

Specifications for the Home Health Within-Stay Potentially Preventable Hospitalization Measure for the Home Health Quality Reporting Program

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BACKGROUND

CMS has contracted with Abt Associates to develop the home health potentially preventable hospitalization measure. This measure development work was completed under the contracts named Outcome and Assessment Information Set (OASIS) Quality Measure Development and Maintenance Project (HHSM -500-2013-13001I, Task Order HHSM-500T0002) and Home Health and Hospice Quality Reporting Program Quality Measures and Assessment Instruments Development, Modification and Maintenance, & Quality Reporting Program Continued Contract (#75FCMC18D0014, Task Order # 75FCMC19F0001).

The reporting of quality data by HHAs is mandated by Section 1895(b)(3)(B)(v)(II) of the Social Security Act (“the Act”). For more information on the statutory history of the HH Quality Reporting Program (QRP), please refer to <https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/HomeHealthQualityInits/Home-Health-Quality-Reporting-Requirements.html>.

This document describes the specifications for the home health potentially preventable hospitalization measure.

QUALITY MEASURE SPECIFICATIONS

1.1 Quality Measure Description

This measure reports a home health agency (HHA)-level rate of risk-adjusted potentially preventable hospitalization (PPH) or potentially preventable observation stays (PPOBS) that occur within a home health (HH) stay for all eligible stays at each agency. A HH stay is a sequence of HH payment episodes separated from other HH payment episodes by at least two days.

This measure calculates a risk-adjusted PPH rate for each HHA. This is derived by first calculating a standardized risk ratio – the predicted number of unplanned, potentially preventable hospital admissions or observation stays at the HHA divided by the expected number of admissions or observation stays for the same patients if treated at the average HHA. The standardized risk ratio is then multiplied by the mean potentially preventable admission or observation stay rate in the population (i.e., all Medicare FFS patients included in the measure) to generate the HHA-level standardized hospitalization rate of potentially preventable hospitalization.

1.2 Purpose/Rationale for the Quality Measure

Hospitalizations among the Medicare population are common, costly, and often preventable.^{1,2,3} The Medicare Payment Advisory Commission (MedPAC) and a study by Jencks et al. estimated that 17-20 percent of Medicare beneficiaries discharged from the hospital were readmitted within 30 days. Among these hospital readmissions, MedPAC has estimated that 76 percent were considered potentially avoidable – associated with \$12 billion in Medicare expenditures.^{4,5} An analysis of data from a nationally representative sample of Medicare FFS beneficiaries receiving HH services in 2004 shows that HH patients receive significant amounts of acute and post-acute services after discharge from HH care.⁶ Focusing on readmissions, Madigan and colleagues studied 74,580 Medicare HH patients and found that the 30-day rehospitalization rate was 26 percent, with the largest proportion related to a cardiac-related diagnosis (42 percent).⁷ A study of dually eligible Medicare and Medicaid beneficiaries using data on hospitalizations from nursing home and home- and community-based services waiver

¹ Friedman, B. and J. Basu, The rate and cost of hospital readmissions for preventable conditions. *Med Care Res Rev*, 2004. 61(2): p. 225-40.

² Moy, E., Chang, E., and Barret, M. Potentially Preventable Hospitalizations — United States, 2001–2009. *MMWR*, 2013, 62(03);139-143

³ Jencks, S.F., M.V. Williams, and E.A. Coleman, Rehospitalizations among Patients in the Medicare Fee-for-Service Program. *New England Journal of Medicine*, 2009. 360(14): p. 1418-1428.

⁴ *Ibid.*

⁵ MedPAC, Payment policy for inpatient readmissions, in Report to the Congress: Promoting Greater Efficiency in Medicare. 2007: Washington D.C. p. 103-120.

⁶ Wolff, J. L., Meadow, A., Weiss, C.O., Boyd, C.M., Leff, B. Medicare Home Health Patients' Transitions Through Acute And Post-Acute Care Settings." *Medicare Care* 11(46) 2008; 1188-1193

⁷ Madigan, E. A., N. H. Gordon, et al. Rehospitalization in a national population of home health care patients with heart failure." *Health Serv Res* 47(6): 2013; 2316-2338

programs found that 39 percent of admissions were potentially avoidable⁸. Factors associated with hospitalizations from HH including functional disability, primary diagnoses of heart disease, and primary diagnosis of skin wounds.⁹ Some other factors associated with hospitalization include time since most recent hospitalization¹⁰ and chronic conditions such as chronic obstructive pulmonary disease and congestive heart failure.¹¹ These factors, including how HHAs address chronic conditions present before the HH stay, can determine whether patients can successfully avoid hospitalizations.¹² Patients admitted for an observation stay can often be treated in the same medical units and have similar medical needs as a patient admitted for inpatient care, but the service is billed as outpatient services and doesn't count as an index patient stay in the calculations of readmissions.¹³ Understanding these factors can help HHAs design strategies to address avoidable hospitalizations. Few studies have investigated potentially preventable hospitalization rates from Home Health settings, especially hospitalizations that occur within the episode.

The Centers for Medicare & Medicaid Services (CMS) has addressed hospitalizations and readmissions with a number of home health measures. These include the *Acute Care Hospitalization* (Claims based) NQF # 0171; *Acute Care Hospitalization* (OASIS-based) not NQF endorsed; *Rehospitalization During the First 30 Days of Home Health* (Claims-based) NQF # 2380; *Emergency Department Use without Hospitalization* (Claims-based) NQF # 0173; *Emergency Department Use without Hospital Readmission During the First 30 Days of Home Health* (Claims-based) NQF # 2505; and the IMPACT Act *Potentially Preventable 30-Day Post-Discharge Readmission Measure for Home Health* (not NQF endorsed).

