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Hip Fracture-Related Emergency Department Visits, Hospitalizations and Deaths by Mechanism of Injury among Adults Aged 65 and Older, United States 2019

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Abstract

Objective: Describe rates of hip fracture-related emergency department (ED) visits, hospitalizations, and deaths among older adults (aged ≥65 years) in the United States.

Methods: Data from the 2019 Healthcare Cost and Utilization Project and National Vital Statistics System were used to calculate rates of hip fracture-related ED visits, hospitalizations, and deaths among older adults by select characteristics and mechanism of injury.

Results: In 2019, there were 318,797 ED visits, 290,130 hospitalizations, and 7731 deaths related to hip fractures among older adults. About 88% of ED visits and hospitalizations and approximately 83% of deaths related to hip fractures were caused by falls. Rates were highest among older adults living in rural areas and among those aged ≥85 years.

Discussion: Most hip fractures among older adults are fall-related. Healthcare providers can prevent falls among their older patients by screening for fall risk, assessing modifiable risk factors, and offering evidence-based interventions.

Keywords

hip fracture; fall; older adult; injury

Introduction

Falls among older adults (adults aged ≥65 years) result in substantial health and economic costs for patients, the healthcare system, and society. In the United States (USA), falls are the leading cause of injury among older adults. Approximately one out of four older adults in the USA falls each year (Moreland et al., 2020) leading to over eight million injuries (Moreland et al., 2020) approximately three million emergency department (ED) visits (Web-based Injury Statistics Query and Reporting System [WISQARS], 2022), one million hospitalizations (WISQARS, 2022) and 37,000 deaths (Wide-ranging Online Data

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for Epidemiologic Research [WONDER], 2022). Fall-related death rates have increased in the past decade (Burns & Kakara, 2018). In 2020, nonfatal older adult falls resulted in an estimated $53.9 billion in direct medical expenses[1] (Florence et al., 2018).

Common fall-related injuries include hip fractures and traumatic brain injuries, both of which can be fatal (Haddad et al., 2020). More than a quarter of fatal falls involve a hip fracture (Stevens & Rudd, 2014; WONDER, 2022). Potential complications from hip fracture can include deep vein thrombosis, pulmonary embolism, pressure injuries, persistent disability, fear of falling, nursing home placement, loss of independence, and death (Mariconda et al., 2015; Wahlsten et al., 2020). Hip fractures have been estimated to have a 1-year mortality rate of 12%–25% (Braithwaite et al., 2003; LeBlanc et al., 2014).

Literature from the 1990s suggests that over 90% of older adult hip fractures are a result of falls (Grisso et al., 1991; Parkkari et al., 1999). One study in the USA used 2008 data to describe ED-treated hip fracture rates by sex and age (Kim et al., 2012), but there have not been recent studies describing nonfatal and fatal hip fractures by mechanism of injury or geographic characteristics among older Americans. Recent studies have mostly been from countries other than the USA. For example, a recent Swedish study reported 97% of extracapsular hip fractures in older adults were the result of a fall (Mattisson et al., 2018). To our knowledge, there have not been recent attempts to produce comparative estimates of fall-related hip fractures in the USA. This paper aims to quantify the number of ED visits, hospitalizations, and deaths due to hip fracture among older Americans based on data from 2019 from Agency for Healthcare Research and Quality (AHRQ) and Centers for Disease Control and Prevention (CDC) databases, by mechanism of injury and demographics.

Materials and Methods

ED visit and hospitalization data were obtained from the Healthcare Cost Utilization project (HCUP) 2019 Nationwide ED Sample (NEDS) and National Inpatient Sample (NIS), respectively. These datasets are sponsored by the AHRQ and are weighted to represent the USA population. The NEDS includes data from over 30 million ED visit records each year representing approximately 145 million ED visits when weighted to the USA population. The NIS is an approximately 20% stratified sample of USA hospital discharges containing over seven million records representing over 35 million hospitalizations per year when weighted.[2] This analysis was limited to adults aged ≥65 years. There were approximately 7.0 million ED visits and approximately 2.7 million hospitalizations among older adults overall representing over 30 million ED visits and 13 million hospitalizations when weighted (Table 1).

ED visits among older adults were determined to be hip fracture-related if a hip fracture International Classification of Disease 10th revision Clinical Modification (ICD-10-CM) code (Appendix 1) was present in any of the diagnosis fields (Thomas & Johnson, 2021). Hospitalizations were considered hip fracture-related if the primary diagnosis code indicated

1. 2015 dollars inflated to 2020 dollars using the health component of the personal consumption expenditures price index https://apps.bea.gov/iTable/iTable.cfm?reqid=19&step=2#reqid=19&step=2&isuri=1&1921=survey accessed October 6, 2021
2. https://www.hcup-us.ahrq.gov/, accessed September 24, 2021

an injury and a hip fracture code was present in any diagnosis field (Appendix 1) (Thomas & Johnson, 2021). Mechanism of injury for ED visits and hospitalizations were classified as an unintentional fall if one of the appropriate ICD-10-CM codes were in any field (Appendix 1) (Thomas & Johnson, 2021). The mechanism was categorized as "other mechanism of injury" if the record did not have a fall code but did have another code containing external cause of injury information (Appendix 1) (Thomas & Johnson, 2021). Records without such a code had an "unknown mechanism of injury." Records were excluded if the patient died in the ED or hospital.

