two most common sports activities associated with both ED visits (discharged) and inpatient stays in 2013.**

  The following were the most common specific reasons for a sports-related ED visit in 2013:

  - Bicycle riding (13.7 percent of all sports-related ED visits)
  - Walking, marching, and hiking (12.1 percent)
  - Basketball (9.6 percent)
  - American tackle football (7.5 percent)

  The following were the most common reasons for a sports-related inpatient stay in 2013:

  - Walking, marching, and hiking (29.1 percent of all sports-related inpatient stays)
  - Bicycle riding (25.1 percent)
  - Downhill skiing and snowboarding (5.0 percent)
  - School recess and summer camp activities (4.9 percent)

  Soccer and baseball were among the 10 most common reasons for sports-related ED visits but not for inpatient stays. Downhill skiing and snowboarding, and horseback riding were among the 10 most common reasons for sports-related inpatient stays but not for ED visits.

Table 2 focuses on ED visits and presents the five most common sports activities associated with ED visits for males and females across age groups in 2013.

Table 2. Top five sports activities associated with emergency department visits (discharged), by patient sex and age group, 2013

Rank	ED visits for males			ED visits for females		
	Sports activity	n	%[a]	Sports activity	n	%[a]
Ages <18 years		**1,018,630**	**100.0**	**Ages <18 years**	**516,780**	**100.0**
1	American tackle football	167,350	16.4	School recess and summer camp[c]	66,230	12.8
2	Other unspecified sports activity[b]	138,470	13.6	Bicycle riding	50,870	9.8
3	Bicycle riding	120,170	11.8	Other unspecified sports activity[b]	48,330	9.4
4	Basketball	118,140	11.6	Running	40,520	7.8
5	School recess and summer camp[c]	76,920	7.6	Soccer	40,320	7.8
Ages 18–44 years		**602,410**	**100.0**	**Ages 18–44 years**	**255,490**	**100.0**
1	Bicycle riding	96,570	16.0	Walking, marching, and hiking	65,330	25.6
2	Basketball	96,180	16.0	Bicycle riding	29,310	11.5
3	Other unspecified sports activity[b]	73,220	12.2	Other unspecified sports activity[b]	16,200	6.3
4	Walking, marching, and hiking	42,920	7.1	Running	16,180	6.3
5	Roller skating and skateboarding	37,780	6.3	Roller skating and skateboarding	14,480	5.7
Ages 45–64 years		**150,850**	**100.0**	**Ages 45–64 years**	**122,780**	**100.0**
1	Bicycle riding	52,680	34.9	Walking, marching, and hiking	60,200	49.0
2	Walking, marching, and hiking	32,250	21.4	Bicycle riding	19,360	15.8
3	Other unspecified sports activity[b]	7,740	5.1	Running	5,140	4.2
4	Basketball	6,130	4.1	Downhill skiing and snowboarding[d]	4,260	3.5
5	Downhill skiing and snowboarding[d]	5,990	4.0	Roller skating and skateboarding	3,470	2.8
Ages 65+ years		**57,170**	**100.0**	**Ages 65+ years**	**83,680**	**100.0**
1	Walking, marching, and hiking	31,060	54.3	Walking, marching, and hiking	66,730	79.7
2	Bicycle riding	10,400	18.2	Bicycle riding	4,400	5.3
3	Golf	2,010	3.5	Ice and snow, other activity	1,200	1.4
4	Downhill skiing and snowboarding[d]	1,580	2.8	Running	1,090	1.3
5	Running	1,270	2.2	Dancing	1,020	1.2

Abbreviation: ED, emergency department

Notes: For fewer than 1% of ED visits, more than one sports activity was identified. In these cases, the visit is counted separately for each identified sports activity.

[a] The tabled % value refers to the percentage of all sports-related ED visits for the specified sex-age group.

[b] More specific information about the sports activity is not available in the ICD-9-CM diagnosis codes in this category.

[c] Physical games generally associated with school recess, summer camp, and children.

[d] Snow (alpine) (downhill) skiing, snowboarding, sledding, tobogganing, and snow tubing.

Source: Agency for Healthcare Research and Quality (AHRQ), Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project (HCUP), Nationwide Emergency Department Sample (NEDS), 2013

- **Among children and younger adults, males had about twice as many sports-related ED visits (discharged) as did females.**

  There were twice as many sports-related ED visits among male children (just over 1 million) as among female children (approximately 517,000). This pattern held among 18–44-year-olds as well—there were over 600,000 sports-related ED visits among males compared with approximately 255,000 visits among females.

Among 45–64-year-olds, the number of sports-related ED visits for males (150,850) and females (122,780) were more similar. In the oldest age group, females had more sports-related ED visits (83,680) than did males (57,170). This sex differential held even when adjusting for the relatively larger population of older females, with a rate of 333.3 sports-related ED visits per 100,000 female population aged 65 years and older versus 291.7 per 100,000 male population aged 65 years and older (data not shown).

- **Among children, the most common sports-related reasons for ED visits (discharged) were American tackle football (males only), school recess and summer camp activities, and bicycle riding.**

  Among male children under 18 years, American tackle football accounted for over 16 percent of all sports-related ED visits. Bicycle riding, and school recess and summer camp activities were among the five most common sports activities associated with ED visits for both male and female children. For male children, basketball also was a common reason for sports-related ED visits (constituting 11.6 percent of all sports-related ED visits) whereas running and soccer were common for female children (each constituting 7.8 percent of visits).

- **Among males aged 18–64 years, bicycle riding was the most common sports-related reason for ED visits (discharged).**

  Bicycle riding was the most common sports-related reason for ED visits among adult males aged 18–44 years (96,570 visits) and aged 45–64 years (52,680 visits). Among 18–44-year-old males, basketball was a close second with 96,180 visits.

  Among adult females of all ages, walking, marching, and hiking was by far the most common sports-related reason for ED visits—accounting for about a quarter of sports-related ED visits for 18–44-year-olds, nearly half of 45–64-year-old visits, and over three-quarters of sports-related ED visits for women aged 65 years and older. Bicycling was the second most common sports-related reason for ED visits among females but was far less common, especially in the older age groups.