1.3 Denominator

For the eligible HH stays at each HHA, the measure denominator is the risk-adjusted expected number of hospitalizations or observation stays. This estimate includes risk adjustment for patient characteristics with the HHA effect removed. The “expected” number of observation stays or admissions is the projected number of risk-adjusted hospitalizations if the same patients were treated at the average HHA appropriate to the measure.

⁸ Walsh, E. G., J. M. Wiener, et al. (2012). "Potentially avoidable hospitalizations of dually eligible Medicare and Medicaid beneficiaries from nursing facility and Home- and Community-Based Services waiver programs." *J Am Geriatr Soc* 60(5): 821-829.

⁹ Lohman MC, Cotton, BP, Zagaria, AB, Bao, Y, Greenberg, RL, Fortuna, KL, Bruce, ML Hospitalization Risk and Potentially Inappropriate Medications among Medicare Home Health Nursing Patients,(2017) *J Gen Intern Med.* 32(12):1301-1308

¹⁰ Hua M, Gong, MN, Brady J, Wunsch, H, Early and late unplanned rehospitalizations for survivors of critical illness(2015) *Critical Care Medicine*;43(2):430-438.

¹¹ Dye C, Willoughby D, Aybar-Damali B, Grady C, Oran R, Knudson A, Improving Chronic Disease Self-Management by Older Home Health Patients through Community Health Coaching (2018) *Int J Environ Res Public Health.* 15(4): 660.

¹² Lohman MC, Cotton, BP, Zagaria, AB, Bao, Y, Greenberg, RL, Fortuna, KL, Bruce, ML Hospitalization Risk and Potentially Inappropriate Medications among Medicare Home Health Nursing Patients,(2017) *J Gen Intern Med.* 32(12):1301-1308

¹³ Sabbatini AK, Wright B. Excluding Observation Stays from Readmission Rates - What Quality Measures Are Missing, *New England Journal of Medicine,* 31;378(22):2062-2065.

This population, like that of the numerator, is the group of Medicare FFS HH patients who are not excluded for the reasons below.

Home Health Within-Stay Potentially Preventable Hospitalization Measure Exclusions: The following stays are excluded from the measure:

1) Stays where the patients are less than 18 years old.

Rationale: Patients under 18 years old are not included in the target population for this measure. Pediatric patients are relatively few and may have different patterns of care from adults.

2) Stays where the patients were not continuously enrolled in Part A FFS Medicare for the 12 months prior to the HH admission date through the end of the home health stay.

Rationale: The adjustment for certain comorbid conditions in the measure requires information on acute inpatient claims for one year prior to the HH admission, and hospitalizations and observation stays must be observable in the observation window following discharge. Patients without Part A coverage or who are enrolled in Medicare Advantage plans will not have complete claims in the system.

3) Stays that begin with a Low Utilization Payment Adjustment (LUPA) claim.

Rationale: Home health stays designated as LUPAs are excluded because it is unclear that the initial HHA had an opportunity to impact the patient's health outcomes.

4) Stays where the patient receives service from multiple agencies during the home health stay.

Rationale: These home health stays are excluded because it is unclear that the initial HHA had an opportunity to impact the patient's health outcomes.

5) Stays where the information required for risk adjustment is missing.

If one of the four conditions occur, the stays will be excluded:

- Missing beneficiary's birthday information;
- Beneficiary has gender other than male or female;
- Missing payment authorization code information;
- Beneficiary has Medicare Status Code other than the following:
 - 10: Aged without ESRD
 - 11: Aged with ESRD
 - 20: Disabled without ESRD
 - 21: Disabled with ESRD
 - 31: ESRD only

1.4 Numerator Statement

Number of patients in the denominator with at least one potentially preventable hospitalization or observation stay during the HH stay.

1.4.1 Numerator Details

Potentially Preventable Admissions or Observation Stays

The definition of potentially preventable hospitalization relies on the previously developed conceptual framework that for certain diagnoses, proper management and care of the condition by the home health agency, combined with appropriate, clearly explained, and implemented discharge instructions and referrals, can potentially prevent a patient's admission to the hospital. On the basis of this framework, the team followed the working conceptual definition for potentially preventable hospitalizations for home health created during the development of the *Potentially Preventable 30-Day Post-Discharge Readmission Measure for Home Health* measure. Although not specific to PAC or hospitalizations, the team used AHRQ PQIs/Ambulatory Care Sensitive Conditions (ACSCs) as a starting point for this work. The list of ACSCs consists of conditions for which hospitalization can potentially be prevented, given good outpatient care and early intervention.¹⁴

The team also performed analyses on Medicare claims data to identify the most frequent diagnoses associated with admissions among home health beneficiaries and then applied the conceptual PPH definition to evaluate whether these common conditions for a hospitalization may be considered potentially preventable. This list of conditions identified from the literature and claims analysis formed the preliminary PPH definition (see Appendix 1, Table 1-1).

In developing these sets of PPH conditions, we grouped them based on clinical rationale, as follows:

- 1) Inadequate management of chronic conditions
- 2) Inadequate management of infections
- 3) Inadequate management of other unplanned events
- 4) Inadequate injury prevention

We sought technical expert and detailed clinical input on these definitions and overall approach. The Technical Expert Panel's (TEP) consensus was that it is feasible to apply the definitions for both admissions and observation stays. In instances where no clear consensus was reached among TEP members, we deferred to clinical expertise from the measure development

¹⁴ Agency for Healthcare Research and Quality: AHRQ Quality Indicators—Guide to Prevention Quality Indicators: Hospital Admission for Ambulatory Care Sensitive Conditions. AHRQ Pub. No. 02-R0203. Rockville, MD. Agency for Healthcare Research and Quality, 2001.

team along with results from our environmental scan which suggested that these conditions were appropriate to consider as potentially preventable.

