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Skilled Nursing Facility 30-Day All-Cause Readmission Measure (SNFRM)
NQF #2510:
All-Cause Risk-Standardized Readmission Measure

Technical Report Supplement—2019 Update

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Skilled Nursing Facility 30-Day All-Cause Readmission Measure (SNFRM) NQF #2510: All-Cause Risk-Standardized Readmission Measure
Technical Report Supplement

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# Section 1.Introduction

The Centers for Medicare & Medicaid Services (CMS) contracted with RTI International to develop the Skilled Nursing Facility 30-Day All-Cause Readmission Measure (SNFRM; National Quality Forum [NQF] #2510), which estimates the risk-standardized rate of all-cause, unplanned hospital readmissions. The SNFRM was subsequently adopted for use in the Skilled Nursing Facility Value-Based Purchasing (SNF VBP) Program (80 Federal Register 46419). The SNF VBP Program, authorized by the Protecting Access to Medicare Act of 2014, began affecting payment determination in Fiscal Year (FY) 2019. More information on how the SNFRM is used in the SNF VBP Program is provided on the CMS website.[[1]](#footnote-2)

This technical report supplement provides updated analytic and risk-adjustment model results for the SNFRM. Specifically, we present (1) measure specifications and documentation for the SNFRM as well as (2) measure results from FY 2016 and calendar year (CY) 2017.[[2]](#footnote-3) Previous SNFRM technical reports presented full testing and measure results based on earlier data.[[3]](#footnote-4)

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# Section 2.Measure Specifications

In this section, we describe in detail how the SNFRM is specified and calculated. We first provide an overview of the measure and subsequently, in Section 2.2, we describe the data sources used to calculate the measure. Section 2.3 discusses the eligible populations and how we defined the measure outcome (unplanned readmissions), including a definition of the risk window (Section 2.3.1) and an overview of the Planned Readmissions Algorithm (Section 2.3.2). Section 2.4 is an overview of the SNFRM inclusion and exclusion criteria. Finally, in Section 2.5, we discuss the SNFRM risk-adjustment model and statistical calculation of the measure.

Please note that no changes have been made to the SNFRM’s technical specifications or risk-adjustment model since the April 2017 Technical Report Supplement. However, for our readers’ convenience, we include a summary of both the model and measure specifications in this document.

## 2.1 Measure Overview

The SNFRM estimates the risk-standardized rate of all-cause, unplanned hospital readmissions for SNF Medicare fee-for-service (FFS) beneficiaries within 30 days of discharge from a prior proximal acute hospitalization. The measure is risk-adjusted for patient demographics, principal diagnosis from the prior hospitalization, comorbidities, and other health status variables that affect the probability of a hospital readmission. The SNFRM includes Medicare FFS beneficiaries who were admitted to a SNF within 1 day of discharge from a hospital. The measure is calculated annually using a 12-month period.

## 2.2 Data Sources

The SNFRM applies only to Medicare Part A FFS beneficiaries and is calculated using Medicare eligibility and inpatient claims data. The eligibility files include information on date of birth, sex, reasons for Medicare eligibility, duration of Part A coverage, and enrollment periods in the FFS program. Medicare FFS claims include information on the dates of admission and discharge, relevant diagnoses and procedures, and indicators of dialysis use. Inpatient claims data files contain beneficiary-level SNF and hospital records. No additional information or data are needed from providers beyond what is present in claims and Medicare eligibility files (i.e., no additional data collection is required). Following are the specific files used:

* Medicare Provider Analysis and Review (MedPAR) files

Documentation available at <http://www.resdac.org/cms-data/files/medpar-rif/data-documentation>

* Medicare Denominator files

Documentation available at <http://www.cms.gov/Research-Statistics-Data-and-Systems/Files-for-Order/IdentifiableDataFiles/DenominatorFile.html>

## 2.3 Eligible Population and Outcome Definition

The SNFRM includes Medicare Part A FFS beneficiaries who were admitted to a SNF within 1 day of discharge from an inpatient prospective payment system hospital, critical access hospital (CAH), or PPS-exempt psychiatric or cancer hospital. The measure assesses the facility-level rate of all-cause unplanned hospital inpatient readmissions that occur within 30 days of discharge from a prior proximal hospitalization.

Planned readmissions are not counted as readmissions. In order to define whether a readmission is planned or unplanned, we use the RTI-modified version of the CMS Planned Readmission Algorithm, which includes additional procedures specific to post-acute care (PAC) settings (see Section 2.5 below and ***Appendix A***).

This measure is based on data for 12 months of SNF admissions. Because the measure denominator is based on SNF admissions, it is possible that Medicare beneficiaries with more than one eligible admission may be included in the measure multiple times within a given year.

## 2.4 Thirty-Day Readmission Window

The SNFRM’s “readmission window” extends 30 days from the day a beneficiary is discharged from the prior proximal hospitalization. **Figure 1** below illustrates this window. If the readmission occurs within 30 days of discharge from the prior proximal hospitalization, it will be counted in the numerator of the measure. This is true both for beneficiaries that are readmitted directly from the SNF and for those that are readmitted after SNF discharge.

Figure 1
Risk window for the SNFRM



## 2.5 Planned Readmissions

The SNFRM uses a modified version of CMS’s Planned Readmissions Algorithm[[4]](#footnote-5) to identify readmissions that are classified as planned and should therefore not be counted as readmissions. Planned readmissions are not counted against facilities because they are not indicative of poor quality of care. A planned readmission is defined as any non-acute readmission in which one of a set of typically planned procedures or diagnoses occurred. The Planned Readmission Algorithm is based on two main principles:

1. Some diagnoses and procedures should *always* be considered planned.
2. A separate, larger group of procedures should also be considered planned except in the presence of a disqualifying diagnosis. That is, if any of the procedures in this group occurs in conjunction with a diagnosis that disqualifies a readmission from being considered planned, the readmission will be considered *un*planned. The rationale is that the readmission would likely have been necessitated by the acute diagnosis even if the planned procedure was not performed.

Unless a readmission meets the algorithm’s definition of planned, it is considered unplanned and counted in the numerator of the measure calculation. Note that admissions for acute illness or for complications of care are classified as unplanned.

The algorithm developed to identify planned readmissions uses procedure codes and discharge diagnosis categories coded using the Agency for Healthcare Research and Quality (AHRQ) Clinical Classification Software (CCS).[[5]](#footnote-6) Per feedback from a technical expert panel convened by RTI, we added procedures to the CMS Planned Readmission Algorithm that are specific to PAC settings. These additional procedures were codified by a certified nosologist before use.

For additional detail, including a list of codes used to define planned readmissions, please see ***Appendix A***.

## 2.6 Eligible Stays: Exclusion Criteria

SNF stays may be excluded from the SNFRM for a number of reasons. We exclude stays if they are clinically different than most SNF stays, stays for which it would be inappropriate to hold SNFs accountable for possible readmissions, and stays for which the data are insufficient to track readmissions or apply risk adjustment.

To ensure the SNFRM sample aligns with the population of SNFs eligible for the SNF VBP Program, stays at CAH swing beds are excluded from the denominator. Given CAH swing beds are not paid on the SNF Prospective Payment System (PPS), they are not eligible for the SNF VBP Program. However, it should be noted that because the SNF VBP Program includes all SNFs paid on the SNF PPS, SNFs in U.S. territories are included.

**The following SNF stays are not considered eligible for inclusion in the measure (denominator exclusions):**

1. SNF stays where the patient had one or more intervening PAC admissions (such as inpatient rehabilitation facility [IRF] or long-term care hospital [LTCH] admissions) that occurred either between the prior proximal hospital discharge and SNF admission or after the SNF discharge within the 30-day risk window. Thus, care trajectories where the patient had multiple SNF admissions after the prior proximal hospitalization and within the 30-day risk window are excluded.
2. SNF stays with a gap of greater than 1 day between discharge from the prior proximal hospitalization and the SNF admission.
3. SNF stays where the patient did not have at least 12 months of Medicare Part A FFS enrollment before the proximal hospital discharge and throughout the entire risk period (measured as enrollment during the 11 months before the month of proximal hospital discharge, the month of proximal hospital discharge, and the month after the month of discharge)
4. SNF stays where the patient was discharged from the SNF against medical advice.
5. SNF stays in which the principal diagnosis for the prior proximal hospitalization was for the medical treatment of cancer. Please note that patients with cancer whose principal diagnosis from the prior proximal hospitalization was for other diagnoses or who had surgical treatment of their cancer remain in the measure.
6. SNF stays in which the principal diagnosis for the prior proximal hospitalization was for “rehabilitation care; fitting of prostheses; and adjustment of devices” (CCS 254)
7. SNF stays in which the prior proximal hospitalization was for pregnancy.
8. SNF stays in which data were missing or problematic on any covariate or variable used in the SNFRM construction.
9. SNF stays that took place in a CAH swing bed.

***Table 1*** summarizes the frequency of exclusions from the denominator of this measure for data from FY 2016 and CY 2017.

Table 1
Frequency of denominator exclusions, FY 2016, CY 2017a

| Individual exclusions (not mutually exclusive) | FY 2016 frequency (%) | CY 2017 frequency (%) |
| --- | --- | --- |
| ***Exclusion 1***: SNF stays where the patient had one or more PAC admissions (IRF or LTCH) between the prior proximal hospital discharge and SNF admission, or one or more PAC admissions (SNF, IRF, or LTCH) after the SNF discharge within the 30-day risk window | 188,280(7.9%) | 183,188(7.7%) |
| ***Exclusion 2***: Gap of greater than 1 day between prior proximal hospital discharge and SNF admissionb | 136,250(5.7%) | 132,041(5.6%) |
| ***Exclusion 3***: Not continuously enrolled in Medicare FFS for the year before prior proximal hospital discharge, the month of the prior proximal hospitalization, and 1 month after the hospitalization  | 429,708(18.1%) | 387,686(16.4%) |
| ***Exclusion 4***: Discharged from SNF against medical advice | 13,190(0.6%) | 15,701(0.7%) |
| ***Exclusion 5***: Principal diagnosis in prior proximal hospitalization for medically treated cancer  | 29,347(1.2%) | 28,170(1.2%) |
| ***Exclusion 6***: Principal diagnosis in prior proximal hospitalization for rehabilitation care  | 34(0.0%) | 28(< 0.1 %) |
| ***Exclusion 7***: Principal diagnosis in prior proximal hospitalization for pregnancy  | 9(0.0%) | 9(0.0%) |
| ***Exclusion 8***: Missing data on variables used for measure construction or other problematic data elements | 247,689(10.4%) | 265,964(11.2%) |
| ***Exclusion 9***: CAH swing beds | 85,184(3.6%) | 84,637(3.6%) |
| **Total excluded for any reasonc** | 753,111(31.65%) (68.4%) | 704,953(29.8%) (70.2%) |

a Before applying exclusion criteria, the initial analytic file for FY 2016 included 2,379,324 index SNF stays across 16,709 SNFs. After applying exclusions, 1,626,213 index SNF stays across 15,409 SNFs remained. The initial analytic file for CY 2017 included 2,365,357 index SNF stays across 16,719 SNFs. After applying exclusions, 1,660,404 index SNF stays across 15,421 SNFs remained.

b This exclusion includes cases where PAC stays occur during the gap between the prior acute hospital discharge and the SNF admission.

c Exclusions shown in this table are not mutually exclusive. Patients may be counted in more than one excluded category.

SOURCE: RTI International analysis of Medicare claims (RTI programming reference: MS15 and MS15\_001\_pt1.xls [FY 2016]; MS07, MS07\_001.xls, and allstay40\_lk2017\_001.xls [CY 2017])

## 2.7 Risk Adjustment and Statistical Approach to Measure Calculation

The SNFRM risk-adjustment model accounts for variation across SNFs in case mix and patient characteristics. Specifically, the measure risk-adjusts for the following: age, sex, length of stay during prior proximal hospitalization, time spent in the intensive care unit (ICU) during the prior proximal hospitalization, disabled as original reason for Medicare coverage, ESRD, number of acute care hospitalizations in the 365 days before prior proximal hospitalization, principal diagnosis, system-specific surgical indicators, individual comorbidities based on Hierarchical Condition Categories (HCCs),[[6]](#footnote-7) and the presence of multiple comorbidities. The way in which covariates were selected and the rationale for their selection is described in detail in the March 2015 SNFRM Technical Report.[[7]](#footnote-8)

Full risk-adjustment model results for FY 2016 and CY 2017 are reported in ***Appendix B***.

## 2.8 Model Definition

The SNFRM employs a hierarchical logistic regression model to model the log odds of readmission for each index SNF stay. The hierarchical model is used to account for the clustering of observations within SNFs. We modeled “readmission within 30 days” as a function of patient-level demographic and clinical characteristics with a random SNF-level intercept. The use of a random intercept accounts for within-SNF correlation of the observed outcomes and the underlying differences in quality among the SNF facilities being evaluated.

We estimate the hierarchical logistic regression model as follows. Let Yij, denote the outcome (equal to 1 if patient is readmitted within 30 days, 0 otherwise) for a patient i at SNFj. *Z*ij denotes a set of risk factors. We assume the outcome is related linearly to the covariates via a logit function with dispersion:

 logit(Prob(Yij =1)) = αj + β\*Zij + εij (1)

 αj = μ + ωj ; ωj ~ N(0, τ2)

where Zij *=* (Z1, Z2, ... Zk), a set of *k* patient-level covariates, αj represents the SNF-specific intercept, μ is the adjusted average outcome over all SNFs, τ2 is the between-SNF variance component, and ε ~N(0,σ2) captures any over- or under-dispersion.

The hierarchical logistic regression model was estimated using the SAS software (SAS GLIMMIX: SAS/STAT User’s Guide, SAS Institute Inc.).

## 2.9 Calculating the Risk-Standardized Readmission Rate (RSRR)

We specified and estimated the risk-adjustment model using hierarchical logistic regression to calculate a standardized risk ratio (SRR) for each SNF. To calculate this ratio, we used the results from the hierarchical logistic regression model to calculate the *predicted* and *expected* number of readmissions for each SNF. The predicted number of readmissions takes into account the unique impact of each SNF on the likelihood of readmission (quality), whereas the expected number of readmissions is based on the average SNF. The predicted number of readmissions for each SNF was calculated as the sum of the predicted probability of readmission for each patient in the facility, including the SNF-specific (random) effect. The expected number of readmissions for each SNF was calculated as the sum of the predicted probability of readmission for each patient in the facility, *not* including the SNF-specific (random) effect.

Using the notation of the previous section, the RSRR for each SNF is calculated as follows. To calculate the predicted number of readmissions, predj, for index SNF stays at SNF*j*, we used

 predj = Σlogit-1(μ + ωi + β\*Zij) (2)

where the sum is over all stays in SNF*j*, and ωi is the random intercept. To calculate the expected number, expj, we used

 expj = Σlogit-1(μ + β\*Zij) (3)

As a measure of excess or reduced readmissions among index stays at SNF*j*, we calculated the standardized risk ratio SRRj as

 SRRj = predj/expj (4)

This value, SRRj, is the standardized risk ratio for SNF*j*. The standardized risk ratio, SRRj, is multiplied by the overall national raw readmission rate for all SNF stays, Ῡ, to produce RSRRj.

 RSRRj = SRRj\*Ῡ (5)

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# Section 3. Results

## 3.1 Overview

In this section, we summarize key results from the SNFRM for FY 2016 and CY 2017. We summarize descriptive statistics on the observed readmission rates and RSRRs for FY 2016 and CY 2017. Similar to our analyses for prior years,[[8]](#footnote-9) the interquartile ranges show clustering in the middle of the distribution. This is in part attributable to the shrinkage of RSRR scores towards the mean, though the risk adjustment itself can also reduce the range of RSRRs. Full risk-adjustment model results for each year are included in ***Appendix B***.

## 3.2 Results from FY 2016

Next, we report the results of analyses on facilities’ readmission rates in FY 2016. The distribution of the observed readmission rates and RSRRs for FY 2016 is shown in ***Table 2***. The observed readmission rates range from 0.00 to 100.00 percent with an interquartile range of 13.56 to 23.00 percent. The RSRR, compared with the observed unadjusted rate, has a narrower range, from 11.50 to 29.71 percent, a tighter interquartile range of 17.75 to 19.87 percent, and a much smaller standard deviation (SD) (1.77 vs. 8.38). The mean and median RSRR (18.87 and 18.71 percent, respectively) were slightly higher than the mean and median observed rate (18.42 and 18.18 percent, respectively).

The distributions of the observed readmission rates and RSRRs for FY 2016 are illustrated in ***Figure 2***. The vertical axis indicates the percentage of SNFs, and the horizontal axis indicates the readmission rate.

Table 2
Distribution of SNFs’ observed readmission rates and RSRRs, FY 2016

|  | Mean | Std dev  | Min  | 10th percentile  | 25th percentile  | Median  | 75th percentile  | 90th percentile | Max  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Observed  | 18.42 | 8.38 | 0.00 | 9.00 | 13.56 | 18.18 | 23.00 | 27.96 | 100.00 |
| Risk-standardized  | 18.87 | 1.77 | 11.50 | 16.79 | 17.75 | 18.71 | 19.87 | 21.13 | 29.71 |
| Count of SNF stays  | 106 | 111 | 1 | 16 | 35 | 72 | 136 | 236 | 1,876 |

NOTE: There were 15,409 SNFs.

