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U.S. Hospitalizations Involving Osteoporosis and Injury, 2006

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Introduction

Osteoporosis is a condition characterized by the loss of bone density. As a person ages, the bones become more porous, and the weakness may lead to an increased susceptibility to fractures. These fractures can be slow to heal, causing debilitating pain, disability, deformities, and occasionally, death.[1]

An estimated 10 million people in the U.S. had osteoporosis in 2006.[2] Despite its prevalence and impact, osteoporosis is both a preventable and treatable condition. Vitamin D, a diet high in calcium, regular exercise, and access to bone mineral density screenings and medical treatment can prevent, improve, and slow the progression of the condition. However, barriers to care, such as variations and limitations in provider coverage of screening tests, could inhibit early detection and treatment, creating a substantial strain on the U.S. healthcare system as the population ages.[3,4]

This Statistical Brief presents data from the Healthcare Cost and Utilization Project (HCUP) on hospitalizations that noted both an osteoporosis diagnosis and an injury in 2006. Specifically, it discusses utilization and payer characteristics of injurious osteoporosis stays, differences by gender and age, and regional statistics. Additionally, it provides information about the types of injuries most often associated with osteoporosis-related hospitalizations and specific procedures commonly performed during these stays. All differences between estimates provided in the text are statistically significant at the 0.05 level or better.

Highlights

- The rate of hospitalizations that involved an injury likely due to osteoporosis increased 55 percent since 1995, to just over 254,000 hospital stays totaling $2.4 billion in hospital costs in 2006.

- Injuries were noted in one-fourth of all stays with an osteoporosis diagnosis. Pathological fractures (i.e., spontaneous and stress fractures), hip fractures, and fractures of the vertebrae, ribs, and pelvis were the most frequently occurring injuries among these patients.

- Nearly 90 percent of stays involving an injury likely due to osteoporosis occurred among patients 65 years and older; 37 percent occurred among patients 85 and older.

- Females accounted for nearly 89 percent of injurious osteoporosis stays and had hospitalization rates that were more than six times higher than males.

- The Midwest had the highest rate of injurious osteoporosis hospitalizations (107 stays per 100,000 population), while the West had the lowest rate (68 stays per 100,000 population).

- Treatments of hip and leg fractures and dislocations were performed in 16.4 percent of all injurious osteoporosis stays, and 8.1 percent of these stays noted a hip replacement.

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[1]Osteoporosis. The Mayo Clinic, 2007.
http://www.mayoclinic.com/print/osteoporosis/DS00128/METHOD=print&DSECTION=all (Accessed May 14, 2009).
[2]Fast Facts About Osteoporosis. National Institute of Arthritis and Musculoskeletal and Skin Diseases, National Institutes of Health, 2006.
http://www.niams.nih.gov/Health_Info/Bone/Osteoporosis/osteoporosis_ff.asp (Accessed May 20, 2009).
[3] Reimbursement of Bone Mineral Density Tests. National Osteoporosis Foundation. http://www.nof.org/professionals/reimbursement/index.htm (Accessed June 16, 2009).
[4] H.R. 1894: Medicare Fracture Prevention and Osteoporosis Testing Act of 2009, 2009. (http://www.govtrack.us/congress/billtext.xpd?bill=h111-1894 (Accessed May 20, 2009).

In 2006, there were 1,043,900 hospitalizations citing an osteoporosis diagnosis, and nearly one-fourth (254,000 stays) also noted an injury that was likely due to or exacerbated by osteoporosis (table 1). Because it is difficult to determine if the osteoporosis diagnosis directly contributed to the hospitalization or was simply an incidental diagnosis made during a hospitalization for another condition, this brief focuses on those hospital stays noting both an osteoporosis diagnosis and an injury.

As shown in figure 1, the rate of hospitalizations that included an osteoporosis diagnosis and an injury has risen 55 percent since 1995, increasing from 55 stays per 100,000 population to 85 stays per 100,000 population.