Planned Inpatient Admissions or Observation Stays

This measure is focused on inpatient admissions or observation stays that are potentially preventable (PP) and *unplanned*. Thus, planned admissions are not counted in the numerator—PPs are only counted in the numerator if the inpatient admission or observation stay is considered unplanned. Planned inpatient admissions and observation stays are defined largely by the definition used for the *Hospital Wide Readmission*¹⁵ and *Potentially Preventable Within Stay Readmission Measure for Inpatient Rehabilitation Facilities*¹⁶ measures. The definition for classifying a planned inpatient admission or observation stay is described in greater detail below.

If an inpatient or outpatient claim contains a code for a procedure that is frequently a planned procedure, then that inpatient admission or observation stay is designated to be a planned inpatient admission or observation stay. Similarly, if an inpatient or outpatient claim contains a code for a diagnosis that is frequently a planned diagnosis, then that inpatient admission or observation stay is designated to be a planned inpatient admission or observation stay. However, the planned inpatient admission or observation stay is reclassified as unplanned if the claim also contains a code indicating one or more acute diagnoses from a specified list.

Other Documentation

AHRQ CCS groupings of ICD-9 codes: Documentation available at: <http://www.hcup-us.ahrq.gov/toolssoftware/ccs/ccs.jsp>

CMS-HCC Mappings of ICD-9 Codes: Mappings are included in the software at the following website: <http://www.cms.gov/Medicare/Health-Plans/MedicareAdvtgSpecRateStats/Risk-Adjustors.html>

Yale/ CMS Planned Readmission Algorithm used for numerator exclusion criteria: https://hsrc.maryland.gov/documents/HSCRC_Initiatives/readmissions/Version-2-1-Readmission-Planned-CMS-Readmission-Algorithm-Report-03-14-2013.pdf

The AHRQ Ambulatory Care Sensitive Conditions (ACSCs): <https://www.ahrq.gov/downloads/pub/ahrqqi/pqiguide.pdf>

The Potentially Preventable Within Stay Readmission Measure for Inpatient Rehabilitation Facilities: <https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/IRF-Quality-Reporting/IRF-Quality-Reporting-Program-Measures-Information-.html>

¹⁵ <https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/HospitalQualityInits/Measure-Methodology.html>

¹⁶ <https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/IRF-Quality-Reporting/IRF-Quality-Reporting-Program-Measures-Information-.html>

HCPCS General Information:

<https://www.cms.gov/Medicare/Coding/MedHCPCSGenInfo/index.html>

1.5 Data Sources

This measure relies on data from Medicare's Enrollment Database as well as Fee-for-Service (FFS) claims from the home health, inpatient, outpatient, and physician office settings. The enrollment files provide beneficiary-level information such as date of birth, date of death, sex, reasons for Medicare eligibility, and enrollment histories in Medicare Parts A and B. The FFS claims files provide information about each home health, hospital stay and observation stay, including dates of admission and discharge, diagnoses and procedures, and indicators for care received in the intensive care unit, coronary care unit, emergency department, skilled nursing facility, inpatient rehabilitation facility, and long-term care hospital. Furthermore, claims from all three file settings are used to construct for each patient a complete history of care before the home health stay, which is used for constructing risk adjustment variables. Below are links to documentation for each of the specific files for the HH measure.

- Information about the Medicare Enrollment Database is available online at: <https://aspe.hhs.gov/centers-medicare-medicaid-services>
- Documentation for the Medicare claims data is provided online by ResDAC. Data dictionaries are available for all three standard analytical files:
 - Home Health RIF: <http://www.resdac.org/cms-data/files/hha-rif>
 - Inpatient RIF: <http://www.resdac.org/cms-data/files/ip-rif>
 - Outpatient RIF: <http://www.resdac.org/cms-data/files/op-rif>
 - Carrier (Physician Office) RIF: <http://www.resdac.org/cms-data/files/carrier-rif>

1.6 Measure Time Window

The measure will be calculated using one year of data. All HH stays during the year time window, except those that meet the exclusion criteria, will be included in the measure. The PPH observation window begins from the start of home health stay and spans to 1 day after discharge. Data from all home health stays beginning from 1/1/2016 - 12/31/2016 was used for the HH measure development.

1.7 Statistical Risk Model and Risk Adjustment Covariates

The following section summarizes the risk adjustment approach for within stay PPH measure.

A hierarchical regression method using a logistic regression to predict the probability of a countable (potentially preventable, unplanned) inpatient admission or observation stay is used. The risk adjusters are predictor variables. The patient characteristics related to each discharge and a marker for the specific discharging HHA are included in the equation. The equation is hierarchical in that both individual patient characteristics are accounted for as well as the clustering of patients into HHAs. The statistical model estimates both the average predictive

effect of the patient characteristics across all providers and the degree to which each provider has an effect on inpatient admissions or observation stays that differs from that of the average provider. The provider effects are assumed to be randomly distributed around the average (according to a normal distribution). When computing the HHA effect, hierarchical modeling accounts for the known predictors of inpatient admissions or observation stays, on average, such as patient characteristics, the observed provider rate, and the number of provider stays eligible for the measure. The estimated provider effect is determined mostly by the provider’s own data if the number of patient stays is relatively large (as the estimate would be relatively precise), but is adjusted towards the average if the number of patient stays is small (as that would yield an estimate of lower precision).

We used the following model:

Let Y_{ij} , denote the outcome (equal to 1 if patient i is admitted during HH stay, zero otherwise) for a patient i at HH provider j ; Z_{ij} denotes a set of risk factors. We assume the outcome is related linearly to the covariates via a logit function with dispersion:

$$\begin{aligned} \text{logit}(\text{Prob}(Y_{ij}=1)) &= \alpha_j + \beta^*Z_{ij} + \varepsilon_{ij} \\ \alpha_j &= \mu + \omega_j; \omega_j \sim N(0, \tau^2) \end{aligned} \tag{1}$$

where $Z_{ij} = (Z_1, Z_2, \dots, Z_k)$ is a set of k patient-level covariates; α_j represents the HH specific intercept; μ is the adjusted average outcome over all HHAs; τ^2 is the between HHA variance component; and $\varepsilon \sim N(0, \sigma^2)$ is the error term. The hierarchical logistic regression model is estimated using SAS software (PROC GLIMMIX: SAS/STAT User’s Guide, SAS Institute Inc.)