Weighted estimates and percentages for hip fracture-related ED visits and hospitalizations and their 95% confidence intervals were calculated using SAS 9.4 survey procedures. Rates were calculated using bridged race population estimates obtained from National Center for Health Statistics (NCHSs) as the denominator (NCHS, 2021). All rates were age-adjusted, except age-group specific rates, by the direct method of age adjusting using the 2000 standard USA population (Klein, 2001).

Data on hip fracture-related deaths for those aged 65 years and older were obtained from the 2019 National Vital Statistics System (NVSS) multiple cause of death files available through CDC WONDER.[3] The NVSS is a partnership between the National Center for Health Statistics and state/local jurisdictions which results in the compilation of records of all deaths in the USA (Table 1).[4] Deaths were classified as hip fracture-related if they had an injury underlying cause of death (Thomas & Johnson, 2021) and a hip fracture-related International Classification of Diseases, 10th Revision (ICD-10) code in one of the 20 multiple cause of death fields (Appendix 1) (Pabich & Binkley, 2020). The mechanism of death was defined as an unintentional fall if the underlying cause of death included fall death codes (Appendix 1) (Thomas & Johnson, 2021).

For the analysis, the patient's county of residence was categorized as urban if it was labeled one of the following in the three data sets: large central metropolitan, large fringe metropolitan, medium metropolitan, or small metropolitan. County of residence was categorized as rural if it was labeled non-metropolitan or micropolitan (Ingram & Franco, 2014). Hip fracture hospitalizations were reported by census division of the hospital, and deaths were reported by census division of decedent's residence (Appendix 2). Disposition from the ED and hospital were determined from the disposition codes in NEDS and NIS. These included: routine (discharged home or self-care), admitted as inpatient to the same hospital, transfer to short term hospital, other transfer (such as rehabilitation facility or skilled nursing facility), home health care, left against medical advice, or unknown. Those observations missing a disposition code were grouped with those coded as unknown disposition. Z-tests were used to determine statistically significant differences between rates.

3. https://wonder.cdc.gov/, accessed March 14, 2022
4. https://www.cdc.gov/nchs/nvss, accessed March 14, 2022

Results

Emergency Department Visits

In 2019, there were 318,797 ED visits where older adults were diagnosed with a hip fracture (620.0 per 100,000 older adults; 95% CI:598.8, 641.1) (Table 2). Women had a higher rate of hip fracture-related ED visits (727.3 per 100,000 older women; 95% CI: 702.0, 752.6) compared to men (467.2 per 100,000 older men; 95% CI: 450.4, 483.9) (Table 2). Hip fracture ED visits increased with age. There were 2009.9 hip fracture ED visits per 100,000 adults aged 85 years and older (95% CI:1894.7, 2125.0) compared to 716.7 ED visits per 100,000 adults aged 75–84 (95% CI:676.0, 757.5) and 227.9 ED visits per 100,000 adults aged 65–74 (95% CI:216.0, 239.8) (Table 2). The rate of hip fracture-related ED visits was higher among older adults residing in rural areas (759.9 per 100,000 older adults; 95% CI: 718.4, 801.5) compared to older adults residing in urban areas (589.4 per 100,000 older adults; 95% CI:566.0, 612.8) (Table 2). Falls were the reported mechanism of injury for 87.5% of hip fracture ED visits among older adults. Other external causes of injury were responsible for 3.8% of hip fracture ED visits, and another 8.7% of ED visits for hip fractures did not record an external cause of injury (Table 2).

Hospitalizations

In 2019, there were 290,130 hospitalizations for hip fractures among older adults (564.5 per 100,000 older adults; 95% CI: 554.5, 574.5) (Table 3). Women had a higher rate of hospitalizations for hip fractures (668.9 per 100,000 older women; 95% CI:656.3, 681.5) compared to men (415.7 per 100,000 older men; 95% CI: 406.8, 424.6) (Table 3). Hospitalization rates for hip fractures increased with age. There were 205.6 hip fracture hospitalizations (95% CI:199.5, 211.6) per 100,000 adults aged 65–74 years, 654.8 hip fracture hospitalizations (95% CI: 635.6, 673.9) per 100,000 adults aged 75–84 years, and 1831.9 hospitalizations for hip fractures (95% CI: 1777.5, 1886.3) per 100,000 adults aged 85 years and older (Table 3). Age-adjusted rates of hospitalizations varied among census division from a low of 481.4 hospitalizations (95% CI: 458.2, 504.7) per 100,000 older adults in the Pacific division, to a high of 723.7 hospitalizations (95% CI: 665.3, 782.1) per 100,000 older adults in the East South Central division (Table 3). There was a higher rate of hospitalizations for hip fracture among older adults residing in a rural area (629.7 per 100,000 older adults; 95% CI: 607.7, 651.7) compared to those residing in an urban area (549.8 per 100,000 older adults; 95% CI: 539.1, 560.6) (Table 3). Falls were the mechanism of injury for 88.4% of hip fracture hospitalizations. Other mechanisms of injury were responsible for 3.4% of hospitalizations for hip fractures, while 8.2% of hip fracture hospitalization records did not include a mechanism of injury (Table 3). A higher percentage of hospitalizations where older adults resided in a rural area did not have a mechanism of injury recorded (10.6%) compared to urban areas (7.7%) (Table 3).

