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Characteristics of Weekday and Weekend Hospital Admissions

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Introduction

Previous research found that hospital admission on weekends was associated with increased mortality, greater lengths of stay, and delay in performance of procedures for certain conditions, including cardiac arrest, heart attack, stroke, and upper gastrointestinal hemorrhage.[1] Some studies attribute worse weekend outcomes, referred to as the "weekend effect," to lower hospital staffing levels and service availability.[2] Other research suggests that differences in outcomes occur because underlying and complicating conditions available from detailed clinical information are not always fully considered in these studies.[3]

This Statistical Brief presents descriptive data from the Healthcare Cost and Utilization Project (HCUP) Nationwide Inpatient Sample (NIS) and focuses on differences between weekend and weekday admissions in 2007 for patient, hospital, and stay characteristics. This information provides an overview of differences between patients admitted on weekends and those admitted on weekdays, but does not adjust for severity of illness at admission. All differences between estimates provided in the text are statistically significant at the 0.05 level or better.

Highlights

- Of the 39.5 million community hospital stays in 2007, 7.7 million stays or about 19 percent began on a weekend.
- A smaller share of weekend than weekday admissions was elective (11 percent weekend and 28 percent weekday); a larger share was admitted through the emergency department (65 percent weekend and 44 percent weekday) or died in-hospital (2.4 percent weekend and 1.8 percent weekday).
- Patients admitted on weekends tend to experience delays in receiving major procedures. On the day of admission, weekend-admitted patients received 36 percent of major procedures that they would receive during their stays, compared to 65 percent for patients admitted on weekdays. This delay may be related to the scheduled nature of weekday procedures, but may also be an indicator of quality of care.
- By the first day after admission, 64 percent of weekend-admitted patients with heart attacks received major cardiac procedures, compared with 76 percent for weekday-admitted patients. Similarly, 44 percent of weekend-admitted patients with GI bleeds received GI endoscopy, compared with 58 percent of weekday-admitted patients.
- Thirty-four percent of all admissions for crushing or internal injuries and 32 percent for brain injuries prompted weekend admissions in 2007.

[1] Peberdy MA, Ornato JP, Larkin GL, et al. *Survival from in-hospital cardiac arrest during nights and weekends*. JAMA 99(7): 785-792,2008; Kostis WS, Demissie K, Marcella SW, et al. *Weekend versus weekday admission and mortality from myocardial infarction.* N Engl J Med 356(11): 1099-1109, 2007; Ananthakrishnan AN, McGinley EL, Saeian K. *Outcomes of weekend admissions for upper gastrointestinal hemorrhage: A nationwide analysis*. Clin Gastroenterol Hepatol. 7(3):296-302e1, Mar 2009; Cubeddu RJ, Cruz-Gonzalez I, Kiernan TJ et al, *ST-elevation myocardial infarction mortality in a major academic center "on-" versus "off–" hours.* J Invasive Cardiol 21(10):518-523, 2009; Becker DJ. *Do hospitals provide lower quality care on weekends?* Health Serv Res 42 (4):1589-612, 2007.

[2] Hamilton P, Eschiti VA, Hernandez K, et al. *Differences between weekend and weekday nurse work environments and patient outcomes: a focus group approach to model testing.* J Perinat Neonatal Nurs 21(4): 331-41, 2007; Kostis, et al., 2007; Ananthakrishnan et al., 2009; Becker, 2007; Cubeddu et al., 2009.

[3] http://news-releases.uiowa.edu/2004/july/072304weekend.html

Findings

Characteristics of weekday and weekend hospital admissions
Of the 39.5 million community hospital stays in 2007, 7.7 million stays or about 19 percent of all stays began on Saturday or Sunday (table 1). Patient characteristics, including average age, gender, and median household income, were comparable for weekend and weekday hospital admissions, as was the distribution of discharges across hospital characteristics such as bed size, teaching status, urban/rural location, and region (table 1). In addition, there were no differences between weekend and weekday admissions in the average length of stay (4.6 days), the percentage of maternal and newborn stays (25–26 percent), the percentage with an external cause of injury (7–9 percent), or the distribution of discharges by payer.

