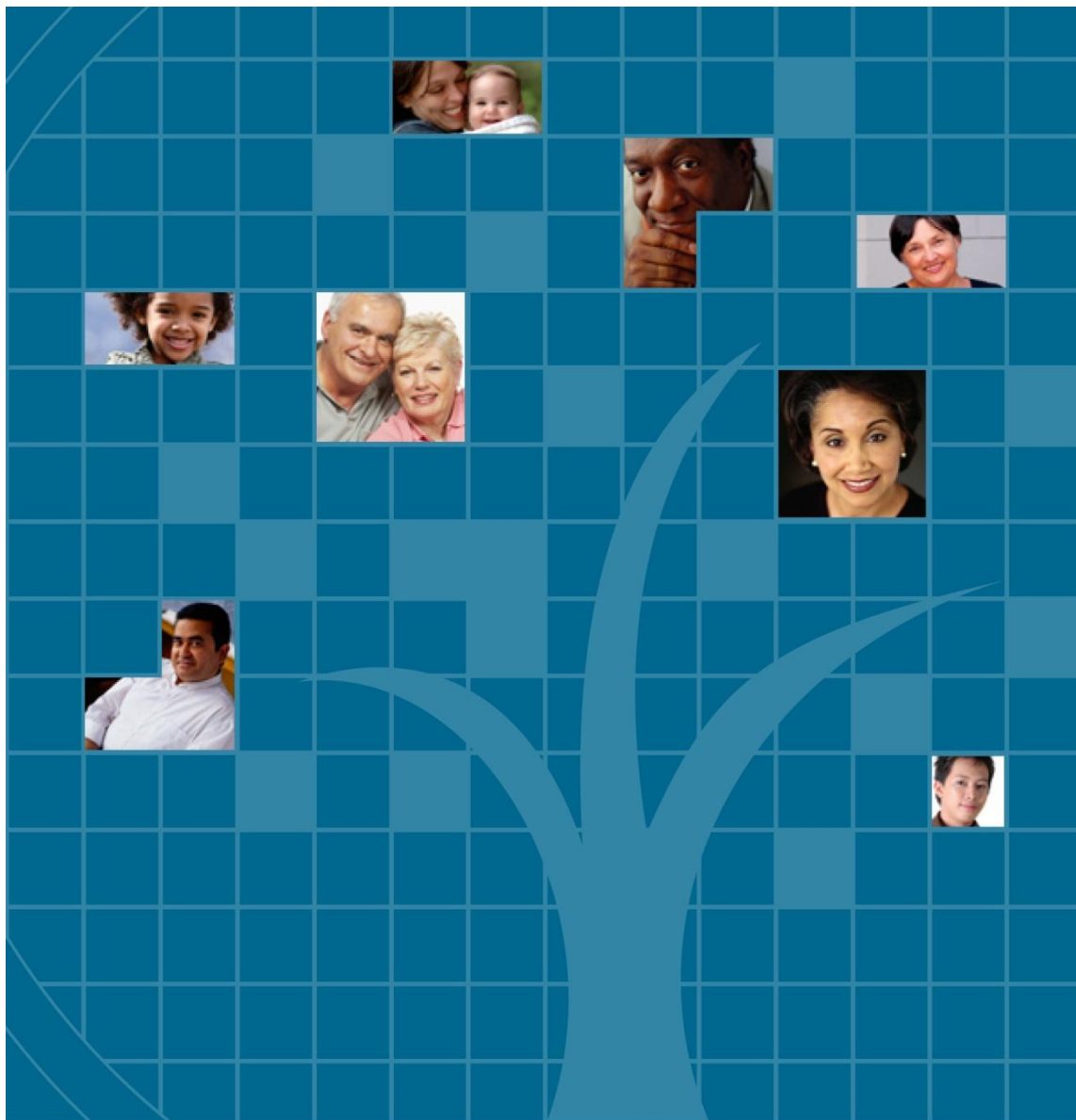


# HCUP FACTS AND FIGURES:

## STATISTICS ON HOSPITAL-BASED CARE IN THE UNITED STATES, 2008



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## HIGHLIGHTS

*HCUP Facts and Figures: Statistics on Hospital-based Care in the United States, 2008* presents information from the 2008 Healthcare Cost and Utilization Project (HCUP) Nationwide Inpatient Sample (NIS), with trend information as far back as 1993. The NIS consists of discharge records for all inpatients treated in a sample of approximately 1,000 hospitals. These discharges are weighted to represent all inpatient stays in community hospitals across the nation, so this report presents national estimates for the U.S.

In addition, this report contains information from the Nationwide Emergency Department Sample (NEDS) for 2007, constructed from data on emergency department (ED) visits from a 20-percent sample of community hospital EDs.

Community hospitals include all non-Federal, short-term, acute care hospitals. This excludes psychiatric and substance abuse facilities, short-term rehabilitation hospitals, and Federal hospitals (Department of Defense, Department of Veterans Affairs, and Indian Health Service).

<b>OVERVIEW STATISTICS FOR INPATIENT HOSPITAL STAYS</b>	<b>EXHIBIT</b>
<ul style="list-style-type: none"> <li>▪ The number of hospital discharges increased from 34.7 million in 1997 to 39.9 million in 2008, a 15-percent increase overall, or an average annual increase of 1.3 percent.</li> </ul>	<a href="#"><u>1.1</u></a>
<ul style="list-style-type: none"> <li>▪ Between 1997 and 2008, the aggregate inflation-adjusted costs for hospitalizations—the actual costs of producing hospital services—increased 61 percent. Costs rose from \$227.2 billion to \$364.7 billion—an average annual increase of 4.4 percent.</li> </ul>	<a href="#"><u>1.1</u></a>
<ul style="list-style-type: none"> <li>▪ The average length of stay (ALOS) in 2008 (4.6 days) was almost 20 percent shorter than in 1993 (5.7 days). The ALOS declined throughout most of the 1990s and has remained unchanged since 2000.</li> </ul>	<a href="#"><u>1.2</u></a>
<ul style="list-style-type: none"> <li>▪ Circulatory conditions were the most frequent major cause of hospital stays in 2008, accounting for 5.9 million stays or 15 percent of all discharges.</li> </ul>	<a href="#"><u>1.3</u></a>
<ul style="list-style-type: none"> <li>▪ Even when pregnancy and childbirth stays are excluded, females accounted for more stays than males—18.6 million stays for females compared to 16.5 million stays for males.</li> </ul>	<a href="#"><u>1.3</u></a>
<ul style="list-style-type: none"> <li>▪ Pregnancy and childbirth was the reason for 1 out of every 5 female hospitalizations (4.7 million stays).</li> </ul>	<a href="#"><u>1.3</u></a>
<ul style="list-style-type: none"> <li>▪ Medicare and Medicaid were the expected primary payers for more than half (55 percent) of all inpatient hospital discharges.</li> </ul>	<a href="#"><u>1.4</u></a>
<ul style="list-style-type: none"> <li>▪ Between 1997 and 2008, Medicaid discharges (up 30 percent) grew at double the rate of all discharges, followed closely by uninsured discharges (up 27 percent).</li> </ul>	<a href="#"><u>1.4</u></a>
<ul style="list-style-type: none"> <li>▪ The number of discharges billed to Medicare grew by 18 percent.</li> </ul>	<a href="#"><u>1.4</u></a>
<ul style="list-style-type: none"> <li>▪ Growth in the number of discharges billed to private insurance remained relatively stable (5 percent).</li> </ul>	<a href="#"><u>1.4</u></a>
<ul style="list-style-type: none"> <li>▪ The number of discharges to home health care grew by 69 percent (1.6 million discharges) between 1997 and 2008.</li> </ul>	<a href="#"><u>1.5</u></a>
<ul style="list-style-type: none"> <li>▪ Uninsured and Medicaid stays accounted for nearly half (48 percent) of all stays</li> </ul>	<a href="#"><u>1.5</u></a>

discharged against medical advice, but only about one-quarter (23 percent) of all stays in 2008.	
<ul style="list-style-type: none"> <li>Persons residing in the poorest communities had a 21-percent higher rate of hospitalization in 2008 (148 discharges per 1,000 population) than those residing in all other communities (122 discharges per 1,000 population).</li> </ul>	<u>1.6</u>

<b>INPATIENT HOSPITAL STAYS BY DIAGNOSIS</b>	<b>EXHIBIT</b>
<ul style="list-style-type: none"> <li>Conditions related to pregnancy, childbirth, and liveborn infants were the most frequent reasons for hospitalization, accounting for nearly one in four discharges (23 percent) in 2008. <ul style="list-style-type: none"> <li>Stays with a principal diagnosis of previous C-section nearly doubled (up 96 percent) between 1997 and 2008.</li> <li>Stays with a principal diagnosis of high blood pressure during pregnancy increased by 22 percent during this period.</li> </ul> </li> </ul>	<u>2.1</u>
<ul style="list-style-type: none"> <li>Pneumonia (2.9 percent of all discharges) and congestive heart failure (2.6 percent) were the most common reasons for hospitalization.</li> </ul>	<u>2.1</u>
<ul style="list-style-type: none"> <li>Between 1997 and 2008, stays for osteoarthritis increased 118 percent and stays for septicemia increased by 91 percent.</li> </ul>	<u>2.1</u>
<ul style="list-style-type: none"> <li>Mood disorders was ranked as the fifth most common condition in 1997 and 2008, but increased nearly 30 percent over this time period.</li> </ul>	<u>2.1</u>
<ul style="list-style-type: none"> <li>Chronic obstructive pulmonary disease was the ninth ranked condition in 2008 and increased 30 percent since 1997.</li> </ul>	<u>2.1</u>
<ul style="list-style-type: none"> <li>Complication of device, implant or graft increased 39 percent from 1997 to 2008 and was the tenth ranked condition in 2008.</li> </ul>	<u>2.1</u>
<ul style="list-style-type: none"> <li>Hospital stays for acute myocardial infarction declined 12 percent and stays for acute cerebrovascular disease declined 8 percent from 1997 to 2008.</li> </ul>	<u>2.1</u>
<ul style="list-style-type: none"> <li>Asthma stays declined 35 percent among children 1-17 years between 1997 and 2008, while stays for skin and subcutaneous tissue infections increased 97 percent.</li> </ul>	<u>2.3</u>
<ul style="list-style-type: none"> <li>Mood disorders was the third most common diagnosis for children 1-17 and adults 18-44 years.</li> </ul>	<u>2.3</u>
<ul style="list-style-type: none"> <li>Among adults 85 and older, hospitalizations for septicemia (up 95 percent) and urinary tract infections (up 81 percent) increased at more than twice the rate of all hospitalizations for this age group between 1997 and 2008.</li> </ul>	<u>2.3</u>
<ul style="list-style-type: none"> <li>Osteoarthritis more than tripled among adults 45-64 and increased 73 percent among adults 65-84.</li> </ul>	<u>2.3</u>
<ul style="list-style-type: none"> <li>Spondylosis, intervertebral disc disorders, and other back problems increased 51 percent for 45-64 year olds between 1997 and 2008.</li> </ul>	<u>2.3</u>

<ul style="list-style-type: none"> <li>Medicaid accounted for 41 percent of all liveborn infant discharges in 2008. Three of the most common conditions with Medicaid as the primary payer were pregnancy and childbirth-related; altogether, stays for these conditions made up approximately 30 percent of all Medicaid stays.</li> </ul>	<u>2.5</u>
<ul style="list-style-type: none"> <li>Three of the most common conditions for uninsured hospital stays increased from 1997 to 2008: mood disorders (44 percent), non-specific chest pain (73 percent), and skin and subcutaneous tissue infections (138 percent).</li> </ul>	<u>2.5</u>

<b>INPATIENT HOSPITAL STAYS BY PROCEDURE</b>	<b>EXHIBIT</b>
<ul style="list-style-type: none"> <li>Blood transfusion occurred in over ten percent of all hospital stays that included a procedure and was the most frequently performed procedure in 2008.</li> </ul>	<u>3.1</u>
<ul style="list-style-type: none"> <li>Episiotomy fell from the list of top procedures, dropping in rank from eighth in 1997 to thirty-first in 2008, a 60-percent decrease.</li> </ul>	<u>3.1</u>
<ul style="list-style-type: none"> <li>C-section was the most frequent major operating room procedure—performed on 1.4 million women in 2008, up from 800,000 in 1997.</li> </ul>	<u>3.1</u>
<ul style="list-style-type: none"> <li>PTCA—a procedure involving the use of a balloon-tipped catheter to enlarge a narrowed artery—grew 56 percent from 1997 to 2006. Between 2006 and 2008, however, there was a 17-percent decline in discharges with this procedure.</li> </ul>	<u>3.1</u>
<ul style="list-style-type: none"> <li>Discharges with coronary artery bypass graft (CABG) procedures declined 38 percent between 1997 and 2008.</li> </ul>	<u>3.1</u>
<ul style="list-style-type: none"> <li>Respiratory intubation and mechanical ventilation grew rapidly from 1997 to 2008 among 45-64 year olds (123 percent), 65-84 year olds (45 percent), and seniors 85 years and older (89 percent).</li> </ul>	<u>3.2</u>
<ul style="list-style-type: none"> <li>Although hysterectomies and oophorectomies increased during the 5-year period from 1997-2002, these female-specific procedures declined in subsequent years. Over the 1997 to 2008 period, hysterectomies decreased by 13 percent and oophorectomies by 21 percent.</li> </ul>	<u>3.2</u>

COSTS FOR INPATIENT HOSPITAL STAYS	EXHIBIT
<ul style="list-style-type: none"> <li>▪ The top three conditions with the highest aggregate costs—septicemia, coronary atherosclerosis, and osteoarthritis —accounted for more than 11 percent of all hospital costs in 2008.</li> </ul>	<u>4.1</u>
<ul style="list-style-type: none"> <li>▪ Three of the twenty most expensive conditions were musculoskeletal: osteoarthritis, spondylosis, intervertebral disc disorders, and other back problems, and fracture of neck of femur (hip). <ul style="list-style-type: none"> <li>▪ Costs for osteoarthritis and spondylosis grew at more than twice the pace of total hospital costs between 1997 and 2008.</li> </ul> </li> </ul>	<u>4.1</u>
<ul style="list-style-type: none"> <li>▪ Between 1997 and 2008, costs for acute renal failure, septicemia, and respiratory failure grew at two to three times the rate of total hospital costs.</li> </ul>	<u>4.1</u>
<ul style="list-style-type: none"> <li>▪ Hospital stays for septicemia cost a total of \$14.6 billion and accounted for 791,000 discharges.</li> </ul>	<u>4.1</u>
<ul style="list-style-type: none"> <li>▪ Aggregate costs for stays in community hospitals grew 4.4 percent annually between 1997 and 2008.</li> </ul>	<u>4.2</u>
<ul style="list-style-type: none"> <li>▪ Growth in intensity of services accounted for 71 percent of the growth in aggregate costs, while population growth was responsible for 24 percent and an increased number of discharges per population for only 5 percent of the growth in aggregate costs.</li> </ul>	<u>4.2</u>
<ul style="list-style-type: none"> <li>▪ Non-elderly adult (45 to 64 years) discharges accounted for less than half (48 percent) of the aggregate cost of all inpatient stays, including maternal and neonatal stays.</li> </ul>	<u>4.3</u>
<ul style="list-style-type: none"> <li>▪ Patients 65-84 years accounted for 35 percent of all hospital costs while they made up 27 percent of all discharges.</li> </ul>	<u>4.3</u>
<ul style="list-style-type: none"> <li>▪ Medicare, the single largest expected payer for hospitalizations in 2008, accounted for 46 percent of aggregate inpatient costs and 37 percent of all discharges.</li> </ul>	<u>4.4 &amp; 1.4</u>
<ul style="list-style-type: none"> <li>▪ Medicaid stays accounted for 14 percent of in-hospital costs and 18 percent of all discharges.</li> </ul>	<u>4.4 &amp; 1.4</u>
<ul style="list-style-type: none"> <li>▪ Private insurance was responsible for 32 percent of aggregate costs and 35 percent of all discharges; the uninsured were responsible for 4 percent of costs and 5 percent of all discharges.</li> </ul>	<u>4.4 &amp; 1.4</u>
<ul style="list-style-type: none"> <li>▪ Five broad groups of conditions – circulatory, musculoskeletal system and connective tissue, respiratory, digestive, and maternal/neonatal stays accounted for more than half of total hospital costs in 2008.</li> </ul>	<u>4.5</u>
<ul style="list-style-type: none"> <li>▪ Maternal and neonatal stays were responsible for the greatest portion of Medicaid hospitalization costs (27 percent) compared to only 14 percent of private payer costs.</li> </ul>	<u>4.5</u>
<ul style="list-style-type: none"> <li>▪ Stays for musculoskeletal system and connective tissue conditions accounted for larger shares of hospital costs for Medicare (14 percent) and private insurance (15 percent) than for Medicaid (6 percent) and the uninsured (8 percent).</li> </ul>	<u>4.5</u>

HOSPITAL CARE FOR MENTAL HEALTH AND SUBSTANCE ABUSE CONDITIONS	EXHIBIT
<ul style="list-style-type: none"> <li>Of the 39.9 million community hospital discharges in 2008, about 5 percent had a principal diagnosis of a mental health (MH) or substance abuse (SA) disorder.</li> </ul>	<p><u>5.1</u></p>
<ul style="list-style-type: none"> <li>An additional 13.6 percent of all hospital discharges had a secondary MH diagnosis and 5.4 percent had a secondary SA diagnosis.</li> </ul>	<p><u>5.8</u></p>
<ul style="list-style-type: none"> <li>Depression was responsible for 24 percent of MHPA stays and bipolar disorders for another 20 percent of MHPA stays.</li> </ul>	<p><u>5.2</u></p>
<ul style="list-style-type: none"> <li>Non-elderly adults (18-64 years old) accounted for a disproportionate share of all MHPA hospitalizations (83 percent) relative to their share of the total population (63 percent) and all hospitalizations (49 percent).</li> </ul>	<p><u>5.5</u></p>
<ul style="list-style-type: none"> <li>Alcohol-related disorders accounted for 12 percent of MHPA stays among 18-44 year olds, 21 percent of MHPA stays among 45-64 year olds, and 12 percent of MHPA stays for 65-84 year olds.</li> </ul>	<p><u>5.6</u></p>
<ul style="list-style-type: none"> <li>The number of hospital stays for drug-related conditions rose rapidly for all age groups over 45 years old (87-117-percent increase from 1997-2008), while remaining relatively stable (11-percent decline) among 18-44 year olds. The underlying causes of this increase were rapid growth in drug-induced delirium and in poisonings by opiate-based pain medications.</li> </ul>	<p><u>5.6</u></p>
<ul style="list-style-type: none"> <li>In 2008, the average cost for a MHPA hospital stay was \$5,500, compared to an average of \$9,100 for all stays and \$6,700 for all stays without a major operating room procedure.</li> </ul>	<p><u>5.1</u> &amp; <u>5.10</u></p>
<ul style="list-style-type: none"> <li>Hospital stays with MH and SA diagnoses were more commonly uninsured (12 percent) or insured by Medicaid (27 percent) than were hospital stays overall (5 percent uninsured and 18 percent insured by Medicaid).</li> </ul>	<p><u>5.9</u></p>
<ul style="list-style-type: none"> <li>In 2008, patients living in the poorest communities experienced MH hospitalization rates 44 percent higher than patients living in higher income communities—5.8 stays per 1,000 compared to 4.0 stays per 1,000 in higher income communities.</li> </ul>	<p><u>5.11</u></p>
<ul style="list-style-type: none"> <li>Hospitalizations for schizophrenia and other psychotic disorders for residents in the poorest communities (1.9 discharges per 1,000) occurred at twice the rate of all other communities (0.9 discharges per 1,000).</li> </ul>	<p><u>5.11</u></p>
<ul style="list-style-type: none"> <li>Patients residing in the poorest communities experienced similar overall rates of hospitalization for SA as patients residing in higher income communities.</li> </ul>	<p><u>5.11</u></p>
<ul style="list-style-type: none"> <li>In 2007, there were 122.3 million emergency department (ED) visits. Of those ED visits, 9.9 million had an all-listed MH diagnosis, 2.8 million had an all-listed alcohol-related diagnosis, and 2.2 million had an all-listed drug-related diagnosis. (All-listed diagnoses include all diagnoses listed on the discharge record.)</li> </ul>	<p><u>5.12</u></p>
<ul style="list-style-type: none"> <li>A diagnosis of depression was the most frequently noted MHPA diagnosis (4.2 million ED visits), and the second most frequent MHPA diagnosis was anxiety (3.3 million ED visits).</li> </ul>	<p><u>5.12</u></p>

<ul style="list-style-type: none"><li>▪ About one in five of all ED visits (20.4 million, or 17 percent of all ED visits) in 2007 resulted in inpatient hospital admission. In comparison, ED visits were much more likely to result in inpatient admission for MHSA conditions:<ul style="list-style-type: none"><li>▪ 42 percent of all MH ED visits resulted in hospitalization.</li><li>▪ 44 percent of alcohol-related ED visits resulted in hospitalization.</li><li>▪ 49 percent of all drug-related ED visits resulted in hospitalization.</li></ul></li></ul>	<u>5.12</u>
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## INTRODUCTION

The mission of the Agency for Healthcare Research and Quality (AHRQ) is to improve the quality, safety, efficiency, and effectiveness of health care for all Americans. To help fulfill this goal, AHRQ sponsors the Healthcare Cost and Utilization Project (HCUP), a family of health care databases and related software tools, products, and statistical reports to inform policy makers, health system leaders, researchers, and the public.

Through partnerships with a number of State, Federal, and Industry organizations, HCUP has grown from a single database limited to inpatient hospital care to a family of six state- and national-level databases, covering inpatient, ambulatory surgery, emergency department, and pediatric encounters. As a result, HCUP has become the largest all-payer resource of multi-year hospital discharge data from community, non-Federal, short-term (acute care), general, and specialty hospitals in the U.S.

The HCUP databases enable research on a wide range of topics, including treatment use and diagnostic trends, medical practice patterns, readmissions, cost and quality of health services, preventable hospitalizations, payer trends, and outcomes of treatments at the national, state, and local market levels. The Nationwide Inpatient Sample (NIS), the most popular of the six HCUP databases, and the Nationwide Emergency Department Sample (NEDS), are the data sources for the 2008 [HCUP Facts and Figures](#).

This fourth annual edition of [HCUP Facts and Figures](#) highlights the rich potential of HCUP by providing targeted analysis of important trends in hospital care organized around high-interest topics, such as hospital and discharge characteristics, diagnoses, procedures, and costs. In addition to providing updates on many topics presented in previously published HCUP [Fact Books](#), [Statistical Briefs](#), and [HCUP Facts and Figures](#), AHRQ has partnered with the Substance Abuse and Mental Health Services Administration (SAMHSA) to produce a special section in this year's report that details trends in inpatient and emergency department care for mental health and substance abuse conditions.

This report demonstrates the wealth of information accessible through HCUP and illustrates the types of analyses that can be conducted using the NIS. Many of the statistics presented in this report are available online through HCUPnet (<http://hcupnet.ahrq.gov/>). Graphical presentations, statistical tables, and bulleted notes highlight key facts and emerging trends for each topic.

HCUP databases continue to grow: Every year since 1988, HCUP has released new, expanded information on inpatient, emergency department, and ambulatory surgery services. HCUP's inpatient databases now include more than 95 percent of all community hospital discharges in the U.S. HCUP is positioned to assist in understanding many of the hospital-related health care challenges that Americans will face in the future. As the U.S. embarks on a major health reform initiative to cover the uninsured, expand coverage for other populations, and continue its effort to improve the quality and value of care, AHRQ's successful collaboration with its HCUP Partners will continue to provide essential hospital information to measure progress towards these goals.

We invite you to tell us how you are using [HCUP Facts and Figures](#) and other HCUP data and tools. Please share your stories and suggestions on how HCUP products might be enhanced to further meet your needs by e-mailing us at [hcup@ahrq.gov](mailto:hcup@ahrq.gov) or sending a letter to the address below.

Irene Fraser, Ph.D.  
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## HCUP AND ITS DATA PARTNERS

HCUP 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, private data organizations, and the Federal government to create a national information resource of encounter-level health care data. The HCUP Partnership has grown from 8 states in 1988 to 43 states in 2010, and it would not be possible without the current contributions from the following data collection Partners:

**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  
**Louisiana** Department of Health and Hospitals  
**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 Mexico** Health Policy Commission  
**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  
**Pennsylvania** Health Care Cost Containment Council  
**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 Services  
**Wyoming** Hospital Association

## SECTION 1 OVERVIEW STATISTICS FOR INPATIENT HOSPITAL STAYS

<b>EXHIBIT 1.1</b>	Characteristics of U.S. Community Hospitals .....	10
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### HIGHLIGHTS

- The number of hospital discharges increased from 34.7 million in 1997 to 39.9 million in 2008, a 15-percent increase overall, or an average annual increase of 1.3 percent.
- Between 1997 and 2008, the aggregate inflation-adjusted costs for hospitalizations—the actual costs of producing hospital services—increased 61 percent. Costs rose from \$227.2 billion to \$364.7 billion—an average annual increase of 4.4 percent.
- The average length of stay (ALOS) in 2008 (4.6 days) was almost 20 percent shorter than in 1993 (5.7 days). The ALOS declined throughout most of the 1990s and has remained unchanged since 2000.
- Circulatory conditions were the most frequent major cause of hospital stays in 2008, accounting for 5.9 million stays or 15 percent of all discharges.
- Even when pregnancy and childbirth stays are excluded, females accounted for more stays than males—18.6 million stays for females compared to 16.5 million stays for males.
- Pregnancy and childbirth was the reason for 1 out of every 5 female hospitalizations (4.7 million stays).
- Medicare and Medicaid were the expected primary payers for more than half (55 percent) of all inpatient hospital discharges.
- Between 1997 and 2008, Medicaid discharges (up 30 percent) grew at double the rate of all discharges, followed closely by uninsured discharges (up 27 percent).
- The number of discharges billed to Medicare grew by 18 percent.
- Growth in the number of discharges billed to private insurance remained relatively stable (5 percent).
- The number of discharges to home health care grew by 69 percent (1.6 million discharges) between 1997 and 2008.
- Uninsured and Medicaid stays accounted for nearly half (48 percent) of all stays discharged against medical advice, but only about one-quarter (23 percent) of all stays in 2008.
- Persons residing in the poorest communities had a 21-percent higher rate of hospitalization in 2008 (148 discharges per 1,000 population) than those residing in all other communities (122 discharges per 1,000 population).

## EXHIBIT 1.1 Characteristics of U.S. Community Hospitals

### Characteristics of U.S. Community Hospitals, 1997 and 2008

UTILIZATION, CHARGES, AND COSTS	1997	2008
Discharges		
Total discharges in millions	34.7	39.9
Number of discharges per 1,000 population*	127.8	131.0‡
Total days of care in millions	168.1	183.6
Average length of stay in days	4.8	4.6
Percent of discharges from:		
Metropolitan hospitals	84%	87%
Teaching hospitals	47%	47%
Hospital ownership		
Non-Federal government hospitals	14%	14%
Private not-for-profit hospitals	73%	73%
Private for-profit hospitals	13%	13%
Charges and costs†		
Charges		
Average charges per stay	\$11,300	\$29,000
Average inflation-adjusted charges per stay in 2008 dollars**	\$14,500	\$29,000
Costs		
Total aggregate costs in billions	\$177.1	\$364.7
Average costs per stay	\$5,100	\$9,100
Inflation-adjusted costs in 2008 dollars**		
Total aggregate costs in billions	\$227.2	\$364.7
Average costs per stay	\$6,500	\$9,100

\* Calculated using resident population for July 2008 from the U.S. Bureau of the Census, retrieved on June 22, 2010 (<http://www.census.gov/popest/national/asrh/2009-nat-res.html>).

‡ 2008 discharges are not statistically different from 1997 discharges at  $p < 0.05$ .

† Charges represent amounts billed by hospitals. These amounts are seldom paid in full by insurers or patients. Costs are calculated from charges using reported cost-to-charge ratios calculated from information on Medicare Cost Reports, submitted by hospitals to the Centers for Medicare and Medicaid Services (CMS).

\*\* Adjusted for inflation using the GDP deflator (<http://www.bea.gov/national/nipaweb/SelectTable.asp>, Table 1.1.4. Price Indexes for Gross Domestic Product).

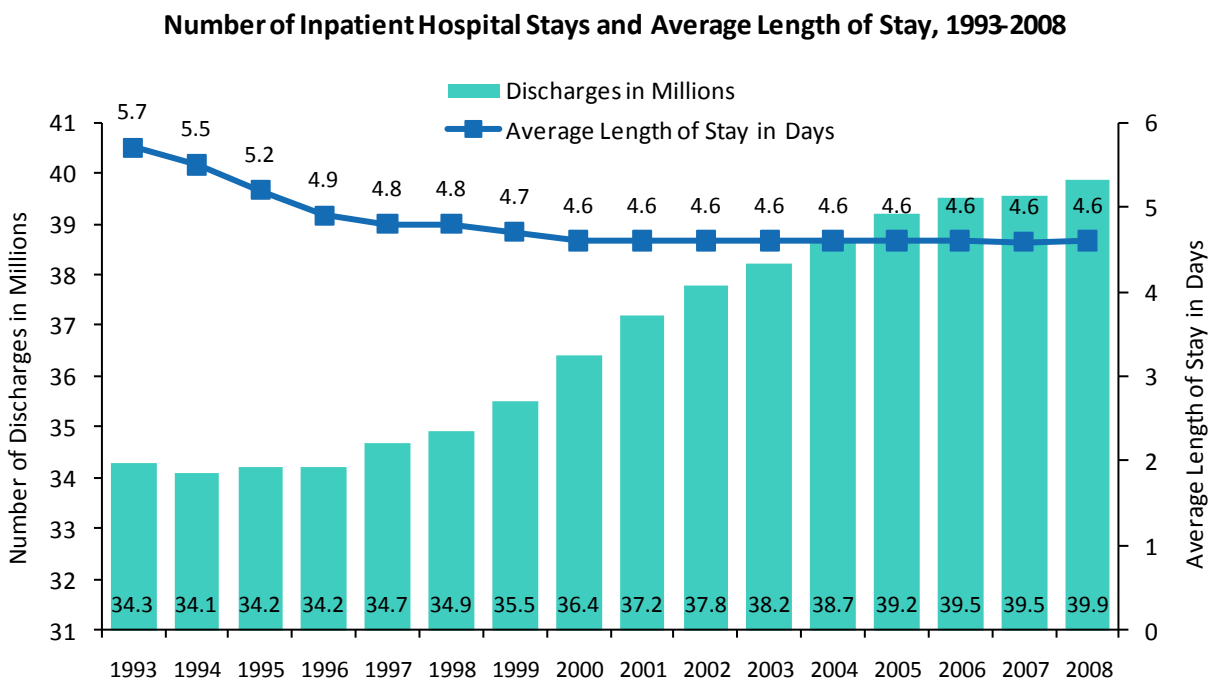
Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 1997 and 2008.

Hospital costs rose rapidly and hospital characteristics changed slowly over time.

- The number of hospital discharges increased from 34.7 million in 1997 to 39.9 million in 2008, a 15-percent increase overall, or an average annual increase of 1.3 percent.
- There were 128 hospital stays for every 1,000 persons in the United States in 1997 and 131 stays per 1,000 persons in 2008.
- The percent of community hospital discharges has changed little in terms of metropolitan location, teaching status, and type of ownership between 1997 and 2008. Most hospital discharges (87 percent) are from facilities located in metropolitan areas, nearly half are from teaching hospitals, and almost three-quarters are from private not-for-profit facilities.

- Average inflation-adjusted charges per stay—what patients are billed for their rooms, nursing care, diagnostic tests, procedures, and other services—rose from \$14,500 in 1997 to \$29,000 in 2008. Few patients or insurers paid those amounts because of discounts negotiated with hospitals.
- Between 1997 and 2008, the aggregate inflation-adjusted costs for hospitalizations—the actual costs of producing hospital services—increased 61 percent. Costs rose from \$227.2 billion to \$364.7 billion—an average annual increase of 4.4 percent.