The estimated equation is used twice in the measure. The sum of the probabilities of admission/observation stay of all patients in the measure, including both the effects of patient characteristics and the provider, is the “predicted number” of admissions/observation stays after adjusting for the provider’s case mix. The same equation is used without the provider effect to compute the “expected number” of potentially preventable admissions/observation stays for the same patients at the average provider. The ratio of the predicted-to-expected number of admissions/observation stays is a measure of the degree to which the admissions/observation stays are higher or lower than what would otherwise be expected. This standardized risk ratio is then multiplied by the mean admission/observation stay rate for all provider stays for the measure, yielding the risk-standardized admission/observation stay rate for each provider. This estimation procedure is recalculated for each measurement period. Estimating the equations for each measurement period allows the estimated effects of the patient characteristics to vary over time as medical treatment patterns change.

To account for beneficiary characteristics that may affect the risk of potentially preventable hospitalizations and observation stays, the risk adjustment model uses potential risk factors that fall into three categories:

- 1) Demographics;

- 2) Care received during a prior proximal hospitalization (if one occurred); and
- 3) Other care received within one year of the HH stay.

The following sub-sections detail risk factors in each of these categories in turn.

Factor 1: Demographics

Demographic risk factors included in the risk adjustment model are age and sex, enrollment status, and activities of daily living (ADL) scores.

Age and Sex

The risk adjustment model includes age and sex as covariates. Age-sex interactions allow the model to account for the differing effects of age on the outcomes for each sex. Age is subdivided into 12 bins for each sex: ages 18-34, 35-44, 45-54, five-year age bins from 55 to 94, and one bin for ages over 95. 65-69, Male is the reference group.

Enrollment Status

The model employs aged (reference), end stage renal disease (ESRD), and disability as covariates for the original reason for Medicare entitlement.

Activities of Daily Living Scores

The Home Health Prospective Payment System (HH-PPS) calculates an Activity of Daily Living (ADL) Severity Score by combining responses from several Outcome and Assessment Information Set (OASIS) fields. The ADL Severity Score is calculated using four methods that differ by how much weight is assigned to the OASIS variables that comprise the score. These four scores are then combined with information related to episode timing (early/late status) and the number of therapy visits to determine which Severity Score is placed on the five-character Health Insurance Prospective Payment System (HIPPS) code as the ADL Severity Score. The risk adjustment model includes all four Severity Scores (i.e., ADL 1-4).

Factor 2: Care Received during the Prior Proximal Hospitalization

Because beneficiaries who enter home health care from prior proximal hospitalizations¹⁷ may have different health statuses, this model takes into account beneficiaries' immediate prior care setting, principal diagnoses, and procedures.

Length of Prior Proximal Hospitalization

¹⁷ Prior proximal hospitalizations for this measure are defined as inpatient stays within 30 days prior to home health admission.

The length of the prior proximal hospitalization is included in the model as a binary variable: 0-7 days (reference) and greater than or equal to 8 days.

Clinical Classification Software (CCS) during Prior Proximal Hospitalization

The risk model relies on CCS diagnosis and procedure groups to adjust for beneficiary health status during a prior proximal hospitalization, if a prior proximal hospitalization occurred. CCS diagnosis groups are defined using principal diagnosis codes from the prior proximal hospitalization. CCS procedure groups are defined using procedure codes recorded during the prior proximal hospitalization.

Factor 3: Other Care Received within One Year of Stay

To further account for beneficiaries who may have different health statuses entering into home health, this model adjusts for the beneficiaries' number of prior acute discharges, number of outpatient emergency department visits, number of skilled nursing facility visits, number of inpatient rehabilitation facility visits, number of long-term care hospital visits, and Hierarchical Condition Categories (HCC) comorbidities.

Number of Prior Acute Discharges

The model adjusts for the number of prior acute hospital discharges in the past year, excluding those that took place within 30 days prior to the start of home health or resumption of care. The number of prior acute discharges is classified in the model as 0 (i.e., no prior acute discharge; reference group), 1, 2, 3, 4, 5, 6, 7, 8, 9, and 10 or more discharges.

Number of Outpatient Emergency Department Visits

The model also takes into account whether or not an outpatient emergency department (ED) visit took place within one year of the HH stay (i.e., 0 ED visits [reference] or 1 or more ED visits).

Number of Skilled Nursing Facility Visits

The model adjusts for whether or not a skilled nursing facility took place within one year of the HH stay (i.e., 0 SNF visits [reference] or 1 or more SNF visits).

Number of Inpatient Rehabilitation Facility Visits

The model adjusts for whether or not an inpatient rehabilitation facility took place within one year of the HH stay (i.e., 0 IRF visits [reference] or 1 or more IRF visits).

Number of Long-Term Care Hospital Visits

The model adjusts for whether or not a long-term care hospital visit took place within one year of the HH stay (i.e., 0 LTCH visits [reference] or 1 or more LTCH visits).

Hierarchical Condition Categories (HCC) Comorbidities

To account for beneficiary health status within one year of the HH stay, the risk adjustment model also relies on the HCC framework.¹⁸ The risk adjustment model includes hierarchically ranked HCCs based on the 2009 CMS-HCC risk adjustment model. HCC comorbidities are defined using secondary diagnoses from the prior proximal hospitalization (if a prior proximal hospitalization occurred) and all other diagnoses recorded in the inpatient, outpatient, and carrier settings during the year prior to the home health stay.

1.8 Measure Calculation Algorithm

The Medicare HH claims are matched to prior acute hospital stays, within-stay inpatient admissions/observation stays, and patient eligibility data to determine which stays remain in the measure (i.e., not excluded per the exclusions described above) and which have potentially preventable, unplanned inpatient admissions/observation stays.

