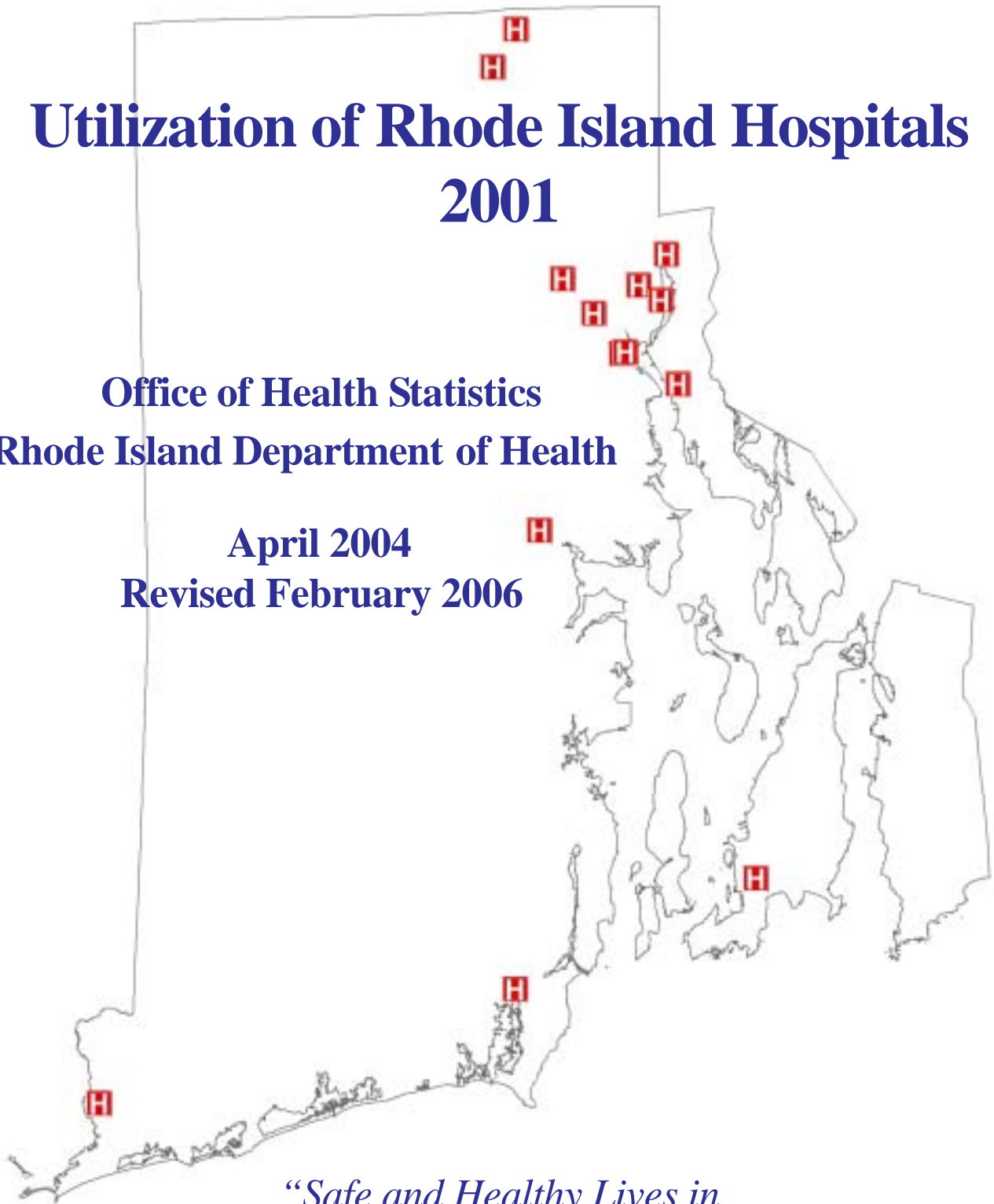


Utilization of Rhode Island Hospitals 2001

Office of Health Statistics
Rhode Island Department of Health

April 2004
Revised February 2006



*“Safe and Healthy Lives in
Safe and Healthy Communities”*

Donald L. Carcieri
Governor



Patricia A. Nolan, MD, MPH
Director of Health

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Prepared by:

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Safe and Healthy Communities”*

PREFACE

This publication, “Utilization of Rhode Island Hospitals 2001,” summarizes inpatient utilization data reported to the Rhode Island Department of Health by the state’s private acute care and inpatient rehabilitation hospitals for discharges during the period January 1, 2001, through December 31, 2001. It has been produced as a reference document for health care policy makers and representatives of health plans and health plan purchasers, as well as other interested parties in the state.

Hospital discharge data have been reported as a requirement for hospital licensure since October 1, 1989. Three specialty hospitals (two psychiatric hospitals and one rehabilitation hospital) began reporting October 1, 1998. Further information on hospital inpatient utilization, including information from prior years and copies of public use data files, are available from staff of the Office of Health Statistics, (401) 222-2550. Information also appears on the Rhode Island Department of Health web site, <http://www.health.ri.gov>.

Acknowledgments

The reporting of the information on which this document is based involves the careful effort of many staff persons in the state's private, acute-care hospitals. Their commitment to producing complete, accurate data is essential to the usefulness of this information system and is acknowledged with gratitude by the authors. The efforts of the Hospital Association of Rhode Island and its contractor, Solucient, Inc., in coordinating the editing and submission of data from the state's eleven acute-care general hospitals are also greatly appreciated. The contributions of these participants are key elements of the public/private partnership supporting the state's hospital discharge data system.

The authors also thank Janice Fontes for her oversight and maintenance activities in support of the hospital discharge database for the Office of Health Statistics and for her computer programming efforts in support of this report.

For Additional Information

The Rhode Island Department of Health website (<http://www.health.ri.gov>) has additional information on the hospital discharge database. Information on how to obtain a public use data file may be obtained at <http://www.health.ri.gov/chic/statistics/hdd.htm>.

Information on hospital financial performance may be obtained at <http://www.health.ri.gov/chic/performance/home.htm>.

Information on the quality of hospital care may be obtained at <http://www.health.ri.gov/chic/performance/series.htm>.

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EXECUTIVE SUMMARY

Rhode Island's non-Federal short-stay hospitals reported 124,263 discharges with 686,450 days of care (excluding discharges of newborns) for the period January 1, 2001 to December 31, 2001. The largest volume hospital, Rhode Island Hospital, provided 166,662 days of care to 29,396 discharges; the lowest volume hospital, Rehabilitation Hospital, provided 18,161 days of care to 874 discharges.

The statewide occupancy rate of licensed beds was 58.7 percent. The occupancy rate of staffed beds was 73.6 percent; by hospital this rate varied from 50.9 percent to 100.4 percent. The average length of stay for all non-Federal hospitals combined (including psychiatric and rehabilitation hospitals) was 5.5 days, and the average charges were \$13,918. The hospital with the shortest average length of stay, 3.4 days, was Women & Infants Hospital of Rhode Island whose case-mix is largely obstetrical, perinatal, and gynecological cases. Among other hospitals, the average stay varied from 4.0 days to 25.0 days. The average charges varied from \$7,806 to \$28,035. Note that average charges by hospital have not been adjusted for variations in case-mix complexity. Also, actual reimbursement to hospitals is generally lower than charges.

UTILIZATION: Hospital discharge rates per 10,000 population were slightly higher in Rhode Island (1,172.7) than the United States (1,151.3). Discharge rates increased with age from the youngest age group, 0 - 14 years, to the oldest, 65 years and over. More hospital days were used by women (383,664) than by men (302,768)¹, with the difference appearing among women in the principal child-bearing years (ages 15 – 44) and among the elderly. While patients 65 years and over comprised approximately 14.4% of the state's population in 2001, they accounted for 42.9% of all discharges and used 48.5% of all days of care.

DIAGNOSES: The most commonly reported principal diagnoses were in the broad categories of diseases of the circulatory system (22,462 discharges), complications of pregnancy, childbirth, and the puerperium (14,342 discharges), mental disorders (12,787 discharges), diseases of the respiratory system (12,074 discharges), and diseases of the digestive system (11,351 discharges). Discharge rates per 10,000 population in Rhode Island were generally higher than national rates for mental disorders (45.1 percent higher), neoplasms (20.2 percent higher), and lower for endocrine, nutritional, and metabolic diseases and immunity disorders (27.6 percent lower) and complications of pregnancy, childbirth, and the puerperium (11.8 percent lower).

PROCEDURES: Most hospitalizations (60.8 percent) involved the performance of one or more surgical or major diagnostic procedures. A total of 171,024 procedures were reported, corresponding to a rate of 1,614.0 per 10,000 population. The three most commonly performed procedures for males were: arteriography and angiocardiology using contrast material (6,552), removal of coronary artery obstruction (3,099), and cardiac catheterization (2,761). For females, the most commonly performed procedures were: repair of current obstetric laceration (5,594), arteriography and angiocardiology using contrast material (4,237), and cesarean section (3,103).

FREQUENCY OF PERFORMANCE – SELECTED SURGICAL PROCEDURES: For some surgical procedures, patient outcomes are generally better in hospitals where the procedure is performed regularly. The federal Agency for Healthcare Research and Quality (AHRQ) established inpatient quality of care indicators, based on minimum volume thresholds for which research literature supports

¹Gender was not reported for 9 discharges comprising 18 of the hospital days.

a general relationship between the frequency of a procedure at a hospital and procedure outcomes. All hospitals in the state that perform coronary artery bypass graft and percutaneous transluminal coronary angioplasty exceeded AHRQ minimum volume thresholds. The one hospital performing pediatric heart surgery fell below the AHRQ volume threshold. The majority of cancer-related procedures and peripheral vascular procedures performed in the state do not meet the AHRQ volume thresholds.

CHARGES: The average hospital charge per discharge was \$13,918. The majority of discharges had charges less than \$10,000 (61.7 percent). Discharges with charges greater than \$30,000 represented 9.4 percent of all discharges.

DELIVERY OF NEWBORNS: There were 13,018 deliveries of newborns reported at the state's seven hospitals with obstetric services plus one delivery at Rhode Island Hospital. Among these, the primary cesarean rate was 17.4 percent, ranging from 13.7 percent to 21.4 percent. Among births to women with previous cesarean sections, 29.4 percent were by vaginal delivery. Overall, 23.8 percent of births were by cesarean section. The average length of stay for vaginal deliveries was 2.4 days; for cesarean section it was 4.7 days.

INJURIES: There were 5,973 discharges with a principal diagnosis of injury and poisoning, excluding nature of injury codes for late effects of injury and complications of surgical and medical care. Of these, the external cause of injury was reported on 92.9 percent. Leading external causes reported were falls (2,917 discharges), motor vehicle injuries (733 discharges), other unintentional (591 discharges) and self-inflicted injuries (478 discharges).

INTRODUCTION

This report provides statistics regarding the use of Rhode Island's non-Federal short-stay hospitals during the period January 1, 2001 - December 31, 2001. The data were collected by means of a statewide reporting system that was established as of October 1, 1989 by regulations promulgated by the Rhode Island Department of Health under its licensure authority (Rhode Island General Laws 23-17-10).² The data for this report came from 100% reporting of inpatient records by all non-Federal short-stay hospitals in the state.

Measurements of hospital use are presented in this report by hospital, patient age, patient sex, diagnostic code groupings, procedure code groupings, and grouped charges. Tables on special topics, including obstetrical utilization and external cause of injury, are also presented. To the extent possible, data have been analyzed and presented in a manner comparable to that used with annual summary reports from the National Hospital Discharge Survey (see Reference 1 on page 36). Consistent with the national reports, all data with respect to discharge of newborn infants are excluded from this report.

Medical data including diagnoses and procedures were coded according to the *Internal Classification of Diseases, 9th Revision, Clinical Modification*, or ICD-9-CM (see Reference 2 on page 36). The first eleven listed diagnoses and the first ten listed procedures on the hospital medical record are reported for each discharge. The conditions diagnosed and procedures performed are presented by major diagnostic and procedure groups of the ICD-9-CM. Within these diagnostic and procedure groups, some specific categories were selected for presentation because of large frequencies or special interest.

Familiarity with the definitions used in the report is important for interpreting the data and for making comparisons with statistical data on short-stay hospital use that are available from other sources. Definitions of the terms and groupings used in this report are included as footnotes to tables and in Appendices 1 - 5.

²Current licensure regulations for hospitalizations, including detailed data reporting specifications, are available on the website of the Rhode Island Secretary of State (www.rules.state.ri.us/rules/released/pdf/DOH/DOH_2372.pdf) or upon request to the Division of Health Services Regulation, Rhode Island Department of Health, 3 Capitol Hill, Providence, RI 02908 (Telephone: 401-222-6015).

SUMMARY STATISTICS BY HOSPITAL

The information contained in the Rhode Island Hospital Discharge Data has been reported by 14 non-Federal short-stay hospitals in Rhode Island. They are comprised of 5 teaching hospitals providing general acute care, 6 other general acute care hospitals, 2 psychiatric teaching hospitals, and 1 for-profit rehabilitation hospital. Hospital characteristics are described in Table 1, based on information reported in the *American Hospital Association: A Guide to United States Hospitals, Health Care Systems, Networks, Alliances, Health Organizations, Agencies, Providers 2001* (see Reference 3 on page 36), and from the Office of Health Statistics of the Rhode Island Department of Health.

The most striking statistic in Table 1 is the all-hospital licensed occupancy rate of 58.7%. Four hospitals experienced occupancy rates of less than 50%, with 34.6% the lowest rate. The highest licensed occupancy rate of 100.4% was for a hospital that provides primarily psychiatric services to children, Emma Pendleton Bradley Hospital.

Hospitals reported a total of 2,554 staffed beds of the total 3,204 licensed beds. The all-hospital occupancy rate of staffed beds was 73.6%. The staffed occupancy rates ranged from 50.9% to 100.4%. (Figure 1)

Table 2 presents utilization data and average charges per discharge for the 14 Rhode Island hospitals reporting discharge data. Utilization data presented include: discharges, patient days, and average length of stay.

There were 124,263 discharges comprising 686,450 days from all hospitals, excluding discharges of newborns. Discharges by hospital ranged from a low of 874 to a high of 29,396, with the average for all hospitals 8,876. Patient days by hospital ranged from a low of 18,161 to a high of 166,662 with the average for all hospitals 49,032.

