

Statistical Brief # 16

Office of Quality and Patient Safety

Division of Information and Statistics

October 2017

Inpatient Planned Admissions to Acute Care Hospitals in New York State, 2015

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Introduction

There are more than 2.3 million inpatient admissions each year in New York State (NYS) acute care hospitals, accounting for the majority of costs, resources and services provided at these facilities. Inpatient admissions may be categorized as planned or emergent. While these two variants are often combined in analysis, each present their own unique set of characteristics. Much of the interest in inpatient admissions is dominated by emergent admissions, especially as attention to emergency rooms as a source of non-emergent healthcare continues to grow. However, few studies isolate planned inpatient admissions to focus on the general hospital and patient characteristics associated with these events. The objective of this brief is to present an overview of planned inpatient admissions in NYS hospitals, highlighting differences in volume and estimated cost.

Data Source

Hospital inpatient discharge data were obtained from the Statewide Planning and Research Cooperative System (SPARCS). SPARCS is an all payer hospital discharge data system established in 1979 through cooperation between the health care industry and government. SPARCS collects claim level detail on patient characteristics, diagnoses, treatments, services, and charges for every Article 28 (acute care) hospital discharge, ambulatory surgery visit, emergency room visit, and hospital-based outpatient service in New York State. More information on SPARCS may be found on the DOH public website at: <http://www.health.ny.gov/statistics/sparcs/>.

Methods

Identification of Planned Inpatient Admissions

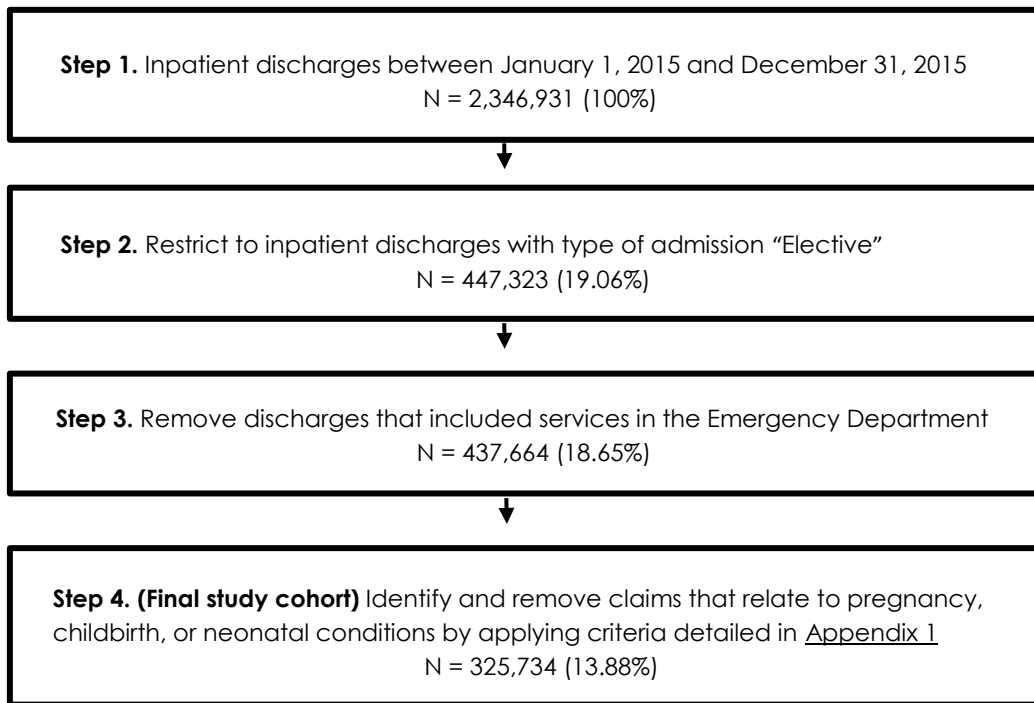
Figure 1 outlines the process used to identify “planned” inpatient stays. The process began with identifying all inpatient discharge records

Highlights

- Excluding newborn and maternity events, there were 325,734 planned admissions in NYS in 2015, or 15.7 admissions per 1,000 NYS population
- Most planned admissions are surgical in nature, 72.1% of admissions had a major procedure performed
- Medicare and dual Medicare/Medicaid enrollees accounted for 39.44% of all planned admissions
- Non-Hispanics had a planned admission rate more than twice as high as Hispanics (16.7 vs 7.0 per 1,000 population)
- NYC had the highest volume of planned admissions (32.4%), but the lowest population based rate: 12.4 per 1,000 NYS population
- The majority (96.7%) of planned admissions occur during the work week
- The two most common planned admissions are knee joint replacements (11.45%) and hip joint replacements (8.11%)
- The most common planned admission for adults age 19-34 was for substance-related disorders' (17.38%)
- The most common planned admission for children age 0-18 was for epilepsy; convulsions (18.76%)

reported to SPARCS by Article 28 (acute care) NYS hospitals with the discharge dates between January 1, 2015 and December 31, 2015 (Figure 1, Step 1). From these discharges, only those with a reported admission type of 'Elective' (indicating adequate time to schedule the admission before treatment is required) were considered as potentially planned admissions. Over 80% of discharges in 2015 were eliminated by this criterion (Figure 1, Step 2). To ensure removal of all admissions resulting from an emergent condition, the remaining records were then further culled of discharges that had any evidence of emergency department use, as indicated by emergency department revenue codes being reported on the discharge (Figure 1, Step 3). The final step refined the cohort to exclude inpatient discharges related to pregnancy, childbirth, or neonatal conditions (Figure 1, Step 4). Identification of such maternity or newborn events utilized Agency for Healthcare Research and Quality (AHRQ) Clinical Classification Software (CCS) categories for procedures and diagnoses in addition to the 3M™ All Patient Refined Diagnostic Related Groups (APR-DRGs) Major Diagnostic Category (MDC). To make certain that all neonatal stays were excluded, any discharges for newborns under 30 days of age were also removed in this step. A more comprehensive illustration of how maternity and newborn events were identified for removal can be found in [Appendix 1](#).

Figure 1. Methodology of Data Extraction for Identifying Study Cohort



Estimated Costs

Estimated costs for inpatient stays were calculated using charges reported by facilities on the SPARCS record and annual Institutional Cost Report (ICR) facility filings to NYS Department of Health. The ICR is a standard report completed by NYS facilities to report income, expenses, assets, liabilities, and statistics to the NYS Department of Health (DOH). Under DOH regulations, (Part 86-1.2), Article 28 hospitals are required to electronically file financial and statistical data with DOH annually through a secure network. Facility-specific Ratio of Cost to Charges (RCCs) by revenue code are included in the ICRs. For example, if hospital charge is \$20,000 and the RCC is 50%, the estimated cost is \$10,000. RCCs were applied to each service charge reported to SPARCS and summed to the discharge level to calculate the estimated cost for that discharge. Cost data presented in this brief was calculated using facility specific 2013 audited RCCs file. Estimated costs

represent the expenses to the hospital to provide the services and is not the same as the amount paid for services by the payers. More information on reported charges in SPARCS is available on page 259 of the SPARCS Submission Data Dictionary, located at:

http://www.health.ny.gov/statistics/sparcs/sysdoc/elements_837/index.htm

Population Rates

Discharge rates per 1,000 population were derived from 2015 Claritas NYS small-area population data. Discharges for which patient data indicated an unknown or out-of-state county, or homelessness were excluded from residence and region population rates due to a lack of population denominator.

Statistical Analysis

This brief utilizes the following grouping software: 3M™ APR-DRG Version 32, AHRQ CCS Software for International Classification of Disease (ICD) Versions 9 and 10, Centers for Disease Control and Prevention (CDC) 2013 National Center for Health Statistics (NCHS) Urban-Rural Classification Scheme for Counties, and Healthcare Cost and Utilization Project (HCUP) Procedure Classes. More information on each of these groupers can be found in the 'Definitions' section of this brief. Summary statistics (e.g., counts, mean, median, percent) and graphics were used to analyze and present findings. Ranking for the most common APR-DRGs, AHRQ CCS categories, and surgical procedures were developed based on frequency of discharges (greatest number of discharges is ranked as 1). All analyses were completed using SAS version 9.4 statistical software.

Findings

In 2015 there were a total of 325,734 inpatient discharges identified as resulting from planned admissions, accounting for 13.88% of all inpatient discharges with a statewide rate of 15.27 per 1,000 NYS population. Of these inpatient discharges, the total estimated costs were about \$7.26 billion, accounting for 19.34% of the \$37.53 billion NYS total hospital inpatient costs in 2015. The average cost per planned admission stay was \$22,283, and median cost per stay was \$15,392. Statewide mean estimated costs were found to be 44.77% percent higher than median estimated costs. This considerable difference between mean and median costs indicates the presence of high-cost outliers that may be excessively influencing the mean estimated cost statistic, thus ensuing comparisons of costs will quote median estimated cost rather than mean.

Table 1 presents utilization and costs for planned inpatient admission discharges by select patient demographics. Generally, the proportion of hospital discharges and rate per 1,000 population tended to increase with age. Older adults (aged 65+ years) accounted for largest proportion of planned admission discharges and had the highest population rate: 39.1 discharges per 1,000 population. With newborn events excluded, children aged 0-5 years represented the lowest proportion of discharges (2.18%) and the second lowest rate (4.7 per 1,000 population); while children aged 6 to 18 years old had the lowest rate of discharges (3.0 per 1,000 population). Estimated median costs also increased with age, with the median costs among patients age 65+ years approximately \$7,000 (74.01% relative to age 0-5) higher than the median costs among discharges for patients age 0-5 years (\$17,464 vs \$10,036, respectively). Total costs for the patients aged 65+ accounted for the 42.01% (\$3.5 billion) of all costs for the planned admission discharges in 2015.

Females constituted a larger proportion of planned admission discharges than males in 2015 and had a higher discharge rate (16.0 vs 14.5 per 1,000 population). However, the median cost per discharge was slightly higher among males compared to females (\$15,681 vs. \$15,181).

Non-Hispanics accounted for 89.26% of all planned admission discharges and had a discharge rate more than twice as high as Hispanics (16.7 vs 7.0 per 1,000 population). Patients whose race was categorized as 'White' accounted for the highest percentage (68.09%) as well as the highest rate (16.1 per 1,000

population) of planned admission discharges in 2015. Those with reported race of 'Other' had the next highest proportion of discharges (15.52%), but this result could be artificially high due to deficiencies in reporting patient's race to SPARCS. Patients reported as 'Asian/Pacific Islander' had the fewest number of planned admission discharges (2.65%) and rate (4.9 per 1,000 population), but highest estimated median cost (\$16,924). Patients with a reported race of 'Black' had the lowest median estimated cost (\$14,545) per discharge.

