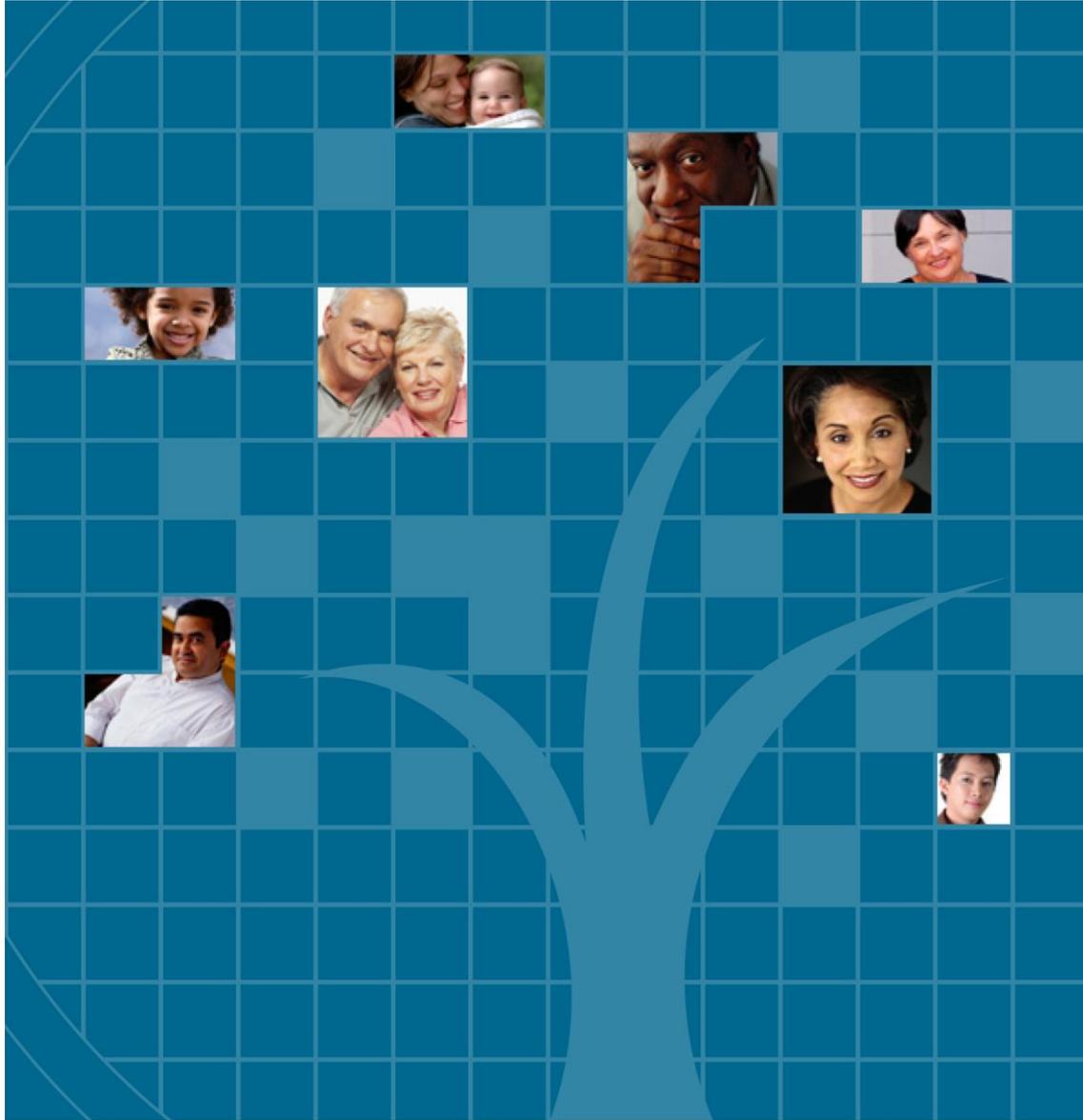


# HCUP

## HCUP FACTS AND FIGURES: STATISTICS ON HOSPITAL-BASED CARE IN THE UNITED STATES, 2007



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## HIGHLIGHTS

*HCUP Facts and Figures: Statistics on Hospital-based Care in the United States, 2007* presents information derived from the 2007 Healthcare Cost and Utilization Project (HCUP) Nationwide Inpatient Sample (NIS), with trend information as far back as 1993. This report includes information from the 2007 database containing discharge records for all patients treated in a sample of approximately 1,000 hospitals. These discharges are weighted to represent all inpatient stays in community hospitals across the nation. Community hospitals include all non-Federal, short-term, acute care hospitals; psychiatric and substance abuse facilities and short-term rehabilitation hospitals are not included.

## OVERVIEW STATISTICS FOR INPATIENT HOSPITAL STAYS

- The number of hospital discharges increased from 34.7 million in 1997 to 39.5 million in 2007, a 14-percent increase overall, or an average increase of 1.3 percent annually.
- The average length of stay (ALOS) in 2007 was 4.6 days—almost 20 percent shorter than in 1993, when the ALOS was 5.7 days. The ALOS declined throughout most of the 1990s and has stabilized during the current decade.
- While people 65 years and older represented 13 percent of the population in 2007, they comprised 33 percent of all hospitalizations.
- The number of discharges to home health care grew by 55 percent (up 1.3 million discharges). Discharges to nursing homes and long term care increased by 32 percent (1.2 million discharges). The number of patients who left the hospital against medical advice, although small, rose by 39 percent (up 103,700 discharges) — the second fastest increase of any discharge type.
- Even when pregnancy and childbirth stays are excluded, females accounted for more stays than males—18.2 million stays for females compared to 16.2 million stays for males.

## INPATIENT HOSPITAL STAYS BY DIAGNOSIS

- Conditions related to pregnancy and childbirth were the reason for more than 1 out of every 5 female hospitalizations in 2007. When combined with stays for newborn infants, these hospitalizations accounted for one-quarter of all male and female stays.
  - Maternal discharges increased to 5.0 million in 2007, a 16-percent increase since 1997.
  - Previous C-sections increased 107 percent between 1997 and 2007.
  - Infant hospitalizations increased to 4.7 million in 2007, a 21-percent increase since 1997.
- Circulatory conditions were the most frequent major cause of hospital stays in 2007, accounting for 16 percent of all discharges. Five circulatory conditions were among the top 10 most frequent principal diagnoses in 2007.
- Several frequently occurring infections were among the most rapidly increasing reasons for hospitalizations between 1997 and 2007.
  - Stays for skin and subcutaneous tissue infections rose 90 percent for men and 75 percent for women.
  - Septicemia increased by 63 percent—up 77 percent among men and 53 percent among women.
- Several conditions were common among children and young adults.
  - Asthma, the most common reason for hospital admission among children 1–17, declined by 28 percent between 1997 and 2007.
- Hypertension was a comorbidity in 35 percent of all hospital stays in 2007, diabetes in 17 percent of stays, depression in 7 percent stays, and alcohol abuse, drug abuse, and/or psychoses each in 3 percent of stays.
- Chronic conditions were a principal or secondary diagnosis for 74 percent of all hospital stays in 2007.

## INPATIENT HOSPITAL STAYS BY PROCEDURE

- During almost two out of every three hospital stays in 2007, at least one procedure was performed.
- Six of the top procedures in 2007 were associated with giving birth or newborns.
  - C-section was the most frequent major operating room procedure—performed on 1.5 million women in 2007. Growth in C-sections, up 85 percent between 1997 and 2007, outpaced increases in most other frequently performed maternal procedures and was among the fastest growing procedures for women 18-44 years old.
- Blood transfusions occurred in one out of every 10 hospital stays that included a procedure. There were 1.1 million stays with this procedure in 1997 and 2.6 million in 2007, for a cumulative growth of 140 percent.
- Discharges for respiratory intubation rose steadily, increasing 48 percent over the 1997-2007 period.
- From 1997 to 2007, arthroplasty of the knee increased by 86 percent.
- Hemodialysis procedures for renal failure grew by 66 percent.
- The use of tube feeding during infant hospitalizations increased 219 percent, compared with a 16-percent growth in all infant discharges.
- Diagnostic cardiac catheterization was performed on 890,000 males and 581,000 females in 2007 and ranked as the 2nd most frequent procedure in men and the 4th most frequent procedure in women.

## COSTS FOR INPATIENT HOSPITAL STAYS

- Inflation-adjusted aggregate costs for hospital stays rose from \$222.4 billion in 1997 to \$343.9 billion in 2007 — an increase of 55 percent.
- The most important driver of cost increases was greater intensity of services provided during the hospital stay. Costs per discharge increased by 3.1 percent annually.
- Circulatory conditions accounted for 22 percent (\$74.6 billion) and injury and poisonings for 11 percent (\$37.2 billion) of all costs for inpatient stays in 2007.
- Hospital stays related to pregnancy, childbirth, and newborns together accounted for the most stays (9.7 million) and the third highest costs (\$34.2 billion) among body systems. The average hospital cost for these conditions was less than that for any other body system condition, making the aggregate costs relatively low despite the high volume of stays.
- The fastest increase in body system costs was for infectious and parasitic diseases, more than doubling between 1997 (\$6.6 billion) and 2007 (\$15.3 billion). Septicemia was responsible for almost all (94 percent) of the increase in costs of infectious and parasitic conditions as it tripled in costs from \$4.1 billion in 1997 to \$12.3 billion in 2007.

## PAYERS FOR INPATIENT HOSPITAL STAYS

### *Discharges*

- In 2007, Medicare and Medicaid were the expected primary payers for more than half (56 percent) of all inpatient hospital discharges, private insurance for 35 percent, and the uninsured for 6 percent. Other payers accounted for the remaining 3 percent of discharges.
  - Medicaid was billed for 44 percent of stays among 0-17 year olds, but only 23 percent of stays among 18-64 year olds and less than 5 percent of stays among those 65 and older.
  - Medicaid was the primary payer for 64 percent of maternal discharges among 18-24 year olds, about one-third of maternal stays for 25-34 year olds, and 21 percent of maternal stays for 35-49 year olds.

- Twenty-seven percent of stays among 60-64 year olds were billed to Medicare, compared to less than 5 percent of non-maternal stays among 18-24 year olds.
- About 10 percent of discharges for patients 18-64 years old were uninsured, compared to 5 percent of discharges among 0-17 year olds and less than 1 percent of discharges among patients 65 and older.
- About 4-5 percent of maternal stays among all age groups were uninsured.
- The share of discharges billed to private insurance fell from 39 percent to 35 percent between 1997 and 2007, reflecting the steady decline in the share of the population with private insurance coverage. The share of discharges billed to Medicare and the share of uninsured discharges held relatively stable, while those billed to Medicaid increased from 16 to 19 percent.
- Between 1997 and 2007, the number of uninsured discharges grew by 38 percent and the number Medicaid discharges grew by 36 percent—more than double the rate of growth of all discharges (14 percent). The number of Medicare discharges grew by 14 percent while stays billed to private insurance grew by just 2 percent.
- Hospitalizations billed to Medicare and Medicaid accounted for more than three-quarters of the increase in discharges from 1997 to 2007.
- The average length of stay for hospitalizations billed to Medicare decreased substantially from 1997 to 2007 (from 6.3 days to 5.6 days) while the ALOS for stays covered by Medicaid, uninsured, and private insurance remained relatively unchanged. Virtually the entire decline in the all payer length of stay from 1997 to 2007 was attributable to Medicare.
- Patients discharged against medical advice were more likely to be uninsured. Three percent of uninsured discharges occurred against medical advice, compared to less than 1 percent of discharges billed to Medicare, Medicaid, and private insurance.

#### *Costs*

- In 2007, costs for Medicare stays amounted to \$156.0 billion and Medicaid stays accounted for \$50.4 billion—a total of about 60 percent of aggregate hospital costs. Discharges billed to private insurance accounted for 31 percent (\$107.8 billion), while the uninsured accounted for a much smaller share (5 percent, or \$16.5 billion).

#### *Conditions*

- Stays for some body system conditions and payers grew rapidly:
  - For Medicare stays, pregnancy and childbirth grew by 185 percent, although the total number of stays remained relatively low (16,400 in 1997 and 46,700 in 2007). Infectious and parasitic conditions (up 57 percent) and blood disorders (up 56 percent) also rose rapidly.
  - There was large growth in Medicaid stays for skin conditions (92 percent), perinatal/newborns (55 percent), pregnancy and childbirth (47 percent), and musculoskeletal conditions (43 percent).
  - There was rapid growth in stays billed to private insurance for skin conditions (63 percent), musculoskeletal conditions (44 percent), blood disorders (31 percent), and endocrine conditions (26 percent).
  - For uninsured stays, large increases occurred in skin (136 percent), blood (112 percent), and endocrine (67 percent) conditions.
- Rapid growth in specific CCS conditions contributed to body system growth:
  - There was rapid growth in stays for acute renal failure billed to the uninsured (387 percent), Medicare (315 percent), Medicaid (306 percent), and private insurance (273 percent).
  - There was also rapid growth in the number of hospitalizations across all payers for skin and subcutaneous tissue infections, anemia, non-specific chest pain, septicemia (blood infection), osteoarthritis, complication of device, implant, or graft, and complication of surgical procedures or medical care.

## 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 policymakers, health system leaders, researchers, and the public.

In 2009, HCUP is celebrating 20 years of substantial contributions to healthcare research and policy. 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 data source for [HCUP Facts and Figures](#), is the largest all-payer database in the U.S., containing all discharge records from a sample of approximately 1,000 hospitals in HCUP-participating states.

This third 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](#), this year's report presents a special section that details trends in hospital care by expected payer, including Medicare, Medicaid, private insurance and the uninsured.

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 90 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. In this anniversary year, AHRQ joins with its HCUP Partners in celebrating the successful collaboration that has and will continue to advance health care research in the 21st century.

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.

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## HCUP AND ITS DATA PARTNERS

Sponsored by the Agency for Healthcare Research and Quality (AHRQ), HCUP is a family of databases, software tools, and products developed through the collaboration of State data organizations, hospital associations, private data organizations, and the Federal government. The HCUP Partnership has grown from 8 states in 1988 to 40 states in 2009, and would not be possible without the current contributions from the following data collection Partners:

**Arizona** Department of Health Services  
**Arkansas** Department of Health & Human Services  
**California** Office of Statewide Health Planning and Development  
**Colorado** Hospital Association  
**Connecticut** Hospital Association  
**Florida** Agency for Health Care Administration  
**Georgia** Hospital Association  
**Hawaii** Health Information Corporation  
**Illinois** Department of Public Health  
**Indiana** Hospital Association  
**Iowa** Hospital Association  
**Kansas** Hospital Association  
**Kentucky** Cabinet for Health and Family Services  
**Maine** Health Data Organization  
**Maryland** Health Services Cost Review Commission  
**Massachusetts** Division of Health Care Finance and Policy  
**Michigan** Health & Hospital Association  
**Minnesota** Hospital Association  
**Missouri** Hospital Industry Data Institute  
**Nebraska** Hospital Association  
**Nevada** Department of Health and Human Services  
**New Hampshire** Department of Health & Human Services  
**New Jersey** Department of Health and Senior Services  
**New York** State Department of Health  
**North Carolina** Department of Health and Human Services  
**Ohio** Hospital Association  
**Oklahoma** State Department of Health  
**Oregon** Association of Hospitals and Health Systems  
**Rhode Island** Department of Health  
**South Carolina** State Budget & Control Board  
**South Dakota** Association of Healthcare Organizations  
**Tennessee** Hospital Association  
**Texas** Department of State Health Services  
**Utah** Department of Health  
**Vermont** Association of Hospitals and Health Systems  
**Virginia** Health Information  
**Washington** State Department of Health  
**West Virginia** Health Care Authority  
**Wisconsin** Department of Health and Family Services  
**Wyoming** Hospital Association

## SECTION 1 OVERVIEW STATISTICS FOR INPATIENT HOSPITAL STAYS

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### HIGHLIGHTS

- The number of hospital discharges increased from 34.7 million in 1997 to 39.5 million in 2007, a 14-percent increase overall, or an average increase of 1.3 percent annually.
- The average length of stay (ALOS) in 2007 was 4.6 days—almost 20 percent shorter than in 1993, when the ALOS was 5.7 days. The ALOS declined throughout most of the 1990s and has stabilized during the current decade.
- Between 1997 and 2007, the aggregate inflation-adjusted costs for hospitalizations (the actual costs of producing hospital services) rose from \$222.4 billion to \$343.9 billion—an increase of 55 percent.
- While people 65 years and older represented 13 percent of the population in 2007, they comprised 33 percent of all hospitalizations.
- The number of discharges to home health care grew by 55 percent (up 1.3 million discharges). Discharges to nursing homes and long term care increased by 32 percent (1.2 million discharges). The number of patients who left the hospital against medical advice, although small, rose by 39 percent (up 103,700 discharges) — the second fastest increase of any discharge type.
- Circulatory conditions were the most frequent major cause of hospital stays in 2007, accounting for 6.4 million stays and 16 percent of all discharges. These stays were for diagnoses such as coronary artery disease, congestive heart failure, heart attack, and irregular heart beat.
- Pregnancy and childbirth was the reason for more than 1 out of every 5 female hospitalizations (5 million stays) in 2007. Even when pregnancy and childbirth stays are excluded, females accounted for more stays than males—18.2 million stays for females compared to 16.2 million stays for males.

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

### Characteristics of U.S. Community Hospitals, 1997 and 2007

UTILIZATION, CHARGES, AND COSTS	1997	2007
<b>Discharges</b>		
Total discharges in millions	34.7	39.5
Number of discharges per 1,000 population*	127.8	131.1
Total days of care in millions	168.1	181.7
Average length of stay in days	4.8	4.6
<b>Percent of discharges from:</b>		
Metropolitan hospitals	84%	87%
Teaching hospitals	47%	47%
<b>Hospital ownership</b>		
Non-Federal government hospitals	14%	14%
Private not-for-profit hospitals	73%	72%
Private for-profit hospitals	13%	13%
<b>Charges and costs<sup>†</sup></b>		
<b>Charges</b>		
Average charges per stay	\$11,300	\$26,100
Average inflation-adjusted charges per stay in 2007 dollars <sup>‡</sup>	\$14,200	\$26,100
<b>Costs</b>		
Total aggregate costs in billions	\$177.1	\$343.9
Average costs per stay	\$5,100	\$8,700
Inflation-adjusted costs in 2007 dollars <sup>‡</sup>		
Total aggregate costs in billions	\$222.4	\$343.9
Average costs per stay	\$6,400	\$8,700

\* Calculated using population from the U.S. Bureau of the Census (<http://www.census.gov/popest/national/asrh/2007-nat-res.html>).

† 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 2007.

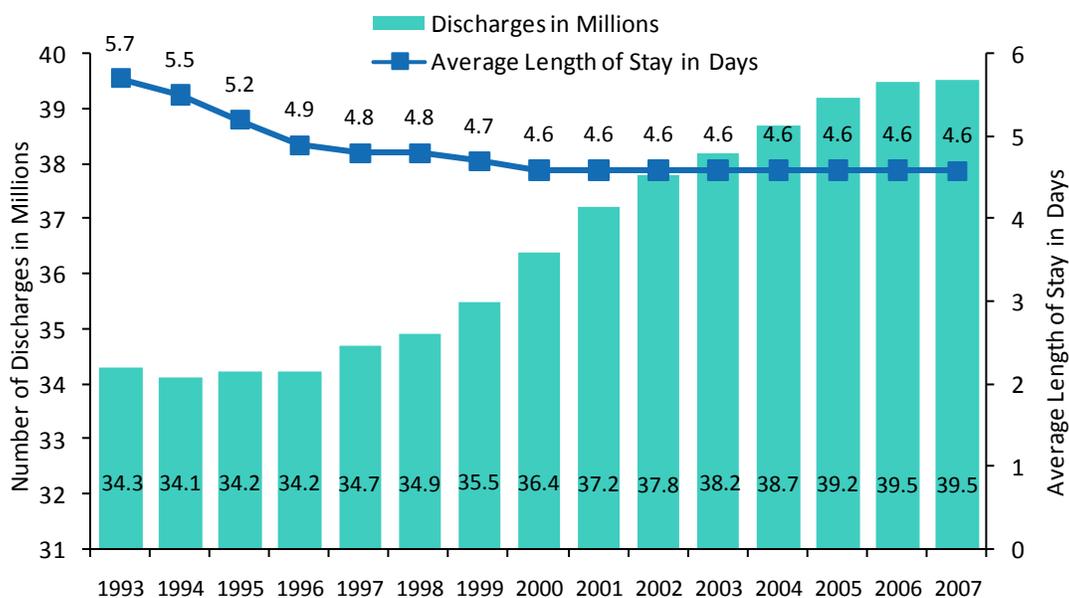
Hospital costs rose rapidly and most hospital characteristics changed slowly over time.

- The number of hospital discharges increased from 34.7 million in 1997 to 39.5 million in 2007, a 14-percent increase overall, or an average increase of 1.3 percent annually.
- The percent of community hospital discharges has changed little in terms of metropolitan location, teaching status, and type of ownership between 1997 and 2007. Most (87 percent) of hospitals are located in metropolitan areas, about half are teaching hospitals, and almost three-quarters are private not-for-profit facilities.
- There were 128 hospital stays for every 1,000 persons in the United States in 1997 and 131 stays per 1,000 persons in 2007.

- Average charges per stay—what patients are billed for their rooms, nursing care, diagnostic tests, and other services—rose from \$11,300 in 1997 to \$26,100 in 2007. Few patients or insurers paid those amounts because of discounts negotiated with hospitals.
- Between 1997 and 2007, the aggregate inflation-adjusted costs for hospitalizations (the actual costs of producing hospital services) increased 55 percent. Costs rose from \$222.4 billion to \$343.9 billion—an average annual increase of 4.5 percent over the period.

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

**Number of Inpatient Hospital Stays and Average Length of Stay, 1993-2007**

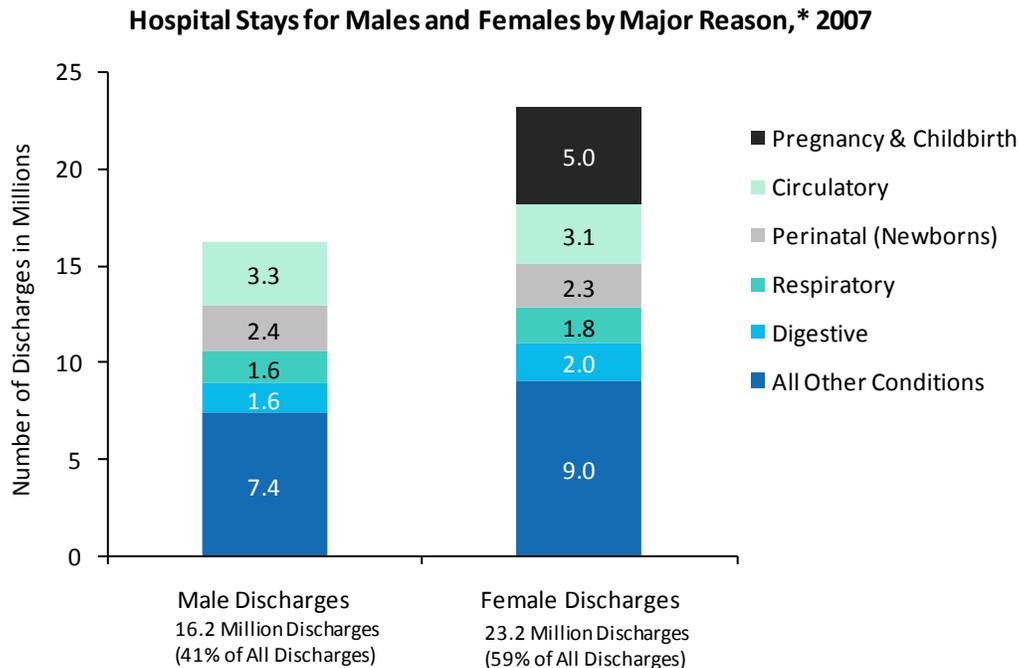


Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 1993-2007.

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 2007 was 4.6 days—almost 20 percent shorter than in 1993, when the ALOS was 5.7 days. The ALOS declined throughout most of the 1990s and has stabilized during the current decade.
- From 1993 to 1998, the number of discharges grew very slowly, increasing by only 0.6 million.
  - Growth in the number of discharges (an average of 0.3 percent annually) did not keep pace with the growth in population (1.2 percent annually).
- From 1998 through 2006, the number of discharges rose by 4.6 million.
  - Growth in the number of discharges (an average of 1.6 percent annually) exceeded population growth (1.0 percent annually).
- In 2007, growth in the number of discharges slowed to just 0.2 percent, once again increasing at a slower pace than population growth (1.0 percent).

## EXHIBIT 1.3 Reasons for Hospital Stays



\* Based on principal diagnosis defined by CCS body system ([www.hcup-us.ahrq.gov/toolssoftware/ccs/ccs.jsp](http://www.hcup-us.ahrq.gov/toolssoftware/ccs/ccs.jsp)).

Note: Excludes a small number of discharges (108,000 or 0.3 percent) with missing gender.