However, there were some notable differences for weekend admissions, as shown in table 1. Only 11 percent of weekend admissions were elective compared to 28 percent of weekday admissions. A higher percentage of weekend admissions came through the emergency department (65 percent weekend versus 44 percent weekday) and a larger share died during the hospital stay (2.4 percent weekend versus 1.8 percent weekday), potentially related to the higher share of emergency admissions with critical conditions. The average cost for a stay beginning on a weekend ($8,200) was slightly lower than for stays beginning on weekdays ($8,800).

Days to procedures for weekend admissions
Most patients entering the hospital on weekends usually do so because of a medical emergency. Patients admitted on weekends tend to experience delays in receiving major procedures (figure 1). On the day of admission, weekend-admitted patients received 36 percent of major procedures that they would be receiving during their stays, compared to 65 percent for patients admitted on weekdays. The treatment gap for major procedures did not become insignificant until day three after admission. Although the delay in treatment may be related to the scheduled nature of weekday procedures, it may also be an indicator of quality of care.

Table 2 lists selected conditions that are likely to require immediate treatment and the associated major procedure performed for each. Conditions are grouped by the delay in treatment, beginning with conditions for which there was no significant delay in treatment or the weekend admissions were treated sooner than weekday admissions. Subsequent entries list conditions with a statistically significant delay in treatment for the day of admission and then for days one and two after admission.

For certain conditions requiring immediate treatment, the days between admission and the major procedure occurred with the same or shorter wait times for weekend as weekday admissions. For example, by the first day after a weekend and a weekday admission, 98 percent of appendectomies had been completed, as had 98 percent of artificial rupture of membranes to assist delivery and 71–73 percent of procedures to treat a fracture or dislocation of hip and femur. Patients requiring wound debridement to treat open wounds or burns received treatment more quickly on weekends (53 percent on the day of admission) than on weekdays (47 percent), as did patients admitted for aortic resection, replacement or anastomosis to treat dissecting or ruptured aneurysm (79 percent received treatment on the day of a weekend admission compared to 72 percent for weekday admissions).

For some conditions, there were gaps in the percentage of procedures performed for weekend admissions on the day of admission but this difference disappeared by the first day after admission. For example, for removal of a clot from the arteries of the legs, 57 percent of weekend admissions and 65 percent of weekday admissions received treatment on the day of admission. Exploratory abdominal surgery was performed on the day of admission for only 54 percent of weekend admissions compared to 60 percent of weekday admissions.

For several other conditions, patients admitted on weekends experienced even longer treatment delays. For heart attacks treated or diagnosed using various cardiac procedures (coronary artery

bypass graph (CABG), PTCA, dissolving of blood clot in the heart, and diagnostic procedure to explore the functioning of the heart), a lower share of procedures was performed by the first day after a weekend admission (64 percent) than first day after a weekday admission (76 percent). Non-hip fractures also experienced some delay in surgical repair for patients admitted on weekends, as measured at the first day after admission: 76 percent of weekend admissions for non-hip fractures received treatment compared to 80 percent of weekday admissions. The treatment gap did not disappear until day two after admission for both of these conditions.

For two other conditions (hip replacement to treat a hip fracture and gastrointestinal (GI) endoscopy to treat a GI bleed), there was no difference in time to treatment between weekend and weekday admissions; for both groups 13–16 percent of GI bleed cases received endoscopy. However, weekend admissions experienced longer wait times on the first day after admission, a gap that disappeared by day two after admission.

The treatment delays for patients admitted on weekends versus weekdays were significant for angina, gall bladder removal to treat acute cholecystitis, and hernia repair to treat complicated hernia from the day of admission; these delays did not abate until more than two days after admission.

For comparison, table 2 also shows procedures where delay in immediate treatment was usually not critical. Wait times for these procedures following weekend admissions were significantly longer than for weekday admissions. Only 50–76 percent of patients admitted on the weekend and who underwent procedures for back surgery, thyroidectomy, or arthroplasty of the knee had the procedure by the first day after admission, compared to 93–98 percent of patients admitted on a weekday.

Reasons for weekend admissions

Table 3 displays the number of discharges for specific conditions. The most common reason for admission to the hospital during the weekend in 2007 was for the birth of a newborn infant (923,000 discharges), followed by pneumonia (286,000 discharges). Four of the top 10 conditions were cardiac-related and included congestive heart failure (227,000 discharges), chest pain (191,000 discharges), heart attack (161,000 discharges), and irregular heart beat (cardiac dysrhythmias) (142,000 discharges). Blood infection (septicemia), chest pain, mood disorders, and COPD were common conditions among patients admitted on weekends.