Residents of New York City comprised 32.43% of planned admission discharges and had a lower discharge rate compared to the rest of the state (12.4 vs 17.4 per 1,000 population), but had higher median estimated cost (\$16,635 vs \$14,383). Patients from out of state accounted for 7.35% of all planned admission discharges and had the highest median estimated cost (\$21,261).

Figure 2 shows the distribution of planned inpatient admission discharges by patient sex and by age in years. Planned admissions volume decreased for patients from 0 years to 3 years, was relatively stable from 3 years to 20 years, and then increased steadily until peaking among patients aged approximately 68 years. The volume then dropped consistently for each consecutive age over 72 years old. There were two unusual spikes in the number of planned admissions for both males and females at age 68 and 72. Both sexes had a similar distribution across ages, though females accounted for slightly more admissions than males for most ages greater than 26 years, particularly among ages 26 to 54 years old, where females accounted for a substantially higher proportion of planned admissions. The highest proportion of planned admission discharges for both sexes occurred between the ages 54 and 68 years old.

Table 2 shows the utilization and inpatient costs data stratified by selected characteristics of the hospitals with planned admission discharges in 2015. A total of 210 hospitals provided care for the 325,734 planned inpatient admissions in NYS.

Hospitalizations in New York City facilities accounted for 41.87% of all planned admission discharges, for 50.23% of total costs, and had the highest median estimated cost (\$18,901) as well as highest mean cost (\$26,735) per discharge. Long Island and Hudson Valley facilities admitted the next highest number of planned events (12.30% and 12.25% of total respectively). The median estimated costs were much lower for the Hudson Valley (\$12,943) than for Long Island (\$17,289) facilities. Same was true for mean costs: \$17,744 for Hudson Valley and \$25,402 for Long Island facilities.

Most planned inpatient admission discharges occurred at teaching facilities (82.50% of all discharges) despite these hospitals accounting for only 56.19% (118) of all facilities. The median estimated cost at a teaching hospital was substantially more than that of a non-teaching hospital (\$16,242 vs. \$11,771).

"Urban" or "Rural" classification of planned admission discharges was based on facilities' regional population and the CDC's 2013 NCHS Urban-Rural Classification Scheme for Counties. Nearly all discharges (97.20%) were reported from Urban facilities, while only 80.95% of facilities being in Urban areas. Rural hospitals make up only 2.80% of discharges, but had a lower median estimated cost (\$11,382) that did not vary substantially from the estimated mean costs (\$13,886).

The small bed size Rural facilities had the lowest median estimated costs overall (\$8,020) while in contrast, small Urban/Teaching facilities had the highest median estimated costs (\$19,213) per discharge, followed by Large Urban/Teaching hospitals (\$16,262). Hospitals located in Rural counties (small/medium/large bedsize combined) accounted for 2.8% of all planned admission discharges, while representing 19.05% (40) of all hospitals in NYS. The difference between median and mean estimated costs per discharge for these facilities was among the smallest for NYS, with percent difference between median and mean (median lower) being 16.47% for medium and 24.51% for large bed size Rural hospitals. Urban/Non-Teaching hospitals combined were responsible for the 15.28% of all planned admissions, while these hospitals represented 25.71% (54) of all in NYS. Small Urban/Non-Teaching hospitals had the second largest disparity between median and mean estimated costs with median being 51.13% lower than mean

(\$12,633 vs \$19,092). Urban/Teaching hospitals of all sizes accounted for 81.92% of all planned discharges from 55.24% (116) of all NYS hospitals that had planned admission discharges in 2015. Almost half (49.41%) of all discharges were from the large Urban/Teaching hospitals that represented only 18.10% (38) of all hospitals. The difference between median and mean estimated costs per discharge was also the most prominent for the large Urban/Teaching hospitals: \$16,262 for the median and \$25,068 for the mean (54.15% percent difference). Interestingly, lowest means and medians for the estimated costs per discharge consistently were calculated for the medium bed size facilities within both Urban/Non-Teaching and Urban/Teaching settings.

Planned admission discharges rates per 1,000 population by NYS region are presented in [Figure 3](#), including the statewide rate in 2015 (15.3 per 1,000 NYS residents) for reference. Though New York City had the largest number of discharges, it had the lowest rate (12.4 per 1,000 population) of any region. Western New York region had the highest discharge rate in 2015 with 19.4 per 1,000 population, followed by the Mid-Hudson and Northeast regions with rates of 18.8 and 18.7 per 1,000 population respectively.

[Table 3](#) displays the distribution of planned admission inpatient discharges by the primary payer associated with the hospitalization. Combined, enrollees with government sponsored insurance: Medicare and Medicaid, including those dually eligible for both, represented more than half (58.64%) of all planned inpatient hospitalizations. Medicaid only enrollees accounted for 19.20% of all discharges and had the lowest median estimated costs of any primary payer (\$12,128) while Medicare only enrollees accounted for 32.44% of admissions and had the highest median estimated costs of any primary payer (\$17,239). Dually enrolled patients (7% of total discharges) had the highest mean costs per discharge across all payers (\$25,617), and the next highest mean costs were for the Self-Pay discharges (\$25,373). Private insurance represented the highest volume of planned admission discharges of any single payer, accounting for 34.02% of all, while Self-Pay had the lowest volume, making up only 1.30% of all discharges.

[Figure 4](#) shows the distribution of planned inpatient admission discharges by day of the week, breaking down each day by APR-DRG type and patient sex. Planned inpatient admissions primarily occurred on weekdays and rarely on weekends, with only 2.01% occurring on Saturday and 1.34% on Sunday. Admissions were highest at the beginning of the work week, with approximately 22% of admissions occurring on Monday or Tuesday each, and dropped steadily throughout work week to 14.57% on Friday.

Surgical APR-DRGs accounted for the majority of weekday planned admission discharges, with the proportion of surgical APR-DRGs gradually decreasing from Tuesday (44.81%) to Friday (38.09%). Over the weekend, medical APR-DRGs make up most planned admissions discharges accounting for 65.07% on Saturdays and for 73.94% on Sundays. More females than males make up surgical APR-DRGs (about 10% absolute difference on weekdays), whereas more males than females have a medical APR-DRG (about 2% absolute difference on weekdays). For the weekends, the difference is reversed: for surgical APR-DRGs male/female difference is under 2% (females are higher) and for Medical APR-DRGs the difference is about 10% (males are still higher).

[Figure 5](#) and [Figure 6](#) show the volume of planned inpatient events by admission day and discharge day over calendar year 2015, respectively. As was seen in [Figure 4](#) above, the majority of patients were admitted early in the week, while most discharges occurred at the end of the work week (Thursday and Friday). This pattern is visible throughout the entire year, with no seasonal trends apparent, though holiday days clearly show not to have much of the planned admissions or discharges resulted from a planned admission.

[Table 4](#) shows the top ten most common medical and surgical reasons for planned inpatient hospitalizations classified by the 3M™ APR-DRG with length of stay (LOS) and estimated cost statistics. The percentage in this table represents the proportion of discharges for one APR-DRG among all medical and surgical planned admission discharges. Medical APR-DRGs represented about a quarter of discharges (25.98%) with a mean length of stay of 10.2 days and a median estimated cost of \$9,680, representing 11.56% (\$838.8 million) of all planned admission discharges costs. Most discharges had surgical APR-DRGs (74.02%)

with a mean length of stay of 3.8 days and a median estimated cost of \$16,903, representing 80.22% of the total costs (\$5.82 billion).

The top ten most frequent medical APR-DRGs contained 61.62% (52,153 out of 84,628) of all medical APR-DRGs with a median estimated cost of \$10,403. Five of the top ten most frequently reported medical APR-DRGs were related to substance abuse disorders. The most common reasons for a medical hospitalization include “Rehabilitation” (4.98%), “Alcohol & drug dependence with rehabilitation or rehabilitation/detoxification therapy” (2.30%), and “Chemotherapy” (2.15%), with the percent representing proportion of the total planned admission discharges. The longest mean LOS for top ten medical discharges was for ‘Alcohol & Drug Dependence with Rehab/Detox Therapy’ (18.2 days) and for medical ‘Rehabilitation’ (14.6 days) discharges. Consequently, ‘Rehabilitation’ planned admission discharges had the highest mean and median estimated costs (\$25,883 and \$19,223 respectively).

The top ten most frequent surgical APR-DRGs amounted to more than half (56.96% or 137,331 out of 241,102) of all surgical APR-DRGs with median estimated costs of \$16,755 per discharge. The most common surgical hospitalization reasons in 2015 were “Knee Joint Replacement” (11.45%), “Hip Joint Replacement” (8.11%), and “Procedures for Obesity” (4.95%). The longest median LOS for surgical discharges in top ten surgical discharges was for ‘Major Small & Large Bowel Procedures’ (6.2 days). The shortest mean stays were for ‘Procedures for Obesity’ (1.9 days). The highest estimated costs among top ten most frequent surgical discharges were for ‘Dorsal & Lumbar Fusion Procedures, Except for Curvature of the Back’ with \$38,920 for the mean and \$31,406 for the median costs.

Figure 7 shows the top five most common medical APR-DRGs by patient age and sex. ‘Alcohol & Drug Dependence with Rehab or Rehab/Detox Therapy’, ‘Chemotherapy’, ‘Seizure’, and ‘Drug & Alcohol Abuse or Dependence, Left Against Medical Advice’ were more common among males than females; while only ‘Rehabilitation’ was more common among females. The highest volume for most APR-DRGs was among adults, while admissions for ‘Seizures’ were highest among children.

Figure 8 shows the top five most common surgical APR-DRGs by patient age and sex. Females generally constituted a larger proportion of these discharges, with the difference among ‘Procedures for Obesity’ and ‘Knee Joint Replacement’ most striking. The large majority of the top 5 surgical procedures were also concentrated among adults.

Table 5 presents the top ten most common primary diagnosis CCS categories by age group. Ranking is based on the frequency of discharges where Rank 1 is the greatest number of discharges. For all ages, discharges with diagnoses codes in the top ten primary diagnosis CCS categories accounted for 66.7% of all planned inpatient discharges. This proportion of discharges in the top ten primary diagnosis CCS categories was similar across all individual age groups. Many of the same diagnosis categories were among the top ranked among adults age >35 years old, including ‘Non-traumatic joint disorders’, ‘Spondylosis; intervertebral disc disorders; other back problems’, and ‘Diseases of the heart’. Much more variation was evident in the younger age groups, with the most common diagnosis category among patients 19-34 years old being ‘Substance-related disorders’ and the top ranked category for both the 0-5 and 6-18 years old age groups being ‘Epilepsy; convulsions’. Overall, the top ten diagnoses on planned admission discharges were related to musculoskeletal disorders, cardiovascular disorders, and malignancies for middle aged and older adults; mental health and substance abuse for younger and middle-aged adults; and congenital disorders for the youngest age group.