  The following were other common reasons for sports-related ED visits among adults:

  - Running—females of all ages
  - Downhill skiing and snowboarding—males aged 45 years and older and females aged 45–64 years
  - Roller skating and skateboarding—males and females aged 18–44 years and females aged 45–64 years

  Among those aged 65 years and older, the most common sports-related reasons for ED visits included golf for males and dancing for females.

Table 3 focuses on hospital inpatient stays and presents the five most common sports activities associated with hospital stays for males and females across age groups in 2013.

Table 3. Top five sports activities associated with hospital inpatient stays, by patient sex and age group, 2013

Rank	Inpatient stays for males			Inpatient stays for females		
	Sports activity	n	%[a]	Sports activity	n	%[a]
Ages <18 years		**18,860**	**100.0**	**Ages <18 years**	**6,990**	**100.0**
1	Bicycle riding	3,850	20.4	School recess and summer camp[b]	2,070	29.6
2	School recess and summer camp[b]	2,680	14.2	Bicycle riding	1,100	15.7
3	Other unspecified sports activity[c]	2,300	12.2	Other unspecified sports activity[c]	430	6.2
4	American tackle football	2,050	10.9	Downhill skiing and snowboarding[d]	350	5.0
5	Roller skating and skateboarding	1,570	8.3	Roller skating and skateboarding	330	4.7
Ages 18–44 years		**21,090**	**100.0**	**Ages 18–44 years**	**6,570**	**100.0**
1	Bicycle riding	6,730	31.9	Bicycle riding	1,580	24.0
2	Downhill skiing and snowboarding[d]	1,630	7.7	Walking, marching, and hiking	1,110	16.9
3	Other unspecified sports activity[c]	1,540	7.3	Roller skating and skateboarding	600	9.1
4	Roller skating and skateboarding	1,530	7.3	Downhill skiing and snowboarding[d]	500	7.6
5	Walking, marching, and hiking	1,510	7.2	Horseback riding	390	5.9
Ages 45–64 years		**14,540**	**100.0**	**Ages 45–64 years**	**8,550**	**100.0**
1	Bicycle riding	7,510	51.7	Walking, marching, and hiking	3,380	39.5
2	Walking, marching, and hiking	2,620	18.0	Bicycle riding	2,220	26.0
3	Downhill skiing and snowboarding[d]	920	6.3	Downhill skiing and snowboarding[d]	650	7.6
4	Horseback riding	420	2.9	Horseback riding	600	7.0
5	Other unspecified sports activity[b]	260	1.8	Roller skating and skateboarding	240	2.8
Ages 65+ years		**11,510**	**100.0**	**Ages 65+ years**	**17,330**	**100.0**
1	Walking, marching, and hiking	6,580	57.2	Walking, marching, and hiking	14,750	85.1
2	Bicycle riding	2,800	24.3	Bicycle riding	710	4.1
3	Downhill skiing and snowboarding[d]	330	2.9	Ice and snow, other activity	250	1.4
4	Ice and snow, other activity	230	2.0	Other muscle strengthening	190	1.1
5	Horseback riding	220	1.9	Horseback riding	150	0.9

Notes: For fewer than 1% of inpatient stays, more than one sports activity was identified. In these cases, the stay is counted separately for each identified sports activity.

[a] The tabled % value refers to the percentage of all sports-related inpatient stays for the specified sex-age group.

[b] Physical games generally associated with school recess, summer camp, and children.

[c] More specific information about the sports activity is not available in the ICD-9-CM diagnosis codes in this category.

[d] Snow (alpine) (downhill) skiing, snowboarding, sledding, tobogganing, and snow tubing.

Source: Agency for Healthcare Research and Quality (AHRQ), Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project (HCUP), National Inpatient Sample (NIS), 2013

- **As shown for sports-related ED visits, males accounted for more sports-related inpatient stays than females in all age groups except for those aged 65 years and older.**

  There were more than twice as many sports-related inpatient stays among male children compared with female children (18,860 vs. 6,990) and more than 3 times as many sports-related inpatient stays for males aged 18–44 years compared with females in that age group (21,090 vs. 6,570).

  Similarly, among 45–64-year-olds, there were more sports-related inpatient stays for males (14,540) than for females (8,550). In the oldest age group, females had more sports-related inpatient stays than did males (17,330 vs. 11,510). This sex differential held even when adjusting for the relatively

larger population of older females, with a rate of 69.0 sports-related inpatient stays per 100,000 female population aged 65 years and older versus 58.7 per 100,000 male population aged 65 years and older (data not shown).

- **Among children, the most common sports-related reasons for hospital inpatient stays were bicycle riding, and school recess and summer camp activities**

  Among children under 18 years, bicycle riding, and school recess and summer camp activities were the two most common sports associated with inpatient stays for both males and females. For males, bicycling ranked first, accounting for over 20 percent of sports-related inpatient stays. For females, school recess and summer camp activities ranked first, accounting for 30 percent of sports-related inpatient stays.

  Among male children, American tackle football was common among sports-related inpatient stays (10.9 percent) whereas downhill skiing and snowboarding was in the top 5 for females (5.0 percent). Roller skating and skateboarding also was in the five sports activities most frequently associated with inpatient stays for both male and female children.

- **Among adult males aged 18–64 years, bicycle riding was the most common sports-related reason for hospital inpatient stays.**

  Bicycle riding was the most common sports-related reason for inpatient stays among young and middle-aged adult males, constituting nearly a third of all sports-related inpatient stays for 18–44-year-olds (31.9 percent) and over half of sports-related stays for 45–64-year-olds (51.7 percent). Bicycle riding was the second most common reason for sports-related inpatient stays among males aged 65 years and older, after walking, marching, and hiking, which accounted for over half of all sports-related stays in this age group (57.2 percent).