## EXHIBIT 1.2 Inpatient Hospital Stays and Average Length of Stay

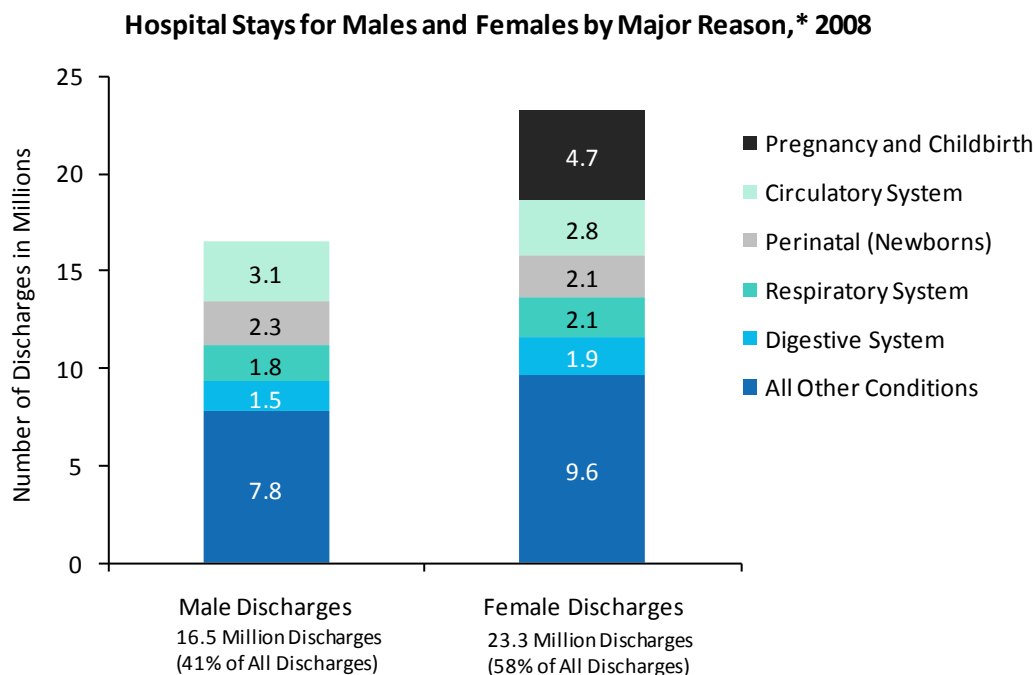


Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 1993-2008.

The average length of stay in U.S. community hospitals stabilized beginning in 2000, while the number of hospital stays continued to slowly rise.

- The average length of stay (ALOS) in 2008 (4.6 days) was almost 20 percent shorter than in 1993 (5.7 days). The ALOS declined throughout most of the 1990s and has remained unchanged since 2000.
- From 1993 to 2008, the number of discharges grew by 5.6 million (an average of 1.0 percent annually).
- Growth in the number of discharges changed over the course of the 15-year period.
  - From 1993 to 1998, the number of discharges remained stable, increasing by only 0.6 million (an average of 0.3 percent annually).
  - Between 1998 and 2003, the number of discharges grew quickly, increasing by 3.3 million (an average of 1.9 percent annually).
  - In the last period, 2003 to 2008, growth again stabilized and the number of discharges increased by 1.7 million (an average of 0.9 percent annually).

## EXHIBIT 1.3 Reasons for Hospital Stays



\* Based on principal diagnosis defined by Major Diagnostic Category (MDC).

Note: Excludes a small number of discharges (111,000 or 0.3 percent) with missing gender.

Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 2008.

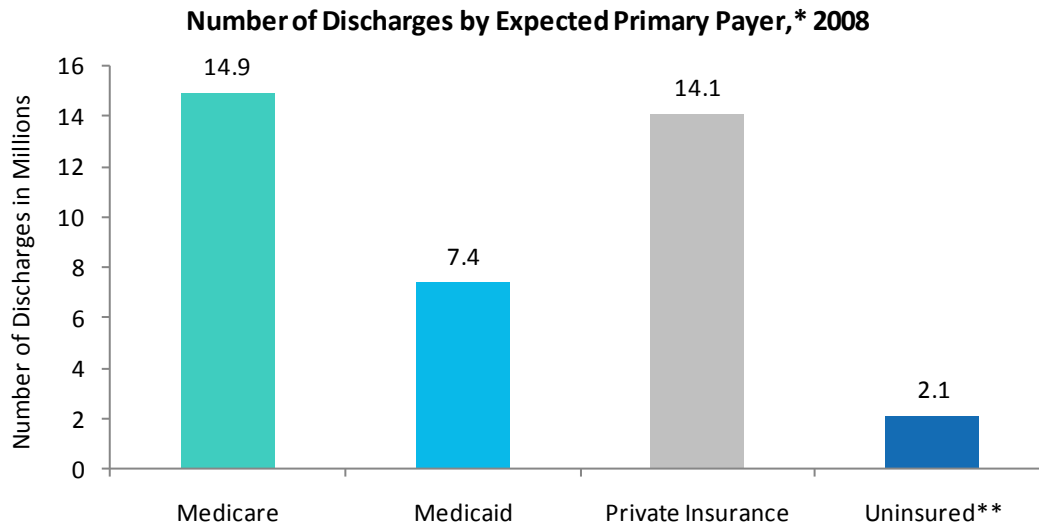
In 2008, males accounted for 16.5 million hospitalizations, while females experienced 23.3 million stays.

- Circulatory conditions were the most frequent major cause of hospital stays in 2008, accounting for 5.9 million stays or 15 percent of all discharges. These stays were for diagnoses such as coronary atherosclerosis, congestive heart failure, acute myocardial infarction, and cardiac dysrhythmias.
  - Circulatory conditions accounted for 19 percent of male discharges and 12 percent of female discharges.
- Excluding pregnancy and childbirth, the largest gender differences in reasons for hospitalization were for diseases of the digestive system (1.9 million female versus 1.5 million male stays) and diseases of the respiratory system (2.1 million female versus 1.8 million male stays).
- Even when pregnancy and childbirth stays are excluded, females accounted for more stays than males—18.6 million stays for females compared to 16.5 million stays for males.
- Males accounted for 41 percent of all hospitalizations in 2008.
  - Of these stays, 19 percent (3.1 million discharges) were for circulatory conditions, 14 percent (2.3 million discharges) were for stays during the perinatal period, 11 percent (1.8 million discharges) were for respiratory conditions, and 9 percent (1.5 million discharges) were for digestive system conditions.
  - These four major conditions amounted to 53 percent of all hospitalizations for males.
- Females accounted for 58 percent of all hospitalizations in 2008.
  - Pregnancy and childbirth was the reason for 1 out of every 5 female hospitalizations (4.7 million stays).
  - Other major reasons for female hospitalizations included conditions related to the circulatory system (12 percent or 2.8 million stays), respiratory system conditions and stays related to the perinatal

period (each 9 percent of stays or 2.1 million stays), and conditions related to the digestive system (8 percent or 1.9 million stays).



## EXHIBIT 1.4 Expected Primary Payer



\*There are an additional 1.3 million discharges (3 percent of discharges) with "other" as the expected primary payer. "Other" payer includes Workers' Compensation, TRICARE, CHAMPUS, CHAMPVA, Title V, and other government programs.

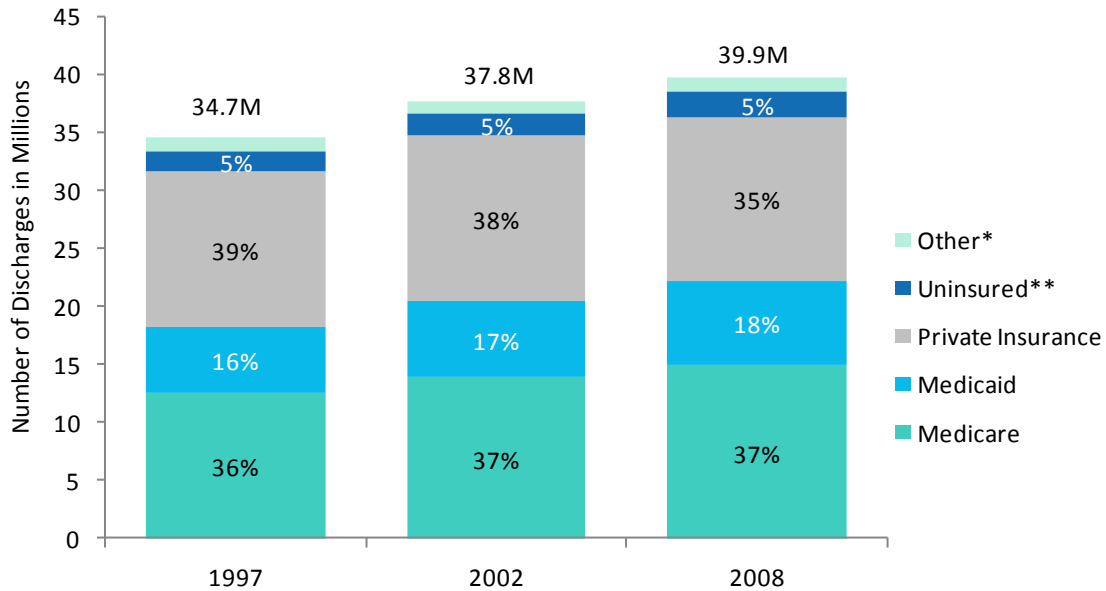
\*\*Includes discharges classified as self-pay or no charge.

Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 2008.

The primary payer bears the major financial responsibility for the hospital stay. Although other payers, including the patients themselves, may also pay part of the cost of hospitalization, only the expected primary payers are depicted in this section.

- In 2008, Medicare, which covers patients who are 65 and older or disabled, was the expected primary payer for the largest number of discharges (14.9 million), followed by private insurance (14.1 million).
- Medicaid, the primary source of insurance for low income families and individuals, was the expected primary payer for 7.4 million discharges.
- There were 2.1 million uninsured discharges in 2008.

## Number and Distribution of Discharges by Expected Primary Payer, 1997-2008



\* Includes other payers such as Workers' Compensation, TRICARE, CHAMPUS, CHAMPVA, Title V, and other government programs.

\*\* Includes discharges classified as self-pay or no charge.

Note: Excludes a small number of discharges (68,000 or 0.2 percent) with missing payer.

Note: Bar segments representing 4 percent or less have not been labeled.

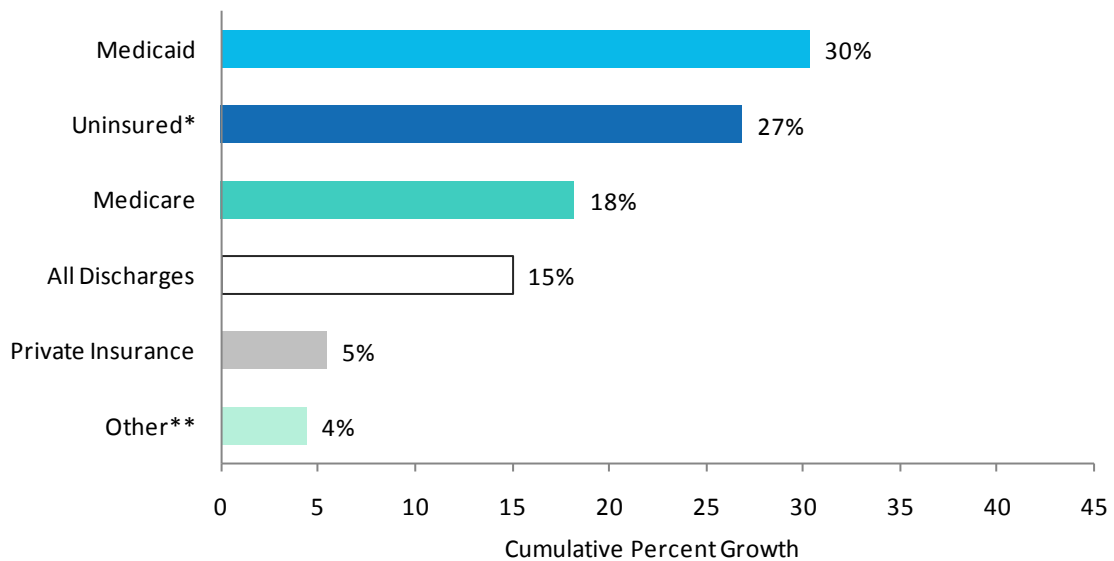
Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 1997-2008.

The number of discharges increased steadily in the 11-year period, growing from 34.7 million in 1997 to 39.9 million in 2008.

- In 2008, Medicare and Medicaid were the expected primary payers for more than half (55 percent) of all inpatient hospital discharges (accounting for 14.9 and 7.4 million hospital stays, respectively).
  - The percentage of discharges billed to Medicare remained relatively stable from 1997 to 2008 at 36-37 percent.
  - Unlike Medicare, the share of discharges with Medicaid as an expected payer increased throughout most of the period, from 16 percent in 1997 to 18 percent in 2008.
- Between 1997 and 2008, the percentage of discharges billed to private insurance fell from 39 percent to 35 percent. This reflects the steady decline in the share of the population with private insurance coverage.<sup>1</sup>
- In both 1997 and 2008, about 5 percent of discharges were listed as uninsured, amounting to 1.7 million hospital stays in 1997 and 2.1 million in 2008.

<sup>1</sup> Cohen, J. W. and Rhoades, J.A. *Group and Non-Group Private Health Insurance Coverage, 1996 to 2007: Estimates for the U.S. Civilian Noninstitutionalized Population under Age 65*. Statistical Brief #267. October 2009. Agency for Healthcare Research and Quality, Rockville, MD. [http://www.meps.ahrq.gov/mepsweb/data\\_files/publications/st267/stat267.pdf](http://www.meps.ahrq.gov/mepsweb/data_files/publications/st267/stat267.pdf).

### Growth in Number of Discharges by Expected Primary Payer, 1997-2008



\* Includes discharges classified as self-pay or no charge.

\*\* Includes other payers such as Workers' Compensation, TRICARE, CHAMPUS, CHAMPVA, Title V, and other government programs.

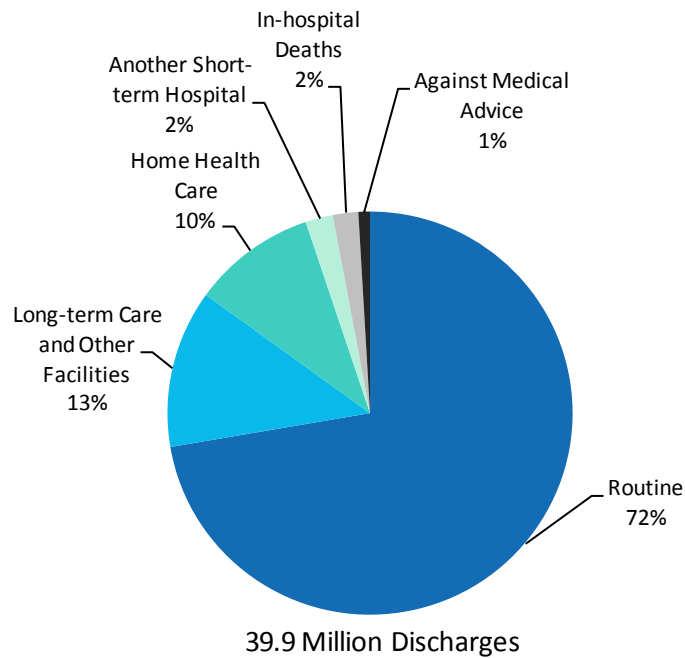
Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 1997 and 2008.

Between 1997 and 2008, the number of hospital discharges grew by 15 percent; however, growth varied widely by expected primary payer.

- Medicaid discharges (up 30 percent) grew at double the rate of all discharges, followed closely by uninsured discharges (up 27 percent).
- The number of discharges billed to Medicare grew by 18 percent.
- While discharges billed to Medicaid, the uninsured, and Medicare experienced substantial growth between 1997 and 2008, growth in the number of discharges billed to private insurance and other payers remained relatively stable (5 percent and 4 percent, respectively).

## EXHIBIT 1.5 Discharge Status

### Distribution of Inpatient Hospital Stays by Discharge Status, 2008

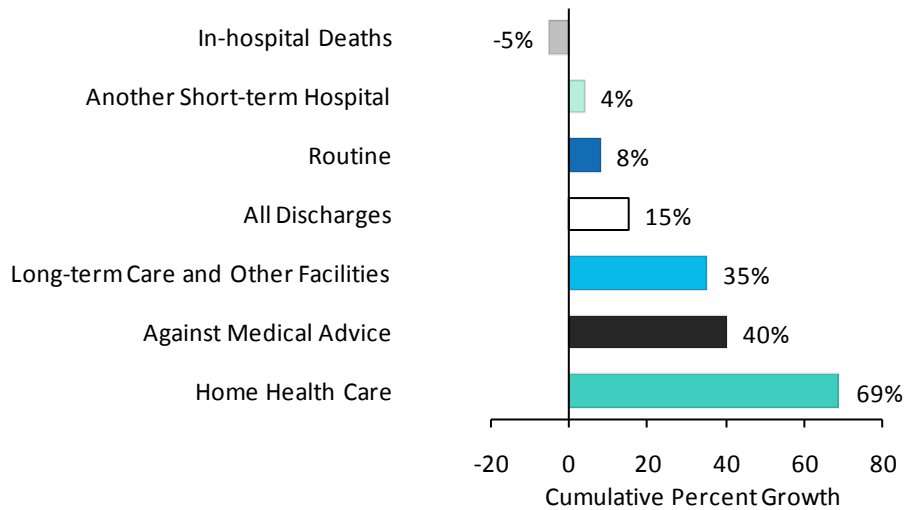


Note: Excludes a small number of discharges (42,000 or 0.1 percent) with missing discharge status.  
Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 2008.

Discharge status indicates the circumstance surrounding the discharge or where the patient went after discharge from the hospital. Most discharges were routine in nature, but discharges to follow-on care were also frequent.

- The most common patient discharge status was routine (72 percent, or 28.8 million discharges), with the patient being sent home without closely supervised health care.
- Discharge to a long-term care facility (5.0 million discharges) was the second most common type of discharge, accounting for 13 percent of discharges.
- Discharge to the home with home health care supervision accounted for 10 percent of discharges (3.9 million discharges).
- Remaining discharge circumstances each accounted for 2 percent or less of discharges. These included discharge to another short-term hospital (877,700 discharges), in-hospital deaths (811,200 discharges), or discharge against medical advice (370,000 discharges).

### Growth in Number of Hospital Stays by Discharge Status, 1997-2008

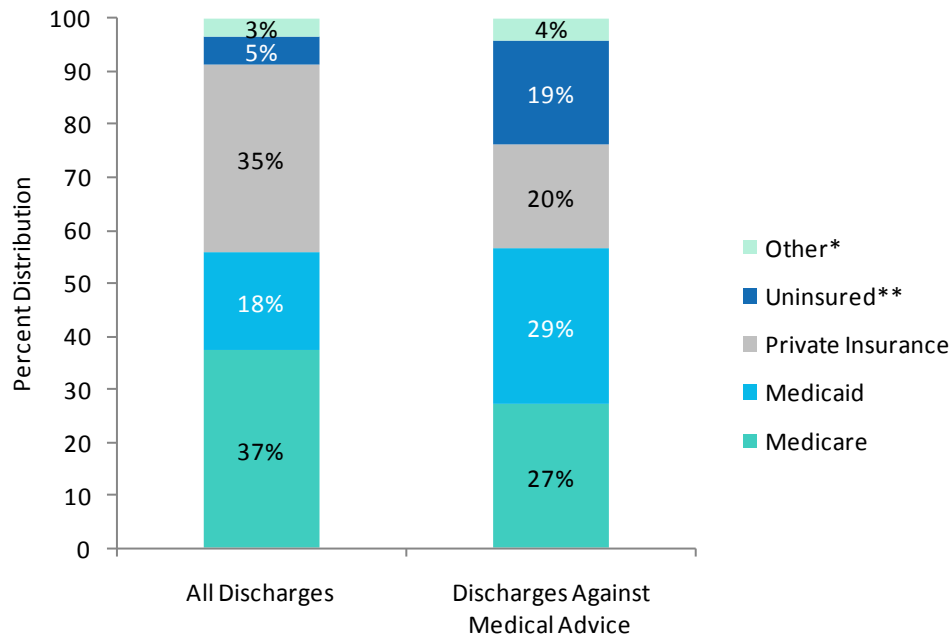


Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 1997 and 2008.

The total number of discharges increased 15 percent (5.2 million discharges) from 1997 to 2008, but the rate of growth varied by discharge status.

- The number of discharges to follow-on care has increased as the average length of stay has fallen.
  - The number of discharges to home health care grew by 69 percent (1.6 million discharges).
  - Discharges to nursing homes and long-term care increased by 35 percent (1.3 million discharges).
- The number of patients who left the hospital against medical advice, although small, rose by 40 percent (105,600 discharges)—the second fastest increase of any discharge type.
- The number of discharges for in-hospital deaths (down 5 percent) and discharges to another short-term hospital (up 4 percent) remained stable between 1997 and 2008.

## All Discharges and Discharges Against Medical Advice by Payer, 2008



\*Includes other payers such as Workers' Compensation, TRICARE, CHAMPUS, CHAMPVA, Title V, and other government programs.

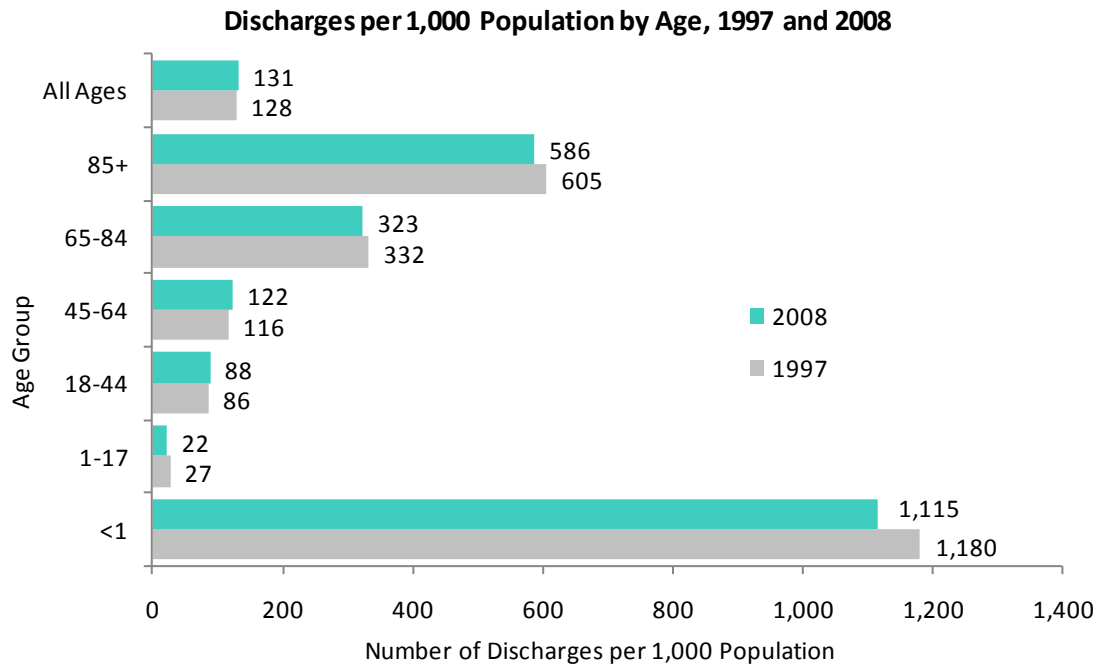
\*\*Includes discharges classified as self-pay or no charge.

Note: Excludes a small number of discharges (68,000 or 0.2 percent) with missing payer.

Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 2008.

- Uninsured and Medicaid stays accounted for nearly half (48 percent) of all stays discharged against medical advice, but only about one-quarter (23 percent) of all stays.
  - Nineteen percent of all discharges against medical advice were uninsured, while only 5 percent of all stays were uninsured.
  - Similarly, Medicaid covered 29 percent of discharges against medical advice, but only 18 percent of all stays.
- Private insurance was the primary payer for 35 percent of all stays, but only 20 percent of discharges against medical advice.
- Medicare-covered discharges accounted for 37 percent of all stays, and 27 percent of stays discharged against medical advice.

## EXHIBIT 1.6 Patient Age



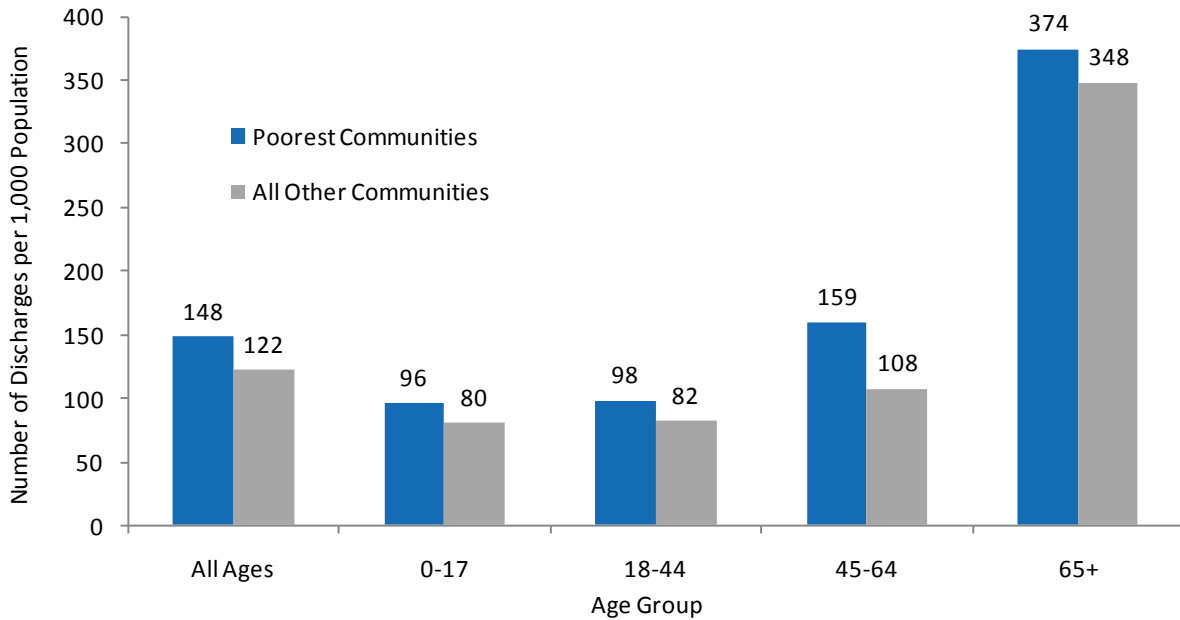
Note: Excludes a small number of discharges (50,000 or 0.1 percent) with missing age.

Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 1997 and 2008.

Discharges per 1,000 population by age group show that persons of older age had a greater chance of hospitalization in both 1997 and 2008.

- Across all age groups, there were 131 discharges for every 1,000 persons in the United States in 2008, little changed from the rate of 128 discharges in 1997.
- There were fewer than 30 hospital stays for every 1,000 children 1-17 years old in 1997 and 2008.
- For adults 85 and older, there were 605 and 586 stays per 1,000 persons in 1997 and 2008, respectively.
- While older age was generally associated with higher hospitalization rates, infants younger than 1 year of age experienced the highest rates of hospitalization: 1,180 hospitalizations per 1,000 infants in 1997 and 1,115 hospitalizations per 1,000 infants in 2008. These high rates of hospital stays occur because nearly all births happen in the hospital and some infants require additional hospitalization in the first year of life.

### Discharges per 1,000 Population by Age in the Poorest\* and All Other Communities, 2008



\* The poorest communities are defined by ZIP code and have median household income of less than \$39,000.

Note: Excludes a small number of discharges (868,000 or 2.2 percent) with missing age or income.

Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 2008.

- Persons residing in the poorest communities had a 21-percent higher rate of hospitalization in 2008 (148 discharges per 1,000 population) than those residing in all other communities (122 discharges per 1,000 population).
  - The rate of hospitalization for children 0-17 and adults 18-44 in the lowest income communities (96 and 98 discharges per 1,000 population) compared to all other communities (80 and 82 discharges per 1,000 population) was about 19 percent higher.
  - The discharge rate for adults 45-64 was 48 percent higher in the poorest than in all other communities (159 discharges per 1,000 population in the poorest communities compared to 108 discharges per 1,000 population in all other communities).
  - Community income level had the least impact on the hospitalization rate of patients 65 years and older, with the poorest communities experiencing similar hospitalization rates to all other communities (374 discharges per 1,000 population in the poorest communities compared to 348 discharges per 1,000 population in wealthier communities).



## SECTION 2 INPATIENT HOSPITAL STAYS BY DIAGNOSIS

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### HIGHLIGHTS

- Conditions related to pregnancy, childbirth, and liveborn infants were the most frequent reasons for hospitalization, accounting for nearly one in four discharges (23 percent) in 2008.
  - Stays with a principal diagnosis of previous C-section nearly doubled (up 96 percent) between 1997 and 2008.
  - Stays with a principal diagnosis of high blood pressure during pregnancy increased by 22 percent during this period.
- Pneumonia (2.9 percent of all discharges) and congestive heart failure (2.6 percent) were the most common reasons for hospitalization.
- Between 1997 and 2008, stays for osteoarthritis increased 118 percent and stays for septicemia increased by 91 percent.
- Mood disorders was ranked as the fifth most common condition in 1997 and 2008, but increased nearly 30 percent over this time period.
- Chronic obstructive pulmonary disease was the ninth ranked condition in 2008 and increased 30 percent since 1997.
- Complication of device, implant or graft increased 39 percent from 1997 to 2008 and was the tenth ranked condition in 2008.
- Hospital stays for acute myocardial infarction declined 12 percent and stays for acute cerebrovascular disease declined 8 percent from 1997 to 2008.
- Asthma stays declined 35 percent among children 1-17 years between 1997 and 2008, while stays for skin and subcutaneous tissue infections increased 97 percent.
- Mood disorders was the third most common diagnosis for children 1-17 and adults 18-44 years.
- Among adults 85 and older, hospitalizations for septicemia (up 95 percent) and urinary tract infections (up 81 percent) increased at more than twice the rate of all hospitalizations for this age group between 1997 and 2008.
- Osteoarthritis more than tripled among adults 45-64 and increased 73 percent among adults 65-84.
- Spondylosis, intervertebral disc disorders, and other back problems increased 51 percent for 45-64 year olds between 1997 and 2008.
- Medicaid accounted for 41 percent of all liveborn infant discharges in 2008. Three of the most common conditions with Medicaid as the primary payer were pregnancy and childbirth-related; altogether, stays for these conditions made up approximately 30 percent of all Medicaid stays.
- Three of the most common conditions for uninsured hospital stays increased from 1997 to 2008: mood disorders (44 percent), non-specific chest pain (73 percent), and skin and subcutaneous tissue infections (138 percent).