Table 3 also examines the 10 most frequently occurring reasons for hospitalization among the top 100 conditions. Some of these reasons for admission were more likely to occur on the weekend, such as certain injuries. Thirty-four percent of all admissions for crushing or internal injuries and 32 percent of admissions for brain injuries prompted weekend admissions in 2007. However, some of the top reasons were no more likely (and some were less likely) to occur for admissions that began on weekends than on weekdays. These admissions included other accident-related reasons—such as fractures of the upper and lower limbs and hip—and other reasons, such as poisonings by other medications and drugs, fainting, aspiration of stomach contents into the lungs, heart attack, and stroke.

Weekday hospital admissions were often planned in advance for many of the top conditions and the reasons for those planned admissions seldom led to weekend admissions. Ninety-nine percent of admissions for degenerative joint disease (osteoarthritis) and 93 percent for back problems were weekday admissions. Admissions with diagnoses of tumors in the uterus, prostrate, and breast, as well as chemotherapy and radiation therapy occurred as part of a weekday admission more than 95 percent of the time. Discharges with prolapse of female genital organs, menstrual disorders, blockage of arteries before the brain, and heart valve disorders were seldom the reason for a weekend admission.

Procedures for weekend admissions

The 10 most frequent major procedures performed for patients admitted on a weekend are listed in table 4. The two most frequent procedures, circumcision and C-section, were associated with

childbirth and newborns—the most frequent reason for hospitalization. Tubal ligation, the tenth most frequently performed procedure, was often performed in conjunction with childbirth. Three additional frequently performed procedures were for conditions associated with accidents or injuries (treatment for a hip or non-hip fracture or dislocation and wound debridement). The remaining top procedures are often required on an emergency basis. They include PTCA (percutaneous transluminal coronary angioplasty—a procedure involving the use of a balloon-tipped catheter to enlarge a narrowed artery), removal of the gall bladder, removal of the appendix, and excision of intra-abdominal adhesions.

Table 4 also displays the most frequently performed major procedures (50,000 or more in 2007) with the highest and lowest share performed on patients admitted on weekends. Procedures with the highest share performed on weekend admissions (18 percent or more of the specific procedures) were usually those related to injury or unexpected onset of illness, were life-threatening, or in one case (circumcision), related to newborns. Procedures with some of the highest shares occurring on weekend admissions were treatment of a fracture (leg, hip, and lower arm) and wound debridement—conditions usually caused by accidents or injuries. Other procedures with the highest share performed on weekend admissions were for emergency conditions, including removal of gall bladder and cholangiogram (an associated x-ray procedure where contrast dye is injected into the bile duct during surgery), colostomy (surgical construction of an artificial anus between the colon and the surface of the abdomen), and bronchoscopy (a procedure to view and biopsy the breathing passages in the lung through a lighted tube).

Frequently performed major operating room procedures (performed at least 50,000 or more times in 2007) that were associated with conditions that do not immediately endanger the health of the patient were seldom scheduled for weekends. Half of the top 10 major procedures with the lowest share performed on patients admitted on weekends (3 percent or less of the procedures) were typically related to cancer treatment, including surgery to remove the prostate (open prostatectomy), breast (mastectomy), uterus (hysterectomy), thyroid (thyroidectomy), and ovary (oophorectomy). Two percent or fewer of two orthopedic procedures, arthroplasty of the knee and back surgery, were performed on patients admitted on weekends. The remaining procedures were among those that were almost never performed on patients whose stays began on weekends: repair of bladder and rectal hernias (zero percent on weekends) and urinary incontinence procedures (one percent on weekends).

Data Source

The estimates in this Statistical Brief are based upon data from the HCUP Nationwide Inpatient Sample, 2007.

Definitions

Diagnoses, Procedures, ICD-9-CM, and Clinical Classifications Software (CCS)
The principal diagnosis is that condition established after study to be chiefly responsible for the patient's admission to the hospital. Secondary diagnoses are concomitant conditions that coexist at the time of admission or that develop during the stay. The principal procedure is the procedure that was performed for definitive treatment rather than one performed for diagnostic or exploratory purposes (i.e., the procedure that was necessary to take care of a complication). If two procedures appear to meet this definition, the procedure most related to the principal diagnosis was selected as the principal procedure. All-listed procedures include all procedures performed during the hospital stay.