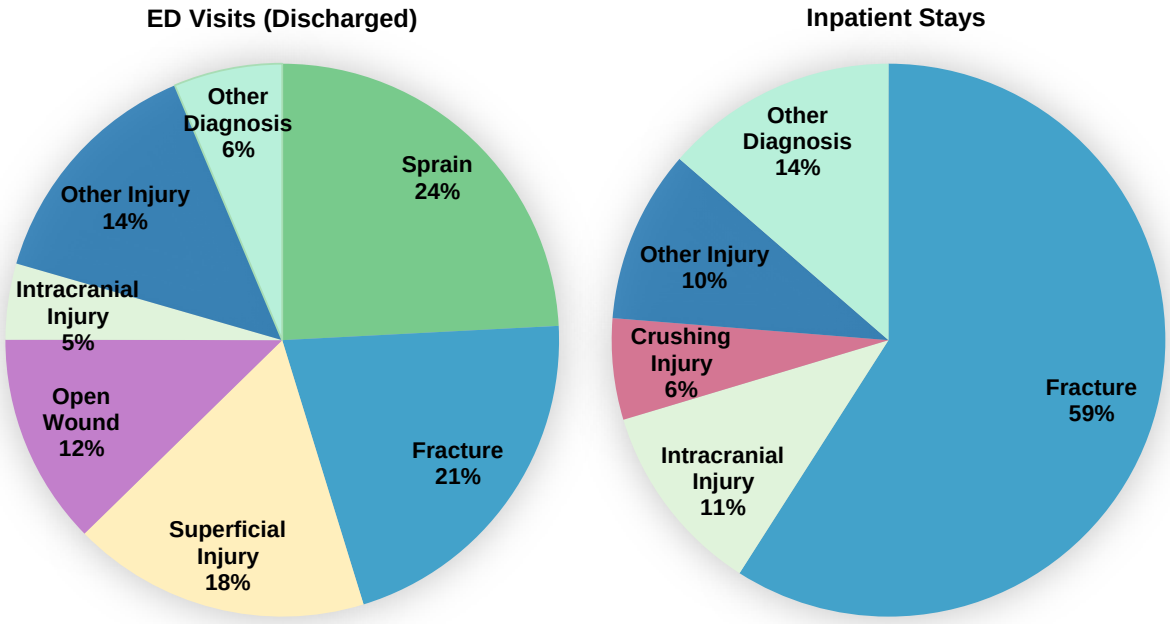
  Among females aged 18–44 years, bicycle riding was the number one reason for sports-related inpatient stays, constituting nearly a quarter (24.0 percent) of stays. For females aged 45–64 years, bicycle riding was the second most common reason for sports-related inpatient stays (26.0 percent), after walking, marching, and hiking, which accounted for 39.5 percent of sports-related stays.

  The following are other common reasons for sports-related inpatient stays among adults:

  - Downhill skiing and snowboarding—which accounted for 6–8 percent of sports-related stays for adult males and females aged 18–64 years
  - Horseback riding—adult females of all ages and males aged 45 years and older
  - Roller skating and skateboarding—males and females aged 18–44 years and females aged 45–64 years

Most common injuries associated with sports-related ED and hospital inpatient use, 2013
Figure 3 presents information on the types of injuries associated with sports-related ED visits (discharged) and hospital inpatient stays in 2013.

Figure 3. Primary type of injury[a] associated with sports-related emergency department visits (discharged) and hospital inpatient stays, 2013



Abbreviation: ED, emergency department

Note: For fewer than 1% of ED visits and inpatient stays, more than one sports activity was identified. In these cases, the visit or stay is counted separately for each identified sports activity.

[a] Type of injury was based on the Clinical Classifications Software (CCS) principal diagnosis.

Source: Agency for Healthcare Research and Quality (AHRQ), Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project (HCUP), National Inpatient Sample (NIS) and Nationwide Emergency Department Sample (NEDS), 2013

- **The most common injuries for sports-related ED visits (discharged) were sprains, fractures, and superficial injuries, accounting for nearly two-thirds of all visits (63 percent). Fractures and intracranial injury accounted for 70 percent of all sports-related inpatient stays.**

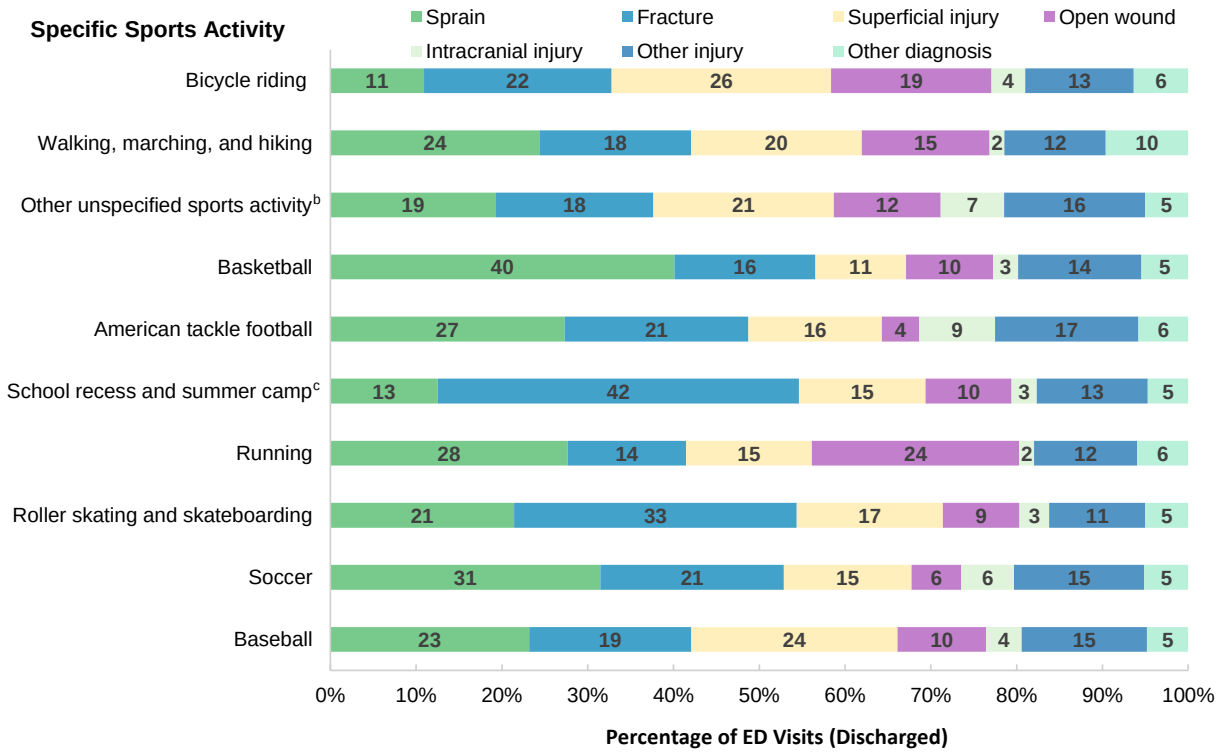
  The most common types of injuries among sports-related ED visits were sprains (24 percent), fractures (21 percent), and superficial injuries (18 percent). Other common, specific types of injuries included open wounds (12 percent) and intracranial injuries (5 percent).

