INPATIENT HOSPITALIZATIONS IN NEW JERSEY, 1998

By: Bretta J. Jacquemin, M.P.H.

Abstract

New Jersey has higher rates of hospitalization and longer average length of stay than does the nation as a whole for most major conditions. The New Jersey State Inpatient Database was used to analyze inpatient hospitalizations for 1998, and the National Inpatient Sample is used to provide national estimates. In 1998, New Jersey had higher admission rates for eleven out of the top twenty causes for hospitalization, and longer mean lengths of stay for eighteen out of twenty causes as compared to national averages. Length of stay contributed more to New Jersey's overall greater hospital utilization than did admission rates.

Introduction

People across the country are well-acquainted with the high cost of health care at both the consumer and the provider level. In 1998 the nation spent $1.016 trillion on personal health care, averaging $3,759 per person. New Jersey residents spent $34.1 billion or $4,197 per capita, making it one of the top 10 states in terms of per capita spending on personal health care expenditures (PHCE).[1,*] From the provider perspective, State Health Expenditures Accounts (SHEA) data from the Centers for Medicare and Medicaid (formerly the Health Care Financing Administration), show that personal health care expenditures represented 10.7% of the gross state product for New Jersey (1997 figure). For the United States as a whole, these expenses as a percent of the gross state product was 11.9% in 1997.[†] Inpatient hospitalization is the largest component of health care spending, accounting for approximately 34% of all personal health care spending by providers in New Jersey in 1998 (at a cost of $11.3 billion), compared to about 37% for the nation as a whole (at a cost of $380 billion).[2] Despite decreases throughout the 1990's in health care spending, recent trend data show that growth in health care

---

[*] Top 10 in per capita spending are: Washington DC, Massachusetts, New York, Connecticut, Rhode Island, Delaware, New Jersey, Pennsylvania, Florida, West Virginia. State per capita costs ranged from $4,044 (WV) to $4,810 (MA). Washington DC was at the top of the list, with per capita costs of $6,656 in 1998.[1]

[†] These expenses include hospital care, physician and other professional services, dental services, home health care, drugs and other medical nondurables, vision products and other medical durables, nursing home care, and other personal health care.[2]

James E. McGreevey
Governor

Clifton R. Lacy, MD, Commissioner
New Jersey Department of Health and Senior Services
PO Box 360, Trenton, NJ 08625-0360

spending has been rapidly increasing again since 1998, with inpatient and outpatient hospital care leading the rising growth in spending.[3] Hospital utilization patterns may provide some insight into how the money is being used.

Data

This report uses data from the 1998 New Jersey State Inpatient Database (SID), and the 1998 National Inpatient Sample (NIS) to provide estimates for national comparison.[‡] The SID is derived from the Uniform Billing (UB92) data collected on all hospital discharges in the state each year by the New Jersey Department of Health and Senior Services (NJDHSS), Health Care Systems Analysis Division. While NJDHSS maintains, shares, and directly utilizes UB92 data for its own research, it also sends the data to the Agency for Healthcare Research and Quality (AHRQ), which sponsors the Healthcare Cost and Utilization Project (HCUP), a federal, state, and industry partnership whose task it is to build a standardized health data system. As of the 1998 data year, 22 states had contributed data to HCUP.[4] It is from the SIDs that the NIS is drawn, containing data from approximately 7 million hospital discharges.[5] The 1998 NIS includes all discharges from a sample of about 1,000 community hospitals within the universe of participating states,[6] and is used to provide national estimates from a database that is in the same format as the state databases.[7]

Some of the most useful variables added to the SID and NIS by AHRQ are based on the re-coding of diagnosis codes from ICD-9-CM using the Clinical Classification System (CCS). Developed by AHRQ, the CCS groups diagnosis codes into approximately 260 clinically meaningful codes from the over 12,000 ICD-9-CM codes, making coding of diseases easier to report and interpret.[4] A set of CCS codes has also been created for ICD-9-CM procedures codes. New Jersey captures up to 9 diagnosis codes and 8 procedure codes per discharge for its Uniform Billing data set. A complete description of AHRQ's Clinical Classification system can be found on its web site: http://www.ahrq.gov/data/hcup/.

Observations were selected and ranked based on principal diagnosis, the condition determined during the hospital stay as being the main reason for admission. Outpatient services like same-day-surgery have been excluded from this analysis unless the visit resulted in at least one overnight stay. Each observation is a unique admission, but not necessarily a unique patient. In this report, the terms "admissions", "hospitalizations", and "discharges" are used synonymously in terms of observations. A completed discharge record can have any one of several endpoints, including being discharged to home, another facility, home health care, or death.[8]

Findings

Major Reasons for Hospitalization

The major causes of hospital admission in 1998 are summarized in Table 1.[§] New Jersey had higher hospitalization rates for many of these conditions than did the rest of the nation.[**] The hospitalization rate was about 27% higher in New Jersey for coronary atherosclerosis than nationally, and 28% higher in New Jersey than nationally for cardiac dysrhythmias. New Jersey also had higher hospitalization rates for other cardiovascular diseases, asthma, diabetes,

---

[‡] A comparison of the NIS with the National Hospital Discharge Survey (NHDS) by AHRQ showed that most statistics, particularly average length of stay, calculated from an earlier release of the NIS were comparable to the NHDS, based on 19 states participating in the NIS.[6]

[§] This report does not take into account the number of individual patients, only the number of hospitalizations in both New Jersey and the United States, so utilization rates for certain conditions may be the result of repeat admissions of very sick patients throughout the year, especially among the over 65 population.