SOURCE: RTI International analysis of FY 2016 MedPAR data (RTI programming reference: MS15, idxSNF02\_lk2016\_003\_facility.xls, and idxSNF02\_lk2016\_003\_FORMATTED.xls)

Figure 2
Distribution of SNFs’ observed readmission rates and
RSRRs, FY 2016



NOTE: There were 15,409 SNFs. Observed mean (SD): 18.42 (8.38); risk-standardized mean (SD): 18.87 (1.77)

SOURCE: RTI International analysis of FY 2016 MedPAR data (RTI programming reference: MS15 and MS15\_001\_pt2\_dualplotsALL.rtf)

## 3.3 Results from CY 2017

Next we report the results of analyses on facilities’ readmission rates in CY 2017. The distribution of the observed readmission rates and RSRRs for CY 2017 is shown in ***Table 3***. The observed readmission rates range from 0.00 to 100.00 percent, with an interquartile range of 14.20 to 23.44 percent. The RSRR, compared with the observed unadjusted rate, had a narrower range, from 12.80 to 33.13 percent, a tighter interquartile range of 18.35 to 20.36 percent, and a much smaller SD (1.70 vs. 8.15). The mean and median RSRR (19.42 and 19.27 percent, respectively) were slightly higher than the mean and median observed rate (18.87 and 18.70 percent, respectively).

The distributions of the observed readmission rates and RSRRs for FY 2016 are illustrated in ***Figure 3***. The vertical axis indicates the percentage of SNFs and the horizontal axis indicates the readmission rate.

Table 3
Distribution of SNFs’ observed readmission rates and RSRRs, CY 2017

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Mean | Std dev  | Min  | 10th percentile  | 25th percentile  | Median  | 75th percentile  | 90th percentile  | Max  |
| Observed  | 18.87 | 8.15 | 0.00 | 9.52 | 14.20 | 18.70 | 23.44 | 28.26 | 100.00 |
| Risk-standardized  | 19.42 | 1.70 | 12.80 | 17.43 | 18.35 | 19.27 | 20.36 | 21.60 | 33.13 |
| Count of SNF stays  | 108 | 113 | 1 | 17 | 35 | 73 | 139 | 240 | 1,802 |

NOTE: There were 15,421 SNFs.

SOURCE: RTI International analysis of CY 2017 MedPAR data (RTI programming reference: CK69, av33\_CY\_002\_summmeans2.xls, and idxSNF04\_lk2017\_CY\_001\_FORMATTED.xls)

Figure 3
Distribution of SNFs’ observed readmission rates and
RSRRs, CY 2017



NOTE: There were 15,421 SNFs. Observed mean (SD): 18.87 (8.15); risk-standardized mean (SD): 19.42 (1.70)

SOURCE: RTI International analysis of CY 2017 MedPAR data (N = 15,421 facilities) (RTI programming reference: MS05 and idxSNF04\_lk2017\_CY\_001\_MS05\_rsrrplots\_DualAll.rtf)

## 3.4 Model Fit in FY 2016 and CY 2017

The c-statistics for the FY 2016 and CY 2017 risk models were 0.674 and 0.673, respectively**(*Table 4*)**. These results are comparable to results from models in previous years.[[9]](#footnote-10)

Table 4
C-statistics for FY 2016 and CY 2017 risk-adjustment models

|  |  |  |  |
| --- | --- | --- | --- |
| Year |  | FY 2016 | CY 2017 |
| C-statistic |  | 0.674 | 0.673 |

SOURCE: RTI International analysis of Medicare claims (RTI programming reference: CK26 and idxSNF02\_lk2016\_003.xls [FY 2016]; MS05 and idxSNF04\_lk2017\_CY\_001\_logreg\_MS05.xls [CY 2017])

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Appendix A:
Planned Readmission Algorithm

List of Tables in Appendix A

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[A-4 Acute diagnoses that disqualify potentially planned procedures 25](#_Toc2846975)

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The Planned Readmissions Algorithm version 3.0 was updated for the FY 2019 SNF VBP Program using FY 2018 ICD-10 codes.

When calculating the SNFRM, planned readmissions are distinguished from unplanned readmissions. Only unplanned readmissions are counted in the numerator of the measure. Whether a readmission is planned or unplanned is determined by the algorithm shown in Figure A-1. Table A-1 lists the procedures that automatically qualify a readmission as planned. Similarly, Table A-2 lists diagnoses that automatically qualify a readmission as planned. If a readmission contains a procedure listed in Table A-3, it is a *potentially* planned readmission and will be considered planned only if it does *not*contain a diagnosis listed in Table A-4. In other words, if a readmission contains a procedure listed in Table A-3 but also contains a diagnosis from Table A-4, the readmission is considered unplanned. Please see the algorithm in Figure A-1 below for further detail on how planned readmissions are defined.

For both the procedures in Table A-3 and the diagnoses in Table A-4, we list “Panel A” and “Panel B.” In Panel A of Table A-3, *all* ICD-10 codes for each listed AHRQ CCS group are considered potentially planned procedures that may be disqualified if coupled with an acute diagnosis listed in Table A-4. In Panel B, *some, but not all,* ICD-10 codes for each listed AHRQ CCS group are considered potentially planned procedures that may be disqualified if coupled with an acute diagnosis listed in Table A-4. ICD-10 codes for each AHRQ CCS group are in the supplementary Excel file: Tab 3a for Panel A and Tab 3b for Panel B.

In Panel A of Table A-4, *all* ICD-10 codes for each listed AHRQ CCS group are considered disqualifying diagnoses if coupled with a procedure listed in Table A-3. In Panel B, *some, but not all,* ICD-10 codes for each listed AHRQ CCS group are considered disqualifying diagnoses if coupled with a procedure listed in Table A-3. ICD-10 codes for each AHRQ CCS group are in the supplementary Excel file: Tab 4a for Panel A and Tab 4b for Panel B.

Figure A-1
Planned Readmission Algorithm[[10]](#footnote-11)

Readmission

**No**

**No**

**PLANNED**

Does this readmission include a procedure that is always planned regardless of diagnosis (listed in ***Table A-1***)?

**No**

**UNPLANNED**

Does this readmission include an acute diagnosis that disqualifies a readmission from being considered planned (listed in ***Table A-4***)?

**PLANNED**

**PLANNED**

**Yes**

**UNPLANNED**

**Yes**

**Yes**

**Yes**

**No**

Does this readmission include a diagnosis that is always planned regardless of procedure (listed in ***Table A-2***)?

Does this readmission include a potentially planned procedure(listed in ***Table A-3***)?

Table A-1
Procedure categories that are always planned

|  |  |  |
| --- | --- | --- |
| AHRQ CCS | CCS description | # of ICD codes in this CCS |
| 64 | Bone marrow transplant | 88 |
| 105 | Kidney transplant | 6 |
| 134 | Cesarean section | 3 |
| 135 | Forceps; vacuum; and breech delivery | 4 |
| 176 | Organ transplantation (other than bone marrow corneal or kidney) | 76 |

NOTE: ICD-10 codes under each AHRQ CCS are included in the supplementary Excel file, Tab 1.

Table A-2
Diagnosis categories that are always planned

|  |  |  |
| --- | --- | --- |
| AHRQ CCS | CCS description | # of ICD codes in this CCS |
| 45 | Maintenance chemotherapy; radiotherapy | 3 |
| 194 | Forceps delivery | 1 |
| 196 | Other pregnancy and delivery including normal | 119 |
| 254 | Rehabilitation care; fitting of prostheses; and adjustment of devices | 37 |

NOTE: ICD-10 codes under each AHRQ CCS are included in the supplementary Excel file, Tab 2.

Table A-3
Potentially planned procedure that may be disqualified

|  |
| --- |
| Panel A: AHRQ CCS procedure categories in entirety |
| AHRQ CCS | CCS description | # of ICD codes in this CCS |
| 3 | Excision destruction or resection of intervertebral disc | 42 |
| 5 | Insertion of catheter or spinal stimulator and injection into spinal canal | 42 |
| 9 | Other OR therapeutic nervous system procedures | 1,980 |
| 10 | Thyroidectomy; partial or complete | 24 |
| 12 | Therapeutic endocrine procedures | 621 |
| 33 | Other OR procedures on mouth and throat | 924 |
| 36 | Lobectomy or pneumonectomy | 74 |
| 37 | Diagnostic bronchoscopy and biopsy of bronchus | 173 |
| 38 | Other diagnostic procedures on lung and bronchus | 48 |
| 40 | Other diagnostic procedures on the respiratory system and mediastinum | 120 |
| 43 | Heart valve procedures | 307 |
| 44 | Coronary artery bypass graft (CABG) | 296 |
| 45 | Percutaneous transluminal coronary angioplasty (PTCA) with or without stent placement | 176 |
| 47 | Diagnostic cardiac catheterization; coronary arteriography | 88 |
| 48 | Insertion; revision; replacement; removal of cardiac pacemaker or cardioverter/defibrillator | 118 |
| 49 | Other OR heart procedures | 963 |
| 51 | Endarterectomy; vessel of head and neck | 84 |
| 52 | Aortic resection; replacement or anastomosis | 15 |
| 53 | Varicose vein stripping; lower limb | 27 |
| 55 | Peripheral vascular bypass | 2,322 |
| 56 | Other vascular bypass and shunt; not heart | 800 |
| 59 | Other OR procedures on vessels of head and neck | 2,082 |
| 62 | Other diagnostic cardiovascular procedures | 832 |
| 66 | Procedures on spleen | 51 |
| 67 | Other procedures; hemic and lymphatic systems | 1,478 |
| 71 | Gastrostomy; temporary and permanent | 16 |
| 74 | Gastrectomy; partial and total | 27 |
| 78 | Colorectal resection | 40 |
| 79 | Excision (partial) of large intestine (not endoscopic) | 13 |
| 82 | Fluoroscopy of the biliary and pancreatic ducts (ERCP ERC and ERP) | 9 |
| 84 | Cholecystectomy and common duct exploration | 5 |
| 85 | Inguinal and femoral hernia repair | 54 |
| 86 | Other hernia repair | 24 |
| 87 | Laparoscopy (GI only) | 9 |
| 89 | Exploratory laparotomy | 7 |

(continued)

Table A-3 (continued)
Potentially planned procedure that may be disqualified

|  |
| --- |
| Panel A: AHRQ CCS procedure categories in entirety |
| AHRQ CCS | CCS description | # of ICD codes in this CCS |
| 99 | Other OR gastrointestinal therapeutic procedures | 1,527 |
| 104 | Nephrectomy; partial or complete | 34 |
| 106 | Genitourinary incontinence procedures | 12 |
| 107 | Extracorporeal lithotripsy; urinary | 43 |
| 109 | Procedures on the urethra | 227 |
| 112 | Other OR therapeutic procedures of urinary tract | 1,214 |
| 113 | Transurethral resection of prostate (TURP) | 6 |
| 114 | Open prostatectomy | 8 |
| 119 | Oophorectomy; unilateral and bilateral | 15 |
| 120 | Other operations on ovary | 142 |
| 124 | Hysterectomy; abdominal and vaginal | 10 |
| 129 | Repair of cystocele and rectocele; obliteration of vaginal vault | 4 |
| 132 | Other OR therapeutic procedures; female organs | 589 |
| 142 | Partial excision bone | 260 |
| 152 | Arthroplasty knee | 68 |
| 153 | Hip replacement; total and partial | 120 |
| 154 | Arthroplasty other than hip or knee | 574 |
| 157 | Amputation of lower extremity | 81 |
| 158 | Spinal fusion | 577 |
| 159 | Other diagnostic procedures on musculoskeletal system | 1,809 |
| 160 | Other therapeutic procedures on muscles and tendons | 2,510 |
| 164 | Other OR therapeutic procedures on musculoskeletal system | 2,145 |
| 166 | Lumpectomy; quadrantectomy of breast | 16 |
| 167 | Mastectomy | 3 |
| 171 | Repair of skin subcutaneous tissue and fascia | 67 |
| 172 | Skin graft | 191 |
| 175 | Other OR therapeutic procedures on skin subcutaneous tissue fascia and breast | 1,069 |

(continued)

Table A-3 (continued)
Potentially planned procedure that may be disqualified

|  |
| --- |
| Panel B: Partial AHRQ CCS procedure categories |
| AHRQ CCS | CCS description | # of ICD codes in this CCS considered potentially planned procedures | Total # of ICD codes in this CCS |
| 2 | Insertion; replacement; or removal of extracranial ventricular shunt | 6 | 133 |
| 8 | Other non-OR or closed therapeutic nervous system procedures | 5 | 290 |
| 21 | Other extraocular muscle and orbit therapeutic procedures | 8 | 298 |
| 26 | Other therapeutic procedures on the ear nose and sinus | 26 | 1,584 |
| 32 | Other non-OR procedures on mouth and throat | 48 | 392 |
| 34 | Tracheostomy; temporary and permanent | 6 | 6 |
| 35 | Tracheoscopy and laryngoscopy with biopsy | 3 | 86 |
| 41 | Other non-OR therapeutic procedures on respiratory system and mediastinum | 53 | 658 |
| 42 | Other OR Rx procedures on respiratory system and mediastinum | 84 | 1,621 |
| 60 | Embolectomy and endarterectomy of lower limbs | 102 | 102 |
| 61 | Other OR procedures on vessels other than head and neck | 3,759 | 9,067 |
| 63 | Other non-OR therapeutic cardiovascular procedures | 4 | 905 |
| 73 | Ileostomy and other enterostomy | 7 | 25 |
| 93 | Other non-OR upper GI therapeutic procedures | 14 | 287 |
| 94 | Other OR upper GI therapeutic procedures | 31 | 1,104 |
| 95 | Other non-OR lower GI therapeutic procedures | 62 | 322 |
| 96 | Other OR lower GI therapeutic procedures | 54 | 1,714 |
| 97 | Other gastrointestinal diagnostic procedures | 26 | 324 |
| 98 | Other non-OR gastrointestinal therapeutic procedures | 56 | 646 |
| 103 | Nephrotomy and nephrostomy | 4 | 16 |
| 111 | Other non-OR therapeutic procedures of urinary tract | 2 | 260 |
| 117 | Other non-OR therapeutic procedures; male genital | 19 | 629 |
| 146 | Fracture treatment including reposition with or without fixation; hip or femur fracture or dislocation | 18 | 330 |
| 147 | Fracture treatment including reposition with or without fixation; lower extremity fracture or dislocation (other than hip or femur) | 36 | 560 |
| 148 | Fracture treatment including reposition with or without fixation of other fracture or dislocation | 9 | 995 |
| 161 | Other OR therapeutic procedures on bone | 181 | 4,321 |

(continued)

Table A-3 (continued)
Potentially planned procedure that may be disqualified

|  |
| --- |
| Panel B: Partial AHRQ CCS procedure categories |
| AHRQ CCS | CCS description | # of ICD codes in this CCS considered potentially planned procedures | Total # of ICD codes in this CCS |
| 162 | Other OR therapeutic procedures on joints | 175 | 3,660 |
| 163 | Other non-OR therapeutic procedures on musculoskeletal system | 278 | 2,635 |
| 174 | Other non-OR therapeutic procedures on skin subcutaneous tissue fascia and breast | 209 | 983 |
| 211 | Radiation therapy | 5 | 2,369 |
| 218 | Psychological and psychiatric evaluation and therapy | 5 | 31 |
| 224 | Cancer chemotherapy | 10 | 166 |
| 226 | Other diagnostic radiology and related techniques | 5 | 769 |

Table A-4
Acute diagnoses that disqualify potentially planned procedures

|  |
| --- |
| Panel A: AHRQ CCS diagnosis categories in entirety |
| AHRQ CCS | CCS description | # of ICD codes in this CCS |
| 1 | Tuberculosis | 58 |
| 2 | Septicemia (except in labor) | 43 |
| 3 | Bacterial infection; unspecified site | 142 |
| 4 | Mycoses | 87 |
| 5 | HIV infection | 4 |
| 7 | Viral infection | 149 |
| 8 | Other infections; including parasitic | 210 |
| 9 | Sexually transmitted infections (not HIV or hepatitis) | 131 |
| 54 | Gout and other crystal arthropathies | 460 |
| 55 | Fluid and electrolyte disorders | 13 |
| 60 | Acute posthemorrhagic anemia | 1 |
| 61 | Sickle cell anemia | 17 |
| 63 | Diseases of white blood cells | 27 |
| 76 | Meningitis (except that caused by tuberculosis or sexually transmitted disease) | 41 |

(continued)

Table A-4 (continued)
Acute diagnoses that disqualify potentially planned procedures

|  |
| --- |
| Panel A: AHRQ CCS diagnosis categories in entirety |
| AHRQ CCS | CCS description | # of ICD codes in this CCS |
| 77 | Encephalitis (except that caused by tuberculosis or sexually transmitted disease) | 52 |
| 78 | Other CNS infection and poliomyelitis | 28 |
| 82 | Paralysis | 56 |
| 83 | Epilepsy; convulsions | 51 |
| 84 | Headache; including migraine | 80 |
| 85 | Coma; stupor; and brain damage | 104 |
| 87 | Retinal detachments; defects; vascular occlusion; and retinopathy | 291 |
| 89 | Blindness and vision defects | 176 |
| 90 | Inflammation; infection of eye (except that caused by tuberculosis or sexually transmitted disease) | 486 |
| 91 | Other eye disorders | 1,255 |
| 92 | Otitis media and related conditions | 278 |
| 93 | Conditions associated with dizziness or vertigo | 57 |
| 99 | Hypertension with complications and secondary hypertension | 18 |
| 102 | Nonspecific chest pain | 4 |
| 104 | Other and ill-defined heart disease | 20 |
| 107 | Cardiac arrest and ventricular fibrillation | 5 |
| 109 | Acute cerebrovascular disease | 188 |
| 112 | Transient cerebral ischemia | 7 |
| 116 | Aortic and peripheral arterial embolism or thrombosis | 21 |
| 118 | Phlebitis; thrombophlebitis and thromboembolism | 163 |
| 120 | Hemorrhoids | 8 |
| 122 | Pneumonia (except that caused by tuberculosis or sexually transmitted disease) | 54 |
| 123 | Influenza | 18 |
| 124 | Acute and chronic tonsillitis | 13 |
| 125 | Acute bronchitis | 14 |
| 126 | Other upper respiratory infections | 42 |
| 127 | Chronic obstructive pulmonary disease and bronchiectasis | 16 |
| 128 | Asthma | 18 |
| 129 | Aspiration pneumonitis; food/vomitus | 1 |
| 130 | Pleurisy; pneumothorax; pulmonary collapse | 23 |
| 131 | Respiratory failure; insufficiency; arrest (adult) | 18 |
| 135 | Intestinal infection | 72 |