The majority (85.1%) of older adults who were diagnosed with a hip fracture in the ED were admitted as an inpatient to the same hospital (Table 4). The majority (82.8%) of older adults who were hospitalized for a hip fracture were transferred to another facility such as a skilled nursing facility or rehabilitation facility following their hospitalization (Table 4).

Deaths

In 2019, 7731 older adult deaths were related to a hip fracture (Table 5). The rate of hip fracture-related deaths did not significantly differ by sex but did differ by age group (Table 5). Adults aged ≥85 years with hip fracture had a death rate of 78.1 per 100,000 (95% CI:76.0, 80.2), compared to 1.9 deaths (95% CI: 1.7, 2.0) per 100,000 adults aged 65–74 years, and 12.4 deaths (11.9, 13.0) per 100,000 adults aged 75–84 years (Table 5). Falls were the mechanism of injury for 83.3% of these deaths (Table 5). Hip fracture death rates varied by census division from a low of 7.5 deaths (95% CI: 6.9, 8.2) per 100,000 older adults in the Middle Atlantic division and a high of 23.0 deaths per 100,000 older adults living in the Mountain division (95% CI:21.4, 24.6) (Table 5). The hip fracture mortality rate was higher among older adults residing in rural areas (18.2 deaths per 100,000 older adults; 95% CI: 17.3, 19.1) compared to older adults residing in urban areas (14.3 deaths per 100,000 older adults; 95% CI: 13.9, 14.7) (Table 5).

Discussion

In 2019, there were over 318,000 ED visits and 290,000 hospitalizations related to hip fractures among older adults. Approximately 88% of ED-treated and hospitalized hip fractures were the result of a fall. Females and those living in rural settings had higher rates of ED visits and hospitalizations due to hip fracture than males and those living in urban settings, respectively. Older age was associated with increased rates of ED visits and hospitalizations related to hip fractures. Adults aged ≥85 years had hip fracture-related ED visit rates 9 times higher than those aged 65–74 years. Additionally, people in East South Central and West South Central census divisions had higher rates of hip fracture-related hospitalizations compared to other census divisions.

Nonfatal hip fractures significantly contribute to long-term disability (Papadimitriou et al., 2017). One study showed hip fractures were responsible for a loss of 27 Disability Adjusted Life Years per 1000 middle-aged and older adults in the USA and Europe (Papadimitriou et al., 2017). Hip fractures often result in nursing home admission. The percentage of hip fractures resulting in nursing home admission increases with age from 3.2% among adults in their 60s to 22.4% among adults in their 90s (Wahlsten et al., 2020). In our study, approximately 83% of hip fracture-related hospitalizations resulted in transfer to a skilled nursing facility, rehabilitation, or another facility, likely including both short- and long-term stays. Older adults who have been hospitalized for a hip fracture spend an estimated 334 days in a nursing facility during their lifetime compared to an estimated 97 days for older adults without a hip fracture (Braithwaite et al., 2003).

In 2019, over 7700 older adult deaths were related to hip fractures. Increasing age was associated with hip fracture-related deaths, with rates 41 times higher in those aged ≥85 years when compared to those aged 65–74. Although women had higher rates of hip fracture-related ED visits and hospitalizations, hip fracture-related death rates did not significantly differ by sex. There was regional variation, with those living in certain census divisions, such as the West North Central and Mountain divisions experiencing higher death rates related to hip fracture when compared to other divisions. In one study of patients who had surgery for hip fracture, 4.3% died within 30 days of being discharged from the hospital

including patients who died during surgery and 18.8% of patients had died within 1 year (Mariconda et al., 2015). Factors associated with death following surgery for hip fracture included increased age, number of chronic conditions, dependence with activities of daily living after 1 year and male gender (Mariconda et al., 2015).

One previous study found that following a hip fracture, women had 1.3 times the odds of death compared to those without a hip fracture, while men had 7.2 times the odds of death compared to those without hip fracture (Fransen et al., 2002). This suggests that although women have higher rates of nonfatal hip fractures, men are more likely to die following a hip fracture, compared to older women. While our study was not able to draw conclusions regarding sex-specific case fatality rates among those with hip fracture, such research suggests that men may be at increased risk. Research also shows that men are less likely than women to be evaluated or treated with anti-resorptive therapy for osteoporosis after a hip fracture (Kiebzak et al., 2002) potentially a missed opportunity for secondary prevention.