[**] Population estimates for calculating rates are from the Population Estimates Program, Population Division, U.S. Census Bureau, Release date April 2000 (for national estimates) and August 2000 for NJ estimates. NJ 1998: 8,095,542; US 1998: 270,248,003.

substance-related mental disorders, gallbladder disease, fluid and electrolyte disorders, septicemia, and certain pregnancy complications. New Jersey had below average rates for several conditions, including pneumonia, trauma to the perineum and vulva, affective disorders, COPD, back problems, and osteoarthritis.

NJ Rank	Diagnosis Category (Single Level CCS)	NJ Discharges	Discharge rate per 10,000	NJ LOS Mean	NJ LOS Median	US Rank	US Discharges	Discharge rate per 10,000	US LOS Mean	US LOS Median
	Table 1. Major Hospitalizations by Primary Diagnosis for New Jersey and the United States, 1998.									
1	Liveborn (218)	110,503	136.5	3.8	2.7	1	3,755,916	139.0	3.1	2.5
2	Coronary atherosclerosis (101)	49,808	61.5	4.1	3.1	2	1,313,890	48.6	4.0	3.1
3	Congestive heart failure, nonhypertensive (108)	34,711	42.9	7.5	6.0	4	1,008,599	37.3	5.7	4.7
4	Pneumonia (except that caused by tuberculosis and sexually transmitted diseases) (122)	32,428	40.1	8.0	6.3	3	1,298,545	48.1	6.1	5.0
5	Cardiac dysrhythmias (106)	22,608	27.9	4.7	3.8	11	588,353	21.8	3.7	3.2
6	Acute myocardial infarction (100)	22,353	27.6	6.7	5.6	5	752,910	27.9	5.6	4.8
7	Nonspecific chest pain (102)	20,076	24.8	2.2	2.2	7	625,058	23.1	1.9	2.0
8	Biliary tract disease (149)	17,768	21.9	4.0	2.8	16	440,539	16.3	4.2	3.5
9	Trauma to perineum and vulva (193)	17,625	21.8	2.2	2.6	6	722,081	26.7	1.9	2.4
10	Acute cerebrovascular disease (109)	17,332	21.4	9.8	7.3	8	619,086	22.9	6.8	5.3
11	Affective disorders (69)	15,964	19.7	8.8	7.2	9	611,197	22.6	8.1	6.4
12	Fluid and electrolyte disorders (55)	15,526	19.2	6.3	4.5	15	468,035	17.3	4.3	3.4
13	Chronic obstructive pulmonary disease and bronchiectasis (127)	15,483	19.1	7.3	6.1	10	605,064	22.4	5.5	4.7
14	Diabetes mellitus with complications (50)	15,174	18.7	8.3	5.8	17	430,831	15.9	5.7	4.3
15	Substance-related mental disorders (67)	15,072	18.6	4.0	3.8	44	204,814	7.6	4.8	4.1
16	Septicemia (except in labor) (2)	14,568	18.0	10.9	8.3	22	399,433	14.8	8.0	6.3
17	Normal pregnancy and/or delivery (196)	13,920	17.2	2.2	2.6	13	515,874	19.1	1.8	2.3
18	Other complications of pregnancy (181)	13,734	17.0	2.5	2.6	25	370,165	13.7	2.4	2.5
19	Asthma (128)	13,493	16.7	3.9	3.4	23	388,328	14.4	3.4	3.1
20	Spondylosis, intervertebral disc disorders, and other back problems (205)	13,283	16.4	3.4	2.7	12	548,403	20.3	3.2	2.8
21	Complication of device, implant or graft (237)	13,283	16.4	3.4	4.4	14	473,796	17.5	5.8	4.4
22	Other complications of birth, puerperium affecting management of mother (195)	11,986	14.8	2.8	2.8	18	427,131	15.8	2.4	2.6
24	Urinary tract infections (159)	11,133	13.8	6.4	5.1	19	425,199	15.7	4.7	4.1
41	Osteoarthritis (203)	7,862	9.7	4.6	4.4	20	409,937	15.2	4.4	4.4
	Total Discharges 1998	**1,082,746**	**1,337**	**5.4**	**3.7**		**34,874,001**	**1,290**	**4.8**	**3.5**