(continued)

Table A-4 (continued)
Acute diagnoses that disqualify potentially planned procedures

|  |
| --- |
| Panel A: AHRQ CCS diagnosis categories in entirety |
| AHRQ CCS | CCS description | # of ICD codes in this CCS |
| 137 | Diseases of mouth; excluding dental | 43 |
| 139 | Gastroduodenal ulcer (except hemorrhage) | 21 |
| 140 | Gastritis and duodenitis | 16 |
| 142 | Appendicitis and other appendiceal conditions | 12 |
| 145 | Intestinal obstruction without hernia | 19 |
| 146 | Diverticulosis and diverticulitis | 24 |
| 148 | Peritonitis and intestinal abscess | 11 |
| 153 | Gastrointestinal hemorrhage | 22 |
| 154 | Noninfectious gastroenteritis | 9 |
| 157 | Acute and unspecified renal failure | 6 |
| 159 | Urinary tract infections | 35 |
| 165 | Inflammatory conditions of male genital organs | 23 |
| 168 | Inflammatory diseases of female pelvic organs | 38 |
| 172 | Ovarian cyst | 16 |
| 197 | Skin and subcutaneous tissue infections | 156 |
| 198 | Other inflammatory condition of skin | 124 |
| 225 | Joint disorders and dislocations; trauma-related | 1,985 |
| 226 | Fracture of neck of femur (hip) | 1,130 |
| 227 | Spinal cord injury | 313 |
| 228 | Skull and face fractures | 450 |
| 229 | Fracture of upper limb | 6,651 |
| 230 | Fracture of lower limb | 6,888 |
| 232 | Sprains and strains | 1,364 |
| 233 | Intracranial injury | 571 |
| 234 | Crushing injury or internal injury | 2,736 |
| 235 | Open wounds of head; neck; and trunk | 1,302 |
| 237 | Complication of device; implant or graft | 1,558 |
| 238 | Complications of surgical procedures or medical care | 749 |
| 239 | Superficial injury; contusion | 2,211 |
| 240 | Burns | 2,584 |
| 241 | Poisoning by psychotropic agents | 157 |
| 242 | Poisoning by other medications and drugs | 1,312 |
| 243 | Poisoning by nonmedicinal substances | 1,206 |
| 244 | Other injuries and conditions due to external causes | 3,126 |

(continued)

Table A-4 (continued)
Acute diagnoses that disqualify potentially planned procedures

|  |
| --- |
| Panel A: AHRQ CCS diagnosis categories in entirety |
| AHRQ CCS | CCS description | # of ICD codes in this CCS |
| 245 | Syncope | 1 |
| 246 | Fever of unknown origin | 2 |
| 247 | Lymphadenitis | 13 |
| 249 | Shock | 5 |
| 250 | Nausea and vomiting | 6 |
| 251 | Abdominal pain | 28 |
| 252 | Malaise and fatigue | 6 |
| 253 | Allergic reactions | 138 |
| 259 | Residual codes; unclassified | 354 |
| 650 | Adjustment disorders | 9 |
| 651 | Anxiety disorders | 51 |
| 652 | Attention-deficit conduct and disruptive behavior disorders | 21 |
| 653 | Delirium dementia and amnestic and other cognitive disorders | 24 |
| 656 | Impulse control disorders NEC | 8 |
| 658 | Personality disorders | 12 |
| 660 | Alcohol-related disorders | 68 |
| 661 | Substance-related disorders | 499 |
| 662 | Suicide and intentional self-inflicted injury | 1,071 |
| 663 | Screening and history of mental health and substance abuse codes | 19 |
| 670 | Miscellaneous mental health disorders | 88 |

(continued)

Table A-4 (continued)
Acute diagnoses that disqualify potentially planned procedures

|  |
| --- |
| Panel B: Partial AHRQ CCS Diagnosis Categories |
| AHRQ CCS | CCS description | # of ICD codes in this CCS considered disqualifying diagnoses | Total # of ICD codes in this CCS |
| 96 | Heart valve disorders | 1 | 51 |
| 97 | Peri-; endo-; and myocarditis; cardiomyopathy (except that caused by tuberculosis or sexually transmitted disease) | 37 | 57 |
| 105 | Conduction disorders | 20 | 27 |
| 106 | Cardiac dysrhythmias | 7 | 22 |
| 108 | Congestive heart failure; nonhypertensive | 24 | 24 |
| 149 | Biliary tract disease | 23 | 61 |
| 152 | Pancreatic disorders (not diabetes) | 21 | 33 |

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Appendix B:
Risk-Adjustment Model Results

List of Tables in Appendix B

[B-1 Risk-adjustment model results, FY 2016 33](#_Toc2847015)

[B-2 Risk-adjustment model results, CY 2017 49](#_Toc2847016)

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Table B-1
Risk-adjustment model results, FY 2016

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Covariate |  FY 2016 count with variable  | FY 2016 % with variable | FY 2016 count with readmission  | FY 2016% with readmission  | FY 2016 odds ratio | FY 2016LCL | FY 2016 UCL |
| Readmission | 306,149  | 18.8 | — | — | — | — | — |
| Age-Sex Groups (Reference group: Females 65-69) |
| Male age 0\_34 | 1,009 | 0.1 | 231 | 22.9 | 1.025 | 0.878 | 1.197 |
| Male age 35\_44 | 3,750 | 0.2 | 879 | 23.4 | 1.025 | 0.945 | 1.112 |
| Male age 45\_54 | 15,365 | 0.9 | 3,555 | 23.1 | 0.979 | 0.937 | 1.022 |
| Male age 55\_59 | 19,374 | 1.2 | 4,440 | 22.9 | 0.955 | 0.918 | 0.994 |
| Male age 60\_64 | 28,083 | 1.7 | 6,477 | 23.1 | 0.955 | 0.923 | 0.988 |
| Male age 65\_69 | 73,571 | 4.5 | 18,296 | 24.9 | 0.987 | 0.964 | 1.011 |
| Male age 70\_74 | 81,933 | 5.0 | 17,143 | 20.9 | 1.027 | 1.002 | 1.053 |
| Male age 75\_79 | 96,185 | 5.9 | 20,346 | 21.2 | 1.063 | 1.038 | 1.089 |
| Male age 80\_84 | 107,760 | 6.6 | 22,224 | 20.6 | 1.064 | 1.039 | 1.090 |
| Male age 85\_89 | 106,991 | 6.6 | 21,773 | 20.4 | 1.068 | 1.042 | 1.095 |
| Male age 90\_94 | 66,175 | 4.1 | 12,778 | 19.3 | 1.036 | 1.008 | 1.066 |
| Male age GT 95 | 20,586 | 1.3 | 3,745 | 18.2 | 1.006 | 0.965 | 1.048 |
| Female age 0\_34 | 832 | 0.1 | 230 | 27.6 | 1.271 | 1.081 | 1.493 |
| Female age 35\_44 | 3,316 | 0.2 | 762 | 23.0 | 0.992 | 0.909 | 1.082 |
| Female age 45\_54 | 14,040 | 0.9 | 3,270 | 23.3 | 1.039 | 0.993 | 1.086 |
| Female age 55\_59 | 18,532 | 1.1 | 4,033 | 21.8 | 0.982 | 0.943 | 1.022 |
| Female age 60\_64 | 29,763 | 1.8 | 6,611 | 22.2 | 1.005 | 0.972 | 1.039 |
| Female age 70\_74 |  116,202  | 7.1 |  20,472  | 17.6 | 0.979 | 0.956 | 1.002 |
| Female age 75\_79 |  145,492  | 8.9 |  25,230  | 17.3 | 0.975 | 0.953 | 0.998 |
| Female age 80\_84 |  176,963  | 10.9 |  29,738  | 16.8 | 0.961 | 0.940 | 0.983 |

(continued)

**Table B-1 (continued)
Risk-adjustment model results, FY 2016**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Covariate |  FY 2016 count with variable  | FY 2016 % with variable | FY 2016 count with readmission  | FY 2016% with readmission  | FY 2016 odds ratio | FY 2016LCL | FY 2016 UCL |
| Female age 85\_89 |  199,166  | 12.2 |  32,176  | 16.2 | 0.936 | 0.915 | 0.957 |
| Female age 90\_94 |  148,266  | 9.1 |  22,161  | 14.9 | 0.883 | 0.861 | 0.904 |
| Female age GT 95 |  61,122  | 3.8 |  8,666  | 14.2 | 0.868 | 0.842 | 0.894 |
| Prior Length of Stay (Reference group: LOS 1-3 Days) |
| LOS btwn 4 & 7 days (based on proximal IPPS) |  727,147  | 44.7 |  131,236  | 18.0 | 1.137 | 1.124 | 1.149 |
| LOS btwn 8 & 14 days (based on proximal IPPS) |  330,838  | 20.3 |  80,637  | 24.4 | 1.368 | 1.350 | 1.386 |
| LOS GT 14 days (based on proximal IPPS) |  118,696  | 7.3 |  33,756  | 28.4 | 1.525 | 1.498 | 1.552 |
| Originally disabled (Reference group: not originally disabled) |
| Originally disabled: based on origreas from denominator |  370,844  | 22.8 |  81,169  | 21.9 | 1.042 | 1.030 | 1.055 |
| End Stage Renal Disease Indicator (ESRD) (Reference group: no end stage renal disease) |
| End Stage Renal Disease Indicator (ESRD recoded) |  62,719  | 3.9 |  21,684  | 34.6 | 1.141 | 1.099 | 1.184 |
| Surgical Groups (Reference group: no surgery or only ophthalmology surgery) |
| Vascular Surgery |  16,479  | 1.0 |  4,308  | 26.1 | 1.096 | 1.053 | 1.141 |
| Orthopedics Surgery |  307,241  | 18.9 |  35,113  | 11.4 | 0.949 | 0.930 | 0.969 |
| General Surgery |  92,201  | 5.7 |  21,205  | 23.0 | 1.002 | 0.982 | 1.022 |
| Cardio Thoracic Surgery |  41,569  | 2.6 |  9,828  | 23.6 | 0.907 | 0.881 | 0.933 |
| Urologic surgery |  12,066  | 0.7 |  2,997  | 24.8 | 1.088 | 1.033 | 1.146 |
| Neurosurgery |  13,610  | 0.8 |  2,784  | 20.5 | 1.183 | 1.129 | 1.240 |
| Plastic Surgery |  35,148  | 2.2 |  7,189  | 20.5 | 0.982 | 0.954 | 1.011 |

(continued)

**Table B-1 (continued)
Risk-adjustment model results, FY 2016**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Covariate |  FY 2016 count with variable  | FY 2016 % with variable | FY 2016 count with readmission  | FY 2016% with readmission  | FY 2016 odds ratio | FY 2016LCL | FY 2016 UCL |
| Otolaryngology Surgery |  3,194  | 0.2 |  730  | 22.9 | 1.067 | 0.972 | 1.171 |
| Obstetrics/Gynecology Surgery |  5,507  | 0.3 |  1,198  | 21.8 | 1.027 | 0.953 | 1.107 |
| Prior Care Utilization - Count of Prior Stays (reference group: zero prior stays) |
| Count IPPS stays 365 days prior to discharge from proximal stay: 1-3 |  773,148  | 47.5 |  160,338  | 20.7 | 1.071 | 1.060 | 1.083 |
| Count IPPS stays 365 days prior to discharge from proximal stay: 4-6 |  120,259  | 7.4 |  38,724  | 32.2 | 1.266 | 1.243 | 1.289 |
| Count IPPS stays 365 days prior to discharge from proximal stay: 7-9 |  21,623  | 1.3 |  9,032  | 41.8 | 1.543 | 1.494 | 1.594 |
| Count IPPS stays 365 days prior to discharge from proximal stay: 10+ |  6,377  | 0.4 |  3,248  | 50.9 | 2.043 | 1.936 | 2.156 |
| At least one day in ICU (reference group: no prior days in ICU) |
| At least one day in ICU |  625,857  | 38.5 |  145,699  | 23.3 | 1.104 | 1.094 | 1.115 |
| CCS Groupings - based on principal diagnosis (Reference group: Osteoarthritis [203] + Immunizations and screening for infectious disease [1] + Menstrual disorders [171] + Administrative/social admission [255] + Medical examination/evaluation [256] + Adverse effects of medical drugs [2617] + Disorders of lipid metabolism [53] + Disorders usually diagnosed in infancy [655] + Impulse control disorders [656] + Mood disorders [657]) |

(continued)

**Table B-1 (continued)
Risk-adjustment model results, FY 2016**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Covariate |  FY 2016 count with variable  | FY 2016 % with variable | FY 2016 count with readmission  | FY 2016% with readmission  | FY 2016 odds ratio | FY 2016LCL | FY 2016 UCL |
| 2 Septicemia (except in labor) |  170,201  | 10.5 |  40,578  | 23.8 | 1.881 | 1.819 | 1.946 |
| 4 Mycoses |  1,494  | 0.1 |  406  | 27.2 | 2.340 | 2.074 | 2.640 |
| 5 HIV infection |  533  | 0.0 |  171  | 32.1 | 2.339 | 1.921 | 2.849 |
| 6 Hepatitis |  634  | 0.0 |  230  | 36.3 | 2.815 | 2.372 | 3.340 |
| Infections\_1\_3\_7\_8\_9 |  3,605  | 0.2 |  703  | 19.5 | 1.814 | 1.659 | 1.984 |
| 11 Cancer of head and neck |  668  | 0.0 |  141  | 21.1 | 1.708 | 1.389 | 2.100 |
| GIcancers\_12\_13\_14\_15 |  6,786  | 0.4 |  1,389  | 20.5 | 1.781 | 1.659 | 1.911 |
| GIother\_cancers\_16\_17\_18 |  1,356  | 0.1 |  340  | 25.1 | 2.088 | 1.833 | 2.379 |
| RespiratoryCancer\_19\_20 |  1,793  | 0.1 |  379  | 21.1 | 1.975 | 1.748 | 2.231 |
| 21 Cancer of bone and connective tissue |  373  | 0.0 |  72  | 19.3 | 2.142 | 1.645 | 2.788 |
| SkinCancer\_22\_23 |  329  | 0.0 |  46  | 14.0 | 1.394 | 1.014 | 1.917 |
| 24 Cancer of breast |  456  | 0.0 |  57  | 12.5 | 1.464 | 1.103 | 1.942 |
| FemaleGenitalCancer\_25\_26\_27\_28 |  1,285  | 0.1 |  276  | 21.5 | 2.275 | 1.948 | 2.656 |
| MaleGenitalCancer\_29\_30\_31 |  324  | 0.0 |  67  | 20.7 | 1.667 | 1.261 | 2.202 |
| 32 Cancer of bladder |  1,534  | 0.1 |  461  | 30.1 | 2.723 | 2.400 | 3.089 |
| KidneyUrinaryCancer\_33\_34 |  1,081  | 0.1 |  194  | 17.9 | 1.510 | 1.276 | 1.787 |
| 35 Cancer of brain and nervous system |  410  | 0.0 |  97  | 23.7 | 2.216 | 1.749 | 2.807 |
| ThyroidCancerDisorders\_36\_48 |  986  | 0.1 |  201  | 20.4 | 2.053 | 1.747 | 2.411 |
| HodgkinLeukemia\_37\_38\_39\_40 |  821  | 0.1 |  263  | 32.0 | 2.977 | 2.554 | 3.471 |
| 42 Secondary malignancies |  2,060  | 0.1 |  558  | 27.1 | 2.316 | 2.085 | 2.573 |
| otherCancerNeoplasms\_41\_43\_44 |  579  | 0.0 |  134  | 23.1 | 2.130 | 1.745 | 2.601 |

(continued)