  The most common types of injuries among sports-related inpatient stays were fractures (59 percent), intracranial injuries (11 percent), and crushing injuries (6 percent).

  Other noninjury diagnoses reported frequently as primary reasons for sports-related ED visits included: other nontraumatic joint disorders, spondylosis (back problems), headache, syncope (fainting), and nonspecific chest pain. Other noninjury diagnoses reported frequently as primary reasons for sports-related inpatient stays included: skin or tissue infection, other connective tissue disease, septicemia, syncope, spondylosis, and cardiac dysrhythmias.

Figure 4 focuses on ED visits and provides additional details on the types of injuries for the 10 most common sports activities associated with ED visits in 2013.

Figure 4. Primary type of injury[a] among the 10 most common sports activities associated with emergency department visits (discharged), 2013



Abbreviation: ED, emergency department

Note: For fewer than 1% of ED visits, more than one sports activity was identified. In these cases, the visit is counted separately for each identified sports activity.

[a] Type of injury was based on the Clinical Classifications Software (CCS) principal diagnosis.

[b] More specific information about the sports activity is not available in the ICD-9-CM diagnosis codes in this category.

[c] Physical games generally associated with school recess, summer camp, and children.

Source: Agency for Healthcare Research and Quality (AHRQ), Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project (HCUP), Nationwide Emergency Department Sample (NEDS), 2013

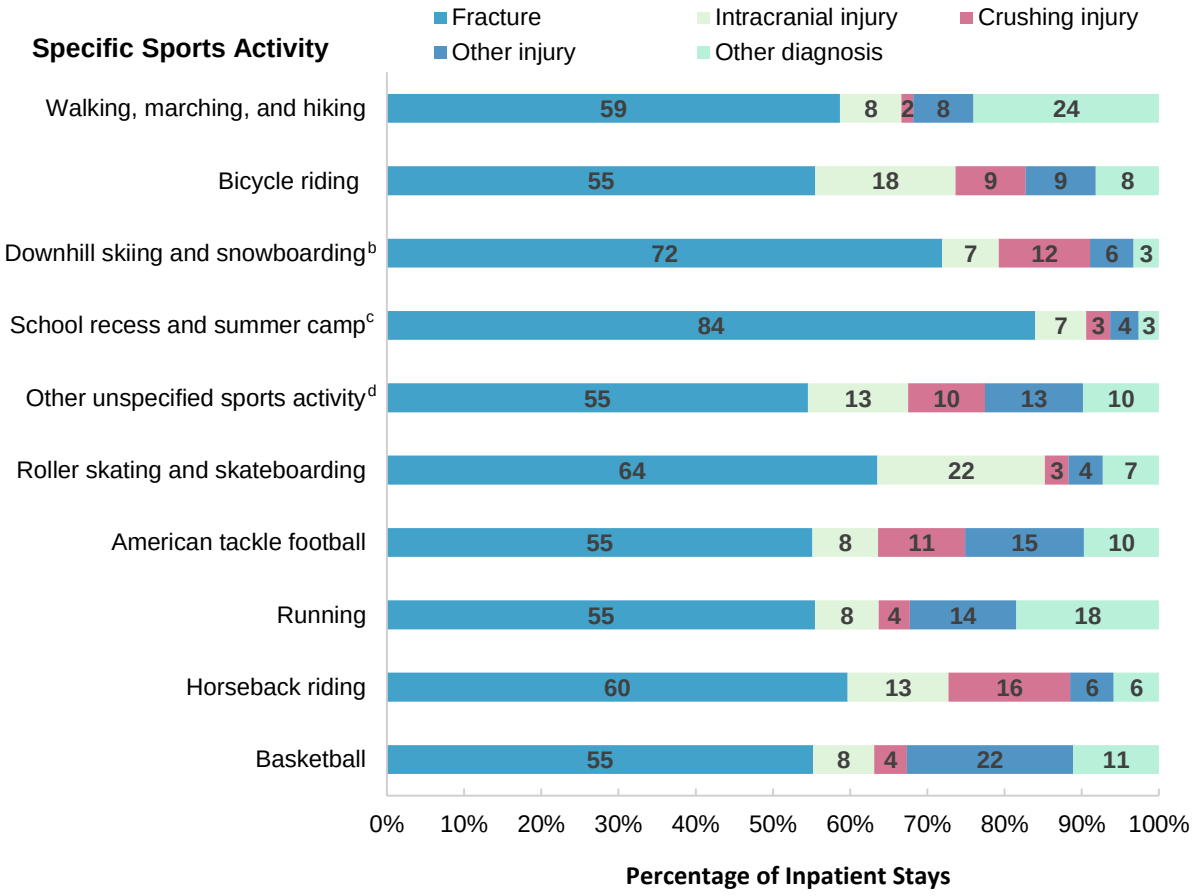
- **The most common injuries among sports-related ED visits (discharged) included sprains—seen in 40 percent of basketball-related visits—and fractures—seen in 42 percent of visits related to school recess and summer camp activities.**

  Among the 10 most common sports activities associated with ED visits in 2013 (from Table 1), the frequency of types of injuries varied by specific sports activity:

  - Sprains—basketball (40 percent); soccer (31 percent); running (28 percent); American tackle football (27 percent); walking, marching, and hiking (24 percent); baseball (23 percent); and roller skating and skateboarding (21 percent)
  - Fractures—school recess and summer camp activities (42 percent), roller skating and skateboarding (33 percent), bicycle riding (22 percent), American tackle football (21 percent), and soccer (21 percent)
  - Superficial injuries—bicycle riding (26 percent), baseball (24 percent), and walking, marching, and hiking (20 percent)
  - Open wounds—running (24 percent) and bicycle riding (19 percent)
  - Intracranial injury—tackle football (9 percent)

Figure 5 focuses on hospital inpatient stays and presents information on the types of injuries for the 10 most common sports activities associated with inpatient stays in 2013.