## EXHIBIT 2.1 Most Frequent Principal Diagnoses

Number of Discharges, Percent Distribution, Rank, and Growth of the Most Frequent Principal Diagnoses for Inpatient Hospital Stays, 1997 and 2008

PRINCIPAL CCS DIAGNOSIS	NUMBER OF DISCHARGES IN THOUSANDS		PERCENT OF DISCHARGES		RANK <sup>1</sup>		CUMULATIVE GROWTH
	1997	2008	1997	2008	1997	2008	1997-2008
All discharges	34,679	39,885	100.0%	100.0%	—	—	15%
Pregnancy, childbirth, and newborn infants	8,233	9,084#	23.7	22.8	—	—	10
All maternal discharges*	4,338	4,667#	12.5	11.7	—	—	8
Trauma to vulva and perineum due to childbirth	713	820	2.1	2.1	—	—	15
Previous C-section	271	533	0.8	1.3	—	—	96
Normal pregnancy and/or delivery	544	279	1.6	0.7	—	—	-49
Hypertension complicating pregnancy, childbirth and the puerperium	185	227	0.5	0.6	—	—	22
Early or threatened labor	261	212	0.8	0.5	—	—	-19
Umbilical cord complication	259	202	0.7	0.5	—	—	-22
Polyhydramnios and other problems of amniotic cavity	202	185#	0.6	0.5	—	—	-9
All infant discharges	3,899	4,391	11.2	11.0	—	—	13
Pneumonia	1,232	1,156	3.6	2.9	2	1	-6
Congestive heart failure	991	1,020#	2.9	2.6	3	2	3
Coronary atherosclerosis	1,407	919	4.1	2.3	1	3	-35
Osteoarthritis	418	911	1.2	2.3	16	4	118
Mood disorders	641	824	1.8	2.1	5	5	29
Cardiac dysrhythmias	572	798	1.7	2.0	7	6	39
Septicemia	413	791	1.2	2.0	17	7	91
Non-specific chest pain	538	727	1.6	1.8	9	8	35
Chronic obstructive pulmonary disease and bronchiectasis	551	716	1.6	1.8	8	9	30
Complication of device, implant or graft	491	685	1.4	1.7	11	10	39
Acute myocardial infarction	732	645	2.1	1.6	4	11	-12
Acute cerebrovascular disease	616	565	1.8	1.4	6	14	-8

<sup>1</sup> Rankings for principal diagnoses other than pregnancy, childbirth or newborn infant.

— Rank not applicable.

# 2008 discharges are not statistically different from 1997 discharges at p<0.05.

\* Includes additional maternal CCS diagnoses not shown on this table but listed in the Sources and Methods of this report.

Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 1997 and 2008.

In 2008, there were 39.9 million hospital stays, an increase of 15 percent since 1997. Trends in these stays are displayed for pregnancy, childbirth and liveborn infants, and for other frequent conditions.

Pregnancy, childbirth, and liveborn infants:

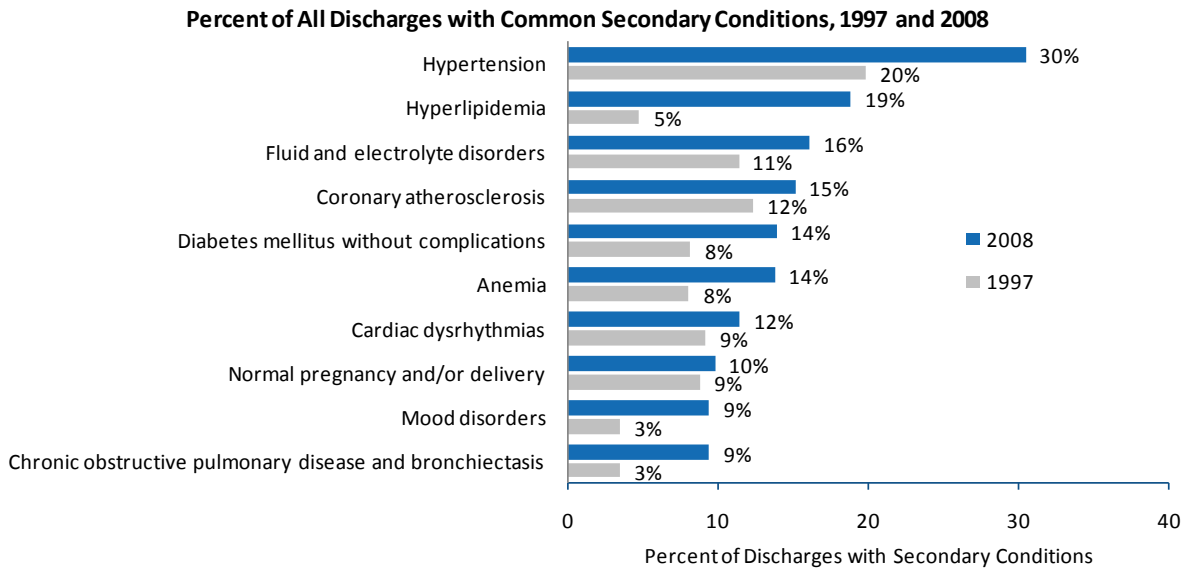
- Conditions related to pregnancy, childbirth, and liveborn infants were the most frequent reasons for hospitalization, accounting for nearly one in four discharges (23 percent) in 2008.
- There were 4.7 million maternal discharges in 2008. Not all of these maternal discharges involved the birth of an infant; some dealt with complications during pregnancy.
  - The most common principal diagnosis among maternal discharges was trauma to the vulva and perineum due to childbirth, which increased 15 percent between 1997 and 2008.
  - Normal pregnancy and delivery stays declined by 49 percent and stays with a principal diagnosis of umbilical cord complications declined by 22 percent from 1997 to 2008.

- In contrast, principal diagnosis of previous C-section nearly doubled (up 96 percent) during this period.
- Stays with a principal diagnosis of high blood pressure during pregnancy increased by 22 percent between 1997 and 2008.
- There were 4.4 million infant discharges in 2008, a 13-percent increase since 1997.

CCS principal diagnoses:

- The 10 most frequent principal diagnoses outside of pregnancy, childbirth and liveborn infants accounted for about one-quarter of all discharges in 2008.
  - Pneumonia (2.9 percent of all discharges) and congestive heart failure (2.6 percent) were the most common reasons for hospitalization.
  - The fourth and seventh most frequent principal diagnoses in 2008 (osteoarthritis and septicemia) were not among the most frequent diagnoses in 1997. Between 1997 and 2008, stays for osteoarthritis increased 118 percent and stays for septicemia increased by 91 percent.
  - Mood disorders was ranked fifth in 1997 and 2008, but increased nearly 30 percent over this time period.
  - Chronic obstructive pulmonary disease was the ninth ranked condition in 2008 and increased 30 percent since 1997.
  - Complication of device, implant or graft increased 39 percent from 1997 to 2008 and was the tenth ranked condition in 2008.
- Four circulatory diseases—congestive heart failure, coronary artery disease, non-specific chest pain, and irregular heartbeat—were among the top ten most frequent principal diagnoses in 2008.
  - Stays for irregular heart beat increased 39 percent between 1997 and 2008 and stays for non-specific chest pain grew 35 percent. Stays for coronary artery disease declined 35 percent. Stays for congestive heart failure changed very little from 1997 to 2008.
- Two conditions were among the top ten conditions in 1997, but were not in 2008.
  - Hospital stays for acute myocardial infarction declined 12 percent. This condition ranked fourth in 1997, but dropped to eleventh by 2008.
  - Acute cerebrovascular disease ranked sixth in 1997 and declined 8 percent to rank fourteenth in 2008.

## EXHIBIT 2.2 Most Frequent Secondary Diagnoses



Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 1997 and 2008.

- From 1997 to 2008, there was a substantial increase in the share of discharges with a secondary diagnosis of hypertension (from 20 to 30 percent).
- Stays with a secondary diagnosis of hyperlipidemia increased from 5 percent in 1997 to 19 percent in 2008.
- The percent of stays with a secondary diagnosis of mood disorders or chronic obstructive pulmonary disease and bronchiectasis tripled from 3 percent in 1997 to 9 percent in 2008.

## EXHIBIT 2.3 Most Frequent Principal Diagnoses by Age

Number of Discharges, Percent Distribution, and Growth of the Most Frequent Principal Diagnoses for Inpatient Hospital Stays by Age, 1997 and 2008

AGE GROUP AND PRINCIPAL CCS DIAGNOSIS	NUMBER OF DISCHARGES IN THOUSANDS		PERCENT OF AGE-SPECIFIC TOTAL DISCHARGES		CUMULATIVE GROWTH
	1997	2008	1997	2008	1997-2008
<b>All ages, total discharges*</b>	<b>34,679</b>	<b>39,885</b>			<b>15%</b>
<b>&lt; 1 year, total discharges</b>	<b>4,426</b>	<b>4,775‡</b>	<b>100.0%</b>	<b>100.0%</b>	<b>8</b>
Liveborn infant	3,776	4,247	85.3	88.9	12
Acute bronchitis	108	82	2.4	1.7	-24
Hemolytic jaundice and perinatal jaundice	33	41	0.7	0.9	24
Pneumonia	55	34	1.3	0.7	-39
Short gestation, low birth weight, and fetal growth retardation	22	20‡	0.5	0.4	-10
<b>1-17 years, total discharges</b>	<b>1,821</b>	<b>1,574‡</b>	<b>100.0</b>	<b>100.0</b>	<b>-14</b>
Pneumonia	135	110	7.4	7.0	-19
Asthma	159	103	8.7	6.5	-35
Mood disorders	64	83‡	3.5	5.2	29
Appendicitis and other appendiceal conditions	65	75‡	3.6	4.8	15
Skin and subcutaneous tissue infections	29	57	1.6	3.6	97
<b>18-44 years, total discharges</b>	<b>9,444</b>	<b>10,026‡</b>	<b>100.0</b>	<b>100.0</b>	<b>6</b>
Trauma to vulva and perineum due to childbirth	676	787	7.2	7.8	17
Previous C-section	270	529	2.9	5.3	96
Mood disorders	335	415	3.5	4.1	24
Normal pregnancy and/or delivery	511	268	5.4	2.7	-48
Hypertension complicating pregnancy, childbirth and the puerperium	172	217	1.8	2.2	26
<b>45-64 years, total discharges</b>	<b>6,496</b>	<b>9,504</b>	<b>100.0</b>	<b>100.0</b>	<b>46</b>
Coronary atherosclerosis	526	385	8.1	4.1	-27
Osteoarthritis	105	368	1.6	3.9	249
Non-specific chest pain	242	349	3.7	3.7	44
Spondylosis, intervertebral disc disorders, and other back problems	190	287	2.9	3.0	51
Pneumonia	199	255	3.1	2.7	28
<b>65-84 years, total discharges</b>	<b>10,121</b>	<b>10,761‡</b>	<b>100.0</b>	<b>100.0</b>	<b>6</b>
Congestive heart failure	581	510	5.7	4.7	-12
Osteoarthritis	281	486	2.8	4.5	73
Pneumonia	514	449	5.1	4.2	-13
Coronary atherosclerosis	741	447	7.3	4.2	-40
Cardiac dysrhythmias	333	415	3.3	3.9	25
<b>85+ years, total discharges</b>	<b>2,362</b>	<b>3,196</b>	<b>100.0</b>	<b>100.0</b>	<b>35</b>
Congestive heart failure	202	246	8.6	7.7	22
Pneumonia	197	199‡	8.3	6.2	1
Septicemia	76	149	3.2	4.7	95
Urinary tract infections	75	135	3.2	4.2	81
Cardiac dysrhythmias	70	125	3.0	3.9	79

\* Includes a small number of discharges (50,000 or 0.1 percent) with missing age.

‡ 2008 discharges are not statistically different from 1997 discharges at p<0.05.

Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 1997 and 2008.

The principal diagnoses for hospitalizations generally varied by age, although some conditions were frequent among all ages.

#### Infants, children and young adults:

- Pregnancy, childbirth, and liveborn infants:
  - In 2008, most discharges for children under one year old (89 percent) were for liveborn infants, which increased 12 percent between 1997 and 2008.
  - Among 18-44 year olds, previous C-sections increased 96 percent between 1997 and 2008, while normal pregnancy and/or delivery fell 48 percent.
- Asthma stays declined 35 percent among children 1-17 years between 1997 and 2008, while stays for skin and subcutaneous tissue infections increased 97 percent.
- Appendicitis accounted for 4.8 percent of discharges among children 1-17 years.
- Mood disorders was the third most common diagnosis for children 1-17 and adults 18-44 years.

#### Older adults:

- Cardiovascular conditions were the most common diagnoses for adults over 44 years old. However, specific diagnoses differed between age groups for older adults:
  - Coronary atherosclerosis accounted for 4.1 percent of all discharges for adults 45-64; these stays declined by 27 percent between 1997 and 2008. This condition also ranked fourth for 65-84 year olds (4.2 percent of stays in 2008), with stays declining 40 percent between 1997 and 2008.
  - Congestive heart failure (CHF) was the most common condition for adults 65-84 and 85 and older. In 2008, CHF accounted for 4.7 percent of all stays among adults 65-84 and 7.7 percent of all stays among adults 85 and older.
  - Cardiac dysrhythmias was the reason for 125,000 hospitalizations (3.9 percent) in 2008 among adults age 85 years and older, an increase of 79 percent since 1997.
- Among adults 85 and older, hospitalizations for septicemia (up 95 percent) and urinary tract infections (up 81 percent) increased at more than twice the rate of all hospitalizations for this age group between 1997 and 2008.
- Musculoskeletal conditions:
  - Osteoarthritis more than tripled among adults 45-64 and increased 73 percent among adults 65-84.
  - Spondylosis, intervertebral disc disorders, and other back problems increased 51 percent for 45-64 year olds between 1997 and 2008.

#### All patients:

- Pneumonia was a top five condition for all age groups except 18-44 year olds:
  - Hospital stays for pneumonia declined among children (a drop of 39 percent for children less than one and a 19-percent decline for children 1-17 years).
  - Pneumonia stays rose among 45-64 year olds (28 percent), but fell among 65-84 year olds (down 13 percent).
  - The number of pneumonia stays remained relatively stable for adults 85 years and older.

## EXHIBIT 2.4 Most Frequent Principal Diagnoses by Gender

### Number of Discharges, Percent Distribution, and Growth of the Most Frequent Principal Diagnoses for Inpatient Hospital Stays by Gender, 2008

PRINCIPAL CCS DIAGNOSIS	NUMBER OF DISCHARGES IN THOUSANDS		PERCENT OF GENDER-SPECIFIC DISCHARGES		MALE PERCENT OF DIAGNOSIS-SPECIFIC DISCHARGES	CUMULATIVE GROWTH 1997-2008	
	MALES	FEMALES	MALES	FEMALES		MALES	FEMALES
All discharges*	16,499	23,275	100.0%	100.0%	41.4%	16%	14%
All maternal discharges	—	4,667	—	20.1	—	—	8
Liveborn infant	2,176	2,069‡	13.2	8.9	51.3	13	12
Coronary atherosclerosis	581	337	3.5	1.4	63.3	-30	-41
Pneumonia	554	600	3.4	2.6	48.0	-7	-5
Congestive heart failure	501	519‡	3.0	2.2	49.1	11	-4
Cardiac dysrhythmias	392	405‡	2.4	1.7	49.2	43	36
Acute myocardial infarction	384	260	2.3	1.1	59.6	-13	-10
Septicemia	374	417	2.3	1.8	47.3	106	80
Osteoarthritis	358	550	2.2	2.4	39.4	124	114
Mood disorders	358	463	2.2	2.0	43.6	44	19
Non-specific chest pain	325	401	2.0	1.7	44.8	32	38
Urinary tract infections	158	420	1.0	1.8	27.3	35	45
Chronic obstructive pulmonary disease and bronchiectasis	317	399	1.9	1.7	44.3	32	28

\* Excludes a small number of discharges (111,000 or 0.3 percent) with missing gender.

‡ Female discharges are not statistically different from male discharges at  $p < 0.05$ .

Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 1997 and 2008.

Females accounted for almost 6 out of every 10 hospital stays—23.3 million stays in 2008. About 20 percent of all female hospitalizations were related to pregnancy and childbirth. Males accounted for 16.5 million hospitalizations in 2008. If childbirth is excluded, most diagnoses are common to both males and females. However, some diagnoses were more frequent in one gender.

- Five heart-related diagnoses—coronary atherosclerosis, congestive heart failure, cardiac dysrhythmias, acute myocardial infarction, and non-specific chest pain—were among the ten most common principal inpatient diagnoses for both males and females.
  - Males accounted for 63 percent of hospital stays for coronary atherosclerosis and 60 percent of stays for acute myocardial infarction (AMI). Hospitalizations for coronary atherosclerosis and AMI decreased for males (30 and 13 percent, respectively) and females (41 and 10 percent, respectively) between 1997 and 2008.
  - The number of hospital stays for cardiac dysrhythmias (392,000 stays for males and 405,000 for females) and congestive heart failure (501,000 stays for males and 519,000 for females) were similar for males and females.
  - Women accounted for a greater share of hospitalizations for non-specific chest pain (55 percent of stays) than men (45 percent of stays).
- Women accounted for a greater number of hospital stays for mood disorders in 2008 than men (463,000 female versus 358,000 male discharges). The number of stays for mood disorders grew 44 percent for men and 19 percent for women between 1997 and 2008.

- Infections such as septicemia and urinary tract infections were common reasons for hospital stays among both men and women in 2008 and grew rapidly for both genders between 1997 and 2008.
  - Stays for septicemia rose 106 percent among men and 80 percent among women. In 2008, 2.3 percent of male hospital stays and 1.8 percent of female hospital stays were due to septicemia.
  - Growth was similar in stays for urinary tract infections for women (35 percent) and men (45 percent); however, 73 percent of all stays for urinary tract infections were for women.
- Osteoarthritis caused more hospitalizations for females (550,000 discharges) than for males (358,000 discharges) in 2008; 61 percent of stays for this condition were for females. Hospital stays for osteoarthritis more than doubled for men (124 percent) and women (114 percent) between 1997 and 2008.



## EXHIBIT 2.5 Most Frequent Principal Diagnoses by Payer

Number of Discharges, Percent Distribution, and Growth of the Most Frequent Principal Diagnoses for Inpatient Hospital Stays by Payer, 1997 and 2008

PAYER AND PRINCIPAL CCS DIAGNOSIS	NUMBER OF DISCHARGES IN THOUSANDS		PERCENT OF PAYER-SPECIFIC TOTAL DISCHARGES		PERCENT OF TOTAL DISCHARGES FOR DIAGNOSIS		CUMULATIVE GROWTH
	1997	2008	1997	2008	1997	2008	1997-2008
<b>All payers, total discharges*</b>	<b>34,679</b>	<b>39,885</b>					<b>15%</b>
<b>Medicare</b>	<b>12,618</b>	<b>14,917</b>	<b>100.0%</b>	<b>100.0%</b>	<b>36.4%</b>	<b>37.4%</b>	<b>18</b>
Congestive heart failure	757	759‡	6.0	5.1	76.4	74.4	0.2
Pneumonia	703	666‡	5.6	4.5	57.1	57.7	-5
Septicemia	276	535	2.2	3.6	66.9	67.6	94
Cardiac dysrhythmias	375	515	3.0	3.5	65.6	64.5	37
Chronic obstructive pulmonary disease and bronchiectasis	380	502	3.0	3.4	68.8	70.1	32
<b>Medicaid</b>	<b>5,644</b>	<b>7,355</b>	<b>100.0</b>	<b>100.0</b>	<b>16.3</b>	<b>18.4</b>	<b>30</b>
Liveborn infant	1,224	1,722	21.7	23.4	32.4	40.5	41
Trauma to vulva and perineum due to childbirth	224	288	4.0	3.9	31.5	35.1	28
Previous C-section	84	214	1.5	2.9	31.0	40.1	155
Mood disorders	147	210	2.6	2.9	22.9	25.5	43
Pneumonia	166	157‡	2.9	2.1	13.5	13.6	-6
<b>Private Insurance</b>	<b>13,388</b>	<b>14,108‡</b>	<b>100.0</b>	<b>100.0</b>	<b>38.6</b>	<b>35.4</b>	<b>5</b>
Liveborn infant	2,204	2,169‡	16.5	15.4	58.4	51.0	-2
Trauma to vulva and perineum due to childbirth	431	476‡	3.2	3.4	60.4	58.0	10
Osteoarthritis	117	358	0.9	2.5	27.9	39.3	207
Spondylosis, intervertebral disc disorders, and other back problems	258	305	1.9	2.2	48.1	46.0	18
Coronary atherosclerosis	484	302	3.6	2.1	34.4	32.9	-38
<b>Uninsured**</b>	<b>1,676</b>	<b>2,126</b>	<b>100.0</b>	<b>100.0</b>	<b>4.8</b>	<b>5.3</b>	<b>27</b>
Liveborn infant	191	240‡	11.4	11.3	5.0	5.7	26
Mood disorders	55	79	3.3	3.7	8.6	9.6	44
Non-specific chest pain	39	68	2.3	3.2	7.3	9.4	73
Skin and subcutaneous tissue infections	28	67	1.7	3.1	8.5	10.8	138
Alcohol-related disorders	48	61‡	2.8	2.9	19.7	23.2	27

\* Excludes a small number of discharges (68,000 or 0.2 percent) with missing payer.

‡ 2008 discharges are not statistically different from 1997 discharges at p<0.05.

\*\* Includes discharges classified as self-pay or no charge.

Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 1997 and 2008.

This exhibit shows the top five reasons for hospital stays for each primary payer. The principal diagnoses for hospitalizations by primary payer generally varied, although some conditions were frequent across payers.

Medicare:

- Congestive heart failure was the most common principal diagnosis among discharges with Medicare as a primary payer. Medicare was responsible for payment for nearly 75 percent of all congestive heart failure discharges.
- Pneumonia, septicemia, cardiac dysrhythmias, and chronic obstructive pulmonary disease were also frequent reasons for hospital stays among Medicare discharges. In each case, the Medicare-covered discharges accounted for the majority of total discharges for the condition.

Medicaid:

- Three of the most common conditions with Medicaid as the primary payer were pregnancy and childbirth-related: liveborn infant, trauma to the vulva and perineum due to childbirth, and previous C-section. Altogether, stays for these conditions made up approximately 30 percent of all Medicaid stays.
- Liveborn infants covered by Medicaid accounted for 41 percent of all liveborn infant discharges in 2008. In 1997, just 32 percent of all liveborn infant discharges were covered by Medicaid.

Private Insurance:

- Liveborn infant stays were the most common hospital stay paid for by private insurance, accounting for 15 percent of all private insurance stays. There was no significant change in the number of private insurance liveborn infant stays between 1997 and 2008.
- Osteoarthritis and back problems were also among the top conditions for private insurance. Private insurance discharges for osteoarthritis increased by 207 percent between 1997 and 2008. Stays for treatment of a back problem increased by 18 percent during this period.

Uninsured:

- Three of the most common conditions for uninsured hospital stays increased from 1997 to 2008: mood disorders (44 percent), non-specific chest pain (73 percent), and skin and subcutaneous tissue infections (138 percent). Hospital stays for liveborn infants and alcohol-related disorders did not increase significantly between 1997 and 2008.
- Although the uninsured stays comprised only 5 percent of total discharges in 2008, they accounted for about one-quarter (23 percent) of all discharges for alcohol-related conditions and about 10 percent of all discharges for skin infections, mood disorders, and non-specific chest pain.

## SECTION 3 INPATIENT HOSPITAL STAYS BY PROCEDURE

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### HIGHLIGHTS

- The number of discharges with procedures increased from 21.3 million in 1997 to 25.1 million in 2008, an 18-percent increase.
- Blood transfusion occurred in over ten percent of all hospital stays that included a procedure and was the most frequently performed procedure in 2008.
- Episiotomy fell from the list of top procedures, dropping in rank from eighth in 1997 to thirty-first in 2008, a 60-percent decrease.
- C-section was the most frequent major operating room procedure—performed on 1.4 million women in 2008, up from 800,000 in 1997. PTCA—a procedure involving the use of a balloon-tipped catheter to enlarge a narrowed artery—grew 56 percent from 1997 to 2006. Between 2006 and 2008, however, there was a 17-percent decline in discharges with this procedure.
- Discharges with coronary artery bypass graft (CABG) procedures declined 38 percent between 1997 and 2008.
- Respiratory intubation and mechanical ventilation grew rapidly from 1997 to 2008 among 45-64 year olds (123 percent), 65-84 year olds (45 percent), and seniors 85 years and older (89 percent).
- Although hysterectomies and oophorectomies increased during the 5-year period from 1997-2002, these female-specific procedures declined in subsequent years. Over the 1997 to 2008 period, hysterectomies decreased by 13 percent and oophorectomies by 21 percent.

## EXHIBIT 3.1 Most Frequent All-listed Procedures

### Number, Percent Distribution, Rank, and Growth of Discharges for the Most Frequent All-listed Inpatient Hospital Procedures, 1997 and 2008

ALL-LISTED CCS PROCEDURES	NUMBER OF DISCHARGES WITH THE PROCEDURE IN THOUSANDS		PERCENT OF DISCHARGES WITH THE PROCEDURE		RANK		CUMULATIVE GROWTH 1997-2008
	1997	2008	1997	2008	1997	2008	
All discharges (with and without procedures)	34,679	39,885					15%
All discharges with any procedure	21,257	25,118	100.0%	100.0%			18
Percent of all discharges with a procedure	61%	63%					
Discharges with maternal and newborn procedures							
Prophylactic vaccinations and inoculations	567	1,619	3.0	6.4	14	2	186
Cesarean section	800	1,378	4.0	5.5	9	5	72
Repair of obstetric laceration	1,137	1,371	5.0	5.5	3	6	21
Circumcision	1,164	1,231‡	5.0	4.9	2	8	6
Artificial rupture of membranes to assist delivery	747	1,000‡	4.0	4.0	10	9	34
Fetal monitoring	1,002	957‡	5.0	3.8	6	10	-4
Episiotomy	866	348	4.0	1.4	8	31	-60
Discharges with all other procedures							
Blood transfusion	1,097	2,725	5.0	10.8	5	1	148
Diagnostic cardiac catheterization, coronary arteriography	1,461	1,521‡	7.0	6.1	1	3	4
Respiratory intubation and mechanical ventilation	919	1,444	4.0	5.8	7	4	57
Upper gastrointestinal endoscopy	1,105	1,256	5.0	5.0	4	7	14
Echocardiogram	632	839	3.0	3.3	11	11	33
Hemodialysis	473	794	2.2	3.2	17	12	68
Percutaneous transluminal coronary angioplasty (PTCA)	581	758	2.7	3.0	13	13	30
Arthroplasty knee	329	687	1.5	2.7	32	14	109
Colonoscopy and biopsy	531	587	2.5	2.3	16	15	10

‡2008 discharges are not statistically different from 1997 discharges at  $p < 0.05$ .

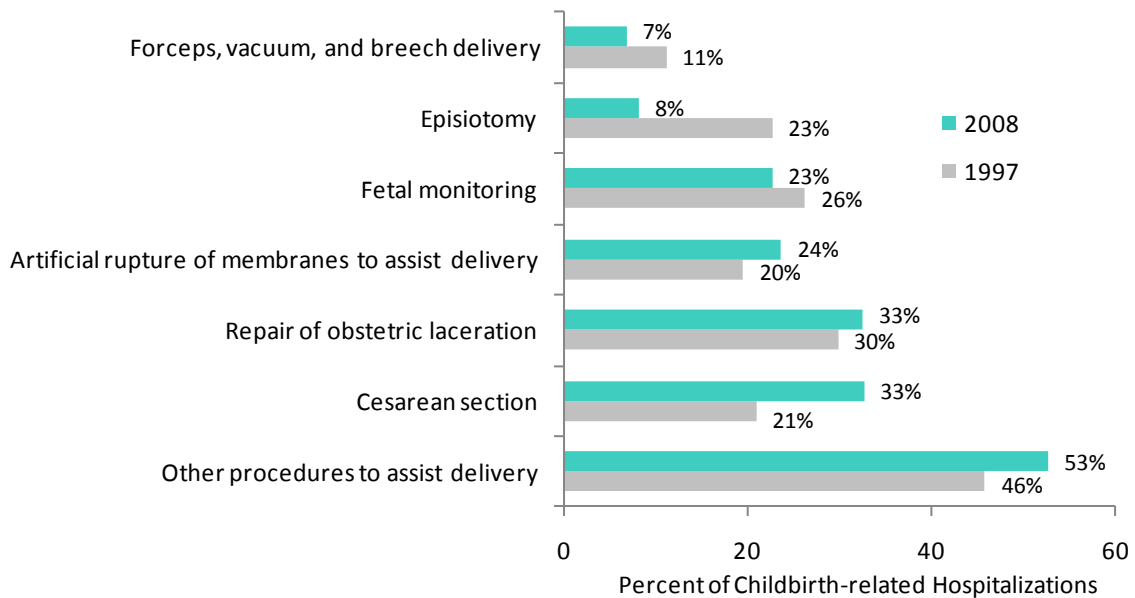
Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 1997 and 2008.

At least one procedure was performed during almost two out of every three hospital stays in 2008 and often more than one procedure was performed. The number of discharges with procedures increased from 21.3 million in 1997 to 25.1 million in 2008, an 18-percent increase.

- Blood transfusion occurred in over ten percent of all hospital stays that included a procedure and was the most frequently performed procedure in 2008.
- While many of the fifteen most common procedures in 2008 were also frequently performed in 1997, there were some notable exceptions:
  - Vaccinations rose in rank from fourteenth in 1997 to second in 2008. These vaccinations were overwhelmingly hepatitis B immunizations for liveborn infants.
  - Episiotomy, a surgical incision to prevent traumatic tearing during vaginal delivery, fell from the list of top procedures, dropping in rank from eighth in 1997 to thirty-first in 2008, a 60-percent decrease.

- Discharges with arthroplasty of the knee procedures more than doubled from 329,000 in 1997 to 687,000 in 2008. Arthroplasty of the knee was the fourteenth most common inpatient procedure in 2008.
- Hemodialysis and colonoscopy/biopsy also rose in frequency to rank in the top 15 procedures performed in hospitals in 2008.
- C-section was the most frequent major operating room procedure—performed on 1.4 million women in 2008.

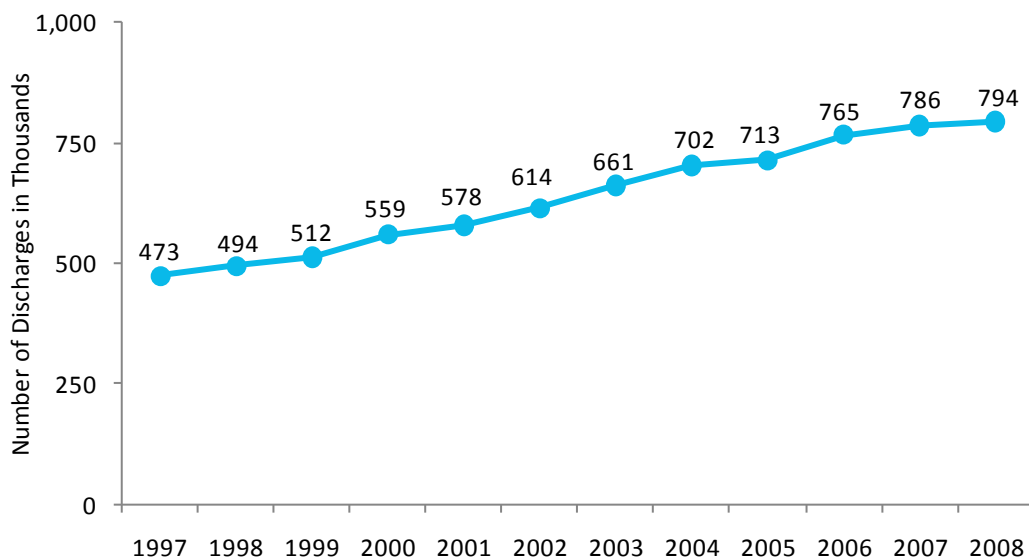
### Percent of Childbirth-related Hospitalizations with Childbirth Procedures, 1997 and 2008



Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 1997 and 2008.

- Only 8 percent of childbirth-related hospitalizations involved episiotomy procedures in 2008, down from 23 percent in 1997.
- Repair of obstetric laceration and C-section were each performed in one-third of childbirth-related hospitalizations in 2008.
- Artificial rupture of membranes to assist delivery was performed in 24 percent of all childbirths (up from 20 percent in 1997) and fetal monitoring was performed in 23 percent of all childbirths (compared with 26 percent in 1997).
- More than half (53 percent) of childbirth-related hospitalizations involved other procedures to assist delivery in 2008, up from 46 percent in 1997.