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

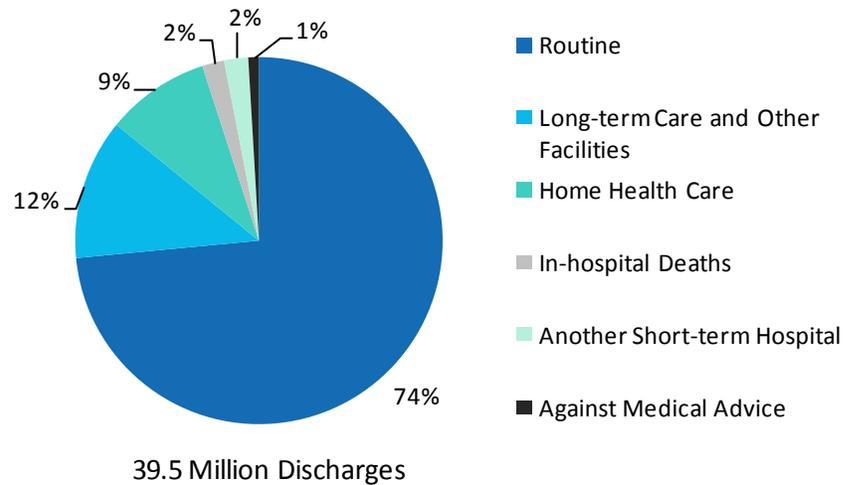
Males accounted for 16.2 million stays in 2007 and females experienced 23.2 million hospitalizations in 2007—7 million more stays than males.

- Circulatory conditions were the most frequent major cause of hospital stays in 2007, accounting for 6.4 million stays and 16 percent of all discharges. These stays were for diagnoses such as coronary artery disease, congestive heart failure, heart attack, and irregular heart beat.
- If pregnancy and childbirth are excluded, the largest differences between males and females in reasons for hospitalization were for diseases of the digestive system, which accounted for 2.0 million female stays, but only 1.6 million male stays, and for diseases of the respiratory system, where females accounted for 1.8 million stays and males for 1.6 million stays.
- Even when pregnancy and childbirth stays are excluded, females accounted for more stays than males—18.2 million stays for females compared to 16.2 million stays for males.
- Males accounted for 41 percent of all hospitalizations in 2007.
  - Of these stays, 20 percent (3.3 million discharges) were for circulatory conditions, 15 percent (2.4 million discharges) were for stays during the perinatal period, and 10 percent (1.6 million discharges) each were for respiratory and digestive system conditions.
  - These four major conditions amounted to 55 percent of all hospitalizations for males.
- Females accounted for 59 percent of all hospitalizations in 2007.
- Pregnancy and childbirth was the reason for more than 1 out of every 5 female hospitalizations (5 million stays).

- Other major reasons for female hospitalizations included conditions related to the circulatory system (14 percent or 3.1 million stays), respiratory system (8 percent or 1.8 million stays), and digestive system (8 percent or 2.0 million stays).

## EXHIBIT 1.4 Discharge Status

Distribution of Inpatient Hospital Stays by Discharge Status,\* 2007

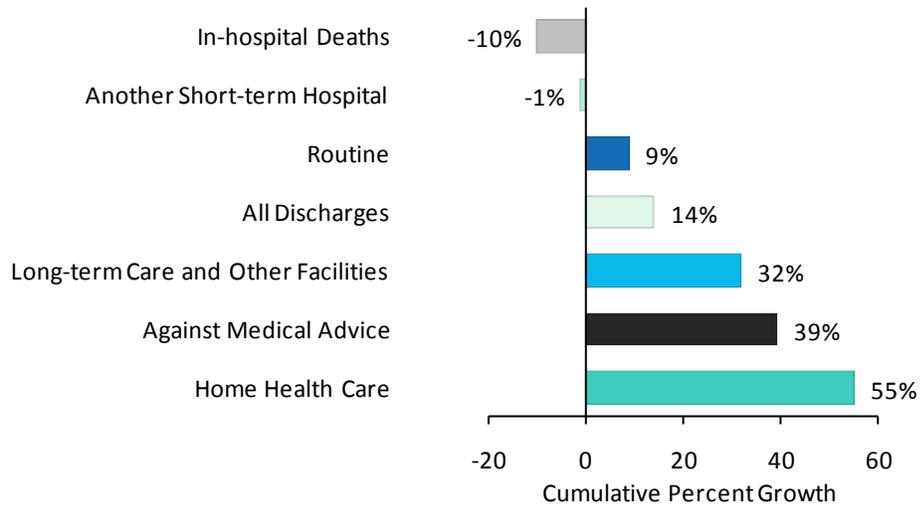


\* Excludes less than 9,000 discharges (0.01 percent) with missing discharge status.  
Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 2007.

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 (74 percent, or 29 million discharges), with the patient being sent home without closely supervised health care.
- Discharge to a long-term care facility (4.9 million discharges) was the second most common type of discharge, accounting for 12 percent of discharges.
- Discharge to the home with home health care supervision accounted for 9 percent (3.6 million discharges).
- Remaining discharge circumstances each accounted for 2 percent or less of discharges. These included in-hospital death or discharge to another short-term hospital, each with 0.8 million discharges, or discharge against medical advice (0.4 million discharges).

### Growth in Number of Hospital Stays by Discharge Status, 1997-2007



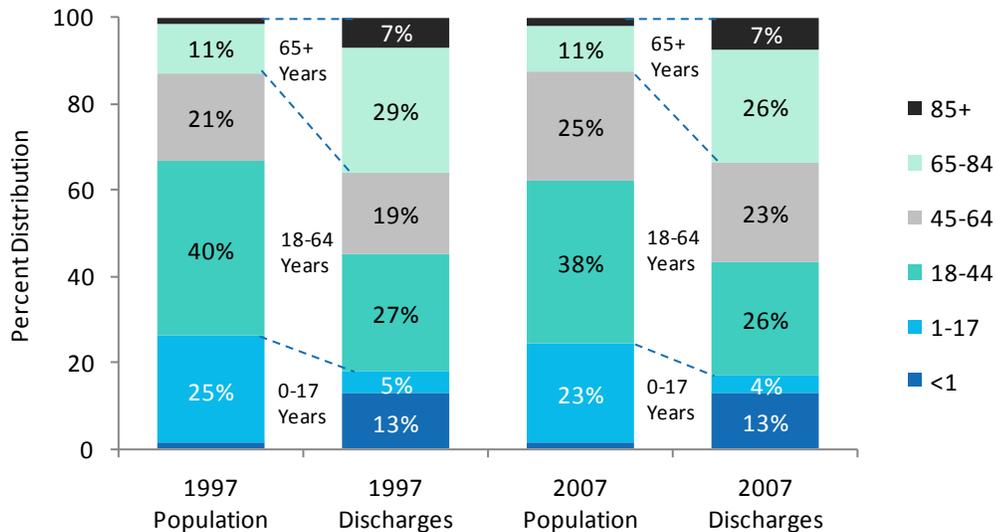
Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 1997 and 2007.

The number of discharges increased by 14 percent (up 4.9 million discharges) from 1997 to 2007, but growth varied by discharge status.

- The number of discharges to follow-on care in nursing homes and other rehabilitation facilities and to home care has increased as the average length of stay has fallen.
  - The number of discharges to home health care grew by 55 percent (up 1.3 million discharges).
  - Discharges to nursing homes and long term care increased by 32 percent (1.2 million discharges).
- The number of in-hospital deaths decreased by 10 percent (down 86,000 discharges).
- The number of patients who left the hospital against medical advice, although small, rose by 39 percent (up 103,700 discharges)—the second fastest increase of any discharge type.

## EXHIBIT 1.5 Patient Age

**Distribution of U.S. Population and Hospital Discharges by Age, 1997 and 2007**



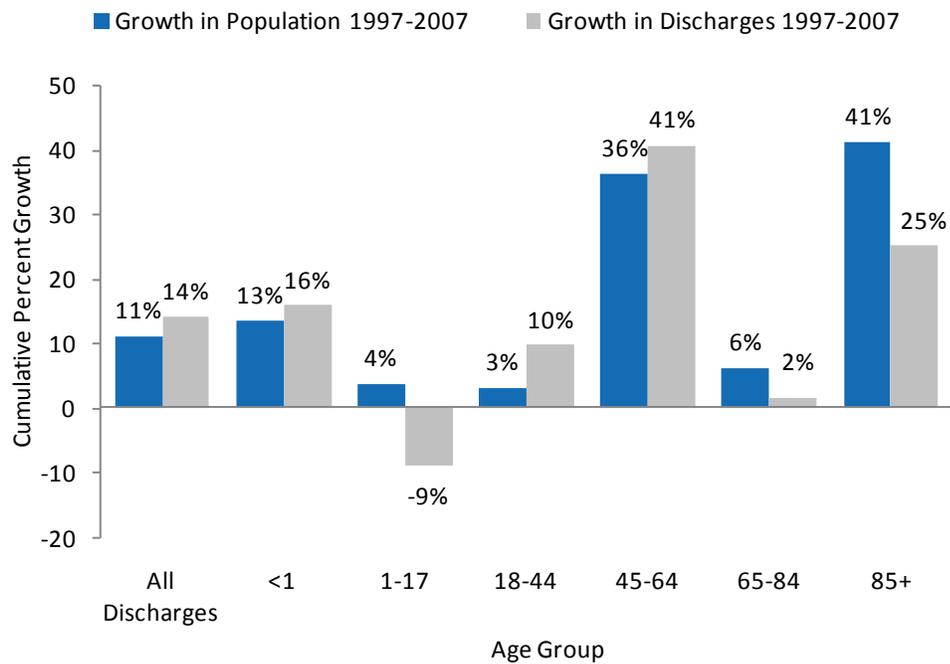
Note: Bar segments representing 2 percent or less have not been labeled. Excludes less than 41,000 discharges (0.1 percent) with missing age.

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

In both 1997 and 2007, older people accounted for a disproportionately larger share of hospitalizations compared to their proportion in the population.

- While people 65 years and older represented 13 percent of the population in 1997 and 2007, they comprised 36 and 33 percent of all hospitalizations in those years.
- The younger patient age groups had a lower proportion of hospitalizations relative to their representation in the population.
  - In 1997 and 2007, patients 18-64 years of age, at 61 and 63 percent of the population, accounted for 46 and 49 percent of hospitalizations.
  - Those under age 18, at roughly a quarter of the population in 1997 and 2007, accounted for 18 percent or less of the hospital stays.

### Growth in Discharges and U.S. Population by Age, 1997-2007



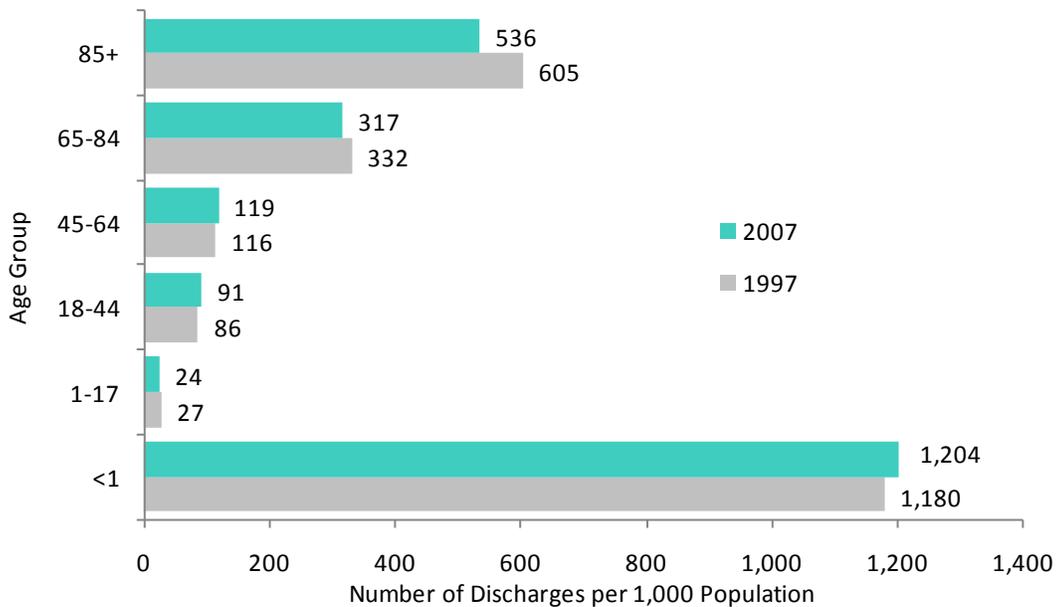
Note: Excludes less than 41,000 discharges (0.1 percent) with missing age.

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

Overall, the number of discharges grew 14 percent from 1997 to 2007 and the total U.S. population grew at a similar rate—11 percent. Growth in the number of discharges and the overall population varied among age groups over this period.

- The 45-64 year old group (including baby boomers) and those 85 years and older grew rapidly—36 percent and 41 percent, respectively, outpacing growth in other age groups. For 45-64 year olds, growth in hospitalizations (41 percent) kept pace with population increases. For individuals 85 years and older, however, population growth at 41 percent exceeded the 25-percent growth in hospitalizations.
- Population grew more moderately for younger age groups (0-44 year olds) and for those 65-84 years old. With the exception of the 1-17 age group in which hospitalizations declined by 9 percent, growth in hospitalizations was similar to population growth.

### Discharges per 1,000 Population by Age, 1997 and 2007



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

Discharges for an age group divided by the number of people in that age group (discharges per 1,000 population) show that older age is associated with a greater chance of hospitalization.

- Across all age groups, there were 131 discharges for every 1,000 persons in the United States in 2007, little changed from the rate of 128 discharges in 1997.
- There were less than 30 hospital stays for every 1,000 children 1 to 17 years old in 1997 and 2007.
- For adults 85 and older, there were 605 stays in 1997 and 536 stays in 2007 per 1,000 persons.
- The one exception to the rising rate of hospitalization as the population ages was for infants younger than 1 year of age. This group experienced roughly 1,200 hospitalizations per 1,000 infants in 1997 and 2007. This high rate of hospital stays occurs because nearly all births occur in the hospital and some infants require additional hospitalization in the first year of life.

## SECTION 2 INPATIENT HOSPITAL STAYS BY DIAGNOSIS

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### HIGHLIGHTS

- Conditions related to pregnancy and childbirth were the reason for more than 1 out of every 5 female hospitalizations in 2007. When combined with stays for newborn infants, these hospitalizations accounted for one-quarter of all male and female stays.
  - Maternal discharges increased to 5.0 million in 2007, a 16-percent increase since 1997.
  - Previous C-sections increased 107 percent between 1997 and 2007.
  - Stays with high blood pressure during pregnancy increased by 28 percent between 1997 and 2007.
  - Stays with umbilical cord complications declined by 15 percent.
  - Infant hospitalizations increased to 4.7 million in 2007, a 21-percent increase since 1997.
- Circulatory conditions were the most frequent major cause of hospital stays in 2007, accounting for 16 percent of all discharges. Five circulatory conditions were among the top 10 most frequent principal diagnoses in 2007.
  - Stays for non-specific chest pain increased by 47 percent between 1997 and 2007 while those for irregular heart beat increased by 28 percent.
  - Stays for coronary artery disease declined 31 percent and for heart attack by 15 percent.
  - Stays for congestive heart failure changed very little from 1997 to 2007.
  - Ranking 6th in 1997, hospital stays for acute cerebrovascular disease dropped to 15th in 2007 as stays declined 14 percent.
- Several frequently occurring infections were among the most rapidly increasing reasons for hospitalizations between 1997 and 2007.
  - Stays for skin and subcutaneous tissue infections rose 90 percent for men and 75 percent for women.
  - Septicemia increased by 63 percent—up 77 percent among men and 53 percent among women.
  - Among adults 85 and over, septicemia (up 64 percent) and urinary tract infections (up 58 percent) increased at more than twice the rate of all hospitalizations for this age group.
- Several conditions were common among children and young adults.
  - Asthma, the most common reason for hospital admission among children 1–17, declined by 28 percent between 1997 and 2007.
  - Appendicitis, another common reason for hospital stays for children 1-17, accounted for 5 percent of discharges in this age group in 2007, increasing by 20 percent between 1997 and 2007.
  - Depression and bipolar disorders (mood disorders), among the most common diagnoses for children and young adults, increased 27 percent for children 1-17 and 15 percent for adults 18-44 between 1997 and 2007. Among all ages, mood disorders grew by 32 percent for men and by 13 percent for women over the same period.
- Degenerative joint disease (osteoarthritis) increased 95 percent over the 1997-2007 period. This condition caused many more hospitalizations for females (498,000 discharges) than for males (314,000 discharges) in 2007.
- Hypertension was a comorbidity in 35 percent of all hospital stays in 2007, diabetes in 17 percent of stays, depression in 7 percent stays, and alcohol abuse, drug abuse, and/or psychoses each in 3 percent of stays.
- Chronic conditions were a principal or secondary diagnosis for 74 percent of all hospital stays in 2007.

## EXHIBIT 2.1 Most Frequent Principal Diagnoses

Number of Discharges, Percent Distribution, Rank, and Growth of the Most Frequent Principal CCS Diagnoses for Inpatient Hospital Stays, 1997 and 2007

PRINCIPAL CCS DIAGNOSIS	NUMBER OF DISCHARGES IN THOUSANDS		PERCENT OF DISCHARGES		RANK <sup>1</sup>		CUMULATIVE GROWTH
	1997	2007	1997	2007	1997	2007	1997-2007
All discharges	34,679	39,542	100.0%	100.0%	—	—	14%
Chronic conditions <sup>†</sup>	13,778	14,447‡	39.7	36.5	—	—	5
Pregnancy, childbirth, and newborn infants	8,236	9,732	23.7	24.6	—	—	18
All maternal discharges*	4,338	5,031	12.5	12.7	—	—	16
Trauma to external female genitals (vulva) and area between anus and vagina (perineum) due to childbirth	713	868	2.1	2.2	—	—	22
Previous C-section	271	562	0.8	1.4	—	—	107
Normal pregnancy and/or delivery	544	312	1.6	0.8	—	—	-43
Prolonged pregnancy	§	276	§	0.7	—	—	§
Fetal distress and abnormal forces of labor	§	246	§	0.6	—	—	§
Hypertension complicating pregnancy, childbirth and the puerperium (high blood pressure during pregnancy)	185	238	0.5	0.6	—	—	28
Early or threatened labor	261	235‡	0.8	0.6	—	—	-10
Umbilical cord complication	259	219	0.7	0.6	—	—	-15
Polyhydramnios and other problems of amniotic cavity (excess amniotic fluid and other problems of amniotic cavity)	202	209‡	0.6	0.5	—	—	3
All infant discharges	3,898	4,701	11.2	11.9	—	—	21
Pneumonia	1,232	1,172	3.6	3.0	2	1	-5
Congestive heart failure	991	1,025‡	2.9	2.6	3	2	3
Coronary atherosclerosis (coronary artery disease)	1,407	964	4.1	2.4	1	3	-31
Osteoarthritis (degenerative joint disease)	418	815	1.2	2.1	15	4	95
Non-specific chest pain	538	788	1.6	2.0	9	5	47
Mood disorders (depression and bipolar disorder)	641	774	1.8	2.0	5	6	21
Cardiac dysrhythmias (irregular heart beat)	572	731	1.7	1.8	7	7	28
Septicemia (blood infection)	413	675	1.2	1.7	16	8	63
Disorders of intervertebral discs and bones in spinal column (back problems)	536	634	1.5	1.6	10	9	18
Acute myocardial infarction (heart attack)	732	625	2.1	1.6	4	10	-15
Acute cerebrovascular disease	616	527	1.8	1.3	6	15	-14
Chronic obstructive pulmonary disease and bronchiectasis	551	593	1.6	1.5	8	13	8

1 Rankings for principal diagnoses other than pregnancy, childbirth or newborn infant.

— Rank not applicable.

†Includes the number of discharges with a principal diagnosis that is considered to be a chronic condition.

‡2007 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.

§ Consistent data are not available for this diagnosis due to coding changes that took place between 1997 and 2007.

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

In 2007, there were 39.5 million hospital stays, an increase of 14 percent since 1997. Trends in these stays are displayed for chronic conditions, for pregnancy, childbirth and newborn infants, and for specific other conditions.

Chronic conditions:

- Chronic conditions were the main reason for 40 percent of all hospitalizations in 1997 and for 37 percent in 2007.

- The number of discharges with principal chronic condition diagnoses remained relatively stable between 1997 and 2007, despite the growth in discharges overall (up 14 percent).

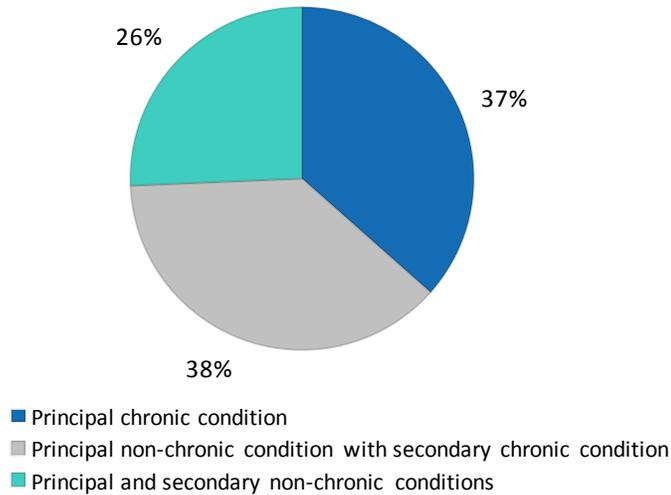
#### Pregnancy, childbirth, and newborn infants:

- Conditions related to pregnancy, childbirth, and newborn infants were by far the most frequent reasons for hospitalization, accounting for 25 percent of discharges (nearly one in four) in 2007.
- There were 5.0 million maternal discharges in 2007, a 16-percent increase since 1997. 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 external female genitals during childbirth, which increased 22 percent between 1997 and 2007.
  - Stays for normal pregnancy declined by 43 percent from 1997 to 2007. More maternal stays in 2007 had a principal diagnosis that indicated some problem in pregnancy or delivery than in 1997.
  - In contrast, the principal diagnosis of previous C-section increased 107 percent between 1997 and 2007.
  - Stays with a principal diagnosis of high blood pressure during pregnancy increased by 28 percent between 1997 and 2007.
  - Stays with a principal diagnosis of umbilical cord complications declined by 15 percent.
- There were 4.7 million infant discharges in 2007, a 21-percent increase since 1997.

#### CCS principal diagnoses:

- The 10 most frequently occurring principal diagnoses outside of pregnancy, childbirth and newborn infants accounted for about one-fifth of all discharges in 2007.
  - Pneumonia (3.0 percent of all discharges) and congestive heart failure (2.6 percent) were the most common principal diagnoses.
  - Two of the 10 most frequent principal diagnoses in 2007 were not among the most frequent diagnoses in 1997, but were added to the list because of their rapid growth. Stays for treatment of osteoarthritis (degenerative joint disease) increased 95 percent over the 1997-2007 period. Similarly, septicemia discharges increased by 63 percent.
- Five circulatory diseases—congestive heart failure, coronary artery disease, non-specific chest pain, irregular heartbeat, and acute myocardial infarction (heart attack)—were among the top 10 most frequent principal diagnoses in 2007.
  - Stays for non-specific chest pain increased 47 percent between 1997 and 2007 while those for irregular heart beat increased 28 percent. Stays for coronary artery disease declined 31 percent and for heart attack by 15 percent. Stays for congestive heart failure changed very little from 1997 to 2007.
- Two conditions were among the top 10 in 1997, but were not among the top 10 conditions in 2007.
  - Hospital stays for acute cerebrovascular disease declined 14 percent. This condition ranked 6th in 1997, but dropped to 15th by 2007.
  - Chronic obstructive pulmonary disease ranked 8th among the most common conditions in 1997. Discharges with this diagnosis increased by 42,000 between 1997 and 2007, but still dropped in rank to 13th.

## Distribution of Discharges by Type of Principal and Secondary Conditions, 2007



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

A chronic condition is defined as a condition that lasts 12 months or longer and limits an individual's self-care, independent living, and social interactions or results in the need for ongoing intervention with medical products, services, and special equipment.<sup>1</sup> More than 40 percent of the non-institutionalized population has at least one chronic condition—a share that has risen over time, particularly in the mid to older age population.<sup>2</sup> The incidence of chronic conditions and the ability to manage these conditions in an outpatient setting will determine the extent to which chronic conditions are the cause or contributing diagnosis for hospital stays.

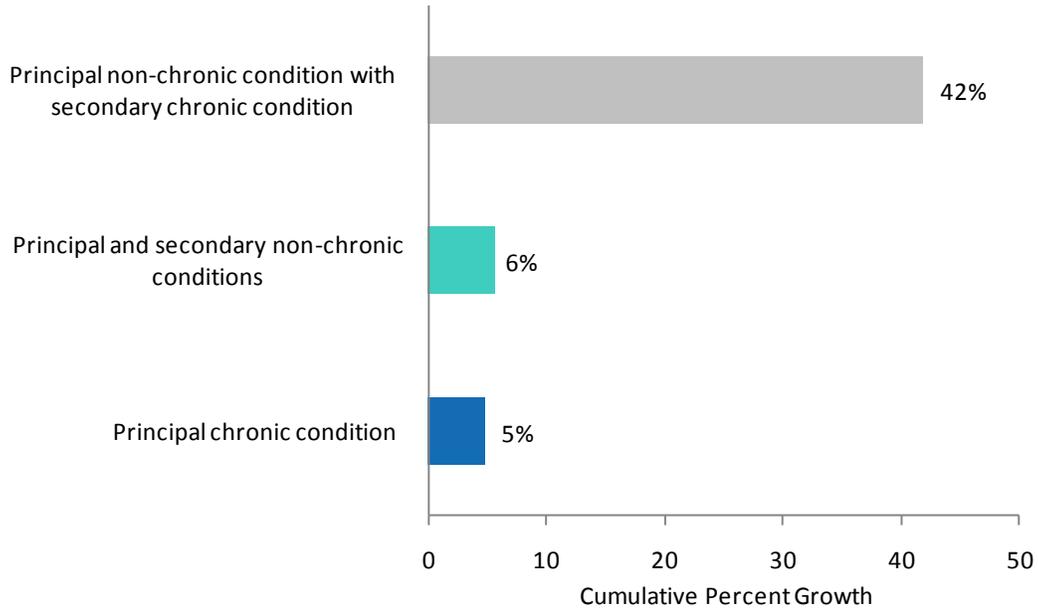
- Chronic conditions<sup>3</sup> were a principal or secondary diagnosis for 74 percent of all hospital stays in 2007.
  - Thirty-seven percent of all discharges had a principal chronic condition.
  - Another 38 percent of all discharges had a secondary chronic condition that could complicate treatment and recovery for an acute condition (the reason for the hospital stay).
- Hospital stays with no mention of a chronic condition on the discharge record accounted for just 26 percent of all stays.