Table 6 presents the top ten most common principal procedure CCS categories by age group. Ranking is based on the frequency of discharges where Rank 1 is the greatest number of discharges. Across all age groups, the top ten principal procedure categories accounted for more than half of all principal procedures performed. Overall trends for most common procedures were similar to the trends seen among primary diagnosis categories. Across all ages, procedures with the most volume were related to the musculoskeletal surgeries (‘Arthroplasty’, ‘Spinal fusion’) ranking consistently in the top five starting from age

of 35 and older ('Arthroplasty') and in top four starting from the age group 6-18 ('Spinal fusion'). 'Alcohol and drug rehabilitation/detoxification' procedures were in the top three for adults between ages 19 and 64; and being ranked first for age groups 19-34 and 35-49. Adults in the same age range (19-64) had 'Gastrectomy; partial and total' performed often enough to have it ranked as second, fourth, and fifth most common procedure for age groups 19-34, 35-49, and 50-64 respectively. Procedures possibly related to treatment of the malignancies ('Hysterectomy; abdominal and vaginal', 'Colorectal resection', 'Open prostatectomy', 'Procedures on the breast') were among top ten ranked for adults between ages 19 and 64, with 'Hysterectomy; abdominal and vaginal' ranked fifth overall and 'Colorectal resection' ranked 7 for all ages. Procedures addressing cardiovascular conditions ('Heart valve procedures', 'Aortic resection; replacement or anastomosis', 'Other OR procedures on vessels other than head and neck', 'Coronary artery bypass graft(CABG)) were ranked fourth, seventh, eighth, and ninth respectively, for 65+ age group.

Most common principle procedures for children under age of 5 were 'Other diagnostic procedures (interview; evaluation; consultation)', 'Tonsillectomy and/or adenoidectomy', 'Other OR heart procedures', 'Cancer chemotherapy', and 'Encephalogram (EEG)'. Most common principle procedures for older children (6-18 age group) were ranked first through fifth as follows: 'Other diagnostic procedures (interview; evaluation; consultation)', 'Cancer chemotherapy', 'Spinal fusion', 'Encephalogram (EEG)', 'Other OR therapeutic procedures on bone'.

Injury related procedures ('Treatment of fracture or dislocation') were consistently in the top 20 procedures for all ages, but were ranked seventh for 6-18 and '19-34' age groups.

Figure 9 shows the rates per 100,000 population of the top 4 most common principal procedure CCS categories by patient county. Rates of 'Arthroplasty' and 'Spinal Fusion' were highest in western New York and Capital Region counties, while 'Alcohol and Drug Rehabilitation/Detoxification' and 'Gastrectomy' are more common in the Hudson Valley, downstate, and some Western New York counties.

Figure 10 shows the distribution of principal procedures performed during a planned admission by HCUP Procedure Classes. The largest proportion of planned admission discharges (72.1%) had a 'Major Therapeutic' procedure listed as the principal procedure, followed by 'Minor Therapeutic' procedures (15.5%). Diagnostic procedures accounted for 5.3% of principal procedures, with most being 'Minor Diagnostic' procedures. There was no principal procedure indicated on 7.2% of planned admission discharges.

Conclusions

There were over 2.3 million inpatient discharges to NYS hospitals in 2015. Approximately 14% of these discharges were planned admissions, accounting for an estimated 7.2 billion dollars in hospital costs (19.3% of total inpatient costs). These planned admission discharges occur at a much higher rate among older adults (39.1 per 1,000 population) and at a slightly higher rate among females, even after excluding birth and maternity events. New York City accounted for the largest proportion of planned admission discharges (32.43%) compared to all other regions, but had the lowest admission rate in 2015 (12.4 per 1,000 population) that was also below the statewide rate of 15.3 planned admissions per 1,000 population. The highest rate of planned admission discharges was in Western NY region (19.4 per 1,000 population). Mean LOS for planned admissions was 5.5 days and the median was three days, though admissions with medical APR-DRGs, when no OR was used during the stay, had longer LOS (10.1 mean, 5 days median LOS) than surgical APR-DRG (3.8 mean and 3 days median). While planned admissions to rural hospitals have approximately \$4,000 lower median costs, over 97% of planned admissions occurred at facilities in urban counties and over 49% were at large bed size urban facilities alone accounting for 55.59% of all planned admissions costs. Median estimated costs per discharge were the highest in small Urban/Teaching hospitals (\$19,213) and the lowest in Rural small hospitals (\$8,020). Private insurance was the primary payer for the largest share of discharges compared to

any other single payer (34.02%), however Medicare enrollees combined with those dually enrolled in Medicare and Medicaid was the primary payer for 39.44% of planned admission discharges. The most common reasons for a planned admission as determined by primary diagnosis varied substantially by age. 'Epilepsy; convulsions' was most common among children, 'Substance-related disorders' was most common among younger adults 19-34 years old (particularly males) and 'Non-traumatic joint disorders' was most common among adults 50+ years old. Most planned admissions occur with some surgery intended. Only 7.2% of planned admissions did not have a principal procedure reported and 72.1% of admissions had a Major Therapeutic procedure performed. The most common of these included 'Arthroplasty' and 'Spinal Fusion'.

There are three limitations to this analysis that warrant noting. Firstly, as with any study utilizing administrative claims data, this definition of planned admission is subject to potential misclassification due to possible misreporting and the limited nature of data on administrative claims. While SPARCS data undergoes extensive quality assurance process as it is reported, whether an admission was planned must be inferred from the data elements available and cannot be concluded with absolute certainty. Also, while comparisons using median estimated costs were considered more meaningful in the context of this brief to mitigate the impact of outliers, the presence of high cost planned admissions should not be ignored. Though it lies outside of the scope of this brief, a more accurate comparison of costs would likely include some adjustment for complexity of patients' conditions and severity of illness.

Tables and Figures

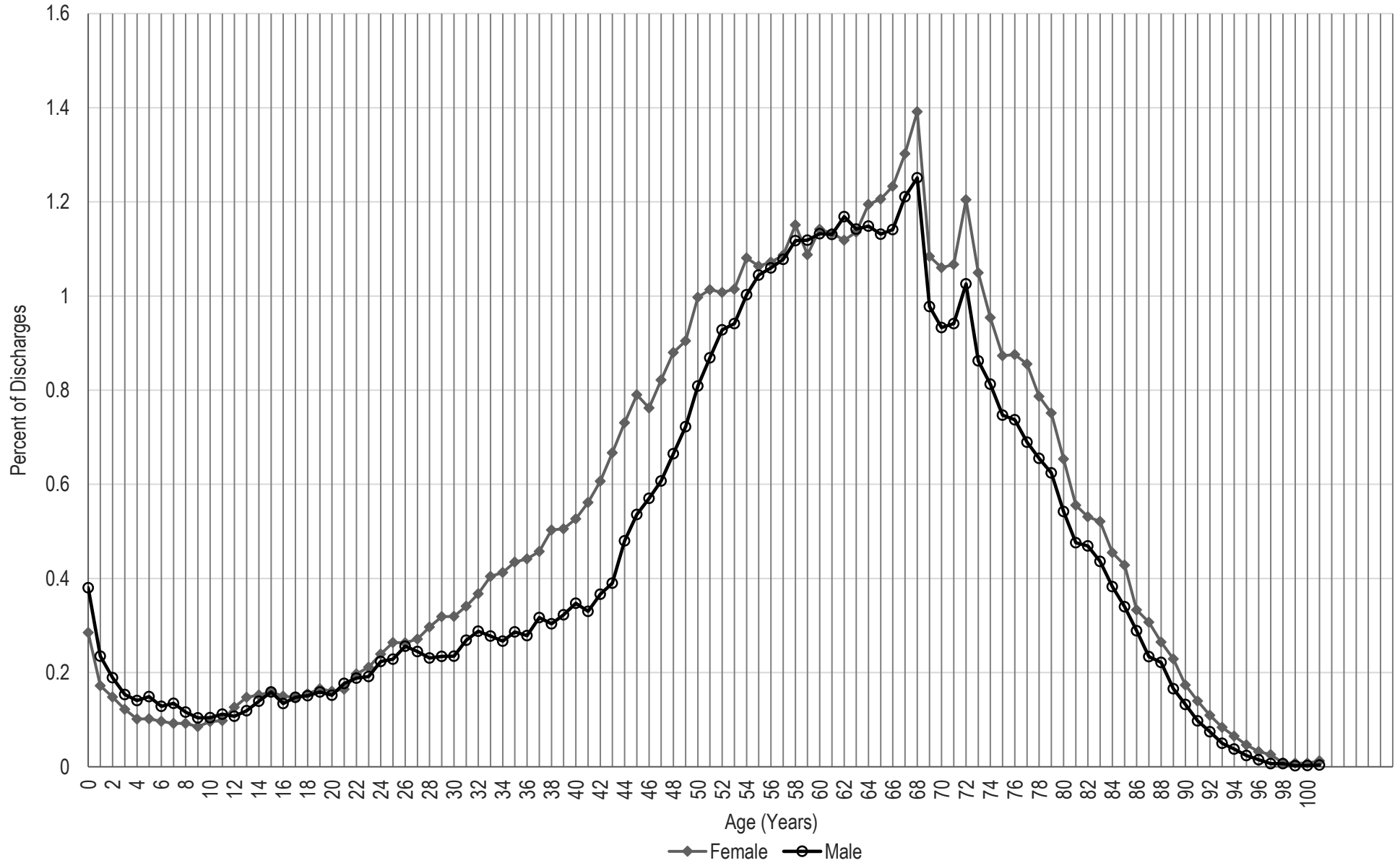
Table 1. NYS Planned Inpatient Discharges and Costs by Patient Demographics, 2015