This report also used major procedure codes for diagnostic and therapeutic procedures. These procedures are all procedures considered valid operating room procedures by the Diagnosis Related Group (DRG) grouper and that are performed for diagnostic reasons (e.g., 01.14 Open brain biopsy) or for therapeutic reasons (e.g., 39.24 Aorta-renal bypass) and exclude non-operating room procedure categories as well as non-specific procedure categories. Examples of excluded procedure categories include blood transfusions and CT scans.

ICD-9-CM is the International Classification of Diseases, Ninth Revision, Clinical Modification, which assigns numeric codes to diagnoses. There are about 12,000 ICD-9-CM diagnosis codes.

Clinical Classification Software (CCS) is a tool that categorizes ICD-9-CM diagnoses and procedures into clinically meaningful categories.[4] This "clinical grouper" makes it easier to quickly understand patterns of diagnoses and procedures.

Case definition
In table 2, the following principal CCS codes were used to identify diagnoses and the related all-listed CCS procedures (listed after the colon below in each grouping):

- Appendicitis principal CCS code 142: Appendectomy (removal of appendix) all-listed CCS procedure code 80
- Heart attack (acute myocardial infarction) principal CCS code 100: CABG (coronary artery bypass graft, procedure to restore blood supply to the heart muscle), PTCA (percutaneous transluminal coronary angioplasty, procedure involving use of a balloon-tipped catheter to enlarge a narrowed artery), dissolving of blood clot in the heart, and diagnostic procedure to explore the functioning of the heart all-listed CCS procedure codes 44–47
- Hip fracture principal CCS code 226: Treatment of fracture or dislocation of hip and femur all-listed CCS procedure code 146, and hip replacement, total and partial all-listed CCS procedure code 153

The following all-listed CCS codes were used to identify diagnoses with the related all-listed CCS procedures (listed after the colon in each grouping) in table 2:

- Open wound or burn all-listed CCS codes 235, 236, 240: Wound debridement all-listed CCS procedure code 169
- Any fracture (non-hip) all-listed CCS codes 228–231: Treatment of fracture or dislocation (other than hip and femur) all-listed CCS procedure codes 144–148

The following principal ICD-9-CM codes were used to identify diagnoses with the related all-listed CCS procedures (listed after the colon in each grouping) in table 2:

- Dissecting or ruptured aneurysm principal ICD-9-CM codes 44100–4411, 4413, 4415, 4416: Aortic resection, replacement or anastomosis all-listed CCS procedure code 52
- Acute cholecystitis w or w/o cholelithiasis principal ICD-9-CM codes 57400, 57401, 57430, 57431, 57460, 57461, 5480, 57481, 5750, 57512: Cholecystectomy (gall bladder removal) all-listed CCS procedure code 84
- Complicated hernia—gangrene, obstructed, strangulated principal ICD-9-CM codes 55000–55013, 55100–5529: Hernia repair all-listed CCS procedure codes 85, 86
- Arterial embolism, thrombosis, or atheroembolism of lower extremities principal ICD-9-CM codes 44422, 4450: Embolectomy and endarterectomy of lower limbs all-listed CCS procedure code 60
- Angina principal ICD-9-CM codes 4130–4139: CABG, PTCA, dissolving of blood clot in the heart, and diagnostic procedure to explore the functioning of the heart all-listed CCS procedure codes 44–47
- GI bleed principal ICD-9-CM codes 5780–5789: GI endoscopy all-listed CCS procedure codes 70, 76

[4] HCUP CCS. Healthcare Cost and Utilization Project (HCUP). May 2008. U.S. Agency for Healthcare Research and Quality, Rockville, MD. www.hcup-us.ahrq.gov/toolssoftware/ccs/ccs.jsp

The following all-listed CCS procedures were used to identify procedures regardless of diagnosis in table 2:

- Any diagnosis: Artificial rupture of membranes to assist delivery all-listed CCS procedure code 136
- Any diagnosis: Exploratory abdominal surgery (exploratory laparotomy) all listed CCS procedure code 89
- Any diagnosis: Back surgery (laminectomy) all-listed CCS procedure code 3
- Any diagnosis: Thyroidectomy (removal of all or part of thyroid gland) all-listed CCS procedure code 10
- Any diagnosis: Arthroplasty of knee (surgical reconstruction or replacement of knee) all-listed CCS procedure code 152