Utilization characteristics of hospital stays noting injurious osteoporosis
Table 1 compares the utilization of hospital care for stays noting an osteoporosis diagnosis to the average hospitalization. Hospitalizations involving injurious osteoporosis had a longer length of stay (5.5 days versus 5.1 days), yet cost approximately $300 less per stay than the average hospitalization ($9,600 versus $9,900). In 2006, injurious osteoporosis hospitalizations totaled $2.4 billion in hospital costs.

Patients who had an osteoporosis diagnosis and an injury were admitted through the emergency department more often than the average hospitalization (67.3 percent versus 55.7 percent, respectively). Patients hospitalized with osteoporosis and injury were four times as likely to be discharged to a long-term care facility, such as a nursing home or rehabilitation center (56.5 percent versus 15.9 percent), and slightly more likely to be discharged to home health care (14.5 percent versus 11.0 percent) than the average patient.

Patient characteristics of hospital stays noting injurious osteoporosis
Osteoporosis more commonly occurs in females; women are four times more likely to be diagnosed with the disease than men.[5] As shown in table 1, 88.6 percent of hospitalizations noting an osteoporosis diagnosis and an injury occurred among female patients, while only 11.4 percent occurred among males. Overall, the rate of hospitalization for injurious osteoporosis by gender was 149 stays per 100,000 population for females and 20 stays per 100,000 population for males—a rate more than six times higher for women than for men.

Osteoporosis is primarily a disease of the elderly. Nearly 90 percent of stays citing injurious osteoporosis occurred among patients aged 65 years and over. Patients 85 years and older accounted for 37.2 percent of hospitalizations involving an injury likely due to osteoporosis. The average age of patients with injurious osteoporosis was 79.5 years—more than 21 years older than the average hospitalization (58.1 years).

The rate of hospitalization for injurious osteoporosis increased with age for both males and females (figure 2). For males, patients under the age of 45 years had a rate of 1 stay per 100,000 population; this increased to nearly 500 stays per 100,000 population for males ages 85 and older. For females under the age of 45 years, the rate of hospitalizations involving an injury likely due to osteoporosis was 2 stays per 100,000 population; this increased to almost 2,400 stays per 100,000 for females over the age of 85. In fact, female hospitalization rates for injurious osteoporosis were five times higher than rates for males among patients 65 years and older.

Hospital stays noting injurious osteoporosis, by payer
Due to the high percentage of elderly patients with an osteoporosis diagnosis and an injury, Medicare was the primary payer for 87.4 percent of all stays citing injurious osteoporosis, followed by private insurance (8.6 percent) (table 1). Comparatively, Medicare is the primary payer in less than half of all hospitalizations, and private insurance is the payer in slightly less than 30 percent. Medicaid and the uninsured accounted for only 2.1 and 0.6 percent of all hospitalizations with injurious osteoporosis, respectively. In comparison, patients with Medicaid and the uninsured comprised 12.3 and 5.8 percent, respectively, of all hospital stays.

Hospital stays noting injurious osteoporosis, by region
Figure 3 displays the rate of hospitalizations citing an injury likely due to osteoporosis by geographic region. Overall, the Midwest had the highest rate of hospitalizations for injurious osteoporosis, with 107 stays per 100,000 population, followed by the Northeast, with 87 stays per 100,000 population. Rates in

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[5] Osteoporosis: A debilitating disease that can be prevented and treated. National Osteoporosis Foundation, 2008. http://www.nof.org/osteoporosis/index.htm (Accessed May 14, 2009).

the South and West were considerably lower. The South had 81 stays per 100,000 population, and the West had the lowest rate, at 68 stays per 100,000 population. The Midwest continued to have the highest rate of hospitalizations for injurious osteoporosis, even when adjusted for differences in the age and gender distributions of each region (data not shown).