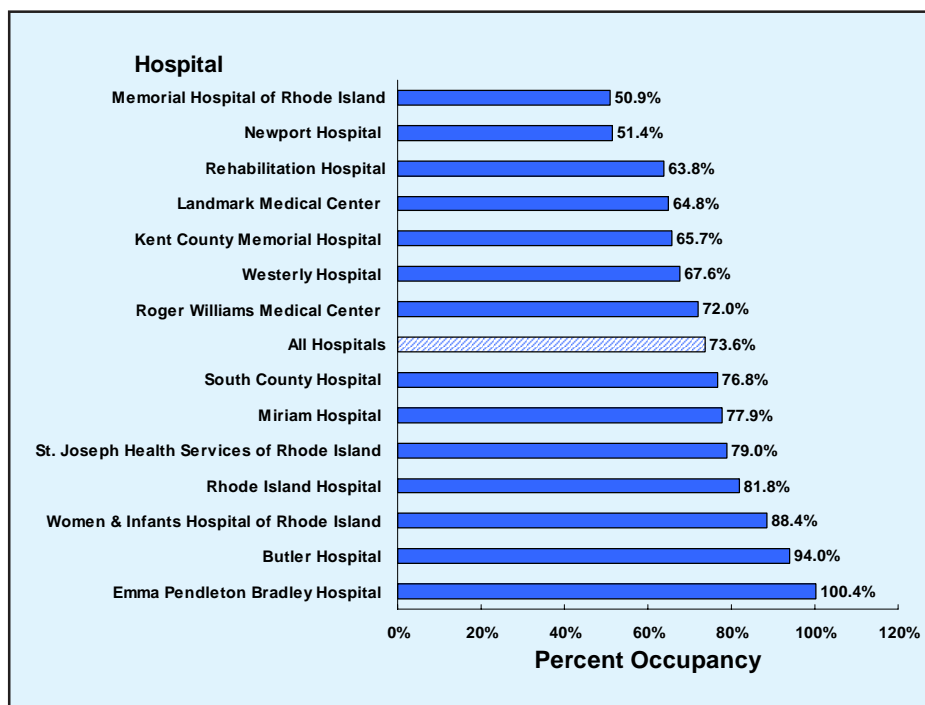


Figure 1. Staffed Occupancy Rate by Hospital, Rhode Island, 2001

The all-hospital average length of stay was 5.5 days. The average length of stay by hospital ranged from 3.4 days for Women & Infants Hospital of Rhode Island to 25.0 days for Emma Pendleton Bradley Hospital, a psychiatric hospital for children.

The all-hospital average charge per discharge was \$13,918, ranging from \$7,806 for South County Hospital to \$28,035 for Rehabilitation Hospital (Figure 2). These averages are not adjusted for the different complexity of the hospitals' case-mix. Actual reimbursement to the hospitals per discharge

Table 1. Characteristics of Rhode Island hospitals, 2001¹

Hospital	Licensed Beds ²	Staffed Beds ²	Licensed Occupancy	Staffed Occupancy
All Hospitals	3,204	2,554	58.7%	73.6%
Emma Pendleton Bradley Hospital [F,I,1,4]	60	60	100.4%	100.4%
Butler Hospital [F,I,1,5]	105	105	94.0%	94.0%
Kent County Memorial Hospital [B,D,E,H,1,5]	359	338	61.8%	65.7%
Landmark Medical Center [A,D,E,1]	214	149	45.2%	64.8%
Memorial Hospital of Rhode Island [B,D,E,H,I,1]	294	200	34.6%	50.9%
Miriam Hospital [A,E,H,I,1,4]	247	209	65.9%	77.9%
Newport Hospital [B,D,E,1,4]	176	140	40.9%	51.4%
Rehabilitation Hospital [G,3,6]	82	78	60.7%	63.8%
Rhode Island Hospital [B,E,H,I,1,4]	719	558	63.5%	81.8%
Roger Williams Medical Center [A,E,H,I,1]	220	155	50.8%	72.0%
South County Hospital [B,D,E,1]	100	76	58.4%	76.8%
St. Joseph Health Services of Rhode Island [A,E,2]	366	274	59.1%	79.0%
Westerly Hospital [B,D,E,1]	125	75	40.6%	67.6%
Women & Infants Hospital of Rhode Island [C,D,H,I,1,5]	137	137	88.4%	88.4%

Types of Services:

- [A] General Med/Surg Adult
- [B] General Med/Surg Adult & Pediatrics
- [C] General Acute Care
- [D] Obstetrics
- [E] Emergency Room
- [F] Psychiatric Specialty Hospital
- [G] Hospital Based Rehabilitation
- [H] Meets State of Rhode Island Criteria for Tertiary Status³
- [I] Teaching Hospital

Types of Ownership:

- [1] Not-for-profit
- [2] Not-for-profit, church
- [3] For profit

Network Affiliations:

- [4] Lifespan
- [5] Care New England
- [6] Partnership

¹Sources: American Hospital Association: *A Guide to United States Hospitals, Health Care Systems, Networks, Alliances, Health Organizations, Agencies, Providers 2001* (see Reference 3 on page 36). Center for Health Information and Communication, Rhode Island Department of Health (see Reference 4 on page 36).

²Beds exclude bassinets.

³Tertiary care services include: cardiac catheterization, positron emission tomography, linear accelerators, open heart surgery, organ transplantation, and neonatal intensive care services, per Rules and Regulations for Determination of Need for New Health Care Equipment and New Institutional Health Services (R23-15-CON, State of Rhode Island and Providence Plantations, Department of Health June 1979, January 2, 2002) (see Reference 5 on page 36).

will generally be lower than average charges, depending on the specific arrangements under which payers reimburse hospitals. Data on actual payments to the hospitals are not available in the discharge data, but may be found in reports on aggregate hospital financial performance, *Hospital Financial Operations Dataset 2001*, available at <http://www.health.ri.gov/chic/performance/HOSPITAL-DATASE.xls>.

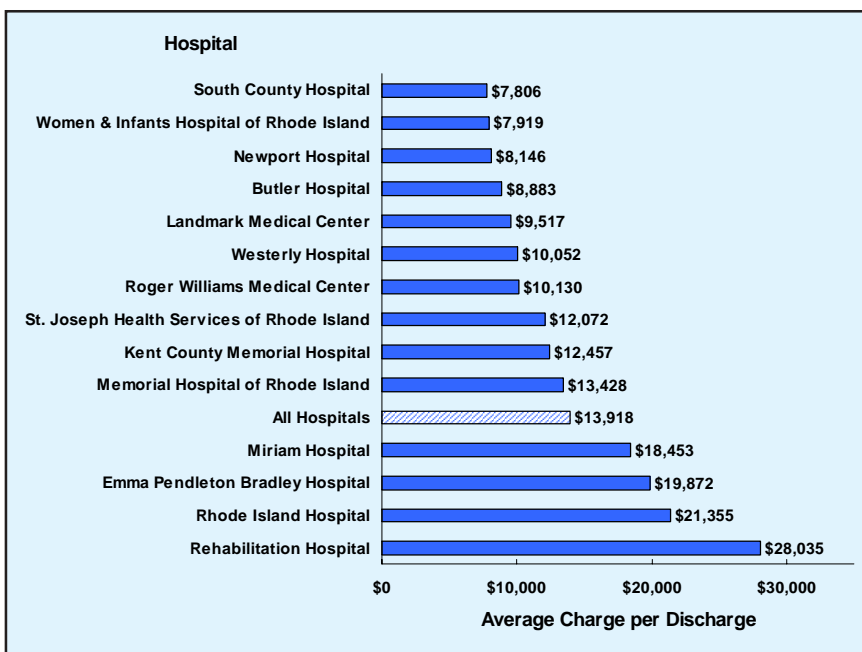


Figure 2. Average Charge per Discharge by Hospital, Rhode Island, 2001

Table 2. Hospital utilization, Rhode Island, 2001

Discharges of newborn infants are excluded.

Hospital	Discharges	Patient Days ¹	Average Length of Stay ¹	Average Charge per Discharge
All Hospitals	124,263	686,450	5.5	\$13,918
Emma Pendleton Bradley Hospital	878	21,990	25.0	\$19,872
Butler Hospital	4,704	36,023	7.7	\$8,883
Kent County Memorial Hospital	13,726	81,016	5.9	\$12,457
Landmark Medical Center	7,244	35,268	4.9	\$9,517
Memorial Hospital of Rhode Island	7,548	37,180	4.9	\$13,428
Miriam Hospital	12,047	59,409	4.9	\$18,453
Newport Hospital	5,591	26,968	4.8	\$8,146
Rehabilitation Hospital	874	18,161	20.8	\$28,035
Rhode Island Hospital	29,396	166,662	5.7	\$21,355
Roger Williams Medical Center	8,205	40,758	5.0	\$10,130
South County Hospital	5,337	21,302	4.0	\$7,806
St. Joseph Health Services of Rhode Island	11,328	79,015	7.0	\$12,072
Westerly Hospital	4,558	18,505	4.1	\$10,052
Women & Infants Hospital of Rhode Island	12,827	44,193	3.4	\$7,919

¹Patient days and average length of stay are computed after adjusting patients admitted and discharged on the same day to a stay of one day.

UTILIZATION BY AGE GROUP AND GENDER

Table 3 presents utilization data for Rhode Island hospitals by selected age groups and gender. Utilization data presented include: discharges, patient days, and average length of stay, while age groups used are: under 15 years, 15-44 years, 45-64 years, and 65 years and over. Table 4 presents the discharge and patient day data from Table 3, but on the basis of rate per 1,000 population.

With the exception of those under age 15, the average length of stay increased with age. The average length of stay for those under 15 was 6.6. For the other age groups, length of stay ranged from 4.3 for those ages 15-44 to 6.3 for those 65 years and over.

A significant statistic with respect to age was that while patients 65 years and over comprised approximately 14.4% of the state's population, they accounted for 42.9% of all discharges and used 48.5% of all days of care. (Figure 3 and Figure 4)

As would be expected, all measures of hospital utilization increased with age, and women were hospitalized more often and used more days of care than men. The discharge rate per 1,000 population for all ages was 117.3; by age group the rate per 1,000 population ranged from a low of 35.7 for those under 15 years to a high of 349.5 for those 65 years and over.

The patient day rate per 1,000 population showed a similar pattern. The patient day rate per 1,000 population for all ages was 647.8; by age group the rate per 1,000 population ranged from a low of 237.0 for those under 15 years to a high of 2,185.1 for those 65 years and over.

An analysis of discharges and patient days by gender shows that females had significantly higher rates per 1,000 population than males. For all ages, females had a discharge rate per 1,000 population of 133.8 compared to the male rate of 99.4 (Figure 5), and the patient day rate per 1,000 population for females was 697.3 compared to the male rate of 594.3 (Figure 6). All of the disparity occurs in the age group 15-44 (which includes the peak child-bearing years), where the discharge rate was 114.2 for females and 48.3 for males, and the patient day rate was 446.7 for females and 255.6 for males. In general, the average length of stay showed less variation by gender. The exception was the 15-44 year group where the length of stay for females was 3.9 days (heavily weighted by obstetrical cases) compared to 5.3 for males.

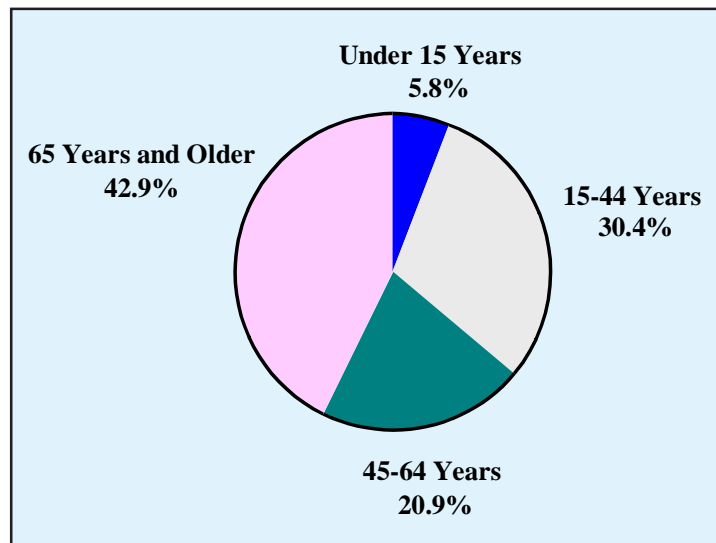


Figure 3. Percent of Total Discharges by Age, Rhode Island, 2001

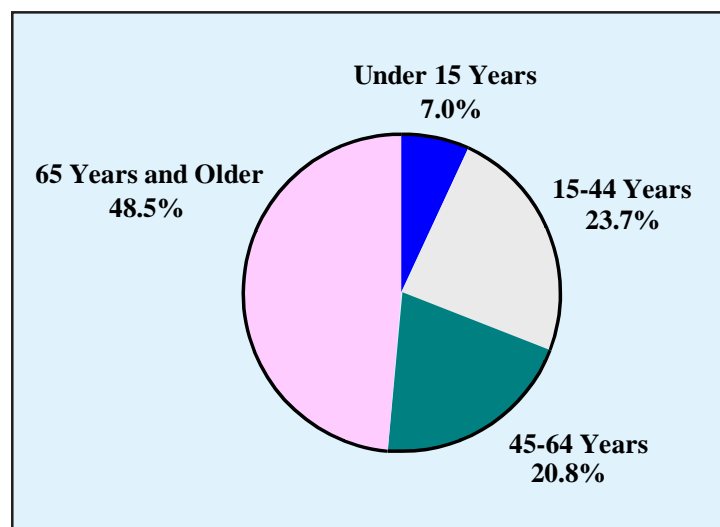


Figure 4. Percent of Total Hospital Utilization (Days) by Age, Rhode Island, 2001

Table 3. Hospital utilization by age groups and gender, Rhode Island, 2001

Discharges of newborn infants are excluded.

Age Group	Discharges	Patient Days ¹	Average Length of Stay ¹
Under 15 Years: All²	7,232	47,954	6.6
Female	3,094	18,489	6.0
Male	4,137	29,455	7.1
15-44 Years: All	37,730	162,810	4.3
Female	26,732	104,559	3.9
Male	10,998	58,251	5.3
45-64 Years: All	26,008	142,541	5.5
Female	12,881	70,486	5.5
Male	13,127	72,055	5.5
65 Years and Older	53,273	333,032	6.3
Female	30,898	190,055	6.2
Male	22,375	142,977	6.4
Age not reported	20	113	5.7
All Ages	124,263	686,450	5.5

Gender	Discharges	Patient Days ¹	Average Length of Stay ¹
Female	73,613	383,664	5.2
Male	50,641	302,768	6.0
Gender not reported	9	18	2.0
Total	124,263	686,450	5.5

¹Patient days and average length of stay are computed after adjusting patients admitted and discharged on the same day to a stay of one day.

