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Hospital Stays for Gastrointestinal Diseases, 2004

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Introduction

Gastrointestinal (GI) diseases, including conditions of the esophagus, stomach, intestine, colon, and anus, are a large and diverse group of conditions that result in major health and economic costs to the U.S. population. Several of the GI diseases (such as irritable bowel syndrome, diverticulosis, and ulcerative colitis) are chronic and have a significant impact on individuals' quality of life.* Many patients who present to the emergency department with GI diseases are subsequently admitted to the hospital.

This Statistical Brief provides data from the Healthcare Cost and Utilization Project (HCUP) on the hospital treatment of GI diseases in 2004. The usage and cost of hospital stays for GI diseases are compared with hospital stays for all conditions. Additionally, the most common GI diseases resulting in hospital admission are described, and variations in hospital utilization are illustrated by payer. Finally, the GI diseases with the largest change in the number of hospital stays between 1994 and 2004 are examined. All differences between estimates noted in the text are statistically significant at the 0.05 level or better.

Findings

General characteristics of hospital stays for gastrointestinal diseases

In 2004, there were 2.5 million hospital stays for gastrointestinal diseases, which accounted for approximately 7 percent of all hospitalizations in the United States. The total hospital cost for GI diseases was \$20.1 billion—7 percent of the total cost of hospital care in the U.S.

Table 1 describes the general characteristics of hospitalizations for GI diseases. In general, hospital stays for GI disorders were longer, more costly, and originated in the emergency room more often when compared with hospital stays for all conditions. GI-related hospitalizations were a little more expensive than the average for all hospitals stays (\$8,200 versus \$7,700) and had a slightly longer length of stay (4.9 days versus 4.6 days). Nearly 64 percent of all

Highlights

- In 2004, gastrointestinal diseases accounted for approximately 2.5 million hospitalizations, representing 7 percent of all hospital stays in the United States. Hospital costs for these conditions totaled \$20.1 billion.
- Hospital stays for GI diseases were slightly longer, a little more costly, and more likely to originate in the emergency department than the average hospital stay.
- Gastrointestinal hemorrhage was the most common GI disease seen in U.S. hospitals, accounting for 14 percent of all GI-related hospital stays.
- Compared to all GI diseases, hospital stays for GI cancers were longer and more costly. Cancers of the esophagus and stomach resulted in the highest rates of in-hospital deaths.
- Medicare was billed for more than half of all hospital stays for gastrointestinal hemorrhage, diverticulosis and diverticulitis (bulging and inflammation of the walls of the colon), and intestinal obstruction. Private insurance was billed for more than 60 percent of hospital stays for appendicitis, a condition that occurs more often in younger populations.
- Between 1994 and 2004, hospital admissions increased significantly for six GI conditions (regional enteritis and ulcerative colitis, diverticulosis, appendicitis, disorders of the esophagus, digestive congenital anomalies, and intestinal infections), while hospital stays for gastroduodenal ulcer decreased.

*Goodman C., Cronin K., Gemmen E., Shah S., Avdic A., Rubin R. *The Burden of Gastrointestinal Diseases*. American Gastrointestinal Association. May 2001. Accessed on July 26, 2006. <http://www.gastro.org/user-assets/Documents/burden-report.pdf>

hospital stays for GI diseases originated in the emergency department, compared with 43.1 percent overall. The in-hospital death rate for patients with GI disorders was similar to the average hospital stay—about 2 percent.

Gastrointestinal diseases causing hospitalization

Table 2 highlights specific GI disorders that resulted in hospital stays. In 2004, the top 10 GI diseases accounted for 87 percent of all GI hospitalizations in the United States. Gastrointestinal hemorrhage was the most common GI disease in the hospital, accounting for 14 percent of all GI-related hospital stays. This was followed by diverticulosis and diverticulitis (bulging and inflammation of the walls of the colon), intestinal obstruction, and appendicitis, each of which resulted in about 12 percent of all hospitalizations. Other common GI diseases included disorders of the esophagus (including such conditions as ulcers, strictures, and gastroesophageal reflux disease or GERD), abdominal hernia, intestinal infections, noninfectious gastroenteritis, gastritis and duodenitis (inflammation of the lining of the stomach and the first part of the small intestine), and cancer of the colon.