Injuries commonly associated with hospital stays involving osteoporosis
In 2006, 24.3 percent of all stays noting an osteoporosis diagnosis also involved an injury. Table 2 shows the top 10 most common injuries for stays noting both an osteoporosis diagnosis and an injury.[6] Five of the most common injuries likely due to osteoporosis were fracture-related. Among these stays, pathological fracture (i.e., spontaneous and stress fractures) was the most frequent injury, accounting for nearly one-third of all injurious osteoporosis stays (29.5 percent). Hip fractures and fractures of the vertebrae, ribs, and pelvis were also very common, comprising 23.6 percent and 20.2 percent of all injurious osteoporosis stays, respectively. Superficial injury and contusion accounted for 9.9 percent of hospitalizations noting injuries likely due to osteoporosis. Additional types of fractures noted during injurious osteoporosis stays included leg fracture and arm fracture (each at 8.9 percent).

Hip fracture was the most expensive injury ($12,100) and required the longest hospital stay (5.7 days). In fact, as demonstrated in table 1, injurious osteoporosis stays averaged $900 more in hospital costs than all stays noting an osteoporosis diagnosis ($9,600 versus $8,700) and had a longer length of stay (5.5 days versus 5.2 days).

Common procedures associated with hospital stays noting injurious osteoporosis
Table 3 describes the ten most common procedures performed during hospitalizations noting a diagnosis of osteoporosis and an injury. Procedures related directly to the diagnosis or treatment of injuries commonly associated with osteoporosis accounted for many of the ten most common procedures. For example, the treatment of hip fractures was performed in 16.4 percent of all injurious osteoporosis stays, and 8.1 percent cited a hip replacement. Other common procedures that may be associated with osteoporosis included blood transfusion (13.3 percent), treatment of a fracture or dislocation of the lower extremity (other than hip or femur) (3.2 percent), physical therapy (2.7 percent), and treatment of fracture or dislocation of the radius and ulna (2.3 percent).

Data Source

The estimates in this Statistical Brief are based upon data from the HCUP Nationwide Inpatient Sample (NIS) for 2006. Historical data were drawn from the 1995, 1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, and 2005 NIS. Supplemental sources included data from the U.S. Census Bureau, Population Division, Annual Estimates of the Population for the United States, Regions, and Divisions and U.S. Census Bureau, Current Population Reports.

Definitions

Diagnoses, Procedures, 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 that develop during the stay.

The principal procedure is the procedure that was performed for definitive treatment rather than one performed for diagnostic or exploratory purposes (i.e., the procedure that was necessary to take care of a complication). If two procedures appear to meet this definition, the procedure most related to the principal diagnosis was selected as the principal procedure.

ICD-9-CM is the International Classification of Diseases, Ninth Revision, Clinical Modification, which assigns numeric codes to diagnoses. There are about 13,600 ICD-9-CM diagnosis codes.

CCS categorizes ICD-9-CM diagnoses into a manageable number of clinically meaningful categories.[7] This "clinical grouper" makes it easier to quickly understand patterns of diagnoses and procedures.

[6] A hospital stay can involve more than one injury.
[7] HCUP CCS. Healthcare Cost and Utilization Project (HCUP). May 2008. U.S. Agency for Healthcare Research and Quality, Rockville, MD. www.hcup-us.ahrq.gov/toolssoftware/ccs/ccs.jsp

For this Statistical Brief, injuries were defined in a manner consistent with the State and Territorial Injury Prevention Directors Association's (STIPDA) Consensus Recommendations for Using Hospital Discharge Data for Injury Surveillance.[8] Records with an all-listed ICD-9-CM diagnosis code in the range of 800–909.2, 909.4, 909.9, 910–994.9, 995.5–995.59, and 995.80–995.85 were identified as injury hospitalizations. In addition, pathological fractures, such as spontaneous and stress fractures, were included by identifying records with an ICD-9-CM diagnosis code in the range of 733.1–733.19 and 733.93–733.98.