Category	Hospital Discharges			Estimated Costs			
	(N)	(%)	Rate per 1,000 Population*	Mean (\$)	Median (\$)	Total Cost (\$)	Total Cost (%)
NYS Inpatient Total	2,346,931		118.8	\$15,991	\$8,794	\$37,529,465,463	
NYS Planned Inpatient Total	325,734	100.00	15.3	\$22,283	\$15,392	\$7,258,306,751	100.00
Patient Age							
0-5 Years	7,099	2.18	4.7	\$24,276	\$10,036	\$172,333,047	2.37
6-18 Years	10,605	3.26	3.0	\$24,612	\$11,896	\$261,007,575	3.60
19-34 Years	26,129	8.02	5.4	\$18,308	\$11,344	\$478,370,145	6.59
35-49 Years	52,498	16.12	12.7	\$18,624	\$12,900	\$977,697,089	13.47
50-64 Years	104,201	31.99	24.5	\$22,264	\$15,850	\$2,319,928,762	31.96
65+ Years	125,202	38.44	39.1	\$24,352	\$17,464	\$3,048,970,134	42.01
Patient Sex							
Female	174,287	53.51	16.0	\$21,439	\$15,184	\$3,736,468,732	51.48
Male	151,447	46.49	14.5	\$23,255	\$15,681	\$3,521,838,019	48.52
Patient Ethnicity							
Hispanic	26,786	8.22	7.0	\$24,350	\$14,736	\$652,252,051	8.99
Non-Hispanic	290,765	89.26	16.7	\$22,140	\$15,494	\$6,437,584,877	88.69
Other	8,183	2.51	-	\$20,588	\$13,713	\$168,469,823	2.32
Patient Race							
White	221,803	68.09	16.1	\$21,334	\$15,351	\$4,731,874,713	65.19
Black	44,742	13.74	13.8	\$21,733	\$14,545	\$972,379,541	13.40
Asian/Pacific Islander	8,637	2.65	4.9	\$25,076	\$16,924	\$216,585,162	2.98
Other	50,552	15.52	-	\$26,457	\$16,169	\$1,337,467,335	18.43
Patient Residence							
New York City	105,634	32.43	12.4	\$24,369	\$16,635	\$2,574,175,180	35.47
Rest of State	196,151	60.22	17.4	\$20,297	\$14,383	\$3,981,343,377	54.85
Other†	23,949	7.35	-	\$29,345	\$21,261	\$702,788,194	9.68
Quarter of Discharge							
Jan-Mar	79,844	24.51	3.8	\$22,049	\$15,250	\$1,760,467,228	24.25
Apr-Jun	83,278	25.57	3.9	\$22,187	\$15,361	\$1,847,694,472	25.46
Jul-Sep	81,657	25.07	3.8	\$22,393	\$15,419	\$1,828,551,802	25.19
Oct-Dec	80,955	24.85	3.8	\$22,501	\$15,543	\$1,821,593,250	25.10

*Visit rates per 1,000 population were derived from 2015 Claritas small-area population data. Visits for which patient data indicated an unknown or out-of-state county, or homelessness were excluded from residence and region population rates

†Visits for which patient data where patient residence was listed as unknown, out-of-state, or homeless

Figure 2. Planned Inpatient Discharges by Patient Age and Sex, 2015



Note: Discharges where the age was 101 years or over are presented as 101 years in this figure

Table 2. Planned Inpatient Discharges by Hospital Characteristics, 2015

Category		Discharges		Hospitals		Estimated Costs				
		(N)	(%)	(N)	(%)	Mean (\$)	Median (\$)	Total Cost (\$)	Total Cost (%)	
NYS Planned Inpatient Total		325,734	100.00	210	100.00	\$22,283	\$15,392	\$7,258,306,751	100.00	
Health Service Area	Capital/Adirondacks	27,357	8.40	28	13.33	\$16,615	\$12,583	\$454,547,653	6.26	
	Central NY	23,507	7.22	24	11.43	\$17,605	\$13,113	\$413,838,958	5.70	
	Finger Lakes	23,008	7.06	18	8.57	\$15,899	\$11,898	\$365,799,657	5.04	
	Hudson Valley	39,914	12.25	33	15.71	\$17,744	\$12,943	\$708,220,811	9.76	
	Long Island	40,052	12.30	23	10.95	\$25,402	\$17,289	\$1,017,408,551	14.02	
	New York City	136,374	41.87	54	25.71	\$26,735	\$18,901	\$3,645,891,671	50.23	
	Southern Tier	4,181	1.28	4	1.90	\$17,471	\$15,468	\$73,045,647	1.01	
	Western NY	31,341	9.62	26	12.38	\$18,492	\$13,321	\$579,553,803	7.98	
Teaching Status	Non-teaching hospital	57,012	17.50	92	43.81	\$15,768	\$11,771	\$898,951,978	12.39	
	Teaching hospital	268,722	82.50	118	56.19	\$23,665	\$16,242	\$6,359,354,773	87.61	
Urban-Rural Classification	Urban	316,623	97.20	170	80.95	\$22,525	\$15,526	\$7,131,791,018	98.26	
	Rural	9,111	2.80	40	19.05	\$13,886	\$11,382	\$126,515,733	1.74	
HCUP Bed Size Category by Region Type*	Rural	Small (1-49 beds)	1,254	0.38	19	9.05	\$9,666	\$8,020	\$12,121,045	0.17
		Medium (50-99)	3,575	1.10	11	5.24	\$13,124	\$11,269	\$46,919,918	0.65
		Large (100+)	4,282	1.31	10	4.76	\$15,758	\$12,656	\$67,474,770	0.93
	Urban/Non-Teaching	Small (1-124)	8,367	2.57	23	10.95	\$19,092	\$12,633	\$159,746,542	2.20
		Medium (125-199)	22,113	6.79	17	8.10	\$12,763	\$10,013	\$282,233,596	3.89
		Large (200+)	19,298	5.92	14	6.67	\$19,178	\$14,149	\$370,104,784	5.10
	Urban/Teaching	Small (1-249)	52,959	16.26	42	20.00	\$24,580	\$19,213	\$1,301,705,762	17.93
		Medium (250-424)	52,931	16.25	36	17.14	\$18,574	\$14,077	\$983,146,413	13.55
		Large (425+)	160,955	49.41	38	18.10	\$25,068	\$16,262	\$4,034,814,266	55.59

*Bedsizes categories are based on hospital beds and are specific to the hospital's location and teaching status. The definitions of small, medium, and large vary by region. See [Appendix 2](#) for more details about bedsizes categorization.

Figure 3. Planned Inpatient Discharges by Patient Region, 2015

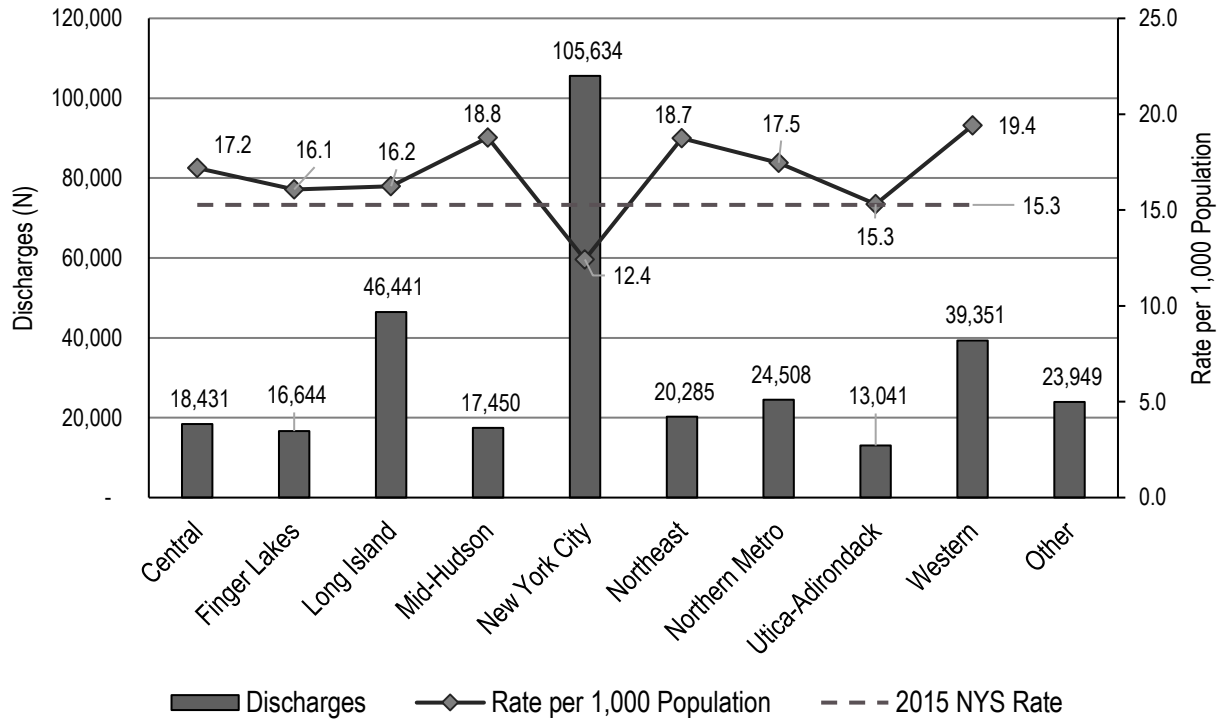


Table 3. Planned Inpatient Discharges by Primary Payer, 2015

Primary Payer	Hospital Discharges		Costs			
	(N)	(%)	Mean (\$)	Median (\$)	Total Cost (\$)	Total Cost (%)
NYS Planned Inpatient Total	325,734	100.00	\$22,283	\$15,392	\$7,258,306,751	100.00
Dual Eligible*	22,802	7.00	\$25,617	\$16,613	\$584,114,530	8.05
Medicaid only	62,536	19.20	\$19,253	\$12,128	\$1,203,958,453	16.59
Medicare only	105,680	32.44	\$23,905	\$17,239	\$2,526,237,970	34.80
Private	110,814	34.02	\$21,389	\$15,180	\$2,370,220,557	32.66
Self-Pay	4,233	1.30	\$25,373	\$14,270	\$107,405,171	1.48
Other	19,669	6.04	\$23,709	\$16,295	\$466,330,414	6.42

*Dual: Dually eligible for Medicare and Medicaid

Figure 4. Planned Inpatient Discharges by Admission Day, APR-DRG Type, and Patient Sex, 2015