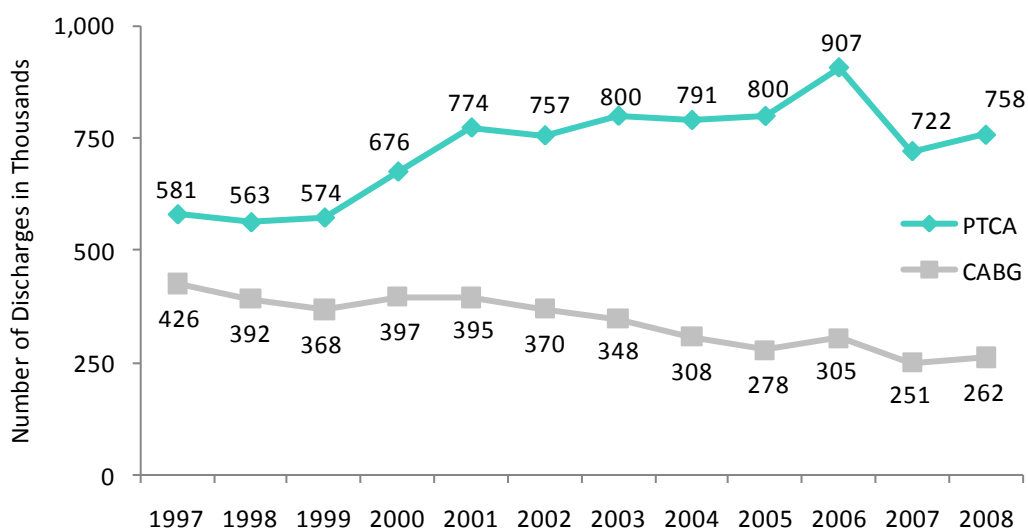
### Number of Stays with All-Listed Hemodialysis, 1997-2008



Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 1997-2008.

- Discharges with hemodialysis grew 68 percent between 1997 and 2008. There were 473,000 stays for this procedure in 1997 and 794,000 in 2008.

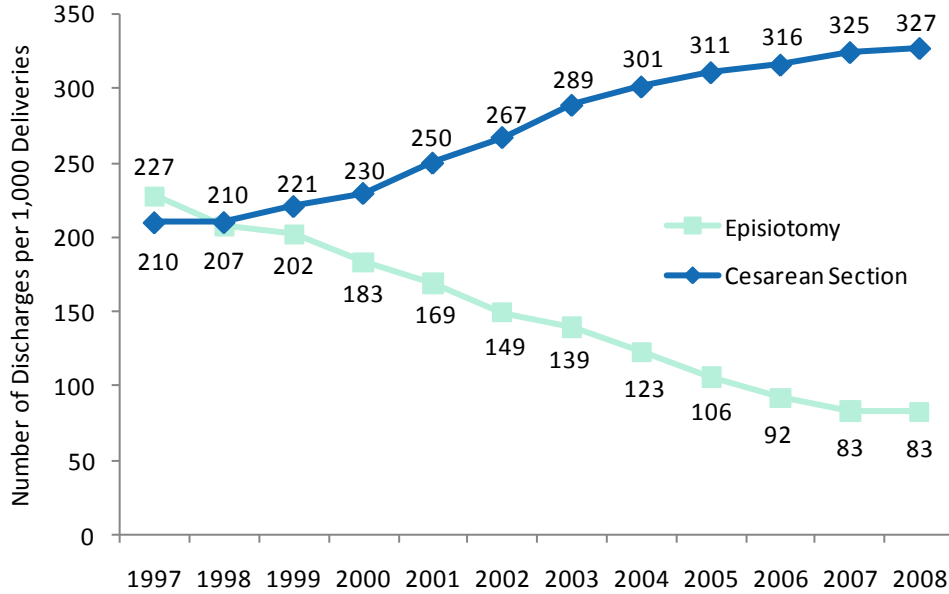
### Number of Stays with All-Listed Percutaneous Transluminal Coronary Angioplasty (PTCA) or Coronary Artery Bypass Graft (CABG), 1997-2008



Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 1997-2008.

- PTCA—a procedure involving the use of a balloon-tipped catheter to enlarge a narrowed artery—grew 56 percent from 1997 to 2006. Between 2006 and 2008, however, there was a 17-percent decline in discharges with this procedure.
- Discharges with coronary artery bypass graft (CABG) procedures declined 38 percent between 1997 and 2008. There were 426,000 stays for this procedure in 1997 and 262,000 in 2008.

**Discharges per 1,000 Deliveries with All-Listed Episiotomy or Cesarean Section Procedures, 1997-2008**



Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 1997-2008.

- In 1997 there were 227 episiotomy procedures performed per 1,000 deliveries. By 2008, this procedure was performed during only 83 per 1,000 deliveries —a decline of 64 percent.
- The rate of C-sections increased by 56 percent between 1997 and 2008. There were 210 C-sections performed per 1,000 deliveries in 1997 and 327 per 1,000 deliveries in 2008.

## EXHIBIT 3.2 Most Frequent All-listed Procedures by Age

### Number of Discharges, Percent Distribution, and Growth for the Most Frequent All-listed Inpatient Hospital Procedures by Age Group, 1997 and 2008

AGE GROUP AND ALL-LISTED CCS PROCEDURES	NUMBER OF DISCHARGES IN THOUSANDS		PERCENT OF AGE-SPECIFIC TOTAL DISCHARGES		CUMULATIVE GROWTH
	1997	2008	1997	2008	1997-2008
All ages, total discharges <sup>†</sup>	34,679	39,885			15%
<b>&lt; 1 year, total discharges</b>	<b>4,426</b>	<b>4,775</b>	<b>100.0%</b>	<b>100.0%</b>	<b>8</b>
Prophylactic vaccinations and inoculations	549	1,397	12.4	29.3	155
Circumcision	1,159	1,226	26.2	25.7	6
Respiratory intubation and mechanical ventilation	163	173	3.7	3.6	6
Enteral and parenteral nutrition	39	115	0.9	2.4	196
Diagnostic spinal tap	147	84	12.7	1.8	-43
<b>1-17 years, total discharges</b>	<b>1,821</b>	<b>1,574</b>	<b>100.0</b>	<b>100.0</b>	<b>-14</b>
Appendectomy	74	78	4.1	4.9	5
Repair of obstetric laceration	58	53	3.2	3.4	-9
Blood transfusion	26	52	1.4	3.3	100
Cancer chemotherapy	43	41	2.4	2.6	-6
Artificial rupture of membranes to assist delivery	40	34	2.2	2.2	-15
<b>18-44 years, total discharges</b>	<b>9,444</b>	<b>10,354</b>	<b>100.0</b>	<b>100.0</b>	<b>6</b>
Cesarean section	773	1,343	8.2	13.4	74
Repair of obstetric laceration	1,079	1,315	11.4	13.1	22
Artificial rupture of membranes to assist delivery	706	964	10.1	9.6	36
Fetal monitoring	952	925	7.5	9.2	-3
Episiotomy	813	329	8.6	3.3	-60

(continued on next page)



**Number of Discharges, Percent Distribution, and Growth for the Most Frequent All-listed Inpatient Hospital Procedures by Age Group, 1997 and 2008--continued**

AGE GROUP AND ALL-LISTED CCS PROCEDURES	NUMBER OF DISCHARGES IN THOUSANDS		PERCENT OF AGE-SPECIFIC TOTAL DISCHARGES		CUMULATIVE GROWTH
	1997	2008	1997	2008	1997-2008
<b>45-64 years, total discharges</b>	<b>6,496</b>	<b>9,504</b>	<b>100.0%</b>	<b>100.0%</b>	<b>46%</b>
Blood transfusion	247	741	3.8	7.8	200
Diagnostic cardiac catheterization, coronary arteriography	578	655‡	8.9	6.9	13
Respiratory intubation and mechanical ventilation	186	415	2.9	4.4	123
Upper gastrointestinal endoscopy	275	392	4.2	4.1	42
Percutaneous transluminal coronary angioplasty (PTCA)	247	335	3.8	3.5	36
<b>65-84 years, total discharges</b>	<b>10,121</b>	<b>10,761‡</b>	<b>100.0</b>	<b>100.0</b>	<b>6</b>
Blood transfusion	514	1,205	5.1	11.2	134
Diagnostic cardiac catheterization, coronary arteriography	738	686‡	7.3	6.4	-7
Respiratory intubation and mechanical ventilation	366	532	3.6	4.9	45
Upper gastrointestinal endoscopy	530	508‡	5.2	4.7	-4
Echocardiogram	306	371‡	2.8	3.4	21
<b>85+ years, total discharges</b>	<b>2,362</b>	<b>3,196</b>	<b>100.0</b>	<b>100.0</b>	<b>35</b>
Blood transfusion	138	373	5.8	11.7	170
Upper gastrointestinal endoscopy	122	143	5.2	4.5	17
Respiratory intubation and mechanical ventilation	65	123	2.8	3.8	89
Echocardiogram	65	96	2.7	3.0	49
Treatment, fracture or dislocation of hip and femur	87	89‡	3.7	2.8	2

† Includes a small number of discharges (50,000 or 0.1 percent) with missing age.

‡ 2008 discharges are not statistically different from 1997 discharges at p<0.05.

Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 1997 and 2008.

While some of the most frequent procedures varied by age group, some were common across several age groups.

- Blood transfusion was a top five procedure in all age groups except infants less than 1 year and individuals 18-44 years old. It was the third most common procedure for 1-17 year olds and the first for adults 45-64, 65-84, and 85 years and older. Blood transfusion was one of the fastest growing procedures from 1997 to 2008.
- Respiratory intubation and mechanical ventilation was common among four age groups (infants, adults 45-64, 65-84 years old, and 85 years and older) and represented 4 to 5 percent of discharges in each age group.
  - Respiratory intubation and mechanical ventilation grew rapidly from 1997 to 2008 among 45-64 year olds (123 percent), 65-84 year olds (45 percent), and seniors 85 years and older (89 percent).
- Upper gastrointestinal endoscopy was common among 45-64 year olds and both senior age groups (65-84 and 85 years and older). From 1997 to 2008, the number of discharges grew for 45-64 year olds (42 percent) and patients 85 years and older (17 percent). For 65-84 year olds, however, the number of discharges remained fairly stable (4-percent decline).
- Diagnostic cardiac catheterization and coronary arteriography was common for 45-64 year olds (655,000 procedures) and 65-84 year olds (686,000 procedures), but the number of procedures grew negligibly.

- Echocardiogram was the fifth most frequent procedure for patients 65-84 years (371,000 stays) and the fourth most frequent procedure for patients 85 years and older (96,000 stays)

#### For infants:

- The most common procedures performed on infants were routine procedures, such as vaccinations (performed in 29.3 percent of infant stays) and circumcision (performed in 25.7 percent of infant stays).
  - In 2008, 1.2 million circumcisions were completed in the hospital (56 percent of male liveborn infants).
- Procedures on infants also included those done for complex conditions affecting severely ill babies, such as respiratory intubation and mechanical ventilation (performed during 173,000 infant stays in 2008), enteral/parenteral nutrition (performed during 115,000 infant stays in 2008), and diagnostic spinal tap (performed during 84,000 infant stays in 2008).
  - Enteral and parenteral nutrition, or tube feeding, during infant hospitalizations increased 196 percent whereas spinal tap procedures decreased 43 percent, compared with an 8-percent growth in all infant discharges from 1997 to 2008.

#### For children 1-17:

- Appendectomy was the most common procedure for 1-17 year olds, accounting for 4.9 percent of hospitalizations in this age group.
- Other top procedures common in stays for children included repair of obstetric laceration in teen deliveries, cancer chemotherapy, and artificial rupture of membranes to assist in teen delivery.

#### For adults 18-44:

- All five of the most common procedures were related to pregnancy and childbirth for adults 18-44 years old.
  - C-sections and repair of obstetric laceration were the most frequently performed procedures each occurring in over 13 percent of all discharges in 2008.
  - C-sections increased by 74 percent from 1997 to 2008.
  - Episiotomy was the fifth most frequently occurring procedure in this age group, but decreased by 60 percent between 1997 and 2008.
  - Artificial rupture of membranes to assist delivery also experienced rapid growth from 1997 to 2008 (up 36 percent), while fetal monitoring procedures declined slightly (down 3 percent).

#### For adults 45-64 and 65-84:

- In 2008, the top four most frequently performed procedures were the same for individuals 45-64 and 65-84 years old: blood transfusion, diagnostic cardiac catheterization and coronary arteriography, respiratory intubation and mechanical ventilation, and upper gastrointestinal endoscopy.
  - Blood transfusion was the leading procedure for 45-64 year olds and 65-84 year olds.
  - Diagnostic cardiac catheterization and coronary arteriography was the second most common procedure performed in each of these age groups.

#### For adults 85 years and older:

- For patients 85 years and older, treatment of a fracture or dislocation of the hip and femur was a top procedure performed during a hospital stay and appeared only in this age group.
  - Discharges for treatment of a hip fracture or dislocation changed very little (2 percent) from 1997 to 2008, accounting for 89,000 stays in 2008.
- Twelve percent of all hospital stays for this age group involved a blood transfusion.

## EXHIBIT 3.3 Most Frequent All-listed Procedures by Gender

Number of Discharges, Percent Distribution, and Rank of the Most Frequent All-listed Procedures for Inpatient Hospital Stays Excluding Pregnancy and Childbirth, by Gender, 2008

ALL-LISTED CCS PROCEDURES	NUMBER OF DISCHARGES IN THOUSANDS		PERCENT OF DISCHARGES WITH A PROCEDURE		RANK	
	MALES	FEMALES	MALES	FEMALES	MALES	FEMALES
Discharges with a procedure†	8,565	9,451	100.0%	100.0%		
Blood transfusion	1,177	1,545	13.7	16.4	1	1
Diagnostic cardiac catheterization, coronary arteriography	923	598	10.8	6.3	2	4
Respiratory intubation and mechanical ventilation	768	676	9.0	7.2	3	3
Upper gastrointestinal endoscopy	568	687	6.6	7.3	4	2
Percutaneous transluminal coronary angioplasty (PTCA)	501	256	5.9	2.7	5	16
Echocardiogram	439	400‡	5.1	4.2	6	7
Hemodialysis	414	379‡	4.8	4.0	7	8
Enteral and parenteral nutrition	284	282‡	3.3	3.0	8	13
Arthroplasty knee	259	426	3.0	4.5	9	6
Alcohol and drug rehabilitation/detoxification	257	120	3.0	1.3	10	36
Colonoscopy and biopsy	244	342	2.8	3.6	13	10
Hysterectomy	–	511	–	5.4	–	5
Oophorectomy, unilateral and bilateral	–	374	–	4.0	–	9

† Excludes procedures related to pregnancy and childbirth and a small number of discharges (111,000 or 0.3 percent) with missing gender.

‡ Female discharges are not statistically different from male discharges at  $p < 0.05$ .

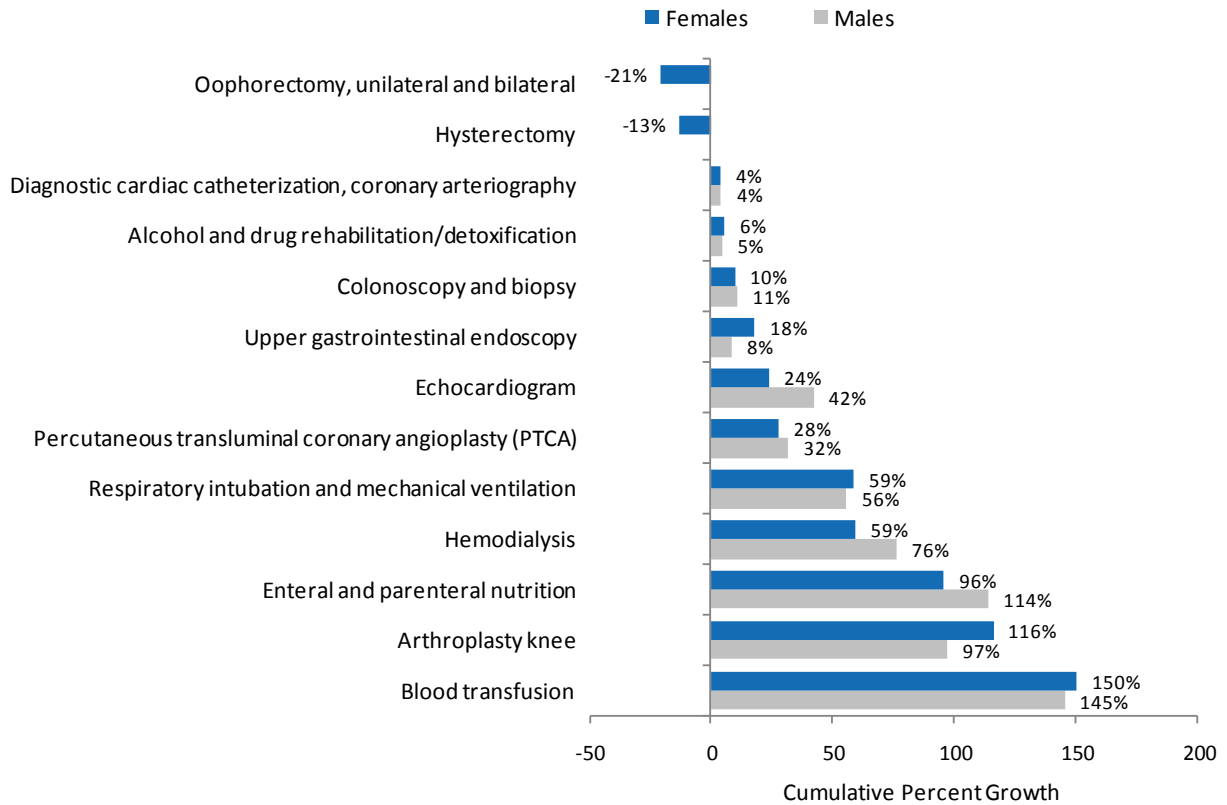
Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 2008.

When procedures related to childbirth and liveborn infants are excluded, males and females received similar procedures.

- Blood transfusion was the most common procedure for both genders when childbirth and liveborn infant procedures are excluded. Transfusion occurred in 13.7 percent of all procedure-related stays for males and 16.4 percent of stays for females.
- For procedures common to both males and females, some procedures occurred more frequently in one gender:
  - Two heart-related procedures—diagnostic cardiac catheterization and PTCAs—were performed more often for males than females. Diagnostic cardiac catheterization was performed in 10.8 percent of male discharges and 6.3 percent of female discharges in 2008 and was ranked as the second most frequent procedure in men and the fourth most frequent procedure in women.
  - PTCAs were performed in 5.9 percent of male stays and 2.7 percent of female stays. PTCA was the fifth most common procedure for men and the sixteenth most common for women.
  - Males also underwent more respiratory intubation and mechanical ventilation (9.0 percent of stays) than females (7.2 percent of stays). The procedure ranked third for both genders.
  - Males received alcohol and drug rehabilitation/detoxification (3.0 percent of male stays) more than females (1.3 percent of female stays). Alcohol and drug rehabilitation/detoxification ranked tenth for males and thirty-sixth for females.
  - Females received blood transfusion, upper gastrointestinal endoscopy, colonoscopy and biopsy, and arthroplasty of the knee more often than males.
  - For all other top ranking procedures (echocardiogram, hemodialysis, and enteral and parenteral nutrition), there was little difference between males and females in the volume of procedures performed.

- Hysterectomy and oophorectomy were the fifth and ninth most common procedures for females, respectively.

**Growth of the Most Frequent All-listed Procedures for Females and Males,\* 1997-2008**



\*Excludes procedures related to pregnancy and childbirth.

Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 1997 and 2008.

From 1997 to 2008, all discharges grew by 15 percent and discharges with a procedure grew by 18 percent. Growth varied widely among common procedures, but less so between females and males within a given procedure.

- The number of discharges for blood transfusion, the most frequent procedure for both genders, was among the fastest growing common procedures since 1997, increasing by 150 percent for females and 145 percent for males.
- Other rapidly growing procedures for both females and males were arthroplasty of the knee (116 and 97 percent, respectively), enteral and parenteral nutrition (96 and 114 percent, respectively), hemodialysis (59 and 76 percent, respectively), and respiratory intubation and mechanical ventilation (59 percent for females and 56 percent for males).
- Colonoscopy, alcohol and drug rehabilitation/detoxification, and diagnostic cardiac catheterization grew slowly or remained stable for both females and males.
- Although hysterectomies and oophorectomies increased during the 5-year period from 1997-2002, these female-specific procedures declined in subsequent years. Over the 1997 to 2008 period, hysterectomies decreased by 13 percent and oophorectomies by 21 percent.

## SECTION 4 COSTS FOR INPATIENT HOSPITAL STAYS

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### HIGHLIGHTS

- The top three conditions with the highest aggregate costs—septicemia, coronary atherosclerosis, and osteoarthritis—accounted for more than 11 percent of all hospital costs in 2008.
- Three of the twenty most expensive conditions were musculoskeletal: osteoarthritis, spondylosis, intervertebral disc disorders, and other back problems, and fracture of neck of femur (hip).
  - Costs for osteoarthritis and spondylosis grew at more than twice the pace of total hospital costs between 1997 and 2008.
- Between 1997 and 2008, costs for acute renal failure, septicemia, and respiratory failure grew at two to three times the rate of total hospital costs.
- Hospital stays for septicemia cost a total of \$14.6 billion and accounted for 791,000 discharges.
- Aggregate costs for stays in community hospitals grew 4.4 percent annually between 1997 and 2008.
- Growth in intensity of services accounted for 71 percent of the growth in aggregate costs, while population growth was responsible for 24 percent and an increased number of discharges per population for only 5 percent of the growth in aggregate costs.
- Non-elderly adult (45 to 64 years) discharges accounted for less than half (48 percent) of the aggregate cost of all inpatient stays, including maternal and neonatal stays.
- Patients 65-84 years accounted for 35 percent of all hospital costs.
- Medicare, the single largest expected payer for hospitalizations in 2008, accounted for 46 percent of aggregate inpatient costs.
- Medicaid stays accounted for 14 percent of in-hospital costs.
- Private insurance was responsible for 32 percent of aggregate costs; the uninsured were responsible for 4 percent.
- Five broad groups of conditions – circulatory, musculoskeletal system and connective tissue, respiratory, digestive, and maternal/neonatal stays accounted for more than half of total hospital costs in 2008.
- Maternal and neonatal stays were responsible for the greatest portion of Medicaid hospitalization costs (27 percent) compared to only 14 percent of private payer costs.
- Stays for musculoskeletal system and connective tissue conditions accounted for larger shares of hospital costs for Medicare (14 percent) and private insurance (15 percent) than for Medicaid (6 percent) and the uninsured (8 percent).

## EXHIBIT 4.1 Cost by Principal Diagnosis

### Aggregate Costs by Principal Diagnosis, 1997, 2002, and 2008

PRINCIPAL CCS DIAGNOSIS	TOTAL INFLATION-ADJUSTED† HOSPITAL COSTS IN BILLIONS: 2008 DOLLARS			PERCENT OF TOTAL COSTS			AVERAGE ANNUAL GROWTH
	1997	2002	2008	1997	2002	2008	1997-2008
All diagnoses	\$227.2	\$305.7	\$364.7	100.0%	100.0%	100.0%	4.4%
Septicemia	4.2	5.1	14.6	1.9	1.7	4.0	11.9
Coronary atherosclerosis	15.2	17.0‡	14.5	6.7	5.6	4.0	-0.4
Osteoarthritis	4.9	7.4	13.5	2.1	2.4	3.7	9.7
Acute myocardial infarction	9.5	12.5	11.6‡	4.2	4.1	3.2	1.9
Liveborn infant	8.2	10.1	11.5	3.6	3.3	3.1	3.1
Complication of device, implant or graft	5.7	8.4	11.5	2.5	2.8	3.1	6.5
Congestive heart failure	6.9	9.9	10.7‡	3.0	3.2	2.9	4.1
Pneumonia	9.2	11.2	10.5‡	4.1	3.7	2.9	1.1
Spondylosis, intervertebral disc disorders, and other back problems	3.6	6.2	9.5	1.6	2.0	2.6	9.4
Respiratory failure	3.4	4.7	9.1	1.5	1.5	2.5	9.3
Acute cerebrovascular disease	5.6	6.4	7.6	2.5	2.1	2.1	2.8
Cardiac dysrhythmias	3.7	6.6	7.4	1.6	2.2	2.0	6.6
Complication of surgical procedures or medical care	3.0	4.5	6.1	1.3	1.5	1.7	6.7
Chronic obstructive pulmonary disease and bronchiectasis	3.4	4.5	5.4	1.5	1.5	1.5	4.1
Rehabilitation care, fitting of prostheses, and adjustment of devices	3.9	5.1	4.9‡	1.7	1.7	1.3	2.2
Biliary tract disease	3.4	4.5	4.9	1.5	1.5	1.3	3.2
Diabetes mellitus with complications	2.8	4.0	4.6	1.3	1.3	1.3	4.4
Fracture of neck of femur (hip)	3.3	3.8	4.5	1.5	1.3	1.2	2.9
Acute renal failure	1.0	1.8	4.3	0.4	0.6	1.2	14.2
Mood disorders	3.2	4.3	4.2‡	1.4	1.4	1.1	2.4

† Adjusted for inflation using the GDP deflator (<http://www.bea.gov/national/nipaweb/SelectTable.asp>, Table 1.1.4. Price Indexes for Gross Domestic Product).

‡ Costs are not statistically different from previously reported year shown on table at p<0.05.

Note: Aggregate costs for residual codes and those not elsewhere classified are not shown here. As a result, aggregate costs for all body systems may be larger than the sum of the component parts.

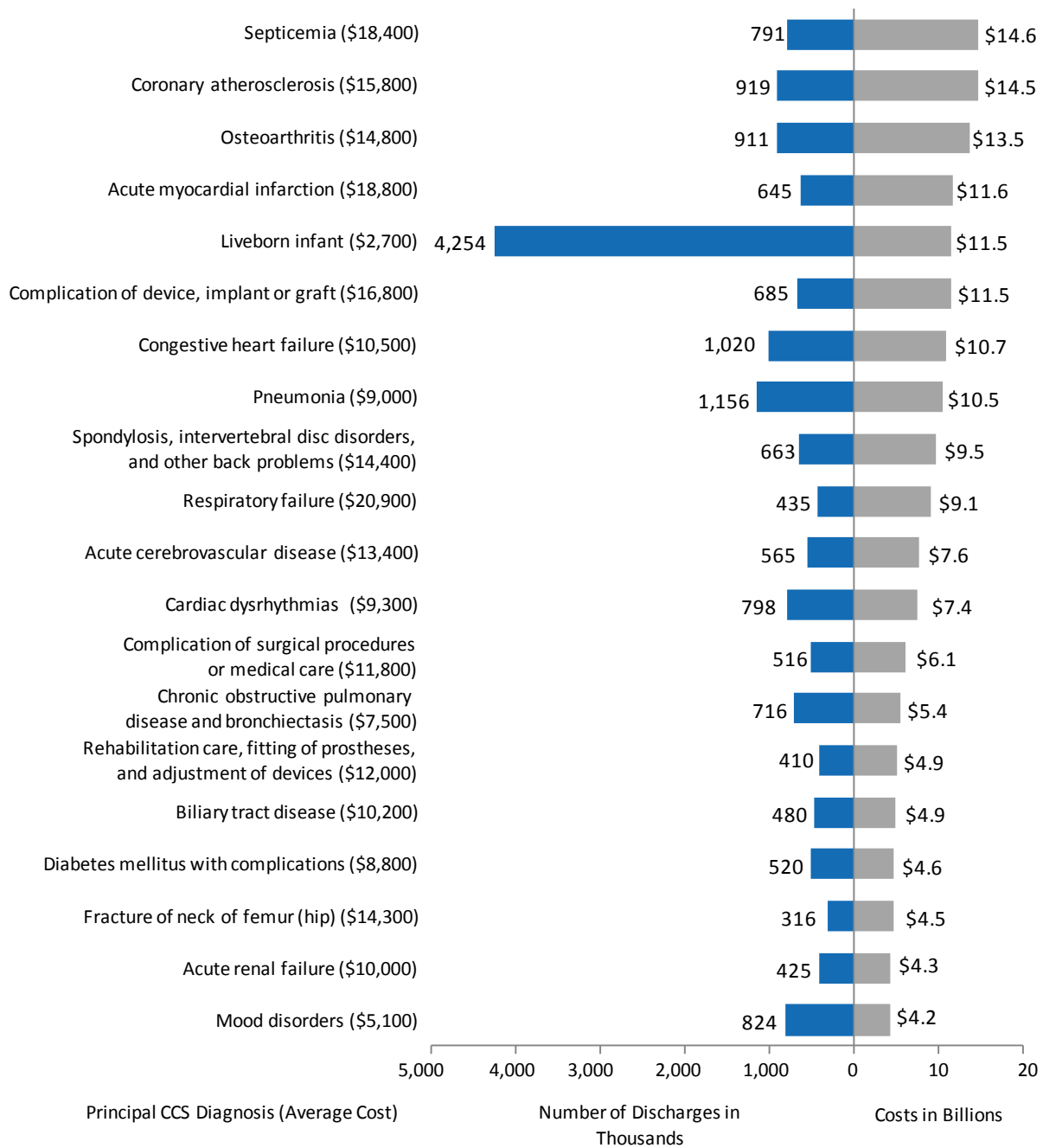
Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 1997, 2002, and 2008.

Inflation-adjusted aggregate costs for community hospital stays rose from \$227.2 billion in 1997 to \$364.7 billion in 2008.

- The top three conditions with the highest aggregate costs—septicemia, coronary atherosclerosis, and osteoarthritis—accounted for more than 11 percent of all hospital costs in 2008.
- Five of the twenty most expensive conditions were cardiovascular: coronary atherosclerosis, acute myocardial infarction, congestive heart failure, acute cerebrovascular disease, and cardiac dysrhythmias.
  - With the exception of costs of stays for cardiac dysrhythmias, the costs for these cardiovascular diagnoses grew at a slower pace than total hospital costs between 1997 and 2008.
- Three of the twenty most expensive conditions were musculoskeletal: osteoarthritis, spondylosis, intervertebral disc disorders, and other back problems, and fracture of neck of femur (hip).
  - Costs for osteoarthritis and spondylosis grew at more than twice the pace of total hospital costs between 1997 and 2008.

- Between 1997 and 2008, costs for acute renal failure, septicemia, and respiratory failure grew at two to three times the rate of total hospital costs. Costs for pneumonia, acute myocardial infarction, rehabilitation care, fitting of prostheses, and adjustment of devices, and mood disorders grew at a slower pace than overall costs. Costs for coronary atherosclerosis stabilized between 1997 and 2008.

### Number of Discharges and Aggregate Costs by Principal Diagnosis, 2008

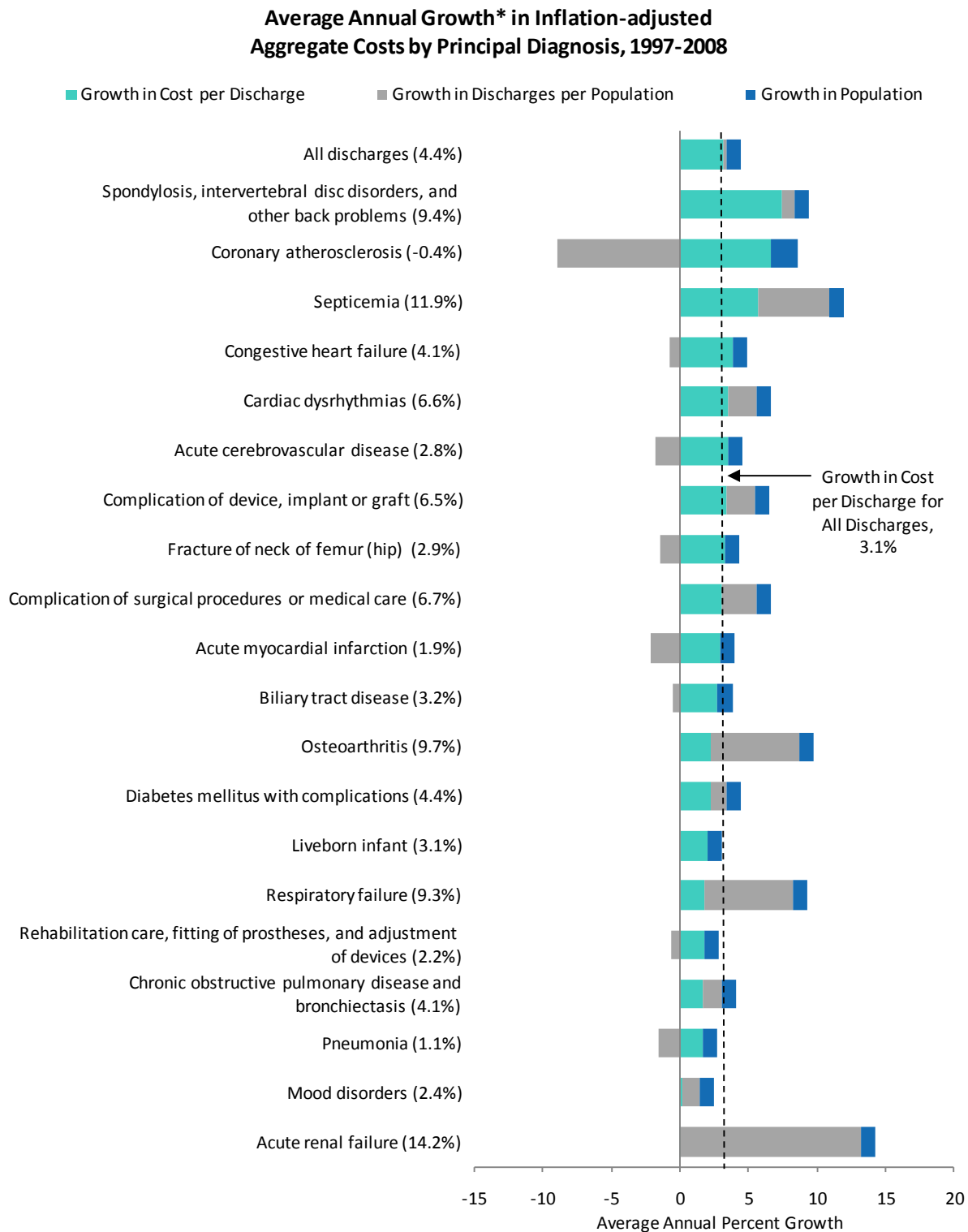


Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 2008.