Figure 5. Primary type of injury[a] among the 10 most common sports activities associated with hospital inpatient stays, 2013



Note: For fewer than 1% of inpatient stays, more than one sports activity was identified. In these cases, the visit or stay is counted separately for each identified sports activity.

[a] Type of injury was based on the Clinical Classifications Software (CCS) principal diagnosis.

[b] Snow (alpine) (downhill) skiing, snowboarding, sledding, tobogganing, and snow tubing.

[c] Physical games generally associated with school recess, summer camp, and children.

[d] More specific information about the sports activity is not available in the ICD-9-CM diagnosis codes in this category.

Source: Agency for Healthcare Research and Quality (AHRQ), Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project (HCUP), National Inpatient Sample (NIS), 2013

- **Fractures accounted for more than half of inpatient stays for each of the 10 most common sports-related reasons for hospitalization.**

  Among the 10 most common sports activities associated with inpatient stays in 2013 (from Table 1), fracture was the most frequent type of injury. Fractures accounted for more than half of inpatient stays for each sports activity, reaching as high as 84 percent of sports-related inpatient stays involving school recess and summer camp activities, 72 percent of stays related to downhill skiing and snowboarding, and 64 percent of roller skating and skateboarding-related stays.

- **Sports-related inpatient stays for intracranial injury were most common for roller skating and skateboarding. Stays for crushing injury were most common for horseback riding.**

  Among the 10 most common sports activities associated with inpatient stays in 2013, intracranial injury was most frequent for roller skating and skateboarding (22 percent) and bicycle riding (18 percent). Crushing injury was most frequent for horseback riding (16 percent) and downhill skiing and snowboarding (12 percent).

Appendix A. Number of emergency department visits (discharged) and hospital inpatient stays associated with sports-related activities, by general type of and specific sports activity, 2013

Sports activity	ED visits (discharged), n	Inpatient stays, n
All activities	**2,807,880**	**105,490**
Walking and running	**488,940**	**32,890**
Walking, marching, and hiking	340,290	30,650
Running	148,650	2,240
Water and water craft sports	**77,610**	**3,750**
Swimming	26,750	770
Springboard and platform diving	8,340	860
Water polo	1,000	*
Water aerobics and water exercise	120	*
Underwater diving and snorkeling	3,100	210
Rowing, canoeing, kayaking, rafting, and tubing	5,340	170
Water skiing and wake boarding	6,080	420
Surfing, windsurfing, and boogie boarding	11,620	340
Water sliding	3,180	*
Water and watercraft	12,090	900
Ice and snow sports	**134,770**	**7,170**
Ice skating	12,530	360
Ice hockey	14,540	290
Snow (alpine) (downhill) skiing, snowboarding, sledding, tobogganing, and snow tubing	91,210	5,320
Cross-country skiing	620	*
Ice and snow, other activity	15,870	1,150
Climbing, rappelling, and jumping off	**35,300**	**1,550**
Mountain climbing, rock climbing, and wall climbing	3,380	370
Rappelling	180	*
BASE jumping	740	*
Bungee jumping	100	*
Hang gliding	130	*
Climbing, rappelling, and jumping off, other activity	30,760	1,050
Dancing and other rhythmic movement	**113,330**	**1,770**
Dancing	22,880	480
Yoga	1,010	*
Gymnastics	22,310	240
Trampoline	43,050	810
Cheerleading	18,490	*

Sports activity	ED visits (discharged), n	Inpatient stays, n
Dancing and other rhythmic movements, other activity	5,574	150
Other sports and athletics played individually	**580,740**	**35,630**
Roller skating (inline) and skateboarding	143,780	4,600
Horseback riding	18,830	2,220
Golf	8,430	510
Bowling	5,240	150
Bicycle riding (total)	383,790	26,530
- Bicycle riding - Motor vehicle traffic	49,230	6,810
- Bicycle riding - Nontraffic vehicle	2,370	240
- Bicycle riding - Other bicycle accident	332,190	19,470
Jumping rope	1,490	*
Nonrunning track and field events	1,070	*
Other sports and athletics played individually, other activity	18,110	1,540
Other sports and athletics played as a team or group	**947,030**	**14,230**
American tackle football	211,220	2,830
American flag or touch football	10,280	150
Rugby	6,640	140
Baseball	113,420	1,370
Lacrosse and field hockey	15,640	170
Soccer	128,950	1,820
Basketball	268,580	2,020
Volleyball (beach) (court)	27,870	170
Physical games generally associated with school recess, summer camp, and children	150,150	5,140
Other sports and athletics played as a team or group, other activity	14,270	400
Other specified sports and athletics	**86,140**	**1,930**
Boxing	6,390	110
Wrestling	40,920	490
Racquet and hand sports	9,800	150
Frisbee	2,830	*
Martial arts	15,450	160
Other specified sports and athletics activity	10,750	940
Other cardiorespiratory exercise	**13,430**	**500**
Exercise machines primarily for cardiorespiratory conditioning	4,900	230
Calisthenics	1,420	*
Aerobic and step exercise	1,800	*
Circuit training	220	*
Obstacle course	590	*
Grass drills	150	*
Cardiorespiratory exercise, other activity	4,370	200

Sports activity	ED visits (discharged), n	Inpatient stays, n
Other muscle strengthening exercises	**42,200**	**1,080**
Exercise machines primarily for muscle strengthening	3,560	120
Push-ups, pull-ups, sit-ups	4,300	*
Free weights	21,300	300
Pilates	160	*
Other muscle strengthening exercises, other activity	12,890	580
Sports activity, not elsewhere classified	**288,380**	**4,970**

Abbreviations: BASE, building, antenna, span, earth; ED, Emergency department

Note: For fewer than 1% of ED visits and inpatient stays, more than one sports activity was identified. In these cases, the visit or stay is counted separately for each identified sports activity.