Among the 10 most common GI diseases, the highest emergency admission rates were for appendicitis (80.7 percent), intestinal obstruction (75.7 percent), and gastrointestinal hemorrhage (74.3 percent).

GI cancers had the longest hospital stays and resulted in average lengths of stays that were 4 to 6 days longer than the average stay for all GI conditions combined. Mean hospital costs for GI cancers were also higher than costs for non-cancer GI conditions. Although relatively rare, two GI cancers—cancer of the esophagus and stomach cancer—resulted in the highest rates of in-hospital deaths (13.5 percent and 10.4 percent, respectively).

Common gastrointestinal diseases, by payer

Figure 1 shows the distribution of hospital stays by payer for five common GI diseases. Medicare was billed for more than half of all hospital stays for intestinal obstruction, diverticulosis and diverticulitis, and gastrointestinal hemorrhage, a finding consistent with the higher mean age among patients hospitalized for these diseases (as shown in table 2). Conversely, more than 60 percent of hospitalizations for appendicitis were billed to private insurers, reflecting a younger mean age of 33 years (as shown in table 2). In addition, more appendicitis hospitalizations were for uninsured patients (11.4 percent), as compared with hospital admissions for the other four conditions.

Change in hospitalizations for gastrointestinal diseases, 1994–2004

Seven GI diseases exhibited a significant change (greater than 25 percent) in the number of hospitalizations occurring between 1994 and 2004 (figure 2). The greatest increase was observed among hospitalizations for enteritis and ulcerative colitis (47.7 percent), diverticulosis (46.4 percent), appendicitis (36.4 percent), disorders of the esophagus (34.7 percent), digestive congenital anomalies (33.8 percent), and intestinal infections (32.7 percent). Conversely, admissions for gastroduodenal ulcer decreased 28.8 percent. Hospitalizations for cancers of the GI system remained relatively stable over the 11-year period (not shown in figure).

Data Source

The estimates in this Statistical Brief are based upon data from the HCUP 2004 Nationwide Inpatient Sample (NIS). Historical data were drawn from the 1994 NIS.

Definitions

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

Costs were 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 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. For the purposes of this Statistical Brief, costs are reported to the nearest hundreds.

Payer

Up to two payers can be coded for a hospital stay in HCUP data. When this occurs, the following hierarchy was used:

- If either payer is listed as Medicaid, payer is "Medicaid."
- For non-Medicaid stays, if either payer is listed as Medicare, payer is "Medicare."
- For stays that are neither Medicaid nor Medicare, if either payer is listed as private insurance, payer is "private insurance."
- For stays that are not Medicaid, Medicare or private insurance, if either payer is some other third party payer, payer is "other," which consists of Worker's Compensation, TRICARE/CHAMPUS, CHAMPVA, Title V, and other government programs.
- For stays that have no third-party payer and the payer is listed as "self-pay" or "no charge," the payer is "uninsured."

Principal diagnosis, 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.

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.

CCS categorizes ICD-9-CM diagnoses into 260 clinically meaningful categories. This "clinical grouper" makes it easier to quickly understand patterns of diagnoses and procedures.

For this report, gastrointestinal diseases were defined as CCS categories:

- 12 Cancer of esophagus
- 13 Cancer of stomach
- 14 Cancer of colon
- 15 Cancer of rectum and anus
- 135 Intestinal infection
- 138 Esophageal disorders
- 139 Gastroduodenal ulcer (except hemorrhage)
- 140 Gastritis and duodenitis
- 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
- 153 Gastrointestinal hemorrhage
- 154 Noninfectious gastroenteritis
- 214 Digestive congenital anomalies

Not included in this report are diseases of the mouth, liver, pancreas, biliary tract, and gall bladder. Also excluded are "other gastrointestinal disorders," "other disorders of stomach and duodenum," and "cancer

of other GI organs, peritoneum” (which comprise a number of infrequent conditions and often include symptoms rather than specific GI disorders).

Admission source: Emergency department

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

Discharge status

Discharge status indicates the disposition of the patient at discharge from the hospital, and includes 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. This analysis used information on patients who died in the hospital.

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 90 percent of all discharges in the United States. The vast size of the NIS allows the study of topics at both the national and regional levels for specific subgroups of patients. In addition, NIS data are standardized across years to facilitate ease of use.

About 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.

For more information about HCUP, visit <http://www.hcup-us.ahrq.gov/>.