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

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

Costs and charges
Total hospital charges were converted to costs using HCUP Cost-to-Charge Ratios based on hospital accounting reports from the Centers for Medicare and Medicaid Services (CMS).[5] Costs will tend to reflect the actual costs of production, while charges represent what the hospital billed for the case. For each hospital, a hospital-wide cost-to-charge ratio is used because detailed charges are not available across all HCUP States. Hospital charges reflect the amount the hospital charged for the entire hospital stay and does not include professional (physician) fees. For the purposes of this Statistical Brief, costs are reported to the nearest hundred.

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

- Medicare includes fee-for-service and managed care Medicare patients.
- Medicaid includes fee-for-service and managed care Medicaid patients. Patients covered by the State Children's Health Insurance Program (SCHIP) may be included here. Because most state data do not identify SCHIP patients specifically, it is not possible to present this information separately.
- Private insurance includes Blue Cross, commercial carriers, and private HMOs and PPOs.
- Other includes 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.

Median income of the patient's ZIP Code
Median community-level income is the median household income of the patient's ZIP Code of residence. The cut-offs for the quartile designation are determined using ZIP Code demographic

[5] HCUP Cost-to-Charge Ratio Files (CCR). Healthcare Cost and Utilization Project (HCUP). 2001–2007. U.S. Agency for Healthcare Research and Quality, Rockville, MD. www.hcup-us.ahrq.gov/db/state/costtocharge.jsp.

data obtained from Claritas. The income quartile value is missing for homeless and foreign patients. In 2006, the lowest income quartile ranged from $1–$37,999, while the highest income quartile was defined as $62,000 or above. Patients in the lowest quartile were classified as living in the poorest communities; all others were classified as living in "relatively wealthier" or "other communities."

Admission source
Admission source indicates where the patient was located prior to admission to the hospital. Emergency admission indicates the patient was admitted to the hospital through the emergency department. Admission from another hospital indicates the patient was admitted to this hospital from another short-term, acute-care hospital. This usually signifies that the patient required the transfer in order to obtain more specialized services that the originating hospital could not provide. Admission from long-term care facility indicates the patient was admitted from a long-term facility such as a nursing home.

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

About HCUP

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

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

Arizona Department of Health Services
Arkansas Department of Health
California Office of Statewide Health Planning and Development
Colorado Hospital Association
Connecticut Hospital Association
Florida Agency for Health Care Administration
Georgia Hospital Association
Hawaii Health Information Corporation
Illinois Department of Public Health
Indiana Hospital Association
Iowa Hospital Association
Kansas Hospital Association
Kentucky Cabinet for Health and Family Services
Louisiana Department of Health and Hospitals
Maine Health Data Organization
Maryland Health Services Cost Review Commission
Massachusetts Division of Health Care Finance and Policy
Michigan Health & Hospital Association
Minnesota Hospital Association
Missouri Hospital Industry Data Institute
Nebraska Hospital Association
Nevada Department of Health and Human Services

New Hampshire Department of Health & Human Services
New Jersey Department of Health and Senior Services
New York State Department of Health
North Carolina Department of Health and Human Services
Ohio Hospital Association
Oklahoma State Department of Health
Oregon Association of Hospitals and Health Systems
Pennsylvania Health Care Cost Containment Council
Rhode Island Department of Health
South Carolina State Budget & Control Board
South Dakota Association of Healthcare Organizations
Tennessee Hospital Association
Texas Department of State Health Services
Utah Department of Health
Vermont Association of Hospitals and Health Systems
Virginia Health Information
Washington State Department of Health
West Virginia Health Care Authority
Wisconsin Department of Health Services
Wyoming Hospital Association

About the NIS

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

For More Information

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

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

For information on other hospitalizations in the U.S., download *HCUP Facts and Figures: Statistics on Hospital-based Care in the United States in 2007*, located at http://www.hcup-us.ahrq.gov/reports.jsp.