* Indicates fewer than 100 discharge records.

Source: Agency for Healthcare Research and Quality (AHRQ), Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project (HCUP), National Inpatient Sample (NIS) and Nationwide Emergency Department Sample (NEDS), 2013

Data Source

The estimates in this Statistical Brief are based upon data from the Healthcare Cost and Utilization Project (HCUP) 2013 National Inpatient Sample (NIS) and Nationwide Emergency Department Sample (NEDS).

Definitions

Diagnoses, ICD-9-CM, and Clinical Classifications Software (CCS)
The *principal diagnosis* is that condition established after study to be chiefly responsible for the patient's admission to the hospital. *Secondary diagnoses* are concomitant conditions that coexist at the time of admission or develop during the stay. *All-listed diagnoses* include the principal diagnosis plus these additional secondary conditions.

ICD-9-CM is the International Classification of Diseases, Ninth Revision, Clinical Modification, which assigns numeric codes to diagnoses. There are approximately 14,000 ICD-9-CM diagnosis codes.

CCS categorizes ICD-9-CM diagnosis codes or procedure codes into a manageable number of clinically meaningful categories.[11] This clinical grouper makes it easier to quickly understand patterns of diagnoses or procedure use. CCS categories identified as Other typically are not reported; these categories include miscellaneous, otherwise unclassifiable diagnoses or procedures that may be difficult to interpret as a group.

Case definition
In this study we focused on identifying sports activities using the ICD-9-CM "activity" external cause of injury codes (E codes), E001–E030, as presented in Table 4. We also searched to identify any other E codes that could indicate that the hospital stay or emergency department (ED) visit was associated with a sports activity. These additional E codes that were included as part of a specific sports activity category also are provided in Table 4. Finally, we included three E codes (E886.0, E917.0, and E917.5) that specified that an injury occurred during sports, but there was no further information provided (i.e., by a more specific E code on the record) to indicate which specific sports activity was involved. These records are coded to the "other unspecified sports" (sports not elsewhere classified) category.

[11] Agency for Healthcare Research and Quality. HCUP Clinical Classifications Software (CCS). Healthcare Cost and Utilization Project (HCUP). Rockville, MD: Agency for Healthcare Research and Quality. Updated June 2015. http://www.hcup-us.ahrq.gov/toolssoftware/ccs/ccs.jsp. Accessed February 17, 2016.

Table 4. ICD-9-CM E codes identifying sports activities

ICD-9-CM activity E code	Sports activity description	ICD-9-CM other E code	Other E code description
Walking and running			
E001.0	Walking, marching, and hiking		
E001.1	Running		
Water and water craft sports			
E002.0	Swimming	E830.5, E831.5, E832.5, E833.5, E834.5, E835.5, E836.5, E837.5, E838.5	Water transport accidents injuring swimmer
E002.1	Springboard and platform diving	E883.0	Accident from diving or jumping into water (swimming pool)
E002.2	Water polo		
E002.3	Water aerobics and water exercise		
E002.4	Underwater diving and snorkeling	E902.2	High and low air pressure and changes in air pressure - due to diving
		E910.1	Accidental drowning and submersion while engaged in other sport or recreational activity with diving equipment
E002.5	Rowing, canoeing, kayaking, rafting, and tubing		
E002.6	Water skiing and wakeboarding	E830.4, E831.4, E832.4, E833.4, E834.4, E835.4, E836.4, E837.4, E838.4	Water transport accidents injuring water skier
		E910.0	Accidental drowning and submersion while water skiing
E002.7	Surfing, windsurfing, and boogie boarding		
E002.8	Water sliding		
E002.9	Water and watercraft	E910.2	Accidental drowning and submersion while engaged in other sport or recreational activity without diving equipment
Ice and snow sports			
E003.0	Ice skating		
E003.1	Ice hockey		
E003.2	Snow (alpine) (downhill) skiing, snowboarding, sledding, tobogganing, and snow tubing	E885.3, E885.4	Fall from skis, snowboard
E003.3	Cross-country skiing		
E003.9	Ice and snow, other activity		
Climbing, rappelling, and jumping off			
E004.0	Mountain climbing, rock climbing, and wall climbing		
E004.1	Rappelling		
E004.2	BASE jumping		
E004.3	Bungee jumping		
E004.4	Hang gliding		
E004.9	Climbing, rappelling, and jumping off, other activity		

ICD-9-CM activity, E code	Sports activity description	ICD-9-CM other E code	Other E code description
Dancing and other rhythmic movement			
E005.0	Dancing		
E005.1	Yoga		
E005.2	Gymnastics		
E005.3	Trampoline		
E005.4	Cheerleading		
E005.9	Dancing and other rhythmic movements, other activity		
Other sports and athletics played individually			
E006.0	Roller skating (inline) and skateboarding	E885.1, E885.2	Fall from roller skates, skateboard
E006.1	Horseback riding		
E006.2	Golf		
E006.3	Bowling		
E006.4	Bicycle riding	E800.3, E801.3, E802.3, E803.3, E804.3, E805.3, E806.3, E807.3	Railway accidents injuring pedal cyclist
		E810.6, E811.6, E812.6, E813.6, E814.6, E815.6, E816.6, E817.6, E818.6, E819.6	Motor vehicle traffic accidents injuring pedal cyclist
		E820.6, E821.6, E822.6, E823.6, E824.6, E825.6	Motor vehicle nontraffic accidents injuring pedal cyclist
		E826.1	Pedal cycle accident injuring pedal cyclist
E006.5	Jumping rope		
E006.6	Nonrunning track and field events		
E006.9	Other sports and athletics played individually, other activity		
Other sports and athletics played as a team or group			
E007.0	American tackle football		
E007.1	American flag or touch football		
E007.2	Rugby		
E007.3	Baseball		
E007.4	Lacrosse and field hockey		
E007.5	Soccer		
E007.6	Basketball		
E007.7	Volleyball (beach) (court)		
E007.8	Physical games generally associated with school recess, summer camp, and children	E884.0	Fall from playground equipment
E007.9	Other sports and athletics played as a team or group, other activity		
Other specified sports and athletics			
E008.0	Boxing		
E008.1	Wrestling		
E008.2	Racquet and hand sports		