Sources: Healthcare Cost and Utilization Project (HCUP), New Jersey State Inpatient Database (SID) and the National Inpatient Sample (NIS), Agency for Healthcare Research and Quality.
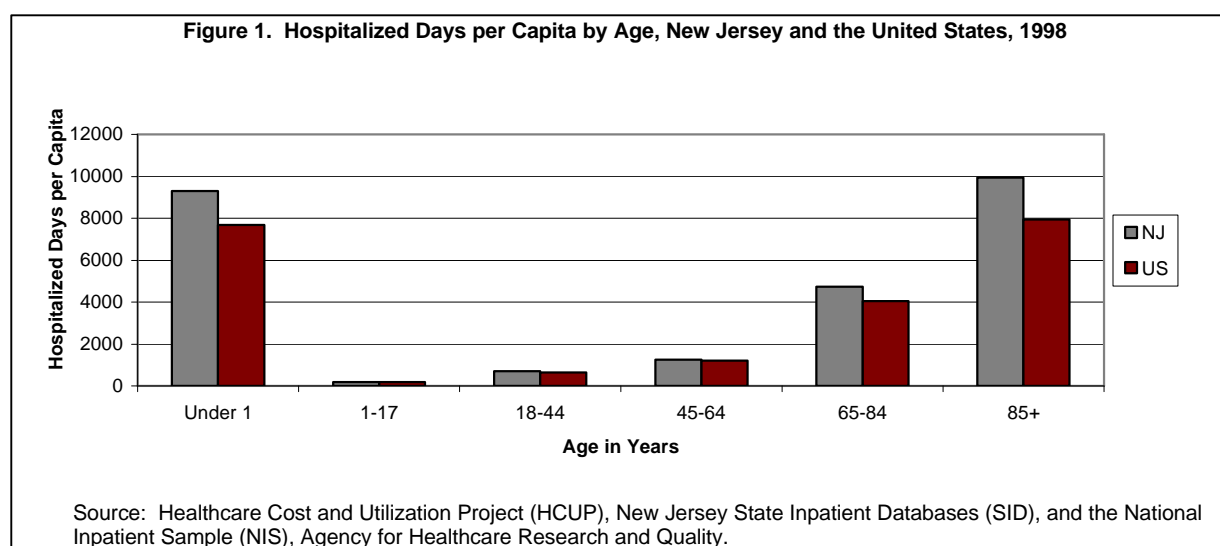
Length of stay was longer in New Jersey than for the nation as a whole for most of the top reasons for hospitalization. Mean length of stay overall in New Jersey was 5.4 days (median 3.7 days), compared to 4.8 days (median 3.5 days) for the nation. The most pronounced differences in length of stay were observed for conditions that were the main reasons for

admissions in the 65+ age groups: congestive heart failure (CHF), pneumonia, acute cerebrovascular disease (stroke), fluid and electrolyte disorders, chronic obstructive pulmonary disease (COPD), diabetes, and septicemia, and urinary tract infections. New Jersey's average length of stay was either two or three days longer than the national average for each of these diagnoses.[††]

Hospitalizations in New Jersey and the United States

One way to measure utilization is to calculate "hospitalized days per capita" by multiplying the number of hospitalizations by the mean length of stay for a diagnosis to arrive at a total number of hospitalized days, and then dividing by the population (results are expressed as hospitalized days per 1,000 population).

Figure 1 shows that differences between New Jersey and the rest of the nation were concentrated at the beginning and the end of life, which is also when overall hospital use is greatest.

Figure 1. Hospitalized Days per Capita by Age, New Jersey and the United States, 1998

Source: Healthcare Cost and Utilization Project (HCUP), New Jersey State Inpatient Databases (SID), and the National Inpatient Sample (NIS), Agency for Healthcare Research and Quality.
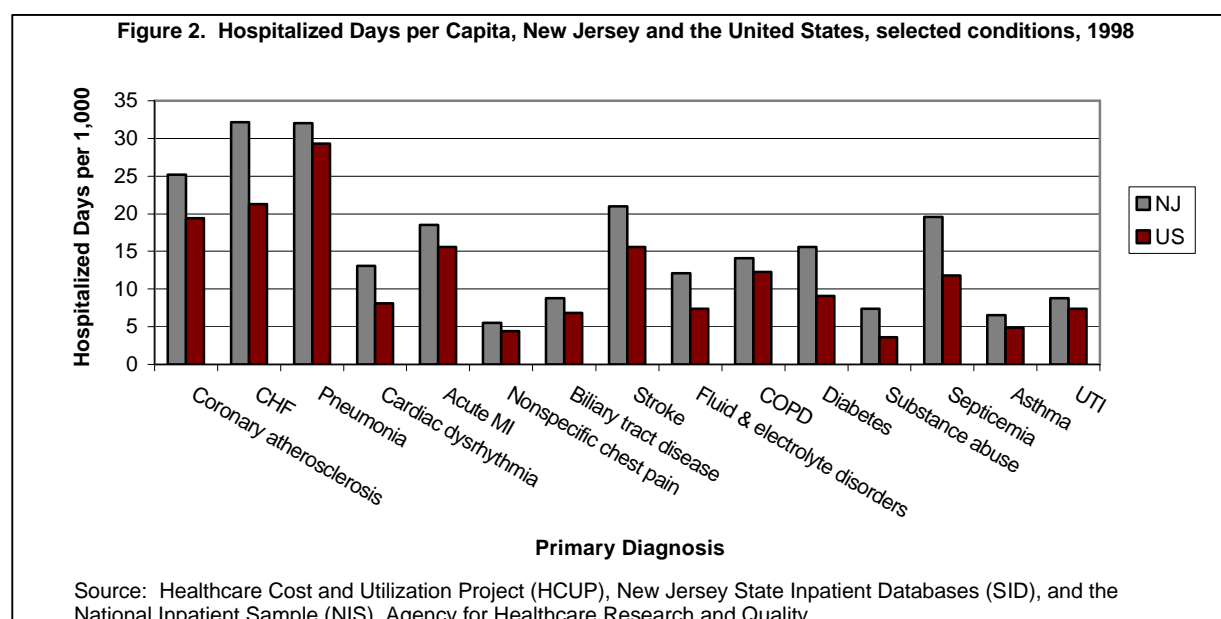
New Jersey had more hospitalized days per capita for most diagnoses (Figure 2), despite having lower discharge rates for some conditions. This is because of a longer average length of stay. The largest difference between New Jersey and the nation in terms of hospitalized days per capita was for congestive heart failure (CHF), where New Jersey had both longer average length of stay and a higher discharge rate. For pneumonia, New Jersey had a lower discharge rate, but because the average length of stay was two days longer, New Jersey still had more hospitalized days per capita for this diagnosis.