- Hospital stays for septicemia cost a total of \$14.6 billion and accounted for 791,000 discharges. The average cost per discharge was \$18,400, about twice as much as the average cost for all discharges.
- The greatest number of discharges was for liveborn infants (4.3 million). These stays were responsible for \$11.5 billion in hospital costs; each stay cost an average of \$2,700.
- Mood disorders cost \$4.2 billion and accounted for 824,000 discharges. This diagnosis had the lowest average cost per stay (\$5,100) after liveborn infants.



## EXHIBIT 4.2 Cost Factors Accounting for Growth by Principal Diagnosis

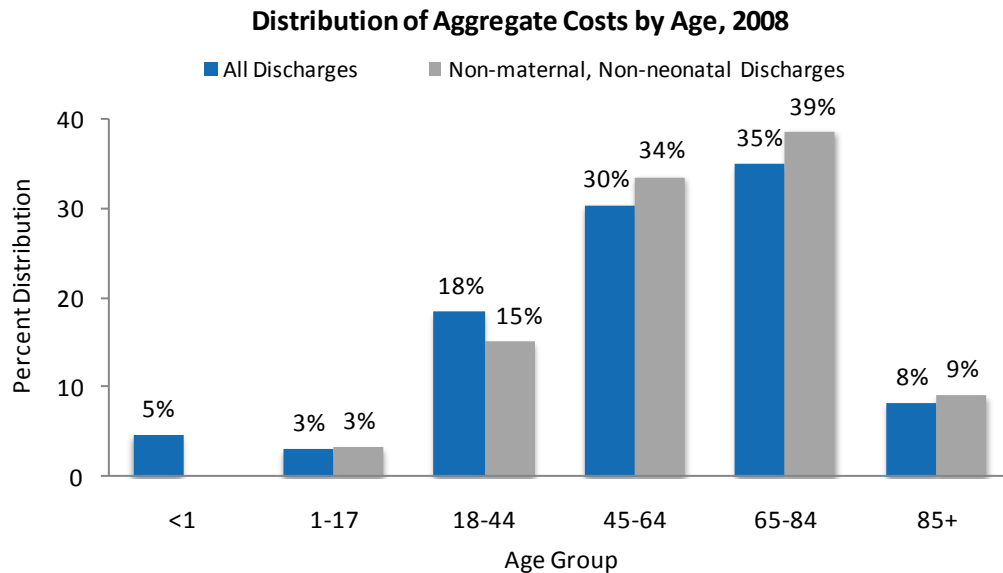


\*Bar segments depict the portion of growth attributable to each of the factors listed in the key. The net average annual growth is noted in the axis label.

Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 1997 and 2008.

- Aggregate costs for stays in community hospitals grew 4.4 percent annually between 1997 and 2008. The factors that comprised this overall growth were:
  - Greater intensity of services (cost per discharge) provided during the hospital stay (averaging 3.1 percent annually),
  - Population growth (up 1.0 percent annually), and
  - Growth in the number of stays per person (only 0.2 percent annually).
- Overall, growth in intensity of services accounted for 71 percent of the growth in aggregate costs, while population growth was responsible for 24 percent and an increased number of discharges per population for only 5 percent of the growth in aggregate costs.
- The growth in costs for most conditions with high aggregate costs was driven predominantly by higher than average growth in cost per discharge, indicating greater intensity of service utilization and more expensive interventions.
- Growth in stays per person made up more than half the growth in costs for discharges for osteoarthritis, respiratory failure, mood disorders, and acute renal failure.
- The increase in number of stays per person was a relatively more important factor in cost growth for discharges with septicemia, cardiac dysrhythmias, complication of surgical procedures or medical care, diabetes mellitus with complications, and chronic obstructive pulmonary disease and bronchiectasis.
- The decline in hospitalizations per population dampened increases in the net cost of hospital stays for coronary atherosclerosis, congestive heart failure, acute cerebrovascular disease, fracture of neck of femur (hip), acute myocardial infarction, rehabilitation care, and pneumonia.

## EXHIBIT 4.3 Cost by Age

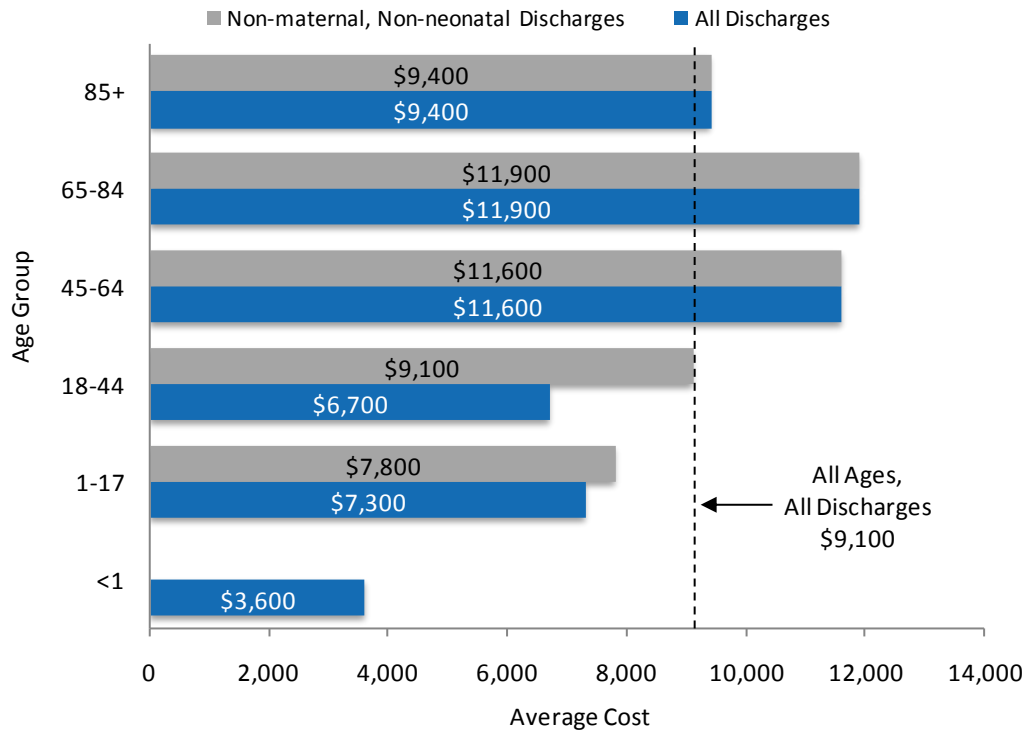


Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 2008.

In 2008, the aggregate cost for all hospital stays was \$364.7 billion.

- Non-elderly adult discharges accounted for less than half (48 percent) of the aggregate cost of all inpatient stays, including maternal and neonatal stays.
- Patients 65-84 years accounted for 35 percent of all hospital costs.
- Discharges among patients 45-64 and 65-84 years accounted for larger shares of aggregate non-maternal, non-neonatal costs (34 and 39 percent, respectively) relative to other age groups.

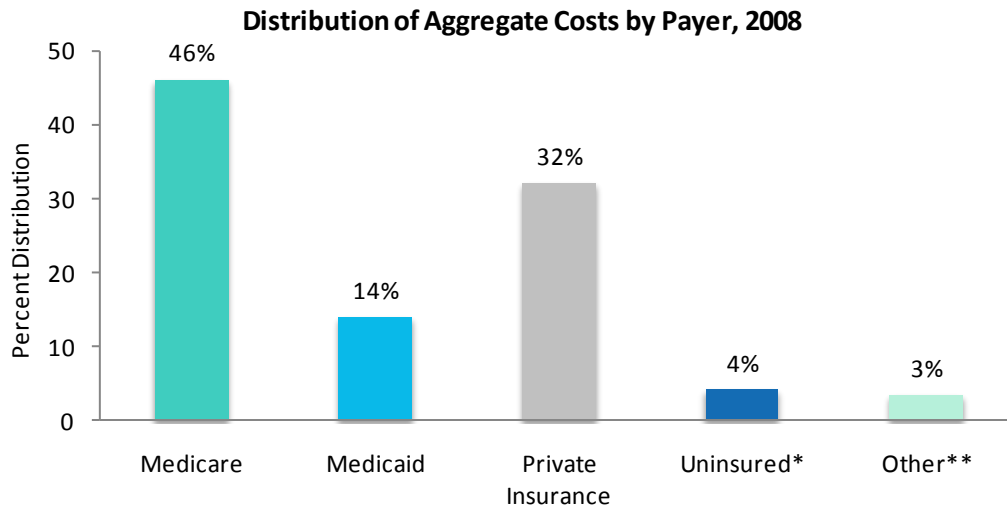
### Average Cost per Discharge by Age, 2008



Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 2008.

- Stays for patients under one year of age had an average cost of \$3,600. The overwhelming majority of these discharges were liveborn infants.
- On average, the cost per discharge for all patients 1-17 years (\$7,300) was less than the average cost per discharge across all age groups (\$9,100).
- When maternal hospital stays were excluded, the average cost of a discharge for patients 18-44 years changed from \$6,700 to \$9,100.
- The average cost per discharge for patients 45-64 years and 65-84 years were similar—\$11,600 and \$11,900, respectively— and were greater than the cost per discharge across all age groups (\$9,100).
- The average cost per discharge for patients 85 years and over was \$9,400.

## EXHIBIT 4.4 Cost by Payer



\*Includes discharges classified as self-pay or no charge.

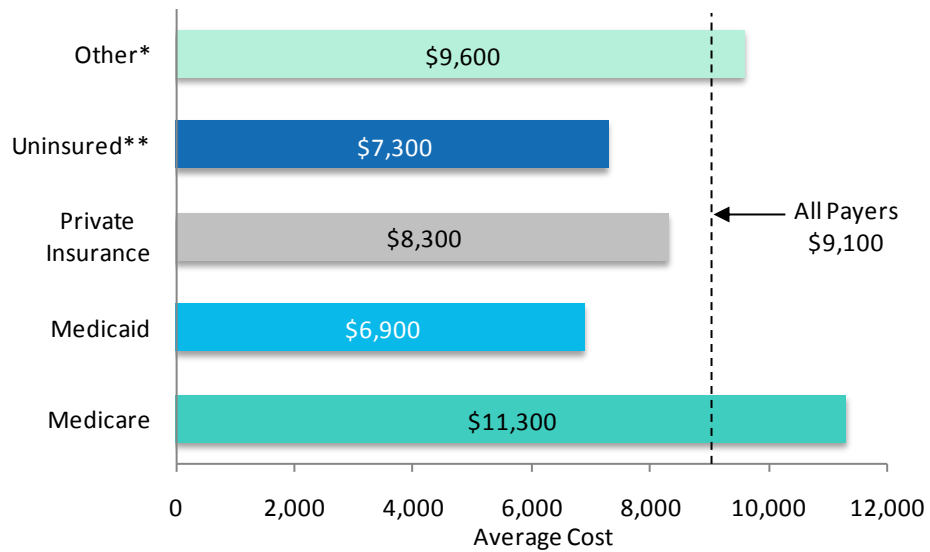
\*\*Includes other payers such as Workers' Compensation, TRICARE, CHAMPUS, CHAMPVA, Title V, and other government programs.

Note: Excludes a small number of discharges (68,000 or 0.2 percent) with missing payer that have a small sum of missing costs (\$642 million or 0.2 percent).

Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 2008.

- Medicare, the single largest expected payer for hospitalizations in 2008, accounted for 46 percent of aggregate inpatient costs.
- Medicaid stays accounted for 14 percent of in-hospital costs.
- Private insurance was responsible for 32 percent of aggregate costs; the uninsured were responsible for 4 percent.

### Average Cost per Discharge by Payer, 2008



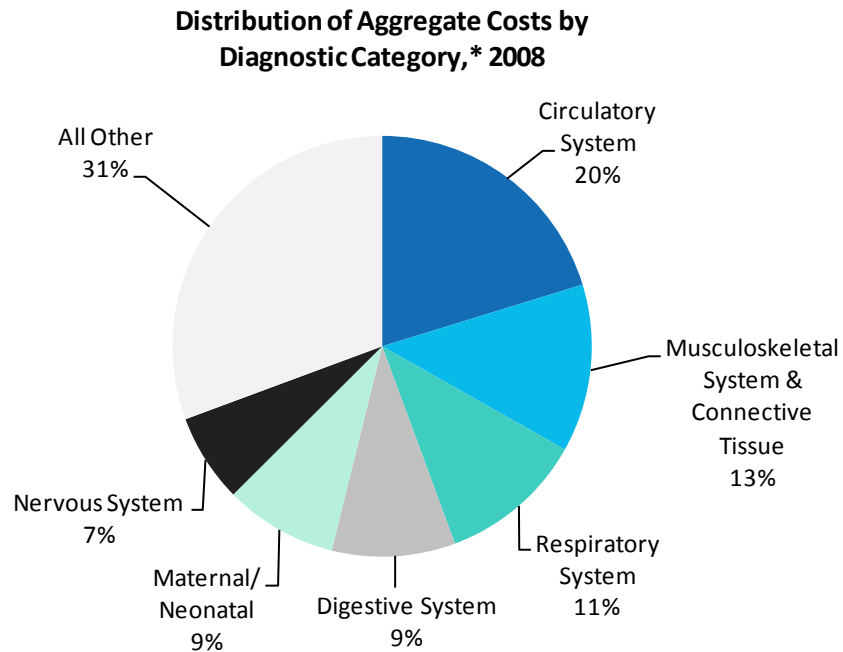
\*Includes other payers such as Workers' Compensation, TRICARE, CHAMPUS, CHAMPVA, Title V, and other government programs.

\*\*Includes discharges classified as self-pay or no charge.

Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 2008.

- Medicare discharges had the highest average cost per hospital stay (\$11,300).
- The average cost per discharge billed to private insurance (\$8,300), the uninsured (\$7,300), and Medicaid (\$6,900) was lower than the all payer average cost per discharge (\$9,100).

## EXHIBIT 4.5 Cost by Diagnostic Category



\* Based on principal diagnosis defined by Major Diagnostic Category (MDC).

Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 2008.

- Circulatory conditions accounted for the largest share of hospital costs (20 percent) in 2008.
- Additional diagnostic categories responsible for large portions of hospital costs included:
  - Musculoskeletal system and connective tissue conditions (13 percent),
  - Respiratory conditions (11 percent),
  - Digestive conditions and maternal/neonatal stays (each 9 percent), and
  - Nervous system conditions (7 percent).

### Aggregate Costs and Percent Distribution for each Payer by Diagnostic Category, † 2008

	MEDICARE		MEDICAID		PRIVATE INSURANCE		UNINSURED*		OTHER**	
	Cost (Billions)	Percent	Cost (Billions)	Percent	Cost (Billions)	Percent	Cost (Billions)	Percent	Cost (Billions)	Percent
Total	\$167.9	100.0%	\$51.1	100.0%	\$117.1	100.0%	\$15.5	100.0%	\$12.6	100.0%
Circulatory System	43.3	25.8	5.9	11.5	19.8	16.9	2.9	18.5	1.9	14.8
Musculoskeletal System & Connective Tissue	22.8	13.6	3.0	5.8	17.3	14.8	1.2	7.6	2.8	22.5
Respiratory System	24.2	14.4	5.2	10.2	9.0	7.6	1.4	8.9	1.0	8.1
Digestive System	16.6	9.9	3.6	7.1	11.6	9.9	1.6	10.5	1.0	8.2
Maternal/Neonatal	0.2	0.1	13.6	26.7	15.8	13.5	1.1	6.8	0.9	6.8
Nervous System	11.5	6.8	3.4	6.6	7.7	6.6	1.3	8.5	0.9	7.5
All Other	49.3	29.3	16.4	32.1	35.8	30.6	6.1	39.3	4.0	32.0

† Based on principal diagnosis defined by Major Diagnostic Category (MDC).

\* Includes discharges classified as self-pay or no charge.

\*\* Includes other payers such as Workers' Compensation, TRICARE, CHAMPUS, CHAMPVA, Title V, and other government programs.

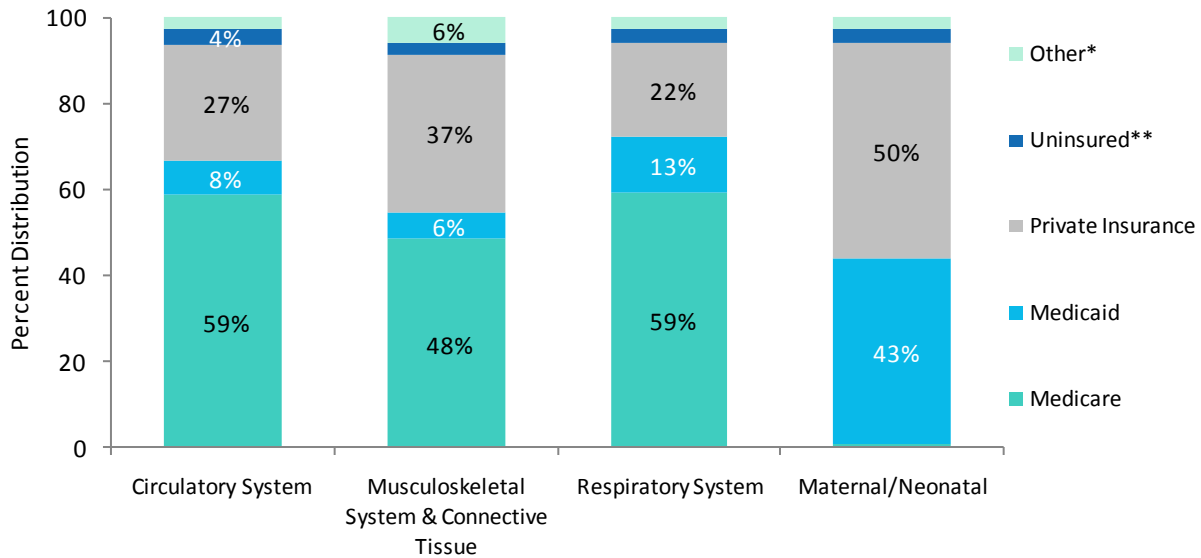
Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 2008.

Costs by diagnostic category varied by payer, as did the distribution of costs.

- Stays for circulatory conditions accounted for the largest share of hospital costs for Medicare (26 percent), private insurance (17 percent), and the uninsured (19 percent).
- Maternal and neonatal stays were responsible for the greatest portion of Medicaid hospitalization costs (27 percent) compared to only 14 percent of private payer costs.
- Stays for musculoskeletal system and connective tissue conditions accounted for larger shares of hospital costs for Medicare (14 percent) and private insurance (15 percent) than for Medicaid (6 percent) and the uninsured (8 percent).



### Distribution of Aggregate Costs by Payer for Selected Diagnostic Categories, † 2008



† Based on principal diagnosis defined by Major Diagnostic Category (MDC).

\* Includes other payers such as Workers' Compensation, TRICARE, CHAMPUS, CHAMPVA, Title V, and other government programs.

\*\* Includes discharges classified as self-pay or no charge.

Note: Each diagnostic category excludes a small percentage of discharges (0.1 - 0.2 percent) with missing payer that have a small percentage of missing costs (0.1 - 0.2 percent).

Note: Bar segments representing 3 percent or less have not been labeled.

Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 2008.

- The majority of costs for circulatory conditions (59 percent) were billed to Medicare. Just over one quarter of circulatory system costs (27 percent) were covered by private insurance.
- About half (48 percent) of the costs for musculoskeletal and connective tissue conditions were for discharges with Medicare as primary expected payer. Discharges covered by private insurance accounted for 37 percent of these costs.
- The majority of costs for respiratory conditions (59 percent) were billed to Medicare.
- Discharges covered by private insurance and Medicaid accounted for most of the costs associated with maternal and neonatal hospitalizations (50 and 43 percent, respectively).

## SECTION 5 HOSPITAL CARE FOR MENTAL HEALTH AND SUBSTANCE ABUSE CONDITIONS

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### HIGHLIGHTS

This section focuses on inpatient stays and emergency department (ED) visits in community hospitals for mental health (MH) and substance abuse (SA) treatment, providing details on principal conditions of:

- anxiety disorders
- adjustment disorders
- attention-deficit, conduct, and disruptive behavior disorders
- developmental disorders
- autism and other childhood disorders
- impulse control disorders
- mood disorders
- personality disorders
- schizophrenia and other psychotic disorders
- alcohol-related disorders
- drug-related disorders
- pregnancy and other miscellaneous mental health disorders

Dementia and other cognitive disorders are excluded because they are often characterized by multiple cognitive problems that result from a condition that requires medical instead of psychiatric treatment. Screenings for mental health (MH) and substance abuse (SA) conditions are also excluded because they may not result in a MHSA diagnosis. In addition, suicide and intentional self-inflicted injury is excluded from analyses of principal reasons for inpatient MH stays because it occurs less than 2,000 times in 2008; however, this diagnosis is included in analysis of secondary diagnoses for inpatient MH stays and for emergency department visits where it appears more frequently as a reason for the stay/visit.

This analysis reflects care only in community hospitals and thus excludes MHSA stays in specialty psychiatric and chemical dependency hospitals.

## Hospitalizations for Mental Health and Substance Abuse (MHSA) Conditions

- Of the 39.9 million community hospital discharges in 2008, about 5 percent had a principal diagnosis of a MH or SA disorder.
- An additional 13.6 percent of all hospital discharges had a secondary MH diagnosis and 5.4 percent had a secondary SA diagnosis.
- Depression was responsible for 24 percent of MHSA stays and bipolar disorders for another 20 percent of MHSA stays.
- Hospital stays with MH and SA diagnoses were more commonly uninsured (12 percent) or insured by Medicaid (27 percent) than were hospital stays overall (5 percent uninsured and 18 percent insured by Medicaid).
- In 2008, the average cost for a MHSA hospital stay was \$5,500, compared to an average of \$9,100 for all stays and \$6,700 for all stays without a major operating room procedure.
- Non-elderly adults (18-64 years old) accounted for a disproportionate share of all MHSA hospitalizations (83 percent) relative to their share of the total population (63 percent) and all hospitalizations (49 percent).
- From 1997 to 2008, the MHSA discharge rate for adults 65 years and older has fallen appreciably—from 55 to 43 discharges per 10,000.

## Hospitalizations for Mental Health Conditions

- In 2008, patients living in the poorest communities experienced MH hospitalization rates 44 percent higher than patients living in higher income communities—5.8 stays per 1,000 compared to 4.0 stays per 1,000 in higher income communities.
- Hospitalizations for schizophrenia and other psychotic disorders for residents in the poorest communities (1.9 discharges per 1,000) occurred at twice the rate of all other communities (0.9 discharges per 1,000).

## Hospitalizations for Substance Abuse Conditions

- Patients residing in the poorest communities experienced similar overall rates of hospitalization for SA as patients residing in higher income communities.
- Between 1997 and 2008, the number of hospital stays for drug-related conditions rose rapidly among 45-64 year olds (117-percent increase), 65-84 year olds (96-percent increase), and adults 85 and older (87-percent increase) while remaining relatively stable (11-percent decline) among adults 18-44 years.
- Rapid growth in drug-induced delirium and in poisonings by opiate-based pain medications was primarily responsible for the increase in drug-related hospitalizations for patients 65 years and older. In 2008, these two conditions accounted for 60 percent of drug-related stays for patients 65-84 years old and 78 percent of the drug-related stays in patients 85 years and older.
- Alcohol-related disorders accounted for 12 percent of MHSA hospital stays among 18-44 year olds, 21 percent of MHSA stays among 45-64 year olds, and 12 percent of MHSA stays for 65-84 year olds.

## ED Visits for MHSA Conditions<sup>2</sup>

- In 2007, there were 122.3 million emergency department visits. Of those ED visits, 9.9 million had an all-listed MH diagnosis, 2.8 million had an all-listed alcohol-related diagnosis, and 2.2 million had an all-listed drug-related diagnosis. (All-listed diagnoses include all diagnoses listed on the discharge record.)

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<sup>2</sup> This section contains information from the Nationwide Emergency Department Sample (NEDS) for 2007, constructed from information from a 20-percent sample of community hospital emergency departments.

- A diagnosis of depression was the most frequently noted MHS diagnosis (4.2 million ED visits), and the second most frequent MHS diagnosis was anxiety (3.3 million ED visits).
- About one in five of all ED visits (20.4 million, or 17 percent of all ED visits) in 2007 resulted in inpatient hospital admission. In comparison, ED visits were much more likely to result in inpatient admission for MHS conditions:
  - 42 percent of all MH ED visits resulted in hospitalization.
  - 44 percent of alcohol-related ED visits resulted in hospitalization.
  - 49 percent of all drug-related ED visits resulted in hospitalization.
- Three-quarters of ED visits for personality disorders led to an inpatient admission in 2007 and another 4 percent in a transfer to another facility such as a psychiatric hospital or to a skilled nursing or intermediate care facility. Among ED visits for suicide or intentional self-inflicted injury, 42 percent resulted in inpatient admission and another 28 percent resulted in transfer to another facility.

## EXHIBIT 5.1 Characteristics of U.S. Community Hospitals for MHSA Stays

### Characteristics of U.S. Community Hospitals<sup>†</sup> for All Stays and Stays with a Principal Mental Health (MH) and Substance Abuse (SA) Diagnosis, 2008

UTILIZATION, CHARGES, AND COSTS	ALL STAYS	MHSA STAYS	MH STAYS	SA STAYS
Discharges				
Total discharges in millions	39.9	1.8	1.3	0.5
Number of discharges per 1,000 population*	131.0	6.0	4.4	1.6
Total days of care in millions	183.6	13.1	10.8	2.3
Average length of stay in days	4.6	7.1	8.0	4.7
Percent of discharges from:				
Metropolitan hospitals	87%	89%‡	89%‡	90%
Teaching hospitals	47%	50%‡	50%‡	51%‡
Hospital ownership				
Non-Federal government hospitals	14%	14%‡	13%‡	16%‡
Private not-for-profit hospitals	73%	76%‡	76%‡	74%‡
Private for-profit hospitals	13%	11%‡	11%‡	9%‡
Charges and costs**				
Charges				
Average charges per stay	\$29,000	\$16,400	\$17,000	\$14,600
Costs				
Total aggregate costs in billions	\$364.7	\$10.1	\$7.7	\$2.4
Average costs per stay	\$9,100	\$5,500	\$5,700	\$4,900

† 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). Community hospitals (and HCUP data) include OB-GYN, ENT, orthopedic, cancer, pediatric, public, and academic medical hospitals. They exclude hospitals whose main focus is long-term care, psychiatric, and alcoholism and chemical dependency treatment, although discharges from these types of units that are part of community hospitals are included.

\* Calculated using resident population for July 2008 from the U.S. Bureau of the Census, retrieved on June 22, 2010 (<http://www.census.gov/popest/national/asrh/2009-nat-res.html>).

‡ Distribution of MHSA, MH, or SA discharges is not statistically different from distribution of all discharges at  $p < 0.05$ .

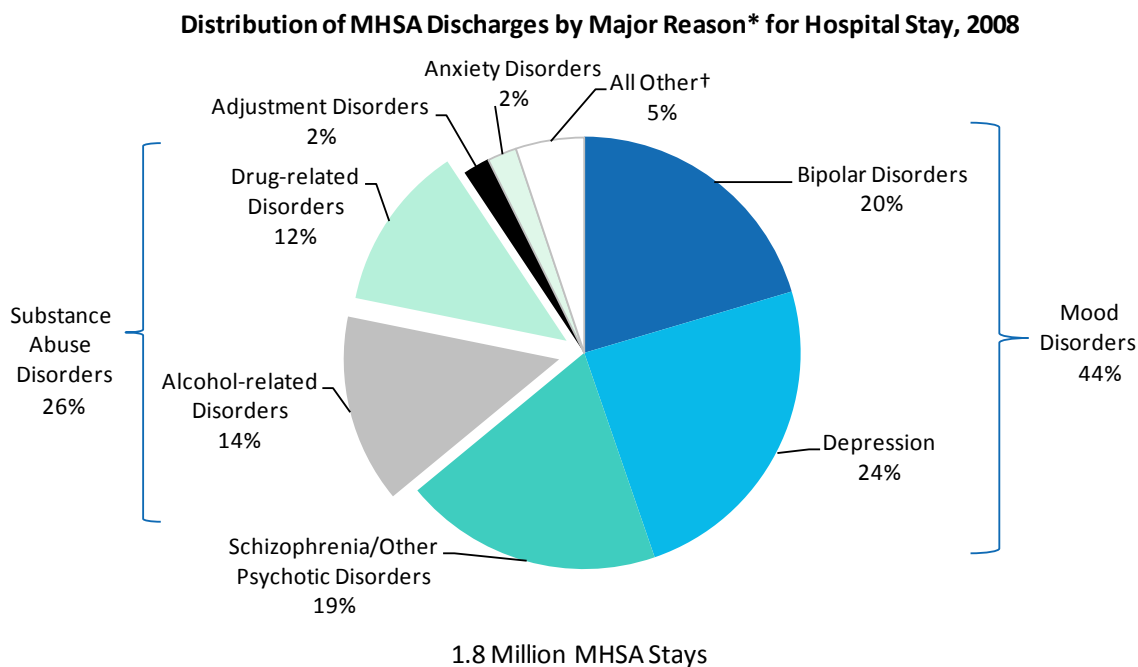
\*\* Charges represent amounts billed by hospitals. These amounts are seldom paid in full by insurers or patients. Costs are calculated from charges using cost-to-charge ratios calculated from hospital-reported Medicare Cost Reports submitted to the Centers for Medicare and Medicaid Services (CMS).

Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 2008.

- Of the 39.9 million community hospital discharges in 2008, 1.8 million discharges, or about 5 percent, had a principal diagnosis of a MHSA condition—1.3 million discharges with a MH diagnosis and 0.5 million with a SA disorder as the major reason for the stay.
- For every 1,000 persons in the United States in 2008, there were 6.0 stays for a principal MHSA condition—4.4 stays for MH disorders and 1.6 stays for SA disorders.
- The average length of stay (ALOS) for any MHSA condition was 7.1 days. The ALOS for MH (8.0 days) was 75 percent longer than for all stays (4.6 days). When the main reason for the stay was a SA disorder, the average length of stay (4.7 days) was similar to all stays (4.6 days).