ICD-9-CM activity, E code	Sports activity description	ICD-9-CM other E code	Other E code description
E008.3	Frisbee		
E008.4	Martial arts		
E008.9	Other specified sports and athletics activity		
Other cardiorespiratory exercise			
E009.0	Exercise machines primarily for cardiorespiratory conditioning		
E009.1	Calisthenics		
E009.2	Aerobic and step exercise		
E009.3	Circuit training		
E009.4	Obstacle course		
E009.5	Grass drills		
E009.9	Cardiorespiratory exercise, other activity		
Other muscle strengthening exercises			
E010.0	Exercise machines primarily for muscle strengthening		
E010.1	Push-ups, pull-ups, sit-ups		
E010.2	Free weights		
E010.3	Pilates		
E010.9	Other muscle strengthening exercises, other activity		
Sports activity, not elsewhere classified			
	Other unspecified sports activity	E886.0	Fall on same level from collision, pushing, or shoving, by or with other person – in sports
		E917.0, E917.5	Striking against or struck accidentally by objects or persons in sports, without or with subsequent fall

Abbreviation: BASE, building, antenna, span, earth

Each relevant E code was classified into one of three categories:

1. **Nonspecific Sports E Codes**: E002.9, E003.9, E004.9, E005.9, E006.9, E007.9, E008.9, E009.9, E010.9
2. **Sports NEC ("not elsewhere classified") Codes**: E886.0, E917.0, E917.5
3. **Specific Sports E Codes**: all other codes listed in the Sports E Codes

Each discharge record (ED visit that resulted in discharge or hospital inpatient stay) was classified into one or more of the sports activity categories based on the following rules:

1. If a **Specific Sports E Code** was present anywhere on the record, then the record was classified into that sports activity.
2. If no **Specific Sports E Codes** were present anywhere on the record, then:
   - If a **Nonspecific Sports E Code** was present anywhere on the record, the record was classified into that sports activity.
3. If no **Specific Sports E Codes** and no **Nonspecific Sports E Codes** were present anywhere on the record, then:
   - If a **Sports NEC Code** was present anywhere on the record, the record was classified into the "Other unspecified sports activity" category.

For bicycle riding, each discharge record was further subset into one of three categories based on the following hierarchy:

1. If any one of the following codes was on the record—E810.6, E811.6, E812.6, E813.6, E814.6, E815.6, E816.6, E817.6, E818.6, E819.6—then the record was classified as bicycle riding: motor vehicle traffic.
2. Else, if any of the following codes were on the record—E800.3, E801.3, E802.3, E803.3, E804.3, E805.3, E806.3, E807.3, E820.6, E821.6, E822.6, E823.6, E824.6, E825.6—then the record was classified as bicycle riding: nontraffic vehicle.
3. Else, the record was classified as bicycle riding: other bicycle.

Note that the following E codes associated with gun-related injuries were not included in any of the categories of sports activities examined in this Statistical Brief.

Table 5. Gun-related ICD-9-CM E codes not included

ICD-9-CM E code	Description
E922.2	Accident caused by hunting rifle
E922.4	Accident caused by air gun
E922.5	Accident caused by paintball gun

Types of hospitals included in the HCUP National (Nationwide) Inpatient Sample
The National (Nationwide) Inpatient Sample (NIS) is based on data from community hospitals, which are defined as short-term, non-Federal, general, and other hospitals, excluding hospital units of other institutions (e.g., prisons). The NIS includes obstetrics and gynecology, otolaryngology, orthopedic, cancer, pediatric, public, and academic medical hospitals. Excluded are long-term care facilities such as rehabilitation, psychiatric, and alcoholism and chemical dependency hospitals. Beginning in 2012, long-term acute care hospitals are also excluded. However, if a patient received long-term care, rehabilitation, or treatment for a psychiatric or chemical dependency condition in a community hospital, the discharge record for that stay will be included in the NIS.

Types of hospitals included in the HCUP Nationwide Emergency Department Sample
The Nationwide Emergency Department Sample (NEDS) is based on data from community hospitals, which are defined as short-term, non-Federal, general, and other hospitals, excluding hospital units of other institutions (e.g., prisons). The NEDS includes specialty, pediatric, public, and academic medical hospitals. Excluded are long-term care facilities such as rehabilitation, psychiatric, and alcoholism and chemical dependency hospitals. Hospitals included in the NEDS have hospital-owned emergency departments and no more than 90 percent of their ED visits resulting in admission.

Unit of analysis
The unit of analysis is the hospital discharge (i.e., the hospital stay) or the ED encounter, not a person or patient. This means that a person who is admitted to the hospital or seen in the ED multiple times in 1 year will be counted each time as a separate discharge from the hospital or encounter in the ED.

About HCUP

The Healthcare Cost and Utilization Project (HCUP, pronounced "H-Cup") is a family of health care databases and related software tools and products developed through a Federal-State-Industry partnership and sponsored by the Agency for Healthcare Research and Quality (AHRQ). HCUP databases bring together the data collection efforts of State data organizations, hospital associations, and private data organizations (HCUP Partners) and the Federal government to create a national information resource of encounter-level health care data. HCUP includes the largest collection of longitudinal hospital care data in the United States, with all-payer, encounter-level information beginning in 1988. These databases enable research on a broad range of health policy issues, including cost and quality of health services, medical practice patterns, access to health care programs, and outcomes of treatments at the national, State, and local market levels.