The measures are calculated according to the following steps:

- Step 1:* Identify patients meeting the denominator (measure inclusion) criteria.
- Step 2:* Identify patients meeting the numerator (unplanned PPH/PPOBS) criteria.
- Step 3:* Identify presence or absence of risk adjustment variables for each patient.
- Step 4:* Calculate the predicted and expected number of inpatient admissions/observation stays for each provider using hierarchical logistic regression model.

The predicted number of inpatient admissions/observation stays for each HHA is calculated as the sum of the predicted probability of admission/observation stay for each patient included in the measure within HH stay, including the provider-specific effect. The expected number of inpatient admissions/observation stays for each HHA is calculated as the sum of the predicted probability of admission/observation stay for each patient included in the measure within HH stay, without the provider-specific effect. The model specific risk standardized admission/observation stay ratio for each HHA is calculated as follows.

To calculate the predicted number of admissions/observation stays $pred_j$ for index HH episodes at HHA_j , we used

$$pred_j = \Sigma \text{logit}^{-1}(\mu + \omega_i + \beta * Z_{ij}) \quad (1)$$

¹⁸ CMS-HCC Mappings of ICD-9 Codes: Mappings are included in the software at the following website: <http://www.cms.gov/Medicare/Health-Plans/MedicareAdvtgSpecRateStats/Risk-Adjustors.html>

where the sum is over all episodes in provider_j, and ω_i is the random intercept. To calculate the expected number exp_j use

$$\text{exp}_j = \Sigma \text{logit}^{-1} (\mu + \beta * Z_{ij}) \quad (2)$$

Then, as a measure of excess or reduced admissions/observation stays among index stays at HHA_j, calculate the HH-wide standardized risk ratio, SRR_j , as

$$\text{SRR}_j = \text{pred}_j / \text{exp}_j \quad (3)$$

Step 5: Calculate the risk-standardized HH potentially preventable admission/observation stay rate.

The value obtained from equation (3) above, the SRR_j , is the HH-wide standardized risk ratio for HHA_j. To aid interpretation, the provider-wide standardized risk ratio, SRR_j , is then multiplied by the overall national raw admission/observation stay rate for all provider episodes, \bar{Y} , to produce the provider-wide risk-standardized admission/observation stay rate (RSR_j).

$$\text{RSR}_j = \text{SRR}_j * \bar{Y} \quad (4)$$

1.9 Measure Results

We present measure results for the HH PPH measure in the **Appendix 1, Table 1-1 and Table 1-2**. These include the listing of potentially preventable conditions considered and the preliminary risk adjustment model results.

MEASURE TESTING

The HH PPH measure has completed measure testing to assess the usability, reliability, and validity. Section 2.1 describes the measure’s reportability, Section 2.2 outlines the measure’s variability, Section 2.3 assesses the measure’s reliability, and Section 2.4 assesses the measure’s validity.

2.1 Reportability

Reportability testing examines the total number and proportion of HHAs that would have at least 20 eligible stays for the HH PPH measure in the reporting period. The HH QRP requires that all HHAs have at least 20 stays to be eligible for public reporting. In CY 2016, 81.69% of total HHAs (n = 10,976) met this threshold. This indicates high reportability and usability of the measure.

Table 1: Publicly Reportable HHAs, CY 2016

Total Number of HHAs	Percentage of HHAs with ≥ 20 stays
10,976	81.69%

2.2 Variability

Variability testing summarizes the distribution of the agency-level, risk-standardized PPH rate. In CY 2016, the mean risk-adjusted PPH rate among HHAs with at least 20 stays was 11.40% (median: 10.97%, IQR: 9.25% - 13.24%). The risk-adjusted PPH rate among reportable HHAs ranged from a minimum of 3.09% to a maximum of 26.09%. This wide variation indicates there is a performance gap in PPH rates across HHAs.

Table 2: Agency-Level Distribution of Risk-Adjusted PPH Rates, CY 2016

N	Rate	Mean	Std	Min	25th Percentile	Median	75th Percentile	Max
8,966	Risk Standardized Rate	11.40%	3.03%	3.09%	9.25%	10.97%	13.24%	26.09%

2.3 Reliability

We performed split-sample reliability testing that examined agreement between two performance measure scores for a home health agency calculated using randomly split,

independent subsets of patient stays in the same measurement period. Good agreement between the two performance measure scores calculated in this manner provides evidence that the measure is capturing an attribute of the agency (quality of care) rather than the patient stays (case-mix) used for measure calculation. Table 3 presents ICC (2,1) and ICC (3,1) between the split-sample scores for the overall sample of 8,966 HHAs included in this testing. The ICC in the overall sample was 0.6, with a 95% confidence interval (CI) of 0.59 to 0.62. Intraclass correlation coefficients below 0.5 indicate low reliability; between 0.5 and 0.7, moderate; above 0.7, good; and above 0.9, excellent reliability.¹⁹ The ICC for the overall HH sample was 0.6, indicating moderate reliability.

Table 3: Split-Sample Reliability: Intraclass Correlation Coefficients between Split-Sample Performance Measure Scores for Overall HHA Sample, CY 2016

Agency Sample	Number of HHAs	ICC (2,1) (95%CI)	ICC (3,1) (95%CI)
Overall	8,966	0.6 (0.59-0.62)	0.6 (0.59-0.62)

2.4 Validity

To test the validity of the measure, we assessed model fit and convergent validity. The model fit statistic determines if the HH PPH model can accurately predict cases of potentially preventable hospitalizations and observation stays while controlling for differences in resident case-mix. The C-statistic is a measure of model discrimination that judges the model’s ability to correctly classify outcomes as negative or positive. Using CY 2016 data, the C-statistic of the model was 0.727, which suggests good model discrimination.