- The distribution of discharges among hospitals by metropolitan location, teaching status and ownership was similar for all stays, MHSA stays, MH stays, and SA stays. The only exception was for patients with principal SA diagnoses, who were more likely to be hospitalized in a metropolitan hospital.
- Average charges per stay—the amounts patients are billed for their rooms, nursing care, diagnostic tests, and other services—were lower for MHSA (\$16,400) than for all stays (\$29,000). Average charges for MH stays (\$17,000) were higher than for SA stays (\$14,600) and about half of the average charges for all stays. (Charges are seldom paid in full because insurers negotiate substantial discounts with hospitals.)
- The aggregate costs for hospital stays with a principal MHSA diagnosis (\$10.1 billion) accounted for 2.8 percent of the all hospital costs (\$364.7 billion) in 2008. Most of these MHSA charges were for MH stays: MH disorders contributed \$7.7 billion (2.1 percent) of all hospital costs and SA disorders accounted for \$2.4 billion (0.7 percent).
- The average cost for a MHSA stay (\$5,500) was smaller than for all stays (\$9,100) in 2008. The average cost was \$5,700 for MH stays and \$4,900 for SA stays.

## EXHIBIT 5.2 Reasons for MHA Inpatient Hospital Stays



\* Based on principal CCS conditions.

† Includes attention-deficit, conduct, and disruptive behavior disorders; impulse control disorders; personality disorders; autism and other childhood disorders; developmental disorders; and pregnancy-related and other miscellaneous MH disorders.

Note: Pie slices do not add to 100% because of rounding.

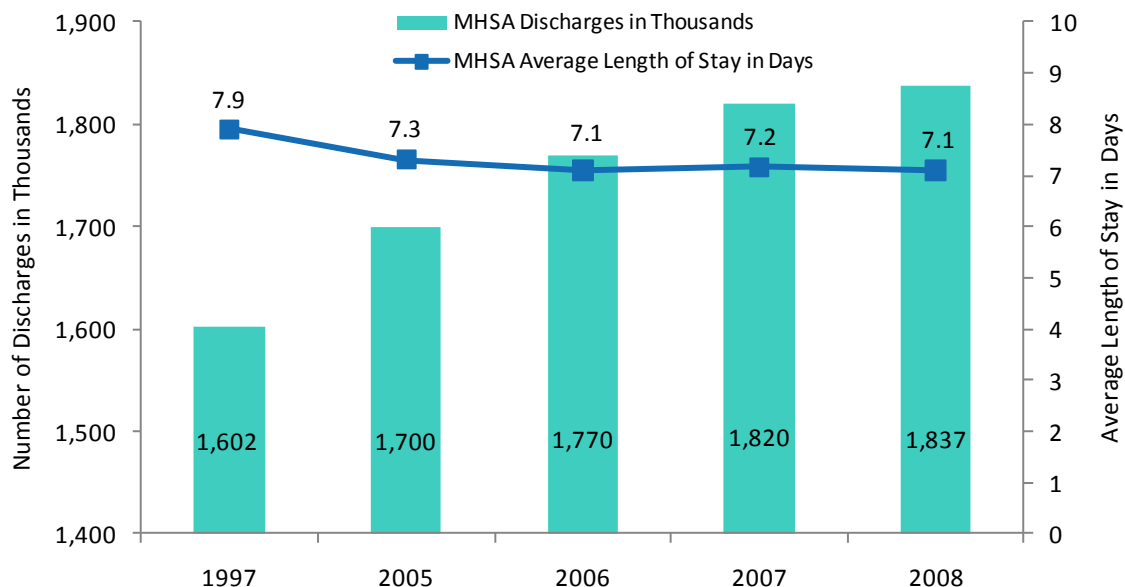
Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 2008.

In 2008, there were 1.8 million stays for a principal MHA diagnosis. About three-quarters (1.3 million) of these stays had a MH disorder and one-quarter of these (0.5 million) had a SA disorder.

- Accounting for 44 percent of discharges, mood disorders (depression and bipolar disorders) was the most common reason for a MHA stay in 2008. Depression was responsible for 24 percent of the 1.8 million MHA stays and bipolar disorders for another 20 percent of MHA stays.
- SA disorders contributed 26 percent of all MHA discharges, with alcohol-related disorders responsible for 14 percent and drug-related disorders for 12 percent of all MHA discharges.
- Schizophrenia/other psychotic disorders made up nearly one in five MHA hospitalizations (19 percent).
- The remaining 9 percent of MHA stays in 2008 were for anxiety disorders (2 percent), adjustment disorders (2 percent), and all other MH conditions (5 percent).

## EXHIBIT 5.3 MHPA Hospitalizations and Average Length of Stay

**Number of Inpatient Hospital Stays and Average Length of Stay for Discharges with a Principal MHPA Diagnosis, 1997-2008**



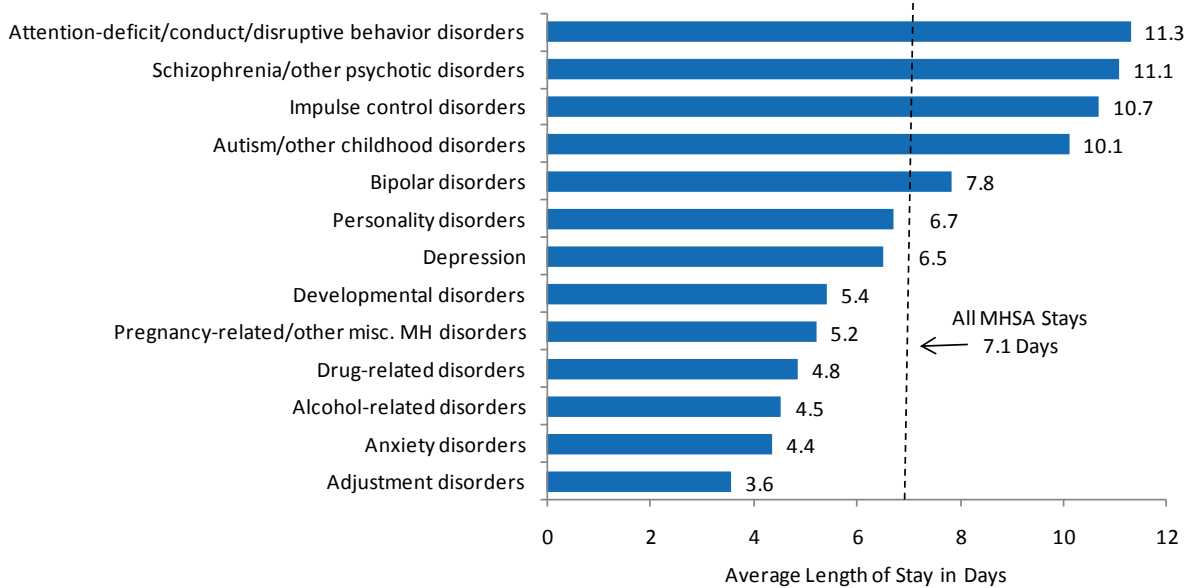
Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 1997, 2005, 2006, 2007 and 2008.

The average length of stay (ALOS) for all discharges in U.S. community hospitals in 2008 was 4.6 days ([Exhibit 1.2](#)). In contrast, the ALOS for discharges with a principal diagnosis of a MHPA disorder was much longer—7.1 days.

- From 1997 to 2008, the number of discharges for all conditions and for MHPA conditions each rose by 15 percent (increasing by 5.2 million discharges for all conditions ([Exhibit 1.2](#)) and by 0.2 million discharges for MHPA conditions).
- The ALOS for all hospital stays declined by 4 percent from 1997 to 2008 (from 4.8 days in 1997 to 4.6 days in 2008, [Exhibit 1.2](#)). The ALOS for MHPA hospital stays fell at more than twice the rate of all hospital stays, or 10 percent (from 7.9 days in 1997 to 7.1 days in 2008).



### Average Length of Stay by Principal Reason for MHSA Stay, 2008



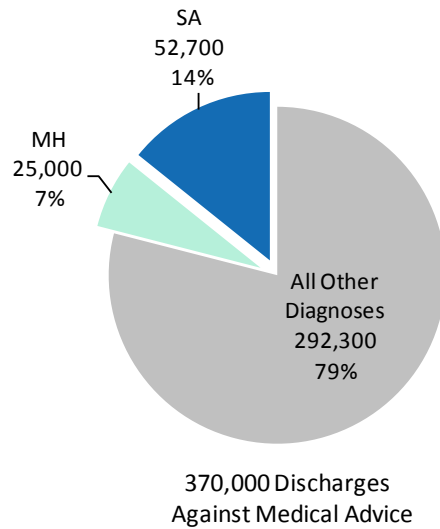
Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 2008.

Although the average length of stay (ALOS) for all MHSA stays in community hospitals was 7.1 days, ALOS varied considerably by MHSA condition.

- Attention-deficit/conduct/disruptive behavior disorders and schizophrenia/other psychotic disorders each had an ALOS that was greater than 11 days, or 4 days more than the average MHSA stay in 2008.
- The ALOS was 7.8 days for bipolar disorders and 6.5 days for depression.
- The ALOS for both drug- and alcohol-related disorders in community hospitals was less than 5 days—4.8 and 4.5 days, respectively.

## EXHIBIT 5.4 MH and SA Inpatient Hospital Discharges Against Medical Advice

**MHSA\* Inpatient Hospital Discharges Against Medical Advice (AMA)  
as a Share of All Discharges AMA, 2008**



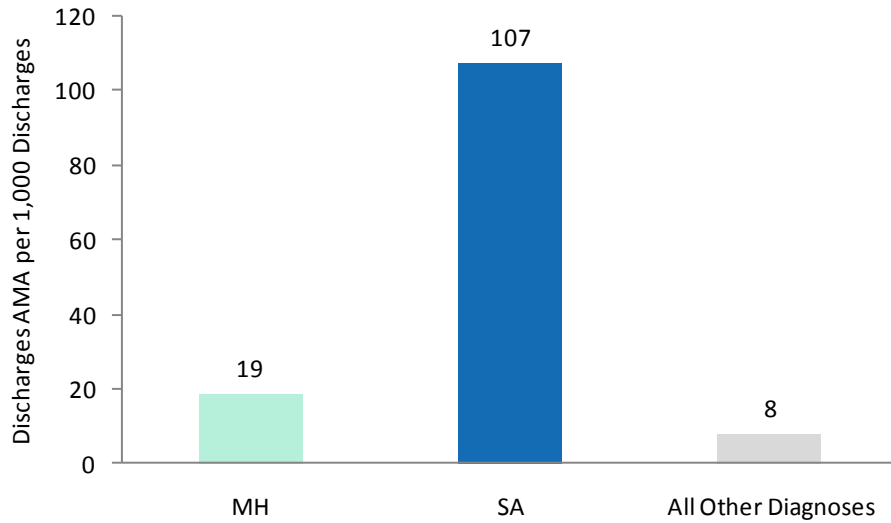
\* Based on principal CCS diagnosis.

Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 2008.

Although MHA discharges represented 5 percent of all community hospital discharges in 2008, they accounted for 21 percent of all discharges leaving the hospital against medical advice (AMA).

- Of the 39.5 million hospital discharges in 2008, 370,000 discharges were designated as AMA. Of these AMA discharges, 25,000 AMA stays (7 percent) had a principal MH diagnosis and 52,700 (14 percent) had a principal SA diagnosis.

### Discharge Rate Against Medical Advice (AMA) for MHSA\* and All Other Diagnoses, 2008



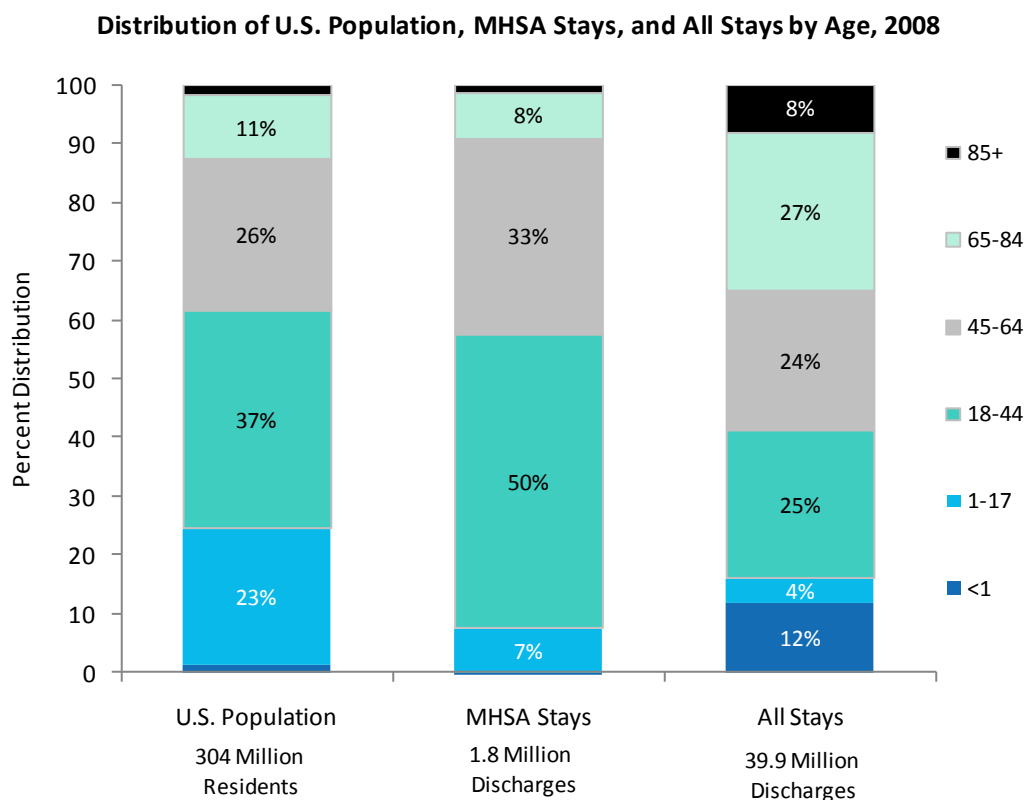
\* Based on principal CCS diagnosis.

Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 2008.

The rate of discharges AMA was higher for MH and SA discharges than for all other discharges in 2008.

- Of the 1.3 million MH stays, 19 per 1,000 discharges were AMA.
- Of the 0.5 million SA stays, 107 per 1,000 discharges were AMA. Discharges AMA occurred 11 times more frequently for SA stays than for all the other non-MHSA discharges (8 per 1,000 discharges).

## EXHIBIT 5.5 MHA Inpatient Hospital Discharges by Age



Note: Excludes a small number of MHA discharges (2,500 or 0.1 percent) and of all discharges (50,000 or 0.1 percent) with missing age.

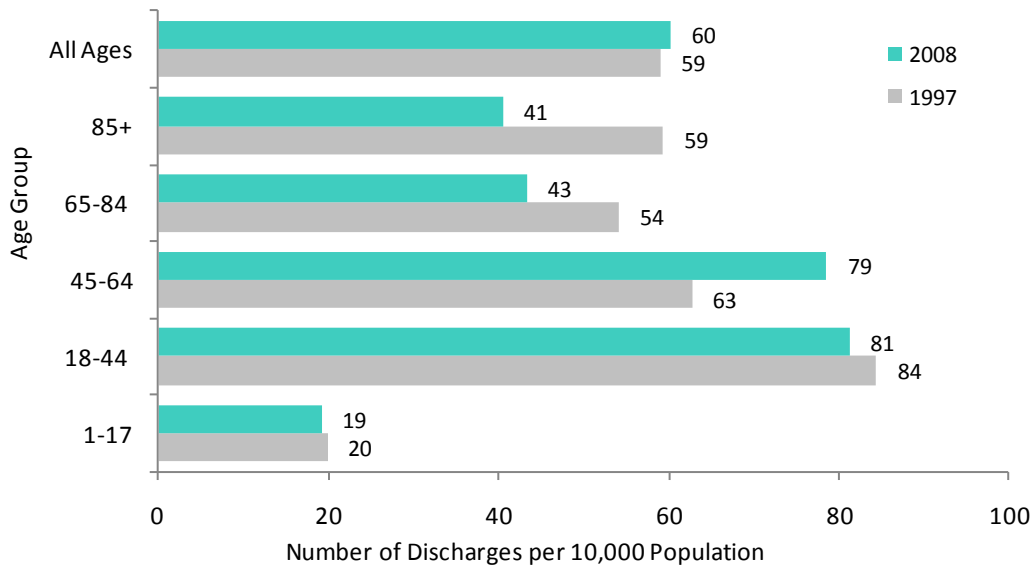
Note: Bar segments representing 2 percent or less have not been labeled.

Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 2008.

By age, the distribution of MHA hospitalizations differed substantially from the distribution of hospitalizations for all reasons and from the distribution of the U.S. population in 2008.

- Adults 18-64 years old accounted for a disproportionate share of all MHA hospitalizations (83 percent) relative to their share of the total population (63 percent) and all hospitalizations (49 percent).
- While those 65 years and older were responsible for 35 percent of all stays and 13 percent of the U.S. population, they accounted for only 9 percent of MHA stays.
- Children 1-17 years old accounted for 4 percent of all hospital stays and 7 percent of MHA stays, compared to their population share of 23 percent.
- Children under 1 year accounted for 1 percent of the overall population, 12 percent of all hospital stays (mostly as newborns), and less than 0.1 percent of MHA discharges (mostly for drug-related disorders).

### MHSA Discharges per 10,000 Population by Age, 1997 and 2008



Note: Excludes a small number of discharges (4,000 or 0.2 percent) less than 1 year of age or with missing age.  
 Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 1997 and 2008.

- In 2008, there were 60 MHSA hospital stays per 10,000 population.
  - Children 1-17 had the lowest rate of hospitalization for MHSA conditions—19 stays per 10,000.
  - For adults 65 and older, MHSA hospitalization occurred at about twice the rate of children—more than 40 discharges per 10,000. These stays excluded those with a principal diagnosis of dementia.
  - Adults 18-64 experienced the highest rate of MHSA hospital stays—about 80 discharges per 10,000, or twice the rate of adults 65 years and older.
- The MHSA discharge rate for adults 65 years and older has fallen appreciably from 1997 to 2008:
  - The MHSA discharge rates for adults 65 to 84 years decreased from 54 to 43 discharges per 10,000 between 1997 and 2008.
  - The rates for those 85 years and older also declined over the same period—from 59 to 41 discharges per 10,000.
- While the rates of MHSA hospitalizations have remained steady or fallen for other age groups, the discharge rate for 45-64 year olds increased from 63 to 79 discharges per 10,000 from 1997 to 2008.

## EXHIBIT 5.6 Most Frequent Principal MHA Diagnoses by Age

**Number of Discharges, Percent Distribution, and Growth of the Most Frequent Principal MHA Diagnoses for Inpatient Hospital Stays by Age, 1997 and 2008**

AGE GROUP AND PRINCIPAL CCS DIAGNOSIS	NUMBER OF MHA DISCHARGES IN THOUSANDS		PERCENT OF AGE-SPECIFIC TOTAL MHA DISCHARGES		CUMULATIVE GROWTH
	1997	2008	1997	2008	1997-2008
<b>All ages, total MHA discharges*</b>	<b>1,602</b>	<b>1,837‡</b>			<b>15%</b>
<b>1-17 years, total discharges</b>	<b>134</b>	<b>135‡</b>	<b>100.0%</b>	<b>100.0%</b>	<b>1</b>
Mood disorders	64	83‡	48.0	61.3	29
Depression	54	38‡	40.3	28.3	-29
Bipolar disorders	10	45	7.7	33.0	333
Attention-deficit/conduct/disruptive behavior disorders	23	16‡	17.4	12.0	-30
Schizophrenia/other psychotic disorders	7	6‡	4.9	4.1	-14
Anxiety disorders	5	5‡	3.7	4.0	9
<b>18-44 years, total discharges</b>	<b>927</b>	<b>920‡</b>	<b>100.0</b>	<b>100.0</b>	<b>-1</b>
Mood disorders	335	415	36.1	45.1	24
Depression	236	212‡	25.5	23.1	-10
Bipolar disorders	98	202	10.6	22.0	106
Schizophrenia/other psychotic disorders	197	173‡	21.2	18.8	-12
Drug-related disorders	156	139‡	16.8	15.1	-11
Alcohol-related disorders	141	109	15.2	11.9	-22
<b>45-64 years, total discharges</b>	<b>353</b>	<b>612</b>	<b>100.0</b>	<b>100.0</b>	<b>73</b>
Mood disorders	136	251	38.7	41.1	84
Depression	93	145	26.3	23.7	56
Bipolar disorders	44	107	12.4	17.4	145
Schizophrenia/other psychotic disorders	84	136	23.9	22.3	62
Alcohol-related disorders	78	131	22.1	21.4	68
Drug-related disorders	30	65	8.5	10.7	117
<b>65-84 years, total discharges</b>	<b>165</b>	<b>144</b>	<b>100.0</b>	<b>100.0</b>	<b>-13</b>
Mood disorders	92	65	55.5	45.3	-28
Depression	72	44	43.8	30.6	-39
Bipolar disorders	19	21‡	11.7	14.7	10
Schizophrenia/other psychotic disorders	33	34‡	19.8	23.5	4
Alcohol-related disorders	18	18‡	11.0	12.3	-2
Drug-related disorders	8	16	4.9	11.1	96
<b>85+ years, total discharges</b>	<b>23</b>	<b>22‡</b>	<b>100.0</b>	<b>100.0</b>	<b>-5</b>
Mood disorders	14	9	59.8	41.6	-34
Depression	13	8	54.0	35.3	-38
Bipolar disorders	1	1‡	5.8	6.4	5
Schizophrenia/other psychotic disorders	5	6	20.2	28.1	33
Drug-related disorders	2	3	7.4	14.6	87
Anxiety disorders	1	1‡	4.0	4.8	14

\* Includes a small number of discharges (2,500 or 0.1 percent) with missing age.

‡ 2008 discharges are not statistically different from 1997 discharges at p<0.05.

Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 1997 and 2008.

- Mood disorders was the most frequent principal MHA diagnosis across all age groups in 1997 and 2008.
  - Mood disorders accounted for the majority (61 percent) of all MHA hospitalizations among children 1-17 years in 2008 and about four in ten MHA discharges in other age groups.
  - The number of stays with a principal diagnosis of mood disorders increased among 18-44 year olds (24 percent) and 45-64 year olds (84 percent) from 1997 to 2008.
  - The number of hospitalizations specifically for depression changed little for children 1-17 and adults 18-44, rose for adults 45-64 (by 56 percent), and decreased for older adults (by -39 percent for 65-84 year olds and -38 percent for those 85 years and older).
  - In contrast, stays for bipolar disorders more than doubled over the same period for patient age groups of 64 years and younger. Growth in stays was especially high for children 1-17 years (increasing by 333 percent between 1997 and 2008). While the cause of this increase is unclear and should be interpreted cautiously, it may reflect an increased recognition of bipolar disorder, especially in children—a group that has been historically under-diagnosed.<sup>3,4</sup> It may also reflect the difficulty of assigning a diagnosis for a condition, especially in children, that may share presenting symptoms with schizophrenia/other psychotic disorders and attention deficit/conduct/disruptive behavior disorders.
- Schizophrenia/other psychotic disorders was the second most frequent MHA condition for all adult age groups (18 years and older), and it was the third most frequent MHA condition for children 1-17 years in 2008.
  - While the number of stays for schizophrenia for most age groups changed little from 1997 to 2008, it increased 62 percent for 45-64 year olds and 33 percent for patients 85 years and older.
- Alcohol-related disorders accounted for 12 percent of MHA hospital stays among 18-44 year olds, 21 percent of MHA stays among 45-64 year olds, and 12 percent of MHA stays for 65-84 year olds.
- Drug-related disorders appeared prominently among the top four principal MHA conditions for all age groups except children (1-17 years):
  - The number of hospital stays for drug-related conditions rose rapidly among 45-64 year olds (117 percent), 65-84 year olds (96 percent), and adults 85 and older (87 percent) while remaining relatively stable (11-percent decline) among adults 18-44.

**Number, Growth, and Percent Contribution to Growth of Drug-related Discharges for Selected Age Groups, 1997-2008**

PRINCIPAL ICD-9-CM DIAGNOSIS	NUMBER OF DRUG-RELATED DISCHARGES IN 2008			CUMULATIVE GROWTH IN DRUG-RELATED DISCHARGES 1997-2008			PERCENT CONTRIBUTION TO GROWTH IN DRUG-RELATED DISCHARGES 1997-2008		
	45-64 YEARS	65-84 YEARS	85+ YEARS	45-64 YEARS	65-84 YEARS	85+ YEARS	45-64 YEARS	65-84 YEARS	85+ YEARS
All drug-related discharges	65,400	16,000	3,200	117%	96%	87%	100.0%	100.0%	100.0%
Drug withdrawal (ICD-9-CM 292.0)	20,300	2,000	100	270	107	71	41.9	13.5	3.9
Drug-induced delirium (ICD-9-CM 292.81)	4,200	6,400	2,100	143	56	98	7.0	29.0	69.8
Poisonings by codeine [methylmorphine], meperidine [pethidine], morphine (ICD-9-CM 965.09)	8,300	3,300	400	693	381	245	20.6	32.9	19.1
All other drug-related conditions*	32,600	4,300	600	49	80	24	21.5	14.0	0.4

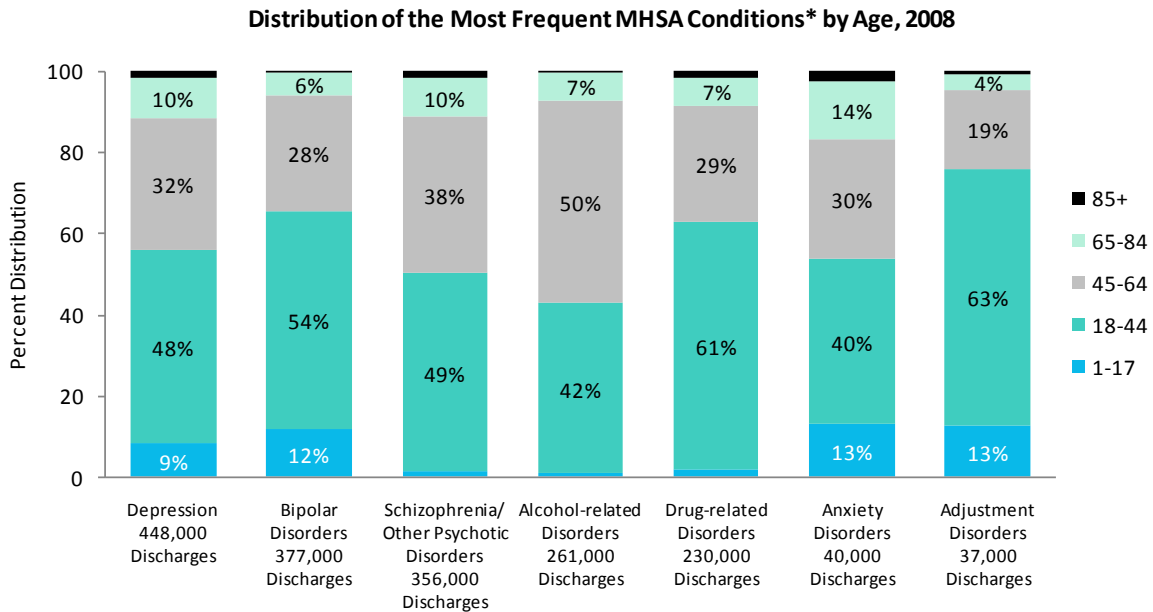
\* ICD-9-CM codes 292.1, 292.2, 292.82-292.89, 292.9, 304, 305.2-305.9, 648.3, 655.5, 760.72, 760.73, 760.75, 779.5, 965.00-965.02, and V65.42.

Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 1997 and 2008.

<sup>3</sup> Rates of Bipolar Diagnosis in Youth Rapidly Climbing, Treatment Patterns Similar to Adults. National Institutes for Mental Health, Press Release. September 3, 2007. Available at <http://www.nimh.nih.gov/science-news/2007/rates-of-bipolar-diagnosis-in-youth-rapidly-climbing-treatment-patterns-similar-to-adults.shtml>.

<sup>4</sup> Moreno C, Laje G, Blanco C, Jiang H, Schmidt AB, Olfson M. National trends in the outpatient diagnosis and treatment of bipolar disorder in youth. *Arch Gen Psychiatry*. 2007 Sep;64(9): 1032-1039.

- Rapid growth in drug-induced delirium and in poisonings by opiate-based pain medications was primarily responsible for the increase in drug-related hospitalizations for patients 85 years and older. Together in 2008, these conditions accounted for 78 percent of the drug-related stays and 89 percent of the increase in drug-related stays for these oldest patients. Drug-induced delirium can result from side-effects of medications and occurs often in elderly hospitalized patients.<sup>5,6,7</sup>
- Drug-induced delirium and poisonings by opiate-based pain medications were also responsible for a large number of drug-related discharges in 45-64 year olds (19 percent) and 65-84 year olds (60 percent).



\* Based on principal CCS diagnosis.

Note: Excludes a small number of MHSA discharges (2,500 or 0.1 percent) and of all discharges (50,000 or 0.1 percent) with missing age.

Note: Bar segments representing 3 percent or less have not been labeled.

Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 2008.

- Adults 18-44 years accounted for the majority of stays for bipolar disorders, drug-related disorders, and adjustment disorders.
- For alcohol-related disorders, 18-44 year olds accounted for 42 percent of stays and 45-64 year olds accounted for 50 percent of stays.
- For schizophrenia/other psychotic disorders, 18-44 year olds accounted for 49 percent of stays and 45-64 year olds accounted for 38 percent of stays.
- Children 1-17 years accounted for a substantial proportion (9 to 13 percent) of stays for depression, bipolar disorders, anxiety disorders, and adjustment disorders.
- Patients 65 and older accounted for 17 percent of anxiety disorders and 12 percent of both depression and schizophrenia/other psychotic disorders.

<sup>5</sup> Alagiakrishnan K, Wiens C. An approach to drug induced delirium in the elderly. Postgrad Med J. 2004 July; 80(945): 388-393.

<sup>6</sup> Alagiakrishnan K. Delirium. Available at <http://emedicine.medscape.com/article/288890-overview>, updated Apr 2, 2010.

<sup>7</sup> Fong TG, Tulebaev SR, and Inouye SK. Delirium in elderly adults: diagnosis, prevention and treatment. Nat Rev Neurol. 2009 Apr; 5: 210-220.