²One case, age 0-14 years, with gender not reported is included. This case used a total of 10 days.

Table 4. Hospital utilization rate per 1,000 population¹ by age groups and gender, Rhode Island, 2001

Discharges of newborn infants are excluded.

Age Group	Discharge Rate ²	Utilization Rate (Days) ²
Under 15 Years: All³	35.7	237.0
Female	31.3	187.3
Male	39.9	284.2
15-44 Years: All	81.7	352.4
Female	114.2	446.7
Male	48.3	255.6
45-64 Years: All	107.1	586.8
Female	102.8	562.7
Male	111.6	612.6
65 Years and Older	349.5	2,185.1
Female	335.4	2,062.8
Male	371.2	2,372.0
All Ages⁴	117.3	647.8
Female	133.8	697.3
Male	99.4	594.3

¹Census populations for Rhode Island as of July 1, 2001 were provided by the Bureau of the Census, United States Department of Commerce.

²Rates are not adjusted for patient's state of residence.

³One case for which age is known and gender is not reported is included.

⁴Twenty cases where age is not reported are included.

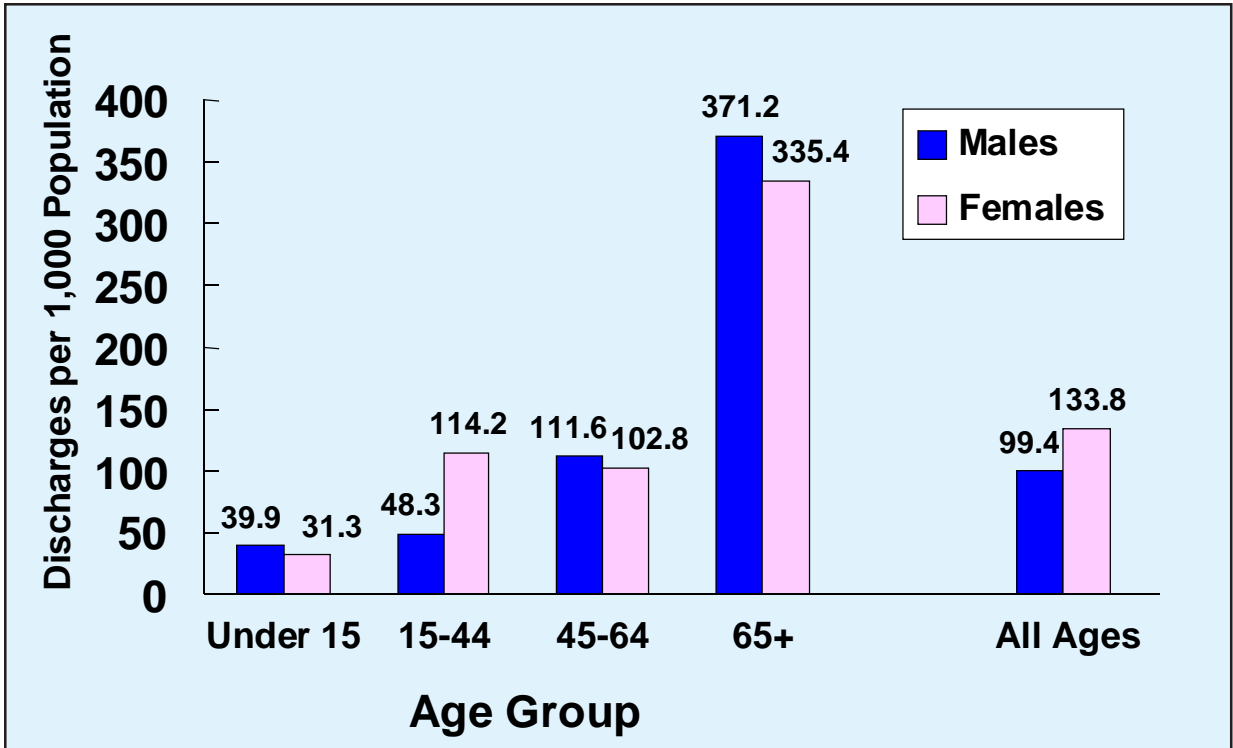


Figure 5. Discharges per 1,000 Population by Age Group and Gender, Rhode Island, 2001

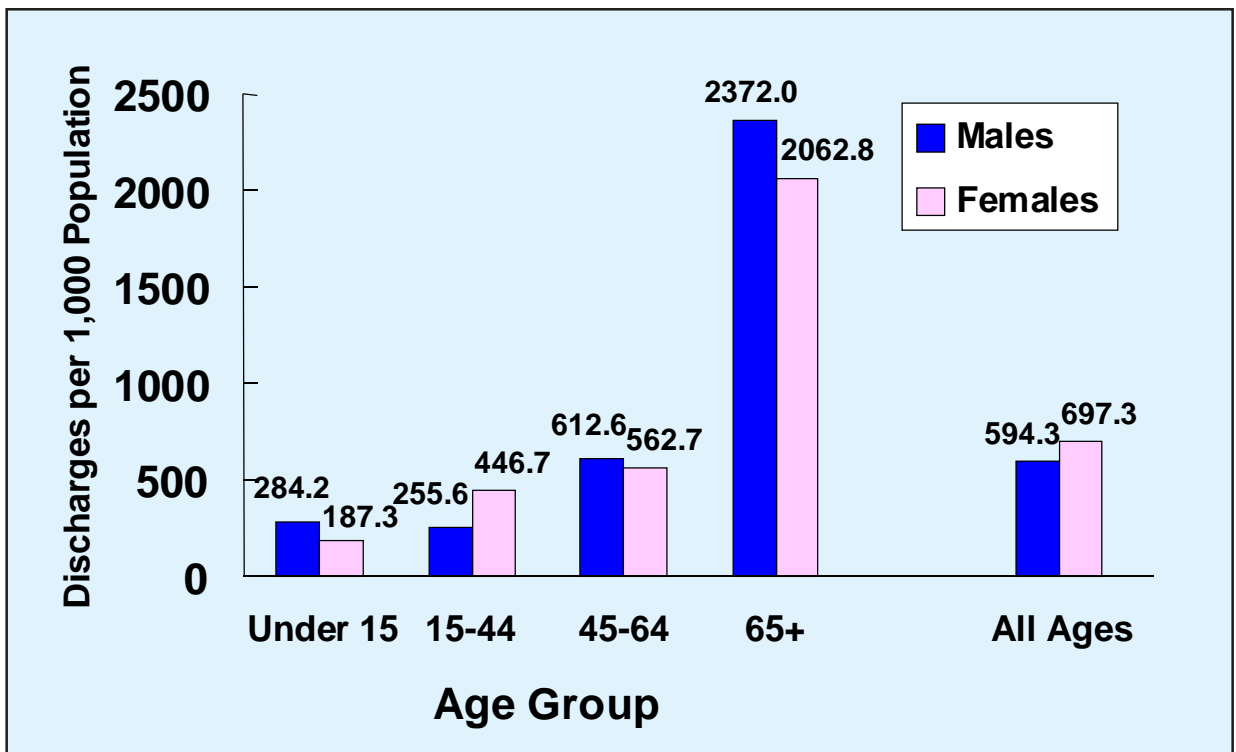


Figure 6. Utilization Rate (Days) per 1,000 Population by Age Group and Gender, Rhode Island, 2001

DISCHARGES BY DIAGNOSIS GROUP

Table 5 presents data regarding the number of discharges from Rhode Island hospitals by gender and first-listed diagnosis. Table 6, a subset of Table 5, shows the leading diagnoses for admission by gender. Table 7 presents the discharge rate per 10,000 population for Rhode Island and the United States by first-listed diagnosis. Finally, Tables 8 and 9 present the average length of stay (ALOS) by the same groups.

Diagnostic codes have been grouped into 18 major categories and 33 specific categories. The specific categories are all sub-classifications of the major diagnostic categories, but are not necessarily inclusive of these groups. Of the total 124,051 discharges with reported primary diagnostic codes, diseases of the circulatory system were most often reported with 22,462 (18.1% of total discharges), while complications of pregnancy, childbirth, and the puerperium were second with 14,342 (11.6%), and mental disorders were third with 12,787 (10.3%). These top three categories accounted for 40.0% of all discharges. The three least frequent diagnostic categories reported, certain conditions originating in the perinatal period (400 discharges), congenital anomalies (425 discharges), and diseases of the blood and blood-forming organs (1,309 discharges), accounted for only 1.7% of all discharges.

Table 6 presents data regarding the leading reasons for hospital admission by first-listed diagnosis and gender. Among the specific categories, heart disease (16,409 discharges), deliveries (13,018 discharges), and psychoses (9,680 discharges), were by far the leading diagnostic categories.

Comparisons of the discharge rate per 10,000 population for Rhode Island and the United States by first-listed diagnosis in Table 7 shows a slight difference between RI (1,172.7), US (1,151.3). The rates for the three leading specific categories locally and nationally varied slightly for heart disease (RI—154.9; US—152.4) and deliveries (RI—122.9; US—135.4). There was significant variation in the comparative rates for psychoses (RI—91.4; US 57.6).

The greatest disparity among the major categories appear in mental disorders (RI—120.7; US—83.2), and symptoms, signs, and ill-defined conditions (RI—62.8; US—8.7). The large difference seen in the latter category may be due to differences in medical record coding practices between the two systems.

Table 8 shows that the average length of stay (ALOS) for all discharges was 5.5. Among the 18 major diagnostic categories, ALOS varied from a low of 3.0 for symptoms, signs, and ill-defined conditions and complications of pregnancy, childbirth, and the puerperium to a high of 11.0 for supplemental classifications. For minor categories, the shortest ALOS, 2.4 days, was for intervertebral disc disorders, and the longest ALOS, 9.5 days, was for malignant neoplasms of the large intestine and rectum.

The ALOS for all discharges was 6.0 days for males and 5.2 days for females. Except for two major diagnostic categories, there were no substantial differences in ALOS by gender. The male ALOS for neoplasms was 8.0 days compared to 6.1 days for females, and the ALOS for certain conditions originating in the perinatal period was 9.5 days for males and 7.4 days for females.

Table 9 compares the ALOS by first-listed diagnosis for Rhode Island and the US. For all conditions, the ALOS was 5.5 days for Rhode Island and 4.9 days for the US. Among the 18 major diagnostic categories, the Rhode Island ALOS was most often slightly higher than that of the US. Rhode Island ALOS was significantly shorter for certain conditions originating in the perinatal period (RI—8.6; US—10.9). For minor categories, Rhode Island ALOS was similar to that of the US, with the exception of alcohol dependence syndrome (RI—3.4; US—5.3).

Table 5. Number of discharges by gender and first-listed diagnosis, Rhode Island, 2001

Discharges of newborn infants are excluded.

First-Listed Diagnosis¹	Total	Female	Male
All conditions ²	124,263	73,494	50,556
Infectious and parasitic diseases	2,660	1,357	1,303
Septicemia	1,156	609	547
Neoplasms	7,378	4,454	2,924
Malignant neoplasms	5,625	3,012	2,613
Malignant neoplasm of large intestine and rectum	723	354	369
Malignant neoplasm of trachea, bronchus, and lung	705	304	401
Malignant neoplasm of the breast	359	359	0
Benign neoplasms	1,544	1,322	222
Endocrine, nutritional, and metabolic diseases and immunity disorders	4,232	2,381	1,851
Diabetes mellitus	1,610	737	873
Volume depletion	1,541	921	620
Diseases of the blood and blood-forming organs	1,309	717	592
Mental disorders	12,787	6,608	6,179
Psychoses	9,680	5,193	4,487
Alcohol dependence syndrome	550	185	365
Diseases of the nervous system and sense organs	1,738	960	778
Diseases of the circulatory system	22,462	10,916	11,546
Heart disease	16,409	7,802	8,607
Acute myocardial infarction	3,549	1,461	2,088
Coronary atherosclerosis	3,942	1,480	2,462
Other ischemic heart disease	428	222	206
Cardiac dysrhythmias	2,355	1,233	1,122
Congestive heart failure	4,332	2,391	1,941
Cerebrovascular disease	3,485	1,837	1,648
Diseases of the respiratory system	12,074	6,397	5,677
Acute bronchitis and bronchiolitis	776	373	403
Pneumonia	4,538	2,428	2,110
Chronic bronchitis	2,266	1,307	959
Asthma	1,402	867	535
Diseases of the digestive system	11,351	6,175	5,176
Appendicitis	957	431	526
Noninfectious enteritis and colitis	1,008	603	405
Diverticula of intestine	1,178	691	487
Cholelithiasis	1,108	703	405
Diseases of the genitourinary system	5,890	3,906	1,984
Calculus of kidney and ureter	616	299	317

Table 5 (Continued)

Table 5. Number of discharges by gender and first-listed diagnosis, Rhode Island, 2001

Discharges of newborn infants are excluded.

First-Listed Diagnosis¹	Total	Female	Male
Complications of pregnancy, childbirth, and the puerperium	14,342	14,342	0
Females with deliveries	13,018	13,018	0
Diseases of the skin and subcutaneous tissue	2,139	1,121	1,018
Cellulitis and abscess	1,709	880	829
Diseases of the musculoskeletal system and connective tissue	6,346	3,651	2,695
Osteoarthritis and allied disorders	1,883	1,239	644
Intervertebral disc disorders	1,571	714	857
Congenital anomalies	425	185	240
Certain conditions originating in the perinatal period	400	178	222
Symptoms, signs, and ill-defined conditions	6,653	3,760	2,893
Injury and poisoning	9,215	4,911	4,304
Fractures, all sites	3,705	2,267	1,438
Fracture of neck of femur	1,369	1,063	306
Poisonings	677	383	294
Supplementary classifications	2,649	1,475	1,174

¹Diagnosis groups are defined in Appendix 1.

²There are 212 cases missing primary diagnosis code of the 124,263 discharges. When these cases are excluded, the All Conditions total is 124,051.

Table 6. Leading reasons for hospital admission, by gender and first-listed diagnosis, Rhode Island, 2001

Discharges of newborn infants are excluded.