More than 8% of ED visits and hospitalizations did not have a documented external cause code, and approximately 3% had an external cause other than a fall. In a recent Swedish study, only 3.1% of hip fractures were caused by a mechanism other than a fall. It is possible some of the visits in our datasets without an external cause code were due to undocumented falls. Compared to older, smaller studies that reported 90%–95% of hip fracture deaths were caused by a fall (Grisso et al., 1991; Hedlund & Lindgren, 1987; Parkkari et al., 1999.), only 83% of the hip fracture-related deaths were associated with a fall in our study. Approximately 17% of hip fracture-related deaths had an external code other than a fall (e.g., X59, exposure to unspecified factor); this ranged from 8.4% among Pacific states up to 42.2% in East South Central states. This variation may be due to coding behaviors that vary by state and could result in incomplete ascertainment of fall-related deaths.

This analysis produced updated estimates based on a large sample of nationally representative ED visits, hospitalizations, and death records. However, there are limitations of this study. First, HCUP data describes medical visits, not patients, so we could not describe the number of patients treated for a hip fracture. Second, hip fracture ED visits and hospitalization records could have multiple mechanisms of injury reported. In cases where both falls and another mechanism of injury were reported, these visits were considered fall-related. Third, the accuracy and completeness of the codes submitted by each healthcare system and medical examiner/coroner is unknown. Over 8% of medically-treated hip fractures were missing an external cause code, which could contribute to undercounting of fall-related hip fractures. Fourth, we were not able to stratify our results by race or ethnicity as this information was not consistently reported across datasets. Future studies are needed to determine if rates of hip fractures in the USA differ by race or ethnicity.

Our research has important clinical implications. Hip fractures are common among both older women and men, and they increase with age. In addition, hip fractures have the potential to result in long-term disability and loss of independence. Most hip fractures among older adults in the USA are caused by falls. Although common, falls can be

prevented. Our findings suggest that certain groups may benefit from targeted fall prevention efforts, namely, those aged ≥85 years, women, and those residing in rural settings.

The CDC created the Stopping Elderly, Accidents, Deaths, and Injuries (STEADI) initiative to help healthcare providers screen their older patients for fall risk, assess modifiable fall risk factors, and intervene to reduce older patients' fall risk (CDC STEADI, 2021). The American Geriatrics Society, British Geriatrics Society (AGS/BGS), and CDC recommend that adults aged ≥65 years should be screened annually for fall risk or following a reported fall (AGS/BGS, 2011; CDC STEADI, 2021). Patients at risk for falls can be evaluated and treated for modifiable risk factors by evaluating gait, strength, and balance and referring to physical therapy when indicated; identifying and adjusting medications that increase fall risk (with a particular focus on psychotropic medications); diagnosing and treating orthostatic hypotension; and identifying and addressing home safety hazards (CDC STEADI, 2021). Interventions such as referral to evidence-based exercise programs, such as tai chi, referral to ophthalmologist or optometrist to address visual issues, and home modifications conducted by an occupational therapist have the potential to prevent falls (Stevens & Lee, 2018).

When indicated, screening for and treatment of osteoporosis, which increases risk for fracture, are also critical to prevent hip and other fractures. The United States Preventive Services Task Force (USPSTF) recommends that, among older adults, women aged ≥65 years should be screened routinely for osteoporosis with bone mineral density (BMD) testing to prevent osteoporotic fracture (USPSTF, 2018). While the USPSTF found insufficient evidence to make a similar recommendation for men, several expert groups recommend BMD testing for men older than 70, and for younger men aged 50–70 when risk factors are present (Cosman et al., 2014; Watts et al., 2012).

Conclusion

There were over 318,000 ED visits, over 290,000 hospitalizations, and over 7700 deaths related to hip fractures among older adults in the USA in 2019. Most hip fractures were caused by falls. Falls are common among older adults, but many are preventable. Primary care providers can prevent falls among their older patients by screening for fall risk annually or after a fall, assessing modifiable risk factors such as strength and balance issues, and offering evidence-based interventions to reduce older adults' risk of falls.

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Disclaimer

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention

Appendix 1

Injury Case Definitions for Emergency Department Visits, Hospitalizations, and Deaths

Hip Fracture-Related Emergency Department Visits

One of the following ICD-10-CM codes in any field

Code[a]	Description
S72.0	Fracture of head and neck of femur
S72.1	Pertrochanteric fracture
S72.2	Subtrochanteric fracture
M97.0	Periprosthetic fracture around internal prosthetic hip joint

[a]Include only cases with a seventh character A,B,C or missing (Initial encounter).