In general, differences in length of stay contributed more to overall differences between New Jersey and elsewhere than did differences in admission rates. However, in the case of substance-abuse related mental disorders ("Substance abuse" in Figure 2) the reverse was true. Average length of stay for this condition was almost a day shorter in the state as

---

[††] Top 10 for 65 to 84-year-olds, NJ: coronary atherosclerosis, CHF, pneumonia, cardiac dysrhythmias, acute myocardial infarction, stroke, COPD, septicemia, complications of device or implant, and fluid/electrolyte disorders. 85+: CHF, pneumonia, septicemia, hip fracture, stroke, fluid/electrolyte disorders, cardiac dysrhythmias, coronary atherosclerosis, acute myocardial infarction, and urinary tract infections. Top 10 for 65 to 84-year olds, US: coronary atherosclerosis, CHF, pneumonia, acute myocardial infarction, COPD, stroke, cardiac dysrhythmias, osteoarthritis, rehab care/fitting prosthetics/device adjustment, complications of device or implant. 85+: pneumonia, CHF, hip fracture, stroke, fluid/electrolyte disorders, acute myocardial infarction, urinary tract infections, septicemia, cardiac dysrhythmias, coronary atherosclerosis.[8]

compared to the nation as a whole, but the discharge rate in New Jersey was 145% higher than the for rest of the country.

In 1995, New Jersey passed legislation requiring HMOs to cover a 48 hour minimum stay for vaginal deliveries and a 96 hour minimum stay for cesarean sections.[9] In 1996, this became federal legislation as well, taking effect January 1, 1998.[10] In New Jersey, 125,464 hospitalizations were associated with pregnancy and delivery, or their complications (CCS codes 181-196), accounting for 11.6% of all hospitalizations in 1998. Of these, 121,369 accounted for 56.8% of observations for women aged 18-44, and 40% of all hospital stays for persons 18-44. Nationally, these types of hospitalizations accounted for 57.7% of observations for women in the same age group and 42% of all stays for 18-44 year-olds.[11] Length of stay for women with normal pregnancy and/or delivery was slightly over 48 hours, while the average length of stay nationally was slightly under 48 hours. Length of stay for women who underwent a cesarean section nationally was 3.8 days, while in New Jersey the average was 4.2 days. Average length of stay for liveborn babies in New Jersey hospitals was over half a day longer than the national average.
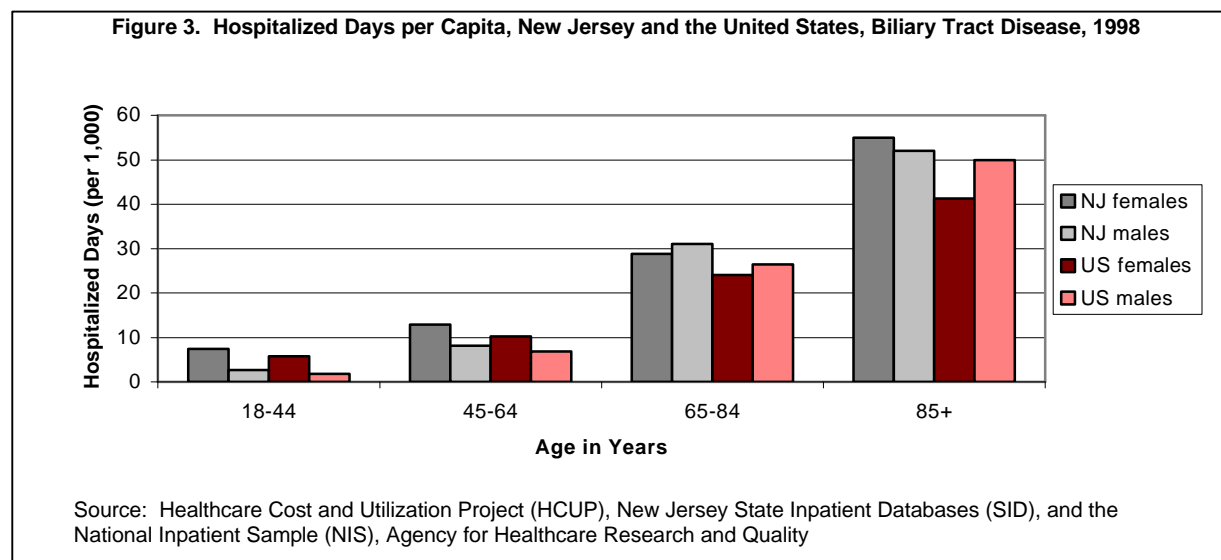

Figure 2. Hospitalized Days per Capita, New Jersey and the United States, selected conditions, 1998

Source: Healthcare Cost and Utilization Project (HCUP), New Jersey State Inpatient Databases (SID), and the National Inpatient Sample (NIS), Agency for Healthcare Research and Quality.