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 & Human Services
California Office of Statewide Health Planning & Development
Colorado Health & Hospital Association
Connecticut Integrated Health Information (Chime, Inc.)
Florida Agency for Health Care Administration
Georgia GHA: An Association of Hospitals & Health Systems
Hawaii Health Information Corporation
Illinois Health Care Cost Containment Council and Department of Public Health
Indiana Hospital&Health Association
Iowa Hospital Association
Kansas Hospital Association
Kentucky Department for Public Health
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 Division of Health Care Financing and Policy, Department of Human Resources

New Hampshire Department of Health & Human Services
New Jersey Department of Health & Senior Services
New York State Department of Health
North Carolina Department of Health and Human Services
Ohio Hospital Association
Oregon Office for Oregon Health Policy and Research and 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 & Family Services

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

References

For a detailed description of HCUP and 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.

Design of the HCUP Nationwide Inpatient Sample, 2004. Online. August 14, 2006. U.S. Agency for Healthcare Research and Quality. http://www.hcup-us.ahrq.gov/db/nation/nis/reports/NIS_2004_Design_Report.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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Table 1. Hospitalizations for gastrointestinal (GI) diseases compared to hospitalizations for all conditions, 2004*

	Hospital stays for GI diseases*	All hospital stays
Number of hospital stays (percentage of all hospital stays)	2,533,400 (6.6%)	38,661,800 (100%)
Mean length of stay, days	4.9	4.6
Mean hospital cost	\$8,200	\$7,700
Aggregate costs (percentage of total national cost)	\$20.1 billion (7.0%)	\$287.0 billion (100%)
Percentage admitted through the emergency department	63.9%	43.1%
Percentage died in hospital	1.9%	2.1%

*Based on principal diagnosis.

Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 2004.

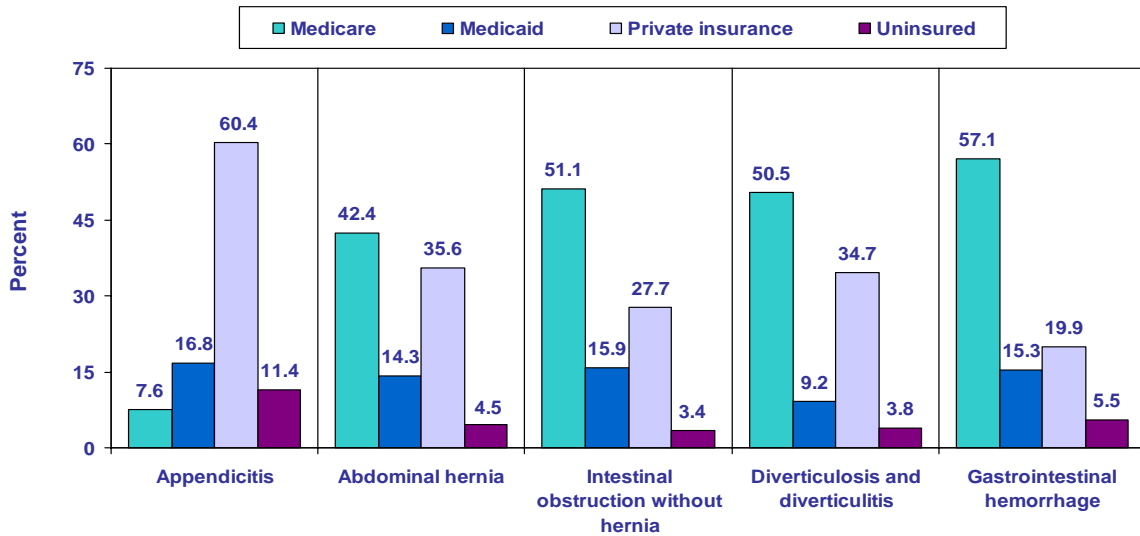
Table 2. Gastrointestinal conditions in U.S. hospitals, 2004