HCUP would not be possible without the contributions of the following data collection Partners from across the United States:

Alaska State Hospital and Nursing Home Association
Arizona Department of Health Services
Arkansas Department of Health
California Office of Statewide Health Planning and Development
Colorado Hospital Association
Connecticut Hospital Association
District of Columbia Hospital Association
Florida Agency for Health Care Administration
Georgia Hospital Association
Hawaii Health Information Corporation
Illinois Department of Public Health
Indiana Hospital Association
Iowa Hospital Association
Kansas Hospital Association
Kentucky Cabinet for Health and Family Services
Louisiana Department of Health and Hospitals
Maine Health Data Organization
Maryland Health Services Cost Review Commission
Massachusetts Center for Health Information and Analysis
Michigan Health & Hospital Association
Minnesota Hospital Association
Mississippi Department of Health
Missouri Hospital Industry Data Institute
Montana MHA - An Association of Montana Health Care Providers
Nebraska Hospital Association
Nevada Department of Health and Human Services
New Hampshire Department of Health & Human Services
New Jersey Department of Health
New Mexico Department of Health
New York State Department of Health
North Carolina Department of Health and Human Services
North Dakota (data provided by the Minnesota Hospital Association)
Ohio Hospital Association
Oklahoma State Department of Health
Oregon Association of Hospitals and Health Systems
Oregon Office of Health Analytics
Pennsylvania Health Care Cost Containment Council
Rhode Island Department of Health
South Carolina Revenue and Fiscal Affairs Office
South Dakota Association of Healthcare Organizations
Tennessee Hospital Association
Texas Department of State Health Services
Utah Department of Health
Vermont Association of Hospitals and Health Systems
Virginia Health Information
Washington State Department of Health
West Virginia Health Care Authority
Wisconsin Department of Health Services
Wyoming Hospital Association

About Statistical Briefs

HCUP Statistical Briefs are descriptive summary reports presenting statistics on hospital inpatient and emergency department use and costs, quality of care, access to care, medical conditions, procedures, patient populations, and other topics. The reports use HCUP administrative health care data.

About the NIS

The HCUP National (Nationwide) Inpatient Sample (NIS) is a national database of hospital inpatient stays. The NIS is nationally representative of all community hospitals (i.e., short-term, non-Federal, nonrehabilitation hospitals). The NIS includes all payers. It is drawn from a sampling frame that contains hospitals comprising more than 95 percent of all discharges in the United States. The vast size of the NIS allows the study of topics at the national and regional levels for specific subgroups of patients. In addition, NIS data are standardized across years to facilitate ease of use. Over time, the sampling frame for the NIS has changed; thus, the number of States contributing to the NIS varies from year to year. The NIS is intended for national estimates only; no State-level estimates can be produced.

The 2012 NIS was redesigned to optimize national estimates. The redesign incorporates two critical changes:

- Revisions to the sample design—starting with 2012, the NIS is now a *sample of discharge records from all HCUP-participating hospitals*, rather than a sample of hospitals from which all discharges were retained (as is the case for NIS years before 2012).

- Revisions to how hospitals are defined—the NIS now uses the *definition of hospitals and discharges supplied by the statewide data organizations* that contribute to HCUP, rather than the definitions used by the American Hospital Association (AHA) Annual Survey of Hospitals.

The new sampling strategy is expected to result in more precise estimates than those that resulted from the previous NIS design by reducing sampling error: for many estimates, confidence intervals under the new design are about half the length of confidence intervals under the previous design. The change in sample design for 2012 necessitates recomputation of prior years' NIS data to enable analysis of trends that uses the same definitions of discharges and hospitals.

About the NEDS

The HCUP Nationwide Emergency Department Database (NEDS) is a unique and powerful database that yields national estimates of ED visits. The NEDS was constructed using records from both the HCUP State Emergency Department Databases (SEDD) and the State Inpatient Databases (SID). The SEDD capture information on ED visits that do not result in an admission (i.e., treat-and-release visits and transfers to another hospital); the SID contain information on patients initially seen in the ED and then admitted to the same hospital. The NEDS was created to enable analyses of ED utilization patterns and support public health professionals, administrators, policymakers, and clinicians in their decisionmaking regarding this critical source of care. The NEDS is produced annually beginning in 2006. Over time, the sampling frame for the NEDS has changed; thus, the number of States contributing to the NEDS varies from year to year. The NEDS is intended for national estimates only; no State-level estimates can be produced.

For More Information

For more information about HCUP, visit http://www.hcup-us.ahrq.gov/.

For additional HCUP statistics, visit HCUP Fast Stats at http://www.hcup-us.ahrq.gov/faststats/landing.jsp for easy access to the latest HCUP-based statistics for health information topics, or visit HCUPnet, HCUP's interactive query system, at http://hcupnet.ahrq.gov/.

For information on other hospitalizations in the United States, refer to the following HCUP Statistical Briefs located at http://www.hcup-us.ahrq.gov/reports/statbriefs/statbriefs.jsp:

- Statistical Brief #180, Overview of Hospital Stays in the United States, 2012
- Statistical Brief #181, Costs for Hospital Stays in the United States, 2012
- Statistical Brief #186, Most Frequent Operating Room Procedures Performed in U.S. Hospitals, 2003–2012
- Statistical Brief #162, Most Frequent Conditions in U.S. Hospitals, 2011

For a detailed description of HCUP and more information on the design of the National Inpatient Sample (NIS) and the Nationwide Emergency Department Sample (NEDS), please refer to the following database documentation:

Agency for Healthcare Research and Quality. Overview of the National (Nationwide) Inpatient Sample (NIS). Healthcare Cost and Utilization Project (HCUP). Rockville, MD: Agency for Healthcare Research and Quality. Updated November 2016. http://www.hcup-us.ahrq.gov/nisoverview.jsp. Accessed February 17, 2016

Agency for Healthcare Research and Quality. Overview of the Nationwide Emergency Department Sample (NEDS). Healthcare Cost and Utilization Project (HCUP). Rockville, MD: Agency for Healthcare Research and Quality. Updated January 2016. http://www.hcup-us.ahrq.gov/nedsoverview.jsp. Accessed February 17, 2016.

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* * *

AHRQ welcomes questions and comments from readers of this publication who are interested in obtaining more information about access, cost, use, financing, and quality of health care in the United States. We also invite you to tell us how you are using this Statistical Brief and other HCUP data and tools, and to share suggestions on how HCUP products might be enhanced to further meet your needs. Please e-mail us at hcup@ahrq.gov or send a letter to the address below:

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