**Table B-1 (continued)
Risk-adjustment model results, FY 2016**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Covariate |  FY 2016 count with variable  | FY 2016 % with variable | FY 2016 count with readmission  | FY 2016% with readmission  | FY 2016 odds ratio | FY 2016LCL | FY 2016 UCL |
| 45 Maintenance chemotherapy; radiotherapy |  49  | 0.0 |  11  | 22.4 | 1.433 | 0.727 | 2.824 |
| BenignNeoplasms\_46\_47 |  2,614  | 0.2 |  507  | 19.4 | 1.950 | 1.757 | 2.164 |
| Diabetes\_49\_50 |  23,336  | 1.4 |  4,948  | 21.2 | 1.695 | 1.620 | 1.774 |
| 51 Other endocrine disorders |  5,040  | 0.3 |  964  | 19.1 | 1.918 | 1.774 | 2.073 |
| 52 Nutritional deficiencies |  1,223  | 0.1 |  265  | 21.7 | 2.123 | 1.841 | 2.447 |
| 54 Gout and other crystal arthropathies |  1,780  | 0.1 |  280  | 15.7 | 1.648 | 1.444 | 1.882 |
| 55 Fluid and electrolyte disorders |  25,476  | 1.6 |  4,826  | 18.9 | 1.913 | 1.829 | 2.000 |
| CysticFibrosisCOPD\_56\_127 |  30,596  | 1.9 |  7,210  | 23.6 | 2.206 | 2.117 | 2.299 |
| ImmunityWhtBloodDisorders\_57\_63 |  1,130  | 0.1 |  301  | 26.6 | 2.243 | 1.953 | 2.576 |
| 58 Other nutritional; endocrine; and metabolic disorders |  4,767  | 0.3 |  974  | 20.4 | 1.955 | 1.808 | 2.113 |
| 59 Deficiency and other anemia |  8,067  | 0.5 |  2,094  | 26.0 | 2.373 | 2.235 | 2.519 |
| 60 Acute posthemorrhagic anemia |  3,863  | 0.2 |  910  | 23.6 | 2.056 | 1.893 | 2.232 |
| BloodDisorders\_61\_62\_64 |  1,460  | 0.1 |  365  | 25.0 | 2.084 | 1.838 | 2.361 |
| 653 Delirium |  25,995  | 1.6 |  2,779  | 10.7 | 1.151 | 1.094 | 1.211 |
| BehvrDevelDis650\_651\_652\_654\_662 |  1,025  | 0.1 |  143  | 14.0 | 1.250 | 1.043 | 1.499 |
| MentalIllness\_658\_659 |  8,119  | 0.5 |  817  | 10.1 | 0.973 | 0.898 | 1.054 |
| SubstanceAbuse\_660\_661\_663 |  5,900  | 0.4 |  1,167  | 19.8 | 1.662 | 1.544 | 1.788 |
| 670 Miscellaneous disorders |  342  | 0.0 |  39  | 11.4 | 1.133 | 0.809 | 1.586 |
| 76 Meningitis (except that caused by tuberculosis or sexually transmitted disease) |  517  | 0.0 |  108  | 20.9 | 1.922 | 1.546 | 2.390 |
| 77 Encephalitis (except that caused by tuberculosis or sexually transmitted disease) |  652  | 0.0 |  153  | 23.5 | 2.116 | 1.756 | 2.548 |
| 78 Other CNS infection and poliomyelitis |  611  | 0.0 |  147  | 24.1 | 2.063 | 1.702 | 2.501 |

(continued)

**Table B-1 (continued)
Risk-adjustment model results, FY 2016**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Covariate |  FY 2016 count with variable  | FY 2016 % with variable | FY 2016 count with readmission  | FY 2016% with readmission  | FY 2016 odds ratio | FY 2016LCL | FY 2016 UCL |
| 79 Parkinson`s disease |  3,221  | 0.2 |  356  | 11.1 | 1.341 | 1.196 | 1.504 |
| 80 Multiple sclerosis |  798  | 0.0 |  102  | 12.8 | 1.638 | 1.326 | 2.023 |
| 81 Other hereditary and degenerative nervous system conditions |  1,858  | 0.1 |  260  | 14.0 | 1.485 | 1.296 | 1.701 |
| 82 Paralysis |  557  | 0.0 |  86  | 15.4 | 1.659 | 1.313 | 2.097 |
| 83 Epilepsy; convulsions |  10,468  | 0.6 |  1,815  | 17.3 | 1.659 | 1.562 | 1.762 |
| 84 Headache; including migraine |  412  | 0.0 |  66  | 16.0 | 1.687 | 1.290 | 2.206 |
| 85 Coma; stupor; and brain damage |  175  | 0.0 |  34  | 19.4 | 1.604 | 1.094 | 2.351 |
| 93 Conditions associated with dizziness or vertigo |  2,155  | 0.1 |  190  | 8.8 | 1.094 | 0.939 | 1.274 |
| EyeEarSensoryDsord\_86\_to\_92\_94 |  1,033  | 0.1 |  181  | 17.5 | 1.845 | 1.562 | 2.179 |
| 95 Other nervous system disorders |  24,533  | 1.5 |  4,521  | 18.4 | 1.805 | 1.725 | 1.888 |
| 96 Heart valve disorders |  10,775  | 0.7 |  2,246  | 20.8 | 1.832 | 1.722 | 1.949 |
| 97 Peri- endo- & myocarditis cardiomyopathy (except caused by tuberculosis or sexually transmitted disease) |  2,085  | 0.1 |  592  | 28.4 | 2.284 | 2.061 | 2.532 |
| 98 Essential hypertension |  1,962  | 0.1 |  225  | 11.5 | 1.400 | 1.214 | 1.615 |
| 99 Hypertension with complications and secondary hypertension |  16,075  | 1.0 |  4,362  | 27.1 | 1.959 | 1.868 | 2.055 |
| 100 Acute myocardial infarction |  27,177  | 1.7 |  6,350  | 23.4 | 2.095 | 2.007 | 2.187 |
| 101 Coronary atherosclerosis and other heart disease |  10,954  | 0.7 |  2,168  | 19.8 | 1.784 | 1.681 | 1.893 |
| 102 Nonspecific chest pain |  3,845  | 0.2 |  702  | 18.3 | 1.621 | 1.482 | 1.772 |
| 103 Pulmonary heart disease |  9,884  | 0.6 |  1,950  | 19.7 | 1.827 | 1.722 | 1.939 |
| 104 Other and ill-defined heart disease |  417  | 0.0 |  80  | 19.2 | 1.697 | 1.324 | 2.177 |

(continued)

**Table B-1 (continued)
Risk-adjustment model results, FY 2016**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Covariate |  FY 2016 count with variable  | FY 2016 % with variable | FY 2016 count with readmission  | FY 2016% with readmission  | FY 2016 odds ratio | FY 2016LCL | FY 2016 UCL |
| 105 Conduction disorders |  4,233  | 0.3 |  660  | 15.6 | 1.541 | 1.409 | 1.686 |
| 106 Cardiac dysrhythmias |  31,871  | 2.0 |  6,774  | 21.3 | 2.064 | 1.980 | 2.152 |
| 107 Cardiac arrest and ventricular fibrillation |  574  | 0.0 |  132  | 23.0 | 1.402 | 1.148 | 1.712 |
| 108 Congestive heart failure; nonhypertensive |  77,873  | 4.8 |  19,873  | 25.5 | 2.112 | 2.038 | 2.189 |
| 109 Acute cerebrovascular disease |  52,377  | 3.2 |  9,339  | 17.8 | 1.989 | 1.914 | 2.068 |
| 110 Occlusion or stenosis of precerebral arteries |  1,518  | 0.1 |  248  | 16.3 | 1.518 | 1.315 | 1.752 |
| 111 Other and ill-defined cerebrovascular disease |  771  | 0.0 |  130  | 16.9 | 1.558 | 1.282 | 1.893 |
| 112 Transient cerebral ischemia |  6,298  | 0.4 |  830  | 13.2 | 1.503 | 1.387 | 1.628 |
| 113 Late effects of cerebrovascular disease |  2,499  | 0.2 |  393  | 15.7 | 1.561 | 1.394 | 1.748 |
| 114 Peripheral and visceral atherosclerosis |  8,409  | 0.5 |  2,059  | 24.5 | 2.130 | 2.004 | 2.265 |
| 115 Aortic; peripheral; and visceral artery aneurysms |  3,417  | 0.2 |  741  | 21.7 | 1.870 | 1.711 | 2.045 |
| 116 Aortic and peripheral arterial embolism or thrombosis |  1,960  | 0.1 |  513  | 26.2 | 2.309 | 2.068 | 2.578 |
| 117 Other circulatory disease |  8,208  | 0.5 |  1,542  | 18.8 | 1.737 | 1.629 | 1.852 |
| 118 Phlebitis; thrombophlebitis and thromboembolism |  7,949  | 0.5 |  1,500  | 18.9 | 1.855 | 1.738 | 1.979 |
| VeinLymphDisease\_119\_120\_121\_247 |  2,657  | 0.2 |  550  | 20.7 | 1.937 | 1.751 | 2.142 |
| 122 Pneumonia (except that caused by tuberculosis or sexually transmitted disease) |  62,902  | 3.9 |  13,040  | 20.7 | 1.916 | 1.846 | 1.988 |
| 123 Influenza |  2,361  | 0.1 |  383  | 16.2 | 1.522 | 1.356 | 1.707 |
| 125 Acute bronchitis |  2,537  | 0.2 |  331  | 13.0 | 1.431 | 1.269 | 1.614 |
| UpperRespInfect\_Tons\_124\_126 |  704  | 0.0 |  106  | 15.1 | 1.577 | 1.276 | 1.949 |
| 128 Asthma |  1,060  | 0.1 |  177  | 16.7 | 1.788 | 1.514 | 2.110 |

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**Table B-1 (continued)
Risk-adjustment model results, FY 2016**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Covariate |  FY 2016 count with variable  | FY 2016 % with variable | FY 2016 count with readmission  | FY 2016% with readmission  | FY 2016 odds ratio | FY 2016LCL | FY 2016 UCL |
| 129 Aspiration pneumonitis; food/vomitus |  22,433  | 1.4 |  5,013  | 22.3 | 1.935 | 1.849 | 2.024 |
| 130 Pleurisy; pneumothorax; pulmonary collapse |  5,248  | 0.3 |  1,329  | 25.3 | 1.993 | 1.856 | 2.140 |
| 131 Respiratory failure; insufficiency; arrest (adult) |  30,274  | 1.9 |  8,662  | 28.6 | 2.270 | 2.179 | 2.365 |
| LungExtAgentOthLowRespDis132\_133 |  3,807  | 0.2 |  868  | 22.8 | 2.061 | 1.896 | 2.241 |
| 134 Other upper respiratory disease |  988  | 0.1 |  224  | 22.7 | 1.903 | 1.628 | 2.224 |
| 135 Intestinal infection |  12,557  | 0.8 |  3,007  | 23.9 | 2.154 | 2.044 | 2.270 |
| Mouth\_DisordersDiseases\_136\_137 |  918  | 0.1 |  174  | 19.0 | 1.798 | 1.516 | 2.133 |
| 138 Esophageal disorders |  4,541  | 0.3 |  983  | 21.6 | 1.912 | 1.768 | 2.069 |
| 139 Gastroduodenal ulcer (except hemorrhage) |  1,585  | 0.1 |  327  | 20.6 | 1.896 | 1.669 | 2.155 |
| 140 Gastritis and duodenitis |  2,671  | 0.2 |  588  | 22.0 | 1.924 | 1.744 | 2.124 |
| 141 Other disorders of stomach and duodenum |  2,408  | 0.1 |  662  | 27.5 | 2.197 | 1.994 | 2.421 |
| 142 Appendicitis and other appendiceal conditions |  936  | 0.1 |  161  | 17.2 | 1.785 | 1.498 | 2.126 |
| 143 Abdominal hernia |  7,299  | 0.4 |  1,310  | 17.9 | 1.730 | 1.613 | 1.856 |
| 144 Regional enteritis and ulcerative colitis |  1,187  | 0.1 |  348  | 29.3 | 2.832 | 2.481 | 3.233 |
| 145 Intestinal obstruction without hernia |  14,540  | 0.9 |  2,992  | 20.6 | 1.854 | 1.760 | 1.954 |
| 146 Diverticulosis and diverticulitis |  10,185  | 0.6 |  2,165  | 21.3 | 2.072 | 1.956 | 2.196 |
| 147 Anal and rectal conditions |  1,884  | 0.1 |  368  | 19.5 | 1.816 | 1.609 | 2.048 |
| 148 Peritonitis and intestinal abscess |  783  | 0.0 |  233  | 29.8 | 2.127 | 1.811 | 2.498 |
| 149 Biliary tract disease |  9,576  | 0.6 |  1,780  | 18.6 | 1.802 | 1.694 | 1.917 |
| 151 Other liver diseases |  5,594  | 0.3 |  1,982  | 35.4 | 2.596 | 2.426 | 2.778 |
| 152 Pancreatic disorders (not diabetes) |  3,860  | 0.2 |  840  | 21.8 | 1.986 | 1.825 | 2.161 |
| 153 Gastrointestinal hemorrhage |  23,803  | 1.5 |  5,537  | 23.3 | 1.970 | 1.885 | 2.059 |

(continued)

**Table B-1 (continued)
Risk-adjustment model results, FY 2016**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Covariate |  FY 2016 count with variable  | FY 2016 % with variable | FY 2016 count with readmission  | FY 2016% with readmission  | FY 2016 odds ratio | FY 2016LCL | FY 2016 UCL |
| 154 Noninfectious gastroenteritis |  3,328  | 0.2 |  624  | 18.8 | 1.899 | 1.729 | 2.086 |
| 155 Other gastrointestinal disorders |  8,878  | 0.5 |  2,070  | 23.3 | 2.068 | 1.948 | 2.194 |
| 156 Nephritis; nephrosis; renal sclerosis |  251  | 0.0 |  68  | 27.1 | 2.158 | 1.623 | 2.868 |
| 157 Acute and unspecified renal failure |  55,764  | 3.4 |  12,351  | 22.1 | 2.039 | 1.964 | 2.116 |
| 158 Chronic renal failure |  612  | 0.0 |  177  | 28.9 | 1.869 | 1.558 | 2.242 |
| 159 Urinary tract infections |  64,715  | 4.0 |  10,443  | 16.1 | 1.755 | 1.690 | 1.822 |
| 160 Calculus of urinary tract |  810  | 0.0 |  149  | 18.4 | 1.655 | 1.374 | 1.993 |
| 161 Other diseases of kidney and ureters |  2,042  | 0.1 |  437  | 21.4 | 1.979 | 1.768 | 2.216 |
| 162 Other diseases of bladder and urethra |  1,068  | 0.1 |  234  | 21.9 | 1.932 | 1.660 | 2.249 |
| 163 Genitourinary symptoms and ill-defined conditions |  1,935  | 0.1 |  418  | 21.6 | 1.992 | 1.776 | 2.234 |
| 164 Hyperplasia of prostate |  1,252  | 0.1 |  226  | 18.1 | 1.640 | 1.410 | 1.908 |
| 165 Inflammatory conditions of male genital organs |  688  | 0.0 |  124  | 18.0 | 1.491 | 1.220 | 1.822 |
| 166 Other male genital disorders |  198  | 0.0 |  53  | 26.8 | 2.342 | 1.694 | 3.239 |
| Female\_167\_to\_170\_172\_173\_175 |  1,179  | 0.1 |  220  | 18.7 | 1.830 | 1.569 | 2.135 |
| 197 Skin and subcutaneous tissue infections |  26,583  | 1.6 |  4,401  | 16.6 | 1.671 | 1.597 | 1.748 |
| 199 Chronic ulcer of skin |  5,727  | 0.4 |  1,058  | 18.5 | 1.679 | 1.557 | 1.811 |
| SkinDisorders\_198\_200 |  764  | 0.0 |  184  | 24.1 | 2.435 | 2.049 | 2.894 |
| 201 Infective arthritis and osteomyelitis (except that caused by tuberculosis or sexually transmitted disease) |  8,176  | 0.5 |  1,520  | 18.6 | 1.650 | 1.548 | 1.759 |
| 202 Rheumatoid arthritis and related disease |  821  | 0.1 |  100  | 12.2 | 1.513 | 1.223 | 1.873 |
| 204 Other non-traumatic joint disorders |  3,732  | 0.2 |  456  | 12.2 | 1.526 | 1.377 | 1.692 |

(continued)

**Table B-1 (continued)
Risk-adjustment model results, FY 2016**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Covariate |  FY 2016 count with variable  | FY 2016 % with variable | FY 2016 count with readmission  | FY 2016% with readmission  | FY 2016 odds ratio | FY 2016LCL | FY 2016 UCL |
| SpondyDiscDisordersOsteo\_205\_206 |  26,405  | 1.6 |  3,231  | 12.2 | 1.566 | 1.496 | 1.641 |
| 207 Pathological fracture |  14,098  | 0.9 |  2,017  | 14.3 | 1.714 | 1.623 | 1.811 |
| FootOtherDeformities\_208\_209 |  5,101  | 0.3 |  533  | 10.4 | 1.535 | 1.397 | 1.685 |
| 210 Systemic lupus erythematosus and connective tissue disorders |  497  | 0.0 |  130  | 26.2 | 2.310 | 1.878 | 2.842 |
| 211 Other connective tissue disease |  10,748  | 0.7 |  1,370  | 12.7 | 1.477 | 1.385 | 1.576 |
| 212 Other bone disease and musculoskeletal deformities |  2,047  | 0.1 |  244  | 11.9 | 1.522 | 1.326 | 1.746 |
| CongenitalAnomomalies\_213\_to\_217 |  840  | 0.1 |  197  | 23.5 | 2.096 | 1.775 | 2.475 |
| 225 Joint disorders and dislocations; trauma-related |  1,334  | 0.1 |  187  | 14.0 | 1.946 | 1.662 | 2.279 |
| 226 Fracture of neck of femur (hip) |  104,269  | 6.4 |  13,855  | 13.3 | 1.729 | 1.674 | 1.785 |
| 227 Spinal cord injury |  361  | 0.0 |  79  | 21.9 | 2.278 | 1.763 | 2.943 |
| 228 Skull and face fractures |  1,846  | 0.1 |  238  | 12.9 | 1.533 | 1.332 | 1.764 |
| 229 Fracture of upper limb |  16,689  | 1.0 |  2,005  | 12.0 | 1.578 | 1.495 | 1.665 |
| 230 Fracture of lower limb |  29,647  | 1.8 |  3,978  | 13.4 | 1.730 | 1.658 | 1.805 |
| 231 Other fractures |  44,253  | 2.7 |  5,477  | 12.4 | 1.550 | 1.488 | 1.615 |
| 232 Sprains and strains |  2,101  | 0.1 |  239  | 11.4 | 1.487 | 1.294 | 1.709 |
| 233 Intracranial injury |  16,191  | 1.0 |  3,159  | 19.5 | 2.148 | 2.041 | 2.260 |
| 234 Crushing injury or internal injury |  2,966  | 0.2 |  538  | 18.1 | 1.890 | 1.710 | 2.088 |
| 235 Open wounds of head; neck; and trunk |  1,206  | 0.1 |  167  | 13.8 | 1.561 | 1.319 | 1.846 |
| 236 Open wounds of extremities |  1,231  | 0.1 |  195  | 15.8 | 1.765 | 1.506 | 2.068 |
| 237 Complication of device; implant or graft |  54,752  | 3.4 |  11,678  | 21.3 | 1.986 | 1.918 | 2.057 |