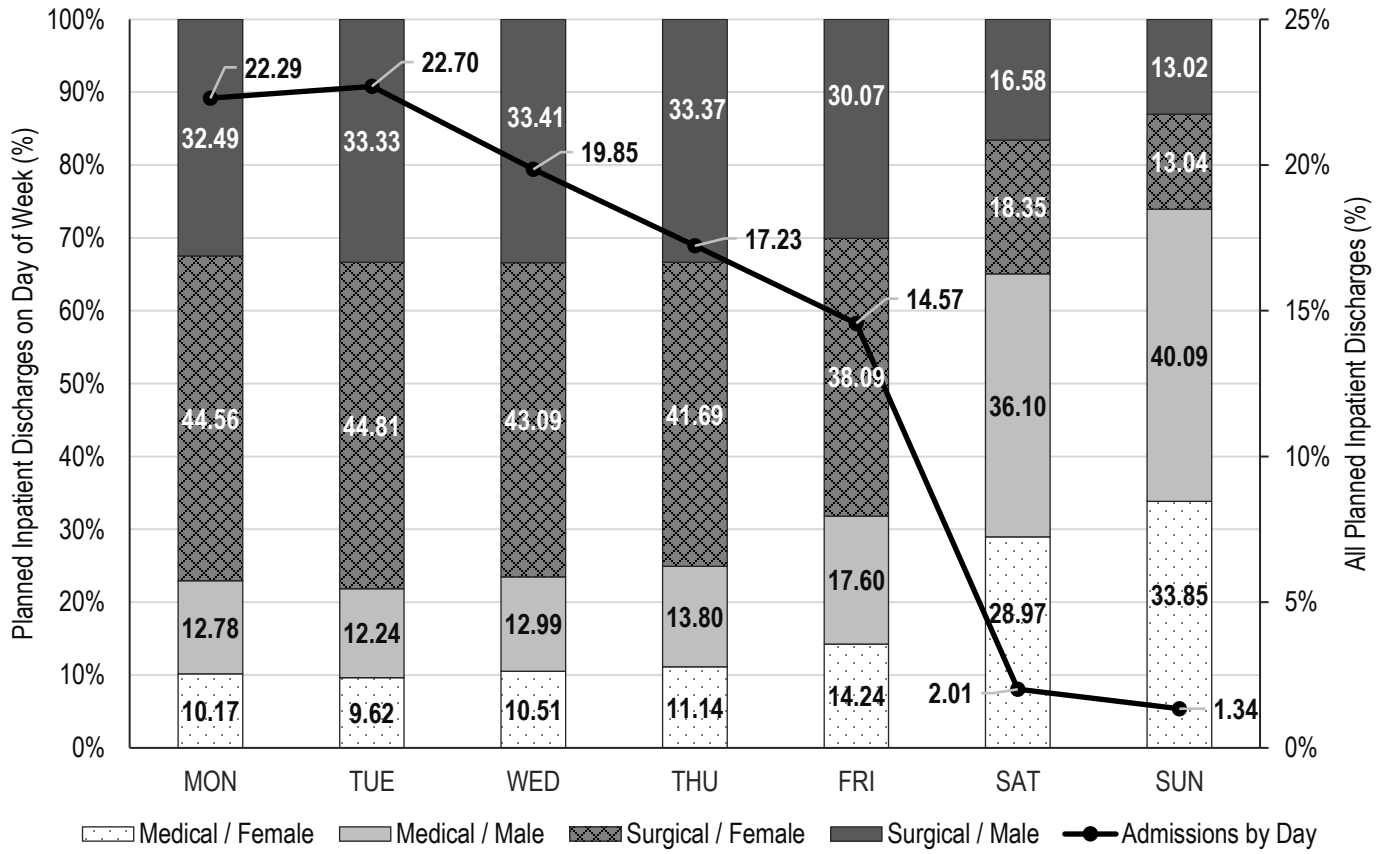


Figure 5. Planned Inpatient Discharges by Day of Admission, 2015

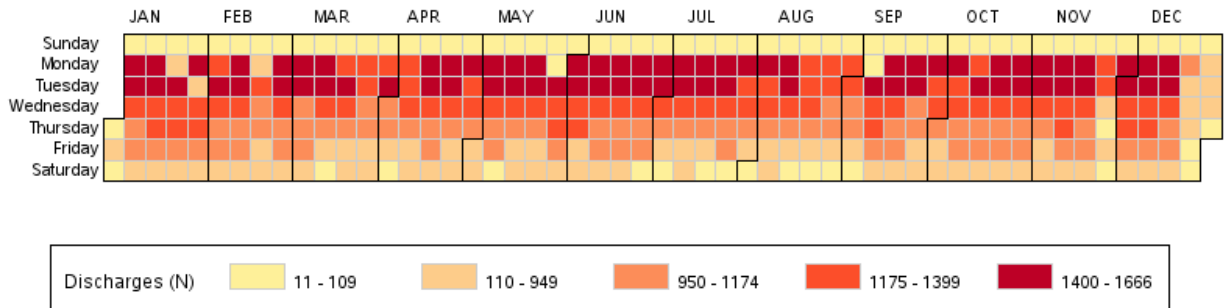


Figure 6. Planned Inpatient Discharges by Day of Discharge, 2015

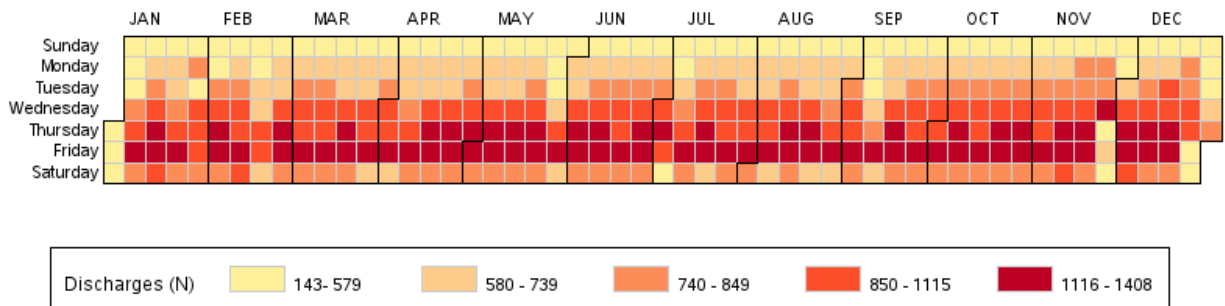


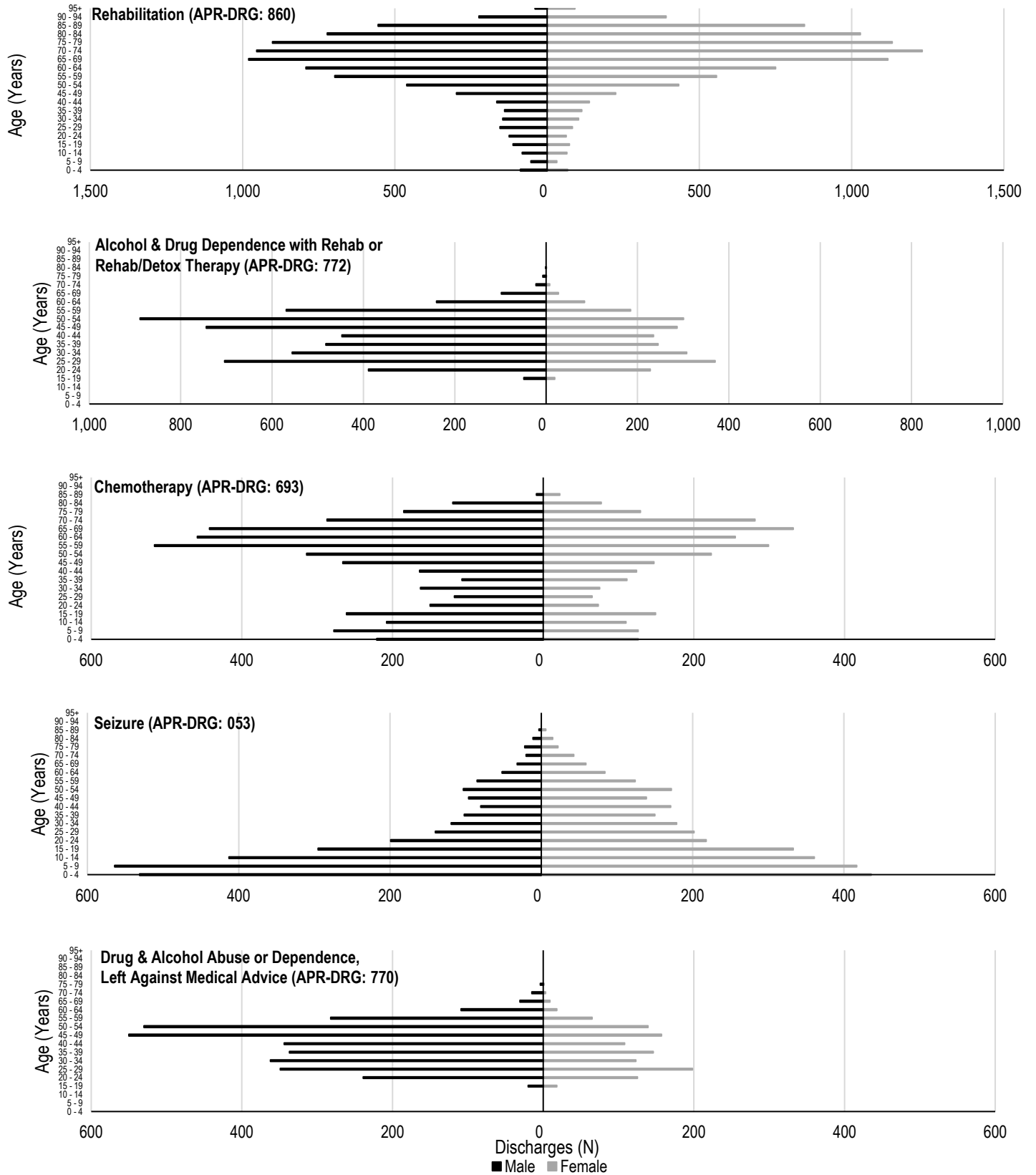
Table 4. Top 10 Most Common Medical and Surgical APR-DRGs for Planned Inpatient Discharges, 2015