<sup>1</sup> Perrin EC, Newacheck P, Pless IB, Drotar D, Gortmaker SL, Leventhal J, Perrin JM, Stein RE, Walker DK, Weitzman M. Issues Involved in the Definition and Classification of Chronic Health Conditions. *Pediatrics* 91(4):787-793, 1993.

<sup>2</sup> Paez KA, Zhao L, and Hwang W. Rising Out-Of-Pocket Spending For Chronic Conditions: A Ten-Year Trend. *Health Affairs* 28(1): 15-25, 2009.

<sup>3</sup> For more information on the chronic condition tool, see <http://www.hcup-us.ahrq.gov/toolssoftware/chronic/chronic.jsp>.

### Growth of Discharges by Type of Principal and Secondary Conditions, 1997-2007



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

Increasingly in recent years, persons with chronic conditions have difficulty paying for care, which can result in hospitalizations when care is delayed and medicines are not purchased because of concerns about cost.<sup>4</sup>

- Hospital stays for principal non-chronic conditions with a noted secondary chronic condition grew by 42 percent between 1997 and 2007.
- During the same period, hospital stays with a principal chronic condition or with no mention of chronic conditions remained relatively unchanged.
- There are a number of possible reasons why the growth in discharges with secondary chronic conditions is outpacing other discharge types, including increased reporting of secondary chronic conditions and a rise in the incidence of chronic conditions.

<sup>4</sup> Tu H, Cohen G. Financial and health burdens of chronic conditions grow. *Track Report* Apr;(24):1-6, 2009.

## EXHIBIT 2.2 Most Frequent Principal Diagnoses by Age

Number of Discharges, Percent Distribution, and Growth of the Most Frequent Principal CCS Diagnoses for Inpatient Hospital Stays by Age, 1997 and 2007

AGE GROUP AND PRINCIPAL CCS DIAGNOSIS	NUMBER OF DISCHARGES IN THOUSANDS		PERCENT OF AGE-SPECIFIC TOTAL DISCHARGES		CUMULATIVE GROWTH
	1997	2007	1997	2007	1997-2007
<b>All ages, total discharges*</b>	<b>34,679</b>	<b>39,542</b>			<b>14%</b>
<b>&lt; 1 year, total discharges</b>	<b>4,426</b>	<b>5,125</b>	<b>100.0%</b>	<b>100.0%</b>	<b>16</b>
Liveborn (newborn infant)	3,776	4,539	85.3	88.6	20
Acute bronchitis	108	92‡	2.4	1.8	-15
Hemolytic jaundice and perinatal jaundice (infant jaundice following birth)	33	43	0.7	0.8	31
Pneumonia	55	34	1.3	0.7	-39
Short gestation, low birth weight, and fetal growth retardation (premature birth and low birth weight)	22	25‡	0.5	0.5	12
<b>1-17 years, total discharges</b>	<b>1,821</b>	<b>1,658‡</b>	<b>100.0</b>	<b>100.0</b>	<b>-9</b>
Asthma	159	114	8.7	6.9	-28
Pneumonia	135	109	7.4	6.6	-19
Mood disorders (depression and bipolar disorder)	64	81‡	3.5	4.9	27
Appendicitis and other appendiceal conditions	65	78	3.6	4.7	20
Fluid and electrolyte disorders (primarily dehydration or fluid overload)	64	61‡	3.5	3.7	-5
<b>18-44 years, total discharges</b>	<b>9,444</b>	<b>10,354</b>	<b>100.0</b>	<b>100.0</b>	<b>10</b>
Trauma to external female genitals (vulva) and area between anus and vagina (perineum) due to childbirth	676	833	7.2	8.0	23
Previous C-section	270	558	2.9	5.4	107
Mood disorders (depression and bipolar disorder)	335	386‡	3.5	3.7	15
Normal pregnancy and/or delivery	511	299	5.4	2.9	-41
Prolonged pregnancy	§	264	§	2.6	§
<b>45-64 years, total discharges</b>	<b>6,496</b>	<b>9,135</b>	<b>100.0</b>	<b>100.0</b>	<b>41</b>
Coronary atherosclerosis (coronary artery disease)	526	405	8.1	4.4	-23
Non-specific chest pain	242	381	3.7	4.2	57
Osteoarthritis (degenerative joint disease)	105	323	1.6	3.5	206
Disorders of intervertebral discs and bones in spinal column (back problems)	190	269	2.9	2.9	42
Pneumonia	199	261	3.1	2.9	31
<b>65-84 years, total discharges</b>	<b>10,121</b>	<b>10,277‡</b>	<b>100.0</b>	<b>100.0</b>	<b>2</b>
Congestive heart failure	581	515	5.7	5.0	-11
Coronary atherosclerosis (coronary artery disease)	741	466	7.3	4.5	-37
Pneumonia	514	465	5.1	4.5	-9
Osteoarthritis (degenerative joint disease)	281	442	2.8	4.3	57
Cardiac dysrhythmias (irregular heart beat)	333	379	3.3	3.7	14
<b>85+ years, total discharges</b>	<b>2,362</b>	<b>2,953</b>	<b>100.0</b>	<b>100.0</b>	<b>25</b>
Congestive heart failure	202	234	8.6	7.9	16
Pneumonia	197	193‡	8.3	6.5	-2
Septicemia (blood infection)	76	126	3.2	4.3	64
Urinary tract infections	75	118	3.2	4.0	58
Fracture of neck of femur (hip fracture)	125	117‡	5.3	4.0	-6

\* Includes a small number of discharges (less than 41,000 or 0.1 percent) with missing age.

‡ 2007 discharges are not statistically different from 1997 discharges at  $p < 0.05$ .

§ Consistent data are not available for this diagnosis due to coding changes that took place between 1997 and 2007.

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

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 newborns:
  - In 2007, most discharges for children under one year old (89 percent) were for liveborn infants, which increased 20 percent between 1997 and 2007.
  - Bronchitis accounted for another 1.8 percent and jaundice for another 0.8 percent of infant stays. Jaundice stays in infants increased 31 percent between 1997 and 2007.
  - Among 18-44 year olds, previous C-sections more than doubled between 1997 and 2007, while normal pregnancy and/or delivery fell 41 percent.
- Asthma among children 1-17 declined by 28 percent between 1997 and 2007.
- Appendicitis, also a common reason for hospital stays for children 1-17 in 2007, accounted for 5 percent of discharges in this age group, increasing 20 percent between 1997 and 2007.
- Depression and bipolar disorders (mood disorders) were the 3rd most common diagnoses for children 1–17 and adults 18–44.

#### Older adults:

- Cardiovascular conditions were the most common diagnoses for adults over 44 years old. However, specific diagnoses differed somewhat between age groups for older adults:
  - Coronary atherosclerosis (coronary artery disease) accounted for 4 percent of all discharges for adults 45-64; these stays declined by 23 percent between 1997 and 2007. This condition also ranked 2nd for 65-84 year olds (4.5 percent of stays in 2007), with stays declining 37 percent between 1997 and 2007.
  - Hospitalizations for non-specific chest pain in 45-64 year olds increased 57 percent between 1997 and 2007 and comprised 4 percent of stays in 2007.
  - Congestive heart failure (CHF) was the most common condition for adults 65-84 and 85 and older. In 2007, CHF accounted for 5 percent of all stays among adults 65-84 and 8 percent of all stays among adults 85 and older.
  - Irregular heart beat was the reason for 379,000 hospitalizations (3.7 percent) in 2007 among 65-84 year olds, an increase of 14 percent since 1997.
- Among adults 85 and older, hospitalizations for septicemia (up 64 percent) and urinary tract infections (up 58 percent) increased at more than twice the rate of all hospitalizations for this age group between 1997 and 2007.
- Musculoskeletal conditions:
  - Degenerative joint disease (osteoarthritis) more than tripled among adults 45-64 and increased 57 percent among adults 65-84.
  - Back problems increased 42 percent for 45-64 year olds between 1997 and 2007.
  - Hospital stays for hip fractures changed very little between 1997 and 2007 for patients 85 and older.

#### 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 adults 45-64 years (31 percent), but fell among adults 65-84 years (down 9 percent).
  - Stays remained relatively stable for adults 85 years and older.

## EXHIBIT 2.3 Most Frequent Principal Diagnoses by Gender

**Number of Discharges, Percent Distribution, Rank and Growth of the Most Frequent Principal CCS Diagnoses for Inpatient Hospital Stays by Gender, 2007**

PRINCIPAL CCS DIAGNOSIS	NUMBER OF DISCHARGES IN THOUSANDS		PERCENT OF GENDER-SPECIFIC DISCHARGES		MALE PERCENT OF DIAGNOSIS-SPECIFIC DISCHARGES	CUMULATIVE GROWTH 1997-2007	
	MALES	FEMALES	MALES	FEMALES		MALES	FEMALES
All diagnoses*	16,231	23,203	100.0%	100.0%	41.0%	14%	13%
Chronic conditions <sup>†</sup>	6,914	7,501	42.6	32.3	47.9	5	4
Pregnancy and childbirth		5,022		21.6	0.0		16
Liveborn (newborn infant)	2,322	2,212‡	14.3	9.5	51.2	20	20
Coronary atherosclerosis (coronary artery disease)	601	362	3.7	1.6	62.4	-28	-37
Pneumonia	562	608	3.5	2.6	48.0	-6	-4
Congestive heart failure	500	524‡	3.1	2.3	48.8	11	-3
Acute myocardial infarction (heart attack)	373	252	2.3	1.1	59.6	-16	-13
Cardiac dysrhythmias (irregular heart beat)	360	370‡	2.2	1.6	49.3	31	25
Non-specific chest pain	352	435	2.2	1.9	44.7	43	50
Mood disorders (depression and bipolar disorder)	330	442	2.0	1.9	42.7	32	13
Septicemia (blood infection)	322	354	2.0	1.5	47.6	77	53
Skin and subcutaneous tissue infections	320	282	2.0	1.2	53.1	90	75
Osteoarthritis (degenerative joint disease)	314	498	1.9	2.1	38.7	96	94
Urinary tract infections	152	383	0.9	1.7	28.4	30	32

\* Excludes a small number of discharges (108,000 or 0.3 percent) with missing gender.

† Includes the number of discharges with a principal diagnosis that is considered to be a chronic condition.

‡ 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 2007.

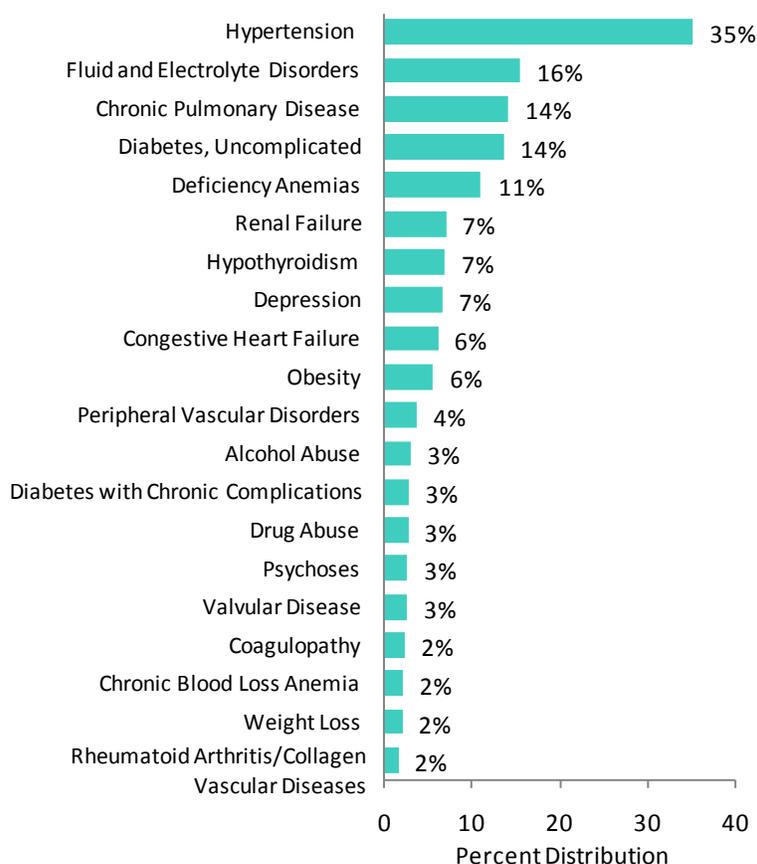
This exhibit shows the top 10 conditions for men and women in the hospital in addition to conditions related to childbirth and newborn infants. Most diagnoses are common to both males and females, if those related to childbirth are excluded. However, some diagnoses were more frequent in one gender, in part because of differences between males and females in health-seeking behaviors and attitudes.

- Females accounted for almost 6 out of every 10 hospital stays—23.2 million stays in 2007. About 22 percent of all female hospitalizations were related to pregnancy and childbirth.
- Males accounted for 16.2 million hospitalizations in 2007.
- Five heart-related diagnoses—coronary artery disease, congestive heart failure, heart attacks, cardiac dysrhythmias, and non-specific chest pain—were among the ten most common principal diagnoses for both male and female hospitalizations.
  - Males accounted for 62 percent of hospital stays for coronary artery disease and 60 percent of stays for heart attack. Hospitalizations for these conditions decreased for both males (coronary artery disease by 28 percent and heart attacks by 16 percent) and females (coronary artery disease by 37 percent and heart attacks by 13 percent) between 1997 and 2007.

- The number of hospital stays for irregular heart beat (360,000 stays for males and 370,000 for females) and congestive heart failure (500,000 stays for males and 524,000 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 2007 than did men (442,000 female discharges versus 330,000 male discharges). The number of stays for mood disorders grew by 32 percent for men and by 13 percent for women between 1997 and 2007.
- Infections such as septicemia, skin and subcutaneous tissue infection, and urinary tract infection were common reasons for hospital stays among both men and women in 2007 and grew rapidly for both genders between 1997 and 2007.
  - Stays for septicemia rose 77 percent among men and 53 percent among women. In 2007, 2 percent of male hospital stays and 1.5 percent of female hospital stays were due to septicemia.
  - The number of stays for skin and subcutaneous tissue infections increased 90 percent for men and 75 percent for women. This condition accounted for 2 percent of male hospitalizations and 1.2 percent of female hospitalizations in 2007.
  - Growth was similar in stays for urinary tract infections for women (32 percent) and men (30 percent). In 2007, this condition was responsible for 1.7 percent of hospitalizations among women and 0.9 percent among men.
- Degenerative joint disease caused many more hospitalizations for females (498,000 discharges) than for males (314,000 discharges) in 2007. Over 61 percent of all discharges with this condition were for females. Hospital stays for degenerative joint disease grew at close to 100 percent for both males and females between 1997 and 2007.

## EXHIBIT 2.4 Most Frequent Comorbidities

**Top Comorbidities and Percent of Discharges with Specific Comorbidity,\* 2007**



\*Comorbidities are based on a classification of ICD-9-CM codes which is distinct from the Clinical Classification System.

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

Comorbidities<sup>5</sup> are chronic disorders that are not the primary reason for hospitalization, but which may influence the course of hospitalization.

- Hypertension was a comorbidity in 35 percent of all hospital stays in 2007.
- Fluid and electrolyte disorders were comorbidities in 16 percent of hospital stays.
- Mental health conditions were among the top comorbidities in 2007, occurring singly or in combination with other mental health conditions. Depression occurred as a comorbid condition in 7 percent of stays in 2007 and alcohol abuse, drug abuse, and/or psychoses were each present in 3 percent of stays.

<sup>5</sup> Comorbidities are different from secondary conditions, as secondary conditions may be directly related to the principal reason for hospitalization while comorbidities are not. For example, retinopathy may be a secondary condition in a hospital stay in which the principal diagnosis is diabetes. However, retinopathy would not be considered a comorbidity of diabetes, as it is a related condition.

- Diabetes, both uncomplicated and with chronic complications, were comorbidities in 17 percent of all stays.
- Other notable comorbidities included chronic pulmonary disease, anemia, renal failure, hypothyroidism, congestive heart failure, and obesity.

## SECTION 3 INPATIENT HOSPITAL STAYS BY PROCEDURE

<b>EXHIBIT 3.1</b>	<b>Most Frequent All-listed Procedures .....</b>	<b>30</b>
<b>EXHIBIT 3.2</b>	<b>Most Frequent All-listed Procedures by Age .....</b>	<b>34</b>
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### HIGHLIGHTS

- During almost two out of every three hospital stays in 2007, at least one procedure was performed.
- Six of the top procedures in 2007 were associated with giving birth or newborns.
  - C-section was the most frequent major operating room procedure—performed on 1.5 million women in 2007. Growth in C-sections, up 85 percent between 1997 and 2007, outpaced increases in most other frequently performed maternal procedures and was among the fastest growing procedures for women 18-44 years old.
  - The use of artificial rupture of membrane to assist delivery increased by 56 percent.
  - Episiotomies declined at a faster rate (56 percent from 1997 to 2007) than any of the most frequent procedures.
- Blood transfusions occurred in one out of every 10 hospital stays that included a procedure. There were 1.1 million stays with this procedure in 1997 and 2.6 million in 2007, for a cumulative growth of 140 percent.
  - Blood transfusion was one of the fastest growing top five procedures across many age groups: 72-percent increase for 1-17 year olds, 187-percent increase for 45-64 year olds, 127-percent increase for 65-84 year olds, and 156-percent increase for patients 85 years and older.
- Discharges for respiratory intubation rose steadily, increasing 48 percent over the 1997-2007 period.
  - Respiratory intubation almost doubled in the 45-64 age group and was up 24 percent for infants, 31 percent for 65-84 year olds, and 66 percent for persons 85 and older.
- From 1997 to 2007, arthroplasty of the knee increased by 86 percent.
- Hemodialysis procedures for renal failure grew by 66 percent.
- The use of tube feeding during infant hospitalizations increased 219 percent, compared with a 16-percent growth in all infant discharges.
- Diagnostic cardiac catheterization was performed on 890,000 males and 581,000 females in 2007 and ranked as the 2nd most frequent procedure in men and the 4th most frequent procedure in women.
- PTCA's were performed on 477,000 males and 244,000 females and ranked as the 5th most common procedure for men and the 16th most common for women.
- Males also received more respiratory intubation and mechanical ventilation procedures—727,000 for men compared with 631,000 for women. The procedure ranked 3rd for both genders.
- For alcohol and drug rehabilitation/detoxification, there were more discharges for males (261,000 procedures) than for females (118,000 procedures). Alcohol and drug rehabilitation/detoxification ranked 9th for males and 35th for females.
- Females received blood transfusions, upper gastrointestinal endoscopy, colonoscopy and biopsy, and arthroplasty of the knee more often than males.
- Hysterectomy (removal of the uterus) and oophorectomy (removal of an ovary or ovaries) were the 5th and 6th most common procedures for females.

## 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 2007

ALL-LISTED CCS PROCEDURES	NUMBER OF STAYS WITH THE PROCEDURE IN THOUSANDS		PERCENT OF DISCHARGES WITH THE PROCEDURE		RANK		CUMULATIVE GROWTH 1997-2007
	1997	2007	1997	2007	1997	2007	
All discharges (with and without procedures)	34,679	39,542					14%
All discharges with any procedure	21,257	25,286	100.0%	100.0%			19
Percent of all discharges with a procedure	61%	64%					
Maternal and newborn procedures	8,233	9,760	38.7	38.6			19
Prophylactic vaccinations and inoculations	567	1,638	3.0	6.5	14	2	189
Cesarean section (C-section)	800	1,482	4.0	5.9	9	3	85
Repair of obstetric laceration	1,137	1,448	5.0	5.7	3	5	27
Circumcision	1,164	1,302‡	5.0	5.2	2	7	12
Fetal monitoring	1,002	1,257‡	5.0	5.0	6	8	25
Artificial rupture of membranes to assist delivery	747	1,169	4.0	4.6	10	10	56
Episiotomy (surgical incision into the perineum and vagina to prevent traumatic tearing during delivery)	866	380	4.0	1.5	8	26	-56
All other procedures	13,024	15,525	61.3	61.4			19
Blood transfusion	1,097	2,629	5.0	10.4	5	1	140
Diagnostic cardiac catheterization, coronary arteriography (diagnostic procedure to explore the functioning of the heart)	1,461	1,471‡	7.0	5.8	1	4	1
Respiratory intubation and mechanical ventilation	919	1,359	4.0	5.4	7	6	48
Upper gastrointestinal endoscopy (procedure to view and biopsy the esophagus, stomach and first portion of intestine through a lighted tube)	1,105	1,191	5.0	4.7	4	9	8
Hemodialysis (dialysis, cleaning the blood by means of a machine or filter to compensate for poor kidney function)	473	786	2.2	3.1	17	11	66
Echocardiogram (diagnostic ultrasound of heart)	632	739‡	3.0	2.9	11	12	17
PTCA (percutaneous transluminal coronary angioplasty, procedure involving use of a balloon-tipped catheter to enlarge a narrowed artery)	581	722	2.7	2.9	13	13	24
Arthroplasty knee	329	611	1.5	2.4	32	14	86
Colonoscopy and biopsy	531	582	2.5	2.3	16	15	10

‡ 2007 discharges are not statistically different from 1997 discharges at p<0.05.

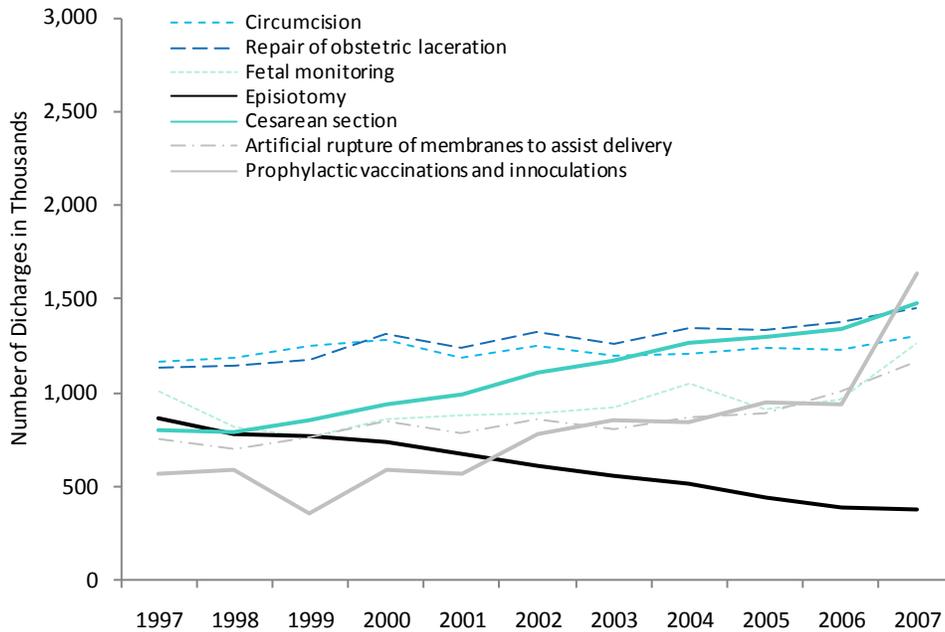
Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 1997 and 2007.

During almost two out of every three hospital stays in 2007, at least one procedure was performed, and this proportion increased slightly since 1997. The number of discharges with procedures increased from 21.3 million in 1997 to 25.3 million in 2007, a 19-percent increase.

- The top all-listed procedures performed in 2007 were performed in 2 to 10 percent of all stays. In many stays, more than one procedure was performed.
  - Blood transfusions occurred in one out of every 10 hospital stays that included a procedure and were the most frequently performed procedures in 2007.

- While many of the top 15 most frequent procedures in 2007 were also on the list in 1997, there were some notable exceptions:
  - Vaccinations were added to the list of top procedures, rising in rank from 14th in 1997 to 2nd in 2007. These vaccinations were overwhelmingly hepatitis B immunizations for newborns.
  - Episiotomy fell from the list of top procedures, dropping in rank from 8th in 1997 to 26th in 2007.
  - Discharges with arthroplasty of the knee procedures have steadily risen from 0.3 million in 1997 to 0.6 million in 2007, rising in rank from the 32nd to the 14th most common procedure.
  - Hemodialysis and colonoscopy and biopsy have risen over the 1997-2007 period and are now ranked in the top 15 procedures performed in hospitals.
- C-section was the most frequent major operating room procedure—performed on 1.5 million women in 2007.

**Number of Stays with the Most Frequent All-listed CCS Maternal and Newborn Procedures, 1997-2007**



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

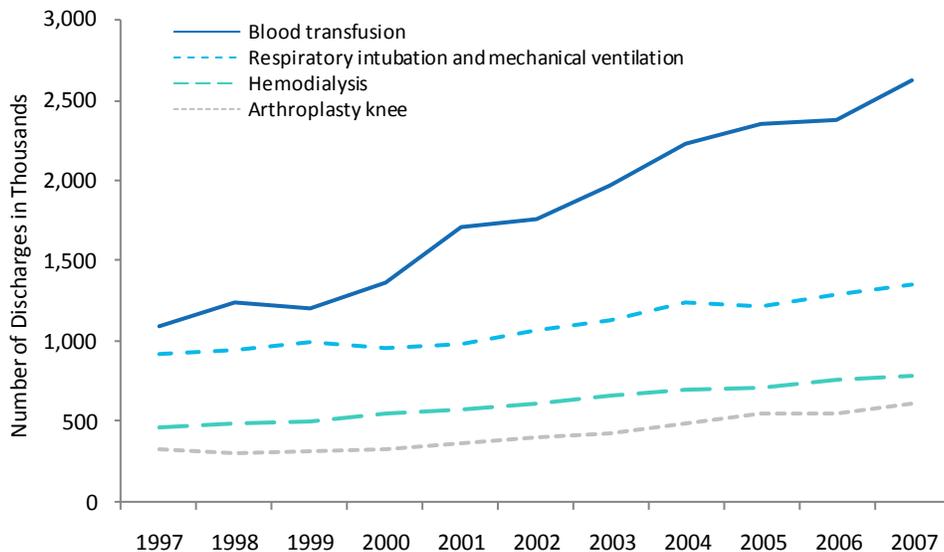
Six of the top procedures in 2007 were associated with giving birth or newborns.