Hip Fracture-Related Hospitalizations

Primary diagnosis field includes one of the following ICD-10-CM codes

Code(s)[a]	Description
S00–S99	Anatomic injuries
T07–T34	Foreign bodies, burns, corrosions, frostbite
T36–T50 with a 6th character of 1, 2, 3, or 4 (except T36.9, T37.9, T39.9, T41.4, T42.7, T43.9, T45.9, T47.9, and T49.9 which have a 5th character of 1, 2, 3, or 4)	Poisoning by drugs, medicaments, and biological substances (includes accidental, intentional self-harm, assault, and underdetermined intents; excludes adverse effects and underdosing)
T51–T65	Toxic effects of substances nonmedicinal as to source
T66–T76	Other and unspecified effects of external causes
T79	Certain early complications of trauma, not elsewhere classified
M97	Periprosthetic fracture around internal prosthetic hip joint

[a]Include only cases with a seventh character A,B,C or missing (initial encounter).

AND one of the following ICD-10-CM codes included in any position

Code[a]	Description
S72.0	Fracture of head and neck of femur
S72.1	Pertrochanteric fracture
S72.2	Subtrochanteric fracture
M97.0	Periprosthetic fracture around internal prosthetic hip joint

[a]Include only cases with a seventh character A,B,C or missing (initial encounter).

Hip Fracture-Related Deaths

Underlying cause of death of one of the following ICD-10 codes

Code(s)	Description
U01–U03	Injuries related to terrorism
V01–V99	Transport accidents
W00–X59	Other external cause of accidental injury
X60–X84	Intentional self-harm
X85–Y09	Assault
Y10–Y34	Event of undetermined intent
Y35–Y36	Legal intervention and operations of war
Y85–Y87	Sequalae of transport accidents, other accidental injury, self-harm assault, or events of undetermined intent
Y89	Sequalae of other external causes

AND multiple cause of death of one of the following ICD-10 codes

Code	Description
S72.0	Fracture of neck of femur
S72.1	Pertrochanteric fracture
S72.2	Subtrochanteric fracture

Hip Fracture-related ED Visits and Hospitalizations Related to Falls and Other External Causes

Hip fracture-related ED visit or hospitalization as previously described **AND** one of the following ICD-10-CM codes in any field

External Cause	Code(s)[a]	Description
Falls	V00.1–V00.8 with 6th character=1	Falls related to pedestrian conveyance
	W00–W15, W17, W19	Falls
	W16 with 6th character=2,W16.42, W16.92	Fall, jump, or dive into water
	W18.1–W18.3	Other falls
Other external causes[b]	T14.19	Suicide attempt
	T15–T19	Effects of foreign body entering through natural orifice
	T36–T50 with 6th character = 1,2,3,4 (except T36.9, T37.9, T39.9, T41.4, T42.7, T43.9, T45.9, T47.9, and T49.9 which have a 5th character=1,2,3,4)	Poisoning by drugs, medicaments, and biological substances
	T51–T65	Toxic effects of substances chiefly nonmedicinal as to source
	T71–T74, T75.0–T75.4, T76	Asphyxiation, Effects of deprivation, adult and child abuse, neglect, other maltreatment

External Cause	Code(s)[a]	Description
		(suspected or confirmed), Effects of lightening, drowning, vibration, motion sickness, and electrocution
	V00.0, V00.1–V00.8 with 6th character = 2, 8	Pedestrian on foot injured in collision with pedestrian conveyance
	V01–V99	Transport related accident
	W16 with a 6th character=1, W16.41, W16.91	Fall, jump, or diving into water causing drowning and submersion
	W18.0, W18.4	Striking against object with subsequent fall, slipping, tripping, or stumbling without falling
	W20–X52	Other external causes of accidental injury
	X71–X83	Intentional self-harm
	X92–Y09	Assault
	Y21–Y33	Event of undetermined intent
	Y35–Y38	Legal intervention, operations of war, military operations, and terrorism

[a]Include only cases with a seventh character A or missing (initial encounter).

[b]Hip fracture-related visits were only considered related to another cause if they were not related to a fall (i.e., if a visit had both a fall and a non-fall external cause code, it was counted as a fall).

Hip Fracture Deaths Related to Falls and Other External Causes

Multiple cause of death related to a hip fracture as previously described and an underlying cause of death of one of the following ICD-10 codes

External Cause	Code(s)	Description
Falls	W00–W19	Falls
Other external cause	U01–U03	Injuries related to terrorism
	V01–V99	Transport accidents
	W20–X59	Other external cause of accidental injury
	X60–X84	Intentional self-harm
	X85–Y09	Assault
	Y10–Y34	Event of undetermined intent
	Y35–Y36	Legal intervention and operations of war
	Y85–Y87	Sequalae of transport accidents, other accidental injury, self-harm assault, or events of undetermined intent
	Y89	Sequalae of other external causes

Appendix 2: United States Census Divisions

USA Census Divisions

Census Division	States
New England	Maine, New Hampshire, Vermont, Massachusetts, Connecticut, Rhode Island

Census Division	States
Middle Atlantic	New York, Pennsylvania, New Jersey
East North Central	Wisconsin, Michigan, Illinois, Indiana, Ohio
West North Central	North Dakota, South Dakota, Nebraska, Kansas, Minnesota, Iowa, Missouri
South Atlantic	West Virginia, Maryland, Delaware, District of Columbia, Virginia, North Carolina, South Carolina, Georgia, Florida
East South Central	Kentucky, Tennessee, Alabama, Mississippi
West South Central	Oklahoma, Arkansas, Louisiana, Texas
Mountain	Montana, Idaho, Wyoming, Utah, Colorado, Arizona, New Mexico, Nevada
Pacific	Alaska, Washington, Oregon, California, Hawaii

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Table 1.