## EXHIBIT 5.7 MHA Inpatient Discharges by Gender

### Number of Discharges, Percent Distribution, and Growth of Principal Diagnoses for MHA Inpatient Hospital Stays by Gender, 2008

PRINCIPAL CCS DIAGNOSIS	NUMBER OF MHA DISCHARGES IN THOUSANDS		PERCENT OF GENDER-SPECIFIC DISCHARGES		CUMULATIVE GROWTH 1997-2008	
	MALES	FEMALES	MALES	FEMALES	MALES	FEMALES
All MHA diagnoses*	947.1	883.5‡	100.0%	100.0%	18%	11%
Mood disorders	358.5	463.3	37.8	52.4	44	19
Depression	193.0	253.3	20.4	28.7	7	-12
Bipolar disorders	165.4	210.1	17.5	23.8	137	104
Schizophrenia/other psychotic disorders	199.6	154.4	21.1	17.5	14	3
Alcohol-related disorders	188.0	72.8	19.9	8.2	7	11
Drug-related disorders	134.6	95.1	14.2	10.8	8	19
Adjustment disorders	18.5	18.1‡	2.0	2.1	-36	-45
Anxiety disorders	15.1	25.2	1.6	2.9	14	8
Attention-deficit/conduct/disruptive behavior disorders	12.7	5.7	1.3	0.6	-26	-19
Impulse control disorders	8.5	3.7	0.9	0.4	29	36
Pregnancy-related/other misc. MH disorders	5.3	40.3	0.6	4.6	-31	4
Pregnancy-related MH disorders	-	24.5	-	2.8	-	36
Autism/other childhood disorders	3.2	1.0	0.3	0.1	69	41
Personality disorders	1.6	2.6	0.2	0.3	-49	-42
Developmental disorders	1.4	1.2‡	0.1	0.1	76	53

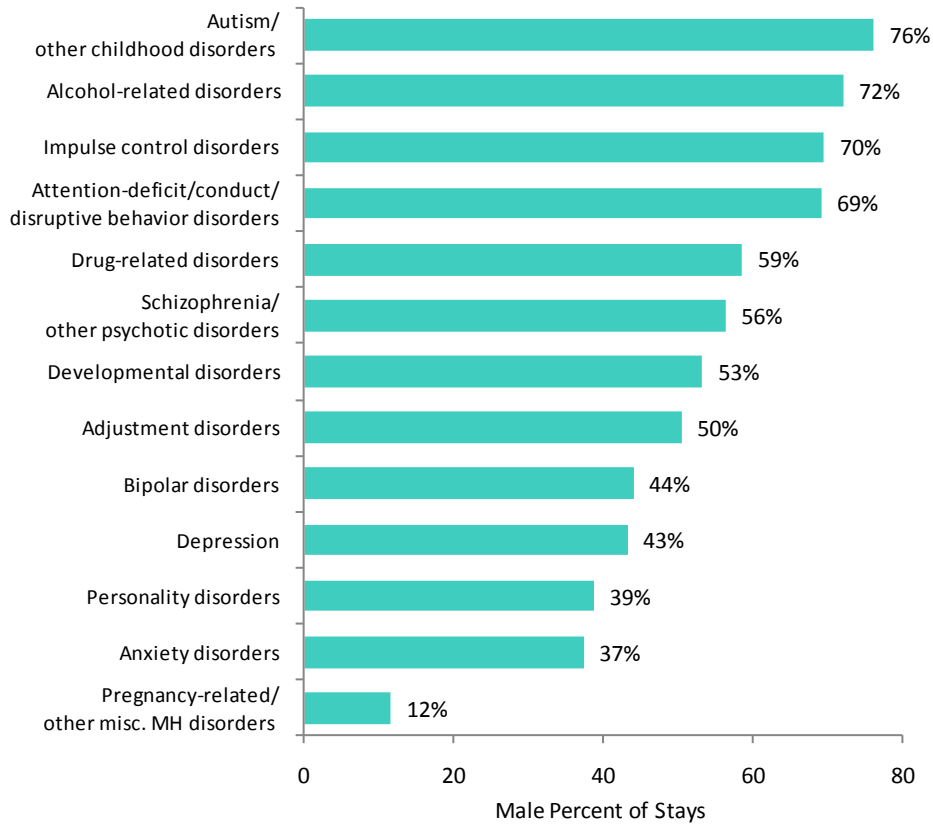
\* Excludes a small number of discharges (6,000 or 0.3 percent) with missing gender.

‡ Female discharges are not statistically different from male discharges at  $p < 0.05$ .

Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 1997 and 2008.

- Males accounted for about half (52 percent) of all MHA discharges—947,100 inpatient hospitalizations in 2008.
- Mood disorders was the most frequent principal diagnosis for a MHA stay for both males (38 percent of all male MHA stays) and females (52 percent of all female MHA stays). The majority of these stays for mood disorders were for depression.
- The second and third most frequent reason for male MHA stays were schizophrenia/other psychotic disorders and alcohol-related disorders; for females, they were schizophrenia/other psychotic disorders and drug-related disorders.

### Percent of MHA Stays for Males by Principal MHA Diagnosis, 2008

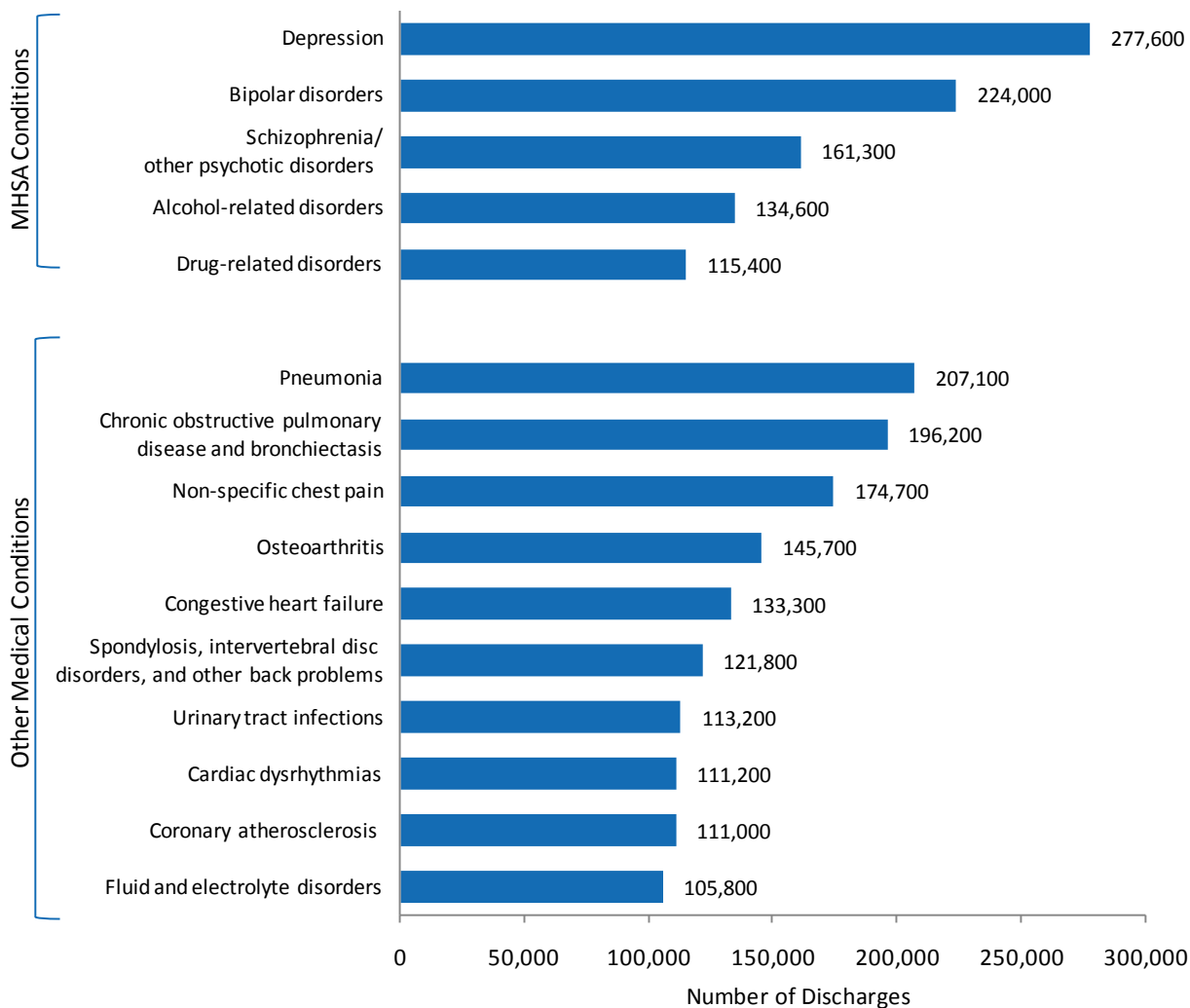


Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 2008.

- Stays for autism/other childhood disorders, alcohol-related disorders, impulse control disorders, attention-deficit/conduct/disruptive behavior disorders, drug-related disorders, and schizophrenia/other psychotic disorders were more frequent among males than females in 2008.
  - About three-quarters of MHA stays with a principal diagnosis of autism/other childhood disorders and alcohol-related disorders were for males.
  - About seven of ten MHA stays for impulse control disorders and attention-deficit/conduct/disruptive behavior disorders were for males.
- In contrast, stays for pregnancy-related/other miscellaneous MH disorders, anxiety disorders, personality disorders, depression, and bipolar disorders were less common among males than females.
- Stays with principal diagnoses of adjustment and developmental disorders were split evenly by gender.

## EXHIBIT 5.8 Principal Diagnoses with a Secondary MH or SA Condition

Most Common Principal Diagnoses with a Secondary MH Condition,\* 2008



\*All conditions are defined using CCS. Once a secondary MH diagnosis is detected, the discharge is counted according to its principal CCS diagnosis. Suicide/intentional self-inflicted injury is included as a secondary MH diagnosis.

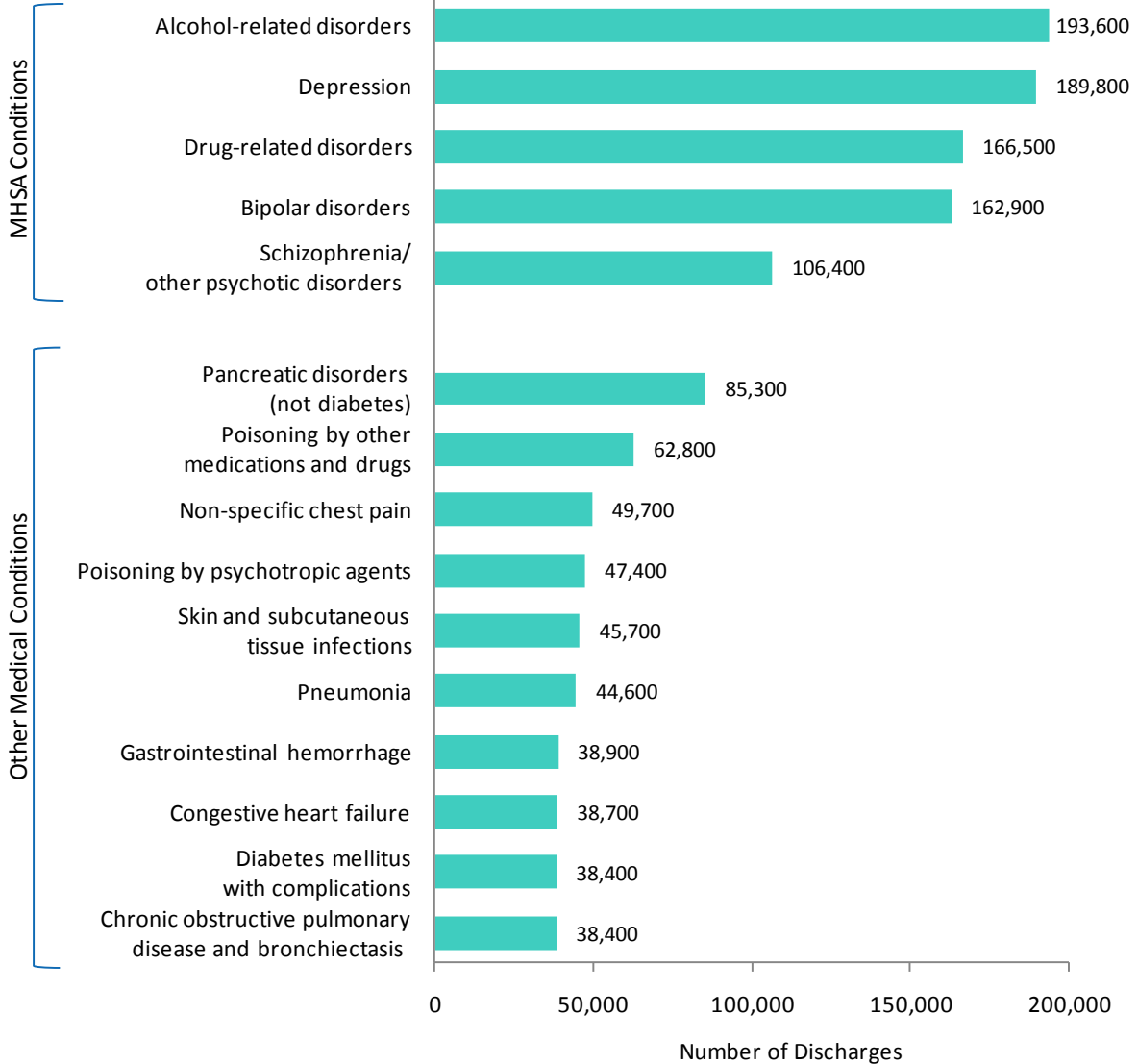
Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 2008.

MH and SA conditions may be the principal reason for hospitalization or they may be secondary, co-existing conditions that potentially complicate the stay. In addition to discharges with a principal MH or SA condition, another 5.4 million discharges (13.6 percent of all hospital discharges) had a secondary MH diagnosis and 2.2 million (5.4 percent) had a secondary SA diagnosis in 2008.

- Stays with a secondary MH condition often co-occur with a principal MH or SA diagnosis.
  - Three of the top 15 principal conditions that occurred with a secondary MH diagnosis in 2008 were MH conditions (depression (277,600 stays), bipolar disorders (224,000 stays), and schizophrenia (161,300 stays)).

- Both alcohol- and drug-related disorders ranked among the top 15 principal reasons for hospitalizations with a secondary MH condition. Alcohol-related disorders were responsible for 134,600 stays and drug-related disorders for another 115,400 stays with a secondary MH diagnosis.
- A secondary MH diagnosis also occurred often with many of the top 15 most frequent medical conditions.
  - The most frequent conditions with a secondary MH diagnosis included pneumonia (207,100 stays), chronic obstructive lung disease (196,200 stays), and non-specific chest pain (174,700 stays).
  - Secondary MH diagnoses often accompanied stays with principal cardiac and musculoskeletal conditions. These conditions included congestive heart failure (133,300 stays), cardiac dysrhythmias (111,200 stays), coronary atherosclerosis (111,000 stays), osteoarthritis (145,700 stays) and spondylosis, intervertebral disc disorders, and other back problems (121,800 stays).
  - Stays for urinary tract infections and fluid and electrolyte disorders also had frequent secondary MH disorders—113,200 and 105,800 stays, respectively.

### Most Common Principal Diagnoses with a Secondary SA Condition,\* 2008



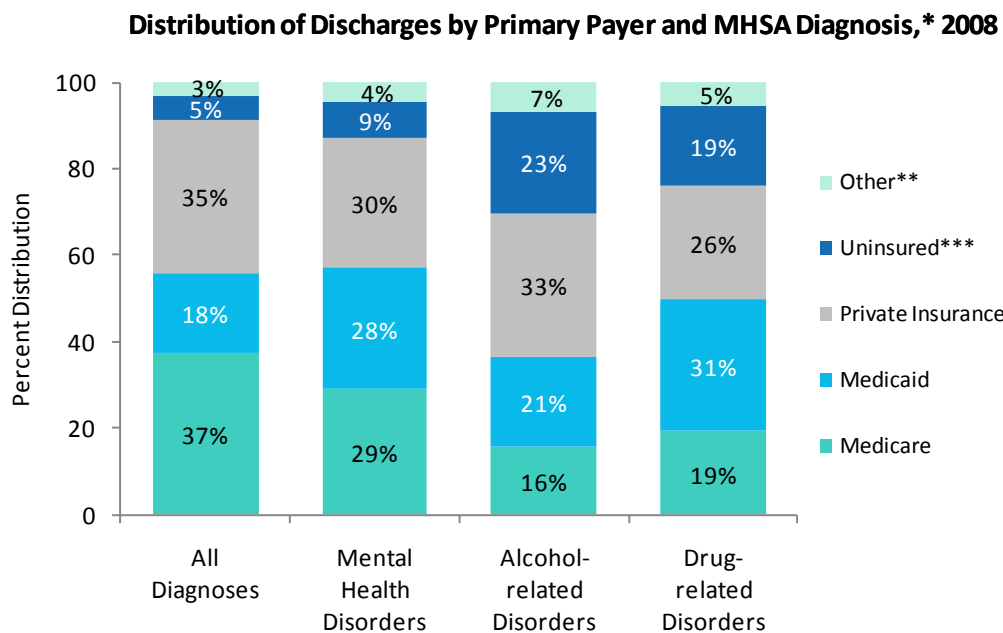
\*All conditions are defined using CCS. Once a secondary SA diagnosis is detected, the discharge is counted according to its principal CCS diagnosis.

Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 2008.

- MH and SA conditions often co-occur.
  - The top five most common principal diagnoses for stays with a secondary SA disorder in 2008 were MHSA conditions: alcohol-related disorders (193,600 stays), depression (189,800 stays), drug-related disorders (166,500 stays), bipolar disorders (162,900 stays), and schizophrenia/other psychotic disorders (106,400 stays).
- Secondary SA diagnoses are often associated with hospitalizations for the treatment of other medical conditions, some of which may be the consequence of or related to SA.
  - Other frequent principal medical conditions that accompanied a secondary SA diagnosis in 2008 included conditions affecting the pancreas, liver, and digestive tract, as well as poisonings. These included pancreatic disorders other than diabetes (85,300 stays), poisonings by other medications or drugs (62,800 stays), poisoning by psychotropic agents (47,400 stays), gastrointestinal hemorrhage (38,900 stays), and diabetes with complications (38,400 stays).

- Non-specific chest pain (49,700 stays), skin and subcutaneous tissue infections (45,700 stays), pneumonia (44,600 stays), congestive heart failure (38,700 stays), and chronic obstructive pulmonary disease and bronchiectasis (38,400 stays) were also frequent reasons for hospitalizations with a secondary SA diagnosis.

## EXHIBIT 5.9 Inpatient Discharges for MH and SA Conditions by Payer



\*Based on principal CCS diagnosis.

\*\*Includes other payers such as Workers' Compensation, TRICARE, CHAMPUS, CHAMPVA, Title V, and other government programs.

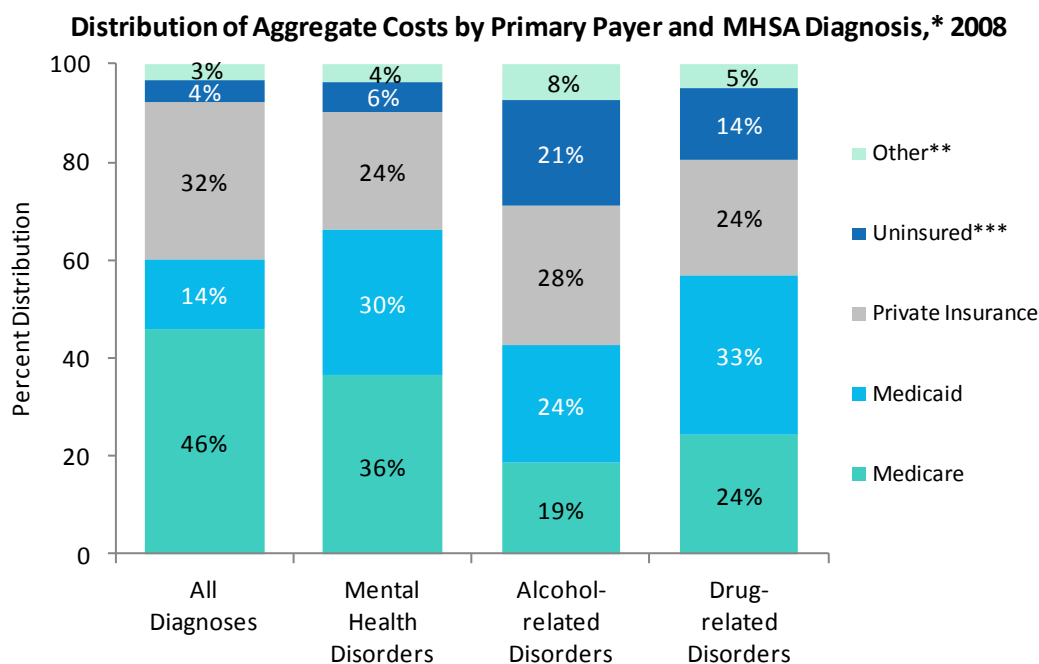
\*\*\*Includes discharges classified as self-pay or no charge.

Note: Excludes a small number of discharges (68,000 or 0.2 percent) with missing payer.

Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 2008.

- Hospital stays with MH and SA diagnoses were more commonly uninsured or insured by Medicaid than were hospital stays overall.
  - Medicaid was the primary insurer for 18 percent of all community hospital discharges in 2008. Medicaid was the primary payer for 21 percent of discharges with an alcohol-related diagnosis, a share similar to all hospitalizations, but for 31 percent of discharges with a drug-related diagnosis and 28 percent of discharges with a MH diagnosis.
  - Five percent of all hospital stays were uninsured. Almost one-quarter of stays for alcohol-related diagnoses, one-fifth for drug-related diagnoses, and one-tenth for MH diagnoses were uninsured.
- Medicare was the primary payer for 37 percent of all hospital stays, but paid for smaller shares of MH and SA stays. Medicare paid for 29 percent of stays with a MH diagnosis, 16 percent with an alcohol-related diagnosis, and 19 percent with a drug-related diagnosis.
- Private insurance was billed for 35 percent of all hospital stays and for almost an equivalent share of alcohol-related stays (33 percent). Private insurance was the primary payer for smaller shares of MH and drug-related stays—30 percent of discharges with a MH diagnosis and 26 percent with a drug-related diagnosis.

## EXHIBIT 5.10 Costs for MH and SA Discharges by Payer



\*Based on principal CCS diagnosis.

\*\*Includes other payers such as Workers' Compensation, TRICARE, CHAMPUS, CHAMPVA, Title V, and other government programs.

\*\*\*Includes discharges classified as self-pay or no charge.

Note: Excludes a small number of discharges (68,000 or 0.2 percent) with missing payer that have a small sum of missing costs (\$642 million or 0.2 percent).

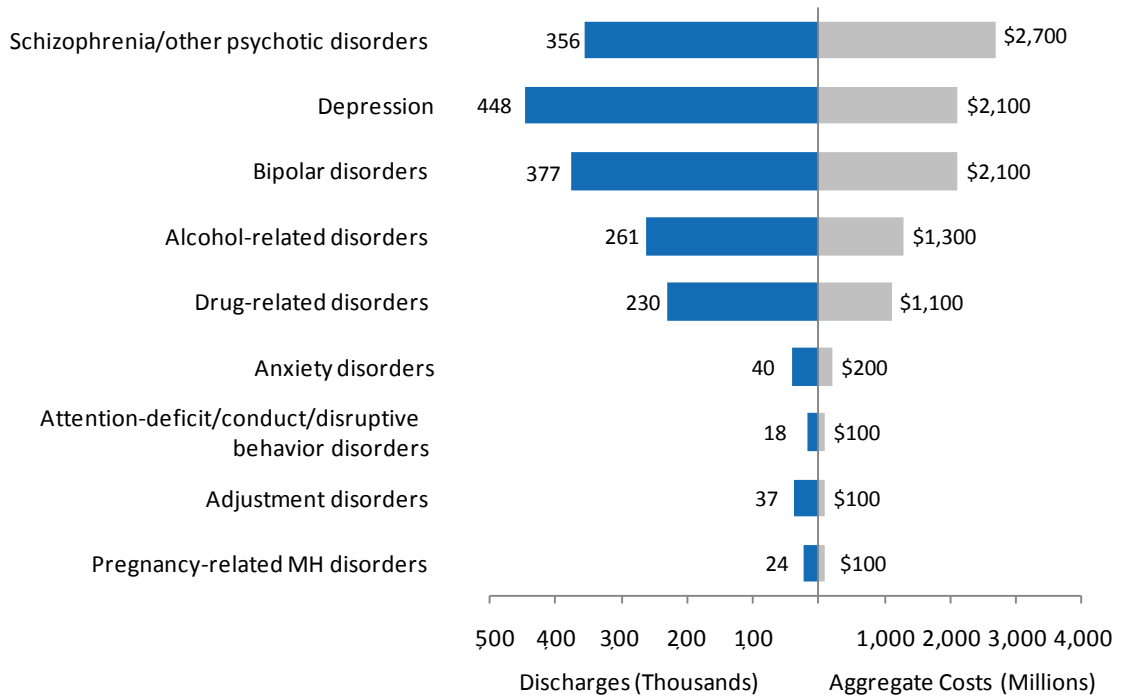
Note: Costs reflect all costs associated with stay, not solely those associated with the principal diagnosis.

Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 2008.

- In 2008, the uninsured and Medicaid covered a disproportionate share of the costs for MH and SA hospital stays.
  - Medicaid insured 14 percent of costs for all hospitalizations, but was responsible for 33 percent of costs for stays with a drug-related diagnosis, 30 percent with a MH diagnosis, and 24 percent with an alcohol-related diagnosis.
  - The uninsured accounted for 4 percent of all hospital costs, but 21 percent of the costs for alcohol-related stays and 14 percent of the costs for drug-related stays.
- The costs of hospital stays with MH and SA diagnoses were less commonly the primary responsibility of Medicare and private insurance than were the costs for all hospital stays.
  - Costs associated with stays where Medicare was the primary payer accounted for 46 percent of the aggregate hospital costs in 2008, but for smaller shares of MHSA stays—36 percent of stays with a principal MH diagnosis, 19 percent with a principal alcohol-related diagnosis, and 24 percent with a principal drug-related diagnosis.
  - Overall, 32 percent of hospital costs were associated with discharges with private insurance as a primary payer, but only 24 percent of discharges with a MH or a drug-related diagnosis and 28 percent with an alcohol-related diagnosis.



### Number of Discharges and Aggregate Costs for the Most Frequent Principal MHA Diagnoses, 2008



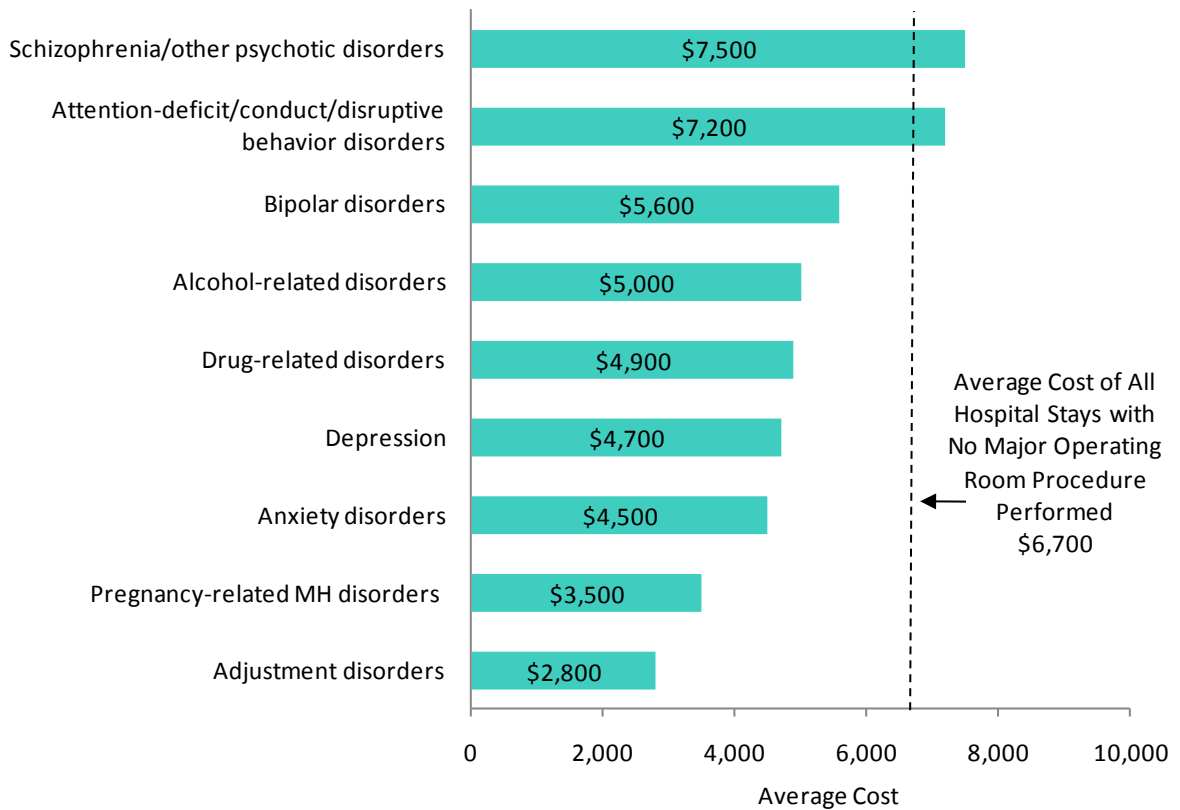
Note: Costs reflect all costs associated with stay, not solely those associated with the principal diagnosis.

Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 2008.

Schizophrenia/other psychotic disorders, depression, bipolar disorders, and alcohol- and drug-related disorders were the most costly MHA diagnoses in 2008, in part because these diagnoses accounted for the majority of MHA hospitalizations.

- The aggregate cost of hospitalizations for schizophrenia (\$2.7 billion) was greater than that for other MHA conditions, although there were fewer hospitalizations for this condition than for a few other MHA conditions.
- Hospitalizations for depression and bipolar disorders each cost \$2.1 billion. There were more hospitalizations for depression than for any other MHA condition.
- Discharges for alcohol-related disorders cost \$1.3 billion in 2008 and those for drug-related disorders cost \$1.1 billion.
- The aggregate costs of hospital stays for other MHA conditions (anxiety disorders, attention-deficit/conduct/disruptive behavior disorders, adjustment disorders, and pregnancy-related MH disorders) were smaller by comparison. Lower aggregate costs were mostly attributable to fewer inpatient hospitalizations for these conditions.

## Average Cost of a Hospital Stay for the Most Frequent Principal MHSAs Diagnoses, 2008



Note: Costs reflect all costs associated with stay, not solely those associated with the principal diagnosis.

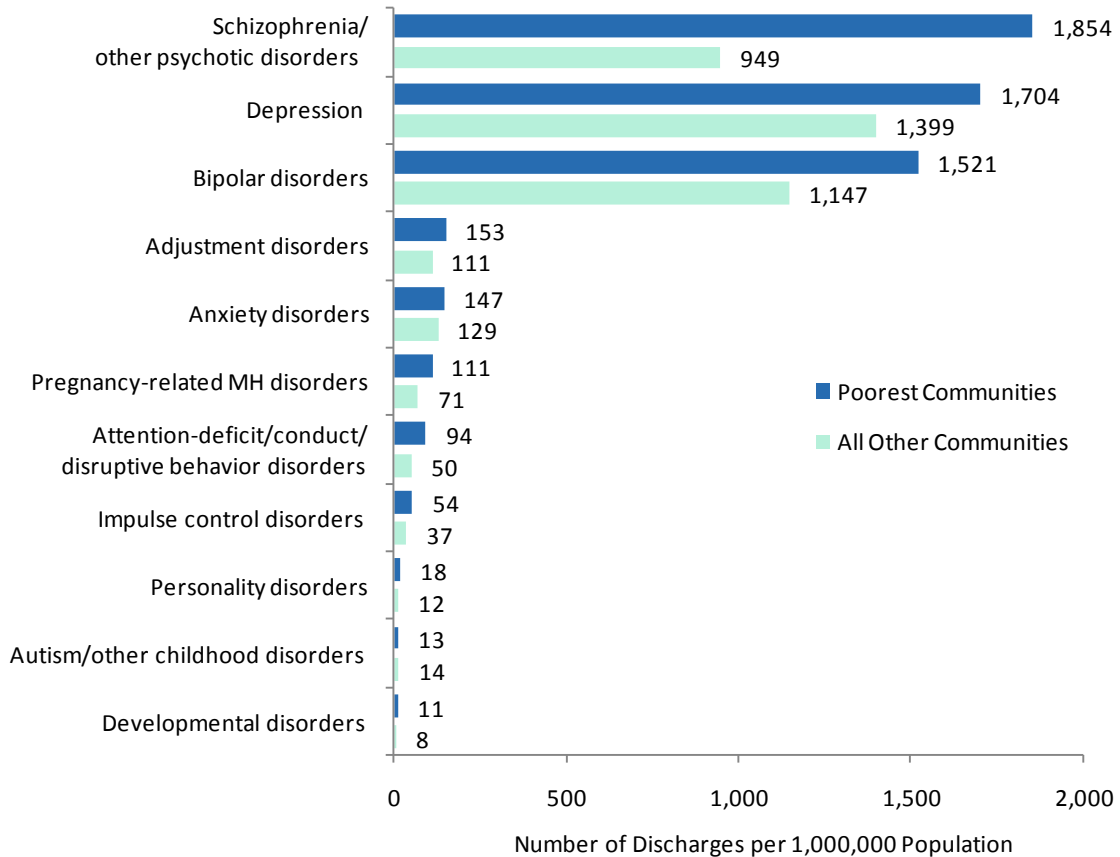
Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 2008.