APR-DRG	Hospital Discharges		Length of Stay		Estimated Costs			
	(N)	(%)	Mean (days)	Median (days)	Mean (\$)	Median (\$)	Total Cost (\$)	Total Cost (%)
Total Medical and Surgical* Hospitalizations, 2015**	325,730	100.00	5.5	3	\$22,283	\$15,393	\$7,258,238,606	100.00
860 REHABILITATION	16,233	4.98	14.6	12	\$25,883	\$19,223	\$420,148,254	5.79
772 ALCOHOL & DRUG DEPENDENCE W REHAB OR REHAB/DETOX THERAPY	7,496	2.30	18.2	18	\$13,415	\$11,517	\$100,537,215	1.39
693 CHEMOTHERAPY	6,997	2.15	5.3	4	\$19,012	\$12,211	\$133,028,003	1.83
053 SEIZURE	6,000	1.84	2.9	2	\$8,146	\$6,213	\$48,876,908	0.67
770 DRUG & ALCOHOL ABUSE OR DEPENDENCE, LEFT AGAINST MEDICAL ADVICE	4,283	1.31	4.1	3	\$3,469	\$2,186	\$14,859,420	0.20
773 OPIOID ABUSE & DEPENDENCE	3,857	1.18	5.1	4	\$5,134	\$3,485	\$19,800,895	0.27
775 ALCOHOL ABUSE & DEPENDENCE	2,264	0.70	5.8	4	\$5,589	\$3,008	\$12,654,434	0.17
058 OTHER DISORDERS OF NERVOUS SYSTEM	2,093	0.64	13.1	11	\$24,240	\$17,805	\$50,735,342	0.70
862 OTHER AFTERCARE & CONVALESCENCE	1,498	0.46	13.1	11	\$20,875	\$16,147	\$31,270,097	0.43
774 COCAINE ABUSE & DEPENDENCE	1,432	0.44	5.2	4	\$4,794	\$2,942	\$6,864,644	0.09
Top 10 Medical APR-DRGs	52,153	16.01	10.2	6	\$16,084	\$10,403	\$838,775,212	11.56
Other Medical Stays	32,475	9.97	10.2	4	\$18,389	\$8,639	\$597,175,572	8.23
Total Medical Stays	84,628	25.98	10.1	5	\$16,968	\$9,680	\$1,435,950,784	19.78
302 KNEE JOINT REPLACEMENT	37,298	11.45	3.2	3	\$20,908	\$17,296	\$779,821,703	10.74
301 HIP JOINT REPLACEMENT	26,404	8.11	2.9	3	\$20,730	\$18,047	\$547,365,517	7.54
403 PROCEDURES FOR OBESITY	16,108	4.95	1.9	2	\$13,074	\$11,203	\$210,599,535	2.90
304 DORSAL & LUMBAR FUSION PROC EXCEPT FOR CURVATURE OF BACK	13,077	4.01	3.9	3	\$38,920	\$31,406	\$508,958,869	7.01
221 MAJOR SMALL & LARGE BOWEL PROCEDURES	11,544	3.54	6.2	5	\$23,171	\$18,049	\$267,482,141	3.69
321 CERVICAL SPINAL FUSION & OTHER BACK/NECK PROC EXC DISC EXCIS/DECOMP	8,546	2.62	2.3	1	\$22,156	\$17,136	\$189,345,475	2.61
519 UTERINE & ADNEXA PROCEDURES FOR LEIOMYOMA	7,402	2.27	2.4	2	\$11,870	\$9,987	\$87,860,026	1.21
175 PERCUTANEOUS CARDIOVASCULAR PROCEDURES W/O AMI	6,132	1.88	2.9	1	\$33,776	\$21,096	\$207,114,498	2.85
173 OTHER VASCULAR PROCEDURES	5,962	1.83	3.5	2	\$25,130	\$19,903	\$149,824,114	2.06
513 UTERINE & ADNEXA PROCEDURES FOR NON-MALIGNANCY EXCEPT LEIOMYOMA	4,858	1.49	2.1	2	\$11,281	\$9,430	\$54,804,423	0.76
Top 10 Surgical APR-DRGs	137,331	42.16	3.2	3	\$21,868	\$16,755	\$3,003,176,299	41.38
Other Surgical APR-DRGs	103,771	31.86	4.8	3	\$27,167	\$17,153	\$2,819,111,523	38.84
Total Surgical APR-DRGs	241,102	74.02	3.8	3	\$24,149	\$16,903	\$5,822,287,822	80.22

*Surgical APR-DRGs: Inpatient discharge is considered surgical if a patient had a procedure performed which would require the use of the operating room (OR).

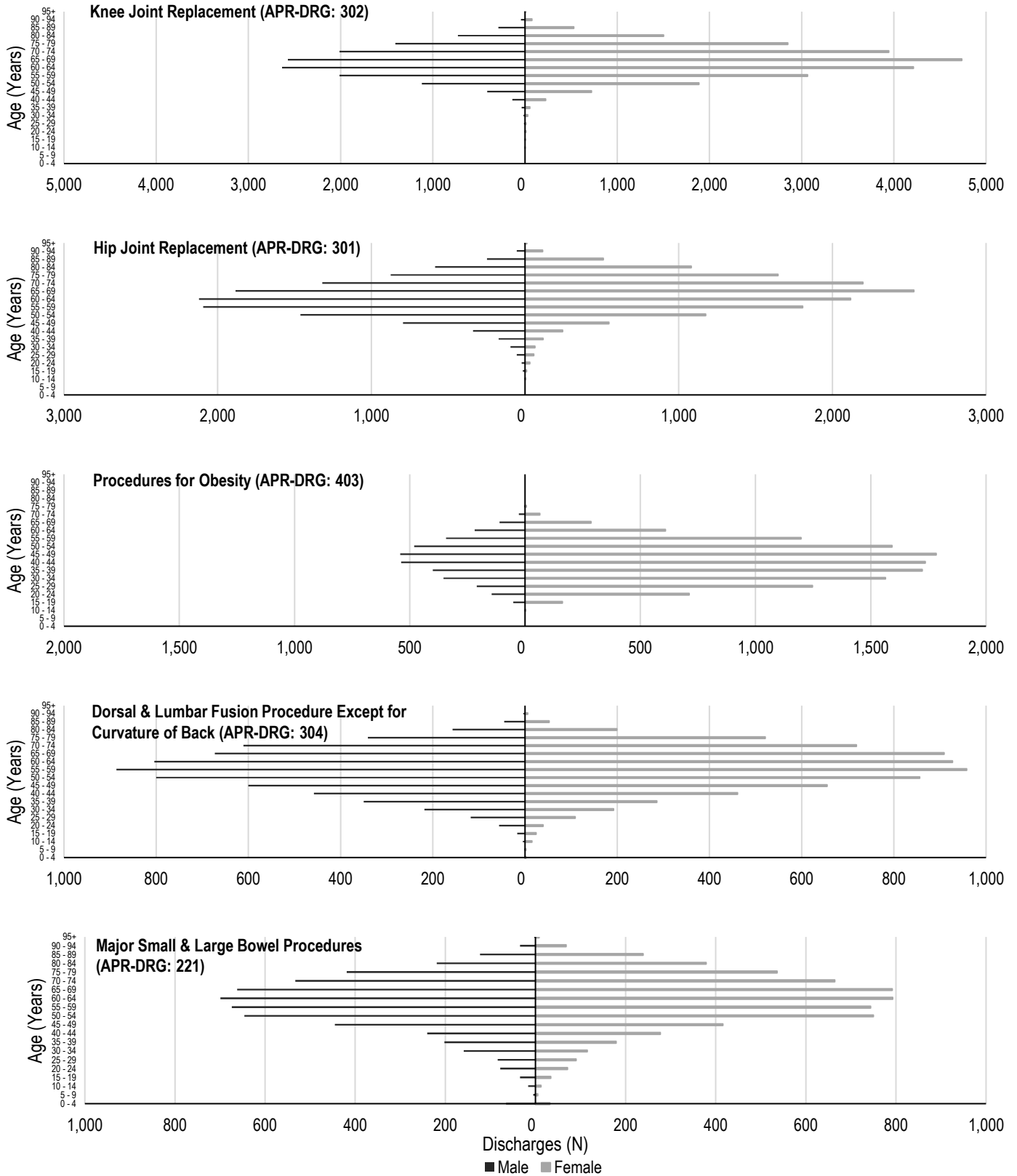
**Discharges that were deemed "Ungroupable" in the Medical/Surgical patient category were excluded (N=4).

Figure 7. Top 5 Most Common Medical APR-DRGs for Planned Inpatient Discharges by Patient Age and Sex, 2015



*Each bar represents a five-year age category.

Figure 8. Top 5 Most Common Surgical APR-DRGs for Planned Inpatient Discharges by Patient Age and Sex, 2015



*Each bar represents a five-year age category.

Table 5. Top 10 Most Common Primary Diagnosis CCS Categories for Planned Inpatient Discharges by Age Group, 2015

Diagnosis CCS Category		Discharges (N) (*Represents counts <10)							Rank						
CCS Code	CCS Description	0-5 Years	6-18 Years	19-34 Years	35-49 Years	50-64 Years	65+ Years	All Ages	0-5 Years	6-18 Years	19-34 Years	35-49 Years	50-64 Years	65+ Years	All Ages
13.2	Non-traumatic joint disorders	15	64	355	3,449	24,968	33,548	62,399	51	31	15	5	1	1	1
13.3	Spondylosis; intervertebral disc disorders; other back problems	*	36	1,305	5,633	9,222	6,940	23,139	78	45	4	3	2	4	2
7.2	Diseases of the heart	45	156	246	1,149	5,320	12,612	19,528	27	18	25	10	3	2	3
17.2	Factors influencing health care	248	430	933	1,304	4,141	10,639	17,695	7	5	7	9	6	3	4
3.11	Other nutritional; endocrine; and metabolic disorders	199	171	4,403	6,899	4,647	634	16,953	10	16	2	1	5	31	5
16.10	Complications	176	388	717	1,983	5,078	6,312	14,654	11	6	10	8	4	5	6
2.16	Benign neoplasms	76	154	1,255	6,080	3,870	1,924	13,359	21	19	6	2	7	13	7
5.12	Substance-related disorders	*	48	4,542	3,861	2,927	165	11,547	75	36	1	4	9	60	8
5.11	Alcohol-related disorders	*	*	1,380	3,037	3,468	332	8,224	91	88	3	6	8	46	9
2.15	Maintenance chemotherapy; radiotherapy	456	977	729	952	2,141	1,945	7,200	5	2	8	13	10	12	10
7.3	Cerebrovascular disease	15	28	68	347	1,650	4,235	6,343	51	53	42	28	15	6	11
6.4	Epilepsy; convulsions	1,218	2,104	1,277	812	651	240	6,302	1	1	5	14	32	53	12
7.4	Diseases of arteries; arterioles; and capillaries	*	24	46	258	1,688	4,227	6,250	65	55	56	32	14	7	13
10.3	Diseases of female genital organs	*	31	467	2,002	1,596	1,126	5,223	91	49	12	7	17	23	14
2.1	Colorectal cancer	-	*	73	495	1,605	2,535	4,710	-	106	39	22	16	9	16
2.3	Cancer of bronchus; lung	*	*	17	127	1,273	2,937	4,356	91	111	82	46	24	8	19
2.9	Cancer of urinary organs	17	*	66	365	1,419	2,265	4,139	49	86	43	27	21	10	21
10.1	Diseases of the urinary system	239	178	307	565	1,140	1,502	3,931	8	14	19	19	26	18	22
13.6	Acquired deformities	36	326	258	503	1,348	1,196	3,667	30	7	23	21	22	22	26
13.9	Other bone disease and musculoskeletal deformities	23	842	329	387	690	538	2,809	37	3	18	25	30	34	29
6.9	Other nervous system disorders	125	308	375	486	613	705	2,612	14	9	14	24	33	29	30
5.8	Mood disorders		284	723	636	662	302	2,607		10	9	17	31	47	31
18	Residual codes; unclassified; all E codes	250	219	263	493	423	343	1,991	6	11	22	23	37	43	33
14.5	Other congenital anomalies	673	537	248	172	204	140	1,974	3	4	24	40	50	62	34
14.1	Cardiac and circulatory congenital anomalies	721	310	207	169	180	98	1,685	2	8	27	41	52	69	36
8.1	Respiratory infections	500	167	64	75	161	345	1,312	4	17	44	51	53	41	40
14.3	Genitourinary congenital anomalies	212	79	43	39	59	23	455	9	24	59	68	74	91	59
	Top Ten Diagnoses Discharges	4,716	6,506	17,264	35,397	65,782	86,250	215,915							
		66.4%	61.3%	66.1%	67.4%	63.1%	68.9%	66.3%							
	All Other Diagnoses Discharges	2,383	4,099	8,865	17,101	38,419	38,952	109,819							
		33.6%	38.7%	33.9%	32.6%	36.9%	31.1%	33.7%							
	Total Planned Discharges	7,099	10,605	26,129	52,498	104,201	125,202	325,734							

*Represents discharge counts less than 10.