- Maternal stays:
  - Growth in C-sections, up 85 percent between 1997 and 2007, outpaced increases in most other frequently performed maternal procedures.
  - Hospital stays with artificial rupture of membrane to assist delivery increased by 56 percent.
  - Exhibiting the opposite trend, hospital stays in which episiotomies were performed declined at a faster rate than any of the most frequent procedures—by 56 percent from 1997 to 2007. Episiotomies are performed to assist or speed delivery and/or prevent trauma to the mother. They

were performed fairly routinely, but lack of clinical evidence of benefits and some indication of increased injury from the procedure has led to decline in the use of the procedure.<sup>6</sup>

- Possibly as a result of the decrease in episiotomies, repair of current obstetric laceration increased by 27 percent, occurring in 310,000 more discharges in 2007 than in 1997. This compares with a decline of 486,000 discharges in which episiotomies were performed over the same period.
- Newborn stays:
  - Vaccinations were the second most frequent procedure for all discharge types as well as the fastest growing of the most common procedures performed during a newborn hospital stay. This procedure was performed during 1.6 million stays in 2007 and increased 189 percent between 1997 and 2007.
  - There has been little change in the number of discharges for circumcision or fetal monitoring since 1997.

**Number of Stays with the Most Frequent and Rapidly Growing All-listed CCS Procedures (Excluding Maternal and Newborn Stays), 1997-2007**



Note: Graph includes only those most frequent procedures (excluding maternal and newborn stays) with significant increases in discharges.

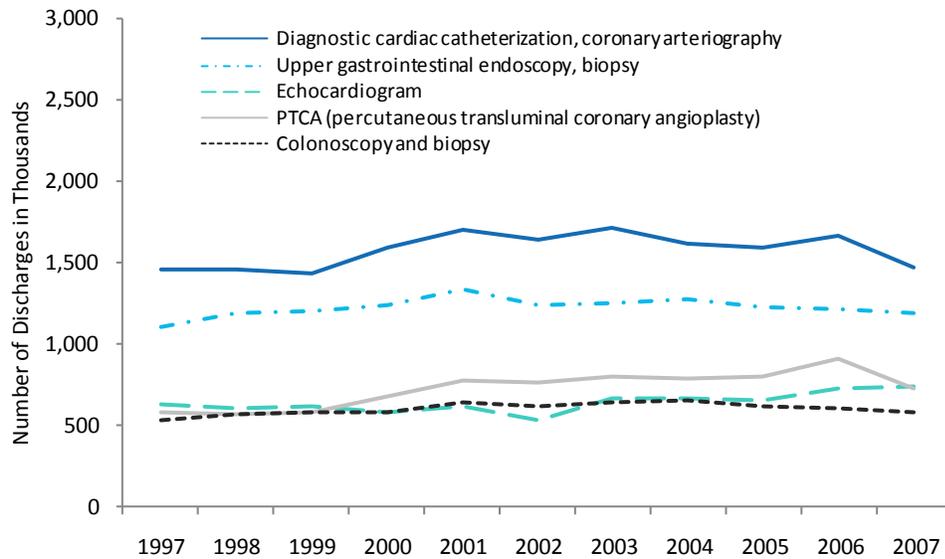
Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 1997-2007.

Other frequent procedures that were not related to giving birth or being born also grew rapidly.

- Discharges with blood transfusions more than doubled between 1997 and 2007. There were 1.1 million stays with this procedure in 1997 and 2.6 million in 2007, for a cumulative growth of 140 percent.
- Discharges for respiratory intubation rose steadily, increasing 48 percent over the 1997-2007 period.
- From 1997 to 2007, arthroplasty of the knee increased by 86 percent and hemodialysis procedures by 66 percent.

<sup>6</sup> Hartmann K, Viswanathan M, Palmieri R, Gartlehner G, Thorp J, Lohr K. Outcomes of Routine Episiotomy: A Systematic Review. *JAMA* 293:2141-2148, 2005.

**Number of Stays with the Most Frequent and Stable All-listed CCS Procedures (Excluding Maternal and Newborn Stays), 1997-2007**



Note: Graph includes only those most frequent procedures (excluding maternal and newborn stays) with relatively slow growth in discharges.  
 Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 1997-2007.

Some of the most frequent non-maternal, non-newborn procedures increased more slowly between 1997 and 2007.

- Three of the five frequent inpatient procedures with slower growth between 1997 and 2007 were cardiac procedures.
  - Procedures for PTCA (percutaneous transluminal coronary angioplasty—a procedure involving the use of a balloon-tipped catheter to enlarge a narrowed artery) grew 56 percent from 1997-2006. Between 2006 and 2007, however, there was a 20-percent decline in discharges with this procedure.
  - After growing 17 percent from 1997-2003, inpatient discharges with diagnostic catheterization and coronary arteriography declined 14 percent from 2003-2007, resulting in almost no change (1 percent) from 1997 to 2007.
  - The use of inpatient echocardiograms changed little between 1997 and 2007.
- Inpatient upper gastrointestinal endoscopy and biopsy procedures increased 8 percent between 1997 and 2007. This overall growth masks a 20-percent increase in the use of this procedure between 1997 and 2001, followed by a decrease between 2001 and 2007 of 11 percent.
- Inpatient colonoscopy and biopsy grew slowly—only 10 percent over the period.

## 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 2007

AGE GROUP AND ALL-LISTED CCS PROCEDURES	NUMBER OF DISCHARGES IN THOUSANDS		PERCENT OF AGE-SPECIFIC TOTAL DISCHARGES		CUMULATIVE GROWTH
	1997	2007	1997	2007	1997-2007
All ages, total discharges <sup>†</sup>	34,679	39,542			14%
<b>&lt; 1 year, total discharges</b>	<b>4,426</b>	<b>5,125</b>	<b>100.0%</b>	<b>100.0%</b>	<b>16</b>
Prophylactic vaccinations and inoculations	549	1,461	12.4	28.5	166
Circumcision	1,159	1,299‡	26.2	25.3	12
Ophthalmologic and otologic diagnosis and treatment (vision and hearing diagnosis and treatment)	*	532	*	10.4	*
Respiratory intubation and mechanical ventilation	163	202	3.7	3.9	24
Enteral and parenteral nutrition	39	124	0.9	2.4	219
<b>1-17 years, total discharges</b>	<b>1,821</b>	<b>1,658‡</b>	<b>100.0</b>	<b>100.0</b>	<b>-9</b>
Appendectomy (removal of appendix)	74	82‡	4.1	4.9	10
Repair of obstetric laceration	58	60‡	3.2	3.6	3
Blood transfusion	26	45	1.4	2.7	72
Cancer chemotherapy	43	44‡	2.4	2.7	3
Artificial rupture of membranes to assist delivery	40	44‡	2.2	2.7	10
<b>18-44 years, total discharges</b>	<b>9,444</b>	<b>10,354</b>	<b>100.0</b>	<b>100.0</b>	<b>10</b>
Cesarean section (C-section)	773	1,443	8.2	13.9	87
Repair of obstetric laceration	1,079	1,386	11.4	13.4	28
Fetal monitoring	952	1,211‡	10.1	11.7	27
Artificial rupture of membranes to assist delivery	706	1,123	7.5	10.9	59
Episiotomy (surgical incision into the perineum and vagina to prevent traumatic tearing during delivery)	813	358	8.6	3.5	-56

(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 2007--continued**

AGE GROUP AND ALL-LISTED CCS PROCEDURES	NUMBER OF DISCHARGES IN THOUSANDS		PERCENT OF AGE-SPECIFIC TOTAL DISCHARGES		CUMULATIVE GROWTH
	1997	2007	1997	2007	1997-2007
<b>45-64 years, total discharges</b>	<b>6,496</b>	<b>9,135</b>	<b>100.0%</b>	<b>100.0%</b>	<b>41%</b>
Blood transfusion	247	708	3.8	7.8	187
Diagnostic cardiac catheterization, coronary arteriography (diagnostic procedure to explore the functioning of the heart)	578	641†	8.9	7.0	11
Respiratory intubation and mechanical ventilation	186	370	2.9	4.1	99
Upper gastrointestinal endoscopy (procedure to view and biopsy the esophagus, stomach and first portion of intestine through a lighted tube)	275	369	4.2	4.0	34
PTCA (percutaneous transluminal coronary angioplasty, procedure involving use of a balloon-tipped catheter to enlarge a narrowed artery)	247	320	3.8	3.5	30
<b>65-84 years, total discharges</b>	<b>10,121</b>	<b>10,277†</b>	<b>100.0</b>	<b>100.0</b>	<b>2</b>
Blood transfusion	514	1,166	5.1	11.3	127
Diagnostic cardiac catheterization, coronary arteriography (diagnostic procedure to explore the functioning of the heart)	738	656†	7.3	6.4	-11
Upper gastrointestinal endoscopy (procedure to view and biopsy the esophagus, stomach and first portion of intestine through a lighted tube)	530	491	5.2	4.8	-7
Respiratory intubation and mechanical ventilation	366	479	3.6	4.7	31
PTCA (percutaneous transluminal coronary angioplasty, procedure involving use of a balloon-tipped catheter to enlarge a narrowed artery)	286	332†	2.8	3.2	16
<b>85+ years, total discharges</b>	<b>2,362</b>	<b>2,953</b>	<b>100.0</b>	<b>100.0</b>	<b>25</b>
Blood transfusion	138	354	5.8	12.0	156
Upper gastrointestinal endoscopy (procedure to view and biopsy the esophagus, stomach and first portion of intestine through a lighted tube)	122	134	5.2	4.5	10
Respiratory intubation and mechanical ventilation	65	108	2.8	3.7	66
Treatment, fracture or dislocation of hip and femur	87	84†	3.7	2.8	-3
Echocardiogram (diagnostic ultrasound of heart)	65	79†	2.7	2.7	23

† Includes a small number of discharges (less than 41,000 or 0.1 percent) with missing age.

‡ 2007 discharges are not statistically different from 1997 discharges at p<0.05.

\* Statistics based on estimates with a relative standard error (standard error/weighted estimate) greater than 0.30 or with standard error equal to 0 in the nationwide statistics are not reliable.

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

While some of the most frequent procedures tended to vary by age group, some were common in 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 2007: 72-percent increase for 1-17 year olds, 187-percent increase for 45-64 year olds, 127-percent increase for 65-84 year olds, and 156-percent increase for patients 85 years and older.
- Procedures for respiratory intubation/mechanical ventilation were common among four of the age groups (infants, adults 45-64 and 65-84 years old, and seniors 85 years and older) and represented 4 to 5 percent of discharges in each age group.
  - Respiratory intubation grew rapidly from 1997 to 2007. It almost doubled in the 45-64 age group and was up 24 percent for infants, 31 percent for 65-84 year olds, and 66 percent for 85 and older.
- Upper GI endoscopy was common among 45-64 year olds and both senior age groups (65-84 and 85 years and older). From 1997 to 2007, the number of discharges grew for 45-64 year olds (34 percent) and patients 85 years and older (10 percent). For 65-84 year olds, however, the number of discharges decreased by 7 percent.
- Diagnostic cardiac catheterization and coronary arteriography were common for 45-64 year olds (641,000 procedures) and 65-84 year olds (656,000 procedures). Growth in these procedures was insignificant, consistent with the negligible growth (1 percent) in this procedure for all ages (Exhibit 3.1).
- The fifth most frequent procedure for patients 45-64 and 65-84 was PTCA, a procedure that uses a balloon-tipped catheter to enlarge a narrowed artery. This procedure was performed during 320,000 stays for 45-64 year olds and 332,000 stays for 65-84 year olds in 2007.

For infants:

- The most common procedures performed on infants were routine procedures, such as circumcision (performed in 25.3 percent of infant stays), vaccinations (performed in 28.5 percent of infant stays), and vision and hearing diagnosis and treatment (performed in 10.4 percent of infant stays).
  - In 2007, 1.3 million circumcisions were completed in the hospital.
  - Procedures on infants also included those done for complex conditions affecting severely ill babies, such as enteral/parenteral nutrition, or tube feeding (performed during 124,000 infant stays in 2007).
  - The use of tube feeding during infant hospitalizations increased 219 percent, compared with a 16-percent growth in all infant discharges.

For children 1-17:

- Overall, hospitalizations for children declined 9 percent between 1997 and 2007.
- Appendectomy was the most common procedure for children 1-17 years old, 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. These procedures each occurred in over 13 percent of all discharges for this age group, up from 8.2 percent for C-sections and 11.4 percent for obstetric lacerations in 1997.
  - C-sections increased by 87 percent from 1997 to 2007, among the fastest-growing of the top five procedures for young adults.
  - Episiotomy, a surgical incision to prevent traumatic tearing during vaginal delivery, was the fifth most frequently occurring procedure in this age group. However, the number of these procedures performed has decreased by 56 percent between 1997 and 2007.
  - Other common procedures experienced growth between 1997 and 2007, including artificial rupture of membranes to assist delivery (up 59 percent) and fetal monitoring (up 27 percent).

For adults 45-64 and 65-84:

- In 2007, the five most frequently performed procedures were the same for individuals 45-64 and 65-84 years old. These procedures were blood transfusions, diagnostic cardiac catheterization and coronary arteriography, respiratory intubation and mechanical ventilation, upper GI endoscopy, and PTCA discussed earlier in this section.
  - Blood transfusion was the leading procedure for 45-64 year olds and 65-84 year olds. Discharges with this procedure have more than doubled for each age group between 1997 and 2007.
  - Diagnostic cardiac catheterization and coronary arteriography was the second most common procedure performed and accounted for 7.0 and 6.4 percent of the hospital stays 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 and echocardiograms were among the top procedures performed during a hospital stay that appeared only in this age group.
  - Discharges for treatment of a hip fracture or dislocation changed very little (-3 percent) from 1997 to 2007.
  - Similarly, the number of echocardiograms performed in 2007 (79,000) was not very different from the number performed in 1997 (65,000).
- Twelve percent of all hospital stays for this age group involved blood transfusions, the largest share for any age group.

## 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, 2007**

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 <sup>†</sup>	9,233	8,413	100.0%	100.0%		
Blood transfusion	1,136	1,491	12.3	17.7	1	1
Diagnostic cardiac catheterization, coronary arteriography (diagnostic procedure to explore the functioning of the heart)	890	581	9.6	6.9	2	4
Respiratory intubation and mechanical ventilation	727	631	7.9	7.5	3	3
Upper gastrointestinal endoscopy (procedure to view and biopsy the esophagus, stomach and first portion of intestine through a lighted tube)	543	647	5.9	7.7	4	2
PTCA (percutaneous transluminal coronary angioplasty, procedure involving use of a balloon-tipped catheter to enlarge a narrowed artery)	477	244	5.2	2.9	5	16
Hemodialysis (dialysis, cleaning the blood by means of a machine or filter to compensate for poor kidney function)	407	378 <sup>‡</sup>	4.4	4.5	6	8
Echocardiogram (diagnostic ultrasound of heart)	385	355 <sup>‡</sup>	4.2	4.2	7	9
Enteral and parenteral nutrition	282	280 <sup>‡</sup>	3.1	3.3	8	14
Alcohol and drug rehabilitation/detoxification	261	118	2.8	1.4	9	35
Colonoscopy and biopsy	243	338	2.6	4.0	10	11
Arthroplasty knee	226	384	2.4	4.6	13	7
Hysterectomy (removal of the uterus)	–	538	–	6.4	–	5
Oophorectomy, unilateral and bilateral (removal of an ovary or ovaries)	–	390	–	4.6	–	6

<sup>†</sup>Excludes procedures related to pregnancy and childbirth and a small number of discharges (less than 108,000 or 0.3 percent) with missing gender.

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

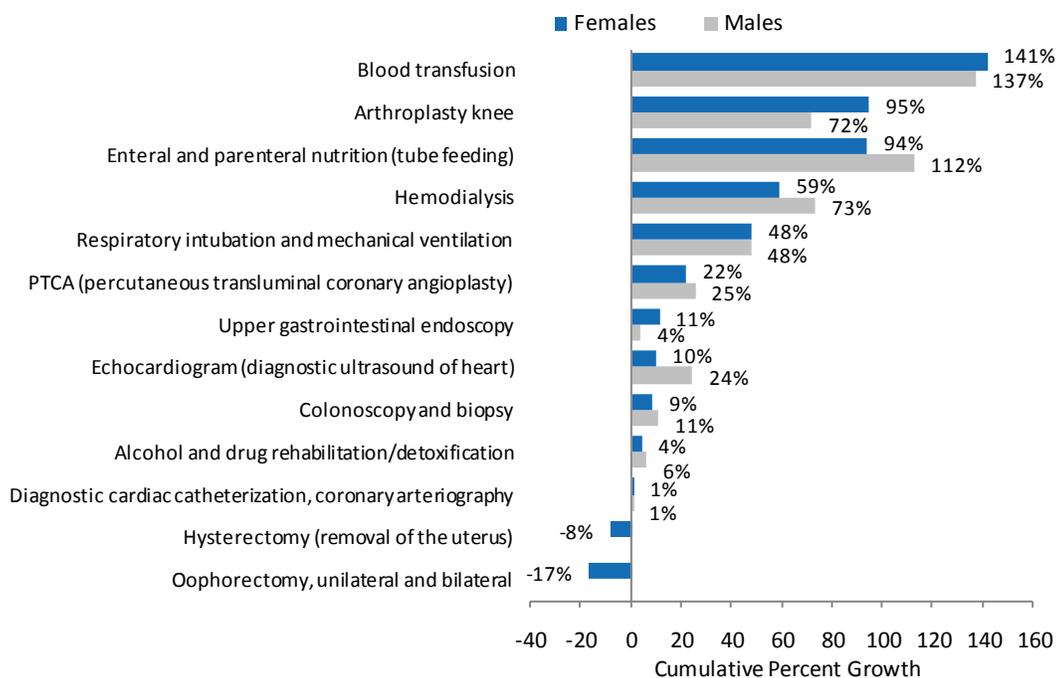
Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 1997 and 2007.

When procedures related to childbirth and newborns are excluded, males and females receive similar procedures.

- Blood transfusions were the most common procedure for both genders when childbirth and newborn procedures are excluded. Transfusions occurred in 12.3 percent of all procedure-related stays for males and 17.7 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 on males than females. Diagnostic cardiac catheterization was performed on 0.9 million males and 0.6 million females in 2007 and ranked as the 2nd most frequent procedure in men and the 4th most frequent procedure in women.
  - PTCAs were performed on 0.5 million males and 0.2 million females and ranked as the 5th most common procedure for men and the 16th most common for women.
  - Males also received more respiratory intubation and mechanical ventilation procedures—727,000 for men compared with 631,000 for women. The procedure ranked 3rd for both genders.

- For alcohol and drug rehabilitation/detoxification, there were more discharges for males (261,000 procedures) than for females (118,000 procedures). Alcohol and drug rehabilitation/detoxification ranked 9th for males and 35th for females.
- Females received blood transfusions, upper gastrointestinal endoscopy, colonoscopy and biopsy, and arthroplasty of the knee more often than males.
- For all other top ranking procedures (hemodialysis, echocardiograms, and enteral and parenteral nutrition), there was little difference between males and females in the volume of procedures performed.
- Hysterectomy (removal of the uterus) and oophorectomy (removal of an ovary or ovaries) were the 5th and 6th most common procedures for females.

### Growth of the Most Frequent All-listed Procedures for Females and Males, 1997-2007



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

From 1997 to 2007, 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 at 141 percent for females and 137 percent for males.
- Other rapidly growing procedures for both females and males were arthroplasty of the knee (95 percent increase for females, 72 percent increase for males), tube feeding (94 percent increase for females, 112 percent increase for males), hemodialysis (59 percent increase for females, 73 percent for males) and respiratory intubation and mechanical ventilation (48 percent increase for both females and males).

- Other procedures, including colonoscopy and alcohol and drug rehabilitation/detoxification increased more slowly—by 11 percent or less for both females and males.
- Although hysterectomies and oophorectomies increased during the 6-year period from 1997-2002, these female-specific procedures declined in subsequent years. Over the 1997 to 2007 period, hysterectomies decreased by 8 percent and oophorectomies by 17 percent.

## SECTION 4 COSTS FOR INPATIENT HOSPITAL STAYS

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### HIGHLIGHTS

- Inflation-adjusted aggregate costs for hospital stays rose from \$222.4 billion in 1997 to \$343.9 billion in 2007 — an increase of 55 percent.
- The most important driver of cost increases was greater intensity of services provided during the hospital stay. Costs per discharge increased by 3.1 percent annually.
- Growth in intensity of services accounted for 70 percent of the growth in aggregate costs, while population growth was responsible for 24 percent and an increased number of discharges per population for 6 percent.
- Circulatory conditions accounted for 22 percent (\$74.6 billion) and injury and poisonings for 11 percent (\$37.2 billion) of all costs for inpatient stays in 2007.
- Hospital stays related to pregnancy, childbirth, and newborns together accounted for the most stays (9.7 million) and the third highest costs (\$34.2 billion) among body systems. The average hospital cost for these conditions was less than that for any other body system condition, making the aggregate costs relatively low despite the high volume of stays.
- The fastest increase in body system costs was for infections and parasitic diseases, more than doubling between 1997 (\$6.6 billion) and 2007 (\$15.3 billion).
  - Septicemia was responsible for almost all (94 percent) of the increase in costs of infectious and parasitic conditions as it tripled in costs from \$4.1 billion in 1997 to \$12.3 billion in 2007.
- Exhibiting the second fastest growth among body systems, costs for stays for musculoskeletal conditions also more than doubled—from \$11.8 billion in 1997 to \$26.8 billion in 2007.
  - Costs for osteoarthritis and back problems more than doubled and were together responsible for 80 percent of the increase in costs of musculoskeletal conditions between 1997 and 2007.

## EXHIBIT 4.1 Cost by Body System

### Aggregate Costs by Principal CCS Body System and Condition Category, 1997, 2002, and 2007

PRINCIPAL CCS BODY SYSTEM AND CONDITION CATEGORY	TOTAL INFLATION-ADJUSTED† HOSPITAL COSTS IN BILLIONS:			PERCENT OF TOTAL COSTS			AVERAGE ANNUAL GROWTH
	2007 DOLLARS			1997	2002	2007	1997-2007
	1997	2002	2007	1997	2002	2007	
All body systems and condition categories	\$222.4	\$298.5	\$343.9	100.0%	100.0%	100.0%	4.5%
Circulatory	57.1	74.3	74.6‡	25.7	24.9	21.7	2.7
Injury and poisoning	23.0	31.0	37.2	10.4	10.4	10.8	4.9
Digestive	20.8	29.0	32.0	9.4	9.7	9.3	4.4
Respiratory	22.7	28.7	31.1	10.2	9.6	9.0	3.2
Neoplasms	19.3	24.2	28.2‡	8.7	8.1	8.2	3.9
Musculoskeletal	11.8	18.6	26.8	5.3	6.2	7.8	8.5
Pregnancy and childbirth	12.2	16.1	18.8	5.5	5.4	5.5	4.4
Perinatal (newborns)	9.7	11.8	15.5	4.4	4.0	4.5	4.8
Infectious and parasitic	6.6	7.9	15.3	3.0	2.6	4.4	8.8
Genitourinary	8.1	11.0	13.5	3.6	3.7	3.9	5.3
Mental	7.9	11.7	12.2‡	3.6	3.9	3.5	4.4
Endocrine	5.8	9.4	10.0‡	2.6	3.1	2.9	5.6
Symptoms	6.9	9.5	9.5‡	3.1	3.2	2.8	3.2
Nervous	3.9	5.7	6.7	1.8	1.9	2.0	5.6
Skin	2.4	3.6	4.8	1.1	1.2	1.4	7.2
Blood	1.8	2.9	3.5	0.8	1.0	1.0	6.7
Congenital	2.0	2.6‡	2.8‡	0.9	0.9	0.8	3.5

† 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.

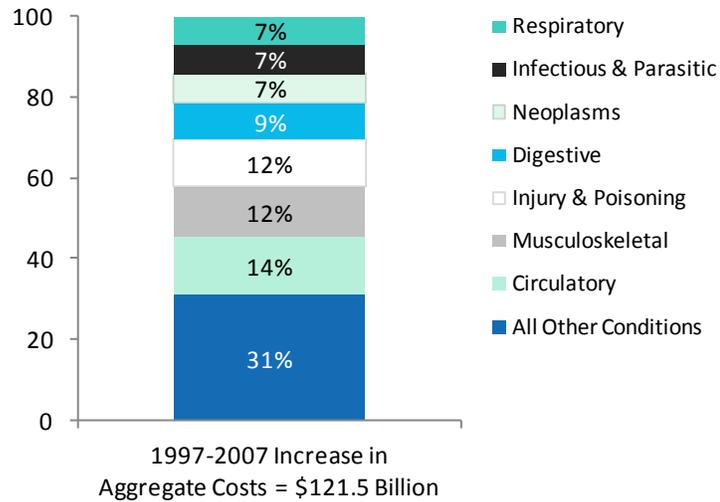
Note: Aggregate costs for residual codes and those not elsewhere classified are not shown here. As a result, aggregate costs for all body systems may be larger than the sum of the component parts.

Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 1997, 2002, and 2007.

Inflation-adjusted aggregate costs for community hospital stays rose from \$222.4 billion in 1997 to \$343.9 billion in 2007.

- Hospital stays for circulatory conditions accounted for the largest share of costs in 1997 (26 percent, \$57.1 billion) and 2007 (22 percent, \$74.6 billion). Most of the increase in costs for circulatory conditions occurred between 1997 and 2002; there was little measureable increase between 2002 and 2007.
- Injury and poisoning was the second most expensive condition in 2007. Stays cost \$37.2 billion (11 percent of aggregate costs) in 2007 and grew 4.9 percent annually from 1997 to 2007.
- Digestive conditions and respiratory conditions were each responsible for one-tenth of the aggregate costs in both 1997 and 2007.
- The fastest increase in costs was for infectious and parasitic diseases, which grew by 8.8 percent per year from 1997 to 2007.
- A close second in cost increases was musculoskeletal diseases, which grew 8.5 percent annually.

### Percent Contribution to Aggregate Costs by Principal CCS Body System and Condition Category, 1997-2007

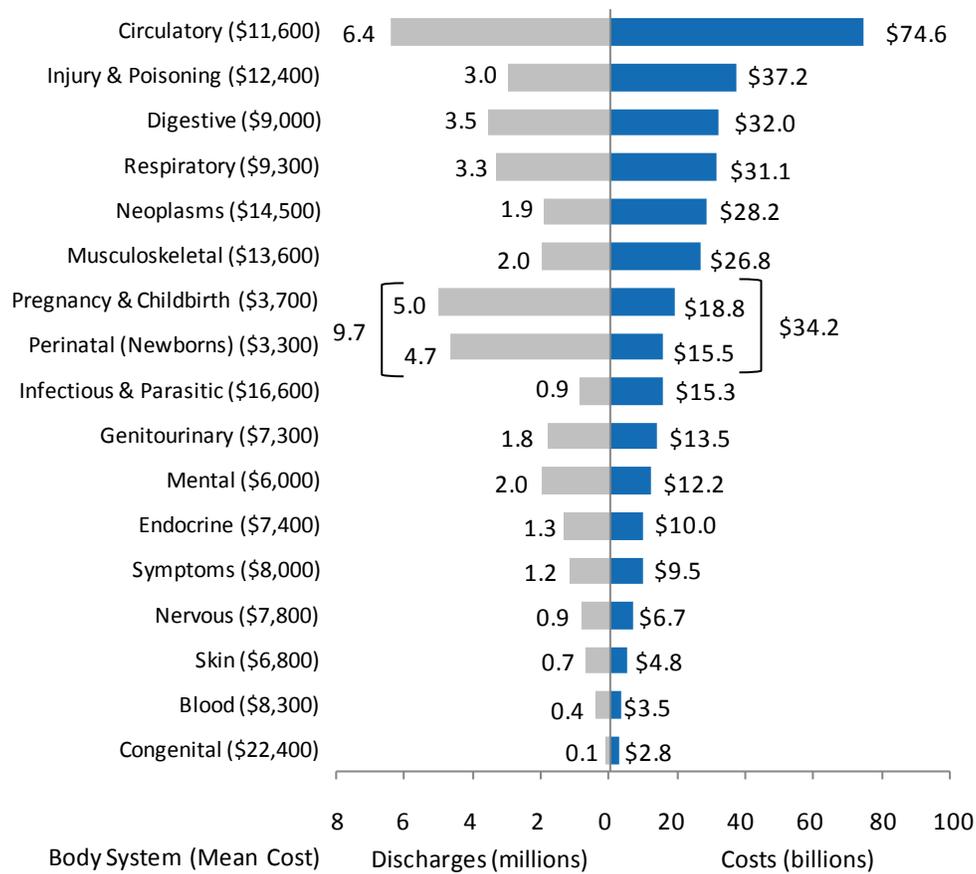


Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 1997 and 2007.

Two body system and condition categories (musculoskeletal and infectious and parasitic conditions) contributed substantially more to the increase in costs between 1997 and 2007 than their share of overall 2007 costs would suggest—an indication of their rapid growth.

- Costs for hospitalizations for infectious and parasitic conditions amounted to \$15.3 billion in 2007, 4.4 percent of aggregate costs. Costs more than doubled between 1997 (\$6.6 billion) and 2007 (\$15.3 billion) and were responsible for 7 percent of the increase in aggregate hospitalization costs.
- Costs for stays for musculoskeletal conditions increased by \$15 billion and were responsible for more than 12 percent of the total cost increase. These costs more than doubled, from \$11.8 billion to \$26.8 billion, between 1997 and 2007. By 2007, costs for stays for musculoskeletal conditions accounted for 8 percent of all costs, up from a 5 percent share in 1997.

**Number of Discharges and Aggregate Costs  
by Principal CCS Body System and Condition Category, 2007**



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

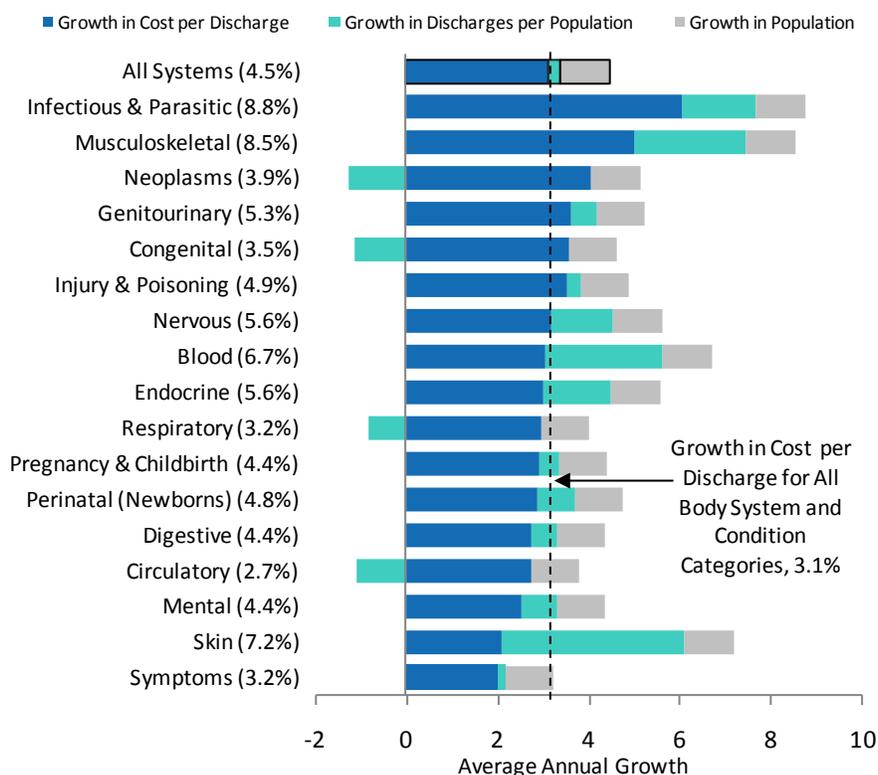
Aggregate costs and the number of discharges varied widely across body system and condition categories.

- In 2007, circulatory conditions, which accounted for the highest aggregate costs across all body systems, also accounted for the greatest number of discharges. On average, these hospitalizations cost \$11,600.
- Injury and poisoning was, in aggregate, the second most expensive condition type in 2007 and the sixth most common reason for a hospital stay. Hospital stays for injury and poisoning cost an average of \$12,400.
- Conditions related to pregnancy and childbirth and perinatal (newborn) conditions were the second and third most frequent reasons for hospitalizations. The average hospital cost for these conditions (\$3,700 for pregnancy and childbirth and \$3,300 for perinatal (newborn) conditions) was less than that for any other type of condition, making the aggregate costs—\$18.8 billion and \$15.5 billion, respectively—relatively low, despite the high volume of these conditions.
- Combined, hospital stays related to pregnancy, childbirth, and newborns accounted for the most stays (9.7 million) and \$34.2 billion in costs.

- Infectious and parasitic conditions accounted for just under 1 million hospital stays; these stays cost \$15.3 billion, or an average of \$16,600 per hospitalization—the second highest average cost for a hospitalization.
- Hospital stays for congenital anomalies cost an average of \$22,400 in 2007—the highest average cost per stay of any body system or condition type. Because hospital stays for these conditions are relatively infrequent—there were just 124,100 of these stays in 2007—the aggregate cost was the lowest of any body system or condition type.

## EXHIBIT 4.2 Cost by Diagnosis

### Average Annual Growth\* in Inflation-adjusted Aggregate Costs by Principal CCS Body System and Condition Category, 1997-2007



The growth in aggregate costs for stays in community hospitals averaged 4.5 percent annually between 1997 and 2007.

- The most important driver of cost increases was greater intensity of services (cost per discharge) provided during the hospital stay (averaging 3.1 percent annually), followed by population growth (up 1.1 percent annually). Growth in the number of stays per person (use) was responsible for an increase of only 0.3 percent annually.
- Growth in intensity of services accounted for 70 percent of the growth in aggregate costs, while population growth was responsible for 24 percent and an increased number of discharges per population for 6 percent.
- The cost growth for infectious and parasitic conditions, musculoskeletal conditions, neoplasms, genitourinary conditions, congenital anomalies and injury and poisoning was predominantly driven by higher than average growth in cost per discharge, indicating greater intensity of use of services and more expensive interventions.
- Although growth in stays per person is seldom a major factor in increasing costs, it was for one body system:

- Skin conditions were the only body condition where more than half of the growth in costs was attributable to growth in hospital use per person (discharges per population).
- In five additional body systems, the increase in use per person was also a relatively more important factor in cost growth than in other body systems. These five body system and condition categories were infectious and parasitic, musculoskeletal, nervous, blood, and endocrine body systems and conditions.
- Increases in the net cost of hospital stays for neoplasms, congenital conditions, respiratory conditions, and circulatory conditions were dampened by an actual decline in hospitalizations per population.

### Cost, Growth and Contribution to CCS Body System Growth for Selected Principal Diagnoses, 1997-2007

PRINCIPAL CCS BODY SYSTEM AND CONDITION CATEGORY & PRINCIPAL CCS DIAGNOSIS	TOTAL INFLATION- ADJUSTED <sup>†</sup> HOSPITAL COSTS IN BILLIONS: 2007 DOLLARS		AVERAGE ANNUAL GROWTH	PERCENT CONTRIBUTION TO GROWTH IN AGGREGATE COSTS	PERCENT CONTRIBUTION TO GROWTH IN BODY SYSTEM COSTS
	1997	2007	1997-2007		
Infectious and parasitic					
Septicemia (blood infection)	\$4.1	\$12.3	11.6%	6.8%	94.4%
Musculoskeletal					
Osteoarthritis (degenerative joint disease)	4.8	11.8	9.5	5.8	47.0
Disorders of intervertebral discs and bones in spinal column (back problems)	3.5	8.5	9.3	4.1	33.2
Genitourinary					
Acute renal failure	1.0	4.0	15.3	2.5	56.5
Injury and poisoning					
Complication of device, implant or graft	5.6	9.9	5.8	3.5	30.1
Complication of surgical procedures or medical care	2.9	5.4	6.2	2.0	17.1
Respiratory					
Respiratory failure	3.3	7.8	8.8	3.6	52.8
Perinatal (newborns)					
Liveborn (newborn infant)	8.1	12.7	4.6	3.8	80.3
Circulatory					
Congestive heart failure	6.8	10.5	4.5	3.0	21.1
Cardiac dysrhythmias (irregular heart beat)	3.6	6.7	6.4	2.5	17.5

<sup>†</sup> 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 2007.

Ten specific CCS conditions with the greatest increase in costs drove more than one-third (38 percent) of the overall hospitalization inflation-adjusted cost increase between 1997 and 2007. In several body system or condition categories, a single condition was responsible for most of the growth for the entire body system.

- The cost of hospital stays for septicemia tripled—from \$4.1 billion in 1997 to \$12.3 billion in 2007. Septicemia was responsible for 7 percent of the increase in costs across all hospitalizations and for 94 percent of the increase in costs of infectious and parasitic conditions.

- Similarly, costs for osteoarthritis and back problems more than doubled, together contributing 10 percent to the growth in costs across all hospitalizations. Osteoarthritis accounted for 47 percent and back problems for 33 percent of the growth in costs for musculoskeletal conditions.
- Costs of hospitalizations for acute renal failure increased from \$1 billion in 1997 to \$4 billion in 2007, at an average annual growth rate of 15 percent. These hospitalizations accounted for 2.5 percent of the growth in aggregate costs and 57 percent of the growth in genitourinary costs during this period.
- Almost half of the increase (47 percent) in the costs of hospital stays for injury and poisoning were driven by two conditions: complication of device, implant or graft and complication of surgical procedures or medical care. Growth in the costs of stays for these two conditions contributed 5.5 percent to the total growth in hospitalization costs.

## SECTION 5 PAYERS FOR INPATIENT HOSPITAL STAYS

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### HIGHLIGHTS

#### *Discharges*

- In 2007, Medicare and Medicaid were the expected primary payers for more than half (56 percent) of all inpatient hospital discharges, private insurance for 35 percent, and the uninsured for 6 percent. Other payers accounted for the remaining 3 percent of discharges.
  - Medicaid was billed for 44 percent of stays among 0-17 year olds, but only 23 percent of stays among 18-64 year olds and less than 5 percent of stays among those 65 and older.
  - Medicaid was the primary payer for 64 percent of maternal discharges among 18-24 year olds, about one-third of maternal stays for 25-34 year olds, and 21 percent of maternal stays for 35-49 year olds.
  - Twenty-seven percent of stays among 60-64 year olds were billed to Medicare, compared to less than 5 percent of non-maternal stays among 18-24 year olds.
  - About 10 percent of discharges for patients 18-64 years old were uninsured, compared to 5 percent of discharges among 0-17 year olds and less than 1 percent of discharges among patients 65 and older.
  - About 4-5 percent of maternal stays among all age groups were uninsured.
- The share of discharges billed to private insurance fell from 39 percent to 35 percent between 1997 and 2007, reflecting the steady decline in the share of the population with private insurance coverage. The share of discharges billed to Medicare and the share of uninsured discharges held relatively stable, while those billed to Medicaid increased from 16 to 19 percent.
- Between 1997 and 2007, the number of uninsured discharges grew by 38 percent and the number Medicaid discharges grew by 36 percent—more than double the rate of growth of all discharges (14 percent). The number of Medicare discharges grew by 14 percent while stays billed to private insurance grew by just 2 percent.
- Hospitalizations billed to Medicare and Medicaid accounted for more than three-quarters of the increase in discharges from 1997 to 2007.
- The average length of stay for hospitalizations billed to Medicare decreased substantially from 1997 to 2007 (from 6.3 days to 5.6 days) while the ALOS for stays covered by Medicaid, uninsured, and private insurance remained relatively unchanged. Virtually the entire decline in the all payer length of stay from 1997 to 2007 was attributable to Medicare.

- Patients discharged against medical advice were more likely to be uninsured. Three percent of uninsured discharges occurred against medical advice, compared to less than 1 percent of discharges billed to Medicare, Medicaid, and private insurance.

#### *Costs*

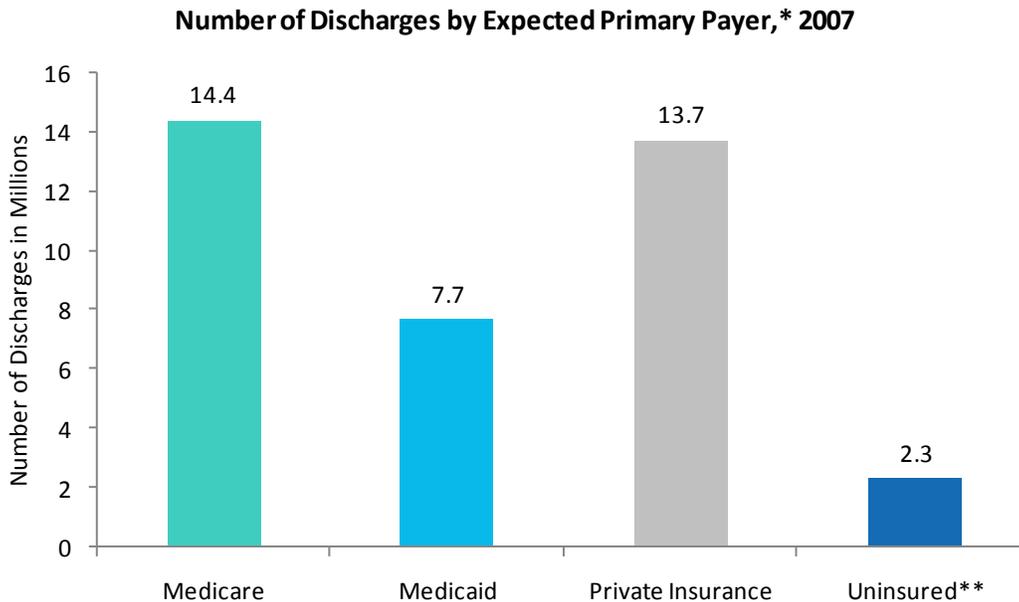
- In 2007, costs for Medicare stays amounted to \$156.0 billion and Medicaid stays accounted for \$50.4 billion—a total of about 60 percent of aggregate hospital costs. Discharges billed to private insurance accounted for 31 percent (\$107.8 billion), while the uninsured accounted for a much smaller share (5 percent, or \$16.5 billion).

#### *Conditions*

- Stays for some body system conditions and payers grew rapidly:
  - For Medicare stays, pregnancy and childbirth grew by 185 percent, although the total number of stays remained relatively low (16,400 in 1997 and 46,700 in 2007). Infectious and parasitic conditions (up 57 percent) and blood disorders (up 56 percent) also rose rapidly.
  - There was large growth in Medicaid stays for skin conditions (92 percent), perinatal/newborns (55 percent), pregnancy and childbirth (47 percent), and musculoskeletal conditions (43 percent).
  - There was rapid growth in stays billed to private insurance for skin conditions (63 percent), musculoskeletal conditions (44 percent), blood disorders (31 percent), and endocrine conditions (26 percent).
  - For uninsured stays, large increases occurred in skin (136 percent), blood (112 percent), and endocrine (67 percent) conditions.
- Rapid growth in specific CCS conditions contributed to body system growth:
  - There was rapid growth in stays for acute renal failure billed to the uninsured (387 percent), Medicare (315 percent), Medicaid (306 percent), and private insurance (273 percent).
  - There was also rapid growth in the number of hospitalizations across all payers for skin and subcutaneous tissue infections, anemia, non-specific chest pain, septicemia (blood infection), osteoarthritis, complication of device, implant, or graft, and complication of surgical procedures or medical care.

## EXHIBIT 5.1 Discharges by Payer

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.



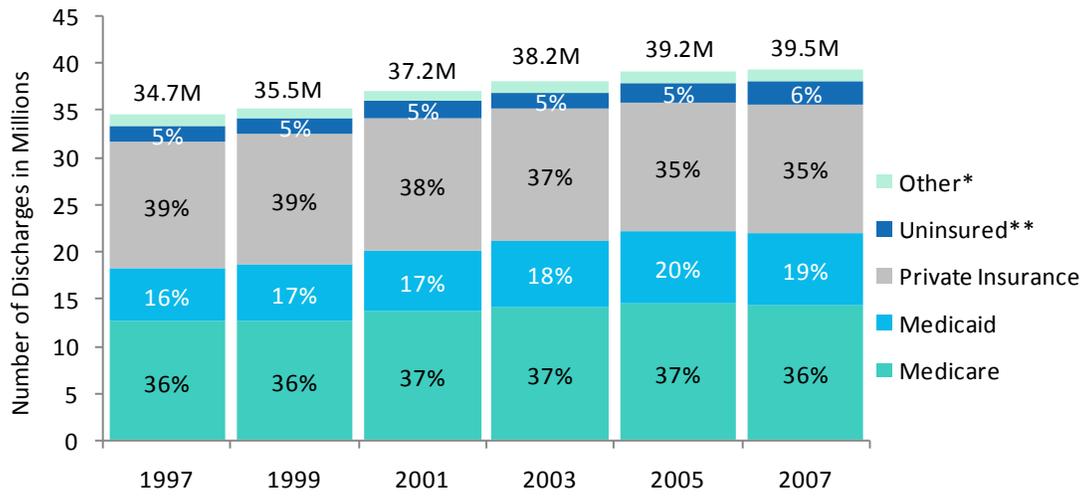
\*There are an additional 1.4 million discharges with "other" as the expected primary payer. "Other" payer includes Workers' Compensation, TRICARE, CHAMPUS, CHAMPVA, Title V, and other government programs.

\*\*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, 2007.

- In 2007, Medicare with 14.4 million discharges and private insurance with 13.7 million discharges were the expected primary payers for the largest number of discharges, followed by Medicaid with 7.7 million discharges. Medicare patients are 65 and older or disabled. Medicaid is the primary source of insurance for low income families and individuals.
- There were 2.3 million uninsured discharges.

## Number and Distribution of Discharges by Expected Primary Payer, 1997-2007



\* 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: Bar segments representing less than 5 percent have not been labeled.

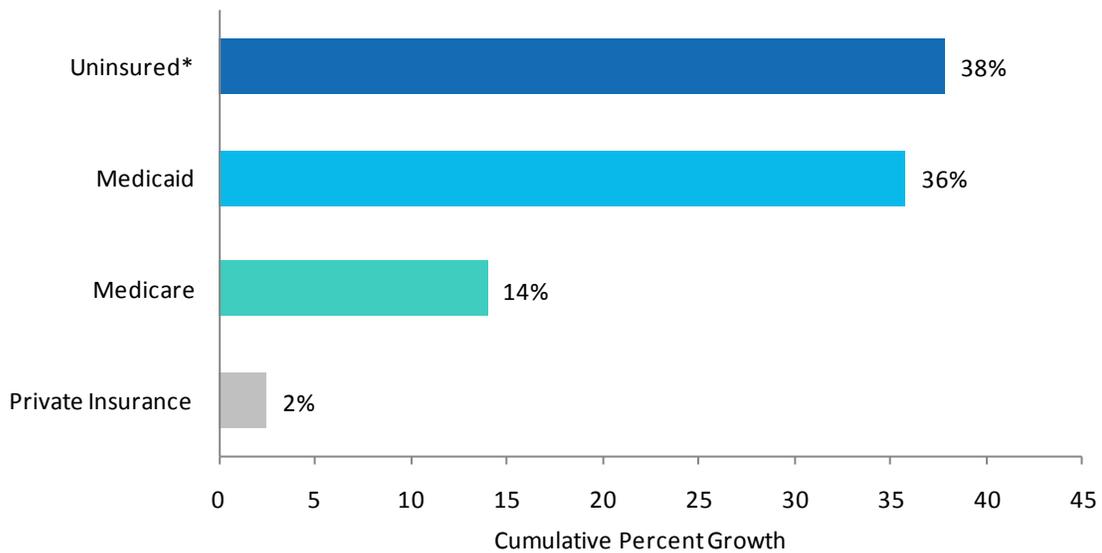
Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 1997-2007.

The number of discharges increased steadily over the past decade, growing from 34.7 million in 1997 to 39.5 million in 2007.

- In 2007, Medicare and Medicaid were the expected primary payers for more than half (56 percent) of all inpatient hospital discharges (accounting for 14.4 and 7.7 million hospital stays, respectively).
  - The percentage of discharges billed to Medicare remained relatively stable from 1997 to 2007 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 19 percent in 2007.
- The percentage of discharges billed to private insurance fell from 39 percent to 35 percent from 1997 to 2007. This reflects the steady decline in the share of the population with private insurance coverage.<sup>7</sup>
- About 5 percent of discharges were listed as uninsured in 1997. By 2007, uninsured stays accounted for 6 percent of all discharges, or 2.3 million hospital stays.

<sup>7</sup> U.S. Census Bureau Current Population Survey (CPS). Table HIA-1. Health Insurance Coverage Status and Type of Coverage—All Persons by Sex, Race and Hispanic Origin: 1999 to 2007 (<http://www.census.gov/hhes/www/hlthins/historic/index.html>).

### Growth in Number of Discharges by Expected Primary Payer, 1997-2007



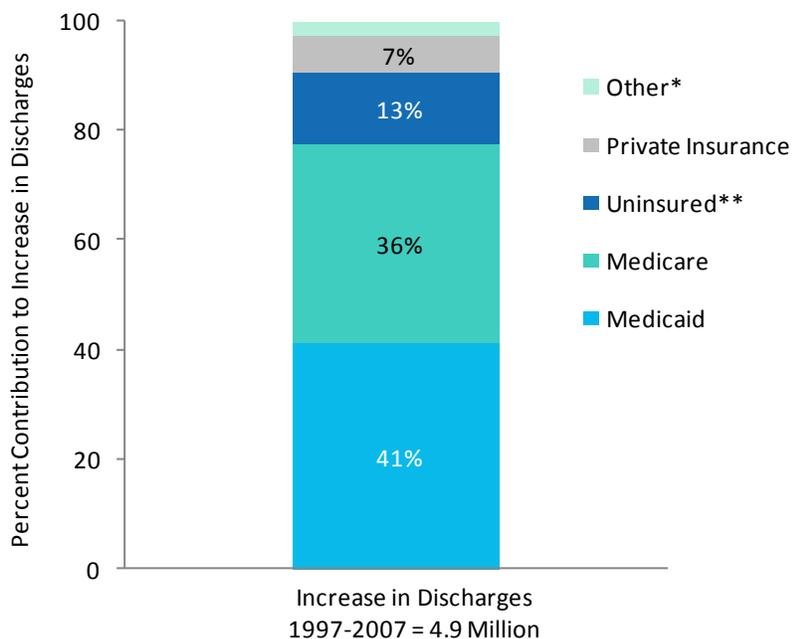
\* Includes discharges classified as self-pay or no charge.