Case Definition
For this report, the following codes were used to identify osteoporosis diagnoses:

– **Hospitalization citing osteoporosis**: all-listed CCS diagnosis code of 206, which includes ICD-9-CM diagnosis codes: 733.00–733.09.
– **Injurious osteoporosis hospitalization**: all-listed CCS diagnosis code of 206 and all-listed ICD-9-CM diagnosis code in the range of 733.1–733.19, 733.93–733.98, 800–909.2, 909.4, 909.9, 910–994.9, 995.5–995.59, and 995.80–995.85.

Types of hospitals included in HCUP
HCUP is based on data from community hospitals, defined as short-term, non-Federal, general and other hospitals, excluding hospital units of other institutions (e.g., prisons). HCUP data include OB-GYN, ENT, orthopedic, cancer, pediatric, public, and academic medical hospitals. They exclude long-term care, rehabilitation, psychiatric, and alcoholism and chemical dependency hospitals, but these types of discharges are included if they are from community hospitals.

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

Costs and charges
Total hospital charges were converted to costs using HCUP Cost-to-Charge Ratios based on hospital accounting reports from the Centers for Medicare and Medicaid Services (CMS).[9] Costs will tend to reflect the actual costs of production, while charges represent what the hospital billed for the case. For each hospital, a hospital-wide cost-to-charge ratio is used because detailed charges are not available across all HCUP States. Hospital charges reflect the amount the hospital charged for the entire hospital stay and does not include professional (physician) fees. For the purposes of this Statistical Brief, costs are reported to the nearest hundred.

Payer
Payer is the expected primary payer for the hospital stay. To make coding uniform across all HCUP data sources, payer combines detailed categories into more general groups:

– Medicare includes fee-for-service and managed care Medicare patients.
– Medicaid includes fee-for-service and managed care Medicaid patients. Patients covered by the State Children's Health Insurance Program (SCHIP) may be included here. Because most state data do not identify SCHIP patients specifically, it is not possible to present this information separately.
– Private insurance includes Blue Cross, commercial carriers, and private HMOs and PPOs.
– Other includes Workers' Compensation, TRICARE/CHAMPUS, CHAMPVA, Title V, and other government programs.
– Uninsured includes an insurance status of "self-pay" and "no charge."

When more than one payer is listed for a hospital discharge, the first-listed payer is used.

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[8] Injury Surveillance Workgroup. Consensus Recommendations for Using Hospital Discharge Data for Injury Surveillance. Online. 2003. State and Territorial Injury Prevention Directors Association. http://stipda.org/associations/5805/files/hdd.pdf (Accessed May 21, 2009).
[9] HCUP Cost-to-Charge Ratio Files (CCR). Healthcare Cost and Utilization Project (HCUP). 2001–2005. U.S. Agency for Healthcare Research and Quality, Rockville, MD. www.hcup-us.ahrq.gov/db/state/costtocharge.jsp.

Region

Region is one of the four regions defined by the U.S. Census Bureau:

  – Northeast: Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, and Pennsylvania
  – Midwest: Ohio, Indiana, Illinois, Michigan, Wisconsin, Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska, and Kansas
  – South: Delaware, Maryland, District of Columbia, Virginia, West Virginia, North Carolina, South Carolina, Georgia, Florida, Kentucky, Tennessee, Alabama, Mississippi, Arkansas, Louisiana, Oklahoma, and Texas
  – West: Montana, Idaho, Wyoming, Colorado, New Mexico, Arizona, Utah, Nevada, Washington, Oregon, California, Alaska, and Hawaii

Admission source

Admission source indicates where the patient was located prior to admission to the hospital. Emergency admission indicates the patient was admitted to the hospital through the emergency department.

Discharge status

Discharge status indicates the disposition of the patient at discharge from the hospital, and includes the following six categories: routine (to home), transfer to another short-term hospital, other transfers (including skilled nursing facility, intermediate care, and another type of facility such as a nursing home), home health care, against medical advice (AMA), or died in the hospital.