MHSA stays, unlike many other hospitalizations, seldom include costly major procedures, making these stays less expensive. In 2008, the average cost of a hospital stay without a major operating room procedure (\$6,700) was higher than the average cost of hospitalizations for most MHSAs conditions.

- The average cost of a hospital stay for schizophrenia/other psychotic disorders (\$7,500) and for attention-deficit/conduct/disruptive behavior disorders (\$7,200) was greater than that of any other common MHSAs condition, and greater than the average cost for all hospitalizations in which no major operating room procedure was performed.
- Two of the most frequent reasons for MHSAs hospitalizations—depression and bipolar disorders—averaged costs of \$4,700 and \$5,600, respectively.
- Costs of stays for alcohol- and drug-related disorders were similar on average, at \$5,000 and \$4,900, respectively.

## EXHIBIT 5.11 Inpatient Discharges for MH and SA Conditions by Community Income

**MH Discharges per 1,000,000 Population in the Poorest Communities,\* 2008**

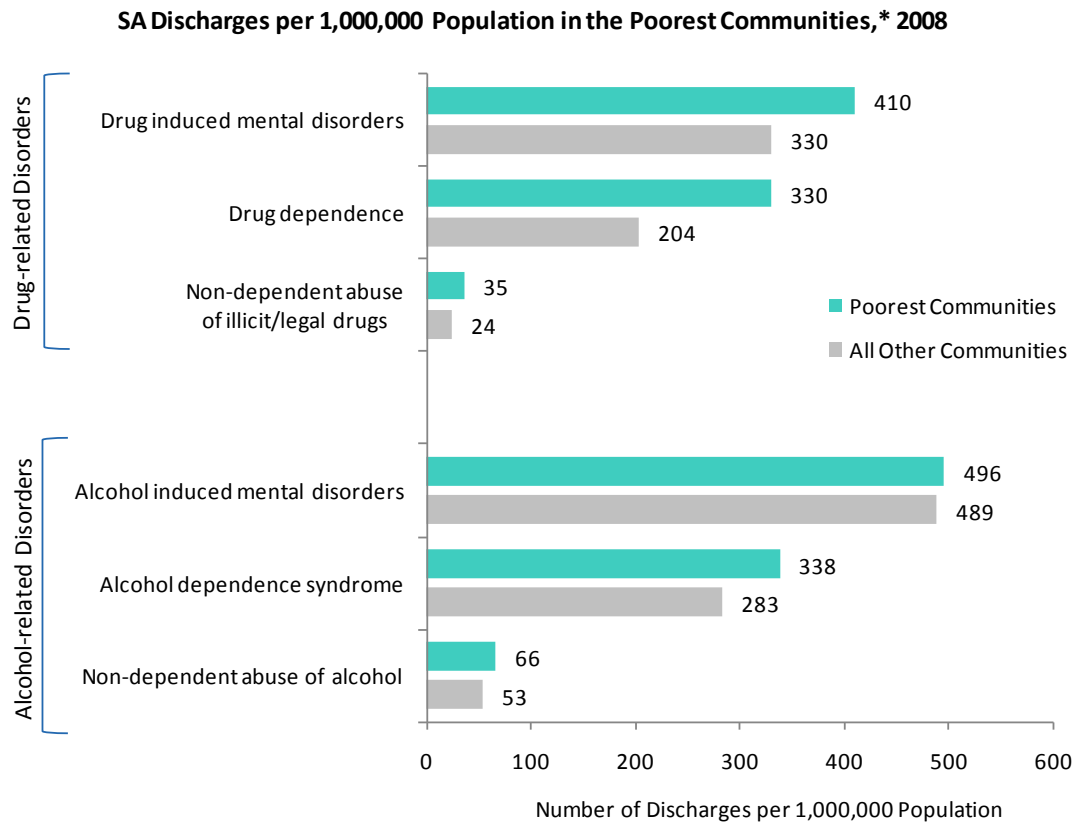


\* The poorest communities are defined by ZIP code and have median household income of less than \$39,000.

Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 2008.

- In 2008, persons living in the poorest communities experienced MH hospitalization rates 44 percent higher than those living in higher income communities—5,753 stays per million population, compared to 3,995 stays in higher income communities. In comparison, persons residing in the poorest communities had a 21-percent higher hospitalization rate for all diagnoses.
  - Hospitalizations for schizophrenia/other psychotic disorders for residents in the poorest communities occurred at almost twice the rate of all other communities (1,854 and 949 discharges per million, respectively).
  - Similarly, discharge rates were significantly higher in the poorest communities compared to all other communities for:
    - bipolar disorders (1,521 discharges per million in the poorest communities, 33 percent higher),
    - pregnancy-related MH disorders (111 discharges per million, 57 percent higher),
    - attention-deficit/conduct/disruptive behavior disorders (94 discharges per million, 87 percent higher), and
    - personality disorders (18 discharges per million, 46 percent higher).

- There is no relationship between community income and hospitalization rates for depression, adjustment disorders, anxiety disorders, impulse control disorders, autism and other childhood disorders, and developmental disorders.<sup>8</sup>



\* The poorest communities are defined by ZIP code and have median household income of less than \$39,000.

Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 2008.

For SA conditions, persons residing in the poorest communities experienced similar rates of hospitalizations as persons residing in higher income communities.<sup>9</sup>

- The rate of hospital stays for non-dependent abuse of illicit or legal drugs was higher among residents of the poorest communities (35 discharges per million) than it was among residents of all other communities (24 discharges per million). However, the rate of hospitalizations for this diagnosis was very small.
- Patients residing in the poorest communities experienced a higher rate of non-dependent abuse of alcohol (66 discharges per million compared to 53 discharges per million in all other communities).
- Drug-induced mental disorders and drug dependence were reasons for the largest number of drug-related hospitalizations in 2008. The rates of hospitalization in the poorest and all other communities were similar for both conditions.<sup>10</sup>
- Hospital stays for alcohol induced mental disorders and alcohol dependence syndrome were the most frequent alcohol-related reasons for hospitalizations in 2008. Community income was unrelated to hospitalization rates for these conditions.<sup>11</sup>

<sup>8</sup> Differences in discharge rates for the poorest and all other communities are not statistically significant at  $p < .05$ .

<sup>9</sup> Differences in discharge rates for the poorest and all other communities are not statistically significant at  $p < .05$ .

<sup>10</sup> Differences in discharge rates for the poorest and all other communities are not statistically significant at  $p < .05$ .

<sup>11</sup> Differences in discharge rates for the poorest and all other communities are not statistically significant at  $p < .05$ .

## EXHIBIT 5.12 Emergency Department Visits for MH and SA Conditions

### Number of Discharges and Percent Distribution of Emergency Department (ED) Visits for Discharges with All-listed MHA Diagnoses,\* 2007

ALL-LISTED CCS DIAGNOSIS	NUMBER OF DISCHARGES IN THOUSANDS	PERCENT OF DISCHARGES
All emergency department visits	122,332	100.0%
Mental health-related disorders	9,927	8.1
Depression	4,150	3.4
Anxiety disorders	3,277	2.7
Bipolar disorders	1,373	1.1
Schizophrenia/other psychotic disorders	1,205	1.0
Suicide/intentional self-inflicted injury	521	0.4
Attention-deficit/conduct/disruptive behavior disorders	496	0.4
Pregnancy-related/other misc. MH disorders	348	0.3
Personality disorders	231	0.2
Adjustment disorders	213	0.2
Alcohol-related disorders	2,815	2.3
Drug-related disorders	2,195	1.8

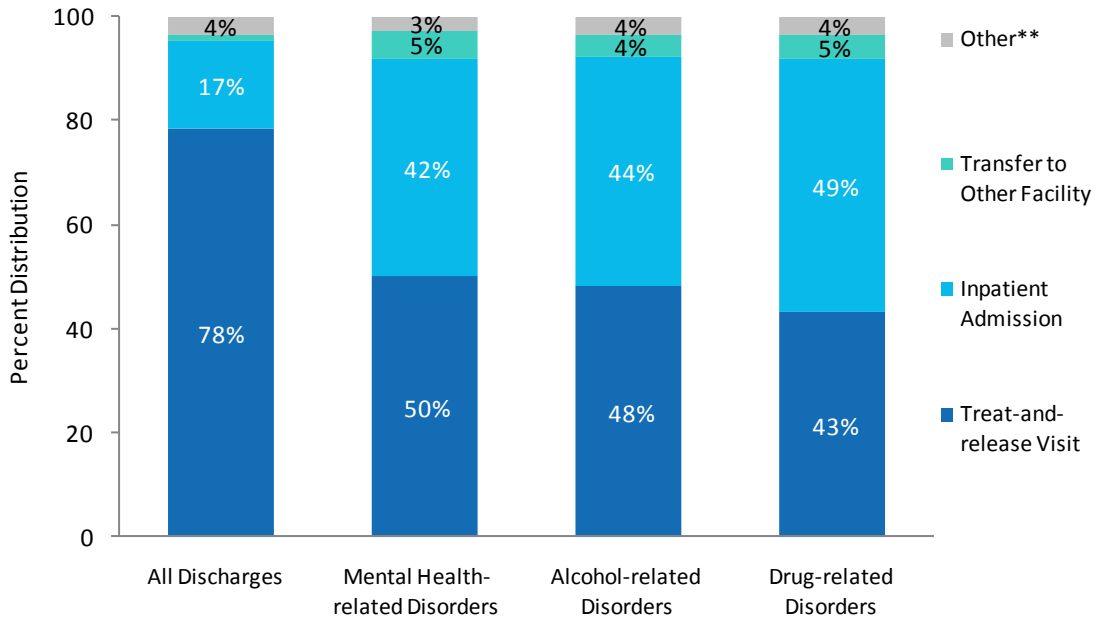
\*All-listed diagnoses include the first-listed diagnosis plus additional conditions that coexist at the time of the ED visit, or that develop during the stay following the ED visit, and which have an effect on the treatment or length of stay in the ED or hospital. All-listed diagnoses are used because there is no indication of the principal cause of the ED visit on the discharge record.

Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Emergency Department Sample, 2007.

The latest available HCUP data on emergency department (ED) visits is for 2007, one year earlier than the most current data for inpatient stays.

- In 2007, there were 122.3 million ED visits for all conditions.
- An all-listed MH diagnosis appeared in discharge records for 8.1 percent of all ED visits (9.9 million visits).
  - A diagnosis of depression was noted during 4.2 million ED visits and a diagnosis of anxiety during 3.3 million visits.
- An alcohol-related disorder was noted during 2.3 percent of ED visits (2.8 million visits) and a drug-related disorder during 1.8 percent of visits (2.2 million visits).

**Distribution of All-listed<sup>†</sup> Emergency Department (ED) Visits  
by Discharge Status for All and MHSA\* Discharges, 2007**



<sup>†</sup> All-listed diagnoses include the first-listed diagnosis plus additional conditions that coexist at the time of the ED visit, or that develop during the stay following the ED visit, and which have an effect on the treatment or length of stay in the ED or hospital. All-listed diagnoses are used because there is no indication of the principal cause of the ED visit on the discharge record.

\* Based on all-listed CCS diagnoses.

\*\* Includes discharges to home health care, against medical advice, destination unknown, and died in the ED.

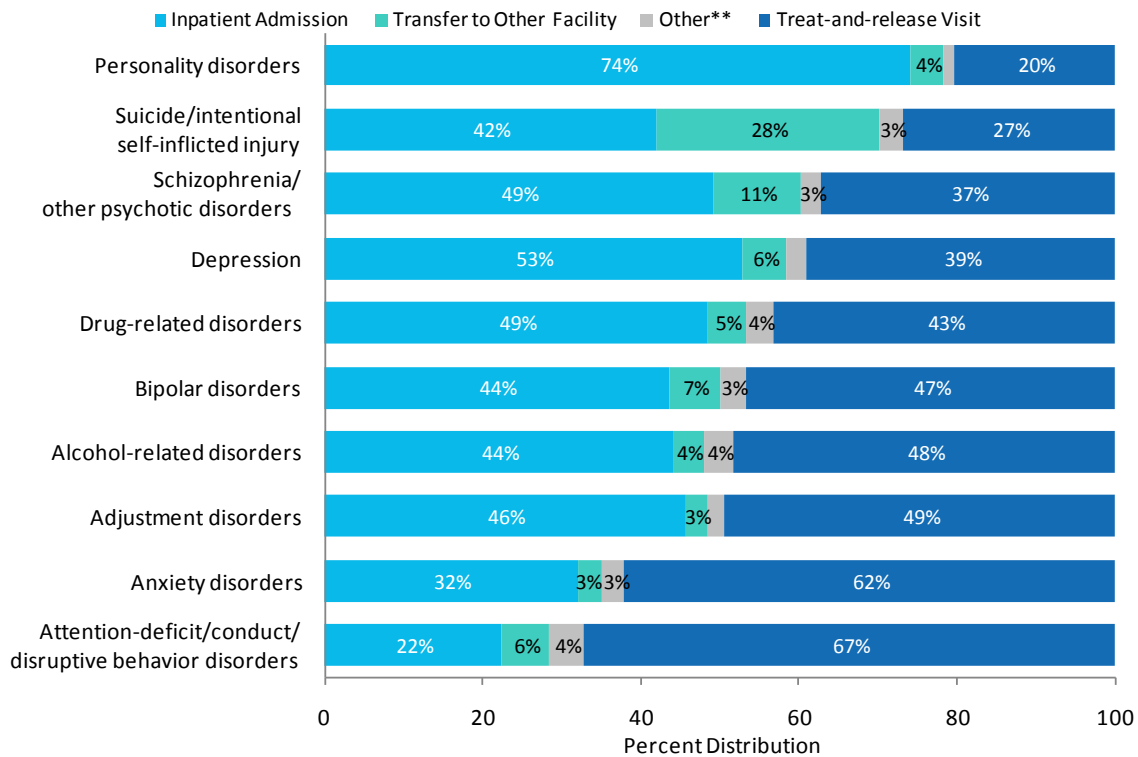
Note: Bar segments representing 1 percent or less have not been labeled.

Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Emergency Department Sample, 2007.

- The vast majority of ED visits resulted in the patient's treatment and release from the ED (78 percent). About one in five visits (20.4 million or 17 percent) resulted in inpatient hospital admission.<sup>12</sup>
- MHSA-related ED visits were more likely to result in inpatient admission than all discharges.
  - Among ED visits involving a MH-related disorder, 42 percent resulted in inpatient admission to a short-term hospital and 5 percent in transfer to another facility, such as a psychiatric hospital, skilled nursing facility, or intermediate care facility.
  - Similarly, 44 percent of ED visits involving an alcohol-related disorder resulted in inpatient admission and 4 percent were transferred to another facility.
  - Almost half (49 percent) of ED visits involving a drug-related disorder led to inpatient admission; 5 percent of these visits resulted in transfer to another facility.

<sup>12</sup> Inpatient admissions through the ED accounted for almost half (48 percent) of all inpatient hospitalizations.

**Distribution of Most Frequent Emergency Department (ED) All-Listed<sup>†</sup> MHA Visits\* by Discharge Status, 2007**



<sup>†</sup> All-listed diagnoses include the first-listed diagnosis plus additional conditions that coexist at the time of the ED visit, or that develop during the stay following the ED visit, and which have an effect on the treatment or length of stay in the ED or hospital. All-listed diagnoses are used because there is no indication of the principal cause of the ED visit on the discharge record.

\* Based on all-listed CCS diagnoses.

\*\* Includes discharges to home health care, against medical advice, destination unknown, and died in the ED.

Note: Bar segments representing 2 percent or less have not been labeled.

Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Emergency Department Sample, 2007.

The discharge status of ED visits involving MHA conditions varied by specific condition.

- Three-quarters of ED visits for personality disorders led to an inpatient admission in 2007 and another 4 percent in a transfer to another facility, such as a psychiatric hospital or to a skilled nursing or intermediate care facility. Only 20 percent of these visits resulted in treatment and release from the ED.
- Among ED visits for suicide or intentional self-inflicted injury, 42 percent ended in an inpatient admission and another 28 percent in transfer to another facility.
- Almost half of the ED visits involving a diagnosis of schizophrenia resulted in an inpatient admission, and in 11 percent of the cases the patient was transferred to another facility.
- ED visits with a depression diagnosis were more likely to result in admission to a health care facility (inpatient hospital admission, 53 percent, or transfer to another facility, 6 percent) than in treat-and-release (39 percent).
- For ED visits in which bipolar disorder was a listed diagnosis, 44 percent led to an inpatient admission; about half (47 percent) were treat-and-release. Another 7 percent of these visits resulted in the patient being transferred to a psychiatric hospital or to a skilled nursing or intermediate care facility.
- Around half of all drug- and alcohol- related visits to the ED ended in an inpatient admission to a hospital (49 percent and 44 percent, respectively), with another 4-5 percent resulting in admission to another facility.

- ED visits for adjustment disorders led to an inpatient admission 46 percent of the time and treat-and-release 49 percent of the time.
- ED visits involving an anxiety or attention-deficit/conduct/disruptive behavior disorder led more often to treat-and-release (62 and 67 percent, respectively) than to inpatient admissions or transfers.



## SOURCES AND METHODS

### Unit of Analysis

The unit of analysis is the hospital stay rather than the patient. All discharges have been weighted to produce national estimates.

### Coding Diagnoses and Procedures

Diagnoses and procedures associated with an inpatient hospitalization can be defined using several different medical condition classification systems. The Clinical Classifications Software (CCS) was used predominantly within this report to identify specific diagnoses and procedures. CCS is based on the *International Classification of Diseases, 9th Revision, Clinical Modification (ICD-9-CM)*, a uniform and standardized coding system containing over 13,600 diagnosis codes and 3,700 procedure codes. Each discharge record in the NIS is associated with one or more ICD-9-CM diagnosis code(s) and may contain one or more ICD-9-CM procedure code(s) if a procedure was performed during that hospitalization. Each hospital stay can have multiple CCS diagnoses and multiple CCS procedures.

In the CCS, ICD-9-CM codes are clustered into a smaller number of clinically meaningful categories that are sometimes more useful for presenting descriptive statistics than are individual ICD-9-CM codes. CCS codes are used extensively in this report to define groups of diagnoses and procedures for analysis. The CCS codes allow the reader to quickly and easily recognize patterns and trends in broad categories of hospital utilization. More information on CCS can be found online (<http://www.hcup-us.ahrq.gov/toolssoftware/ccs/ccs.jsp>). Specific CCS conditions or diagnoses can also be summarized into CCS body system or condition categories, which are broad groups of CCS conditions, such as Neoplasms, Mental Disorders, and Diseases of the Circulatory System.

### Exhibit Diagnoses and Procedures

Throughout this report, combinations of diagnostic and procedure codes are used to isolate specific conditions or procedures. These codes are defined below by exhibit number.

## SECTION 1—OVERVIEW STATISTICS FOR INPATIENT HOSPITAL STAYS

### EXHIBIT 1.3

Reasons for hospital stays are based on principal diagnosis defined by the following Major Diagnostic Categories (MDC):

MDC	CATEGORY DESCRIPTION
0	Principal diagnosis cannot be assigned to MDC (invalid or pre-MDC)
1	Diseases and disorders of the nervous system
2	Diseases and disorders of the eye
3	Diseases and disorders of the ear, nose, mouth and throat
4	Diseases and disorders of the respiratory system
5	Diseases and disorders of the circulatory system
6	Diseases and disorders of the digestive system
7	Diseases and disorders of the hepatobiliary system and pancreas
8	Diseases and disorders of the musculoskeletal system and connective tissue
9	Diseases and disorders of the skin, subcutaneous tissue and breast
10	Endocrine, nutritional and metabolic diseases and disorders
11	Diseases and disorders of the kidney and urinary tract
12	Diseases and disorders of the male reproductive system
13	Diseases and disorders of the female reproductive system
14	Pregnancy, childbirth and the puerperium

- 15 Newborns and other neonates with conditions originating in the perinatal period
- 16 Diseases and disorders of blood, blood forming organs, immunological disorders
- 17 Myeloproliferative diseases and disorders, poorly differentiated neoplasm
- 18 Infectious and parasitic diseases, systemic or unspecified sites
- 19 Mental diseases and disorders
- 20 Alcohol/drug use and alcohol/drug induced organic mental disorders
- 21 Injuries, poisonings and toxic effects of drugs
- 22 Burns
- 23 Factors influencing health status and other contacts with health services
- 24 Multiple significant trauma
- 25 Human Immunodeficiency Virus infections

## SECTION 2—INPATIENT HOSPITAL STAYS BY DIAGNOSIS

### EXHIBIT 2.1

Discharges for pregnancy, childbirth and newborn infants were identified as those assigned to Major Diagnostic Category 14 (Pregnancy, childbirth and the puerperium) or as having one of the following CCS diagnosis codes, which constitute total infant discharges:

CCS	DIAGNOSIS DESCRIPTION
218	Liveborn infant
219	Short gestation, low birth weight, and fetal growth retardation
220	Intrauterine hypoxia and birth asphyxia
221	Respiratory distress syndrome
222	Hemolytic jaundice and perinatal jaundice
223	Birth trauma
224	Other perinatal conditions

Maternal CCS categories not listed on the exhibit table but included in total maternal discharges:

CCS	DIAGNOSIS DESCRIPTION
176	Contraceptive and procreative management
177	Spontaneous abortion
178	Induced abortion
179	Postabortion complications
180	Ectopic pregnancy
181	Other complications of pregnancy
182	Hemorrhage during pregnancy, abruptio placenta, placenta previa
185	Prolonged pregnancy
186	Diabetes or abnormal glucose tolerance complicating pregnancy, childbirth, or the puerperium
187	Malposition, malpresentation
188	Fetopelvic disproportion, obstruction
190	Fetal distress and abnormal forces of labor
194	Forceps delivery
195	Other complications of birth, puerperium affecting management of the mother

## SECTION 3—INPATIENT HOSPITAL STAYS BY PROCEDURE

### EXHIBIT 3.1 (graphic)

Childbirth-related hospitalizations were defined using the following Diagnosis Related Groups (DRG) for 1997:

Childbirth-related hospitalizations:

DRG	PROCEDURE DESCRIPTION
370	Cesarean section with complications and comorbidities
371	Cesarean section without complications and comorbidities
372	Vaginal delivery with complicating diagnoses
373	Vaginal delivery without complicating diagnoses
374	Vaginal delivery with sterilization and/or dilation and curettage
375	Vaginal delivery with operating room procedure except sterilization and/or dilation and curettage

Childbirth-related hospitalizations were defined using the following Diagnosis Related Groups (DRG) for 2008:

Childbirth-related hospitalizations:

DRG	PROCEDURE DESCRIPTION
765	Cesarean section with complications and comorbidities/major complications and comorbidities
766	Cesarean section without complications and comorbidities/major complications and comorbidities
767	Vaginal delivery with sterilization and/or dilation and curettage
768	Vaginal delivery with operating room procedure except sterilization and/or dilation and curettage
774	Vaginal delivery with complicating diagnoses
775	Vaginal delivery without complicating diagnoses

## SECTION 4—SPENDING FOR INPATIENT HOSPITAL STAYS

### EXHIBIT 4.5

See definition for Major Diagnostic Categories (MDC) under Exhibit 1.3 above.

Maternal/neonatal is the sum of MDC 14 (Pregnancy, childbirth and the puerperium) and MDC 15 (Newborns and other neonates with conditions originating in the perinatal period).

## SECTION 5— HOSPITAL CARE FOR MENTAL HEALTH AND SUBSTANCE ABUSE CONDITIONS

### EXHIBIT 5.1

MHSA stays were defined by CCS diagnostic codes for principal MH and SA stays:

MH-related disorders:

CCS	DIAGNOSIS DESCRIPTION
650	Adjustment disorders
651	Anxiety disorders
652	Attention-deficit/conduct/disruptive behavior disorders
654	Developmental disorders
655	Autism/other childhood disorders
656	Impulse control disorders
657	Mood disorders (bipolar disorders and depression)
658	Personality disorders
659	Schizophrenia/other psychotic disorders
670	Pregnancy-related/other misc. MH disorders

SA-related disorders:

CCS	DIAGNOSIS DESCRIPTION
660	Alcohol-related disorders
661	Drug-related disorders

## EXHIBIT 5.2

Depression and bipolar disorders were defined by the following ICD-9-CM principal diagnosis codes:

Depression:

ICD-9-CM	DIAGNOSIS DESCRIPTION
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293.83	Other specified transient mental disorders due to conditions classified elsewhere
296.2	Major depressive disorder, single episode
296.3	Major depressive disorder, recurrent episode
300.4	Dysthymic disorder
311	Depressive disorder, not elsewhere classified

Bipolar disorders:

ICD-9-CM	DIAGNOSIS DESCRIPTION
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296.0	Bipolar I disorder, single manic episode
296.1	Manic disorder, recurrent episode
296.4	Bipolar I disorder, most recent episode (or current) manic
296.5	Bipolar I disorder, most recent episode (or current) depressed
296.6	Bipolar I disorder, most recent episode (or current) mixed
296.7	Bipolar I disorder, most recent episode (or current) unspecified
296.8	Other and unspecified bipolar disorder
296.9	Other and unspecified episodic mood disorder

## EXHIBIT 5.7, 5.10, 5.11

Pregnancy -related MH disorders were defined by the following ICD-9-CM principal diagnosis code:

ICD-9-CM	DIAGNOSIS DESCRIPTION
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648.4	Complications in pregnancy, mental disorders
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## EXHIBIT 5.11

Alcohol-related and drug-related disorders were defined by the following ICD-9-CM principal diagnosis codes:

ICD-9-CM	DIAGNOSIS DESCRIPTION
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291	Alcohol induced mental disorders
292	Drug induced mental disorders
303	Alcohol dependence syndrome
304	Drug dependence
305.0	Non-dependent abuse of alcohol
305.2-	Non-dependent abuse of illicit/legal drugs
305.9	

## EXHIBIT 5.12

In addition to the MHA diagnoses listed in Exhibit 5.1, emergency department MHA visits included:

CCS	DIAGNOSIS DESCRIPTION
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662	Suicide/intentional self-inflicted injury
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## DEFINITIONS

For definitions of medical terms, refer to <http://www.nlm.nih.gov/medlineplus/mpldictionary.html>.

### **Adjusted for general inflation**

Costs can be adjusted for economy-wide inflation by removing increases that reflect the effect of changing average prices for the same goods and services. In this report, the U.S. Bureau of Economic Analysis Gross Domestic Product Price Index is used to remove economy-wide inflation. Additional inflation that is specific to the hospital sector is not removed in this calculation.

### **Aggregate costs**

Aggregate costs are the sum of all costs for all hospital stays.

### **Charges**

Hospital charges reflect the amount the hospital billed for the entire hospital stay and do not include professional (physician) fees. The charge is generally more than the amount paid to the hospital by payers for the hospitalization and is also generally far more than what it costs hospitals to provide care.

### **Community hospitals**

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). Community hospitals (and HCUP data) include OB-GYN, ENT, orthopedic, cancer, pediatric, public, and academic medical hospitals. They exclude hospitals whose main focus is long-term care, psychiatric, and alcoholism and chemical dependency treatment, although discharges from these types of units that are part of community hospitals are included.

### **Costs**

Costs are derived from total hospital charges using cost-to-charge ratios based on hospital accounting reports from the Centers for Medicare and Medicaid Services (CMS). Costs will tend to reflect the actual costs to produce hospital services, while charges represent what the hospital billed for the care. For each hospital, a hospital-wide cost-to-charge ratio is used to transform charges into costs.

### **Diagnoses**

**Principal diagnoses:** The conditions established after study to be chiefly responsible for the patient's admission to the hospital.

**All-listed diagnoses:** The principal diagnosis plus secondary conditions.

**Secondary diagnoses:** The concomitant conditions that coexist at the time of admission or that develop during the stay.

### **Discharge**

Discharge refers to the hospital stay. The unit of analysis for HCUP data is the hospital discharge, 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.

### **Discharges per population**

Discharges per population is the hospital discharge rate of a particular procedure, diagnosis, or event per number of individuals. This measure indicates the prevalence of hospitalizations, procedures or diagnoses within the population.

### **Discharge status**

Discharge status indicates the disposition of the patient at the time of 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, rehabilitation care, swing bed, and another type of facility such as a nursing home), home health care, against medical advice (AMA), or died in the hospital.

#### **Discharge status – Emergency department (ED)**

Discharge status indicates the disposition of the patient at the time of discharge from the ED, and includes the following five categories: routine (to home), also known as a treat-and-release visit; transfer to another short-term hospital; admitted as an inpatient to this hospital; other transfers (including skilled nursing facility, intermediate facility, and another type of facility such as a nursing home); and other. Other includes the following: discharged to home health care; discharged against medical advice (AMA); died in the ED; not admitted to this hospital, destination unknown; and not admitted to this hospital, discharged alive, destination unknown.

#### **In-hospital deaths**

In-hospital deaths refer to hospitalizations in which the patient died during his or her hospital stay.

#### **Infant discharges**

Infant discharges are hospital stays during which a child is born.

#### **Length of stay**

Length of stay is the number of nights the patient remained in the hospital for his or her stay. A patient admitted and discharged on the same day has a length of stay equal to 0.

#### **Maternal discharges**

Maternal discharges are hospital stays for females who are pregnant or gave birth.

#### **Median income**

Median income is the median household income of the patient's ZIP code of residence. Median income is a proxy measure of a patient's socioeconomic status.

**Poorest communities** are identified as having a median household income of less than \$39,000.

**All other communities** are identified as having a median household income greater than or equal to \$39,000.

#### **Metropolitan location**

Metropolitan location indicates that the hospital is in a metropolitan area ("urban") rather than a non-metropolitan area ("rural"), as defined by the American Hospital Association (AHA) Annual Survey, using the 1993 U.S. Office of Management and Budget definition.

#### **Ownership/control**

Ownership/control was obtained from the American Hospital Association (AHA) Annual Survey of Hospitals and includes categories for government non-Federal (public), private not-for-profit (voluntary), and private investor-owned (proprietary). These types of hospitals tend to have different missions and different responses to government regulations and policies.

#### **Patient age**

Patient age in years, calculated based on the patient's date of birth and admission date to the hospital.

#### **Payers**

Payer is the expected 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.

#### **Procedures**

**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 is selected as the principal procedure.

**All-listed procedures** include all procedures performed during the hospital stay.

#### **Stays**

The unit of analysis for HCUP data is the hospital stay (i.e., the hospital discharge), 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.

#### **Treat-and-release ED visits**

Treat-and-release ED visits are those ED visits in which patients are treated and released from the ED (i.e., they are not admitted to the specific hospital in which the ED is located). While the majority of treat-and-release patients are discharged home, some are transferred to another acute care facility, leave against medical advice, go to another type of long-term or intermediate care facility (nursing home or psychiatric treatment facility), are referred to home health care, die, or are discharged alive but the destination is unknown.

## FOR MORE INFORMATION

### HCUP Background Information

For a detailed description of HCUP, 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.

2008 Introduction to the NIS. Healthcare Cost and Utilization Project (HCUP). July 2010. Agency for Healthcare Research and Quality, Rockville, MD ([http://www.hcup-us.ahrq.gov/db/nation/nis/NIS\\_2008\\_INTRODUCTION.pdf](http://www.hcup-us.ahrq.gov/db/nation/nis/NIS_2008_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). Agency for Healthcare Research and Quality ([http://www.hcup-us.ahrq.gov/reports/CalculatingNISVariances\\_200106092005.pdf](http://www.hcup-us.ahrq.gov/reports/CalculatingNISVariances_200106092005.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. Agency for Healthcare Research and Quality ([http://www.hcup-us.ahrq.gov/reports/2006\\_05\\_NISTrendsReport\\_1988-2004.pdf](http://www.hcup-us.ahrq.gov/reports/2006_05_NISTrendsReport_1988-2004.pdf)).

### HCUP Statistics and Website

Many of the statistics presented here were taken directly from HCUPnet, HCUP's interactive query system. For additional HCUP statistics, visit HCUPnet at <http://hcupnet.ahrq.gov>.

### Technical Assistance

For Technical Assistance with HCUP Products:

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## RECOMMENDED CITATION

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