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

Between 1997 and 2007, the number of hospital discharges grew by 14 percent; however, the growth varied widely by expected primary payer.

- Uninsured discharges (up 38 percent) and Medicaid discharges (up 36 percent) grew at more than double the rate of all discharges.
- The number of discharges for which Medicare was the expected primary payer grew at the same rate as the all-payer discharge rate (14 percent).
- The number of discharges billed to private insurance increased slowly (2 percent) between 1997 and 2007, substantially slower than discharges billed to uninsured, Medicaid and Medicare.

### Payer Contribution to the Cumulative Growth in Number of Discharges, 1997-2007



\*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: Bar segments representing less than 5 percent have not been labeled.

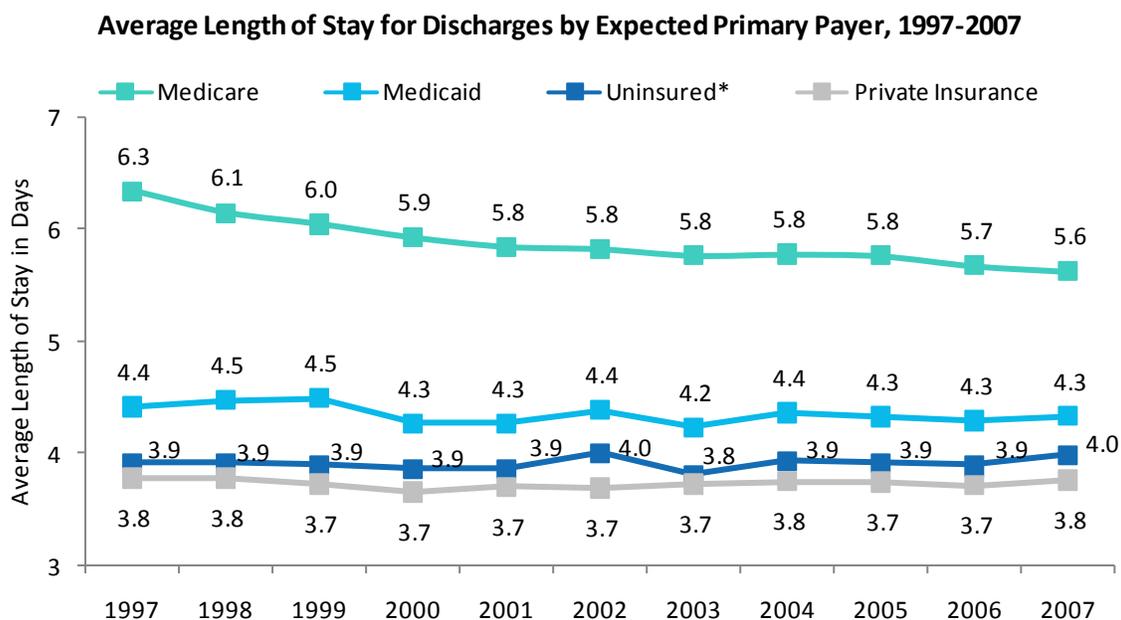
Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 1997 and 2007.

Between 1997 and 2007, the number of discharges from U.S. community hospitals increased by 4.9 million stays, with much of the increase coming from discharges covered by government programs. Government plans tend to pay a smaller proportion of costs than do private insurers. This gradual shift in payment responsibility from private insurers can create financial pressures on hospitals over time. This is especially true during economic recessions when governments are charged with balancing limited and declining resources against increasing need for care.<sup>8</sup>

- Medicare and Medicaid were the expected primary payers for more than three-quarters of the increase in discharges from 1997 to 2007. If other payers that are mostly government programs were added to increases from Medicare and Medicaid discharges, government programs would be responsible for 8 of every 10 additional discharges between 1997 and 2007.
- Uninsured stays accounted for 13 percent of the rise in the number of discharges from 1997 to 2007.
- Private insurance stays, which accounted for 35 percent of all stays in 2007, contributed just 7 percent to the cumulative increase in discharges between 1997 and 2007.

<sup>8</sup> American Hospital Association. *The Economic Downturn and Its Impact on Hospitals*. TrendWatch. Online. January 2009 (<http://www.aha.org/aha/trendwatch/2009/twjan2009econimpact.pdf>).

## EXHIBIT 5.2 Average Length of Stay by Payer



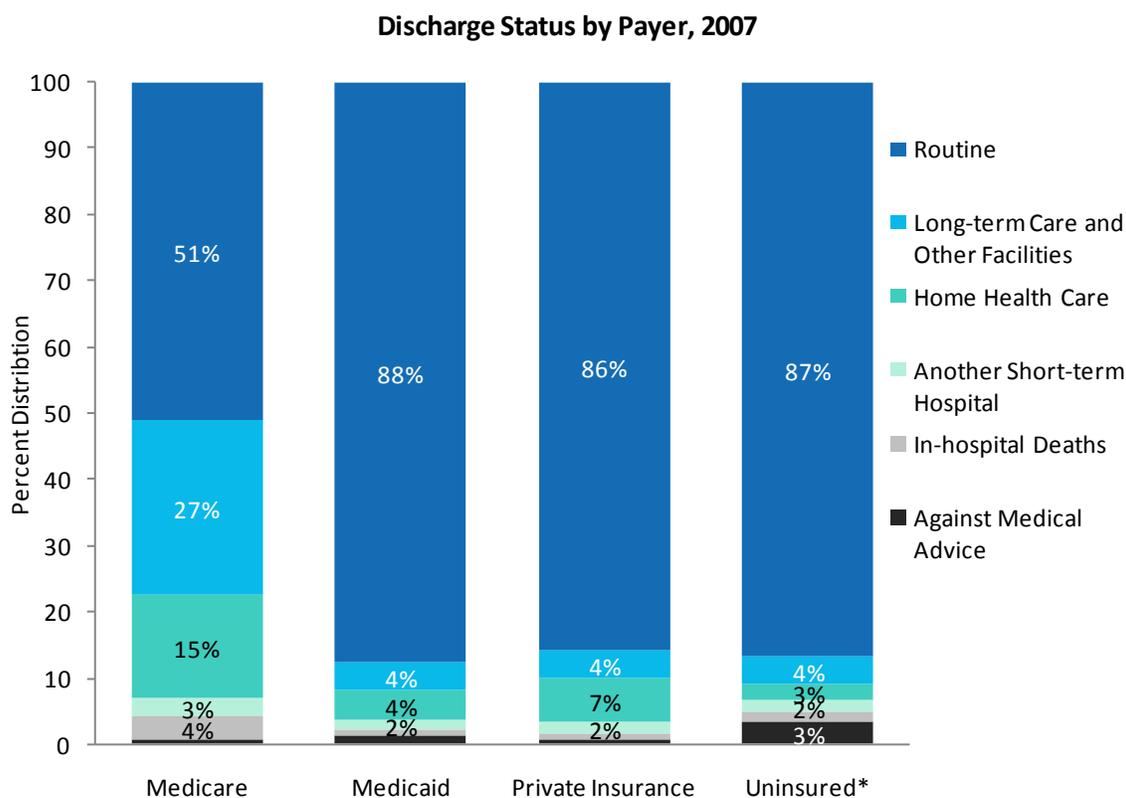
\*Includes discharges classified as self-pay or no charge.

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

From 1997 to 2007, the average length of stay (ALOS) for hospitalizations declined from 4.8 days to 4.6 days (see Exhibit 1.2). However, the ALOS varied by payer and most of the reduction in ALOS over the decade came from Medicare alone.

- The ALOS for stays billed to Medicare decreased substantially from 1997 to 2007 (from 6.3 days to 5.6 days). However, the ALOS for stays covered by Medicaid, uninsured, and private insurance remained relatively stable over time.
- In 2007, hospital stays billed to Medicare had the greatest ALOS (5.6 days), followed by those billed to Medicaid (4.3 days), uninsured (4.0 days), and private insurance (3.8 days). This pattern was consistent throughout all years from 1997 through 2007.

## EXHIBIT 5.3 Discharge Status by Payer



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

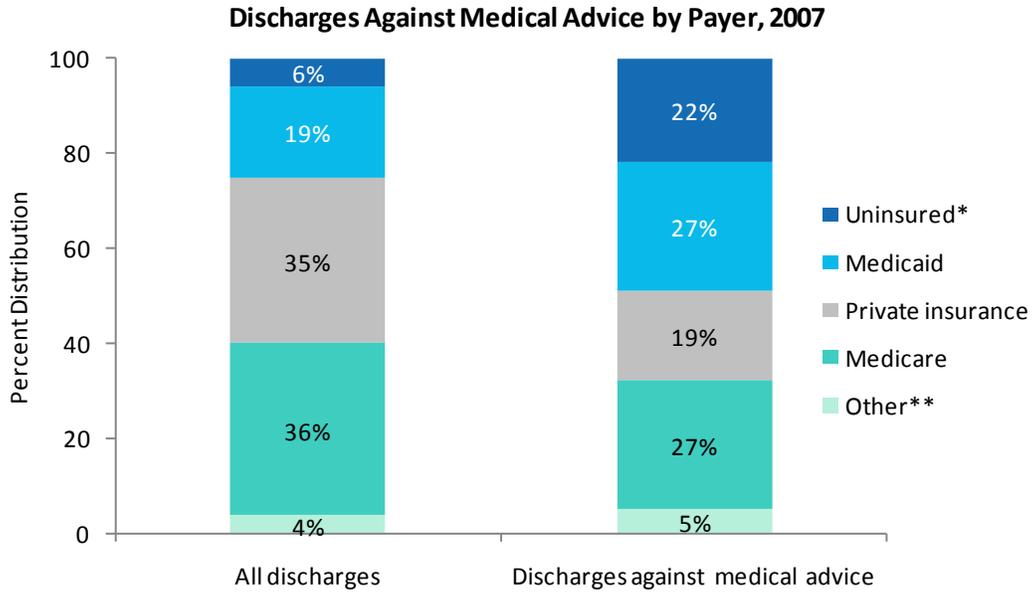
Note: Bar segments representing 1 percent or less have not been labeled.

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

Discharge status indicates the circumstances surrounding the discharge or where the patient went after discharge from the hospital. The majority of discharges were routine in nature regardless of expected primary payer, but discharges to follow-on care were also frequent, especially for Medicare patients.

- For Medicare in 2007, almost half of all stays (49 percent) involved other-than-routine discharges. Because these patients are typically older and more likely to be disabled than persons who are covered by other insurance or are uninsured, routine discharges occur for a smaller share of Medicare-covered stays.
  - More than one-quarter (27 percent) of Medicare stays were discharged to long term care or other facilities, such as rehabilitation.
  - Another 15 percent were discharged to home health care, while 3 percent were discharged to another short-term hospital.
  - Four percent of stays resulted in in-hospital deaths and less than 1 percent were discharges against medical advice.
- For all other payers, routine discharges accounted for the vast majority of stays—86 percent or more.
  - Two percent of Medicaid, private insurance, and uninsured stays were discharged to another short-term hospital.
  - Less than 1 percent of Medicaid, private insurance, and uninsured stays resulted in in-hospital deaths. For stays with Medicare as the primary payer, in-hospital deaths occurred in 4 percent of stays.

- Patients discharged against medical advice were more likely to be uninsured. Three percent of uninsured discharges occurred against medical advice, compared to less than 1 percent of discharges billed to Medicare, Medicaid, and private insurance.



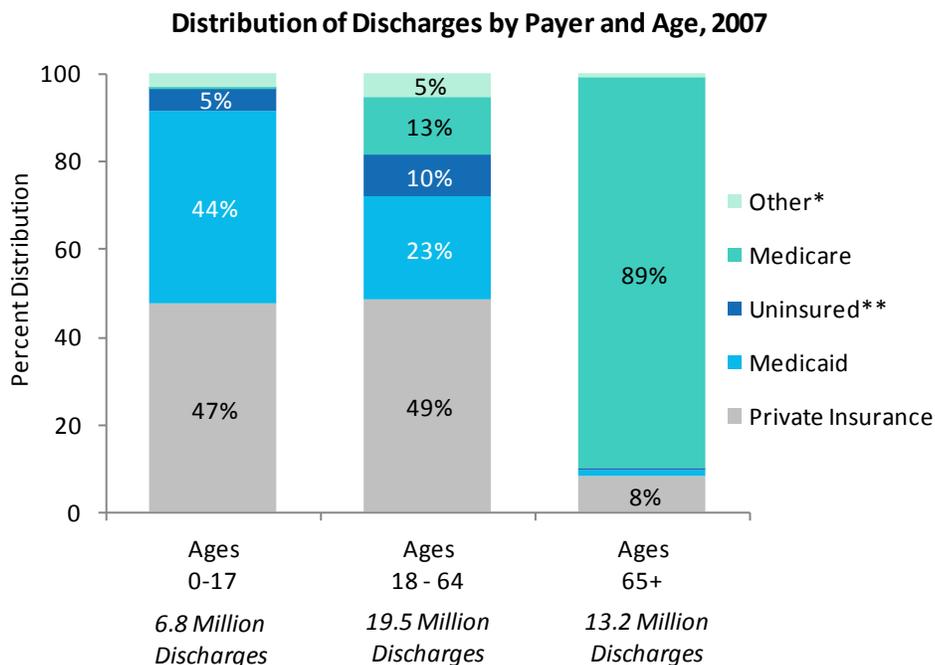
\*Includes discharges classified as self-pay or no charge.

\*\*"Other" payer includes 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, 2007.

- Uninsured stays accounted for 22 percent of discharges against medical advice, but just six percent of discharges overall. Those billed to Medicaid accounted for 27 percent of discharges against medical advice; they represented only 19 percent of all other hospital stays.
- Stays billed to private insurance and Medicare accounted for just under half of discharges against medical advice (46 percent), but close to three quarters of all discharges (71 percent).

## EXHIBIT 5.4 Patient Age by Payer



\*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.

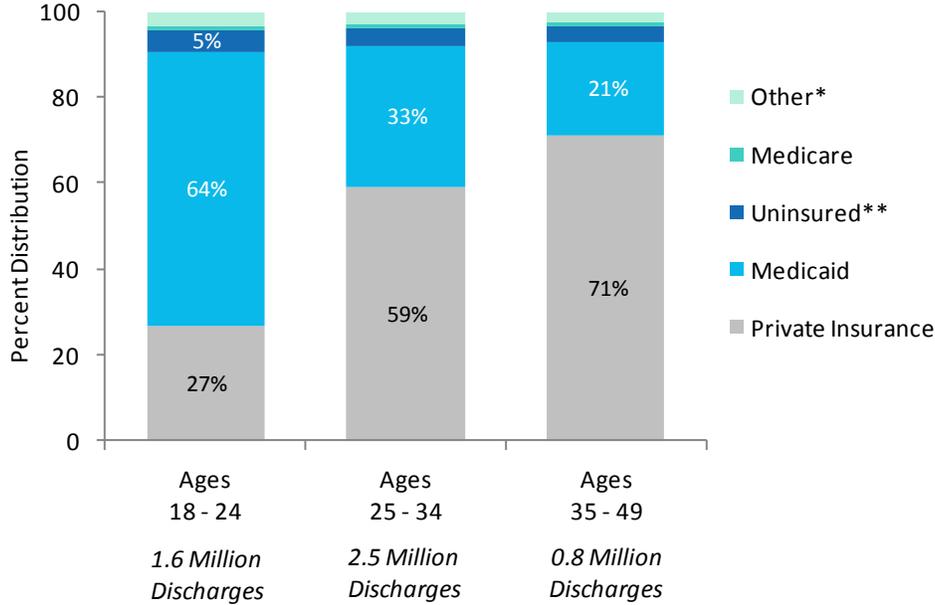
Note: Bar segments representing less than 5 percent have not been labeled.

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

The expected primary payer for hospitalizations varies by age, in part because government programs design eligibility criteria to target specific groups, such as children, pregnant women and families and the elderly, that are concentrated in specific age ranges.

- In 2007, nearly half of discharges among patients 0-17 years (47 percent) and 18-64 years (49 percent) were billed to private insurance. Only 8 percent of stays among patients 65 and over were billed to private insurance.
- Among 0-17 year olds, 44 percent of discharges were billed to Medicaid. Smaller shares of discharges in other age groups were the primary responsibility of Medicaid: 23 percent of stays among 18-64 year olds and less than 5 percent of stays among patients 65 and older.
- Among patients 65 and older, the majority (89 percent) of stays were billed to Medicare. In contrast, 13 percent of stays among 18-64 year olds and less than 1 percent of stays among 0-17 year olds were billed to Medicare.
- About 10 percent of discharges for 18-64 year olds were uninsured, compared to 5 percent of discharges among 0-17 year olds and 1 percent of discharges among patients 65 and older.

**Distribution of Maternal Discharges by Payer and Age, 2007**



\*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: Too few discharges for 50 years and older to reliably calculate a distribution.

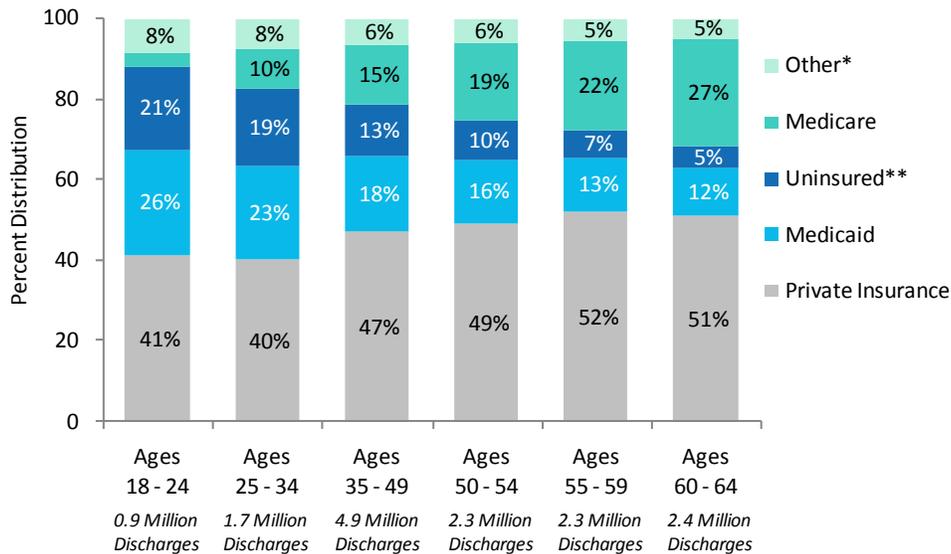
Note: Bar segments representing less than 5 percent have not been labeled.

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

A large proportion of Medicaid and private insurance hospitalizations during the childbearing years are for maternal discharges.

- Medicaid was the primary payer for 64 percent of maternal discharges among 18-24 year olds, about one-third of maternal stays among 25-34 year olds, and 21 percent of maternal stays for 35-49 year olds.
- Private insurance was billed for 27 percent of maternal stays for 18-24 year olds, 59 percent of maternal stays for 25-34 year olds, and 71 percent of maternal stays for 35-49 year olds.
- About 4-5 percent of maternal stays among all age groups were uninsured.

### Distribution of Non-maternal Discharges by Payer and Age, 2007



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

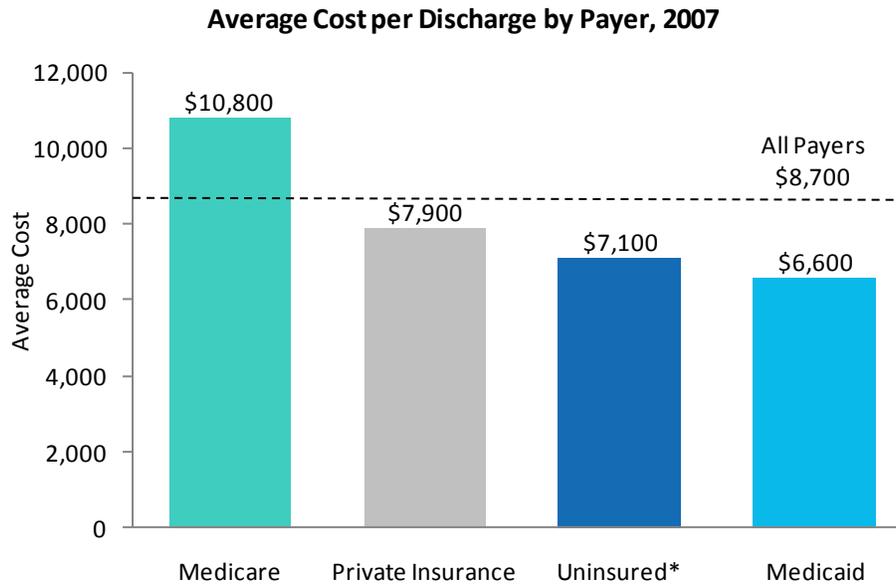
\*\*Includes discharges classified as self-pay or no charge.

Note: Bar segments representing less than 5 percent have not been labeled.

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

- In 2007, 35-49 year olds accounted for the largest number of non-maternal discharges (4.9 million discharges), followed by patients 60-64 (2.4 million), and patients 50-54 and 55-59 (2.3 million each). Younger patients had fewer non-maternal discharges (1.7 million for 25-34 year olds and 0.9 million for 18-24 year olds).
- Twenty-seven percent of stays among 60-64 year olds were billed to Medicare, compared to less than 5 percent of non-maternal stays among 18-24 year olds. This rising share reflects increasing disability with age, which can qualify some individuals younger than 65 for Medicare coverage.
- About 40 percent of stays among patients 18-24 and 25-34 years old were billed to private insurance. Stays billed to private insurance accounted for 47 to 52 percent of stays among 35-64 year olds.
- Among 18-24 year olds, stays billed to uninsured and Medicaid accounted for 47 percent of stays (21 percent and 26 percent, respectively). In contrast, uninsured and Medicaid stays accounted for only 17 percent of all stays among 60-64 year olds (5 percent and 12 percent, respectively).

## EXHIBIT 5.5 Costs by Payer



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

Note: Excludes other payers such as Workers' Compensation, TRICARE, CHAMPUS, CHAMPVA, Title V, and other government programs.

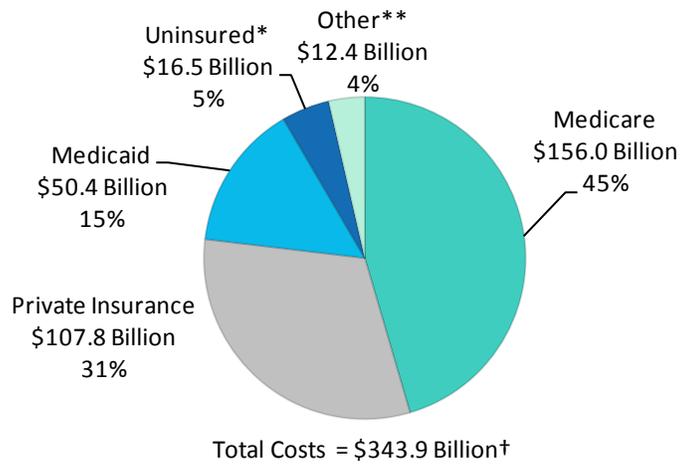
Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 2007.

Costs reflect the actual expense of producing hospital services. In HCUP, costs are estimated from charges using a hospital-wide cost-to-charge ratio<sup>9</sup> developed from Medicare Cost Reports submitted by the hospitals themselves.

- The average cost of a hospital stay for all payers was \$8,700.
- Medicare discharges had the highest average cost (\$10,800).
- The average cost per discharge billed to private insurance (\$7,900), the uninsured (\$7,100), and Medicaid (\$6,600) was lower than the all payer average cost per discharge.

<sup>9</sup> For more information, see <http://www.hcup-us.ahrq.gov/db/state/costtocharge.jsp>.

### Distribution of Aggregate Costs by Payer, 2007



\*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.

†Includes a small number of discharges (less than 84,000 or 0.2 percent) with missing expected primary payer designation.

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

In 2007, the total aggregate cost of hospital stays for all payers was \$343.9 billion.

- Medicare was the single largest expected payer for hospitalizations. Costs for Medicare stays amounted to \$156.0 billion in 2007—45 percent of all costs.
- Medicaid stays accounted for \$50.4 billion in hospital costs.
- In total, Medicare and Medicaid were responsible for about 60 percent of aggregate hospital costs.
- Discharges billed to private insurance accounted for 31 percent of total aggregate costs (\$107.8 billion), while the uninsured accounted for a much smaller share (5 percent, or \$16.5 billion).

## EXHIBIT 5.6 Reasons for Hospital Stays by Payer

### Percent Distribution of Principal CCS Body System and Condition Category Discharges by Expected Primary Payer, 2007

PRINCIPAL CCS BODY SYSTEM AND CONDITION CATEGORY	MEDICARE	MEDICAID	PRIVATE INSURANCE	UNINSURED*
All discharges	100.0%	100.0%	100.0%	100.0%
Circulatory	<b>26.9</b>	<b>5.8</b>	<b>12.0</b>	<b>13.9</b>
Pregnancy and childbirth	0.3	<b>27.6</b>	<b>18.2</b>	9.7
Perinatal (newborns)	0.2	<b>25.8</b>	<b>16.8</b>	<b>11.3</b>
Digestive	<b>10.3</b>	5.4	<b>9.3</b>	<b>11.3</b>
Respiratory	<b>12.6</b>	<b>7.0</b>	5.5	7.0
Injury and poisoning	<b>9.3</b>	4.2	<b>6.6</b>	<b>10.6</b>
Mental	4.1	<b>7.0</b>	3.7	<b>12.0</b>
Musculoskeletal	<b>6.6</b>	1.4	5.6	1.9
Neoplasms	5.3	2.4	6.4	3.0
Genitourinary	6.0	2.6	4.6	4.1
Endocrine	4.3	2.6	2.8	4.0
Symptoms	4.7	1.5	2.2	2.4
Infectious and parasitic	3.7	1.7	1.4	1.9
Nervous	2.3	1.9	2.2	2.3
Skin	1.9	1.5	1.5	3.4
Blood	1.3	1.1	0.8	1.0
Congenital	0.1	0.6	0.4	0.2

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

Note: Body systems and condition categories are listed in order by largest number of discharges for all payers combined.