(continued)

**Table B-1 (continued)
Risk-adjustment model results, FY 2016**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Covariate |  FY 2016 count with variable  | FY 2016 % with variable | FY 2016 count with readmission  | FY 2016% with readmission  | FY 2016 odds ratio | FY 2016LCL | FY 2016 UCL |
| 238 Complications of surgical procedures or medical care |  23,688  | 1.5 |  5,960  | 25.2 | 2.044 | 1.957 | 2.135 |
| SuperficialInjuryBurns\_239\_240 |  5,683  | 0.3 |  865  | 15.2 | 1.652 | 1.526 | 1.789 |
| Poisoning\_241\_242\_243 |  4,569  | 0.3 |  813  | 17.8 | 1.531 | 1.409 | 1.664 |
| 244 Other injuries and conditions due to external causes |  5,950  | 0.4 |  859  | 14.4 | 1.545 | 1.427 | 1.673 |
| 245 Syncope |  7,204  | 0.4 |  928  | 12.9 | 1.427 | 1.322 | 1.539 |
| 246 Fever of unknown origin |  1,060  | 0.1 |  223  | 21.0 | 2.003 | 1.717 | 2.336 |
| 248 Gangrene |  4,790  | 0.3 |  1,233  | 25.7 | 1.986 | 1.842 | 2.142 |
| 249 Shock |  1,171  | 0.1 |  326  | 27.8 | 1.834 | 1.604 | 2.097 |
| 250 Nausea and vomiting |  944  | 0.1 |  206  | 21.8 | 2.111 | 1.797 | 2.479 |
| 251 Abdominal pain |  1,276  | 0.1 |  250  | 19.6 | 1.848 | 1.599 | 2.136 |
| 252 Malaise and fatigue |  5,247  | 0.3 |  752  | 14.3 | 1.602 | 1.473 | 1.743 |
| 253 Allergic reactions |  439  | 0.0 |  85  | 19.4 | 1.847 | 1.449 | 2.356 |
| 257 Other aftercare |  1,154  | 0.1 |  175  | 15.2 | 1.572 | 1.333 | 1.854 |
| ScreeningResidUnclassifd\_258\_259 |  6,238  | 0.4 |  1,072  | 17.2 | 1.773 | 1.647 | 1.908 |
| Comorbidities - Hierarchical Condition Categories (HCCs) (Reference group: NONE of the listed comorbidities.) |
| HCC1 HIV/AIDS |  4,745  | 0.3 |  1,308  | 27.6 | 1.077 | 1.004 | 1.155 |
| HCC6 Opportunistic Infections |  14,864  | 0.9 |  4,823  | 32.4 | 1.121 | 1.081 | 1.162 |
| HCC8 Metastatic Cancer and Acute Leukemia |  45,416  | 2.8 |  12,552  | 27.6 | 1.362 | 1.331 | 1.393 |
| HCC9 Lung and Other Severe Cancers |  28,674  | 1.8 |  7,903  | 27.6 | 1.237 | 1.204 | 1.272 |
| HCC10 Lymphoma and Other Cancers |  24,300  | 1.5 |  5,995  | 24.7 | 1.204 | 1.167 | 1.241 |

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**Table B-1 (continued)
Risk-adjustment model results, FY 2016**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Covariate |  FY 2016 count with variable  | FY 2016 % with variable | FY 2016 count with readmission  | FY 2016% with readmission  | FY 2016 odds ratio | FY 2016LCL | FY 2016 UCL |
| HCC11 Colorectal, Bladder, and Other Cancers |  19,477  | 1.2 |  4,984  | 25.6 | 1.097 | 1.060 | 1.135 |
| HCC12 Breast, Prostate, and Other Cancers and Tumors |  31,482  | 1.9 |  6,665  | 21.2 | 1.033 | 1.004 | 1.062 |
| HCC\_DigestUrinaryNeoplasm\_14\_15 |  44,293  | 2.7 |  10,865  | 24.5 | 1.015 | 0.991 | 1.038 |
| HCC\_DiabetesChronicComp\_17\_18 |  335,630  | 20.6 |  84,658  | 25.2 | 1.099 | 1.086 | 1.111 |
| HCC19 Diabetes without Complication |  293,432  | 18.0 |  55,434  | 18.9 | 1.043 | 1.032 | 1.055 |
| HCC20 Type I Diabetes Mellitus |  17,635  | 1.1 |  5,419  | 30.7 | 1.140 | 1.101 | 1.180 |
| HCC21 Protein-Calorie Malnutrition |  252,106  | 15.5 |  65,955  | 26.2 | 1.096 | 1.084 | 1.109 |
| HCC23 Other Significant Endocrine and Metabolic Disorders |  108,774  | 6.7 |  31,073  | 28.6 | 1.069 | 1.052 | 1.085 |
| HCC24 Disorders of Fluid/Electrolyte/Acid-Base Balance |  947,386  | 58.3 |  212,769  | 22.5 | 1.077 | 1.066 | 1.088 |
| HCC27 End-Stage Liver Disease |  24,300  | 1.5 |  8,496  | 35.0 | 1.407 | 1.365 | 1.451 |
| HCC28 Cirrhosis of Liver |  21,625  | 1.3 |  5,869  | 27.1 | 1.152 | 1.116 | 1.189 |
| HCC29 Chronic Hepatitis |  8,578  | 0.5 |  2,312  | 27.0 | 1.078 | 1.025 | 1.134 |
| HCC31 Other Hepatitis and Liver Disease |  35,813  | 2.2 |  8,586  | 24.0 | 1.009 | 0.984 | 1.035 |
| HCC33 Intestinal Obstruction/Perforation |  87,397  | 5.4 |  23,318  | 26.7 | 1.043 | 1.026 | 1.061 |
| HCC34 Chronic Pancreatitis |  8,147  | 0.5 |  2,369  | 29.1 | 1.042 | 0.991 | 1.096 |
| HCC35 Inflammatory Bowel Disease |  16,355  | 1.0 |  4,150  | 25.4 | 1.102 | 1.062 | 1.144 |
| HCC36 Peptic Ulcer, Hemorrhage, Other Specified Gastrointestinal Disorders |  238,351  | 14.7 |  64,529  | 27.1 | 1.067 | 1.055 | 1.080 |
| HCC40 Rheumatoid Arthritis and Inflammatory Connective Tissue Disease |  102,018  | 6.3 |  21,812  | 21.4 | 1.086 | 1.069 | 1.104 |
| HCC46 Severe Hematological Disorders |  16,253  | 1.0 |  4,956  | 30.5 | 1.369 | 1.321 | 1.419 |

(continued)

**Table B-1 (continued)
Risk-adjustment model results, FY 2016**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Covariate |  FY 2016 count with variable  | FY 2016 % with variable | FY 2016 count with readmission  | FY 2016% with readmission  | FY 2016 odds ratio | FY 2016LCL | FY 2016 UCL |
| HCC47 Disorders of Immunity |  49,989  | 3.1 |  15,287  | 30.6 | 1.128 | 1.104 | 1.153 |
| HCC48 Coagulation Defects and Other Specified Hematological Disorders |  203,291  | 12.5 |  52,050  | 25.6 | 1.108 | 1.093 | 1.123 |
| HCC49 Iron Deficiency and Other/Unspecified Anemias and Blood Disease |  699,908  | 43.0 |  145,645  | 20.8 | 1.095 | 1.084 | 1.106 |
| HCC50 Delirium and Encephalopathy |  382,441  | 23.5 |  89,804  | 23.5 | 1.030 | 1.020 | 1.041 |
| HCC60 Personality Disorders |  2,557  | 0.2 |  555  | 21.7 | 1.037 | 0.941 | 1.144 |
| HCC63 Other Psychiatric Disorders |  134,539  | 8.3 |  26,866  | 20.0 | 1.030 | 1.015 | 1.045 |
| HCC365MentalRetardation\_64\_65 |  2,404  | 0.1 |  553  | 23.0 | 1.064 | 0.964 | 1.175 |
| HCC66 Moderate Mental Retardation/Developmental Disability |  1,122  | 0.1 |  211  | 18.8 | 1.003 | 0.860 | 1.170 |
| HCC69 Attention Deficit Disorder |  2,180  | 0.1 |  414  | 19.0 | 0.917 | 0.821 | 1.025 |
| HCC70 Quadriplegia |  16,004  | 1.0 |  4,214  | 26.3 | 1.053 | 1.014 | 1.093 |
| HCC71 Paraplegia |  10,479  | 0.6 |  2,441  | 23.3 | 0.993 | 0.946 | 1.042 |
| HCC72 Spinal Cord Disorders/Injuries |  13,193  | 0.8 |  2,774  | 21.0 | 1.050 | 1.005 | 1.098 |
| HCC73 Amyotrophic Lateral Sclerosis and Other Motor Neuron Disease |  966  | 0.1 |  236  | 24.4 | 1.170 | 1.005 | 1.362 |
| HCC75 Polyneuropathy |  11,360  | 0.7 |  2,771  | 24.4 | 1.057 | 1.011 | 1.106 |
| HCC79 Seizure Disorders and Convulsions |  113,237  | 7.0 |  25,016  | 22.1 | 0.997 | 0.981 | 1.013 |
| HCC80 Coma, Brain Compression/Anoxic Damage |  24,436  | 1.5 |  6,494  | 26.6 | 1.066 | 1.033 | 1.100 |
| HCC82 Respirator Dependence/Tracheostomy Status |  12,379  | 0.8 |  4,474  | 36.1 | 1.265 | 1.215 | 1.317 |
| HCC83 Respiratory Arrest |  1,140  | 0.1 |  354  | 31.1 | 1.121 | 0.985 | 1.276 |
| HCC84 Cardio-Respiratory Failure and Shock |  368,737  | 22.7 |  100,202  | 27.2 | 1.115 | 1.103 | 1.127 |

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**Table B-1 (continued)
Risk-adjustment model results, FY 2016**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Covariate |  FY 2016 count with variable  | FY 2016 % with variable | FY 2016 count with readmission  | FY 2016% with readmission  | FY 2016 odds ratio | FY 2016LCL | FY 2016 UCL |
| HCC85 Congestive Heart Failure |  622,342  | 38.3 |  154,685  | 24.9 | 1.149 | 1.138 | 1.161 |
| HCC86 Acute Myocardial Infarction |  96,083  | 5.9 |  26,411  | 27.5 | 1.070 | 1.052 | 1.088 |
| HCC87 Unstable Angina and Other Acute Ischemic Heart Disease |  56,463  | 3.5 |  14,627  | 25.9 | 1.075 | 1.053 | 1.098 |
| HCC88 Angina Pectoris |  17,741  | 1.1 |  4,279  | 24.1 | 1.067 | 1.029 | 1.106 |
| HCC89 Coronary Atherosclerosis/Other Chronic Ischemic Heart Disease |  505,228  | 31.1 |  108,788  | 21.5 | 1.045 | 1.035 | 1.055 |
| HCC90 Heart Infection/Inflammation, Except Rheumatic |  24,028  | 1.5 |  6,910  | 28.8 | 1.007 | 0.977 | 1.037 |
| HCC91 Valvular and Rheumatic Heart Disease |  257,317  | 15.8 |  61,044  | 23.7 | 1.038 | 1.026 | 1.050 |
| HCC96 Specified Heart Arrhythmias |  611,977  | 37.6 |  140,794  | 23.0 | 1.109 | 1.099 | 1.119 |
| HCC99 Cerebral Hemorrhage |  18,425  | 1.1 |  4,473  | 24.3 | 1.030 | 0.993 | 1.068 |
| HCC100 Ischemic or Unspecified Stroke |  59,878  | 3.7 |  14,167  | 23.7 | 1.051 | 1.030 | 1.072 |
| HCC106 Atherosclerosis of the Extremities with Ulceration or Gangrene |  36,222  | 2.2 |  10,162  | 28.1 | 1.017 | 0.990 | 1.045 |
| HCC107 Vascular Disease with Complications |  54,160  | 3.3 |  14,157  | 26.1 | 1.067 | 1.045 | 1.090 |
| HCC108 Vascular Disease |  268,922  | 16.5 |  65,235  | 24.3 | 1.059 | 1.047 | 1.071 |
| HCC109 Other Circulatory Disease |  226,618  | 13.9 |  49,192  | 21.7 | 1.011 | 0.999 | 1.023 |
| HCC111 Chronic Obstructive Pulmonary Disease |  474,125  | 29.2 |  114,928  | 24.2 | 1.134 | 1.123 | 1.145 |
| HCC112 Fibrosis of Lung and Other Chronic Lung Disorders |  20,590  | 1.3 |  4,434  | 21.5 | 1.075 | 1.038 | 1.112 |
| HCC114 Aspiration and Specified Bacterial Pneumonias |  127,300  | 7.8 |  36,096  | 28.4 | 1.083 | 1.067 | 1.099 |
| HCC116 Viral and Unspecified Pneumonia, Pleurisy |  253,074  | 15.6 |  64,226  | 25.4 | 1.063 | 1.051 | 1.075 |

(continued)

**Table B-1 (continued)
Risk-adjustment model results, FY 2016**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Covariate |  FY 2016 count with variable  | FY 2016 % with variable | FY 2016 count with readmission  | FY 2016% with readmission  | FY 2016 odds ratio | FY 2016LCL | FY 2016 UCL |
| HCC117 Pleural Effusion/Pneumothorax |  115,494  | 7.1 |  32,992  | 28.6 | 1.070 | 1.055 | 1.086 |
| HCC122 Proliferative Diabetic Retinopathy and Vitreous Hemorrhage |  1,982  | 0.1 |  580  | 29.3 | 0.961 | 0.869 | 1.063 |
| HCC124 Exudative Macular Degeneration |  508  | 0.0 |  95  | 18.7 | 0.954 | 0.759 | 1.198 |
| HCC132 Kidney Transplant Status |  9,112  | 0.6 |  3,209  | 35.2 | 1.586 | 1.509 | 1.666 |
| HCC134 Dialysis Status |  63,130  | 3.9 |  21,791  | 34.5 | 1.409 | 1.358 | 1.462 |
| HCC135 Acute Renal Failure |  524,036  | 32.2 |  128,317  | 24.5 | 1.221 | 1.208 | 1.233 |
| HCC136 Chronic Kidney Disease, Stage 5 |  5,244  | 0.3 |  1,350  | 25.7 | 1.368 | 1.281 | 1.461 |
| HCC137 Chronic Kidney Disease, Severe (Stage 4) |  18,055  | 1.1 |  3,807  | 21.1 | 1.349 | 1.300 | 1.400 |
| HCC138 Chronic Kidney Disease, Moderate (Stage 3) |  89,414  | 5.5 |  15,595  | 17.4 | 1.117 | 1.096 | 1.138 |
| HCC139 Chronic Kidney Disease, Mild or Unspecified (Stages 1-2 or Unspecified) |  62,377  | 3.8 |  11,150  | 17.9 | 1.112 | 1.088 | 1.137 |
| HCC140 Unspecified Renal Failure |  1,254  | 0.1 |  240  | 19.1 | 1.178 | 1.021 | 1.359 |
| HCC141 Nephritis |  3,204  | 0.2 |  622  | 19.4 | 1.062 | 0.971 | 1.161 |
| HCC142 Urinary Obstruction and Retention |  243,356  | 15.0 |  56,266  | 23.1 | 1.058 | 1.045 | 1.070 |
| HCC144 Urinary Tract Infection |  530,540  | 32.6 |  116,515  | 22.0 | 0.999 | 0.989 | 1.008 |
| HCC145 Other Urinary Tract Disorders |  161,490  | 9.9 |  39,122  | 24.2 | 1.018 | 1.005 | 1.032 |
| HCC148 Other Female Genital Disorders |  13,723  | 0.8 |  3,384  | 24.7 | 1.048 | 1.006 | 1.092 |
| HCC157 Pressure Ulcer of Skin with Necrosis Through to Muscle, Tendon, or Bone |  15,235  | 0.9 |  4,477  | 29.4 | 1.144 | 1.101 | 1.188 |
| HCC158 Pressure Ulcer of Skin with Full Thickness Skin Loss |  37,084  | 2.3 |  10,560  | 28.5 | 1.124 | 1.097 | 1.152 |

(continued)

**Table B-1 (continued)
Risk-adjustment model results, FY 2016**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Covariate |  FY 2016count with variable  | FY 2016% with variable | FY 2016count with readmission  | FY 2016% with readmission  | FY 2016odds ratio | FY 2016LCL | FY 2016UCL |
| HCC159 Pressure Ulcer of Skin with Partial Thickness Skin Loss |  48,564  | 3.0 |  12,981  | 26.7 | 1.102 | 1.078 | 1.126 |
| HCC160 Pressure Pre-Ulcer Skin Changes or Unspecified Stage |  37,131  | 2.3 |  9,162  | 24.7 | 1.036 | 1.010 | 1.062 |
| HCC169 Vertebral Fractures without Spinal Cord Injury |  60,427  | 3.7 |  11,788  | 19.5 | 0.994 | 0.973 | 1.016 |
| HCC173 Traumatic Amputations and Complications |  8,647  | 0.5 |  1,658  | 19.2 | 0.921 | 0.872 | 0.973 |
| HCC177 Other Complications of Medical Care |  132,390  | 8.1 |  35,745  | 27.0 | 1.037 | 1.023 | 1.052 |
| HCC178 Major Symptoms, Abnormalities |  929,652  | 57.2 |  196,662  | 21.2 | 1.002 | 0.993 | 1.012 |
| HCC186 Major Organ Transplant or Replacement Status |  4,798  | 0.3 |  1,584  | 33.0 | 1.096 | 1.029 | 1.169 |
| HCC187 Other Organ Transplant Status/Replacement |  19,342  | 1.2 |  4,985  | 25.8 | 1.078 | 1.043 | 1.116 |
| HCC188 Artificial Openings for Feeding or Elimination |  57,985  | 3.6 |  17,452  | 30.1 | 1.211 | 1.187 | 1.236 |
| HCC189 Amputation Status, Lower Limb/Amputation Complications |  30,934  | 1.9 |  8,031  | 26.0 | 0.992 | 0.965 | 1.020 |
| HCC190 Amputation Status, Upper Limb |  2,812  | 0.2 |  685  | 24.4 | 1.002 | 0.916 | 1.095 |
| Two or more HCCs |  1,520,118  | 93.5 |  299,368  | 19.7 | 1.270 | 1.236 | 1.305 |