First-Listed Diagnosis¹	All Patients
Heart disease	16,409
Deliveries	13,018
Psychoses	9,680
Malignant neoplasms	5,625
Pneumonia	4,538

First-Listed Diagnosis¹	Female
Deliveries	13,018
Heart disease	7,802
Psychoses	5,193
Malignant neoplasms	3,012
Pneumonia	2,428

First-Listed Diagnosis¹	Male
Heart disease	8,607
Psychoses	4,487
Malignant neoplasms	2,613
Pneumonia	2,110
Cerebrovascular disease	1,648

¹*Diagnosis groups are defined in Appendix 1.*

Table 7. Hospital discharge rate per 10,000 population¹ by first-listed diagnosis, Rhode Island and the United States, 2001

Discharges of newborn infants are excluded.

First-Listed Diagnosis²	RI Rate³	US Rate⁴
All conditions ⁵	1,172.7	1,151.3
Infectious and parasitic diseases	25.1	29.7
Septicemia	10.9	11.1
Neoplasms	69.6	57.9
Malignant neoplasms	53.1	42.7
Malignant neoplasm of large intestine and rectum	6.8	5.6
Malignant neoplasm of trachea, bronchus, and lung	6.7	5.4
Malignant neoplasm of breast	3.4	3.8
Benign neoplasms	14.6	13.6
Endocrine, nutritional, and metabolic diseases and immunity disorders	39.9	55.1
Diabetes mellitus	15.2	19.8
Volume depletion	14.5	18.8
Diseases of the blood and blood-forming organs	12.4	14.2
Mental disorders	120.7	83.2
Psychoses	91.4	57.6
Alcohol dependence syndrome	5.2	5.2
Diseases of the nervous system and sense organs	16.4	17.4
Diseases of the circulatory system	212.0	219.5
Heart disease	154.9	152.4
Acute myocardial infarction	33.5	28.0
Coronary atherosclerosis	37.2	37.4
Other ischemic heart disease	4.0	8.2
Cardiac dysrhythmias	22.2	25.5
Congestive heart failure	40.9	35.1
Cerebrovascular disease	32.9	32.8
Diseases of the respiratory system	113.9	121.3
Acute bronchitis and bronchiolitis	7.2	9.5
Pneumonia	41.1	45.8
Chronic bronchitis	21.4	17.8
Asthma	13.2	16.0
Diseases of the digestive system	107.1	116.3
Appendicitis	9.0	10.0
Noninfectious enteritis and colitis	9.5	10.6
Diverticula of intestine	11.1	9.9
Cholelithiasis	10.5	12.9
Diseases of the genitourinary system	55.6	63.1
Calculus of kidney and ureter	5.8	6.6

Table 7 (Continued)**Table 7. Hospital discharge rate per 10,000 population¹ by first-listed diagnosis, Rhode Island and the United States, 2001**

Discharges of newborn infants are excluded.

First-Listed Diagnosis ²	RI Rate ³	US Rate ⁴
Complications of pregnancy, childbirth, and the puerperium ⁶	135.3	153.4
Females with deliveries	122.9	135.4
Diseases of the skin and subcutaneous tissue	20.2	20.2
Cellulitis and abscess	16.1	14.2
Diseases of the musculoskeletal system and connective tissue	59.9	56.5
Osteoarthritis and allied disorders	17.8	17.5
Intervertebral disc disorders	14.8	11.5
Congenital anomalies	4.0	7.3
Certain conditions originating in the perinatal period	3.8	6.1
Symptoms, signs, and ill-defined conditions	62.8	8.7
Injury and poisoning	87.0	92.1
Fractures, all sites	35.0	35.2
Fracture of neck of femur	12.9	11.4
Poisonings	6.4	7.3
Supplementary classifications ⁶	25.0	29.2

¹Population estimates for Rhode Island as of July 1, 2001, were provided by the Bureau of the Census, United States Department of Commerce.

²Diagnosis groups are defined in Appendix 1.

³Rates are not adjusted for patient's state of residence. (Rhode Island)

⁴Source for the United States rates: Hall, Margaret J. and DeFrances, Carol J. 2001 National Hospital Discharge Survey. Advance Data From Vital and Health Statistics; No. 332. Hyattsville, Maryland: National Center for Health Statistics, 2003. <http://www.cdc.gov/nchs/data/ad/ad332.pdf>

⁵Two hundred and thirteen (213) cases are missing a primary diagnosis. When these cases are excluded, the discharge rate for Rhode Island is 1,170.7 per 10,000 population.

⁶US rate calculated by the Rhode Island Department of Health using data in the US report.

Table 8. Average length of stay¹ by gender and first-listed diagnosis, Rhode Island, 2001

Discharges of newborn infants are excluded.

First-Listed Diagnosis²	Total	Female	Male
All conditions ³	5.5	5.2	6.0
Infectious and parasitic diseases	6.8	6.5	7.1
Septicemia	8.9	8.6	9.3
Neoplasms	6.9	6.1	8.0
Malignant neoplasms	7.8	7.2	8.4
Malignant neoplasm of large intestine and rectum	9.5	8.8	10.2
Malignant neoplasm of trachea, bronchus, and lung	8.1	7.9	8.2
Malignant neoplasm of breast	2.6	2.6	0.0
Benign neoplasms	3.7	3.5	4.9
Endocrine, nutritional, and metabolic diseases, and immunity disorders	5.1	5.0	5.3
Diabetes mellitus	6.1	5.9	6.2
Volume depletion	3.7	3.7	3.5
Diseases of the blood and blood-forming organs	5.0	5.1	5.0
Mental disorders	8.1	8.2	8.0
Psychoses	8.2	8.4	8.0
Alcohol dependence syndrome	3.4	3.5	3.3
Diseases of the nervous system and sense organs	6.8	6.5	7.1
Diseases of the circulatory system	5.3	5.4	5.1
Heart disease	4.8	5.0	4.6
Acute myocardial infarction	5.4	5.6	5.2
Coronary atherosclerosis	3.8	4.0	3.7
Other ischemic heart disease	2.5	2.6	2.3
Cardiac dysrhythmias	3.9	3.9	3.8
Congestive heart failure	5.4	5.4	5.3
Cerebrovascular disease	6.3	6.2	6.3
Diseases of the respiratory system	6.2	6.1	6.2
Acute bronchitis and bronchiolitis	3.5	3.8	3.3
Pneumonia	6.0	6.0	6.0
Chronic bronchitis	5.2	5.6	4.8
Asthma	3.3	3.6	2.8
Diseases of the digestive system	5.3	5.3	5.2
Appendicitis	3.3	3.2	3.4
Noninfectious enteritis and colitis	5.6	6.0	5.1
Diverticula of intestine	5.8	5.8	5.7
Cholelithiasis	4.5	4.2	5.2
Diseases of the genitourinary system	4.0	3.8	4.3
Calculus of kidney and ureter	2.9	3.2	2.7

Table 8 (Continued)

Table 8. Average length of stay¹ by gender and first-listed diagnosis, Rhode Island, 2001

Discharges of newborn infants are excluded.

First-Listed Diagnosis²	Total	Female	Male
Complications of pregnancy, childbirth, and the puerperium	3.0	3.0	0.0
Females with deliveries	2.9	2.9	0.0
Diseases of the skin and subcutaneous tissue	5.2	5.4	5.0
Cellulitis and abscess	4.9	5.1	4.7
Diseases of the musculoskeletal system and connective tissue	4.2	4.2	4.0
Osteoarthritis and allied disorders	4.7	4.7	4.6
Intervertebral disc disorders	2.4	2.5	2.3
Congenital anomalies	4.7	4.8	4.6
Certain conditions originating in the perinatal period	8.6	7.4	9.5
Symptoms, signs, and ill-defined conditions	3.0	3.1	2.9
Injury and poisoning	6.2	6.0	6.3
Fractures, all sites	6.3	6.0	6.8
Fracture of neck of femur	6.8	6.6	7.6
Poisonings	2.9	2.8	3.0
Supplementary classifications	11.0	10.4	11.7

¹Average length of stay is computed after adjusting patients admitted and discharged on the same day to a stay of one day.

²Diagnosis groups are defined in Appendix 1.

³There are 9 cases without gender listed with an ALOS of 2.0 days included in the total. Additionally, there are 212 cases without diagnosis listed with an ALOS of 28.1 days included in the total.

Table 9. Average length of stay¹ by first-listed diagnosis, Rhode Island and the United States, 2001

Discharges of newborn infants are excluded.

First-Listed Diagnosis²	Total	Total US³
All conditions ⁴	5.5	4.9
Infectious and parasitic diseases	6.8	6.5
Septicemia	8.9	8.9
Neoplasms	6.9	6.1
Malignant neoplasms	7.8	7.0
Malignant neoplasm of large intestine and rectum	9.5	8.6
Malignant neoplasm of trachea, bronchus, and lung	8.1	7.6
Malignant neoplasm of breast	2.6	2.9
Benign neoplasms	3.7	3.2
Endocrine, nutritional, and metabolic diseases and immunity disorders	5.1	4.3
Diabetes mellitus	6.1	4.9
Volume depletion	3.7	3.8
Diseases of the blood and blood-forming organs	5.0	4.6
Mental disorders	8.1	7.4
Psychoses	8.2	8.1
Alcohol dependence syndrome	3.4	5.3
Diseases of the nervous system and sense organs	6.8	5.3
Diseases of the circulatory system	5.3	4.7
Heart disease	4.8	4.6
Acute myocardial infarction	5.4	5.8
Coronary atherosclerosis	3.8	3.6
Other ischemic heart disease	2.5	2.5
Cardiac dysrhythmias	3.9	3.6
Congestive heart failure	5.4	5.4
Cerebrovascular disease	6.3	5.2
Diseases of the respiratory system	6.2	5.3
Acute bronchitis and bronchiolitis	3.5	3.4
Pneumonia	6.0	5.7
Chronic bronchitis	5.2	5.2
Asthma	3.3	3.2
Diseases of the digestive system	5.3	4.7
Appendicitis	3.3	3.1
Noninfectious enteritis and colitis	5.6	4.3
Diverticula of intestine	5.8	5.2
Cholelithiasis	4.5	3.9

Table 9 (Continued)**Table 9. Average length of stay¹ by first-listed diagnosis, Rhode Island and the United States, 2001**

Discharges of newborn infants are excluded.

First-Listed Diagnosis²	Total	Total US³
Diseases of the genitourinary system	4.0	3.7
Calculus of kidney and ureter	2.9	2.4
Complications of pregnancy, childbirth, and the puerperium ⁵	3.0	2.5
Females with deliveries	2.9	2.5
Diseases of the skin and subcutaneous tissue	5.2	5.2
Cellulitis and abscess	4.9	4.8
Diseases of the musculoskeletal system and connective tissue	4.2	4.1
Osteoarthritis and allied disorders	4.7	4.4
Intervertebral disc disorders	2.4	2.9
Congenital anomalies	4.7	5.5
Certain conditions originating in the perinatal period	8.6	10.9
Symptoms, signs, and ill-defined conditions	3.0	2.3
Injury and poisoning	6.2	5.3
Fractures, all sites	6.3	5.4
Fracture of neck of femur	6.8	6.5
Poisonings	2.9	2.7
Supplementary classifications ⁵	11.0	9.3

¹Average length of stay is computed after adjusting patients admitted and discharges on the same day to a stay of one day.

²Diagnosis groups are defined in Appendix 1.

³Source for the United States rates: Hall, Margaret J. and DeFrances, Carol J. 2001 National Hospital Discharge Survey. Advance Data From Vital and Health Statistics; No. 332. Hyattsville, Maryland: National Center for Health Statistics, 2003. <http://www.cdc.gov/nchs/data/ad/ad332.pdf>

⁴There are 212 cases without a primary diagnosis listed with an ALOS of 28.1 days included in the total.

⁵US length of stay calculated by the Rhode Island Department of Health using data in the US report.

UTILIZATION OF SURGICAL AND DIAGNOSTIC PROCEDURES

Table 10 presents data for procedures reported as being performed during inpatient stays in Rhode Island short-stay hospitals by gender and procedure group.³ Table 11 shows the most frequent procedures performed during in-patient admissions by gender and minor procedure category.

Procedures are grouped into 16 major procedure groups and 36 specific categories. The specific categories are all sub-classifications of the major groups, but do not represent a complete sub-division of the major groups in all cases.

Of 124,263 discharges, 75,492 patients, or 60.8%, underwent at least one procedure. The total number of procedures reported was 171,024. Non-surgical procedures, including computerized axial tomography, arteriography and angiocardiology using contrast material, diagnostic ultrasound, respiratory therapy, insertion of endotracheal tube, injection or infusion of cancer chemotherapeutic substance, and others accounted for 56,664 procedures or 33.1% of all procedures. This was the largest single group of procedures performed.

Among the surgical procedures listed, the three most frequently reported major groups were operations on the cardiovascular system (27,871), operations on the digestive system (24,279), and obstetrical procedures (19,568). Together, these accounted for 41.9% of the total. Three procedure categories that were the least reported; operations on the ear (90), operations on the eye (177), and operations on the endocrine system (222), together accounted for only 0.3% of all procedures.

Table 11 shows that among the more specific procedure categories, the three most common procedures were from diverse areas—arteriography and angiocardiology using contrast material (10,789), repair of current obstetric laceration (5,594), and removal of coronary artery obstruction (4,618). By far the leading overall category for males was arteriography and angiocardiology using contrast material; for females, it was repair of current obstetric laceration.

Comparison of the procedure rates for Rhode Island and the United States was not possible, as the data are not collected comparably. Rhode Island collects up to 10 procedures per discharge, while the United States only collects up to 4 procedures per discharge.

³*Up to ten procedures may be reported per discharge, as all reported procedures are included, the information presented is described as “all-listed procedures.”*

Table 10. Number of all-listed procedures for discharges from short-stay hospitals, by gender and procedure category, Rhode Island, 2001

Discharges of newborn infants are excluded.