About HCUP

HCUP is a family of powerful health care databases, software tools, and products for advancing research. Sponsored by the Agency for Healthcare Research and Quality (AHRQ), HCUP includes the largest all-payer encounter-level collection of longitudinal health care data (inpatient, ambulatory surgery, and emergency department) in the United States, beginning in 1988. HCUP is a Federal-State-Industry Partnership that brings together the data collection efforts of many organizations—such as State data organizations, hospital associations, private data organizations, and the Federal government—to create a national information resource.

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

Arizona Department of Health Services
Arkansas Department of Health
California Office of Statewide Health Planning and Development
Colorado Hospital Association
Connecticut 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
Maine Health Data Organization
Maryland Health Services Cost Review Commission
Massachusetts Division of Health Care Finance and Policy
Michigan Health & Hospital Association
Minnesota Hospital Association
Missouri Hospital Industry Data Institute
Nebraska Hospital Association
Nevada Department of Health and Human Services
New Hampshire Department of Health & Human Services
New Jersey Department of Health and Senior Services
New York State Department of Health
North Carolina Department of Health and Human Services

Ohio Hospital Association
Oklahoma State Department of Health
Oregon Association of Hospitals and Health Systems
Rhode Island Department of Health
South Carolina State Budget & Control Board
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 and Family Services
Wyoming Hospital Association

About the NIS

The HCUP Nationwide Inpatient Sample (NIS) is a nationwide database of hospital inpatient stays. The NIS is nationally representative of all community hospitals (i.e., short-term, non-Federal, non-rehabilitation hospitals). The NIS is a sample of hospitals and includes all patients from each hospital, regardless of payer. It is drawn from a sampling frame that contains hospitals comprising about 90 percent of all discharges in the United States. The vast size of the NIS allows the study of topics at both the national and regional levels for specific subgroups of patients. In addition, NIS data are standardized across years to facilitate ease of use.

About HCUPnet

HCUPnet is an online query system that offers instant access to the largest set of all-payer health care databases that are publicly available. HCUPnet has an easy step-by-step query system, allowing for tables and graphs to be generated on national and regional statistics, as well as trends for community hospitals in the U.S. HCUPnet generates statistics using data from HCUP's Nationwide Inpatient Sample (NIS), the Kids' Inpatient Database (KID), the State Inpatient Databases (SID) and the State Emergency Department Databases (SEDD).

For More Information

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

For additional HCUP statistics, visit HCUPnet, our interactive query system, at www.hcup.ahrq.gov.

For information on other hospitalizations in the U.S., download *HCUP Facts and Figures: Statistics on Hospital-based Care in the United States in 2006*, located at http://www.hcup-us.ahrq.gov/reports.jsp.

For a detailed description of HCUP, more information on the design of the NIS, and methods to calculate estimates, please refer to the following publications:

Steiner, C., Elixhauser, A., Schnaier, J. The Healthcare Cost and Utilization Project: An Overview. *Effective Clinical Practice* 5(3):143–51, 2002.

Introduction to the HCUP Nationwide Inpatient Sample, 2006. Online. May 14, 2008. U.S. Agency for Healthcare Research and Quality.
http://www.hcup-us.ahrq.gov/db/nation/nis/2006NIS_INTRODUCTION.pdf

Houchens, R., Elixhauser, A. *Final Report on Calculating Nationwide Inpatient Sample (NIS) Variances, 2001*. HCUP Methods Series Report #2003-2. Online. June 2005 (revised June 6, 2005). U.S. Agency for Healthcare Research and Quality.
http://www.hcup-us.ahrq.gov/reports/CalculatingNISVariances200106092005.pdf

Houchens RL, Elixhauser A. Using the HCUP Nationwide Inpatient Sample to Estimate Trends. (Updated for 1988–2004). HCUP Methods Series Report #2006-05 Online. August 18, 2006. U.S. Agency for Healthcare Research and Quality.
http://www.hcup-us.ahrq.gov/reports/2006_05_NISTrendsReport_1988–2004.pdf

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http://www.hcup-us.ahrq.gov/reports/statbriefs/sb76.pdf.