NOTE:LCL = lower confidence limit; UCL = upper confidence limit

SOURCE: RTI International analysis of FY 2016 MedPAR data (RTI programming reference: CK 26 and idxSNF02\_lk2016\_003\_FORMATTED.xls)

Table B-2
Risk-adjustment model results, CY 2017

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Covariate |  CY 2017 count with variable  | CY 2017 % with variable | CY 2017 count with readmission  | CY 2017% with readmission  | CY 2017 odds ratio | CY 2017LCL | CY 2017 UCL |
| Readmission | 321,757  | 19.4 | — | — | — | — | — |
| Age-Sex Groups (Reference group: Females 65-69) |
| Male age 0\_34 |  1,025  | 0.1 |  235  | 22.9 | 1.039 | 0.890 | 1.214 |
| Male age 35\_44 |  4,061  | 0.2 |  927  | 22.8 | 0.988 | 0.913 | 1.070 |
| Male age 45\_54 |  16,016  | 1.0 |  3,849  | 24.0 | 0.984 | 0.943 | 1.026 |
| Male age 55\_59 |  20,947  | 1.3 |  4,922  | 23.5 | 0.964 | 0.928 | 1.001 |
| Male age 60\_64 |  31,435  | 1.9 |  7,449  | 23.7 | 0.983 | 0.952 | 1.016 |
| Male age 65\_69 |  84,964  | 5.1 |  21,079  | 24.8 | 0.971 | 0.949 | 0.993 |
| Male age 70\_74 |  84,966  | 5.1 |  18,237  | 21.5 | 1.036 | 1.011 | 1.061 |
| Male age 75\_79 |  99,338  | 6.0 |  21,420  | 21.6 | 1.069 | 1.044 | 1.094 |
| Male age 80\_84 |  108,136  | 6.5 |  22,885  | 21.2 | 1.074 | 1.049 | 1.100 |
| Male age 85\_89 |  106,123  | 6.4 |  22,021  | 20.8 | 1.084 | 1.059 | 1.111 |
| Male age 90\_94 |  68,035  | 4.1 |  13,490  | 19.8 | 1.064 | 1.035 | 1.093 |
| Male age GT 95 |  22,359  | 1.3 |  4,183  | 18.7 | 1.037 | 0.997 | 1.078 |
| Female age 0\_34 |  858  | 0.1 |  216  | 25.2 | 1.076 | 0.912 | 1.269 |
| Female age 35\_44 |  3,564  | 0.2 |  896  | 25.1 | 1.061 | 0.977 | 1.152 |
| Female age 45\_54 |  14,285  | 0.9 |  3,341  | 23.4 | 1.026 | 0.981 | 1.072 |
| Female age 55\_59 |  19,486  | 1.2 |  4,348  | 22.3 | 0.983 | 0.945 | 1.023 |
| Female age 60\_64 |  31,945  | 1.9 |  7,287  | 22.8 | 1.005 | 0.974 | 1.038 |
| Female age 70\_74 |  119,241  | 7.2 |  21,993  | 18.4 | 0.997 | 0.974 | 1.019 |
| Female age 75\_79 |  146,882  | 8.8 |  26,396  | 18.0 | 0.989 | 0.967 | 1.011 |
| Female age 80\_84 |  173,199  | 10.4 |  29,838  | 17.2 | 0.973 | 0.952 | 0.995 |

(continued)

**Table B-2 (continued)
Risk-adjustment model results, CY 2017**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Covariate |  CY 2017 count with variable  | CY 2017 % with variable | CY 2017 count with readmission  | CY 2017% with readmission  | CY 2017 odds ratio | CY 2017LCL | CY 2017 UCL |
| Female age 85\_89 |  191,436  | 11.5 |  31,377  | 16.4 | 0.941 | 0.920 | 0.962 |
| Female age 90\_94 |  147,783  | 8.9 |  23,111  | 15.6 | 0.927 | 0.905 | 0.949 |
| Female age GT 95 |  64,205  | 3.9 |  9,121  | 14.2 | 0.863 | 0.838 | 0.889 |
| Prior Length of Stay (Reference group: LOS 1-3 Days) |
| LOS btwn 4 & 7 days (based on proximal IPPS) |  745,639  | 44.9 |  138,427  | 18.6 | 1.130 | 1.117 | 1.142 |
| LOS btwn 8 & 14 days (based on proximal IPPS) |  336,926  | 20.3 |  83,382  | 24.7 | 1.342 | 1.325 | 1.359 |
| LOS GT 14 days (based on proximal IPPS) |  121,071  | 7.3 |  35,536  | 29.4 | 1.535 | 1.508 | 1.562 |
| Originally disabled (Reference group: not originally disabled) |
| Originally disabled: based on origreas from denominator |  391,459  | 23.6 |  87,072  | 22.2 | 1.032 | 1.020 | 1.044 |
| End Stage Renal Disease Indicator (ESRD) (Reference group: no end stage renal disease) |
| End Stage Renal Disease Indicator (ESRD recoded) |  78,954  | 4.8 |  27,753  | 35.2 | 1.346 | 1.303 | 1.390 |
| Surgical Groups (Reference group: no surgery or only ophthalmology surgery) |
| Vascular Surgery |  17,704  | 1.1 |  4,639  | 26.2 | 1.083 | 1.041 | 1.125 |
| Orthopedics Surgery |  300,043  | 18.1 |  35,766  | 11.9 | 0.943 | 0.924 | 0.962 |
| General Surgery |  83,925  | 5.1 |  19,517  | 23.3 | 1.001 | 0.980 | 1.023 |
| Cardio Thoracic Surgery |  31,015  | 1.9 |  6,987  | 22.5 | 0.859 | 0.829 | 0.891 |
| Urologic surgery |  13,359  | 0.8 |  3,321  | 24.9 | 1.036 | 0.988 | 1.087 |
| Neurosurgery |  13,872  | 0.8 |  2,887  | 20.8 | 1.149 | 1.096 | 1.203 |
| Plastic Surgery |  40,345  | 2.4 |  8,529  | 21.1 | 0.986 | 0.960 | 1.013 |

(continued)

**Table B-2 (continued)
Risk-adjustment model results, CY 2017**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Covariate |  CY 2017 count with variable  | CY 2017 % with variable | CY 2017 count with readmission  | CY 2017% with readmission  | CY 2017 odds ratio | CY 2017LCL | CY 2017 UCL |
| Otolaryngology Surgery |  2,900  | 0.2 |  632  | 21.8 | 0.967 | 0.873 | 1.072 |
| Obstetrics/Gynecology Surgery |  3,217  | 0.2 |  651  | 20.2 | 0.932 | 0.834 | 1.042 |
| Prior Care Utilization - Count of Prior Stays (reference group: zero prior stays) |
| Count IPPS stays 365 days prior to discharge from proximal stay: 1-3 |  793,526  | 47.8 |  168,790  | 21.3 | 1.083 | 1.071 | 1.095 |
| Count IPPS stays 365 days prior to discharge from proximal stay: 4-6 |  127,085  | 7.7 |  41,516  | 32.7 | 1.278 | 1.255 | 1.302 |
| Count IPPS stays 365 days prior to discharge from proximal stay: 7-9 |  23,277  | 1.4 |  9,873  | 42.4 | 1.581 | 1.532 | 1.632 |
| Count IPPS stays 365 days prior to discharge from proximal stay: 10+ |  7,209  | 0.4 |  3,741  | 51.9 | 2.098 | 1.993 | 2.209 |
| At least one day in ICU (reference group: no prior days in ICU) |
| At least one day in ICU |  654,073  | 39.4 |  154,846  | 23.7 | 1.097 | 1.087 | 1.107 |
| CCS Groupings - based on principal diagnosis (Reference group: Osteoarthritis [203] + Immunizations and screening for infectious disease [1] + Menstrual disorders [171] + Administrative/social admission [255] + Medical examination/evaluation [256] + Adverse effects of medical drugs [2,617] + Disorders of lipid metabolism [53] + Disorders usually diagnosed in infancy [655] + Impulse control disorders [656] + Mood disorders [657]) |

(continued)

**Table B-2 (continued)
Risk-adjustment model results, CY 2017**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Covariate |  CY 2017 count with variable  | CY 2017 % with variable | CY 2017 count with readmission  | CY 2017% with readmission  | CY 2017 odds ratio | CY 2017LCL | CY 2017 UCL |
| 2 Septicemia (except in labor) |  189,689  | 11.4 |  45,551  | 24.0 | 1.855 | 1.792 | 1.920 |
| 4 Mycoses |  1,326  | 0.1 |  355  | 26.8 | 2.252 | 1.978 | 2.564 |
| 5 HIV infection |  497  | 0.0 |  140  | 28.2 | 1.986 | 1.605 | 2.458 |
| 6 Hepatitis |  408  | 0.0 |  129  | 31.6 | 2.373 | 1.905 | 2.955 |
| Infections\_1\_3\_7\_8\_9 |  3,677  | 0.2 |  708  | 19.3 | 1.754 | 1.603 | 1.920 |
| 11 Cancer of head and neck |  668  | 0.0 |  151  | 22.6 | 1.850 | 1.501 | 2.281 |
| GIcancers\_12\_13\_14\_15 |  6,235  | 0.4 |  1,371  | 22.0 | 1.872 | 1.740 | 2.013 |
| GIother\_cancers\_16\_17\_18 |  1,287  | 0.1 |  369  | 28.7 | 2.432 | 2.136 | 2.770 |
| RespiratoryCancer\_19\_20 |  1,645  | 0.1 |  351  | 21.3 | 2.029 | 1.783 | 2.309 |
| 21 Cancer of bone and connective tissue |  328  | 0.0 |  69  | 21.0 | 2.229 | 1.693 | 2.935 |
| SkinCancer\_22\_23 |  313  | 0.0 |  52  | 16.6 | 1.704 | 1.253 | 2.318 |
| 24 Cancer of breast |  391  | 0.0 |  50  | 12.8 | 1.561 | 1.151 | 2.118 |
| FemaleGenitalCancer\_25\_26\_27\_28 |  1,259  | 0.1 |  256  | 20.3 | 2.102 | 1.763 | 2.506 |
| MaleGenitalCancer\_29\_30\_31 |  308  | 0.0 |  64  | 20.8 | 1.694 | 1.270 | 2.259 |
| 32 Cancer of bladder |  1,435  | 0.1 |  432  | 30.1 | 2.711 | 2.381 | 3.087 |
| KidneyUrinaryCancer\_33\_34 |  1,019  | 0.1 |  192  | 18.8 | 1.637 | 1.380 | 1.941 |
| 35 Cancer of brain and nervous system |  409  | 0.0 |  97  | 23.7 | 2.243 | 1.767 | 2.847 |
| ThyroidCancerDisorders\_36\_48 |  1,017  | 0.1 |  219  | 21.5 | 2.125 | 1.816 | 2.486 |
| HodgkinLeukemia\_37\_38\_39\_40 |  712  | 0.0 |  237  | 33.3 | 3.082 | 2.616 | 3.631 |
| 42 Secondary malignancies |  2,158  | 0.1 |  631  | 29.2 | 2.423 | 2.187 | 2.684 |
| otherCancerNeoplasms\_41\_43\_44 |  516  | 0.0 |  118  | 22.9 | 2.164 | 1.747 | 2.682 |

(continued)

**Table B-2 (continued)
Risk-adjustment model results, CY 2017**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Covariate |  CY 2017 count with variable  | CY 2017 % with variable | CY 2017 count with readmission  | CY 2017% with readmission  | CY 2017 odds ratio | CY 2017LCL | CY 2017 UCL |
| 45 Maintenance chemotherapy; radiotherapy |  30  | 0.0 |  \*  | 26.7 | 1.613 | 0.701 | 3.712 |
| BenignNeoplasms\_46\_47 |  2,467  | 0.1 |  496  | 20.1 | 1.959 | 1.760 | 2.181 |
| Diabetes\_49\_50 |  32,927  | 2.0 |  7,250  | 22.0 | 1.693 | 1.623 | 1.767 |
| 51 Other endocrine disorders |  5,207  | 0.3 |  1,058  | 20.3 | 2.002 | 1.855 | 2.161 |
| 52 Nutritional deficiencies |  1,358  | 0.1 |  284  | 20.9 | 1.914 | 1.666 | 2.199 |
| 54 Gout and other crystal arthropathies |  1,727  | 0.1 |  302  | 17.5 | 1.823 | 1.600 | 2.077 |
| 55 Fluid and electrolyte disorders |  26,157  | 1.6 |  5,164  | 19.7 | 1.907 | 1.823 | 1.994 |
| CysticFibrosisCOPD\_56\_127 |  43,576  | 2.6 |  10,422  | 23.9 | 2.117 | 2.034 | 2.202 |
| ImmunityWhtBloodDisorders\_57\_63 |  1,092  | 0.1 |  276  | 25.3 | 1.944 | 1.682 | 2.246 |
| 58 Other nutritional; endocrine; and metabolic disorders |  5,055  | 0.3 |  1,025  | 20.3 | 1.899 | 1.757 | 2.051 |
| 59 Deficiency and other anemia |  7,851  | 0.5 |  2,006  | 25.6 | 2.217 | 2.085 | 2.358 |
| 60 Acute posthemorrhagic anemia |  3,708  | 0.2 |  910  | 24.5 | 2.057 | 1.892 | 2.236 |
| BloodDisorders\_61\_62\_64 |  3,027  | 0.2 |  779  | 25.7 | 2.058 | 1.881 | 2.252 |
| 653 Delirium |  24,350  | 1.5 |  2,661  | 10.9 | 1.136 | 1.079 | 1.197 |
| BehvrDevelDis650\_651\_652\_654\_662 |  1,031  | 0.1 |  137  | 13.3 | 1.206 | 1.001 | 1.453 |
| MentalIllness\_658\_659 |  8,225  | 0.5 |  942  | 11.5 | 1.088 | 1.007 | 1.176 |
| SubstanceAbuse\_660\_661\_663 |  7,028  | 0.4 |  1,402  | 19.9 | 1.657 | 1.546 | 1.776 |
| 670 Miscellaneous disorders |  355  | 0.0 |  46  | 13.0 | 1.276 | 0.928 | 1.755 |
| 76 Meningitis (except that caused by tuberculosis or sexually transmitted disease) |  475  | 0.0 |  94  | 19.8 | 1.815 | 1.436 | 2.294 |
| 77 Encephalitis (except that caused by tuberculosis or sexually transmitted disease) |  659  | 0.0 |  154  | 23.4 | 2.108 | 1.747 | 2.545 |
| 78 Other CNS infection and poliomyelitis |  643  | 0.0 |  171  | 26.6 | 2.300 | 1.913 | 2.765 |

(continued)

**Table B-2 (continued)
Risk-adjustment model results, CY 2017**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Covariate |  CY 2017 count with variable  | CY 2017 % with variable | CY 2017 count with readmission  | CY 2017% with readmission  | CY 2017 odds ratio | CY 2017LCL | CY 2017 UCL |
| 79 Parkinson`s disease |  3,517  | 0.2 |  398  | 11.3 | 1.327 | 1.188 | 1.481 |
| 80 Multiple sclerosis |  797  | 0.0 |  99  | 12.4 | 1.534 | 1.236 | 1.905 |
| 81 Other hereditary and degenerative nervous system conditions |  1,937  | 0.1 |  269  | 13.9 | 1.398 | 1.221 | 1.601 |
| 82 Paralysis |  492  | 0.0 |  86  | 17.5 | 1.884 | 1.481 | 2.395 |
| 83 Epilepsy; convulsions |  11,050  | 0.7 |  1,946  | 17.6 | 1.641 | 1.546 | 1.743 |
| 84 Headache; including migraine |  466  | 0.0 |  74  | 15.9 | 1.613 | 1.248 | 2.085 |
| 85 Coma; stupor; and brain damage |  168  | 0.0 |  38  | 22.6 | 1.963 | 1.349 | 2.857 |
| 93 Conditions associated with dizziness or vertigo |  2,060  | 0.1 |  192  | 9.3 | 1.135 | 0.974 | 1.324 |
| EyeEarSensoryDsord\_86\_to\_92\_94 |  1,105  | 0.1 |  172  | 15.6 | 1.569 | 1.323 | 1.861 |
| 95 Other nervous system disorders |  25,888  | 1.6 |  4,869  | 18.8 | 1.773 | 1.695 | 1.855 |
| 96 Heart valve disorders |  9,404  | 0.6 |  2,025  | 21.5 | 1.918 | 1.793 | 2.050 |
| 97 Peri- endo- & myocarditis cardiomyopathy (except caused by tuberculosis or sexually transmitted disease) |  2,065  | 0.1 |  546  | 26.4 | 2.048 | 1.841 | 2.278 |
| 98 Essential hypertension |  420  | 0.0 |  61  | 14.5 | 1.858 | 1.407 | 2.453 |
| 99 Hypertension with complications and secondary hypertension |  88,673  | 5.3 |  23,583  | 26.6 | 2.008 | 1.937 | 2.082 |
| 100 Acute myocardial infarction |  27,249  | 1.6 |  6,475  | 23.8 | 2.082 | 1.993 | 2.176 |
| 101 Coronary atherosclerosis and other heart disease |  10,475  | 0.6 |  2,131  | 20.3 | 1.870 | 1.757 | 1.991 |
| 102 Nonspecific chest pain |  3,359  | 0.2 |  633  | 18.8 | 1.613 | 1.467 | 1.773 |
| 103 Pulmonary heart disease |  9,938  | 0.6 |  1,941  | 19.5 | 1.752 | 1.650 | 1.861 |
| 104 Other and ill-defined heart disease |  396  | 0.0 |  82  | 20.7 | 1.920 | 1.494 | 2.467 |