Note: Values in bold are the top five most frequent body systems and condition categories for each payer.

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

Body system and condition categories are collections of specific diagnoses grouped into 17 broad system or condition clusters.

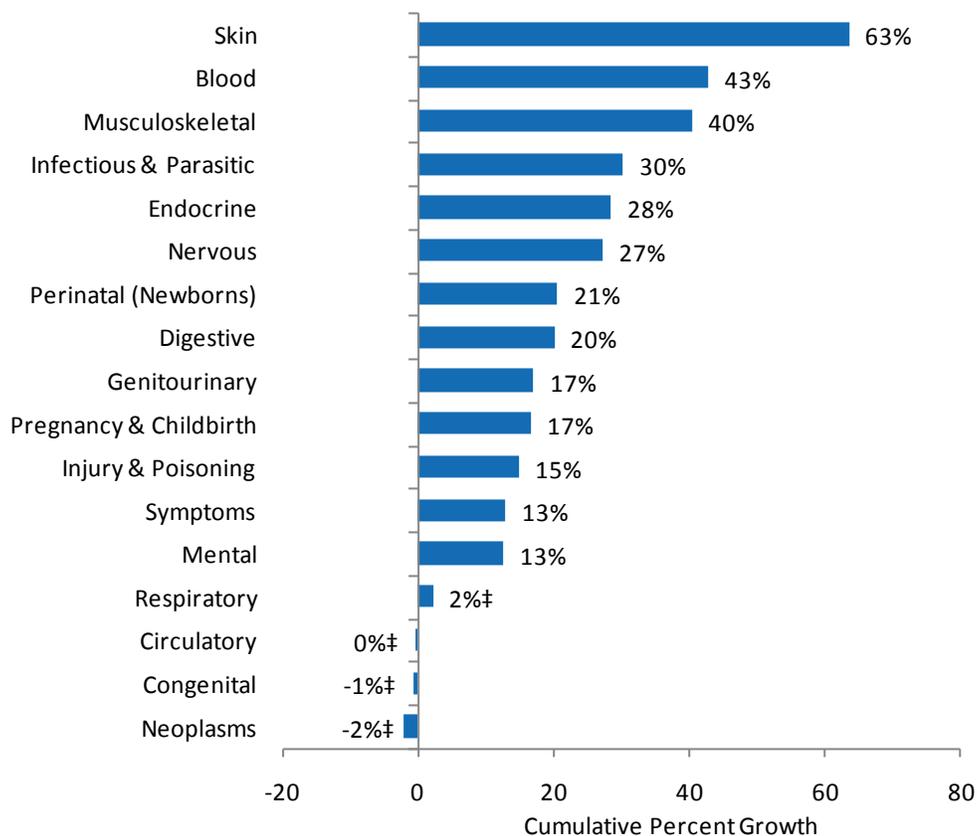
- The 5 most frequent body system categories responsible for hospitalizations differed by expected primary payer, in part because the major payers and their eligibility criteria tend to cover different groups of patients by age and disability status.
  - Only circulatory conditions were among the top five most frequent body systems for each payer, accounting for 27 percent of Medicare discharges, 6 percent of Medicaid discharges, 12 percent of private insurance discharges, and 14 percent of uninsured discharges.
  - A high proportion of Medicare stays were for respiratory conditions (13 percent), digestive conditions (10 percent), injuries and poisonings (9 percent), and musculoskeletal conditions (7 percent).
  - More than half of all Medicaid discharges were for pregnancy and childbirth (28 percent) or perinatal/newborns (26 percent) conditions. Respiratory and mental body system discharges each accounted for 7 percent of stays billed to Medicaid.
  - For patients with private insurance as the expected payer, more than one-third of all discharges were for pregnancy and childbirth (18 percent) or perinatal/newborns (17 percent) conditions. Digestive body system conditions accounted for 9 percent of private insurance discharges and injury and poisoning accounted for 7 percent.

- Discharges for mental conditions were common among the uninsured, accounting for 12 percent of all discharges. Perinatal/newborns and digestive body system discharges each accounted for 11 percent of uninsured stays and injury and poisoning discharges for another 11 percent.

## EXHIBIT 5.7 Growth in Body System Conditions: All Payers

Exhibits 5.7 through 5.11 explore some of the main reasons for rapid growth in inpatient hospitalizations for each payer group between 1997 and 2007. Exhibit 5.7 examines change in discharges by body system for all payers. Exhibits 5.8-5.11 present discharges by payer within body systems for selected conditions that experienced important changes.

**Growth in Discharges by Principal CCS Body System for All Payers, 1997-2007**



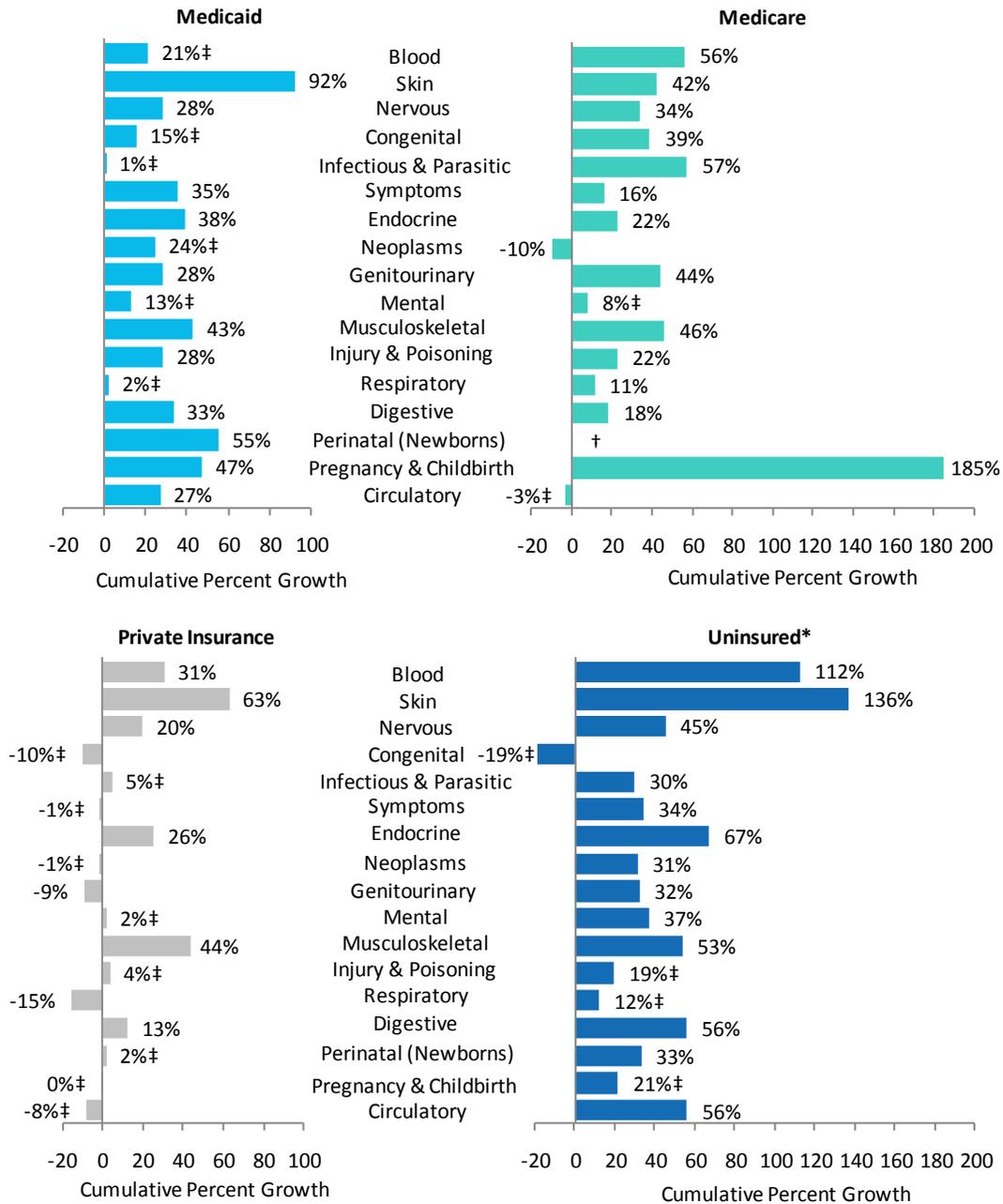
‡2007 discharges are not statistically different from 1997 discharges at  $p < 0.05$ .

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

From 1997 to 2007, the number of discharges increased by 14 percent. By body system, however, the growth in major reasons for hospitalization ranged from no growth to an increase of 63 percent.

- Discharges with skin and subcutaneous tissue disorders grew rapidly at 63 percent. Other rapidly growing reasons for hospital stays included blood disorders (up 43 percent) and musculoskeletal conditions (up 40 percent).
- The number of discharges with neoplasms, congenital, circulatory, and respiratory conditions as the principal reason for the hospital stay changed very little from 1997 to 2007.

## Growth in Principal CCS Body System Discharges by Expected Primary Payer, 1997-2007



‡2007 discharges are not statistically different from 1997 discharges at  $p < 0.05$ .

†Statistics based on estimates with a relative standard error (standard error / weighted estimate) greater than 0.30 or with standard error = 0 in the nationwide statistics are not reliable.

\*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 2007.

From 1997 to 2007, hospitalizations by body systems exhibited different growths by payer.

- There was large growth in Medicaid stays for skin (92 percent), perinatal/newborns (55 percent), pregnancy and childbirth (47 percent), and musculoskeletal (43 percent) discharges. There was no growth in discharges for blood, congenital, infectious and parasitic, neoplasms, mental, or respiratory conditions.
- For Medicare stays, pregnancy and childbirth hospitalizations, although relatively few in number (16,400 in 1997 and 46,700 in 2007), grew by 185 percent. Infectious and parasitic conditions (up 57 percent) and blood disorders (up 56 percent) also rose rapidly. Stays for neoplasms declined by 10 percent. There was no change in stays for mental or circulatory conditions.
- There was rapid growth in stays billed to private insurance for skin conditions (63 percent), musculoskeletal conditions (44 percent), blood disorders (31 percent), and endocrine conditions (26 percent). For most other body systems, the growth in discharges was small or declining, a reflection of the decline in overall private insurance enrollment.
- For uninsured stays, large increases in body system hospitalizations occurred in skin (136 percent), blood (112 percent), and endocrine (67 percent) conditions. There was no significant change in uninsured discharges for congenital, injury and poisoning, respiratory, and pregnancy and childbirth conditions.

Hospitalizations for some body system conditions increased rapidly across all payers.

- Hospital stays for skin conditions rose 92 percent for Medicaid, 42 percent for Medicare, 63 percent for private insurance, and 136 percent for the uninsured.
- There was rapid growth in stays for endocrine conditions billed to Medicaid (38 percent), Medicare (22 percent), private insurance (26 percent), and the uninsured (67 percent).
- Discharges for digestive conditions billed to Medicaid grew by 33 percent, to Medicare by 18 percent, to private insurance by 13 percent, and to the uninsured by 56 percent.
- For musculoskeletal conditions, growth in discharges for each major expected payer was consistently high: Medicaid at 43 percent, Medicare at 46 percent, private insurance at 44 percent, and uninsured at 53 percent.
- There was rapid growth in stays for nervous conditions across all payers: Medicaid at 28 percent, Medicare at 34 percent, private insurance at 20 percent, and uninsured at 45 percent.

## EXHIBIT 5.8 Growth in Discharges for Selected Conditions: Medicare

### Number of Discharges and Cumulative Growth for Principal CCS Conditions Contributing to Body System Change, Medicare, 1997-2007

PRINCIPAL CCS CONDITIONS CONTRIBUTING TO BODY SYSTEM CHANGE	NUMBER OF DISCHARGES IN THOUSANDS		PERCENT OF BODY SYSTEM TOTAL		CUMULATIVE GROWTH
	1997	2007	1997	2007	1997-2007
<b>Circulatory</b>	<b>3,971</b>	<b>3,851</b> ‡	<b>100.0%</b>	<b>100.0%</b>	<b>-3%</b>
Coronary atherosclerosis (coronary artery disease)	776	526	19.5	13.6	-32
Non-specific chest pain	188	308	4.7	8.0	64
Cardiac dysrhythmias (irregular heartbeat)	376	473	9.5	12.3	26
Acute cerebrovascular disease (stroke)	434	338	10.9	8.8	-22
Acute myocardial infarction (heart attack)	418	352	10.5	9.1	-16
<b>Digestive</b>	<b>1,253</b>	<b>1,480</b>	<b>100.0</b>	<b>100.0</b>	<b>18</b>
Intestinal infection	38	115	3.0	7.8	205
<b>Respiratory</b>	<b>1,630</b>	<b>1,809</b>	<b>100.0</b>	<b>100.0</b>	<b>11</b>
Respiratory failure	134	254	8.2	14.0	90
Asthma	69	110	4.2	6.1	59
<b>Injury and poisoning</b>	<b>1,095</b>	<b>1,338</b>	<b>100.0</b>	<b>100.0</b>	<b>22</b>
Complication of device, implant or graft	293	362	26.7	27.1	24
Complication of surgical procedures or medical care	158	214	14.4	16.0	35
<b>Musculoskeletal</b>	<b>645</b>	<b>940</b>	<b>100.0</b>	<b>100.0</b>	<b>46</b>
Osteoarthritis (degenerative joint disease)	279	455	43.3	48.4	63
Disorders of intervertebral discs and bones in spinal column (back problems)	163	234	25.3	24.9	44
<b>Genitourinary</b>	<b>602</b>	<b>865</b>	<b>100.0</b>	<b>100.0</b>	<b>44</b>
Acute renal failure	67	279	11.2	32.3	315
Urinary tract infections	227	330	37.7	38.2	46
<b>Endocrine</b>	<b>509</b>	<b>621</b>	<b>100.0</b>	<b>100.0</b>	<b>22</b>
Diabetes mellitus with complications	183	222	35.9	35.7	21
Fluid and electrolyte disorders (primarily dehydration or fluid overload)	260	295	51.0	47.5	14
<b>Symptoms</b>	<b>579</b>	<b>669</b>	<b>100.0</b>	<b>100.0</b>	<b>16</b>
Syncope	119	167	20.6	25.0	40
Rehabilitation care, fitting of prostheses, and adjustment of devices	265	311‡	45.8	46.5	17
<b>Infectious and parasitic</b>	<b>341</b>	<b>535</b>	<b>100.0</b>	<b>100.0</b>	<b>57</b>
Septicemia (blood infection)	276	464	81.2	86.8	68
<b>Skin and subcutaneous tissue</b>	<b>188</b>	<b>267</b>	<b>100.0</b>	<b>100.0</b>	<b>42</b>
Skin and subcutaneous tissue infections	131	213	69.7	79.6	62
<b>Blood</b>	<b>121</b>	<b>188</b>	<b>100.0</b>	<b>100.0</b>	<b>56</b>
Anemia	56	117	46.6	61.9	107

‡ 2007 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 2007.

This exhibit displays Medicare discharges for selected conditions with important contributions to growth within each body system.

Hospital stays for some conditions billed to Medicare more than doubled from 1997 to 2007:

- Acute renal failure more than quadrupled (315-percent growth).
- Intestinal infection more than tripled (205-percent growth).
- Anemia more than doubled (107-percent growth).

Hospital stays for several conditions grew at least 50 percent:

- There was rapid growth in stays for two respiratory conditions: respiratory failure (90 percent) and asthma (59 percent).
- Septicemia (blood infection) grew 68 percent.
- Non-specific chest pain increased 64 percent.
- Osteoarthritis stays (degenerative joint disease) rose by 63 percent.
- Skin and subcutaneous tissue infections grew 62 percent.

The number of hospital stays for three circulatory conditions decreased rapidly:

- Coronary atherosclerosis (coronary artery disease) dropped by 32 percent.
- Acute cerebrovascular disease (stroke) fell by 22 percent.
- Acute myocardial infarction (heart attack) declined by 16 percent.

## EXHIBIT 5.9 Growth in Discharges for Selected Conditions: Medicaid

Number of Discharges and Cumulative Growth for Principal CCS Conditions Contributing to Body System Change, Medicaid, 1997-2007

PRINCIPAL CCS CONDITIONS CONTRIBUTING TO BODY SYSTEM CHANGE	NUMBER OF DISCHARGES IN THOUSANDS		PERCENT OF BODY SYSTEM TOTAL		CUMULATIVE GROWTH
	1997	2007	1997	2007	1997-2007
<b>Circulatory</b>	<b>353</b>	<b>447</b>	<b>100.0%</b>	<b>100.0%</b>	<b>27%</b>
Non-specific chest pain	48	91	13.4	20.3	91
Congestive heart failure	58	75	16.4	16.8	30
<b>Pregnancy and childbirth</b>	<b>1,440</b>	<b>2,114</b>	<b>100.0</b>	<b>100.0</b>	<b>47</b>
Previous C-section	84	233	5.8	11.0	177
<b>Perinatal (newborns)</b>	<b>1,274</b>	<b>1,974</b>	<b>100.0</b>	<b>100.0</b>	<b>55</b>
Liveborn (newborn infant)	1,224	1,899	96.1	96.2	55
<b>Digestive</b>	<b>309</b>	<b>411</b>	<b>100.0</b>	<b>100.0</b>	<b>33</b>
Appendicitis	27	46	8.8	11.1	68
<b>Respiratory</b>	<b>527</b>	<b>537</b>	<b>100.0</b>	<b>100.0</b>	<b>2</b>
Respiratory failure	19	42	3.5	7.8	125
Pneumonia	166	155	31.5	28.8	-7
Asthma	125	116	23.7	21.5	-8
Chronic obstructive pulmonary disease	47	57	9.0	10.5	20
<b>Injury and poisoning</b>	<b>248</b>	<b>318</b>	<b>100.0</b>	<b>100.0</b>	<b>28</b>
Complication of surgical procedures or medical care	32	51	12.8	16.0	60
Complication of device, implant or graft	41	59	16.7	18.4	42
<b>Musculoskeletal</b>	<b>75</b>	<b>107</b>	<b>100.0</b>	<b>100.0</b>	<b>43</b>
Osteoarthritis (degenerative joint disease)	8	19	10.5	17.5	137
Disorders of intervertebral discs and bones in spinal column (back problems)	22	31	30.0	29.1	39
<b>Mental</b>	<b>473</b>	<b>533</b>	<b>100.0</b>	<b>100.0</b>	<b>13</b>
Mood disorders (depression and bipolar disorders)	147	193	31.0	36.3	32
<b>Genitourinary</b>	<b>152</b>	<b>195</b>	<b>100.0</b>	<b>100.0</b>	<b>28</b>
Acute renal failure	7	30	4.9	15.5	306
Urinary tract infections	52	68	34.2	34.8	30
<b>Endocrine</b>	<b>145</b>	<b>201</b>	<b>100.0</b>	<b>100.0</b>	<b>38</b>
Diabetes mellitus with complications	61	88	41.8	44.0	46
Fluid and electrolyte disorders (primarily dehydration or fluid overload)	61	75	41.7	37.4	24
<b>Symptoms</b>	<b>86</b>	<b>117</b>	<b>100.0</b>	<b>100.0</b>	<b>35</b>
Abdominal pain	20	30	23.4	25.4	47
<b>Infectious and parasitic</b>	<b>127</b>	<b>128</b>	<b>100.0</b>	<b>100.0</b>	<b>1</b>
Septicemia (blood infection)	39	64	30.8	49.8	62
HIV infection	45	27	35.3	21.1	-40

(continued on next page)

**Number of Discharges and Cumulative Growth for Principal CCS Conditions Contributing to Body System Change, Medicaid, 1997-2007—continued**

PRINCIPAL CCS CONDITIONS CONTRIBUTING TO BODY SYSTEM CHANGE	NUMBER OF DISCHARGES IN THOUSANDS		PERCENT OF BODY SYSTEM TOTAL		CUMULATIVE GROWTH
	1997	2007	1997	2007	1997-2007
<b>Nervous</b>	<b>112</b>	<b>143</b>	<b>100.0</b>	<b>100.0</b>	<b>28</b>
Epilepsy, convulsions	52	65	46.7	45.6	25
<b>Skin and subcutaneous tissue</b>	<b>61</b>	<b>117</b>	<b>100.0</b>	<b>100.0</b>	<b>92</b>
Skin and subcutaneous tissue infections	48	103	78.7	88.2	115
<b>Blood</b>	<b>69</b>	<b>83</b>	<b>100.0</b>	<b>100.0</b>	<b>21</b>
Anemia	10	22	14.9	26.9	118

‡ 2007 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 2007.

This exhibit displays Medicaid discharges for selected conditions with important contributions to growth within each body system.

Medicaid hospital stays for some conditions more than doubled from 1997 to 2007:

- Acute renal failure more than quadrupled (306-percent growth).
- Stays for several conditions more than doubled:
  - Previous C-section (up 177 percent).
  - Osteoarthritis (degenerative joint disease; up 137 percent).
  - Respiratory failure (up 125 percent).
  - Anemia (up 118 percent).
  - Skin and subcutaneous tissue infections (up 115 percent).

Hospital stays for several conditions grew at least 50 percent:

- Non-specific chest pain increased 91 percent.
- Appendicitis rose 68 percent.
- Septicemia (blood infection) grew 62 percent.
- Complication of surgical procedures or medical care increased 60 percent.
- Liveborn (newborn infant) discharges grew 55 percent.

There was a 40-percent decline in the number of hospital stays for HIV infection.

## EXHIBIT 5.10 Growth in Discharges for Selected Conditions: Private Insurance

### Number of Discharges and Cumulative Growth for Principal CCS Conditions Contributing to Body System Change, Private Insurance, 1997-2007

PRINCIPAL CCS CONDITIONS CONTRIBUTING TO BODY SYSTEM CHANGE	NUMBER OF DISCHARGES IN THOUSANDS		PERCENT OF BODY SYSTEM TOTAL		CUMULATIVE GROWTH
	1997	2007	1997	2007	1997-2007
<b>Circulatory</b>	<b>1,789</b>	<b>1,641</b> ‡	<b>100.0%</b>	<b>100.0%</b>	<b>-8%</b>
Coronary atherosclerosis (coronary artery disease)	484	313	27.1	19.0	-35
Acute myocardial infarction (heart attack)	240	184	13.4	11.2	-23
Cardiac dysrhythmias (irregular heartbeat)	150	188	8.4	11.4	25
Non-specific chest pain	241	275	13.5	16.8	14
<b>Pregnancy and childbirth</b>	<b>2,504</b>	<b>2,494</b> ‡	<b>100.0</b>	<b>100.0</b>	<b>0</b>
Normal pregnancy and/or delivery	288	121	11.5	4.8	-58
Fetal distress and abnormal forces of labor	248	127	9.9	5.1	-49
Previous C-section	168	286	6.7	11.5	70
Prolonged pregnancy	63	126	2.5	5.1	101
<b>Digestive</b>	<b>1,124</b>	<b>1,267</b>	<b>100.0</b>	<b>100.0</b>	<b>13</b>
Diverticulosis and diverticulitis	77	121	6.8	9.5	57
Appendicitis	140	181	12.5	14.3	29
Pancreatic disorders (not diabetes)	73	102	6.5	8.1	41
<b>Respiratory</b>	<b>883</b>	<b>748</b>	<b>100.0</b>	<b>100.0</b>	<b>-15</b>
Asthma	181	126	20.5	16.8	-31
Pneumonia	281	249	31.8	33.3	-11
Respiratory failure	36	65	4.1	8.7	80
<b>Injury and poisoning</b>	<b>873</b>	<b>904</b> ‡	<b>100.0</b>	<b>100.0</b>	<b>4</b>
Complication of surgical procedures or medical care	137	179	15.7	19.8	31
Complication of device, implant or graft	131	164	15.0	18.2	25
<b>Musculoskeletal</b>	<b>531</b>	<b>765</b>	<b>100.0</b>	<b>100.0</b>	<b>44</b>
Osteoarthritis (degenerative joint disease)	117	311	22.0	40.7	167
<b>Genitourinary</b>	<b>700</b>	<b>635</b>	<b>100.0</b>	<b>100.0</b>	<b>-9</b>
Acute renal failure	18	68	2.6	10.7	273
Endometriosis	70	41	10.0	6.5	-41
Calculus of urinary tract	108	82	15.4	12.9	-24
Menstrual disorders	57	81	8.2	12.8	42
<b>Infectious and parasitic</b>	<b>178</b>	<b>186</b> ‡	<b>100.0</b>	<b>100.0</b>	<b>5</b>
Septicemia (blood infection)	79	113	44.4	60.7	43
<b>Skin and subcutaneous tissue</b>	<b>124</b>	<b>202</b>	<b>100.0</b>	<b>100.0</b>	<b>63</b>
Skin and subcutaneous tissue infections	104	184	84.1	91.0	76
<b>Blood</b>	<b>88</b>	<b>114</b>	<b>100.0</b>	<b>100.0</b>	<b>31</b>
Anemia	27	47	30.5	41.1	76

‡ 2007 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 2007.

This exhibit displays private insurance discharges for selected conditions with important contributions to growth within each body system.