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

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

Introduction to the HCUP Nationwide Inpatient Sample, 2007. Online. June 16, 2009. U.S. Agency for Healthcare Research and Quality. 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). U.S. Agency for Healthcare Research and Quality. http://www.hcup-us.ahrq.gov/reports/CalculatingNISVariances200106092005.pdf

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

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Agency for Healthcare Research and Quality
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Rockville, MD 20850

Table 1: Patient, hospital, and stay characteristics for weekday and weekend admissions, 2007			
Characteristic	**All admissions**	**Weekday admissions**	**Weekend admissions**
All stays (thousands)	39,542	31,882	7,660
Percentage of all admissions		81%	19%
Patient Characteristics			
Average age (years)	47.2	47.4	46.6
Median household income for patient's ZIP Code			
$1–38,999	29%	29%	30%
$39,000–47,999	25%	25%	25%
$48,000–62,999	22%	23%	22%
$63,000+	21%	21%	20%
Percentage male	41%	41%	42%
Hospital Characteristics			
Bed size percentage distribution			
Small	12%	12%	12%
Medium	24%	24%	24%
Large	64%	64%	63%
Percentage teaching	47%	48%	47%
Percentage urban	87%	87%	87%
Region percentage distribution			
Northeast	20%	20%	20%
Midwest	23%	23%	23%
South	39%	39%	38%
West	19%	19%	19%
Stay characteristics			
Average length of stay (days)	4.6	4.6	4.6
Percentage maternal/newborn stay	24.8%	24.7%	25.6%
Percentage elective admissions	24.6%	28.0%*	10.6%*
Percentage admitted from emergency department	47.8%	43.6%*	65.3%*
Percentage with external cause of injury as principal diagnosis	7.6%	7.2%	9.4%
Percentage died	1.9%	1.8%*	2.4%*
Average cost	$8,700	$8,800*	$8,200*
Percentage of discharges by payer			
Medicare	36%	36%	37%
Medicaid	19%	19%	21%
Private insurance	35%	35%	32%
Uninsured	6%	6%	7%
Other	3%	4%	3%

*Differences between weekday and weekend admissions significant at the 0.05 level or better.
Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample (NIS), 2007

Table 2. Conditions with related major procedures and days to procedure by weekday or weekend admission					
Diagnosis: procedure	Admission day	Number of discharges in thousands	Cumulative percentage Days to procedure** 0	1	2
Conditions requiring immediate treatment					
Appendicitis: Appendectomy (removal of appendix)	Weekday	219.9	82%	98%	99%
	Weekend	73.9	83%	98%	99%
Any diagnosis: Artificial rupture of membranes to assist delivery	Weekday	950.3	77%	98%	99%
	Weekend	220.6	77%	98%	99%
Hip fracture: Treatment of fracture or dislocation of hip and femur	Weekday	130.3	28%	73%	89%
	Weekend	50.0	27%	71%	88%
Open wound or burn: Wound debridement	Weekday	32.1	47%*	66%	76%
	Weekend	11.8	53%*	68%	76%
Dissecting or ruptured aneurysm: Aortic resection, replacement or anastomosis	Weekday	3.9	72%*	87%	92%
	Weekend	1.3	79%*	89%	94%
Arterial embolism, thrombosis, or atheroembolism of lower extremities: Surgical removal of an obstructing clot from the arteries of the legs	Weekday	5.5	65%*	83%	89%
	Weekend	1.3	57%*	80%	87%
Any diagnosis: Exploratory abdominal surgery	Weekday	30.5	60%*	73%	78%
	Weekend	7.9	54%*	72%	78%
Heart attack (acute myocardial infarction): CABG† , PTCA‡, dissolving of blood clot in the heart, and diagnostic procedure to explore the functioning of the heart	Weekday	308.0	54%*	76%*	83%
	Weekend	101.9	44%*	64%*	83%
Any fracture (non-hip): Treatment of fracture or dislocation (other than hip and femur)	Weekday	319.4	54%*	80%*	89%
	Weekend	118.5	46%*	76%*	87%
Hip Fracture: Hip replacement, total and partial	Weekday	75.3	22%	68%*	86%
	Weekend	26.4	20%	63%*	84%
GI bleed: GI endoscopy	Weekday	88.5	16%	58%*	79%
	Weekend	25.8	13%	44%*	78%
Angina: CABG† , PTCA‡, dissolving of blood clot in the heart, and diagnostic procedure to explore the functioning of the heart	Weekday	4.1	37%*	73%*	86%*
	Weekend	1.0	23%*	49%*	80%*
Acute cholecystitis w or w/o cholelithiasis: cholecystectomy (gall bladder removal)	Weekday	134.6	32%*	67%*	83%*
	Weekend	40.9	23%*	56%*	78%*
Complicated hernia--gangrene, obstructed, strangulated: Hernia repair	Weekday	63.2	68%*	86%*	92%*
	Weekend	13.7	54%*	78%*	87%*
Other conditions					
Any Diagnosis: Laminectomy (back surgery)	Weekday	610.4	90%*	93%*	95%*
	Weekend	19.9	35%*	50%*	63%*
Any Diagnosis: Thyroidectomy (removal of all or part of thyroid gland)	Weekday	62.7	95%*	97%*	97%*
	Weekend	0.9	48%*	58%*	61%*
Any Diagnosis: Arthroplasty of knee (surgical reconstruction or replacement of knee)	Weekday	647.5	96%*	98%*	99%*
	Weekend	6.0	33%*	76%*	83%*