Hospitalized Days per Capita for Specific Conditions

Some of the biggest differences in hospital use in New Jersey versus the United States are in the area of heart disease. Hospitalized days per capita for coronary atherosclerosis was 25.2 per 1,000 for New Jersey and 19.4 per 1,000 for the United States, accounting for 30% more hospitalized days per capita overall for New Jersey than nationally (Figure 2). For congestive heart failure the number of hospitalized days per capita in New Jersey was about 50% higher than that for the country as a whole. For these heart diseases, the differences between New Jersey and the rest of the nation increase with age.
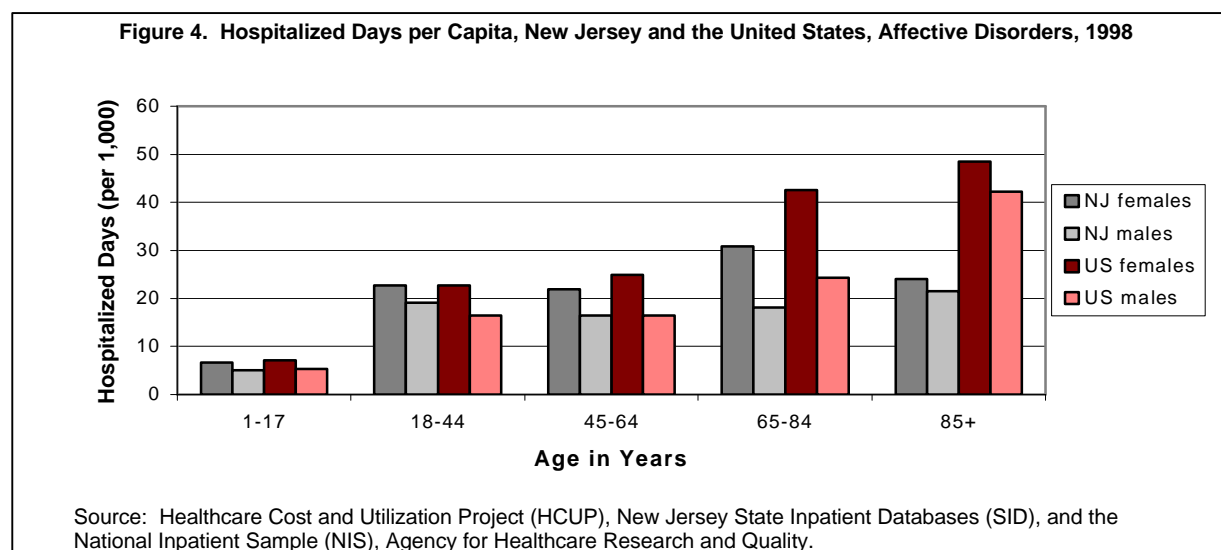
Biliary tract disease was another diagnosis for which admission rates in New Jersey were substantially higher than those in the rest of the country, 21.9 versus 16.3 per 10,000. However, length of stay was relatively similar. Differences in the rate of developing gallstones may have accounted for this variation, but this is unlikely since the prevalence of obesity, a major risk factor for gallstones, is not significantly greater in New Jersey than elsewhere. These differences are more suggestive of some difference in the type or location of treatment.

5

The difference between state and national hospital utilization for biliary tract disease is greater for females. This is particularly pronounced at ages 85 and older (Figure 3). In this age group, females hospitalized in New Jersey spent 33% more days hospitalized for biliary tract disease than for the nation overall, but males only accounted for an extra 4% more days over the nation.
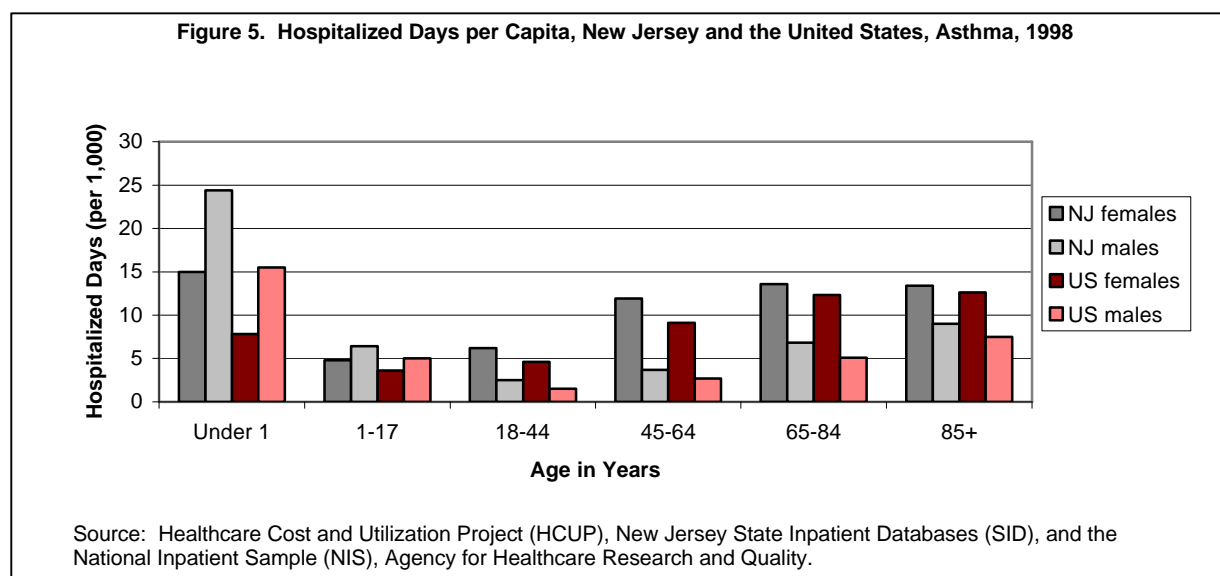
The pattern observed in Figure 3 is driven by length of stay which increased with age. Most patients (80% of New Jersey discharges and 75% of national discharges) had cholecystectomy (removal of the gallbladder) listed as the primary procedure for this diagnosis, and length of stay (in New Jersey relative to elsewhere) increased substantially as the age of the patient increased.[11]

Figure 3. Hospitalized Days per Capita, New Jersey and the United States, Biliary Tract Disease, 1998

Source: Healthcare Cost and Utilization Project (HCUP), New Jersey State Inpatient Databases (SID), and the National Inpatient Sample (NIS), Agency for Healthcare Research and Quality

While the gap between New Jersey and the rest of the nation increased with age for several conditions for which hospitalized days per capita was higher in New Jersey than for the nation as a whole, in the case of affective disorders the pattern is somewhat different. Hospitalized days per capita was lower in New Jersey than for the nation as a whole and this disparity increased with age (Figure 4).