Hospital stays for some conditions billed to private insurance more than doubled from 1997 to 2007:

- Acute renal failure more than tripled (273-percent growth).
- Osteoarthritis (degenerative joint disease) more than doubled (167-percent growth).
- Prolonged pregnancy approximately doubled (101-percent growth).

Hospital stays for several conditions grew at least 50 percent:

- Respiratory failure rose 80 percent.
- Anemia and skin and subcutaneous tissue infections each increased 76 percent.
- Previous C-section was up by percent.
- Diverticulosis and diverticulitis increased 57 percent.

Hospital stays billed to private insurance declined for several conditions. Decreases in the number of stays for specific conditions correspond with the decline in enrollment in private insurance from 1997 to 2007.<sup>10</sup>

- Discharges for two pregnancy and childbirth conditions decreased substantially:
  - Normal pregnancy (58-percent decline).
  - Fetal distress and abnormal forces of labor (declined 49 percent).
- There was a rapid decrease in the number of stays for two genitourinary conditions:
  - Endometriosis (down 41 percent).
  - Calculus of urinary tract (fell 24 percent).
- Stays for two circulatory conditions declined rapidly:
  - Coronary atherosclerosis (coronary artery disease; down 35 percent).
  - Acute myocardial infarction (heart attack; 23-percent decline).
- The number of stays for two respiratory conditions decreased:
  - Asthma (31-percent decline).
  - Pneumonia (down 11 percent).

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<sup>10</sup> U.S. Census Bureau Current Population Survey (CPS). *Table HIA-1. Health Insurance Coverage Status and Type of Coverage—All Persons by Sex, Race and Hispanic Origin: 1999 to 2007* (<http://www.census.gov/hhes/www/hlthins/historic/index.html>).

## EXHIBIT 5.11 Growth in Discharges for Selected Conditions: Uninsured

Number of Discharges and Cumulative Growth for Principal CCS Conditions Contributing to Body System Change, Uninsured, 1997-2007

PRINCIPAL CCS CONDITIONS CONTRIBUTING TO BODY SYSTEM CHANGE	NUMBER OF DISCHARGES IN THOUSANDS		PERCENT OF BODY SYSTEM TOTAL		CUMULATIVE GROWTH
	1997	2007	1997	2007	1997-2007
<b>Circulatory</b>	<b>205</b>	<b>320</b>	<b>100.0%</b>	<b>100.0%</b>	<b>56%</b>
Non-specific chest pain	39	77	19.2	24.1	96
Congestive heart failure	19	36	9.4	11.3	88
<b>Pregnancy and childbirth</b>	<b>184</b>	<b>224</b> ‡	<b>100.0</b>	<b>100.0</b>	<b>21</b>
Previous C-section	9	22	4.7	10.0	156
Prolonged pregnancy	4	14	1.9	6.1	282
Normal pregnancy and/or delivery	24	16	13.2	7.1	-35
Fetal distress and abnormal forces of labor	16	10	8.9	4.4	-40
<b>Perinatal (newborns)</b>	<b>196</b>	<b>260</b>	<b>100.0</b>	<b>100.0</b>	<b>33</b>
Liveborn (newborn infant)	191	252	97.2	96.9	32
<b>Digestive</b>	<b>168</b>	<b>261</b>	<b>100.0</b>	<b>100.0</b>	<b>56</b>
Biliary tract disease	25	41	14.8	15.8	66
Pancreatic disorders (not diabetes)	23	39	13.6	14.9	71
<b>Respiratory</b>	<b>143</b>	<b>161</b> ‡	<b>100.0</b>	<b>100.0</b>	<b>12</b>
Respiratory failure	5	14	3.7	9.0	175
Chronic obstructive pulmonary disease	14	20	9.9	12.7	43
<b>Injury and poisoning</b>	<b>204</b>	<b>243</b> ‡	<b>100.0</b>	<b>100.0</b>	<b>19</b>
Complication of surgical procedures or medical care	9	16	4.4	6.7	80
Crushing injury or internal injury	17	23	8.4	9.4	34
<b>Musculoskeletal</b>	<b>29</b>	<b>44</b>	<b>100.0</b>	<b>100.0</b>	<b>53</b>
Osteoarthritis (degenerative joint disease)	2	5	6.8	11.6	163
<b>Mental</b>	<b>202</b>	<b>276</b>	<b>100.0</b>	<b>100.0</b>	<b>37</b>
Mood disorders (depression and bipolar disorders)	55	94	27.2	34.1	75
<b>Genitourinary</b>	<b>71</b>	<b>94</b>	<b>100.0</b>	<b>100.0</b>	<b>32</b>
Acute renal failure	3	14	4.0	14.7	387
Urinary tract infections	19	25	26.3	26.3	32
<b>Endocrine</b>	<b>56</b>	<b>93</b>	<b>100.0</b>	<b>100.0</b>	<b>67</b>
Diabetes mellitus with complications	31	54	55.7	58.4	75
<b>Symptoms</b>	<b>41</b>	<b>55</b>	<b>100.0</b>	<b>100.0</b>	<b>34</b>
Syncope	7	12	17.2	22.5	75
<b>Infectious and parasitic</b>	<b>34</b>	<b>44</b>	<b>100.0</b>	<b>100.0</b>	<b>30</b>
Septicemia (blood infection)	11	20	31.3	45.4	88
<b>Skin and subcutaneous tissue</b>	<b>33</b>	<b>79</b>	<b>100.0</b>	<b>100.0</b>	<b>136</b>
Skin and subcutaneous tissue infections	28	73	83.9	93.2	162
<b>Blood</b>	<b>11</b>	<b>23</b>	<b>100.0</b>	<b>100.0</b>	<b>112</b>
Anemia	4	12	37.0	52.5	200
Sickle cell anemia	3	5	24.2	21.5	88

‡ 2007 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 2007.

This exhibit displays uninsured discharges for selected conditions with important contributions to growth within each body system.

The large growth in the number of uninsured hospitalizations for several conditions was, in part, due to the increase in the number of uninsured individuals from 1997 to 2007.

Hospital stays for several conditions billed to the uninsured more than doubled from 1997 to 2007:

- Acute renal failure more than quadrupled (387 percent).
- Prolonged pregnancy (up 282 percent) and anemia (up 200 percent) at least tripled.
- Several conditions more than doubled:
  - Respiratory failure (up 175 percent).
  - Osteoarthritis (degenerative joint disease; up 163 percent).
  - Skin and subcutaneous tissue infections (up 162 percent).
  - Previous C-section (up 156 percent).

Hospital stays for several conditions grew at least 50 percent:

- Stays for two circulatory conditions grew rapidly: non-specific chest pain (96 percent) and congestive heart failure (88 percent).
- Septicemia (blood infection) and sickle cell anemia each increased 88 percent.
- Complication of surgical procedures or medical care rose 80 percent.
- Mood disorders (depression and bipolar disorders), diabetes mellitus, and syncope each increased 75 percent.
- The number of stays for two digestive conditions increased: pancreatic disorders (71 percent) and biliary tract disease (66 percent).

There was a decline for some conditions in the number of hospital stays billed to the uninsured:

- Stays for two pregnancy and childbirth conditions fell:
  - Fetal distress and abnormal forces of labor (40-percent decline).
  - Normal pregnancy (35-percent decline).

## 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

Principal CCS by body system or condition categories are summarized from specific CCS conditions using the multi-level CCS tool (<http://www.hcup-us.ahrq.gov/toolssoftware/ccs/ccs.jsp>). Mental health and substance abuse conditions are identified using the CCS-MHSA tool (<http://www.hcup-us.ahrq.gov/toolssoftware/mhsmhsmh.jsp>). (For more information on the ICD-9-CM codes that comprise each CCS, refer to <http://www.hcup-us.ahrq.gov/toolssoftware/ccs/AppendixASingleDX.txt> for diagnoses and <http://www.hcup-us.ahrq.gov/toolssoftware/ccs/AppendixBSinglePR.txt> for procedures.) The body system or condition category, CCS code and category name are listed below.

CATEGORY	CCS	CONDITION DESCRIPTION
1		INFECTIOUS AND PARASITIC DISEASE
	1	Tuberculosis
	2	Septicemia (except in labor)
	3	Bacterial infection; unspecified site
	4	Mycoses
	5	HIV infection
	6	Hepatitis

CATEGORY	CCS	CONDITION DESCRIPTION
	7	Viral infection
	8	Other infections; including parasitic
	9	Sexually transmitted infections (not HIV or hepatitis)
	10	Immunizations and screening for infectious disease
2		NEOPLASMS
	11	Cancer of head and neck
	12	Cancer of esophagus
	13	Cancer of stomach
	14	Cancer of colon
	15	Cancer of rectum and anus
	16	Cancer of liver and intrahepatic bile duct
	17	Cancer of pancreas
	18	Cancer of other GI organs; peritoneum
	19	Cancer of bronchus; lung
	20	Cancer; other respiratory and intrathoracic
	21	Cancer of bone and connective tissue
	22	Melanomas of skin
	23	Other non-epithelial cancer of skin
	24	Cancer of breast
	25	Cancer of uterus
	26	Cancer of cervix
	27	Cancer of ovary
	28	Cancer of other female genital organs
	29	Cancer of prostate
	30	Cancer of testis
	31	Cancer of other male genital organs
	32	Cancer of bladder
	33	Cancer of kidney and renal pelvis
	34	Cancer of other urinary organs
	35	Cancer of brain and nervous system
	36	Cancer of thyroid
	37	Hodgkin`s disease
	38	Non-Hodgkin`s lymphoma
	39	Leukemias
	40	Multiple myeloma
	41	Cancer; other and unspecified primary
	42	Secondary malignancies
	43	Malignant neoplasm without specification of site
	44	Neoplasms of unspecified nature or uncertain behavior
	45	Maintenance chemotherapy; radiotherapy
	46	Benign neoplasm of uterus
	47	Other and unspecified benign neoplasm

CATEGORY	CCS	CONDITION DESCRIPTION
3		ENDOCRINE, NUTRITIONAL, AND OTHER METABOLIC DISEASES AND IMMUNITY DISORDERS
	48	Thyroid disorders
	49	Diabetes mellitus without complication
	50	Diabetes mellitus with complications
	51	Other endocrine disorders
	52	Nutritional deficiencies
	53	Disorders of lipid metabolism
	54	Gout and other crystal arthropathies
	55	Fluid and electrolyte disorders
	56	Cystic fibrosis
	57	Immunity disorders
	58	Other nutritional; endocrine; and metabolic disorders
4		DISEASES OF THE BLOOD AND BLOOD FORMING ORGANS
	59	Deficiency and other anemia
	60	Acute posthemorrhagic anemia
	61	Sickle cell anemia
	62	Coagulation and hemorrhagic disorders
	63	Diseases of white blood cells
	64	Other hematologic conditions
5		MENTAL DISORDERS
	650	MHSA: Adjustment disorders
	651	MHSA: Anxiety disorders
	652	MHSA: Attention-deficit, conduct, and disruptive behavior disorders
	653	MHSA: Delirium, dementia, and amnestic and other cognitive disorders
	654	MHSA: Developmental disorders
	655	MHSA: Disorders usually diagnosed in infancy, childhood, or adolescence
	656	MHSA: Impulse control disorders, NEC
	657	MHSA: Mood disorders
	658	MHSA: Personality disorders
	659	MHSA: Schizophrenia and other psychotic disorders
	660	MHSA: Alcohol-related disorders
	661	MHSA: Substance-related disorders
	662	MHSA: Suicide and intentional self-inflicted injury
	663	MHSA: Screening and history of mental health and substance abuse code
	670	MHSA: Miscellaneous mental disorders
6		DISEASES OF THE NERVOUS SYSTEM AND SENSE ORGANS
	76	Meningitis (except that caused by tuberculosis or sexually transmitted disease)
	77	Encephalitis (except that caused by tuberculosis or sexually transmitted disease)
	78	Other CNS infection and poliomyelitis
	79	Parkinson`s disease
	80	Multiple sclerosis
	81	Other hereditary and degenerative nervous system conditions

CATEGORY	CCS	CONDITION DESCRIPTION
	82	Paralysis
	83	Epilepsy; convulsions
	84	Headache; including migraine
	85	Coma; stupor; and brain damage
	86	Cataract
	87	Retinal detachments; defects; vascular occlusion; and retinopathy
	88	Glaucoma
	89	Blindness and vision defects
	90	Inflammation; infection of eye (except that caused by tuberculosis or transmitted disease)
	91	Other eye disorders
	92	Otitis media and related conditions
	93	Conditions associated with dizziness or vertigo
	94	Other ear and sense organ disorders
	95	Other nervous system disorders
7		DISEASES OF THE CIRCULATORY SYSTEM
	96	Heart valve disorders
	97	Peri-; endo-; and myocarditis; cardiomyopathy (except that caused by tuberculosis or sexually transmitted disease)
	98	Essential hypertension
	99	Hypertension with complications and secondary hypertension
	100	Acute myocardial infarction
	101	Coronary atherosclerosis and other heart disease
	102	Nonspecific chest pain
	103	Pulmonary heart disease
	104	Other and ill-defined heart disease
	105	Conduction disorders
	106	Cardiac dysrhythmias
	107	Cardiac arrest and ventricular fibrillation
	108	Congestive heart failure; nonhypertensive
	109	Acute cerebrovascular disease
	110	Occlusion or stenosis of precerebral arteries
	111	Other and ill-defined cerebrovascular disease
	112	Transient cerebral ischemia
	113	Late effects of cerebrovascular disease
	114	Peripheral and visceral atherosclerosis
	115	Aortic; peripheral; and visceral artery aneurysms
	116	Aortic and peripheral arterial embolism or thrombosis
	117	Other circulatory disease
	118	Phlebitis; thrombophlebitis and thromboembolism
	119	Varicose veins of lower extremity
	120	Hemorrhoids
	121	Other diseases of veins and lymphatics

CATEGORY	CCS	CONDITION DESCRIPTION
8		DISEASES OF THE RESPIRATORY SYSTEM
	122	Pneumonia (except that caused by tuberculosis or sexually transmitted disease)
	123	Influenza
	124	Acute and chronic tonsillitis
	125	Acute bronchitis
	126	Other upper respiratory infections
	127	Chronic obstructive pulmonary disease and bronchiectasis
	128	Asthma
	129	Aspiration pneumonitis; food/vomit
	130	Pleurisy; pneumothorax; pulmonary collapse
	131	Respiratory failure; insufficiency; arrest (adult)
	132	Lung disease due to external agents
	133	Other lower respiratory disease
	134	Other upper respiratory disease
9		DISEASES OF THE DIGESTIVE SYSTEM
	135	Intestinal infection
	136	Disorders of teeth and jaw
	137	Diseases of mouth; excluding dental
	138	Esophageal disorders
	139	Gastroduodenal ulcer (except hemorrhage)
	140	Gastritis and duodenitis
	141	Other disorders of stomach and duodenum
	142	Appendicitis and other appendiceal conditions
	143	Abdominal hernia
	144	Regional enteritis and ulcerative colitis
	145	Intestinal obstruction without hernia
	146	Diverticulosis and diverticulitis
	147	Anal and rectal conditions
	148	Peritonitis and intestinal abscess
	149	Biliary tract disease
	151	Other liver diseases
	152	Pancreatic disorders (not diabetes)
	153	Gastrointestinal hemorrhage
	154	Noninfectious gastroenteritis
	155	Other gastrointestinal disorders
10		DISEASES OF THE GENITOURINARY SYSTEM
	156	Nephritis; nephrosis; renal sclerosis
	157	Acute and unspecified renal failure
	158	Chronic renal failure
	159	Urinary tract infections
	160	Calculus of urinary tract
	161	Other diseases of kidney and ureters

CATEGORY	CCS	CONDITION DESCRIPTION
	162	Other diseases of bladder and urethra
	163	Genitourinary symptoms and ill-defined conditions
	164	Hyperplasia of prostate
	165	Inflammatory conditions of male genital organs
	166	Other male genital disorders
	167	Nonmalignant breast conditions
	168	Inflammatory diseases of female pelvic organs
	169	Endometriosis
	170	Prolapse of female genital organs
	171	Menstrual disorders
	172	Ovarian cyst
	173	Menopausal disorders
	174	Female infertility
	175	Other female genital disorders
11		COMPLICATIONS OF CHILDBIRTH, PREGNANCY, AND THE PUERPERIUM
	176	Contraceptive and procreative management
	177	Spontaneous abortion
	178	Induced abortion
	179	Post abortion complications
	180	Ectopic pregnancy
	181	Other complications of pregnancy
	182	Hemorrhage during pregnancy; abruptio placenta; placenta previa
	183	Hypertension complicating pregnancy; childbirth and the puerperium
	184	Early or threatened labor
	185	Prolonged pregnancy
	186	Diabetes or abnormal glucose tolerance complicating pregnancy; childbirth; or the puerperium
	187	Malposition; malpresentation
	188	Fetopelvic disproportion; obstruction
	189	Previous C-section
	190	Fetal distress and abnormal forces of labor
	191	Polyhydramnios and other problems of amniotic cavity
	192	Umbilical cord complication
	193	OB-related trauma to perineum and vulva
	194	Forceps delivery
	195	Other complications of birth; puerperium affecting management of mother
	196	Normal pregnancy and/or delivery
12		DISEASES OF THE SKIN AND SUBCUTANEOUS TISSUE
	197	Skin and subcutaneous tissue infections
	198	Other inflammatory condition of skin
	199	Chronic ulcer of skin
	200	Other skin disorders

CATEGORY	CCS	CONDITION DESCRIPTION
13		DISEASES OF THE MUSCULOSKELETAL SYSTEM AND CONNECTIVE TISSUE.
	201	Diabetes or abnormal glucose tolerance complicating pregnancy; childbirth; or the puerperium
	202	Rheumatoid arthritis and related disease
	203	Osteoarthritis
	204	Other non-traumatic joint disorders
	205	Spondylosis; intervertebral disc disorders; other back problems
	206	Osteoporosis
	207	Pathological fracture
	208	Acquired foot deformities
	209	Other acquired deformities
	210	Systemic lupus erythematosus and connective tissue disorders
	211	Other connective tissue disease
	212	Other bone disease and musculoskeletal deformities
14		CONGENITAL ANOMALIES
	213	Cardiac and circulatory congenital anomalies
	214	Digestive congenital anomalies
	215	Genitourinary congenital anomalies
	216	Nervous system congenital anomalies
	217	Other congenital anomalies
15		CERTAIN CONDITIONS ORIGINATING IN THE PERINATAL PERIOD
	218	Liveborn
	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
16		INJURIES AND POISONINGS
	225	Joint disorders and dislocations; trauma-related
	226	Fracture of neck of femur (hip)
	227	Spinal cord injury
	228	Skull and face fractures
	229	Fracture of upper limb
	230	Fracture of lower limb
	231	Other fractures
	232	Sprains and strains
	233	Intracranial injury
	234	Crushing injury or internal injury
	235	Open wounds of head; neck; and trunk
	236	Open wounds of extremities
	237	Complication of device; implant or graft

CATEGORY	CCS	CONDITION DESCRIPTION
	238	Complications of surgical procedures or medical care
	239	Superficial injury; contusion
	240	Burns
	241	Poisoning by psychotropic agents
	242	Poisoning by other medications and drugs
	243	Poisoning by nonmedicinal substances
	244	Other injuries and conditions due to external causes
17		OTHER CONDITIONS
	245	Syncope
	246	Fever of unknown origin
	247	Lymphadenitis
	248	Gangrene
	249	Shock
	250	Nausea and vomiting
	251	Abdominal pain
	252	Malaise and fatigue
	253	Allergic reactions
	254	Rehabilitation care; fitting of prostheses; and adjustment of devices
	255	Administrative/social admission
	256	Medical examination/evaluation
	257	Other aftercare
	258	Other screening for suspected conditions (not mental disorders or infectious disease)

## SECTION 2—INPATIENT HOSPITAL STAYS BY DIAGNOSIS

### EXHIBIT 2.1

Chronic conditions were identified using the Chronic Conditions Indicator, an HCUP tool used to categorize ICD-9-CM diagnosis codes into one of two categories: chronic or not chronic (acute). Diagnosis codes for this tool are based on the *International Classification of Diseases, 9th Revision, Clinical Modification (ICD-9-CM)*, Fifth Edition. Additional information can be found at <http://www.hcup-us.ahrq.gov/toolssoftware/chronic/chronic/chronic.jsp>.

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

CCS	CONDITION DESCRIPTION
176	Contraceptive and procreative management (birth control or helping with conception)
177	Spontaneous abortion
178	Induced abortion
179	Postabortion complications (complications following abortion)
180	Ectopic pregnancy (abdominal or tubal pregnancy)
181	Other complications of pregnancy
182	Hemorrhage during pregnancy, abruptio placenta, placenta previa (bleeding and placenta disorders during pregnancy)
186	Diabetes or abnormal glucose tolerance complicating pregnancy, childbirth, or the puerperium (diabetes or high blood glucose during pregnancy)
187	Malposition, malpresentation (breech birth and other disorders of baby's position during birth)

188	Obstructed labor or fetopelvic disproportion
194	Forceps delivery
195	Other maternal complications of birth, puerperium affecting management of mother (other maternal complications of birth and period after childbirth)

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

CCS	CONDITION DESCRIPTION
218	Liveborn
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

#### EXHIBIT 2.4

Comorbidities were defined using the Comorbidity software, an HCUP tool that assigns variables that identify comorbidities in hospital discharge records using the diagnosis coding of ICD-9-CM (*International Classification of Diseases, Ninth Edition, Clinical Modifications*). For more information, see <http://www.hcup-us.ahrq.gov/toolssoftware/comorbidity/comorbidity.jsp>.

### SECTION 3—INPATIENT HOSPITAL STAYS BY PROCEDURE

#### EXHIBIT 3.1

Two steps were used to define maternal and infant procedures. First, all maternal and newborn stays were identified using the following codes:

Maternal stays were identified using the Major Diagnostic Code 14: Pregnancy, childbirth and the puerperium.

Newborn stays were identified using the following CCS diagnostic codes:

CCS	CONDITION DESCRIPTION
218	Liveborn
219	Short gestation, low birth weight, and fetal growth retardation
220	Intrauterine hypoxia and birth asphyxia (lack of oxygen to baby in uterus or during birth)
221	Respiratory distress syndrome
222	Hemolytic jaundice and perinatal jaundice
223	Birth trauma
224	Other perinatal conditions (other conditions occurring around the time of birth)

Second, maternal and newborn stays were examined for the following CCS all-listed procedures that were typically associated with maternal and infant stays:

Maternal procedures:

CCS	PROCEDURE DESCRIPTION
133	Episiotomy (surgical incision into the perineum and vagina to prevent traumatic tearing during delivery)
134	Cesarean section
135	Forceps, vacuum, and breech delivery
136	Artificial rupture of membranes to assist delivery

137	Other procedures to assist delivery
138	Diagnostic amniocentesis (diagnostic sampling of the fluid in the amniotic sac)
139	Fetal monitoring
140	Repair of obstetric laceration
141	Other therapeutic obstetrical procedures

Infant procedures:

CCS	PROCEDURE DESCRIPTION
115	Circumcision
220	Ophthalmologic and otologic diagnosis and treatment (vision and hearing diagnosis and treatment)
228	Prophylactic vaccinations and inoculations

## **SECTION 4—SPENDING FOR INPATIENT HOSPITAL STAYS**

### **EXHIBIT 4.1**

See definition for CCS Body System and Condition Categories under Exhibit 1.3 above.

## **SECTION 5—PAYERS FOR INPATIENT HOSPITAL STAYS**

### **EXHIBIT 5.5**

See definition of maternal stays under Exhibit 3.1 above.

### **EXHIBIT 5.8 and 5.9**

See definition for CCS Body System and Condition Categories under Exhibit 1.3 above.

## 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.

### **Chronic Condition**

A chronic condition is defined as a condition that lasts 12 months or longer and meets one or both of the following tests: (a) it places limitations on self-care, independent living, and social interactions; (b) it results in the need for ongoing intervention with medical products, services, and special equipment. The identification of chronic conditions is based on all 5-digit ICD-9-CM codes. E Codes, or external cause of injury codes, are not classified because all injuries are assumed to be acute. Additional information on the Chronic Condition Indicator (CCI) HCUP tool can be found at <http://www.hcup-us.ahrq.gov/toolssoftware/chronic/chronic.jsp>.

### **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.

### **Comorbidity**

Comorbidities are coexisting medical conditions that are not directly related to the principal diagnosis, or the main reason for admission, and are likely to have originated prior to the hospital stay. Comorbidities can make a hospital stay more expensive and complicated. For more information on the Comorbidity Software tool used in this report see <http://www.hcup-us.ahrq.gov/toolssoftware/comorbidity/comorbidity.jsp>.

### **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.

**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.

**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 per 1,000 population**

Discharges per 1,000 population is the hospital discharge rate of a particular procedure, diagnosis, or event per 1,000 individuals. This measure indicates the prevalence of hospitalizations, procedures or diagnoses within the population.

**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.

**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 Worker's 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.

## 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.

2007 Introduction to the NIS. Healthcare Cost and Utilization Project (HCUP). June 2009. Agency for Healthcare Research and Quality, Rockville, MD ([http://www.hcup-us.ahrq.gov/db/nation/nis/NIS\\_2007\\_INTRODUCTION.pdf](http://www.hcup-us.ahrq.gov/db/nation/nis/NIS_2007_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

Levit K (Thomson Reuters), Wier L (Thomson Reuters), Stranges E (Thomson Reuters), Ryan K (Thomson Reuters), Elixhauser A (AHRQ). *HCUP Facts and Figures: Statistics on Hospital-based Care in the United States, 2007*. Rockville, MD: Agency for Healthcare Research and Quality, 2009 (<http://www.hcup-us.ahrq.gov/reports.jsp>).