Procedures¹	Total	Female	Male
All procedures ²	171,024	96,850	74,174
Operations on the nervous system	4,377	2,094	2,283
Spinal tap	1,403	661	742
Operations on the endocrine system	222	137	85
Operations on the eye	177	86	91
Operations on the ear	90	45	45
Operations on the nose, mouth, and pharynx	831	371	460
Operations on the respiratory system	4,707	2,054	2,653
Bronchoscopy with or without biopsy	1,121	460	661
Operations on the cardiovascular system	27,871	11,532	16,339
Removal of coronary artery obstruction and insertion of stent(s)	4,618	1,519	3,099
Coronary artery bypass graft	2,082	566	1,516
Cardiac catheterization	4,495	1,734	2,761
Insertion, replacement, removal, and revision of pacemaker leads or device	1,581	761	820
Hemodialysis	2,459	1,162	1,297
Operations on the hemic and lymphatic system	1,649	853	796
Operations on the digestive system	24,279	13,389	10,890
Endoscopy of small intestine with or without biopsy	4,296	2,288	2,008
Endoscopy of large intestine with or without biopsy	2,641	1,539	1,102
Partial excision of large intestine	1,255	687	568
Appendectomy, excluding incidental	1,096	544	552
Cholecystectomy	1,462	906	556
Lysis of peritoneal adhesions	1,424	1,059	365
Operations on the urinary system	4,620	2,525	2,095
Cystoscopy with or without biopsy	975	606	369
Operations in the male genital organs	1,020	0	1,020
Prostatectomy	763	0	763
Operations on the female genital organs	6,572	6,572	0
Oophorectomy and salpingo-oophorectomy	1,587	1,587	0
Bilateral destruction or occlusion of fallopian tubes	943	943	0
Hysterectomy	1,984	1,984	0
Obstetrical procedures	19,568	19,568	0
Episiotomy with or without forceps or vacuum extraction	2,102	2,102	0
Artificial rupture of membranes	1,436	1,436	0
Cesarean section	3,103	3,103	0

Table 10 (Continued)

Table 10. Number of all-listed procedures for discharges from short-stay hospitals, by gender and procedure category, Rhode Island, 2001

Discharges of newborn infants are excluded.

Procedures¹	Total	Female	Male
Repair of current obstetric laceration	5,594	5,594	0
Operations on the musculoskeletal system	12,678	6,501	6,177
Partial excision of bone	678	285	393
Reduction of fracture	2,366	1,344	1,022
Open reduction of fracture with internal fixation	1,744	1,060	684
Excision or destruction of intervertebral disc	1,439	635	804
Total hip replacement	727	466	261
Total knee replacement	1,104	740	364
Operations on the integumentary system	5,699	3,095	2,604
Debridement of wound, infection, or burn	1,725	746	979
Miscellaneous diagnostic and therapeutic procedures	56,664	28,028	28,636
Computerized axial tomography	1,213	630	583
Arteriography and angiocardiology using contrast material	10,789	4,237	6,552
Diagnostic ultrasound	3,480	1,830	1,650
Respiratory therapy	4,169	1,992	2,177
Insertion of endotracheal tube	2,648	1,243	1,405
Injection or infusion of cancer chemotherapeutic substance	989	486	503
Other miscellaneous procedures	33,376	17,610	15,766

¹Procedure categories are defined in Appendix 2.

²Up to 10 procedures may be listed per discharge.

Table 11. Most common procedures by gender and procedure category, Rhode Island, 2001

Discharges of newborn infants are excluded.

Procedures¹	All Patients
Arteriography and angiocardiology using contrast material	10,789
Repair of current obstetric laceration	5,594
Removal of coronary artery obstruction	4,618
Cardiac catheterization	4,495
Endoscopy of small intestine with or without biopsy	4,296

Procedures¹	Female
Repair of current obstetric laceration	5,594
Arteriography and angiocardiology using contrast material	4,237
Cesarean section	3,103
Endoscopy of small intestine with or without biopsy	2,288
Episiotomy with or without forceps or vacuum extraction	2,102

Procedures¹	Male
Arteriography and angiocardiology using contrast material	6,552
Removal of coronary artery obstruction	3,099
Cardiac catheterization	2,761
Respiratory therapy	2,177
Endoscopy of small intestine with or without biopsy	2,008

¹Procedure categories are defined in Appendix 2.

FREQUENCY OF PERFORMANCE – SELECTED SURGICAL PROCEDURES

For some surgical procedures, research studies have determined that patients have generally better outcomes where hospitals and/or surgeons perform the procedure regularly (see References 6 and 7 on page 36). Based on this research, the federal Agency for Healthcare Research and Quality (AHRQ) and the Leapfrog Group have developed groups of indicators based on hospital surgical volumes for specific procedures, which can be used as screening tools to identify potential quality of care issues (see References 7 and 8 on page 36). For these procedures it is said that a “volume-outcome relationship” has been established. It should be noted that this is a statistical relationship typically based on data from many dozens and sometimes hundreds of hospitals, and exceptions to the general relationship may be expected. Some low-volume hospitals may have excellent outcomes, and vice-versa. Because of these exceptions, surgical volume alone should not be used as an indicator of the quality of care provided by a specific hospital. Data on hospital surgical volumes should preferably be used in combination with case-mix adjusted measures of surgical outcomes, e.g., in-hospital mortality and/or complication rates, and surgeon-specific volume measures, for patients undergoing the procedure, where such measures are available.

The seven procedures included in this section are those for which AHRQ believes there is strong evidence supporting a general relationship between the frequency of performance of the procedure at a hospital and the outcomes of the procedure at that hospital. As such, AHRQ has included the performance frequencies of the seven procedures as measures in their set of “Inpatient Quality Indicators (IQIs),” one of three sets of indicators of the quality of care provided by hospitals and other health care providers. AHRQ cites volume threshold levels for this volume-outcome relationship for each of the seven procedures, above which treatment outcomes are generally better than at lower frequencies, based on findings in the literature. Some procedures have upper and lower volume threshold levels, reflecting a range of minimum volume thresholds in the research literature (see Reference 7 on page 36). More information on AHRQ’s quality indicators may be obtained at <http://www.qualityindicators.ahrq.gov/>.

The seven AHRQ procedures can be grouped into adult and pediatric cardiac surgery (Tables 12 and 13), cancer surgery (Table 14) and peripheral vascular system procedures (Table 15). [Note that the three specialty hospitals (Bradley, Butler, and the Rehabilitation Hospital) and Women & Infants Hospital do not perform any of these seven procedures and are excluded from all tables.] Only two hospitals performed any of the cardiac procedures during 1999-2001, and both were above AHRQ’s “volume thresholds” for the procedures on adults during all three years. For the pediatric procedure, the one facility involved falls below the AHRQ volume threshold, and the frequency of performance declined from 1999 to 2001. The two surgical procedures related to cancer have been performed at eight hospitals in the state over the past three years, and of those, one hospital has reached or exceeded the volume threshold for either procedure during 1999-2001. All ten hospitals performed each of the two peripheral vascular procedures during 1999-2001, and for both procedures there are several hospitals with volumes above the upper end of the range of thresholds reported by AHRQ for each procedure, and some of the remaining hospitals had volumes falling within AHRQ’s threshold range during one or more of the three years.

Table 12. Number of adult cardiac procedures¹ by hospital, Rhode Island, 1999-2001

Hospital	Coronary Artery Bypass Graft ²				Percutaneous Transluminal Coronary Angioplasty ³			
	1999	2000	2001	1999-2001 Average	1999	2000	2001	1999-2001 Average
Miriam Hospital	669	607	565	613.7	1,136	1,290	1,308	1,244.7
Rhode Island Hospital	590	563	571	574.7	840	860	1,010	903.3
All Hospitals	1,259	1,170	1,136	1,188.3	1,976	2,150	2,318	2,148.0

¹Procedures are defined in Appendix 3.

²Review of literature by AHRQ indicates that above a certain volume threshold, the rate of adverse outcomes decreases. Depending on the study, this threshold is between 100 and 200 procedures per year (see Reference 7 on page 36).

³Review of literature by AHRQ indicates that above a certain volume threshold, the rate of adverse outcomes decreases. Depending on the study, this threshold is between 200 and 400 procedures per year (see Reference 7 on page 36).

Table 13. Number of pediatric heart surgeries¹ by hospital, Rhode Island, 1999-2001

Hospital	Pediatric Heart Surgery ²			
	1999	2000	2001	1999-2001 Average
Rhode Island Hospital	37	32	22	30.3

¹Pediatric heart surgery is defined in Appendix 3.

²Review of literature by AHRQ indicates that above a certain volume threshold, the rate of adverse outcomes decreases. This threshold is 100 procedures per year (see Reference 7 on page 36).

Table 14. Number of cancer-related surgical procedures¹ by hospital, Rhode Island, 1999-2001

Hospital	Esophageal Resection ²				Pancreatic Resection ³			
	1999	2000	2001	1999-2001 Average	1999	2000	2001	1999-2001 Average
Kent County Memorial Hospital	1	1	1	1.0	2	1	5	2.7
Landmark Medical Center	0	0	1	0.3	0	1	0	0.3
Memorial Hospital	0	0	0	0	2	3	2	2.3
Miriam Hospital	0	0	1	0.3	4	4	2	3.3
Rhode Island Hospital	6	0	0	2.0	8	16	12	12.0
Roger Williams Medical Center	0	0	1	0.3	2	6	4	4.0
St. Joseph Health Services	0	0	0	0	1	1	1	1.0
Westerly Hospital	0	0	0	0	1	0	0	0.3
All Hospitals	7	1	4	4.0	20	32	26	26.0

¹Procedures are defined in Appendix 3.

²Review of literature by AHRQ indicates that above a certain volume threshold, the rate of adverse outcomes decreases. Depending on the study, this threshold is between 6 and 7 procedures per year (see Reference 7 on page 36).

³Review of literature by AHRQ indicates that above a certain volume threshold, the rate of adverse outcomes decreases. Depending on the study, this threshold is between 10 and 11 procedures per year (see Reference 7 on page 36).

Table 15. Number of peripheral vascular system surgical procedures¹ by hospital, Rhode Island, 1999-2001

Hospital	Abdominal Aortic Aneurysm Repair ²				Carotid Endarterectomy ³			
	1999	2000	2001	1999-2001 Average	1999	2000	2001	1999-2001 Average
Kent County Memorial Hospital	10	27	11	16.0	148	148	120	138.7
Landmark Medical Center	11	7	15	11.0	43	31	33	35.7
Memorial Hospital	12	17	12	13.7	24	34	39	32.3
Miriam Hospital	39	43	43	41.7	121	100	113	111.3
Newport Hospital	5	3	4	4.0	50	31	32	37.7
Rhode Island Hospital	69	52	45	55.3	180	186	152	172.7
Roger Williams Medical Center	8	10	4	7.3	16	21	14	17.0
South County Hospital	6	3	6	5.0	20	17	18	18.3
St. Joseph Health Services	15	8	7	10.0	76	64	38	59.3
Westerly Hospital	11	7	5	7.7	21	22	41	28.0
All Hospitals	186	177	152	171.7	699	654	600	651.0

¹Procedures are defined in Appendix 3.

²Review of literature by AHRQ indicates that above a certain volume threshold, the rate of adverse outcomes decreases. Depending on the study, this threshold is between 10 and 32 procedures per year (see Reference 7 on page 36).

³Review of literature by AHRQ indicates that above a certain volume threshold, the rate of adverse outcomes decreases. Depending on the study, this threshold is between 50 and 101 procedures per year (see Reference 7 on page 36).

DISCHARGES BY GROUPED CHARGES

Table 16 and Figure 7 present data regarding short-stay hospital discharges and percent distribution grouped by charge category. Charge categories were set by increments of \$1,000 up to \$10,000, of \$5,000 up to \$20,000, and progressively larger increments as the charges became greater.

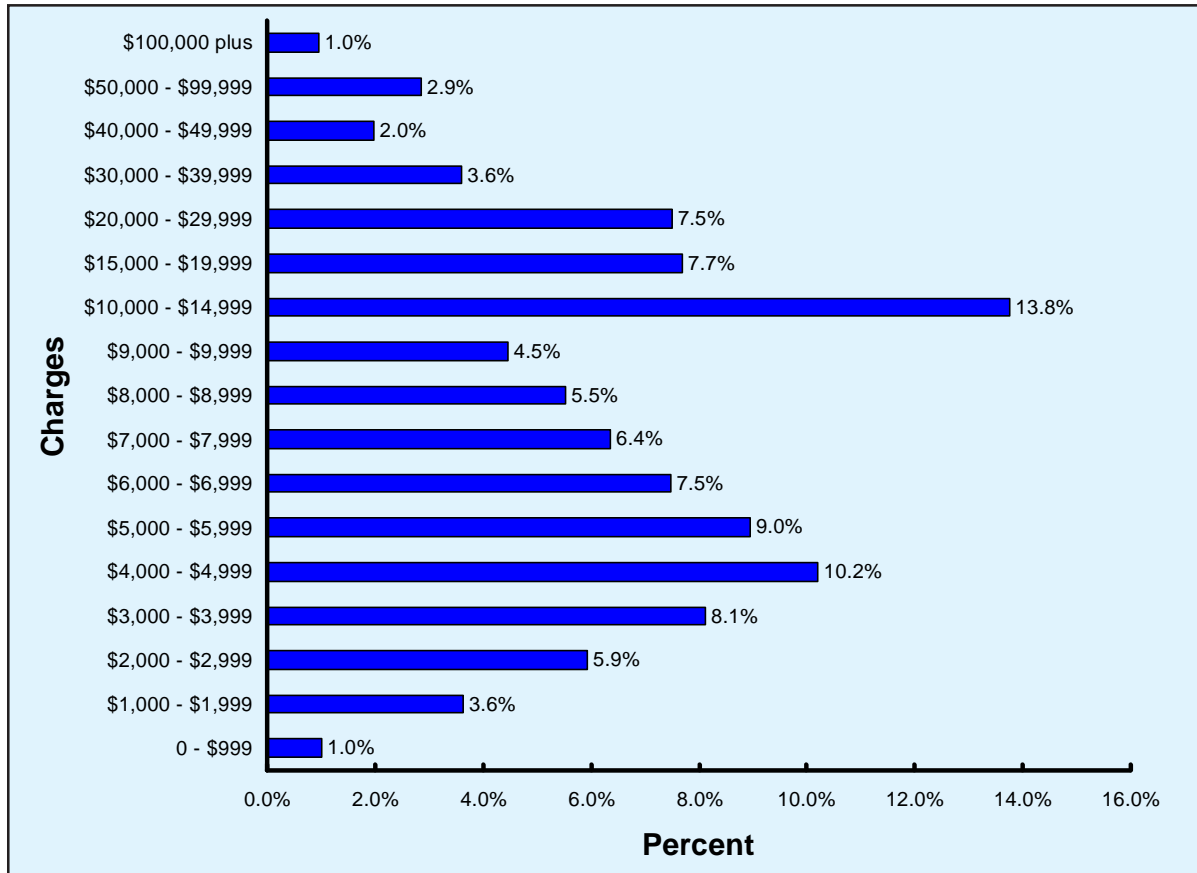


Figure 7. Hospital Discharges and Percent Distribution Grouped by Charge Category, Rhode Island, 2001

Although the all-hospital average charge per discharge was \$13,918 (Table 2), 61.7% of all discharges had a charge of less than \$10,000. The median charge was \$7,719. The most common categories were \$10,000 - \$14,999 (13.8%), and \$4,000 - \$4,999 (10.2%). The \$100,000 plus category had only 1.0% of discharges, while 9.4% of all discharges had charges over \$30,000.