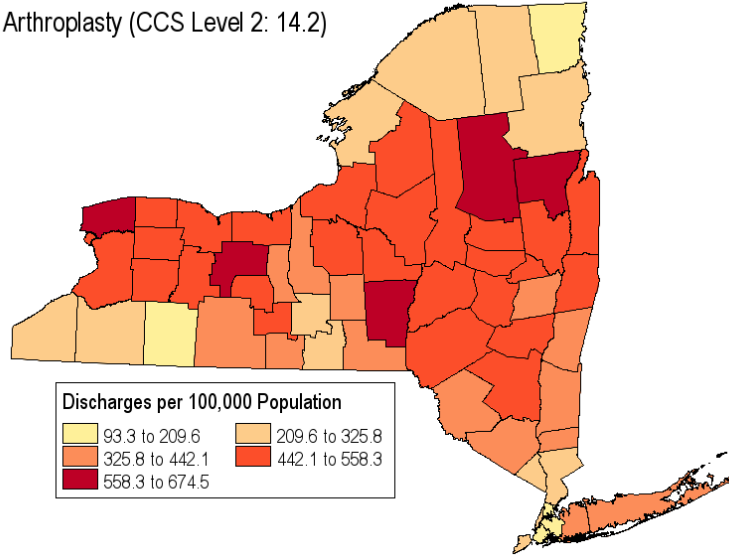
Table 6. Top 10 Most Common Principal Procedure CCS Categories for Planned Inpatient Discharges by Age Group, 2015

CCS Code	Procedure CCS Category CCS Description	Discharges (N)							Rank						
		0-5 Years	6-18 Years	19-34 Years	35-49 Years	50-64 Years	65+ Years	All Ages	0-5 Years	6-18 Years	19-34 Years	35-49 Years	50-64 Years	65+ Years	All Ages
14.7	Arthroplasty	*	81	488	4,000	26,877	36,183	67,631	115	24	9	5	1	1	1
14.11	Spinal fusion	27	869	1,237	5,134	8,531	5,826	21,624	42	3	4	3	2	3	2
16.30	Alcohol and drug rehabilitation/ detoxification	*	41	5,640	6,546	6,018	443	18,690	115	43	1	1	3	46	3
9.6	Gastrectomy; partial and total	*	112	3,204	4,979	3,380	638	12,314	132	20	2	4	5	32	4
12.5	Hysterectomy; abdominal and vaginal	*	*	325	5,205	3,512	1,666	10,710		133	16	2	4	12	5
16.26	Physical therapy	204	367	456	786	2,592	6,135	10,540	9	6	11	11	7	2	6
9.10	Colorectal resection	46	50	351	1,156	2,988	3,326	7,917	31	35	14	7	6	5	7
7.1	Heart valve procedures	55	93	156	344	1,230	4,409	6,287	27	23	28	25	18	4	8
9.26	Other OR upper GI therapeutic procedures	39	50	1,251	2,192	1,873	684	6,089	37	35	3	6	10	29	9
16.35	Cancer chemotherapy	371	924	574	663	1,694	1,603	5,829	4	2	6	14	11	13	10
1.3	Laminectomy; excision intervertebral disc	20	68	386	1,115	1,940	1,956	5,485	52	28	12	8	9	10	11
6.3	Lobectomy or pneumonectomy	39	53	125	310	1,610	2,856	4,993	37	34	40	26	12	6	12
16.38	Other diagnostic procedures (interview; evaluation; consultation)	953	1,628	839	563	501	249	4,733	1	1	5	17	34	65	13
7.19	Other OR procedures on vessels other than head and neck	112	76	110	279	1,177	2,559	4,313	13	25	42	30	20	8	14
11.2	Open prostatectomy	-	-	*	162	2,001	1,520	3,684	-	-	163	46	8	15	17
15.1	Procedures on the breast	-	*	145	932	1,361	1,127	3,567	-	133	34	10	15	19	19
14.3	Treatment of fracture or dislocation	103	331	500	544	939	1,021	3,438	16	7	7	19	22	21	20
7.10	Aortic resection; replacement or anastomosis	26	*	*	33	654	2,697	3,419	44	123	128	92	26	7	21
7.2	Coronary artery bypass graft (CABG)	-	*	*	180	1,199	2,002	3,383	-	153	163	41	19	9	22
1.9	Other OR therapeutic nervous system procedures	286	230	355	518	855	742	2,986	6	8	13	20	24	28	25
7.7	Other OR heart procedures	405	186	99	191	557	896	2,334	3	11	45	39	29	23	26
16.42	Other therapeutic procedures	135	196	222	279	561	870	2,263	11	9	23	30	28	24	28
10.11	Other OR therapeutic procedures of urinary tract	280	145	120	156	433	781	1,915	7	15	41	47	42	27	29
16.29	Psychological and psychiatric evaluation and therapy	*	183	459	443	456	249	1,791	132	12	10	21	38	65	33
12.7	Abortion (termination of pregnancy)	-	*	494	1,007	27	*	1,534	-	133	8	9	135	175	37
16.16	Electroencephalogram (EEG)	325	519	274	176	135	55	1,484	5	4	17	43	72	117	38
5.7	Other OR therapeutic procedures on nose; mouth and pharynx	217	118	100	169	403	447	1,454	8	18	44	44	45	45	40
14.14	Other OR therapeutic procedures on bone	61	383	238	155	207	199	1,243	22	5	20	48	58	70	50
16.28	Other respiratory therapy	137	27	27	52	170	665	1,078	10	56	73	79	64	30	55
5.4	Tonsillectomy and/or adenoidectomy	464	187	32	33	55	32	803	2	10	66	92	112	130	59
	Top Ten Procedures Discharges	3,642	5,634	14,686	32,266	59,712	67,949	167,631							
		56.3%	58.0%	61.3%	64.5%	60.3%	60.0%	55.4%							
	All Other Procedures Discharges	2,829	4,086	9,285	17,728	39,260	45,285	134,731							
		43.7%	42.0%	38.7%	35.5%	40.0%	40.0%	44.6%							
	Total Planned Discharges	6,471	9,720	23,971	49,994	98,972	113,234	302,362							

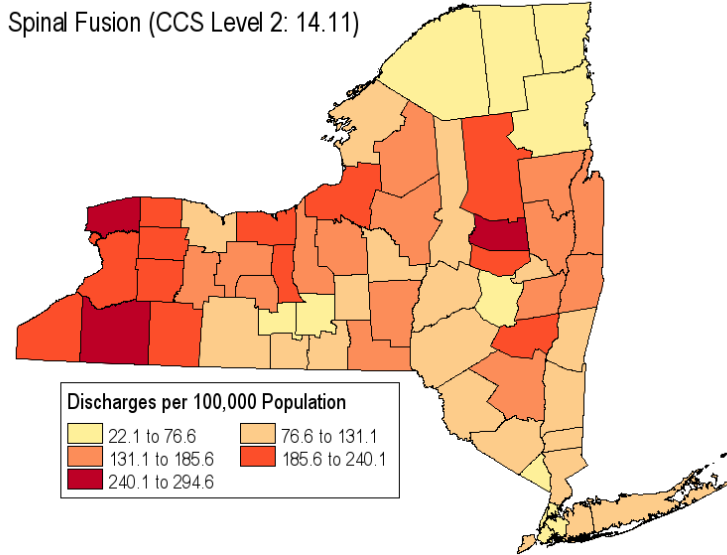
*Represents discharge counts less than 10.

Figure 9. Rate per 100,000 Population of Top 4 Most Common Principal Procedure CCS Categories for Planned Inpatient Discharges by Patient County, 2015

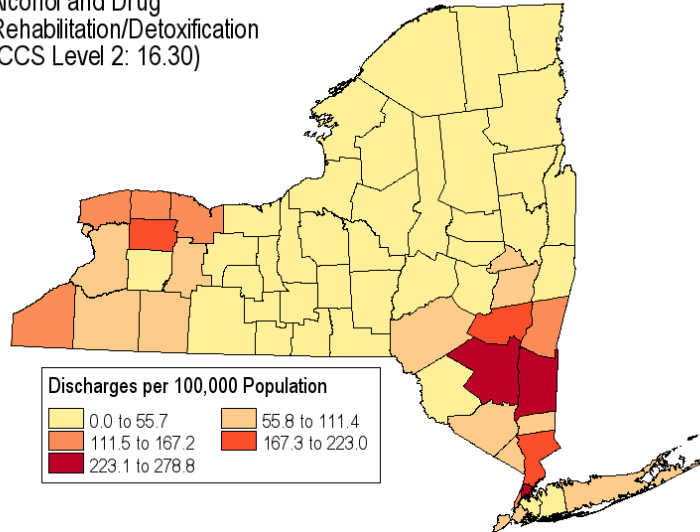
Arthroplasty (CCS Level 2: 14.2)