Description of the Healthcare Cost and Utilization Project-Nationwide Emergency Department Sample (HCUP-NEDS), National Inpatient Sample (HCUP-NIS), and the National Vital Statistics System (NVSS), United States 2019.

Data Set	Description	Total Number of ED Visits/Hospitalizations/Deaths Among Older Adults (Aged ≥65 Years)	Corresponding Table
HCUP-NEDS[a]	Sample of hospital-owned ED visits weighted to be nationally representative of U.S. ED visits	7.0 million ED visits representing 30 million ED visits among older adults when weighted	Tables 2 and 4
HCUP-NIS[b]	20% stratified sample of discharges from all community hospitals in the USA, weighted to be nationally representative of USA hospitalizations	2.7 million hospitalizations representing 13 million hospitalizations among older adults when weighted	Tables 3 and 4
NVSS[c]	Data from all death certificates filed for USA residents in the 50 states and District of Columbia	2.1 million deaths among older adults	Table 5

Note. ED = Emergency Department.

[a] https://www.hcup-us.ahrq.gov/nedsoverview.jsp.

[b] https://www.hcup-us.ahrq.gov/nisoverview.jsp.

[c] https://wonder.cdc.gov/.

Table 2.

Emergency Department Visits among Adults Aged ≥65 years with a Diagnosed Hip Fracture by Mechanism of Injury and Demographic Characteristics, Healthcare Cost and Utilization Project-Nationwide Emergency Department Sample—United States, 2019.

Mechanism	Total Hip Fractures			Hip Fractures Related to Falls			Hip Fractures Related to Other Mechanism of Injury			Hip Fractures Without a Mechanism of Injury Coded		
Characteristic	N[a]	Rate[b]	95% CI[c]	N[a]	%	95% CI[c]	N[a]	%	95% CI[c]	N[a]	%	95% CI[c]
Total[d]	318,797	620.0	(598.8, 641.1)	278,976	87.5	(86.3, 88.8)	12,142	3.8	(3.6, 4.0)	27,679	8.7	(7.4, 10.0)
Sex												
Male	99,506	467.2	(450.4, 483.9)	85,166	85.6	(84.2, 86.9)	5266	5.3	(4.9, 5.6)	9074	9.1	(7.8, 10.5)
Female	219,276	727.3	(702.0, 752.6)	193,795	88.4	(87.1, 89.6)	6876	3.1	(2.9, 3.3)	18,605	8.5	(7.2, 9.8)
Age group												
65–74	71,722	227.9	(216.0, 239.8)	60,092	83.8	(82.5, 85.1)	4752	6.6	(6.2, 7.1)	6878	9.6	(8.3, 10.9)
75–84	114,435	716.7	(676.0, 757.5)	99,999	87.4	(86.1, 88.7)	4339	3.8	(3.5, 4.1)	10,097	8.8	(7.5, 10.1)
85+	132,640	2009.9	(1894.7, 2125.0)	118,885	89.6	(88.3, 91.0)	3050	2.3	(2.1, 2.5)	10,704	8.1	(6.7, 9.4)
Urban/Rural												
Urban	251,894	589.4	(566.0, 612.8)	221,173	87.8	(86.4, 89.2)	9369	3.7	(3.5, 3.9)	21,352	8.5	(7.0, 9.9)
Rural	66,056	759.9	(718.4, 801.5)	57,124	86.5	(84.6, 88.3)	2682	4.1	(3.7, 4.5)	6251	9.5	(7.6, 11.3)

[a] Number of emergency department visits among older adults weighted to be nationally representative of USA.

[b] Rate per 100,000 population. All rates except the age group specific rates were age-adjusted using the direct method of age adjusting to the 2000 standard USA population.

[c] CI = Confidence Interval.

[d] Totals may not add up due to missing values for sex and urban/rural status and rounding of weighted estimates.

Table 3.

Hospitalizations among Adults Aged ≥65 years with a Diagnosed Hip Fracture by Mechanism of Injury and Demographic Characteristics, Healthcare Cost and Utilization Project-National Inpatient Sample—United States, 2019