These averages are not adjusted for the different complexity of the hospitals' case-mix. Actual reimbursement to the hospitals per discharge will generally be lower than average charges, depending on the specific arrangements under which payers reimburse hospitals. Data on actual payments to the hospitals are not available in the discharge data, but may be found in reports on aggregate hospital financial performance, *Hospital Financial Operations Dataset 2001*, available at <http://www.health.ri.gov/chic/performance/HOSPITAL-DATASE.xls>.

Table 16. Discharges and percent distribution grouped by charge category, Rhode Island, 2001

Discharges of newborn infants are excluded.

Grouped Charges¹	Discharges	Percent
0 - \$999	1,264	1.0%
\$1,000 - \$1,999	4,501	3.6%
\$2,000 - \$2,999	7,365	5.9%
\$3,000 - \$3,999	10,086	8.1%
\$4,000 - \$4,999	12,688	10.2%
\$5,000 - \$5,999	11,129	9.0%
\$6,000 - \$6,999	9,303	7.5%
\$7,000 - \$7,999	7,900	6.4%
\$8,000 - \$8,999	6,858	5.5%
\$9,000 - \$9,999	5,524	4.5%
\$10,000 - \$14,999	17,101	13.8%
\$15,000 - \$19,999	9,549	7.7%
\$20,000 - \$29,999	9,333	7.5%
\$30,000 - \$39,999	4,492	3.6%
\$40,000 - \$49,999	2,450	2.0%
\$50,000 - \$99,999	3,531	2.9%
\$100,000 plus	1,188	1.0%
Total	124,262	100.0%

¹Charges were missing for one discharge.

OBSTETRICAL UTILIZATION

Table 17 presents Rhode Island hospital obstetrical utilization data by hospital, including total deliveries, sub-divided by vaginal delivery (total and after previous cesarean delivery), and cesarean delivery (total, primary, and after previous cesarean delivery). Also included are cesarean delivery rates (total and primary), and the rate of vaginal delivery after previous cesarean delivery. (Figure 8 and Figure 9) [See Appendix 4 for definitions.]

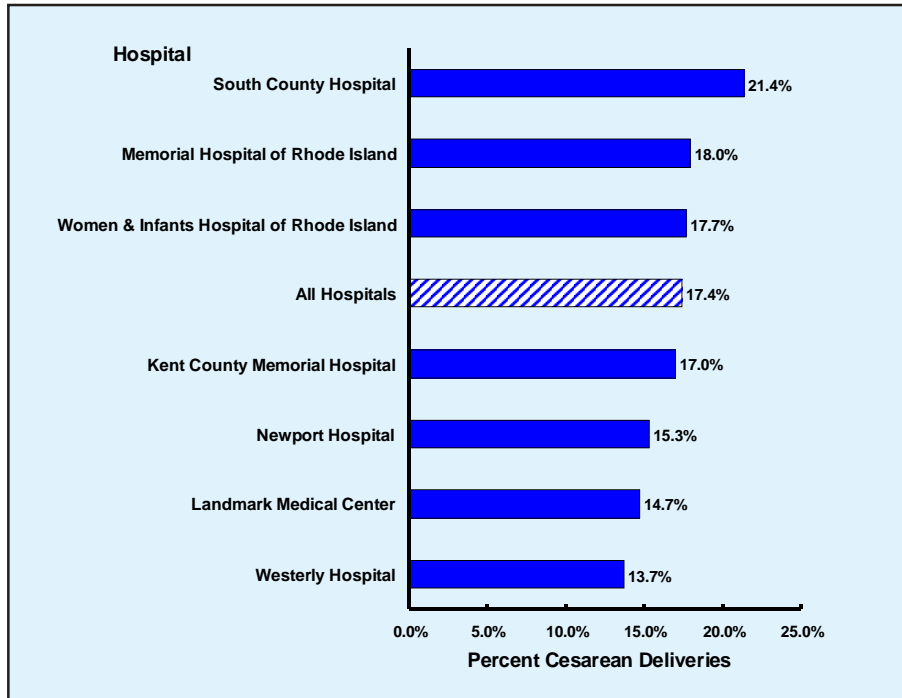


Figure 8. Primary Cesarean Delivery Rate by Hospital, Rhode Island, 2001

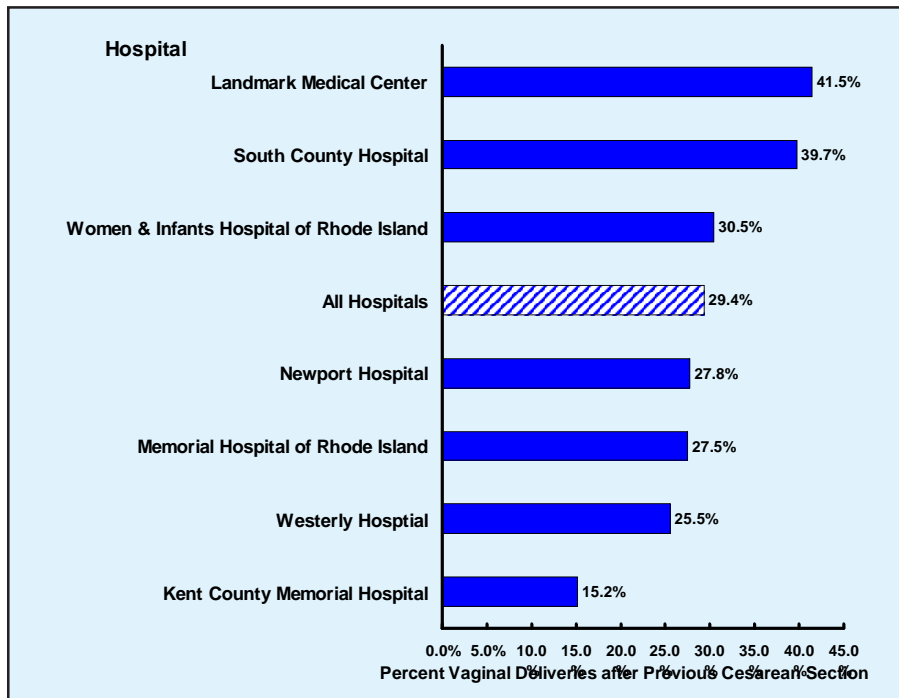


Figure 9. Vaginal Delivery Rate after Previous Cesarean Section by Hospital, Rhode Island, 2001

In 2001, there were 13,017 deliveries at the state's seven hospitals with maternity services and one additional delivery at Rhode Island Hospital. The number of deliveries by hospital ranged from 462 at Westerly Hospital to 8,922 at the Women and Infants Hospital of Rhode Island (68.5% of all deliveries).

The all-hospital total cesarean delivery rate was 23.8%, ranging by hospital from 18.6% to 25.4%. The all-hospital primary cesarean delivery rate was 17.4%, and ranged from 13.7% to 21.4%. Of the 1,566 deliveries to women with previous cesarean sections, 461 (29.4%) were vaginal deliveries.

The highest rate of vaginal deliveries after previous cesarean deliveries was attributable to Landmark Medical Center (41.5%). While the all-hospital rate for vaginal deliveries after previous cesarean was 29.4%, the range among hospitals from 15.2% to 41.5% was wide; however, these statistics are based on a relatively small number of cases for some hospitals.

Table 18 presents short-stay hospital average length of stay by type of delivery, i.e. vaginal and cesarean. The all-hospital average length of stay for vaginal deliveries was 2.4 days compared to 4.7 days for cesarean deliveries. By hospital, vaginal deliveries ranged from 2.0 days to 2.5 days, while cesarean ranged from 3.5 days to 5.1 days.

Table 17. Hospital obstetrical utilization, Rhode Island, 2001

Hospital	Total Deliveries	Method of Delivery ¹						Cesarean Delivery Rate		Rate of Vaginal Deliveries After Previous Cesarean
		Vaginal			Cesarean			Total	Primary	
		Total	Simple Vaginal	After Previous Cesarean	Total	Primary	After Previous Cesarean			
Kent County Memorial Hospital	1,066	795	775	20	271	159	112	25.4%	17.0%	15.2%
Landmark Medical Center	598	487	465	22	111	80	31	18.6%	14.7%	41.5%
Memorial Hospital of Rhode Island	720	547	525	22	173	115	58	24.0%	18.0%	27.5%
Newport Hospital	686	530	505	25	156	91	65	22.7%	15.3%	27.8%
South County Hospital	563	420	397	23	143	108	35	25.4%	21.4%	39.7%
Westerly Hospital	462	370	358	12	92	57	35	19.9%	13.7%	25.5%
Women & Infants Hospital of Rhode Island	8,922	6,769	6,432	337	2,153	1,384	769	24.1%	17.7%	30.5%
All Hospitals ²	13,018	9,919	9,458	461	3,099	1,994	1,105	23.8%	17.4%	29.4%

¹Definitions appear in Appendix 4.

²Total includes one vaginal delivery at Rhode Island Hospital, a non-obstetrical hospital.

Table 18. Hospital average length of stay¹ by type of delivery, Rhode Island, 2001

Hospital	Type of Delivery ²	
	Vaginal	Cesarean
Newport Hospital	2.3	3.9
Memorial Hospital of Rhode Island	2.3	3.7
South County Hospital	2.2	4.0
Kent County Memorial Hospital	2.3	4.0
Westerly Hospital	2.0	3.5
Landmark Medical Center	2.2	3.8
Women & Infants Hospital of Rhode Island	2.5	5.1
All Hospitals ³	2.4 days	4.7 days

¹Average length of stay is computed after adjusting patients admitted and discharged on the same day to a stay of one day.

²Definitions appear in Appendix 4.

³Includes one delivery at Rhode Island Hospital with a length of stay of 1 day.

DISCHARGES BY EXTERNAL CAUSE OF INJURY

Table 19 presents data regarding hospital discharges by external cause of injury. In 2001, there were 5,973 discharges where an injury was reported as the first-listed diagnosis on the hospital medical record, excluding nature of injury codes for late effects of injury and complications of surgical and medical care. Note that discharges with external causes of injury codes corresponding to late effects of injury and medical and surgical misadventure do appear in the discharge data.

Of these injury discharges, 92.9% had an external cause of injury (e.g., motor vehicle crash, fall, assault, etc.) reported. Falls, with 2,917 discharges (48.8% of total injuries), were by far the leading external cause of injury. The only other specific external cause with more than 10% of the total was motor vehicle traffic with 733 discharges (12.3%).

Figures 10 present data with respect to hospital discharges by external cause of injury by age group. There are major differences by age group. Falls represent 73.6% of the total injury cause for hospitalizations for those 65 and over, 43.3% for those ages 45-64, 17.4% for those ages 15-44, and 38.0% for those under age 15. For those ages 15-44, 22.3% of injury related hospitalizations were caused by motor vehicle crashes, the highest among the four age groups.

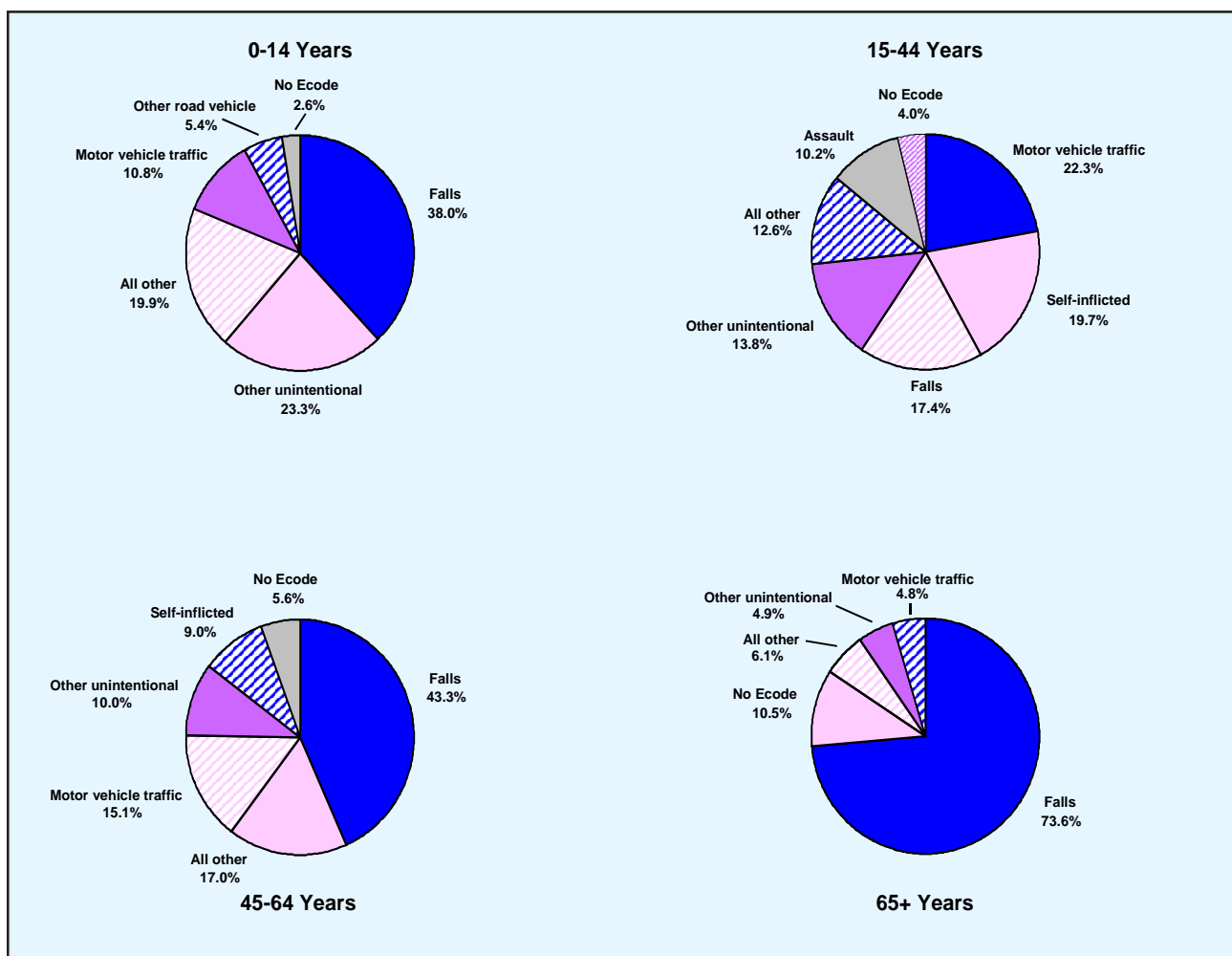


Figure 10. Discharges by External Cause of Injury by Age Group, Rhode Island, 2001

Table 19. Hospital discharges with first-listed diagnosis of injury¹ by external cause of injury, Rhode Island, 2001

External Cause of Injury²	Discharges	Percent
Railway	0	0.0%
Motor vehicle traffic	733	12.3%
Motor vehicle non-traffic	43	0.7%
Other road vehicle	71	1.2%
Water transport	5	0.1%
Air transport	0	0.0%
Other vehicle	5	0.1%
Poisoning	138	2.3%
Medical and surgical misadventure	49	0.8%
Falls	2,917	48.8%
Fire	44	0.7%
Natural and environmental factors	48	0.8%
Submersion and suffocation	43	0.7%
Other unintentional	591	9.9%
Late effects	12	0.2%
Adverse drug reaction	39	0.7%
Self-inflicted	478	8.0%
Assault	239	4.0%
Legal intervention	1	0.0%
Undetermined intent	93	1.6%
War	0	0.0%
External cause of injury not reported	424	7.1%
All injuries	5,973	100.0%

¹Includes discharges with a first-listed diagnosis of ICD-9-CM codes 800-904, 910-994, 995.5, 995.81.