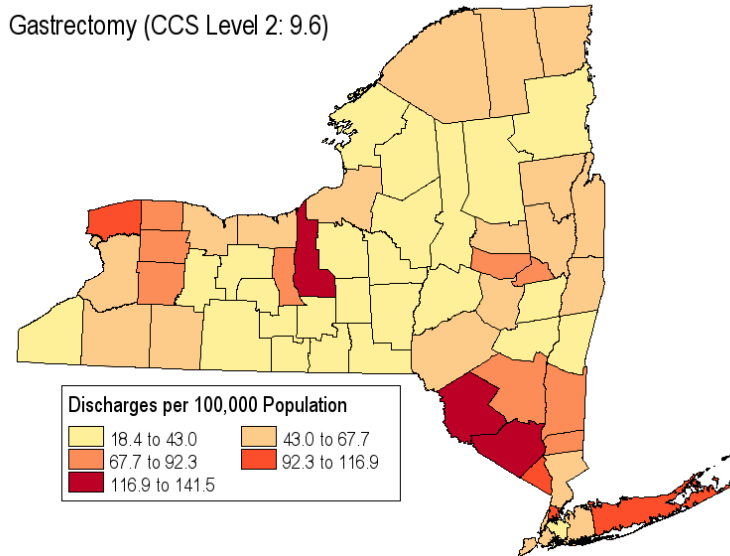
Spinal Fusion (CCS Level 2: 14.11)



Alcohol and Drug Rehabilitation/Detoxification (CCS Level 2: 16.30)

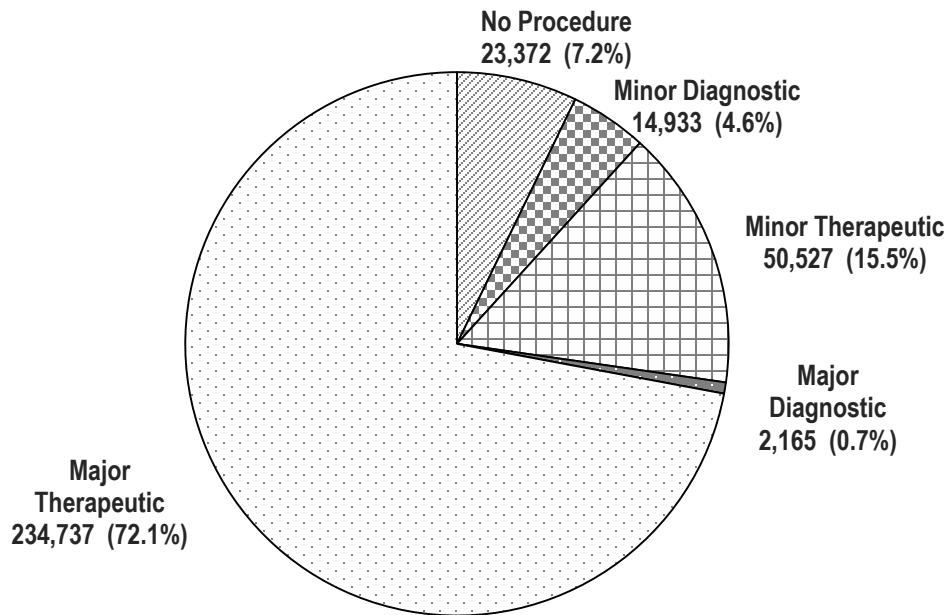


Gastrectomy (CCS Level 2: 9.6)



*Map categories are created from the county level discharge rate specific to each CCS category.

Figure 10. Distribution of Principal Procedure HCUP Procedure Classes for Planned Inpatient Discharges, 2015



Definitions

The Statewide Planning and Research Cooperative System (SPARCS): SPARCS is a comprehensive data reporting system established in 1979 as a result of cooperation between the health care industry and government. Initially created to collect information on discharges from hospitals, SPARCS currently collects patient level detail on patient characteristics, diagnoses and treatments, services, and charges for every Article 28 (acute care) hospital discharge, ambulatory surgery, emergency room visits, and visits to hospital-based outpatient clinics in NYS. More information on SPARCS may be found at the following direct link:
<http://www.health.ny.gov/statistics/sparcs/>

Agency for Healthcare Research and Quality (AHRQ): AHRQ was originally created as the Agency for Health Care Policy and Research (AHCPR) on December 19, 1989, under the Omnibus Budget Reconciliation Act of 1989, as a Public Health Service Agency in the U.S. Department of Health and Human Services (HHS). The Agency was reauthorized with a name change as the Agency for Healthcare Research and Quality on December 6, 1999, under the Healthcare Research and Quality Act of 1999. The AHRQ mission is to produce evidence to make health care safer, higher quality, more accessible, equitable, and affordable, and to work within the U.S. Department of Health and Human Services and with other partners to make sure that the evidence is understood and used.

All Patient Refined Diagnostic Related Groups (APR-DRGs): APR-DRGs were assigned to SPARCS data using grouping software created and distributed by 3M™ Corporation (3M™ Health Information Systems). A total of 314 base APR-DRGs constitute a hospital inpatient services classification system that groups patients according to diagnosis, type of treatment (procedures), and other relevant criteria (ex., age, sex, discharge status). It represents the patient's condition at the time of discharge and includes the impact of conditions that developed during the hospital stay; diagnoses and procedures are eliminated from consideration in the APR-DRG assignment. There are three major component classes of APR-DRGs: surgical, medical and ungroupable. An inpatient discharge is considered surgical if a patient had a procedure performed which would require the use of the operating room, while remaining discharges are considered medical unless there are certain errors on the record such as an invalid primary diagnosis.

Clinical Classifications Software (CCS) for Diagnoses: The Clinical Classifications Software (CCS) for ICD-9-CM is a diagnosis and procedures categorization scheme that is based on the *International Classification of Diseases, 9th Revision, Clinical Modification (ICD-9-CM)*, a uniform and standardized coding system. CCS was formerly known as the Clinical Classifications for Health Policy Research (CCHPR). The ICD-9-CM codes (over 14,000 diagnosis codes and 3,900 procedure codes) are collapsed into a smaller number of clinically meaningful categories that are sometimes more useful for presenting descriptive statistics than are individual ICD-9-CM codes. The software is available at: <https://www.hcup-us.ahrq.gov/toolssoftware/ccs/ccs.jsp>

Clinical Classifications Software (CCS) for Procedures: The Clinical Classifications Software for Services and Procedures (CCS-Services and Procedures) is one in a group of databases and software tools developed as part of the Healthcare Cost and Utilization Project (HCUP), a Federal-State-Industry partnership sponsored by the Agency for Healthcare Research and Quality (AHRQ). CCS-Services and Procedures provides a method for classifying Current

Procedural Terminology (CPT) codes and Healthcare Common Procedure Coding System (HCPCS) codes into procedure categories. The software is available at: https://www.hcup-us.ahrq.gov/toolssoftware/ccs_svcsproc/ccssvcproc.jsp

Healthcare Cost and Utilization Project (HCUP): HCUP includes the largest collection of longitudinal hospital care data in the United States. Sponsored by AHRQ, HCUP includes largest all payer encounter level health care data (inpatient, emergency department and ambulatory surgery records) in the U.S., beginning in 1988. HCUP is a Federal-State-Industry partnership that brings together data collection efforts of many organizations to create a national health care information resource. For more information follow direct link: <http://www.hcup-us.ahrq.gov/>

Payer: A composite was derived from three Source of Payment Typology data elements reported on a SPARCS discharge record. Source of Payment Typology is a hierarchical code list based on the Public Health Data Standards Consortium Source of Payment Typology Version 3.0, Code that provides a range of codes from broad categories to related sub-categories that are more specific. It is used to identify the payer expected to pay all or a portion of the patient's bill. Broad categories (and related sub-categories) were combined into payer categories as follows:

- Self -Pay – No payment from an organization/agency/program/private payer listed
- Dual Eligible – Both Medicaid and Medicare listed as payers
- Medicaid only – Medicaid
- Medicare only – Medicare
- Private – Private health insurance; Blue Cross/Blue Shield Organization
- Other – Other government (Federal/State/Local-excluding Dept. of Corrections); Dept. of Corrections; Managed care, unspecified; Miscellaneous/other

Procedure Classes for Procedures: Procedure Classes is a software tool developed as a part of the Healthcare Cost and Utilization Project (HCUP). The Procedure Classes categorizes procedure codes into one of four broad categories: Minor Diagnostic, Minor Therapeutic, Major Diagnostic, and Major Therapeutic.

1. Minor Diagnostic – Non-operating room procedures that are diagnostic
2. Minor Therapeutic – Non-operating room procedures that are therapeutic
3. Major Diagnostic – All procedures considered valid operating room procedures by the Diagnosis Related Group (DRG) grouper and that are performed for diagnostic reasons
4. Major Therapeutic – All procedures considered valid operating room procedures by the Diagnosis Related Group (DRG) grouper and that are performed for therapeutic reasons

The software is available at: <https://www.hcup-us.ahrq.gov/toolssoftware/procedure/procedure.jsp>

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

Appendices

Appendix 1 – Maternity and Newborn Identification Criteria

Criteria Type	Exclusion Codes	Code Description
Principal Procedure CCS	134	Cesarean section
	135	Forceps; vacuum; and breech delivery
Primary Diagnosis CCS	194	Forceps delivery
	196	Normal pregnancy and/or delivery
MDC	14	Pregnancy, Childbirth and the Puerperium
	15	Newborns and Other Neonates with Conditions Originating in the Perinatal Period
Age in Days	0-29	Infants aged less than 29 Days

Appendix 2 – HCUP Bedsize Classification

Bedsize categories are based on hospital beds, and are specific to the hospital's location and teaching status. Bedsize assesses the number of short-term acute beds in a hospital. Hospital information was obtained from the AHA Annual Survey of Hospitals.

Beginning in 1998, the hospital's bedsize categories are defined using region of the U.S., the urban-rural designation of the hospital, in addition to the teaching status. Rural hospitals were not split according to teaching status, because rural teaching hospitals were rare. A hospital is considered to be a teaching hospital if it has an AMA-approved residency program, is a member of the Council of Teaching Hospitals (COTH) or has a ratio of full-time equivalent interns and residents to beds of .25 or higher. The classification of a hospital location as urban or rural has changed over time. Prior to 2004 data, the urban/rural designation was based on Metropolitan Statistical Areas (MSA). Beginning with the 2004 data, this designation was determined by the Core Based Statistical Area (CBSA). This change in 2004 contributed to a slight decline in the number of hospitals that were classified as rural and a corresponding increase in the number of hospitals that were classified as urban.

The following bedsize classifications were used in this analysis:

NORTHEAST REGION			
Location and Teaching Status	Hospital Bedsize		
	Small	Medium	Large
Rural	1-49	50-99	100+
Urban, nonteaching	1-124	125-199	200+
Urban, teaching	1-249	250-424	425+

Acknowledgments

Authors would like to acknowledge that the funding for the student research assistant come from the “Grant to States to Support Health Insurance Rate Review and Increase Transparency in Health Care Pricing, Cycle III” awarded to the NYS DOH and Department of Financial Services by the U.S. Department of Health and Human Services.

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