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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:

Irene Fraser, Ph.D., Director
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Agency for Healthcare Research and Quality
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Rockville, MD 20850

Table 1. Characteristics of hospitalizations citing an osteoporosis diagnosis compared to hospitalizations for all conditions, 2006

	All hospitalizations citing osteoporosis and an injury	All hospitalizations citing an osteoporosis diagnosis	All hospitalizations*
Utilization characteristics			
Total number of hospitalizations	254,000	1,043,900	30,142,300
Mean length of stay, days	5.5	5.2	5.1
Mean cost per hospitalization	$9,600	$8,700	$9,900
Aggregate costs	$2.4 billion	$25.9 billion	$297.6 billion
Percentage admitted through the emergency department	67.3%	59.1%	55.7%
Percentage died in hospital	1.7%	2.3%	2.6%
Percentage discharged to home health care	14.5%	16.2%	11.0%
Percentage discharged to a long-term care facility	56.5%	35.2%	15.9%
Patient characteristics			
Percentage of female patients	88.6%	89.5%	53.3%
Average age of patients, in years	79.5	76.9	58.1
Percentage of stays by age:			
Less than 45 years	1.0%	1.7%	25.5%
45 to 64 years	9.2%	13.6%	30.2%
65 to 84 years	52.6%	55.9%	34.9%
85 years and older	37.2%	28.9%	9.9%
Percentage of stays by payer:			
Medicare	87.4%	84.3%	48.7%
Private insurance	8.6%	11.0%	29.5%
Medicaid	2.1%	3.0%	12.3%
Uninsured	0.6%	0.6%	5.8%

* Hospital stays for newborns and maternal childbirth have been excluded.
Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 2006.

Table 2. The top 10 injuries commonly associated with hospitalizations citing an osteoporosis diagnosis, 2006*

All-listed injury	Number of stays	Percentage of all injurious osteoporosis hospitalizations	Mean hospital cost	Mean length of stay (days)	In-hospital death rate
Pathological fracture (i.e., spontaneous and stress fracture)	74,800	29.4%	$9,700	5.0	0.7%
Hip fracture	60,000	23.6%	$12,100	5.7	1.6%
Fractures of vertebrae, ribs, and pelvis	51,200	20.2%	$7,300	4.8	0.9%
Superficial injury, contusion	25,100	9.9%	$4,800	3.9	0.3%
Leg fracture	22,700	8.9%	$9,800	4.9	0.9%
Arm fracture	22,500	8.9%	$8,100	4.1	0.7%
Other injuries and conditions due to external causes	20,900	8.2%	$5,500	3.8	1.1%
Sprains and strains	6,700	2.6%	$4,900	3.5	0.5%
Intracranial injury	6,400	2.5%	$9,500	5.0	7.3%
Open wounds of extremities	4,800	1.9%	$7,100	5.5	0.0%
Total injurious osteoporosis hospitalizations	**254,000**	**100.0%**	**$9,600**	**5.5**	**1.7%**

*Number and percentage of hospital stays based on all-listed injury diagnoses; all other characteristics are based on injury as the principal diagnosis. Note that a hospital stay may involve more than one type of injury.
Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 2006.