²Definitions of external cause of injury categories appear in Appendix 5.

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8. The Leapfrog Group for Patient Safety. Factsheet: Evidence-Based Hospital Referral. http://www.leapfrog.org/FactSheets/EHR_FactSheet.PDF

Appendix 1: Diagnostic groupings and code numbers based on the *International Classification of Diseases, 9th Revision, Clinical Modification (ICD-9-CM)*¹

Diagnostic groupings²	Code numbers
Infectious and parasitic diseases	001-139
Septicemia	038
Neoplasms	140-239
Malignant neoplasms	140-208, 230-234
Malignant neoplasm of large intestine and rectum	153-154, 197.5
Malignant neoplasm of trachea, bronchus, and lung	162, 176.4, 197.0, 197.3
Malignant neoplasm of breast	174-175, 198.81
Benign neoplasms	210-229
Endocrine, nutritional and metabolic diseases, and immunity disorders	240-279
Diabetes mellitus	250
Volume depletion	276.5
Diseases of the blood and blood-forming organs	280-289
Mental disorders	290-319
Psychoses	290-299
Alcohol dependence syndrome	303
Diseases of the nervous system and sense organs	320-389
Diseases of the circulatory system	390-459
Heart disease	391-392.0, 393-398, 402, 404, 410-416, 420-429
Acute myocardial infarction	410
Coronary atherosclerosis	414.0
Other ischemic heart disease	411-413, 414.1-414.9
Cardiac dysrhythmias	427
Congestive heart failure	428.0
Cerebrovascular disease	430-438
Diseases of the respiratory system	460-519
Acute bronchitis and bronchiolitis	466
Pneumonia	480-486
Chronic bronchitis	491

Appendix 1 (Continued)

Diagnostic groupings²	Code numbers
Asthma	493
Diseases of the digestive system	520-579
Appendicitis	540-543
Noninfectious enteritis and colitis	555-558
Diverticula of intestine	562
Cholelithiasis	574
Diseases of the genitourinary system	580-629
Calculus of kidney and ureter	592
Complications of pregnancy, childbirth, and the puerperium	630-677
Females with deliveries	640-648 ³ , 650, 651-676 ³
Diseases of the skin and subcutaneous tissue	680-709
Cellulitis and abscess	681-682
Diseases of the musculoskeletal system and connective tissue	710-739
Osteoarthritis and allied disorders	715
Intervertebral disc disorders	722
Congenital anomalies	740-759
Certain conditions originating in the perinatal period	760-779
Symptoms, signs, and ill-defined conditions	780-799
Injury and poisoning	800-999
Fractures, all sites	800-829
Fracture of neck and of femur	820
Poisonings	960-989
Supplementary classifications	V01-V82

¹See Reference 2 on page 36.

²Hall, Margaret J. and DeFrances, Carol J. 2001 National Hospital Discharge Survey. Advance Data From Vital and Health Statistics; No. 332. Hyattsville, Maryland: National Center for Health Statistics, 2003. <http://www.cdc.gov/nchs/data/ad/ad332.pdf>

³With fifth digit of "1" or "2".

Appendix 2: Procedure categories and code numbers based on the *International Classification of Diseases, 9th Revision, Clinical Modification (ICD-9-CM)*¹

Procedure categories²	Code numbers
Operations on the nervous system	01-05
Spinal tap	03.31
Operations on the endocrine system	06-07
Operations on the eye	08-16
Operations on the ear	18-20
Operations on the nose, mouth, and pharynx	21-29
Operations on the respiratory system	30-34
Bronchoscopy with or without biopsy	33.21-33.24, 33.27
Operations on the cardiovascular system	35-39
Removal of coronary artery obstruction and insertion of stent(s)	36.0
Coronary artery bypass graft	36.1
Cardiac catheterization	37.21-37.23
Insertion, replacement, removal, and revision of pacemaker leads or device	37.7-37.8
Hemodialysis	39.95
Operations on the hemic and lymphatic system	40-41
Operations on the digestive system	42-54
Endoscopy of small intestine with or without biopsy	45.11-45.14, 45.16
Endoscopy of large intestine with or without biopsy	45.21-45.25
Partial excision of large intestine	45.7
Appendectomy, excluding incidental	47.0
Cholecystectomy	51.2
Lysis of peritoneal adhesions	54.5
Operations on the urinary system	55-59
Cystoscopy with or without biopsy	57.31-57.33
Operations on the male genital organs	60-64
Prostatectomy	60.2-60.6
Operations on the female genital organs	65-71
Oophorectomy and salpingo-oophorectomy	65.3-65.6
Bilateral destruction or occlusion of fallopian tubes	66.2-66.3

Appendix 2 (Continued)

Procedure categories ²	Code numbers
Hysterectomy	68.3-68.7, 68.9
Obstetrical procedures	72-75
Episiotomy with or without forceps or vacuum extraction	72.1, 72.21, 72.31, 72.71, 73.6
Artificial rupture of membranes	73.0
Cesarean section	74.0-74.2, 74.4, 74.99
Repair of current obstetric laceration	75.5-75.6
Operations on the musculoskeletal system	76-84
Partial excision of bone	76.2-76.3, 77.6-77.8
Reduction of fracture	76.7, 79.0-79.3
Open reduction of fracture with internal fixation	79.3
Excision or destruction of intervertebral disc	80.5
Total hip replacement	81.51
Total knee replacement	81.54
Operations on the integumentary system	85-86
Debridement of wound, infection, or burn	86.22, 86.28
Miscellaneous diagnostic and therapeutic procedures	87-99
Computerized axial tomography	87.03, 87.41, 87.71, 88.01, 88.38
Arteriography and angiocardiology using contrast material	88.4-88.5
Diagnostic ultrasound	88.7
Respiratory therapy	93.9, 96.7
Insertion of endotracheal tube	96.04
Injection or infusion of cancer chemotherapeutic substance	99.25

¹See Reference 2 on page 36.

²Hall, Margaret J. and DeFrances, Carol J. 2001 National Hospital Discharge Survey. Advance Data From Vital and Health Statistics; No. 332. Hyattsville, Maryland: National Center for Health Statistics, 2003. <http://www.cdc.gov/nchs/data/ad/ad332.pdf>

Appendix 3: Agency for Healthcare Research and Quality definitions¹ of selected surgical procedures based on the *International Classification of Diseases, 9th Revision, Clinical Modification (ICD-9-CM)*²

For ICD-9-CM codes introduced after October 1995, the date of introduction is indicated after the code label. For example, “OCT96-” indicates the ICD-9-CM code was introduced in October 1996.

Procedure Volume Indicators

Esophageal Resection Volume (IQI 1)			
Discharges with ICD-9-CM codes of 4240 through 4242 in any procedure field and a diagnosis code of esophageal cancer in any field.			
ICD-9-CM esophageal resection procedure codes:			
4240	ESOPHAGECTOMY NOS		
4241	PARTIAL ESOPHAGECTOMY		
4242	TOTAL ESOPHAGECTOMY		
ICD-9-CM esophageal cancer diagnosis codes:			
1500	MAL NEO CERVICAL ESOPHAG	1504	MAL NEO MIDDLE 3RD ESOPH
1501	MAL NEO THORACIC ESOPHAG	1505	MAL NEO LOWER 3RD ESOPH
1502	MAL NEO ABDOMIN ESOPHAG	1508	MAL NEO ESOPHAGUS NEC
1503	MAL NEO UPPER 3RD ESOPH	1509	MAL NEO ESOPHAGUS NOS
Exclude:			
MDC 14 (pregnancy, childbirth, and puerperium) and MDC 15 (newborns and other neonates).			

Pancreatic Resection Volume (IQI 2)			
Discharges with ICD-9-CM codes of 526 or 527 in any procedure field and a diagnosis code of pancreatic cancer in any field.			
ICD-9-CM pancreatic resection procedure codes:			
526	TOTAL PANCREATECTOMY		
527	RAD PANCREATICODUODENECT		
ICD-9-CM pancreatic cancer diagnosis codes:			
1520	MALIGNANT NEOPL DUODENUM	1572	MAL NEO PANCREAS TAIL
1561	MAL NEO EXTRAHEPAT DUCTS	1573	MAL NEO PANCREATIC DUCT
1562	MAL NEO AMPULLA OF VATER	1574	MAL NEO ISLET LANGERHANS
1570	MAL NEO PANCREAS HEAD	1578	MALIG NEO PANCREAS NEC
1571	MAL NEO PANCREAS BODY	1579	MALIG NEO PANCREAS NOS
Exclude:			
MDC 14 (pregnancy, childbirth, and puerperium) and MDC 15 (newborns and other neonates).			

Appendix 3 (Continued)

Pediatric Heart Surgery Volume (IQI 3)

Discharges with ICD-9-CM codes for specified heart surgery (1P) in any field or for any heart surgery (2P) plus a diagnosis code of hypoplastic left heart syndrome (1D) in any field.

Age less than 18 years.

Specified heart surgery (1P)

ICD-9-CM procedure codes:

3500	CLOSED VALVOTOMY NOS	3552	PROS REPAIR ATRIA DEF-CL
3501	CLOSED AORTIC VALVOTOMY	3553	PROST REPAIR VENTRIC DEF
3502	CLOSED MITRAL VALVOTOMY	3554	PROS REP ENDOCAR CUSHION
3503	CLOSED PULMON VALVOTOMY	3560	GRFT REPAIR HRT SEPT NOS
3504	CLOSED TRICUSP VALVOTOMY	3561	GRAFT REPAIR ATRIAL DEF
3510	OPEN VALVULOPLASTY NOS	3562	GRAFT REPAIR VENTRIC DEF
3511	OPN AORTIC VALVULOPLASTY	3563	GRFT REP ENDOCAR CUSHION
3512	OPN MITRAL VALVULOPLASTY	3570	HEART SEPTA REPAIR NOS
3513	OPN PULMON VALVULOPLASTY	3571	ATRIA SEPTA DEF REP NEC
3514	OPN TRICUS VALVULOPLASTY	3572	VENTR SEPTA DEF REP NEC
3520	REPLACE HEART VALVE NOS	3573	ENDOCAR CUSHION REP NEC
3521	REPLACE AORT VALV-TISSUE	3581	TOT REPAIR TETRAL FALLOT
3522	REPLACE AORTIC VALVE NEC	3582	TOTAL REPAIR OF TAPVC
3523	REPLACE MITR VALV-TISSUE	3583	TOT REP TRUNCUS ARTERIOS
3524	REPLACE MITRAL VALVE NEC	3584	TOT COR TRANSPOS GRT VES
3525	REPLACE PULM VALV-TISSUE	3591	INTERAT VEN RETRN TRANSP
3526	REPLACE PULMON VALVE NEC	3592	CONDUIT RT VENT-PUL ART
3527	REPLACE TRIC VALV-TISSUE	3593	CONDUIT LEFT VENTR-AORTA
3528	REPLACE TRICUSP VALV NEC	3594	CONDUIT ARTIUM-PULM ART
3531	PAPILLARY MUSCLE OPS	3595	HEART REPAIR REVISION
3532	CHORDAE TENDINEAE OPS	3598	OTHER HEART SEPTA OPS
3533	ANNULOPLASTY	3599	OTHER OP ON HRT VALVES
3534	INFUNDIBULECTOMY	3835	THOR VESSEL RESECT/ANAST
3535	TRABECUL CARNEAE CORD OP	3845	RESECT THORAC VES W REPL
3539	TISS ADJ TO VALV OPS NEC	3885	OCCLUDE THORACIC VES NEC
3541	ENLARGE EXISTING SEP DEF	390	SYSTEMIC-PULM ART SHUNT
3542	CREATE SEPTAL DEFECT	3921	CAVAL-PULMON ART ANASTOM
3550	PROSTH REP HRT SEPTA NOS	3959	REPAIR OF VESSEL NEC
3551	PROS REP ATRIAL DEF-OPN		

Or any heart surgery (2P)

ICD-9-CM procedure codes:

0050	IMPL CRT PACEMAKER SYS OCT02-	3732	HEART ANEURYSM EXCISION
0051	IMPL CRT DEFIBRILLAT SYS OCT02-	3733	EXC/DEST OTH HRT LESION
0052	IMP/REP LEAD LF VEN SYS OCT02-	3734	CATH ABLATION LES HEART
0053	IMP/REP CRT PACEMAKR GEN OCT02-	3735	PARTIAL VENTRICULECTOMY OCT97-
0054	IMP/REP CRT DEFIB GENAT OCT02-	374	HEART & PERICARD REPAIR
3601	PTCA-1 VES/ATH W/O AGENT	375	HEART TRANSPLANTATION
3602	PTCA-1 VES/ATH W AGENT	3761	PULSATION BALLOON IMPLAN
3603	OPEN CORONRY ANGIOPLASTY	3762	IMPLANT HRT ASST SYS NEC
3604	INTRCORONRY THROMB INFUS	3763	REPLACE HRT ASSIST SYST