* Significant difference between weekday and weekend admissions at the 0.05 level or better.

**Several states do not report days to procedure; information from reporting states only is used to calculate cumulative percentage days to procedure.

†Coronary artery bypass graft, procedure to restore blood supply to the heart muscle.

‡Percutaneous transluminal coronary angioplasty, procedure involving use of a balloon-tipped catheter to enlarge a narrowed artery.

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

Table 3: Top 10 reasons for weekend admissions; conditions with the highest and lowest share of weekend admissions, 2007

Principal CCS diagnosis	Discharges by day of admission				
	Number in thousands			Percentage of all discharges	
	All admissions	Weekday admission	Weekend admission	Weekday admission	Weekend admission
All stays	39,542	31,882	7,660	81%	19%
Top 10 reasons for weekend admissions					
Liveborn	4,543	3,620	923	80%	20%
Pneumonia	1,172	886	286	76%	24%
Congestive heart failure	1,025	798	227	78%	22%
Trauma to external female genitals and perineum (as a result of childbirth)	868	663	205	76%	24%
Chest pain	788	597	191	76%	24%
Blood infection (septicemia)	675	504	171	75%	25%
Heart attack (acute myocardial infarction)	625	464	161	74%	26%
Mood disorders	774	627	147	81%	19%
Irregular heart beat (cardiac dysrhythmias)	731	590	142	81%	19%
Chronic obstructive pulmonary (lung) disease (COPD)	593	455	138	77%	23%
Conditions with the highest share of weekend admissions*					
Crushing injury or internal injury	113	74	39	66%	34%
Brain injury	190	129	61	68%	32%
Poisoning by other medications and drugs	139	99	39	72%	28%
Fracture of leg	269	193	76	72%	28%
Hip fracture	307	224	83	73%	27%
Fainting	267	195	72	73%	27%
Aspiration of stomach contents into lung (aspiration pneumonitis)	183	135	49	74%	26%
Fracture of arm	158	117	42	74%	26%
Heart attack (acute myocardial infarction)	625	464	161	74%	26%
Stroke (acute cerebrovascular disease)	527	393	135	74%	26%
Conditions with the lowest share of weekend admissions*					
Prolapse of female genital organs	132	132	0.6	100%	0%
Degenerative joint disease (osteoarthritis)	815	807	8	99%	1%
Benign tumor of the uterus	210	207	3	99%	1%
Prostate cancer	102	100	2	98%	2%
Breast cancer	95	93	2	98%	2%
Menstrual disorders	111	108	3	97%	3%
Blockage of arteries before brain (stenosis of precerebral arteries)	141	135	6	96%	4%
Chemotherapy and radiation therapy	185	177	8	96%	4%
Back problems (disorders of intervertebral discs and bones in spinal column)	634	590	44	93%	7%
Heart valve disorders	91	83	7	92%	8%

* Highest and lowest shares among the top 100 conditions.