(continued)

**Table B-2 (continued)
Risk-adjustment model results, CY 2017**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Covariate |  CY 2017 count with variable  | CY 2017 % with variable | CY 2017 count with readmission  | CY 2017% with readmission  | CY 2017 odds ratio | CY 2017LCL | CY 2017 UCL |
| 105 Conduction disorders |  4,337  | 0.3 |  651  | 15.0 | 1.408 | 1.286 | 1.542 |
| 106 Cardiac dysrhythmias |  30,609  | 1.8 |  6,547  | 21.4 | 2.010 | 1.926 | 2.098 |
| 107 Cardiac arrest and ventricular fibrillation |  559  | 0.0 |  129  | 23.1 | 1.375 | 1.121 | 1.688 |
| 108 Congestive heart failure; nonhypertensive |  16,420  | 1.0 |  3,964  | 24.1 | 2.021 | 1.924 | 2.123 |
| 109 Acute cerebrovascular disease |  52,395  | 3.2 |  9,428  | 18.0 | 1.936 | 1.861 | 2.015 |
| 110 Occlusion or stenosis of precerebral arteries |  1,549  | 0.1 |  287  | 18.5 | 1.736 | 1.513 | 1.991 |
| 111 Other and ill-defined cerebrovascular disease |  684  | 0.0 |  118  | 17.3 | 1.527 | 1.242 | 1.878 |
| 112 Transient cerebral ischemia |  5,816  | 0.4 |  773  | 13.3 | 1.485 | 1.366 | 1.614 |
| 113 Late effects of cerebrovascular disease |  2,403  | 0.1 |  393  | 16.4 | 1.568 | 1.397 | 1.759 |
| 114 Peripheral and visceral atherosclerosis |  7,077  | 0.4 |  1,756  | 24.8 | 2.190 | 2.050 | 2.338 |
| 115 Aortic; peripheral; and visceral artery aneurysms |  3,275  | 0.2 |  723  | 22.1 | 1.903 | 1.737 | 2.084 |
| 116 Aortic and peripheral arterial embolism or thrombosis |  1,847  | 0.1 |  462  | 25.0 | 2.250 | 2.005 | 2.526 |
| 117 Other circulatory disease |  8,576  | 0.5 |  1,618  | 18.9 | 1.673 | 1.569 | 1.784 |
| 118 Phlebitis; thrombophlebitis and thromboembolism |  7,087  | 0.4 |  1,378  | 19.4 | 1.829 | 1.708 | 1.958 |
| VeinLymphDisease\_119\_120\_121\_247 |  2,839  | 0.2 |  588  | 20.7 | 1.919 | 1.738 | 2.118 |
| 122 Pneumonia (except that caused by tuberculosis or sexually transmitted disease) |  46,975  | 2.8 |  9,297  | 19.8 | 1.849 | 1.777 | 1.924 |
| 123 Influenza |  9,894  | 0.6 |  1,380  | 13.9 | 1.395 | 1.306 | 1.491 |
| 125 Acute bronchitis |  2,803  | 0.2 |  402  | 14.3 | 1.572 | 1.406 | 1.759 |
| UpperRespInfect\_Tons\_124\_126 |  889  | 0.1 |  143  | 16.1 | 1.735 | 1.441 | 2.089 |
| 128 Asthma |  1,034  | 0.1 |  175  | 16.9 | 1.786 | 1.508 | 2.113 |

(continued)

**Table B-2 (continued)
Risk-adjustment model results, CY 2017**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Covariate |  CY 2017 count with variable  | CY 2017 % with variable | CY 2017 count with readmission  | CY 2017% with readmission  | CY 2017 odds ratio | CY 2017LCL | CY 2017 UCL |
| 129 Aspiration pneumonitis; food/vomitus |  21,916  | 1.3 |  5,028  | 22.9 | 1.959 | 1.871 | 2.052 |
| 130 Pleurisy; pneumothorax; pulmonary collapse |  5,031  | 0.3 |  1,360  | 27.0 | 2.116 | 1.969 | 2.275 |
| 131 Respiratory failure; insufficiency; arrest (adult) |  34,081  | 2.1 |  9,803  | 28.8 | 2.269 | 2.179 | 2.364 |
| LungExtAgentOthLowRespDis132\_133 |  3,710  | 0.2 |  901  | 24.3 | 2.141 | 1.969 | 2.328 |
| 134 Other upper respiratory disease |  976  | 0.1 |  238  | 24.4 | 1.953 | 1.672 | 2.282 |
| 135 Intestinal infection |  11,922  | 0.7 |  2,886  | 24.2 | 2.119 | 2.008 | 2.237 |
| Mouth\_DisordersDiseases\_136\_137 |  917  | 0.1 |  166  | 18.1 | 1.688 | 1.416 | 2.013 |
| 138 Esophageal disorders |  4,613  | 0.3 |  1,019  | 22.1 | 1.893 | 1.750 | 2.048 |
| 139 Gastroduodenal ulcer (except hemorrhage) |  1,531  | 0.1 |  345  | 22.5 | 2.168 | 1.908 | 2.462 |
| 140 Gastritis and duodenitis |  2,623  | 0.2 |  578  | 22.0 | 1.830 | 1.655 | 2.023 |
| 141 Other disorders of stomach and duodenum |  2,423  | 0.1 |  681  | 28.1 | 2.169 | 1.968 | 2.391 |
| 142 Appendicitis and other appendiceal conditions |  951  | 0.1 |  170  | 17.9 | 1.816 | 1.527 | 2.159 |
| 143 Abdominal hernia |  6,882  | 0.4 |  1,345  | 19.5 | 1.891 | 1.761 | 2.030 |
| 144 Regional enteritis and ulcerative colitis |  1,231  | 0.1 |  379  | 30.8 | 2.943 | 2.584 | 3.352 |
| 145 Intestinal obstruction without hernia |  13,994  | 0.8 |  2,999  | 21.4 | 1.903 | 1.804 | 2.007 |
| 146 Diverticulosis and diverticulitis |  9,759  | 0.6 |  2,116  | 21.7 | 2.068 | 1.949 | 2.194 |
| 147 Anal and rectal conditions |  1,909  | 0.1 |  432  | 22.6 | 2.129 | 1.896 | 2.389 |
| 148 Peritonitis and intestinal abscess |  798  | 0.0 |  260  | 32.6 | 2.427 | 2.075 | 2.839 |
| 149 Biliary tract disease |  9,154  | 0.6 |  1,759  | 19.2 | 1.804 | 1.693 | 1.922 |
| 151 Other liver diseases |  6,494  | 0.4 |  2,374  | 36.6 | 2.564 | 2.404 | 2.736 |
| 152 Pancreatic disorders (not diabetes) |  3,782  | 0.2 |  811  | 21.4 | 1.885 | 1.729 | 2.055 |
| 153 Gastrointestinal hemorrhage |  23,248  | 1.4 |  5,694  | 24.5 | 2.026 | 1.937 | 2.118 |

(continued)

**Table B-2 (continued)
Risk-adjustment model results, CY 2017**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Covariate |  CY 2017 count with variable  | CY 2017 % with variable | CY 2017 count with readmission  | CY 2017% with readmission  | CY 2017 odds ratio | CY 2017LCL | CY 2017 UCL |
| 154 Noninfectious gastroenteritis |  3,367  | 0.2 |  665  | 19.8 | 1.920 | 1.749 | 2.106 |
| 155 Other gastrointestinal disorders |  8,923  | 0.5 |  2,087  | 23.4 | 1.976 | 1.861 | 2.099 |
| 156 Nephritis; nephrosis; renal sclerosis |  270  | 0.0 |  84  | 31.1 | 2.566 | 1.965 | 3.349 |
| 157 Acute and unspecified renal failure |  56,745  | 3.4 |  12,762  | 22.5 | 2.005 | 1.930 | 2.083 |
| 158 Chronic renal failure |  294  | 0.0 |  88  | 29.9 | 1.859 | 1.432 | 2.415 |
| 159 Urinary tract infections |  64,614  | 3.9 |  10,547  | 16.3 | 1.721 | 1.656 | 1.788 |
| 160 Calculus of urinary tract |  758  | 0.0 |  157  | 20.7 | 1.861 | 1.548 | 2.237 |
| 161 Other diseases of kidney and ureters |  1,983  | 0.1 |  422  | 21.3 | 1.932 | 1.721 | 2.169 |
| 162 Other diseases of bladder and urethra |  1,023  | 0.1 |  239  | 23.4 | 2.049 | 1.758 | 2.390 |
| 163 Genitourinary symptoms and ill-defined conditions |  1,813  | 0.1 |  419  | 23.1 | 2.186 | 1.945 | 2.457 |
| 164 Hyperplasia of prostate |  1,248  | 0.1 |  252  | 20.2 | 1.879 | 1.623 | 2.175 |
| 165 Inflammatory conditions of male genital organs |  771  | 0.0 |  141  | 18.3 | 1.563 | 1.292 | 1.889 |
| 166 Other male genital disorders |  195  | 0.0 |  48  | 24.6 | 2.058 | 1.469 | 2.885 |
| Female\_167\_to\_170\_172\_173\_175 |  1,148  | 0.1 |  239  | 20.8 | 2.078 | 1.782 | 2.422 |
| 197 Skin and subcutaneous tissue infections |  25,709  | 1.5 |  4,291  | 16.7 | 1.651 | 1.576 | 1.729 |
| 199 Chronic ulcer of skin |  5,384  | 0.3 |  1,013  | 18.8 | 1.671 | 1.545 | 1.807 |
| SkinDisorders\_198\_200 |  788  | 0.0 |  187  | 23.7 | 2.368 | 1.993 | 2.813 |
| 201 Infective arthritis and osteomyelitis (except that caused by tuberculosis or sexually transmitted disease) |  6,606  | 0.4 |  1,218  | 18.4 | 1.651 | 1.539 | 1.772 |
| 202 Rheumatoid arthritis and related disease |  744  | 0.0 |  88  | 11.8 | 1.339 | 1.065 | 1.682 |
| 204 Other non-traumatic joint disorders |  3,331  | 0.2 |  423  | 12.7 | 1.517 | 1.362 | 1.691 |

(continued)

**Table B-2 (continued)
Risk-adjustment model results, CY 2017**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Covariate |  CY 2017 count with variable  | CY 2017 % with variable | CY 2017 count with readmission  | CY 2017% with readmission  | CY 2017 odds ratio | CY 2017LCL | CY 2017 UCL |
| SpondyDiscDisordersOsteo\_205\_206 |  26,555  | 1.6 |  3,477  | 13.1 | 1.652 | 1.577 | 1.731 |
| 207 Pathological fracture |  16,052  | 1.0 |  2,375  | 14.8 | 1.765 | 1.674 | 1.860 |
| FootOtherDeformities\_208\_209 |  4,860  | 0.3 |  504  | 10.4 | 1.471 | 1.335 | 1.622 |
| 210 Systemic lupus erythematosus and connective tissue disorders |  558  | 0.0 |  144  | 25.8 | 2.105 | 1.725 | 2.570 |
| 211 Other connective tissue disease |  10,791  | 0.6 |  1,425  | 13.2 | 1.474 | 1.382 | 1.573 |
| 212 Other bone disease and musculoskeletal deformities |  1,905  | 0.1 |  255  | 13.4 | 1.606 | 1.400 | 1.843 |
| CongenitalAnomomalies\_213\_to\_217 |  752  | 0.0 |  142  | 18.9 | 1.624 | 1.342 | 1.965 |
| 225 Joint disorders and dislocations; trauma-related |  1,320  | 0.1 |  184  | 13.9 | 1.836 | 1.563 | 2.157 |
| 226 Fracture of neck of femur (hip) |  104,785  | 6.3 |  13,867  | 13.2 | 1.690 | 1.635 | 1.747 |
| 227 Spinal cord injury |  450  | 0.0 |  107  | 23.8 | 2.526 | 2.018 | 3.163 |
| 228 Skull and face fractures |  1,774  | 0.1 |  258  | 14.5 | 1.680 | 1.463 | 1.929 |
| 229 Fracture of upper limb |  16,453  | 1.0 |  2,014  | 12.2 | 1.576 | 1.492 | 1.665 |
| 230 Fracture of lower limb |  31,960  | 1.9 |  4,303  | 13.5 | 1.699 | 1.629 | 1.773 |
| 231 Other fractures |  45,954  | 2.8 |  5,931  | 12.9 | 1.563 | 1.500 | 1.629 |
| 232 Sprains and strains |  2,211  | 0.1 |  241  | 10.9 | 1.370 | 1.191 | 1.575 |
| 233 Intracranial injury |  17,069  | 1.0 |  3,436  | 20.1 | 2.175 | 2.068 | 2.288 |
| 234 Crushing injury or internal injury |  3,495  | 0.2 |  636  | 18.2 | 1.887 | 1.718 | 2.072 |
| 235 Open wounds of head; neck; and trunk |  1,190  | 0.1 |  159  | 13.4 | 1.473 | 1.238 | 1.751 |
| 236 Open wounds of extremities |  1,121  | 0.1 |  206  | 18.4 | 1.965 | 1.676 | 2.302 |
| 237 Complication of device; implant or graft |  53,719  | 3.2 |  12,209  | 22.7 | 1.962 | 1.892 | 2.035 |

(continued)

**Table B-2 (continued)
Risk-adjustment model results, CY 2017**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Covariate |  CY 2017 count with variable  | CY 2017 % with variable | CY 2017 count with readmission  | CY 2017% with readmission  | CY 2017 odds ratio | CY 2017LCL | CY 2017 UCL |
| 238 Complications of surgical procedures or medical care |  29,649  | 1.8 |  7,214  | 24.3 | 2.016 | 1.934 | 2.102 |
| SuperficialInjuryBurns\_239\_240 |  5,463  | 0.3 |  865  | 15.8 | 1.677 | 1.547 | 1.818 |
| Poisoning\_241\_242\_243 |  4,596  | 0.3 |  824  | 17.9 | 1.439 | 1.323 | 1.565 |
| 244 Other injuries and conditions due to external causes |  6,756  | 0.4 |  950  | 14.1 | 1.494 | 1.384 | 1.614 |
| 245 Syncope |  6,510  | 0.4 |  851  | 13.1 | 1.395 | 1.288 | 1.512 |
| 246 Fever of unknown origin |  1,025  | 0.1 |  209  | 20.4 | 1.916 | 1.634 | 2.248 |
| 248 Gangrene |  3,451  | 0.2 |  903  | 26.2 | 2.113 | 1.938 | 2.304 |
| 249 Shock |  502  | 0.0 |  138  | 27.5 | 1.901 | 1.550 | 2.331 |
| 250 Nausea and vomiting |  842  | 0.1 |  180  | 21.4 | 1.949 | 1.640 | 2.316 |
| 251 Abdominal pain |  1,028  | 0.1 |  202  | 19.6 | 1.758 | 1.496 | 2.067 |
| 252 Malaise and fatigue |  5,220  | 0.3 |  752  | 14.4 | 1.545 | 1.419 | 1.682 |
| 253 Allergic reactions |  413  | 0.0 |  74  | 17.9 | 1.720 | 1.327 | 2.228 |
| 257 Other aftercare |  1,435  | 0.1 |  184  | 12.8 | 1.219 | 1.038 | 1.431 |
| ScreeningResidUnclassifd\_258\_259 |  5,108  | 0.3 |  871  | 17.1 | 1.720 | 1.586 | 1.865 |
| Comorbidities - Hierarchical Condition Categories (HCCs) (Reference group: NONE of the listed comorbidities.) |
| HCC1 HIV/AIDS |  4,827  | 0.3 |  1,283  | 26.6 | 1.015 | 0.946 | 1.089 |
| HCC6 Opportunistic Infections |  15,171  | 0.9 |  4,957  | 32.7 | 1.101 | 1.062 | 1.141 |
| HCC8 Metastatic Cancer and Acute Leukemia |  47,715  | 2.9 |  14,043  | 29.4 | 1.451 | 1.419 | 1.483 |
| HCC9 Lung and Other Severe Cancers |  30,108  | 1.8 |  8,523  | 28.3 | 1.250 | 1.217 | 1.284 |
| HCC10 Lymphoma and Other Cancers |  24,704  | 1.5 |  6,164  | 25.0 | 1.209 | 1.172 | 1.246 |

(continued)