Appendix 3 (Continued)

Pediatric Heart Surgery Volume (IQI 3)			
3605	PTCA-MULTIPLE VESSEL/ATH	3764	REMOVE HEART ASSIST SYS
3606	INSERT OF COR ART STENT OCT95-	3765	IMP EXT PUL HRT ASST SYS OCT95-
3607	INS DRUG-ELUT CORONRY ST OCT02-	3766	IMP IMP PUL HRT ASST SYS OCT95-
3609	REM OF COR ART OBSTR NEC	3767	IMP CARDIOMYOSTIMUL SYS OCT98-
3610	AORTOCORONARY BYPASS NOS	3770	INT INSERT PACEMAK LEAD
3611	AORTOCOR BYPAS-1 COR ART	3771	INT INSERT LEAD IN VENT
3612	AORTOCOR BYPAS-2 COR ART	3772	INT INSE LEAD ATRI-VENT
3613	AORTOCOR BYPAS-3 COR ART	3773	INT INSE LEAD IN ATRIUM
3614	AORTOCOR BYPAS-4+ COR ART	3774	INT OR REPL LEAD EPICAR
3615	INT MAM-COR ART BYPASS	3775	REVISION OF LEAD
3616	INT MAM-COR ART BYPASS	3776	REPL TV ATRI-VENT LEAD
3617	ABD-CORON ARTERY BYPASS OCT96-	3777	REMOVAL OF LEAD W/O REPL
3619	HRT REVAS BYPS ANAS NEC	3778	INSE TEMP PACEMAKER SYS
362	ARTERIAL IMPLANT REVASC	3779	REVIS OR RELOCATE POCKET
363	HEART REVASCULARIZAT NEC OCT98-	3780	INT OR REPL PERM PACEMKR
3631	OPEN CHEST TRANS REVASC OCT98-	3781	INT INSERT 1-CHAM, NON
3632	OTH TRANSMYO REVASCULAR OCT98-	3782	INT INSERT 1-CHAM, RATE
3639	OTH HEART REVASCULAR OCT98-	3783	INT INSERT DUAL-CHAM DEV
3691	CORON VESS ANEURYSM REP	3785	REPL PACEM W 1-CHAM, NON
3699	HEART VESSEL OP NEC	3786	REPL PACEM 1-CHAM, RATE
370	PERICARDIOCENTESIS	3787	REPL PACEM W DUAL-CHAM
3710	INCISION OF HEART NOS	3789	REVISE OR REMOVE PACEMAK
3711	CARDIOTOMY	3791	OPN CHEST CARDIAC MASSAG
3712	PERICARDIOTOMY	3792	INJECTION INTO HEART
3721	RT HEART CARDIAC CATH	3793	INJECTION INTO PERICARD
3722	LEFT HEART CARDIAC CATH	3794	IMPLT/REPL CARDDEFIB TOT
3723	RT/LEFT HEART CARD CATH	3795	IMPLT CARDIODEFIB LEADS
3724	PERICARDIAL BIOPSY	3796	IMPLT CARDIODEFIB GENATR
3725	CARDIAC BIOPSY	3797	REPL CARDIODEFIB LEADS
3726	CARDIAC ELECTROPHY STIM	3798	REPL CARDIODEFIB GENRATR
3727	CARDIAC MAPPING	3799	OTHER HEART/PERICARD OPS
3728	INTRACARDIAC ECHOCARDIO OCT02-		
3729	HRT/PERICAR DX PROC NEC		
3731	PERICARDIECTOMY		

with only hypoplastic left heart syndrome (1D)
ICD-9-CM diagnosis code:

7467 HYPOPLAS LEFT HEART SYND

Exclude:

- MDC 14 (pregnancy, childbirth, and puerperium).
- Patients who underwent PDA ligation as a single cardiac procedure (diagnosis code 7470 [2D] and procedure code 3885 [3P]):

ICD-9-CM procedure code (3P), if single procedure:

3885 OCCLUDE THORACIC VES NEC*

with ICD-9-CM diagnosis code (2D):

Appendix 3 (Continued)

Pediatric Heart Surgery Volume (IQI 3)			
7470	PATENT DUCTUS ARTERIOSUS		
<ul style="list-style-type: none"> Patients with prosthetic closures of atrial septal defects (procedure codes 3551, 3552, 3571) or ventricular septal defects (codes 3553, 3572) or atrial septal enlargement (3541 [4P]) without concomitant use of cardiopulmonary bypass (code 3961 [5P]): 			
ICD-9-CM procedure codes (4P):			
3541	ENLARGE EXISTING SEP DEF#	3553	PROST REPAIR VENTRIC DEF#
3542	CREATE SEPTAL DEFECT	3571	ATRIA SEPTA DEF REP NEC#
3551	PROS REP ATRIAL DEF-OPN#	3572	VENTR SEPTA DEF REP NEC#
3552	PROS REPAIR ATRIA DEF-CL#		
without cardiopulmonary bypass (5P)			
ICD-9-CM procedure code:			
3961	EXTRACORPOREAL CIRCULAT		
<ul style="list-style-type: none"> Patients with PDA closure as a single cardiac procedure (procedure code 3885 [3P]) with concomitant cardiac catheterization (codes 3721, 3722, 3723, 8842, 8843 [6P]): 			
ICD-9-CM procedure code (3P), if single procedure:			
3885	OCCLUDE THORACIC VES NEC*		
with cardiac catheterization (6P)			
ICD-9-CM procedure codes:			
3721	RT HEART CARDIAC CATH	8842	CONTRAST AORTOGRAM
3722	LEFT HEART CARDIAC CATH	8843	CONTR PULMON ARTERIOGRAM
3723	RT/LEFT HEART CARD CATH		
<ul style="list-style-type: none"> Patients with occlusion of thoracic vessel (procedure code 3885 [3P]) without congenital heart defect (diagnosis codes 7450 through 7479 [3D]): 			
ICD-9-CM procedure code (3P):			
3885	OCCLUDE THORACIC VES NEC*		
without congenital heart defect (3D)			
ICD-9-CM diagnosis codes:			
7450	COMMON TRUNCUS	74684	OBSTRUCT HEART ANOM NEC
74510	COMPL TRANSPOS GREAT VES	74685	CORONARY ARTERY ANOMALY
74511	DOUBLE OUTLET RT VENTRIC	74686	CONGENITAL HEART BLOCK
74512	CORRECT TRANSPOS GRT VES	74687	MALPOSITION OF HEART
74519	TRANSPOS GREAT VESS NEC	74689	CONG HEART ANOMALY NEC
7452	TETRALOGY OF FALLOT	7469	CONG HEART ANOMALY NOS

Appendix 3 (Continued)

Pediatric Heart Surgery Volume (IQI 3)

7453	COMMON VENTRICLE	7470	PATENT DUCTUS ARTERIOSUS
7454	VENTRICULAR SEPT DEFECT	74710	COARCTATION OF AORTA
7455	SECUNDUM ATRIAL SEPT DEF	74711	INTERRUPT OF AORTIC ARCH
74560	ENDOCARD CUSHION DEF NOS	74720	CONG ANOM OF AORTA NOS
74561	OSTIUM PRIMUM DEFECT	74721	ANOMALIES OF AORTIC ARCH
74569	ENDOCARD CUSHION DEF NEC	74722	AORTIC ATRESIA/STENOSIS
7457	COR BILOCULARE	74729	CONG ANOM OF AORTA NEC
7458	SEPTAL CLOSURE ANOM NEC	7473	PULMONARY ARTERY ANOM
7459	SEPTAL CLOSURE ANOM NOS	74740	GREAT VEIN ANOMALY NOS
74600	PULMONARY VALVE ANOM NOS	74741	TOT ANOM PULM VEN CONNec
74601	CONG PULMON VALV ATRESIA	74742	PART ANOM PULM VEN CONN
74602	CONG PULMON VALVE STENOS	74749	GREAT VEIN ANOMALY NEC
74609	PULMONARY VALVE ANOM NEC	7475	UMBILICAL ARTERY ABSENCE
7461	CONG TRICUSP ATRES/STEN	74760	UNSP PRPHERL VASC ANOMAL
7462	EBSTEIN'S ANOMALY	74761	GSTRONTEST VESL ANOMALY
7463	CONG AORTA VALV STENOSIS	74762	RENAL VESSEL ANOMALY
7464	CONG AORTA VALV INSUFFIC	74763	UPR LIMB VESSEL ANOMALY
7465	CONGEN MITRAL STENOSIS	74764	LWR LIMB VESSEL ANOMALY
7466	CONG MITRAL INSUFFICIENC	74769	OTH SPCF PRPH VSCL ANOML
7467	HYOPLAS LEFT HEART SYND	74781	CEREBROVASCULAR ANOMALY
74681	CONG SUBAORTIC STENOSIS	74782	SPINAL VESSEL ANOMALY
74682	COR TRIATRIATUM	74783	PERSISTENT FETAL CIRC OCT02-
74683	INFUNDIB PULMON STENOSIS	74789	CIRCULATORY ANOMALY NEC
		7479	CIRCULATORY ANOMALY NOS

Abdominal Aortic Aneurysm (AAA) Repair Volume (IQI 4)

Discharges with ICD-9-CM codes of 3834, 3844, or 3864 in any procedure field and a diagnosis of AAA in any field.

ICD-9-CM AAA procedure codes:

3834	AORTA RESECTION & ANAST
3844	RESECT ABDM AORTA W REPL
3864	EXCISION OF AORTA

ICD-9-CM AAA diagnosis codes:

4413	RUPT ABD AORTIC ANEURYSM
4414	ABDOM AORTIC ANEURYSM

Exclude:

MDC 14 (pregnancy, childbirth, and puerperium) and MDC 15 (newborns and other neonates).

Appendix 3 (Continued)

Coronary Artery Bypass Graft (CABG) Volume (IQI 5)

Discharges with ICD-9-CM codes of 3610 through 3619 in any procedure field.

Age 40 years and older.

ICD-9-CM CABG procedure codes:

3610	AORTOCORONARY BYPASS NOS	3615	1 INT MAM-COR ART BYPASS
3611	AORTOCOR BYPAS-1 COR ART	3616	2 INT MAM-COR ART BYPASS
3612	AORTOCOR BYPAS-2 COR ART	3617	ABD-CORON ART BYPASS OCT96-
3613	AORTOCOR BYPAS-3 COR ART	3619	HRT REVAS BYPS ANAS NEC
3614	AORTCOR BYPAS-4+ COR ART		

Exclude:

MDC 14 (pregnancy, childbirth, and puerperium) and MDC 15 (newborns and other neonates).

Percutaneous Transluminal Coronary Angioplasty (PTCA) Volume (IQI 6)

Discharges with ICD-9-CM codes of 3601, 3602, 3605, or 3606 in any procedure field.

Age 40 years and older.

ICD-9-CM PTCA procedure codes:

3601	PTCA-1 VESSEL W/O AGENT
3602	PTCA-1 VESSEL WITH AGNT
3605	PTCA-MULTIPLE VESSEL
3606	INSERT OF COR ART STENT OCT95-

Exclude:

MDC 14 (pregnancy, childbirth, and puerperium) and MDC 15 (newborns and other neonates).

Appendix 3 (Continued)

Carotid Endarterectomy Volume (IQI 7)

Discharges with an ICD-9-CM code of 3812 in any procedure field.

ICD-9-CM carotid endarterectomy procedure code:

3812 HEAD & NECK ENDARTER NEC

Exclude:

MDC 14 (pregnancy, childbirth, and puerperium) and MDC 15 (newborns and other neonates).

¹These definitions were extracted from Appendix A of the following document: AHRQ Quality Indicators—Guide to Inpatient Quality Indicators: Quality of Care in Hospitals—Volume, Mortality, and Utilization. Rockville, MD: Agency for Healthcare Research and Quality, 2002. Revision 2 (September 4, 2003). AHRQ Pub. No. 02-RO204.

²See Reference 2 on page 36.

Appendix 4: Obstetrical definitions and code numbers based on the *International Classification of Diseases, 9th Revision, Clinical Modification (ICD-9-CM)*¹

1. Delivery: ICD-9-CM codes: 640-648*, 650, 651-676* [*with fifth digit of “1” or “2”].
2. Cesarean: Delivery with cesarean section as any listed procedure (ICD-9-CM codes: 74.0-74.2, 74.4, 74.99).
3. Previous cesarean: Delivery with any diagnosis of previous cesarean delivery (ICD-9-CM code 654.2: Uterine scar from previous surgery).
4. Primary cesarean: Delivery with no diagnosis of previous cesarean delivery.
5. Total cesarean delivery rate: Total cesareans divided by total deliveries, expressed as percentage.
6. Primary cesarean delivery rate: Primary cesareans divided by total deliveries minus previous cesareans, expressed as percentage.
7. Rate of vaginal deliveries after previous cesarean: Vaginal deliveries after previous cesarean divided by total deliveries after previous cesareans, expressed as percentage.

¹See Reference 2 on page 36.

Appendix 5: External cause of injury categories and code numbers based on the *International Classification of Diseases, 9th Revision, Clinical Modification (ICD-9-CM)*¹

Type of injury	Code numbers
Railway	E800-E807
Motor vehicle traffic	E810-E819
Motor vehicle non-traffic	E820-E825
Other road vehicle	E826-E829
Water transport	E830-E838
Air transport	E840-E845
Other vehicle	E846-E848
Place of injury ²	E849
Poisoning	E850-E869
Medical and surgical misadventure	E870-E879
Falls	E880-E888
Fire	E890-E899
Natural and environmental factors	E900-E909
Submersion and suffocation	E910-E915
Other unintentional	E916-E928
Late effects	E929
Adverse drug reaction	E930-E949
Self-inflicted	E950-E959
Assault	E960-E969
Legal intervention	E970-E978
Undetermined intent	E980-E989
War	E990-E999

¹See Reference 2 on page 36.

²Place of injury is supplementary to an external cause of injury code in the range E850-E869 or E880-E928

**Appendix 6: Census population estimate for
Rhode Island as of July 1, 2001**

Age Group	Population
Under 15 Years: All	202,351
Female	98,721
Male	103,630
15-44 Years: All	462,003
Female	234,086
Male	227,917
45-64 Years: All	242,894
Female	125,270
Male	117,624
65 Years and Older	152,411
Female	92,135
Male	60,276
All Ages	1,059,659
Female	550,212
Male	509,447

**Source: Bureau of the Census, United States
Department of Commerce**