Figure 4. Hospitalized Days per Capita, New Jersey and the United States, Affective Disorders, 1998

Source: Healthcare Cost and Utilization Project (HCUP), New Jersey State Inpatient Databases (SID), and the National Inpatient Sample (NIS), Agency for Healthcare Research and Quality.

In the case of asthma, the difference between New Jersey and the rest of the nation is greatest for those aged 1 year and under (Figure 5). Overall, New Jersey used 69% more hospitalized days per capita in that age group than the nation as a whole. While the admission rate was higher for males than females in both New Jersey and the United States, the difference in hospitalized days per capita between New Jersey and the United States was much larger for females than males. New Jersey females accounted for nearly twice as many hospitalized days as did U.S. females, whereas the number of hospitalized days for New Jersey males versus U.S. males was approximately 57% higher.

Figure 5. Hospitalized Days per Capita, New Jersey and the United States, Asthma, 1998

Source: Healthcare Cost and Utilization Project (HCUP), New Jersey State Inpatient Databases (SID), and the National Inpatient Sample (NIS), Agency for Healthcare Research and Quality.

Among adults, females had both more admissions and more hospitalized days per capita compared with males. At older ages, the gap between New Jersey and the United States for both genders became smaller.

Cancer Hospitalizations

Cancer is one of the leading causes of hospitalization and death in both the state and nation.[12;13] No single cancer site was in the top listing by number of observations, but hospitalizations for all cancers (both malignant neoplasms and cancer *in situ*) accounted for 43,503 hospitalizations in 1998 in New Jersey, making it the third leading primary diagnosis behind liveborns and coronary atherosclerosis.[‡‡] Table 2 provides data on the major cancer and cancer-related hospitalizations in New Jersey and the United States. All other cancer diagnoses are included in the number of total cancers.

Of those admitted for maintenance chemotherapy, the leading diagnosis in New Jersey and third in the U.S., the most commonly associated procedure was pharmaceutical chemotherapy-87.9% of admissions in New Jersey and 82.4% in the United States. New Jersey's mean length of stay was less than the national average by slightly over a day (2.7 vs. 3.8 days).[11]

[‡‡] New Jersey Health Statistics 1998 Annual Report codes cause of death using ICD-9: Diseases of the Heart (ICD-9 390-398, 402, 404-429), Malignant Neoplasms (ICD-9 140-208), and Cerebrovascular Diseases (ICD-9 430-438). Comparisons should be made cautiously because hospitalizations are presented using CCS codes and mortality are presented using ICD-9 codes; mortality figures are for New Jersey residents only and hospitalization figures are for resources utilized in New Jersey, regardless of the residency of the patient.

Table 2. Major Cancer Hospitalizations for New Jersey and the United States, 1998								
Cancer Diagnosis Category Name (Single Level CCS)	NJ Discharges	Discharge rate per 10,000	NJ Mean LOS	NJ Median LOS	US Discharges (Estimated)	Discharge rate per 10,000	US Mean LOS	US Median LOS
Maintenance chemotherapy (45)	8,558	10.6	3.1	2.8	195,582	7.2	4.3	3.9
Secondary malignancy (42)	8,141	10.1	9.5	7.5	271,151	10.0	7.6	6.0
Benign neoplasm of the uterus (46)	7,536	9.3	3.1	3.3	223,984	8.3	2.9	3.2
Other benign neoplasm (47)	6,393	7.9	3.3	2.4	150,585	5.6	4.4	3.6
Cancer of the lung and bronchus (19)	5,088	6.3	9.7	7.8	154,709	5.7	7.9	6.6
Cancer of the breast (24)	4,776	5.9	2.8	2.2	122,723	4.5	2.9	2.4
Cancer of the colon (14)	3,825	4.7	11.0	8.8	119,446	4.4	9.4	8.0
Cancer of the prostate (29)	2,786	3.4	4.3	3.7	88,062	3.3	3.9	3.8
Cancer of the bladder (32)	2,198	2.7	4.8	2.7	44,968	1.7	5.6	3.8
Cancer of the rectum and anus (15)	1,700	2.1	10.1	8.2	49,840	1.8	9.0	8.0
Non-Hodgkin's lymphoma (38)	1,676	2.1	11.2	7.8	49,980	1.8	9.6	7.0
Total Cancer (includes diagnoses not shown)	**67,509**	**83.4**	**6.5**	**4.2**	**1,946,791**	**72.0**	**6.2**	**4.5**

Sources: Healthcare Cost and Utilization Project (HCUP), New Jersey State Inpatient Database (SID) and the National Inpatient Sample (NIS), Agency for Healthcare Research and Quality.

The second most common diagnosis in the U.S. and third in New Jersey in 1998 was benign neoplasm of the uterus. In New Jersey, 77.3% of admissions in this category listed hysterectomy as the principal procedure, while for the nation as a whole the share was somewhat higher- 85.2%.[11] Hospitalized days per capita for these diagnoses in New Jersey was similar to that for the nation as a whole (Figure 6).