To assess convergent validity, the relationships between the HH PPH measure and other publicly reported HH quality measures were examined. Quality measures that reflect clinically related care processes or outcomes to PPH were examined, with the hypothesis that a HHA’s PPH percentile ranking should be somewhat consistent with percentile rankings of other related quality measures. Using the Spearman’s rank correlation, the HH PPH measure was compared to HH QRP claims-based measures: *Potentially Preventable 30-Day Post-Discharge Readmission*, *Discharge to Community*, *Acute Care Hospitalization*, and *Emergency Department Use without Hospitalization*. As expected, the *Discharge to Community* (-0.57) measure was negatively correlated with the PPH measure. The *Potentially Preventable 30-Day Post-Discharge Readmission* (0.17), *Acute Care Hospitalization* (0.22), and *Emergency Department Use without Hospitalization* (0.08) were positively correlated with the PPH measure. All Spearman’s rank correlations were statistically significant at the alpha level of 0.05.

¹⁹ McGraw, K. O., & Wong, S. P. (1996). Forming inferences about some intraclass correlation coefficients. *Psychological methods*, 1(1), 30.

Table 4: Correlations Between PPH and other Publicly Reported Claims-Based Measures

Measure	Spearman Correlation	P-Value
Potentially Preventable 30-Day Post-Discharge Readmission	0.1731	<.0001
Discharge to Community	-0.5681	<.0001
Acute Care Hospitalization	0.2211	<.0001
Emergency Department Use without Hospitalization	0.082	<.0001

In addition to validity testing, we also had three Technical Expert Panel (TEP) meetings in which the TEP had strong support the face validity of the PPH measure.

TEP members agreed with the conceptual and operational definition for potentially preventable hospitalizations and observation stays. Specifically, the TEP agreed that the PPH measure should focus on clinical groupings refined by TEP input that were determined to be actionable by HHAs in addressing hospitalization of patients.

Appendix 1

Table 1-1. Preliminary List of Conditions for Defining Potentially Preventable Admissions or Observation Stays with ICD-10 Codes

Conditions	Subconditions	ICD-10-CM	ICD-10-CM Description
Adult Asthma*	Asthma* (PQI 05)	J4521	Mild intermittent asthma with (acute) exacerbation
		J4522	Mild intermittent asthma with status asthmaticus
		J4531	Mild persistent asthma with (acute) exacerbation
		J4532	Mild persistent asthma with status asthmaticus
		J4541	Moderate persistent asthma with (acute) exacerbation
		J4542	Moderate persistent asthma with status asthmaticus
		J4551	Severe persistent asthma with (acute) exacerbation
		J4552	Severe persistent asthma with status asthmaticus
		J45901	Unspecified asthma with (acute) exacerbation
		J45902	Unspecified asthma with status asthmaticus
		J45990	Exercise induced bronchospasm
		J45991	Cough variant asthma
		J45998	Other asthma
			Acute Bronchitis*^(PQI 05)
J201	Acute bronchitis due to Hemophilus influenzae		
J202	Acute bronchitis due to streptococcus		
J203	Acute bronchitis due to coxsackievirus		
J204	Acute bronchitis due to parainfluenza virus		
J205	Acute bronchitis due to respiratory syncytial virus		
J206	Acute bronchitis due to rhinovirus		
J207	Acute bronchitis due to echovirus		
J208	Acute bronchitis due to other specified organisms		
J209	Acute bronchitis, unspecified		
J40	Bronchitis, not specified as acute or chronic		
Chronic obstructive pulmonary disease (COPD)	COPD* (PQI 05)	J410	Simple chronic bronchitis
		J411	Mucopurulent chronic bronchitis
		J418	Mixed simple and mucopurulent chronic bronchitis

(continued)

Table 1-1. Preliminary List of Conditions for Defining Potentially Preventable Admissions or Observation Stays with ICD-10 Codes (continued)

Conditions	Subconditions	ICD-10-CM	ICD-10-CM Description
Chronic obstructive pulmonary disease (COPD), continued	COPD* (PQI 05), continued	J42	Unspecified chronic bronchitis
		J430	Unilateral pulmonary emphysema [MacLeod's syndrome]
		J431	Panlobular emphysema
		J432	Centrilobular emphysema
		J438	Other emphysema
		J439	Emphysema, unspecified
		J440	Chronic obstructive pulmonary disease with acute lower respiratory infection
		J441	Chronic obstructive pulmonary disease with (acute) exacerbation
		J449	Chronic obstructive pulmonary disease, unspecified
		J470	Bronchiectasis with acute lower respiratory infection
		J471	Bronchiectasis with (acute) exacerbation
J479	Bronchiectasis, uncomplicated		
Congestive heart failure (CHF)		I09.81	Rheumatic heart failure
		I11.0	Hypertensive heart disease with heart failure
		I11.0	Hypertensive heart disease with heart failure
		I11.0	Hypertensive heart disease with heart failure
		I13.0	Hypertensive heart and chronic kidney disease with heart failure and stage 1 through stage 4 chronic kidney disease, or unspecified chronic kidney disease
		I13.2	Hypertensive heart and chronic kidney disease with heart failure and with stage 5 chronic kidney disease, or end stage renal disease
		I13.0	Hypertensive heart and chronic kidney disease with heart failure and stage 1 through stage 4 chronic kidney disease, or unspecified chronic kidney disease
		I13.2	Hypertensive heart and chronic kidney disease with heart failure and with stage 5 chronic kidney disease, or end stage renal disease
		I13.0	Hypertensive heart and chronic kidney disease with heart failure and stage 1 through stage 4 chronic kidney disease, or unspecified chronic kidney disease

(continued)

Table 1-1. Preliminary List of Conditions for Defining Potentially Preventable Admissions or Observation Stays with ICD-10 Codes (continued)