**Table B-2 (continued)
Risk-adjustment model results, CY 2017**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Covariate |  CY 2017 count with variable  | CY 2017 % with variable | CY 2017 count with readmission  | CY 2017% with readmission  | CY 2017 odds ratio | CY 2017LCL | CY 2017 UCL |
| HCC11 Colorectal, Bladder, and Other Cancers |  20,274  | 1.2 |  5,351  | 26.4 | 1.127 | 1.090 | 1.165 |
| HCC12 Breast, Prostate, and Other Cancers and Tumors |  32,924  | 2.0 |  7,121  | 21.6 | 1.035 | 1.007 | 1.064 |
| HCC\_DigestUrinaryNeoplasm\_14\_15 |  45,006  | 2.7 |  11,281  | 25.1 | 1.010 | 0.987 | 1.034 |
| HCC\_DiabetesChronicComp\_17\_18 |  478,679  | 28.8 |  120,915  | 25.3 | 1.108 | 1.097 | 1.120 |
| HCC19 Diabetes without Complication |  182,751  | 11.0 |  30,939  | 16.9 | 1.035 | 1.021 | 1.050 |
| HCC20 Type I Diabetes Mellitus |  18,194  | 1.1 |  5,670  | 31.2 | 1.121 | 1.083 | 1.160 |
| HCC21 Protein-Calorie Malnutrition |  287,163  | 17.3 |  76,151  | 26.5 | 1.103 | 1.091 | 1.115 |
| HCC23 Other Significant Endocrine and Metabolic Disorders |  117,750  | 7.1 |  34,235  | 29.1 | 1.067 | 1.051 | 1.083 |
| HCC24 Disorders of Fluid/Electrolyte/Acid-Base Balance |  993,185  | 59.8 |  228,107  | 23.0 | 1.082 | 1.072 | 1.093 |
| HCC27 End-Stage Liver Disease |  27,461  | 1.7 |  9,876  | 36.0 | 1.459 | 1.417 | 1.502 |
| HCC28 Cirrhosis of Liver |  24,754  | 1.5 |  6,880  | 27.8 | 1.169 | 1.135 | 1.204 |
| HCC29 Chronic Hepatitis |  9,843  | 0.6 |  2,679  | 27.2 | 1.069 | 1.020 | 1.121 |
| HCC31 Other Hepatitis and Liver Disease |  40,752  | 2.5 |  10,119  | 24.8 | 1.041 | 1.016 | 1.066 |
| HCC33 Intestinal Obstruction/Perforation |  91,394  | 5.5 |  24,904  | 27.2 | 1.040 | 1.023 | 1.057 |
| HCC34 Chronic Pancreatitis |  9,140  | 0.6 |  2,763  | 30.2 | 1.067 | 1.018 | 1.119 |
| HCC35 Inflammatory Bowel Disease |  17,080  | 1.0 |  4,314  | 25.3 | 1.086 | 1.047 | 1.127 |
| HCC36 Peptic Ulcer, Hemorrhage, Other Specified Gastrointestinal Disorders |  244,695  | 14.7 |  67,857  | 27.7 | 1.058 | 1.046 | 1.070 |
| HCC40 Rheumatoid Arthritis and Inflammatory Connective Tissue Disease |  106,741  | 6.4 |  23,670  | 22.2 | 1.107 | 1.089 | 1.124 |
| HCC46 Severe Hematological Disorders |  16,336  | 1.0 |  5,209  | 31.9 | 1.426 | 1.376 | 1.477 |

(continued)

**Table B-2 (continued)
Risk-adjustment model results, CY 2017**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Covariate |  CY 2017 count with variable  | CY 2017 % with variable | CY 2017 count with readmission  | CY 2017% with readmission  | CY 2017 odds ratio | CY 2017LCL | CY 2017 UCL |
| HCC47 Disorders of Immunity |  55,123  | 3.3 |  17,128  | 31.1 | 1.118 | 1.095 | 1.142 |
| HCC48 Coagulation Defects and Other Specified Hematological Disorders |  225,256  | 13.6 |  59,051  | 26.2 | 1.100 | 1.086 | 1.115 |
| HCC49 Iron Deficiency and Other/Unspecified Anemias and Blood Disease |  697,197  | 42.0 |  148,851  | 21.3 | 1.093 | 1.082 | 1.103 |
| HCC50 Delirium and Encephalopathy |  435,587  | 26.2 |  103,812  | 23.8 | 1.021 | 1.011 | 1.030 |
| HCC60 Personality Disorders |  2,494  | 0.2 |  564  | 22.6 | 1.035 | 0.938 | 1.143 |
| HCC63 Other Psychiatric Disorders |  143,160  | 8.6 |  29,606  | 20.7 | 1.037 | 1.022 | 1.051 |
| HCC365MentalRetardation\_64\_65 |  2,432  | 0.1 |  613  | 25.2 | 1.188 | 1.079 | 1.307 |
| HCC66 Moderate Mental Retardation/Developmental Disability |  1,097  | 0.1 |  225  | 20.5 | 1.060 | 0.910 | 1.234 |
| HCC69 Attention Deficit Disorder |  2,393  | 0.1 |  466  | 19.5 | 0.969 | 0.871 | 1.078 |
| HCC70 Quadriplegia |  18,970  | 1.1 |  5,116  | 27.0 | 1.080 | 1.043 | 1.119 |
| HCC71 Paraplegia |  11,381  | 0.7 |  2,742  | 24.1 | 1.004 | 0.959 | 1.052 |
| HCC72 Spinal Cord Disorders/Injuries |  14,782  | 0.9 |  3,111  | 21.0 | 0.997 | 0.956 | 1.039 |
| HCC73 Amyotrophic Lateral Sclerosis and Other Motor Neuron Disease |  1,113  | 0.1 |  224  | 20.1 | 0.934 | 0.802 | 1.087 |
| HCC75 Polyneuropathy |  13,115  | 0.8 |  3,149  | 24.0 | 1.004 | 0.962 | 1.047 |
| HCC79 Seizure Disorders and Convulsions |  120,464  | 7.3 |  27,148  | 22.5 | 0.998 | 0.982 | 1.013 |
| HCC80 Coma, Brain Compression/Anoxic Damage |  32,570  | 2.0 |  8,695  | 26.7 | 1.069 | 1.040 | 1.099 |
| HCC82 Respirator Dependence/Tracheostomy Status |  13,513  | 0.8 |  4,915  | 36.4 | 1.268 | 1.219 | 1.318 |
| HCC83 Respiratory Arrest |  856  | 0.1 |  259  | 30.3 | 1.128 | 0.970 | 1.312 |
| HCC84 Cardio-Respiratory Failure and Shock |  416,807  | 25.1 |  113,500  | 27.2 | 1.105 | 1.094 | 1.117 |

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**Table B-2 (continued)
Risk-adjustment model results, CY 2017**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Covariate |  CY 2017 count with variable  | CY 2017 % with variable | CY 2017 count with readmission  | CY 2017% with readmission  | CY 2017 odds ratio | CY 2017LCL | CY 2017 UCL |
| HCC85 Congestive Heart Failure |  674,369  | 40.6 |  169,217  | 25.1 | 1.128 | 1.116 | 1.139 |
| HCC86 Acute Myocardial Infarction |  107,469  | 6.5 |  30,233  | 28.1 | 1.088 | 1.070 | 1.105 |
| HCC87 Unstable Angina and Other Acute Ischemic Heart Disease |  71,354  | 4.3 |  18,779  | 26.3 | 1.079 | 1.059 | 1.100 |
| HCC88 Angina Pectoris |  19,133  | 1.2 |  4,760  | 24.9 | 1.068 | 1.031 | 1.106 |
| HCC89 Coronary Atherosclerosis/Other Chronic Ischemic Heart Disease |  499,249  | 30.1 |  109,895  | 22.0 | 1.057 | 1.047 | 1.067 |
| HCC90 Heart Infection/Inflammation, Except Rheumatic |  27,171  | 1.6 |  8,199  | 30.2 | 1.053 | 1.024 | 1.083 |
| HCC91 Valvular and Rheumatic Heart Disease |  263,859  | 15.9 |  64,305  | 24.4 | 1.051 | 1.040 | 1.063 |
| HCC96 Specified Heart Arrhythmias |  636,929  | 38.4 |  150,128  | 23.6 | 1.119 | 1.109 | 1.129 |
| HCC99 Cerebral Hemorrhage |  20,020  | 1.2 |  5,082  | 25.4 | 1.063 | 1.026 | 1.101 |
| HCC100 Ischemic or Unspecified Stroke |  61,050  | 3.7 |  14,700  | 24.1 | 1.038 | 1.017 | 1.059 |
| HCC106 Atherosclerosis of the Extremities with Ulceration or Gangrene |  41,338  | 2.5 |  11,803  | 28.6 | 1.029 | 1.003 | 1.056 |
| HCC107 Vascular Disease with Complications |  59,198  | 3.6 |  15,522  | 26.2 | 1.051 | 1.030 | 1.072 |
| HCC108 Vascular Disease |  279,215  | 16.8 |  69,126  | 24.8 | 1.058 | 1.046 | 1.070 |
| HCC109 Other Circulatory Disease |  243,146  | 14.6 |  54,073  | 22.2 | 1.013 | 1.001 | 1.025 |
| HCC111 Chronic Obstructive Pulmonary Disease |  488,107  | 29.4 |  121,294  | 24.8 | 1.140 | 1.129 | 1.151 |
| HCC112 Fibrosis of Lung and Other Chronic Lung Disorders |  21,586  | 1.3 |  4,837  | 22.4 | 1.115 | 1.079 | 1.154 |
| HCC114 Aspiration and Specified Bacterial Pneumonias |  139,954  | 8.4 |  40,220  | 28.7 | 1.078 | 1.062 | 1.093 |
| HCC116 Viral and Unspecified Pneumonia, Pleurisy |  266,159  | 16.0 |  67,998  | 25.5 | 1.046 | 1.034 | 1.058 |

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**Table B-2 (continued)
Risk-adjustment model results, CY 2017**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Covariate |  CY 2017 count with variable  | CY 2017 % with variable | CY 2017 count with readmission  | CY 2017% with readmission  | CY 2017 odds ratio | CY 2017LCL | CY 2017 UCL |
| HCC117 Pleural Effusion/Pneumothorax |  119,743  | 7.2 |  35,200  | 29.4 | 1.074 | 1.059 | 1.090 |
| HCC122 Proliferative Diabetic Retinopathy and Vitreous Hemorrhage |  2,668  | 0.2 |  826  | 31.0 | 1.032 | 0.946 | 1.125 |
| HCC124 Exudative Macular Degeneration |  864  | 0.1 |  172  | 19.9 | 1.050 | 0.884 | 1.248 |
| HCC132 Kidney Transplant Status |  9,581  | 0.6 |  3,428  | 35.8 | 1.500 | 1.430 | 1.574 |
| HCC134 Dialysis Status |  70,253  | 4.2 |  24,107  | 34.3 | 1.165 | 1.126 | 1.207 |
| HCC135 Acute Renal Failure |  563,436  | 33.9 |  140,001  | 24.8 | 1.205 | 1.193 | 1.218 |
| HCC136 Chronic Kidney Disease, Stage 5 |  5,191  | 0.3 |  1,394  | 26.9 | 1.278 | 1.197 | 1.366 |
| HCC137 Chronic Kidney Disease, Severe (Stage 4) |  18,294  | 1.1 |  3,819  | 20.9 | 1.295 | 1.248 | 1.344 |
| HCC138 Chronic Kidney Disease, Moderate (Stage 3) |  95,275  | 5.7 |  16,730  | 17.6 | 1.099 | 1.079 | 1.120 |
| HCC139 Chronic Kidney Disease, Mild or Unspecified (Stages 1-2 or Unspecified) |  59,617  | 3.6 |  10,647  | 17.9 | 1.077 | 1.053 | 1.102 |
| HCC140 Unspecified Renal Failure |  1,122  | 0.1 |  199  | 17.7 | 0.998 | 0.853 | 1.167 |
| HCC141 Nephritis |  3,317  | 0.2 |  630  | 19.0 | 1.006 | 0.920 | 1.100 |
| HCC142 Urinary Obstruction and Retention |  256,919  | 15.5 |  61,357  | 23.9 | 1.070 | 1.058 | 1.082 |
| HCC144 Urinary Tract Infection |  539,484  | 32.5 |  122,221  | 22.7 | 1.009 | 1.000 | 1.019 |
| HCC145 Other Urinary Tract Disorders |  157,589  | 9.5 |  39,072  | 24.8 | 1.015 | 1.001 | 1.028 |
| HCC148 Other Female Genital Disorders |  14,157  | 0.9 |  3,514  | 24.8 | 1.022 | 0.982 | 1.065 |
| HCC157 Pressure Ulcer of Skin with Necrosis Through to Muscle, Tendon, or Bone |  17,200  | 1.0 |  5,048  | 29.3 | 1.122 | 1.082 | 1.164 |
| HCC158 Pressure Ulcer of Skin with Full Thickness Skin Loss |  42,787  | 2.6 |  12,383  | 28.9 | 1.129 | 1.103 | 1.155 |

(continued)

**Table B-2 (continued)
Risk-adjustment model results, CY 2017**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Covariate |  CY 2017 count with variable  | CY 2017 % with variable | CY 2017 count with readmission  | CY 2017% with readmission  | CY 2017 odds ratio | CY 2017LCL | CY 2017 UCL |
| HCC159 Pressure Ulcer of Skin with Partial Thickness Skin Loss |  51,621  | 3.1 |  14,248  | 27.6 | 1.107 | 1.084 | 1.131 |
| HCC160 Pressure Pre-Ulcer Skin Changes or Unspecified Stage |  37,502  | 2.3 |  9,372  | 25.0 | 1.037 | 1.011 | 1.063 |
| HCC169 Vertebral Fractures without Spinal Cord Injury |  65,050  | 3.9 |  13,015  | 20.0 | 1.000 | 0.980 | 1.021 |
| HCC173 Traumatic Amputations and Complications |  12,586  | 0.8 |  2,391  | 19.0 | 0.891 | 0.851 | 0.933 |
| HCC177 Other Complications of Medical Care |  129,885  | 7.8 |  35,943  | 27.7 | 1.024 | 1.009 | 1.038 |
| HCC178 Major Symptoms, Abnormalities |  979,105  | 59.0 |  211,112  | 21.6 | 1.009 | 1.000 | 1.018 |
| HCC186 Major Organ Transplant or Replacement Status |  5,495  | 0.3 |  1,764  | 32.1 | 1.061 | 0.999 | 1.128 |
| HCC187 Other Organ Transplant Status/Replacement |  35,755  | 2.2 |  9,452  | 26.4 | 1.049 | 1.023 | 1.076 |
| HCC188 Artificial Openings for Feeding or Elimination |  59,718  | 3.6 |  18,104  | 30.3 | 1.178 | 1.155 | 1.202 |
| HCC189 Amputation Status, Lower Limb/Amputation Complications |  33,793  | 2.0 |  8,796  | 26.0 | 0.982 | 0.956 | 1.009 |
| HCC190 Amputation Status, Upper Limb |  2,810  | 0.2 |  724  | 25.8 | 1.033 | 0.945 | 1.129 |
| Two or more HCCs |  1,563,805  | 94.2 |  315,434  | 20.2 | 1.251 | 1.216 | 1.287 |

\* Suppressed number because of small cell sizes.

SOURCE: RTI International analysis of FY 2016 MedPAR data (RTI programming reference: CK69 and idxSNF04\_lk2017\_CY\_001\_FORMATTED.xls)

1. Available at <https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/Value-Based-Programs/Other-VBPs/SNF-VBP.html> [↑](#footnote-ref-2)
2. In the FY 2017 SNF PPS Final Rule, the SNF VBP program finalized a policy wherein the program moved from calculating readmission measures on calendar years to fiscal years to mitigate operational concerns. The FY 2019 SNF VBP program year used a baseline period of CY 2015 and a performance period of CY 2017. The FY 2020 program year uses a baseline period of FY 2016 and a performance period of FY 2018. Fiscal years will be used in all subsequent years. [↑](#footnote-ref-3)
3. SNFRM NQF #2510: All-Cause Risk-Standardized Readmission Measure Draft Technical Report (March 2015): <https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/NursingHomeQualityInits/Downloads/SNFRM-Technical-Report-3252015.pdf>. SNFRM NQF #2510: All-Cause Risk-Standardized Readmission Measure Technical Report Supplement (April 2017): <https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/Value-Based-Programs/Other-VBPs/Technical-Report-Supplement.pdf>. [↑](#footnote-ref-4)
4. The algorithm we used is adapted from Appendix E, Planned Readmission Algorithm, of *2018 All-Cause Hospital Wide Measure Updates and Specifications Report: Hospital-Level 30-Day Risk-Standardized Readmission Measure – Version 7.0*, written by the Yale New Haven Health Services Corporation, Center for Outcomes Research & Evaluation. The report is available at: <http://qualitynet.org/dcs/BlobServer?blobkey=id&blobnocache=true&blobwhere=1228890804653&blobheader=multipart%2Foctet-stream&blobheadername1=Content-Disposition&blobheadervalue1=attachment%3Bfilename%3DHospWide_Readmission_AUS_Report_2018_3-28.pdf&blobcol=urldata&blobtable=MungoBlobs> [↑](#footnote-ref-5)
5. AHRQ CCS Groups: Documentation available at <https://www.hcup-us.ahrq.gov/toolssoftware/ccs10/ccs10.jsp> [↑](#footnote-ref-6)
6. CMS’s HCC mappings. Mappings are included in the software at the following website: <http://www.cms.gov/Medicare/Health-Plans/MedicareAdvtgSpecRateStats/Risk-Adjustors.html>. [↑](#footnote-ref-7)
7. SNFRM NQF #2510: All-Cause Risk-Standardized Readmission Measure Draft Technical Report (March 2015): <https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/NursingHomeQualityInits/Downloads/SNFRM-Technical-Report-3252015.pdf> [↑](#footnote-ref-8)
8. SNFRM NQF #2510: All-Cause Risk-Standardized Readmission Measure Technical Report Supplement (April 2017): <https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/Value-Based-Programs/Other-VBPs/Technical-Report-Supplement.pdf> [↑](#footnote-ref-9)
9. SNFRM NQF #2510: All-Cause Risk-Standardized Readmission Measure Technical Report Supplement (April 2017): <https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/Value-Based-Programs/Other-VBPs/Technical-Report-Supplement.pdf> [↑](#footnote-ref-10)
10. Readmissions to inpatient psychiatric facilities (hospitals or units) are also classified as planned readmissions. [↑](#footnote-ref-11)