Figure 6. Hospitalized Days per Capita, New Jersey and the United States, cancer-related admissions, 1998
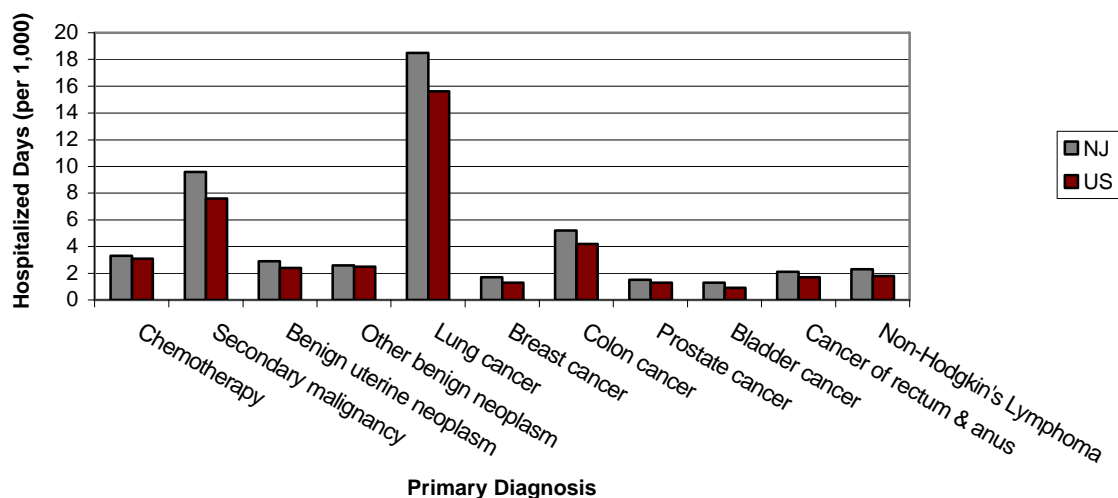
Source: Healthcare Cost and Utilization Project (HCUP), New Jersey State Inpatient Databases (SID), and the National Inpatient Sample (NIS), Agency for Healthcare Research and Quality.

New Jersey had both a higher hospitalization rate and a longer length of stay for lung cancer, which resulted in more hospitalized days per capita than did any other cancer site. More bronchoscopies and biopsies were performed in New Jersey than in the United States as a whole, but there were fewer lobectomies/pneumonectomies.[§§] For colon cancer, almost 80% of

---

[§§] Bronchoscopy/biopsy (diagnostic procedures) and lobectomy/pneumonectomy (removal of lobe or entire lung) are the two principal procedures most commonly associated with admissions for lung cancer.

admissions in both New Jersey and the United States had colorectal resection, but New Jersey had a substantially longer length of stay.[11]

New Jersey and the United States had similar length of stay for breast cancer admissions, but New Jersey had a slightly higher discharge rate. Mastectomies outnumbered lumpectomies 2:1 in the state, but nationally the ratio was almost 4:1. Since lumpectomies spent a full day less in the hospital on average, this probably helped to drive down the number of hospitalized days for New Jersey.[11]

Discharge rates for prostate cancer were also similar in New Jersey and the nation as a whole, as were hospitalized days per capita, despite New Jersey's slightly longer average length of stay. Open prostatectomy was the most common procedure, performed in 42.7% of New Jersey admissions and 59.7% of U.S. admissions, both having mean length of stay around 4 days. The procedure that may have contributed to the relatively low hospitalized days per person was the use of therapeutic radiology, which include radioactive implants. In New Jersey these implants accounted for 10.2% of principal procedures for prostate cancer admissions, but only 3.8% at the national level. Mean length of stay for this procedure was only 1.4 days for New Jersey and 1.9 days for the whole country.[11]

Discussion

There are many potential explanations for above average hospital use in New Jersey. General population health status is one determinant of utilization patterns, but New Jersey death rates are the same as, or lower than, national rates. Differential age composition is another potential factor, but while New Jersey's population is somewhat older than that of the rest of the nation, this difference is not sufficient to explain the patterns observed in hospital use.

Differences in hospital utilization may also be related to access. New Jersey is a relatively wealthy, educated state, having the 3rd highest median household income[14] in the country and the 6th lowest poverty rate,[15] so consumers may have an above average ability to purchase health care. The proportion lacking health insurance is somewhat lower in New Jersey than for the nation as a whole, although the difference is modest.[16] Like other states, New Jersey subsidizes a certain amount of charity care to the uninsured. Overall the state of New Jersey's expansion of Medicaid and provision of care to the uninsured is comparatively generous. Therefore access to care may be somewhat higher in New Jersey relative to most other states. Yet since the major component of New Jersey's higher-than-average hospital utilization is length of stay rather than admission rates, this suggests that access may not be the only factor.