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

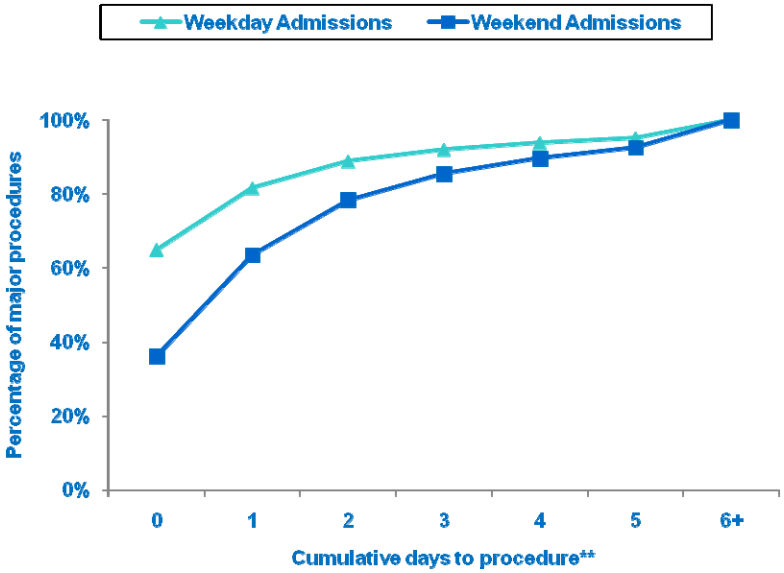
Table 4: Top 10 all-listed major procedures for weekend admissions; all-listed major procedures with the highest and lowest share performed on weekend admissions, 2007

CCS all listed procedure	Number of all-listed major procedures in thousands		Percentage of specific all-listed major procedures performed on patients admitted on weekends
	All admissions	Weekend admission	
Top 10 procedures for weekend admissions			
Circumcision	1,534	295	19%
Cesarean section (C-section)	1,535	233	15%
PTCA (percutaneous transluminal coronary angioplasty, procedure involving use of a balloon-tipped catheter to enlarge a narrowed artery)	776	125	16%
Removal of gall bladder (cholecystectomy)	466	100	21%
Treatment of fracture or dislocation of hip and femur	320	91	28%
Appendectomy (removal of appendix)	429	86	20%
Treatment of fracture or dislocation of leg (other than hip or femur)	324	79	24%
Debridement (surgical removal of foreign material and dead tissue from a wound)	315	57	18%
Excision of intra-abdominal adhesions	490	53	11%
Ligation of fallopian tubes (for sterilization)	363	51	14%
Procedures with the highest share performed on weekend admission patients*			
Treatment of fracture or dislocation of hip and femur	320	91	28%
Treatment of fracture or dislocation of radius and ulna (lower arm)	97	28	28%
Intraoperative cholangiogram (X-ray procedure where a contrast dye is injected into the bile duct during surgery	111	30	27%
Treatment of fracture or dislocation of leg (other than hip or femur)	324	79	24%
Removal of gall bladder (cholecystectomy)	466	100	21%
Colostomy (surgical construction of an artificial anus between the colon and the surface of the abdomen that empties into a bag outside the body)	69	14	21%
Appendectomy (removal of appendix)	429	86	20%
Bronchoscopy (procedure to view and biopsy the breathing passages in the lung through a lighted tube)	60	12	19%
Circumcision	1,534	295	19%
Debridement (surgical removal of foreign material and dead tissue from a wound	315	57	18%
Procedures with the lowest share performed on weekend admission patients*			
Open prostatectomy (surgery involving removal of part or all of the prostate gland)	102	0	0%
Repair of cystocele (bladder hernia) and rectocele (rectal hernia)	156	1	0%
Urinary incontinence procedures	132	1	1%
Arthroplasty of knee (surgical reconstruction or replacement of knee)	794	7	1%
Mastectomy (operation to remove the whole breast)	96	1	1%
Hysterectomy (removal of the uterus)	546	8	1%
Thyroidectomy (removal of all or part of thyroid gland)	65	1	2%
Laminectomy; excision intervertebral disc (back surgery)	813	20	2%
Oophorectomy (removal of an ovary or ovaries)	395	10	3%
Endarterectomy (surgical removal of an obstructing clot from the arteries of the neck and head)	141	5	3%

* Highest and lowest share among procedures with at least 50,000 occurrences.

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

Figure 1. Cumulative percentage of days to major procedure* for patients admitted on weekdays and weekends, 2007



* Principal major diagnostic or major therapeutic procedures.

** Differences between weekday and weekend cumulative percent of major procedures are significant at the 0.05 level of better for 0-2 cumulative days to procedure.

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