	Principal diagnosis	Total number of stays	Mean length of stay	Mean cost	Aggregate costs	Percent admitted through the ED	Percent died in the hospital	Mean age
1	Gastrointestinal hemorrhage	342,800	4.5	\$7,500	\$2,499,484,200	74.3%	3.4%	68
2	Diverticulosis and diverticulitis	313,500	5.2	\$8,300	\$2,543,803,000	65.6%	1.0%	66
3	Intestinal obstruction without hernia	300,900	6.3	\$9,400	\$2,740,935,100	75.7%	2.9%	63
4	Appendicitis	298,000	3.1	\$7,300	\$2,137,971,600	80.7%	0.2%	33
5	Esophageal disorders	181,400	3.2	\$5,800	\$1,019,479,700	59.3%	0.5%	54
6	Abdominal hernia	181,400	4.5	\$9,200	\$1,615,332,700	35.0%	1.3%	59
7	Intestinal infections	177,000	4.2	\$5,300	\$911,375,700	69.0%	1.3%	46
8	Noninfectious gastroenteritis	153,800	2.8	\$3,800	\$564,528,200	69.8%	0.2%	45
9	Gastritis and duodenitis	150,400	3.6	\$5,500	\$804,272,600	68.4%	0.6%	58
10	Cancer of colon	112,900	9.0	\$15,700	\$1,725,984,400	27.3%	5.6%	70
11	Regional enteritis and ulcerative colitis	91,800	6.1	\$9,200	\$821,455,700	57.1%	0.6%	43
12	Anal and rectal conditions	52,700	4.1	\$6,500	\$331,258,000	51.7%	0.7%	54
13	Gastroduodenal ulcer	46,000	6.1	\$11,200	\$501,042,300	69.0%	3.5%	59
14	Cancer of rectum and anus	45,200	8.9	\$15,400	\$674,252,000	19.6%	4.0%	66
15	Digestive congenital anomalies	25,800	6.3	\$11,800	\$299,791,600	35.5%	0.4%	8
16	Cancer of stomach	23,700	10.6	\$18,300	\$421,370,200	36.7%	10.4%	67
17	Peritonitis and intestinal abscess	23,100	8.2	\$13,800	\$311,949,100	62.6%	5.4%	54
18	Cancer of esophagus	13,000	10.0	\$17,800	\$222,517,700	36.6%	13.5%	66

Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 2004.



Figure 1. The distribution of hospital stays for common gastrointestinal diseases, by payer, 2004*

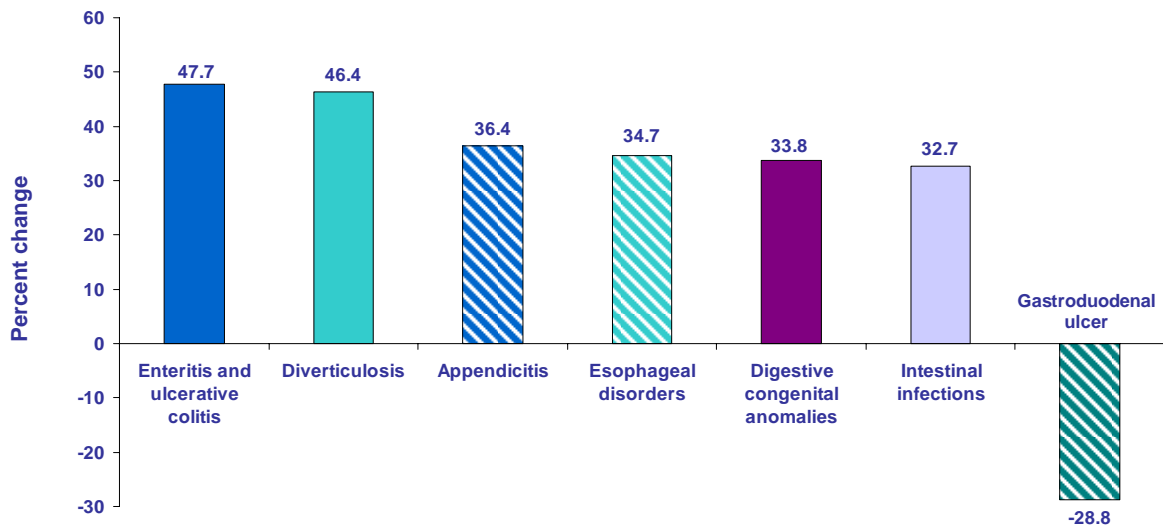


*Based on principal diagnosis.

Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 2004.



Figure 2. Gastrointestinal diseases with largest percentage change in hospitalizations, 1994–2004*



*Based on principal diagnosis.

Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 2004.