Conditions	Subconditions	ICD-10-CM	ICD-10-CM Description
Congestive heart failure (CHF), continued		I13.2	Hypertensive heart and chronic kidney disease with heart failure and with stage 5 chronic kidney disease, or end stage renal disease
		I50.9	Heart failure, unspecified
		I50.1	Left ventricular failure
		I50.20	Unspecified systolic (congestive) heart failure
		I50.21	Acute systolic (congestive) heart failure
		I50.22	Chronic systolic (congestive) heart failure
		I50.23	Acute on chronic systolic (congestive) heart failure
		I50.30	Unspecified diastolic (congestive) heart failure
		I50.31	Acute diastolic (congestive) heart failure
		I50.32	Chronic diastolic (congestive) heart failure
		I50.33	Acute on chronic diastolic (congestive) heart failure
		I50.40	Unspecified combined systolic (congestive) and diastolic (congestive) heart failure
		I50.41	Acute combined systolic (congestive) and diastolic (congestive) heart failure
		I50.42	Chronic combined systolic (congestive) and diastolic (congestive) heart failure
		I50.43	Acute on chronic combined systolic (congestive) and diastolic (congestive) heart failure
		Diabetes short-term complication	Diabetes short-term complication* (PQI 01)
E1010	Type 1 diabetes mellitus with ketoacidosis without coma		
E1011	Type 1 diabetes mellitus with ketoacidosis with coma		
E10641	Type 1 diabetes mellitus with hypoglycemia with coma		
E1065	Type 1 diabetes mellitus with hyperglycemia		
		E1100	Type 2 diabetes mellitus with hyperosmolarity without nonketotic hyperglycemic-hyperosmolar coma (NKHHC)

(continued)

Table 1-1. Preliminary List of Conditions for Defining Potentially Preventable Admissions or Observation Stays with ICD-10 Codes (continued)

Conditions	Subconditions	ICD-10-CM	ICD-10-CM Description
Diabetes short-term complication, continued	Diabetes short-term complication* (PQI 01), continued	E1101	Type 2 diabetes mellitus with hyperosmolarity with coma
		E11641	Type 2 diabetes mellitus with hypoglycemia with coma
		E1165	Type 2 diabetes mellitus with hyperglycemia
		E08.10	Diabetes mellitus due to underlying condition with ketoacidosis without coma
		E09.10	Drug or chemical induced diabetes mellitus with ketoacidosis without coma
		E13.10	Other specified diabetes mellitus with ketoacidosis without coma
		E08.65	Diabetes mellitus due to underlying condition with hyperglycemia
		E08.01	Diabetes mellitus due to underlying condition with hyperosmolarity with coma
		E09.01	Drug or chemical induced diabetes mellitus with hyperosmolarity with coma
		E13.00	Other specified diabetes mellitus with hyperosmolarity without nonketotic hyperglycemic-hyperosmolar coma (NKHHC)
		E08.65	Diabetes mellitus due to underlying condition with hyperglycemia
		E08.11	Diabetes mellitus due to underlying condition with ketoacidosis with coma
		E08.641	Diabetes mellitus due to underlying condition with hypoglycemia with coma
		E09.11	Drug or chemical induced diabetes mellitus with ketoacidosis with coma
		E09.641	Drug or chemical induced diabetes mellitus with hypoglycemia with coma
		E13.11	Other specified diabetes mellitus with ketoacidosis with coma
		E13.641	Other specified diabetes mellitus with hypoglycemia with coma
		E09.65	Drug or chemical induced diabetes mellitus with hyperglycemia
		E08.618	Diabetes mellitus due to underlying condition with other diabetic arthropathy
		E08.620	Diabetes mellitus due to underlying condition with diabetic dermatitis

(continued)

Table 1-1. Preliminary List of Conditions for Defining Potentially Preventable Admissions or Observation Stays with ICD-10 Codes (continued)

Conditions	Subconditions	ICD-10-CM	ICD-10-CM Description
Diabetes short-term complication, continued	Diabetes short-term complication* (PQI 01), continued	E08.621	Diabetes mellitus due to underlying condition with foot ulcer
		E08.622	Diabetes mellitus due to underlying condition with other skin ulcer
		E08.628	Diabetes mellitus due to underlying condition with other skin complications
		E08.630	Diabetes mellitus due to underlying condition with periodontal disease
		E08.638	Diabetes mellitus due to underlying condition with other oral complications
		E08.65	Diabetes mellitus due to underlying condition with hyperglycemia
		E08.69	Diabetes mellitus due to underlying condition with other specified complication
		E09.618	Drug or chemical induced diabetes mellitus with other diabetic arthropathy
		E09.621	Drug or chemical induced diabetes mellitus with foot ulcer
		E09.622	Drug or chemical induced diabetes mellitus with other skin ulcer
		E09.628	Drug or chemical induced diabetes mellitus with other skin complications
		E09.630	Drug or chemical induced diabetes mellitus with periodontal disease
		E09.638	Drug or chemical induced diabetes mellitus with other oral complications
		E09.649	Drug or chemical induced diabetes mellitus with hypoglycemia without coma
		E09.65	Drug or chemical induced diabetes mellitus with hyperglycemia
		E09.69	Drug or chemical induced diabetes mellitus with other specified complication
		E13.620	Other specified diabetes mellitus with diabetic dermatitis
		E13.621	Other specified diabetes mellitus with foot ulcer
		E13.622	Other specified diabetes mellitus with other skin ulcer
		E13.628	Other specified diabetes mellitus with other skin complications
E13.638	Other specified diabetes mellitus with other oral complications		

(continued)

Table 1-1. Preliminary List of Conditions for Defining Potentially Preventable Admissions or Observation Stays with ICD-10 Codes (continued)