Differences in hospital use may arise from characteristics of providers. Alternatively, some of the treatments that are performed in the hospital in New Jersey may be provided on an outpatient basis elsewhere. The supply of hospital beds could also be a factor. In fact, hospital bed supply per capita in New Jersey is higher than the national average. The Dartmouth Atlas of Health Care, a national study of geographic patterns in health care, reported that in 5 of New Jersey's 7 hospital referral regions, New Jersey is above the national average in the number of acute care hospital beds per capita.[17,***] All 7 of New Jersey's hospital referral regions are in the top half of the nation in terms of primary care physicians and medical specialists per capita.[18] In contrast to the supply of physicians and acute care beds, a shortage of nurses and skilled nursing care in sub-acute care settings and increased competition for nursing home space and other post-acute care facilities in New Jersey further complicates the matter. The Post Acute Care Work Group (NJDHSS, Division of Health Care Systems Analysis) addressed the particularly long Medicare length of stay in New Jersey, and their recommendations include

---

*** Newark, Hackensack, Paterson, Camden, and New Brunswick (Ridgewood and Morristown are the other two regions). The 1999 Atlas includes data up to 1996.

promoting growth in the supply of nurses and nurses aides, encouraging use of Medicare home health services, and increasing the number and types of post-acute care choices for consumers.[19]

Some research on utilization patterns suggests that bed supply and utilization rates are related,[17;18] but it has also been found that there is substantial variation among diagnoses. Conditions with a well-defined course of treatment did not show much variability in treatment length of stay, but others such as congestive heart failure, which do not have a defined treatment course, display more variation.[18] In fact, CHF is the condition for which was observed the greatest difference between New Jersey and the nation in hospitalized days per capita. The gap between New Jersey and the rest of the nation was largest for conditions with more variable treatments. Since the cause of New Jersey's elevated levels of hospital use is not well understood, policy implications are not clear. But the contribution of inpatient hospital stays to health care cost is well known to public and private payers alike.

References

1. Centers for Medicare and Medicaid, Office of the Actuary, National Health Statistics Group. 1998 State Estimates (State of Residence)- All Payers -per Capita Personal Health Care. Updated September 24, 2002. Available at: http://cms.hhs.gov/statistics/nhe/state-estimates-residence/us-per-capita10.asp. Accessed September 25, 2002.

2. Centers for Medicare and Medicaid, Office of the Actuary, National Health Statistics Group. 1980-1998 State Health Care Expenditures Tables. Updated July 17, 2002. Available at: http://cms.hhs.gov/statistics/nhe/state-estimates-provider/. Accessed September 25, 2002.

3. Strunk, BC, Ginsburg, PB, and Gabel, JR. Tracking health care costs: Growth accelerates again in 2001. Health Affairs Web site. Updated September 25, 2002. Available at: http://www.healthaffairs.org/WebExclusives/Strunk_Web_Excl_092502.htm. Accessed October 8, 2002.

4. Agency for Healthcare Research and Quality. HCUP State Inpatient Databases (SID). Updated December, 2001. Rockville, MD. Available at: www.ahrq.gov/data/hcup/hcupsid.htm. Accessed December 28, 2001.

5. Agency for Healthcare Research and Quality. Nationwide Inpatient Sample (NIS). Updated December, 2001. Rockville, MD. Available at: www.ahrq.gov/data/hcup/hcupnis.htm. Accessed December 28, 2001.

6. Elixhauser A, Yu K, Steiner C, Bierman AS. *Hospitalization in the United States, 1997.* Rockville, MD. Agency for Healthcare Research and Quality, US Dept of Health and Human Services; 2000 . HCUP Fact Book 1; AHRQ Publication No. 00-0031.

7. *Comparative Analysis of HCUP and NHDS Inpatient Discharge Data. Technical Supplement 13, NIS Release 5.* Rockville, MD: Agency for Health Care Policy and Research. 1996.

8. Health Care Systems Analysis. *Procedures for Release of Data, UB92 Patient Discharge Variables and Specifications.* Trenton, NJ. New Jersey Department of Health and Senior Services; 1999:32.

9. Coverage for birth and natal care; HMO. § P.L. 1995, c. 138 , s. 1 (1995).

10. Longer hospital stays for childbirth. National Center for Health Statistics Web site. Updated June 18, 2002. Hyattsville, MD. Available at: http://www.cdc.gov/nchs/products/pubs/pubd/hestats/hospbirth.htm. Accessed October 8, 2002.

11. Agency for Healthcare Research and Quality. HCUPnet, Healthcare Cost and Utilization Project. Updated December, 2001. Rockville, MD. Available at: www.ahrq.gov/data/hcup/hcupnet.htm . Accessed December 11, 2001.

12. Baron ML. *New Jersey Health Statistics, 1998*. Trenton, NJ. New Jersey Department of Health and Senior Services; 2001.

13. National Center for Health Statistics. *Health, United States, 2000 with Adolescent Chartbook*. Hyattsville, MD. US Dept of Health and Human Services; 2000.

14. US Census Bureau. *Money Income in the United States: 2000*. Washington DC. US Government Printing Office; 2001. Current Population Reports P60-213.

15. Dalaker, J. US Census Bureau. *Poverty in the United States: 2000*. Washington DC. US Government Printing Office; 2001. Current Population Reports P60-214.

16. Mills, R. US Census Bureau. *Health Insurance Coverage: 2000*. Washington, DC. US Government Printing Office; 2001. Current Population Reports P60-215.

17. Wennberg JE, Cooper MM (eds): *The Dartmouth Atlas of Healthcare, 1999*. Chicago, IL, American Hospital Publishing, Inc; 1999:Chapter 3.

18. A Dartmouth Atlas QuickReport: Variations in the use of supply-sensitive services (New Jersey). The Dartmouth Atlas of Healthcare Web site. Available at: www.dartmouthatlas.org/reports/quickreport_supp_sens.php. Accessed January 4, 2002.

19. Post Acute Care Work Group, Health Care System Analysis. *Exploring the Effect of Post-Acute Care Services on Hospital Length of Stay in New Jersey's Medicare Population, Final Report*. Trenton, NJ. New Jersey Department of Health and Senior Services; 2001.