Table 3. Top 10 procedures associated with hospitalizations noting injurious osteoporosis, 2006

Rank	All-listed procedure	Number of stays	Percentage of all injurious osteoporosis hospitalizations	Percentage of all-listed procedures citing osteoporosis
1	Treatment, fracture or dislocation of hip and femur	41,800	16.4%	15.2%
2	Blood transfusion	33,900	13.3%	4.1%
3	Other OR therapeutic procedures on bone	29,300	11.5%	18.9%
4	Hip replacement, total and partial	20,600	8.1%	9.7%
5	Other diagnostic procedures on musculoskeletal system	10,500	4.2%	16.4%
6	Other therapeutic procedures	9,300	3.6%	1.2%
7	Treatment, fracture or dislocation of lower extremity (other than hip or femur)	8,200	3.2%	4.0%
8	Other vascular catheterization, not heart	7,000	2.8%	2.3%
9	Physical therapy exercises, manipulation, and other procedures	6,700	2.7%	6.9%
10	Treatment, fracture or dislocation of radius and ulna	5,800	2.3%	7.1%

Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 2006.
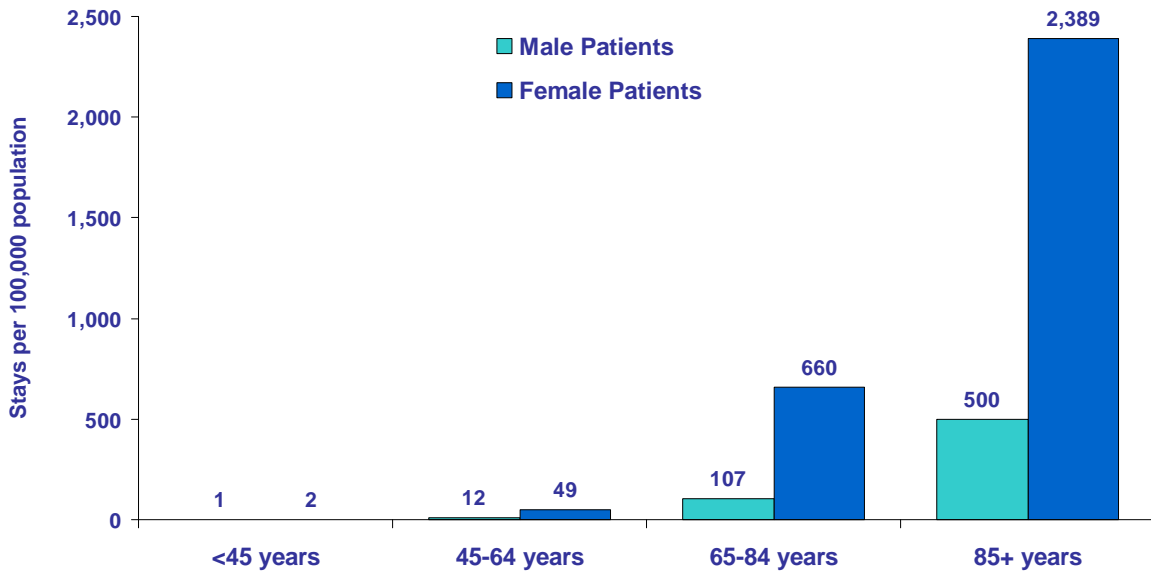
Figure 1. The rate of hospitalizations citing an osteoporosis diagnosis and an injury increased 55 percent between 1995 and 2006
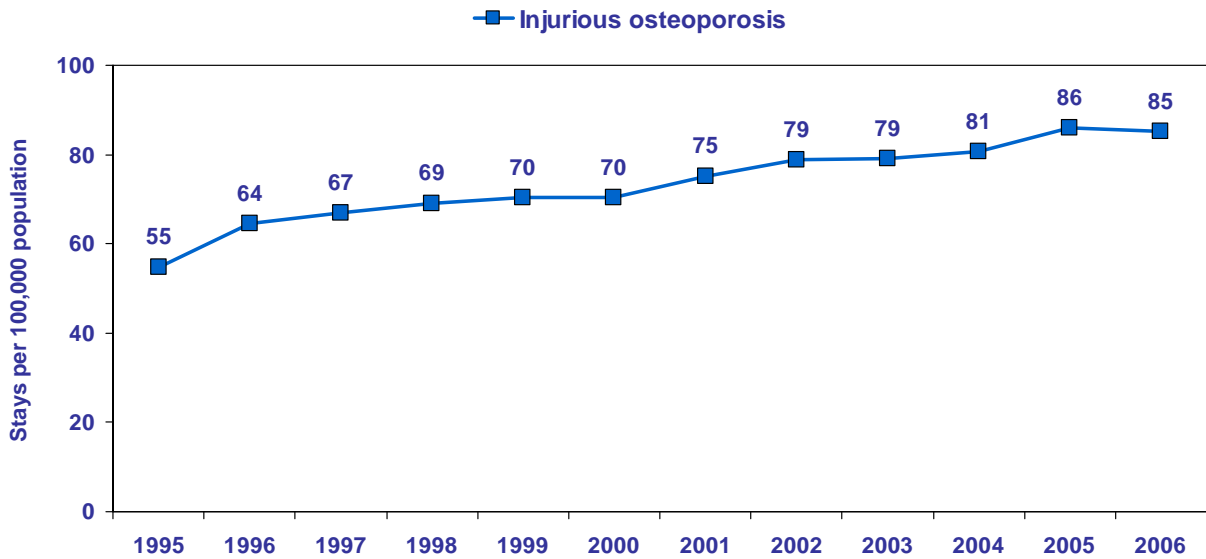
Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, HCUPnet , Nationwide Inpatient Sample, 2006
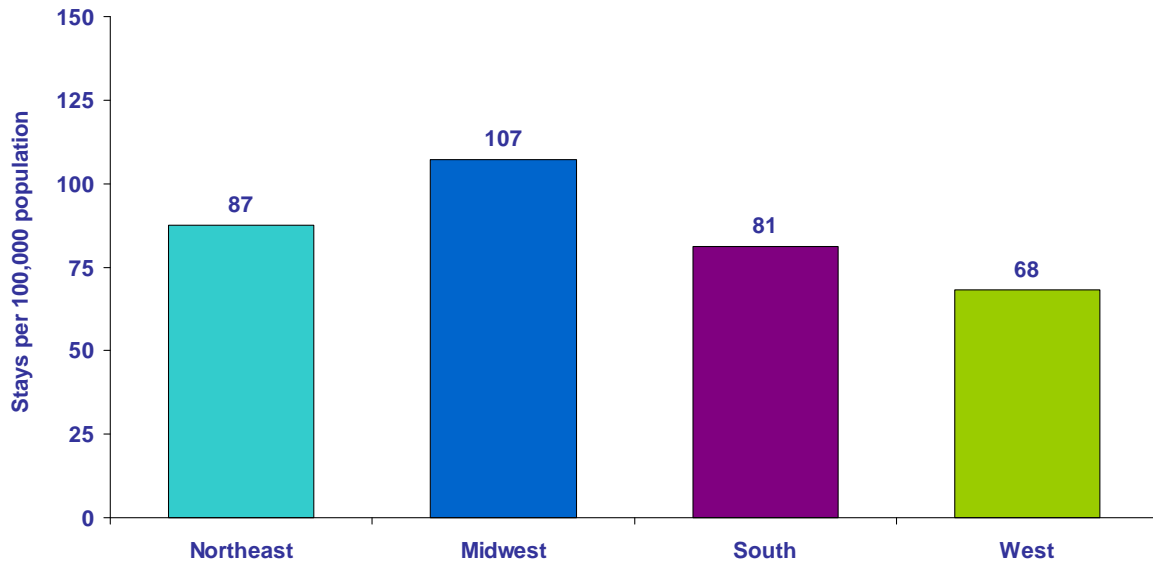

Figure 2. The rate of hospitalizations involving injurious osteoporosis increased dramatically with age, particularly among females aged 65 years and older, 2006

Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, HCUPnet , Nationwide Inpatient Sample, 2006

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Figure 3. The rate of hospitalizations involving injurious osteoporosis was highest in the Midwest and lowest in the West, 2006

Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, HCUPnet , Nationwide Inpatient Sample, 2006