	Total Hip Fractures			Hip Fractures Related to Falls			Hip Fracture-Related to Other External Cause			Hip Fracture Without Mechanism of Injury Coded		
Mechanism	**N**[a]	**Rate**[b]	**95% CI**[b]	**N**[a]	**%**	**95% CI**[c]	**N**[a]	**%**	**95% CI**[c]	**N**[a]	**%**	**95% CI**[c]
Total[d]	290,130	564.5	(554.5, 574.5)	256,465	88.4	(87.6, 89.2)	9840	3.4	(3.2, 3.6)	23,825	8.2	(7.4, 9.0)
Sex												
Male	88,505	415.7	(406.8, 424.6)	76,380	86.3	(85.4, 87.2)	4520	5.1	(4.8, 5.5)	7605	8.6	(7.7, 9.5)
Female	201,615	668.9	(656.3, 681.5)	180,075	89.3	(88.6, 90.1)	5320	2.6	(2.5, 2.8)	16,220	8.0	(7.3, 8.8)
Age group												
65–74	64,695	205.6	(199.5, 211.6)	54,930	84.9	(83.9, 85.9)	3835	5.9	(5.5, 6.4)	5930	9.2	(8.2, 10.1)
75–84	104,540	654.8	(635.6, 673.9)	92,050	88.1	(87.2, 89.0)	3505	3.4	(3.1, 3.6)	8985	8.6	(7.7, 9.5)
85+	120,895	1831.9	(1777.5, 1886.3)	109,485	90.6	(89.8, 91.3)	2500	2.1	(1.9, 2.3)	8910	7.4	(6.6, 8.1)
Census division[e]												
New England	14,420	552.9	(516.7, 589.1)	12,835	89.0	(86.9, 91.1)	525	3.6	(2.9, 4.4)	1060	7.4	(5.3, 9.4)
Middle Atlantic	35,745	495.5	(470.1, 520.9)	33,210	92.9	(92.1, 93.7)	1295	3.6	(3.2, 4.1)	1240	3.5	(2.8, 4.1)
East North Central	42,485	559.7	(536.2, 583.1)	32,475	76.4	(72.7, 80.2)	1425	3.4	(2.9, 3.8)	8585	20.2	(16.4, 24.1)
West North Central	21,545	611.4	(575.9, 647.0)	19,345	89.8	(88.3, 91.3)	735	3.4	(2.8, 4.0)	1465	6.8	(5.4, 8.2)
South Atlantic	61,840	561.4	(538.2, 584.6)	55,920	90.4	(89.3, 91.5)	1895	3.1	(2.7, 3.4)	4025	6.5	(5.4, 7.6)
East South Central	21,370	723.7	(665.3, 782.1)	19,395	90.8	(89.5, 92.0)	640	3.0	(2.3, 3.7)	1335	6.2	(4.9, 7.6)
West South Central	34,580	672.3	(638.7, 705.9)	30,760	89.0	(86.6, 91.3)	995	2.9	(2.4, 3.4)	2825	8.2	(5.8, 10.5)
Mountain	20,760	569.2	(532.2, 606.1)	18,280	88.1	(84.1, 92.0)	865	4.2	(3.4, 4.9)	1615	7.8	(3.7, 11.8)
Pacific	37,385	481.4	(458.2, 504.7)	34,245	91.6	(90.3, 92.9)	1465	3.9	(3.4, 4.4)	1675	4.5	(3.2, 5.7)
Urban/Rural												
Urban	234,800	549.8	(539.1, 560.6)	208,980	89.0	(88.2, 89.8)	7805	3.3	(3.1, 3.5)	18,015	7.7	(6.9, 8.5)
Rural	54,785	629.7	(607.7, 651.7)	47,005	85.8	(84.5, 87.1)	1990	3.6	(3.3, 4.0)	5790	10.6	(9.2, 11.9)

[a] Number of hospitalizations related to hip fractures weighted to be nationally representative of USA hospitalizations among older adults.

[b] Rate per 100,000 population. All rates except the age group specific rates were age-adjusted using the direct method of age adjusting with the 2000 standard USA population.

[c] CI = Confidence Interval.

[d]Totals may not add up due to missing values for sex, census division, urban/rural status and rounding of weighted estimates.

[e]New England (ME, NH, VT, MA, CT, RI); Middle Atlantic (NY, PA, NJ); East North Central (WI, MI, IL, IN, OH); West North Central (ND, SD, NE, KS, MN, IA, MO); South Atlantic (WV, MD, DE, DC, VA, NC, SC, GA, FL); East South Central (KY, TN, AL, MS); West South Central (OK, AR, LA, TX); Mountain (MT, ID, WY, UT, CO, AZ, NM, NV); Pacific (AK, WA, OR, CA, HI).

Table 4.

Disposition Following Emergency Department Visit and Hospitalization for a Diagnosed Hip Fracture among Adults Aged ≥65 Years, Healthcare Cost and Utilization Project-Nationwide Emergency Department Sample, National Inpatient Sample—United States, 2019

	Disposition from Emergency Department Visits (*N* = 318,797)			Disposition after Hospitalization (*N* = 290,130)		
Disposition	**N**[a]	**%**	**95% CI**[b]	**N**[a]	**%**	**95% CI**[b]
Routine	10,944	3.4	(3.1, 3.7)	14,485	5.0	(4.7, 5.2)
Transfer to short term hospital	28,310	8.9	(8.1, 9.7)	5685	2.0	(1.8, 2.1)
Other transfer (SNF, rehab, other facility)[c]	7196	2.3	(2.0, 2.5)	240,205	82.8	(82.4, 83.2)
Home health	792	0.2	(.2, .3)	29,070	10.0	(9.7, 10.3)
Against medical advice	304	0.1	(.1, .1)	585	0.2	(.1, .3)
Admitted as inpatient to same hospital[d]	271,193	85.1	(84.1, 86.0)	–	–	–
Disposition unknown/missing	57	0.0	(.0, .0)	100	0.0	(.0, .1)

[a] Number of ED visits/hospitalizations related to hip fractures weighted to be nationally representative of USA

[b] CI = Confidence Interval.

[c] Other transfers include transfers to skilled nursing facilities, rehabilitation facilities, and other facilities.

[d] The number of patients admitted to same hospital from the emergency department differs from the number of hospitalizations because ED visits and hospitalizations come from two different data sets (HCUP-NEDS and HCUP-NIS).

Table 5.

Number and Rate of Hip Fracture Related Deaths among Adults Aged ≥65 years by Mechanism of Injury and Select Characteristics, National Vital Statistics System—United States, 2019

	Hip Fracture Deaths			Hip Fracture Deaths Related to Falls				Hip Fracture Deaths Related to Other External Causes			
Mechanism	**N[a]**	**Rate[b]**	**95% CI[c]**	**N[a]**	**Rate[b]**	**95% CI[c]**	**% Caused by Falls**	**N[a]**	**Rate[b]**	**95% CI[c]**	**% Caused by Other External Cause**
Total	7731	15.0	(14.6, 15.3)	6438	12.5	(12.2, 12.8)	83.3	1293	2.5	(2.4, 2.6)	16.7
Sex											
Male	2939	14.6	(14.1, 15.2)	2446	12.2	(11.7, 12.7)	83.2	493	2.5	(2.3, 2.7)	16.8
Female	4792	15.1	(14.7, 15.5)	3992	12.6	(12.2, 13.0)	83.3	800	2.5	(2.3, 2.7)	16.7
Age group											
65–74	587	1.9	(1.7, 2.0)	487	1.5	(1.4, 1.7)	83.0	100	0.3	(.3, .4)	17.0
75–84	1985	12.4	(11.9, 13.0)	1702	10.7	(10.2, 11.2)	85.7	283	1.8	(1.6, 2.0)	14.3
85+	5159	78.1	(76.0, 80.2)	4249	64.3	(62.4, 66.3)	82.4	910	13.8	(12.9, 14.7)	17.6
Census divisions[d]											
New England	450	16.5	(15.0, 18.1)	396	14.6	(13.2, 16.1)	88.0	54	1.9	(1.4, 2.5)	12.0
Middle Atlantic	568	7.5	(6.9, 8.2)	372	5.0	(4.5, 5.5)	65.5	196	2.6	(2.2, 2.9)	34.5
East North Central	1462	18.9	(17.9, 19.9)	1220	15.8	(14.9, 16.7)	83.4	242	3.1	(2.7, 3.5)	16.6
West North Central	825	22.5	(20.9, 24.0)	684	18.7	(17.3, 20.1)	82.9	141	3.8	(3.2, 4.4)	17.1
South Atlantic	1780	16.4	(15.6, 17.2)	1624	14.9	(14.2, 15.7)	91.2	156	1.5	(1.2, 1.7)	8.8
East South Central	445	15.5	(14.1, 17.0)	257	9.0	(7.9, 10.1)	57.8	188	6.6	(5.6, 7.5)	42.2
West South Central	590	11.7	(10.7, 12.6)	424	8.4	(7.6, 9.2)	71.9	166	3.3	(2.8, 3.8)	28.1
Mountain	799	23.0	(21.4, 24.6)	717	20.7	(19.2, 22.2)	89.7	82	2.3	(1.9, 2.9)	10.3
Pacific	812	10.3	(9.6, 11.0)	744	9.5	(8.8, 10.2)	91.6	68	0.8	(.7, 1.1)	8.4
Urban/Rural											
Urban	6156	14.3	(13.9, 14.7)	5307	12.4	(12.0, 12.7)	86.2	849	2.0	(1.8, 2.1)	13.8
Rural	1575	18.2	(17.3, 19.1)	1131	13.1	(12.4, 13.9)	71.8	444	5.1	(4.6, 5.6)	28.2

[a] Number of deaths related to hip fractures.

[b] Rate per 100,000 population. All rates except age group specific rates were age-adjusted using direct method and the 2000 standard USA population.

[c] CI = Confidence Interval.

[d] New England (ME, NH, VT, MA, CT, RI); Middle Atlantic (NY, PA, NJ); East North Central (WI, MI, IL, IN, OH); West North Central (ND, SD, NE, KS, MN, IA, MO); South Atlantic (WV, MD, DE, DC, VA, NC, SC, GA, FL); East South Central (KY, TN, AL, MS); West South Central (OK, AR, LA, TX); Mountain (MT, ID, WY, UT, CO, AZ, NM, NV); Pacific (AK, WA, OR, CA, HI).