Conditions	Subconditions	ICD-10-CM	ICD-10-CM Description
Diabetes short-term complication, continued	Diabetes short-term complication* (PQI 01), continued	E13.649	Other specified diabetes mellitus with hypoglycemia without coma
		E13.65	Other specified diabetes mellitus with hyperglycemia
		E13.69	Other specified diabetes mellitus with other specified complication
		E09.69	Drug or chemical induced diabetes mellitus with other specified complication
		E11.618	Type 2 diabetes mellitus with other diabetic arthropathy
		E11.620	Type 2 diabetes mellitus with diabetic dermatitis
		E11.621	Type 2 diabetes mellitus with foot ulcer
		E11.622	Type 2 diabetes mellitus with other skin ulcer
		E11.628	Type 2 diabetes mellitus with other skin complications
		E11.630	Type 2 diabetes mellitus with periodontal disease
		E11.638	Type 2 diabetes mellitus with other oral complications
		E11.649	Type 2 diabetes mellitus with hypoglycemia without coma
		E11.65	Type 2 diabetes mellitus with hyperglycemia
		E11.69	Type 2 diabetes mellitus with other specified complication
		E10.618	Type 1 diabetes mellitus with other diabetic arthropathy
		E10.620	Type 1 diabetes mellitus with diabetic dermatitis
		E10.621	Type 1 diabetes mellitus with foot ulcer
		E10.622	Type 1 diabetes mellitus with other skin ulcer
		E10.628	Type 1 diabetes mellitus with other skin complications
		E10.630	Type 1 diabetes mellitus with periodontal disease
		E10.638	Type 1 diabetes mellitus with other oral complications
		E10.649	Type 1 diabetes mellitus with hypoglycemia without coma
		E10.65	Type 1 diabetes mellitus with hyperglycemia

(continued)

Table 1-1. Preliminary List of Conditions for Defining Potentially Preventable Admissions or Observation Stays with ICD-10 Codes (continued)

Conditions	Subconditions	ICD-10-CM	ICD-10-CM Description
Diabetes short-term complication, continued	Diabetes short-term complication* (PQI 01), continued	E10.69	Type 1 diabetes mellitus with other specified complication
Hypotension/ Hypertension	Hypotension	I95.1	Orthostatic hypotension
		I95.89	Other hypotension
		I95.2	Hypotension due to drugs
		I95.81	Postprocedural hypotension
		I95.89	Other hypotension
		I95.9	Hypotension, unspecified
	Hypertension* (PQI 07)	I10	Essential (primary) hypertension
		I119	Hypertensive heart disease without heart failure
		I129	Hypertensive chronic kidney disease with stage 1 through stage 4 chronic kidney disease, or unspecified chronic kidney disease
		I1310	Hypertensive heart and chronic kidney disease without heart failure, with stage 1 through stage 4 chronic kidney disease, or unspecified chronic kidney disease
Influenza		J11.00	Influenza due to unidentified influenza virus with unspecified type of pneumonia
		J12.9	Viral pneumonia, unspecified
		J10.1	Influenza due to other identified influenza virus with other respiratory manifestations
		J11.1	Influenza due to unidentified influenza virus with other respiratory manifestations
		J11.2	Influenza due to unidentified influenza virus with gastrointestinal manifestations
		J11.81	Influenza due to unidentified influenza virus with encephalopathy
		J11.89	Influenza due to unidentified influenza virus with other manifestations
		J09.X1	Influenza due to identified novel influenza A virus with pneumonia
		J09.X2	Influenza due to identified novel influenza A virus with other respiratory manifestations
		J09.X3	Influenza due to identified novel influenza A virus with gastrointestinal manifestations

(continued)

Table 1-1. Preliminary List of Conditions for Defining Potentially Preventable Admissions or Observation Stays with ICD-10 Codes (continued)

Conditions	Subconditions	ICD-10-CM	ICD-10-CM Description
Influenza, continued		J09.X9	Influenza due to identified novel influenza A virus with other manifestations
		J10.08	Influenza due to other identified influenza virus with other specified pneumonia
Bacterial pneumonia	Bacterial pneumonia* (PQI 11)	J13	Pneumonia due to Streptococcus pneumoniae
		J14	Pneumonia due to Hemophilus influenzae
		J15211	Pneumonia due to Methicillin susceptible Staphylococcus aureus
		J15212	Pneumonia due to Methicillin resistant Staphylococcus aureus
		J153	Pneumonia due to streptococcus, group B
		J154	Pneumonia due to other streptococci
		J157	Pneumonia due to Mycoplasma pneumoniae
		J159	Unspecified bacterial pneumonia
		J160	Chlamydial pneumonia
		J168	Pneumonia due to other specified infectious organisms
		J180	Bronchopneumonia, unspecified organism
		J181	Lobar pneumonia, unspecified organism
		J188	Other pneumonia, unspecified organism
		J189	Pneumonia, unspecified organism
Urinary tract infection / Kidney infection	Urinary tract infection*	N10	Acute tubulo-interstitial nephritis
		N119	Chronic tubulo-interstitial nephritis, unspecified
		N12	Tubulo-interstitial nephritis, not specified as acute or
		N151	Renal and perinephric abscess
		N159	Renal tubulo-interstitial disease, unspecified
		N16	Renal tubulo-interstitial disorders in diseases classified elsewhere
		N2884	Pyelitis cystica
		N2885	Pyeloureteritis cystica
		N2886	Ureteritis cystica

(continued)

Table 1-1. Preliminary List of Conditions for Defining Potentially Preventable Admissions or Observation Stays with ICD-10 Codes (continued)

Conditions	Subconditions	ICD-10-CM	ICD-10-CM Description
Urinary tract infection / Kidney infection, continued	Urinary tract infection*, continued	N3000	Acute cystitis without hematuria
		N3001	Acute cystitis with hematuria
		N3090	Cystitis, unspecified without hematuria
		N3091	Cystitis, unspecified with hematuria
		N390	Urinary tract infection, site not specified
	Kidney infection	N30.10	Interstitial cystitis (chronic) without hematuria
		N30.11	Interstitial cystitis (chronic) with hematuria
		N30.20	Other chronic cystitis without hematuria
		N30.21	Other chronic cystitis with hematuria
		N30.80	Other cystitis without hematuria
		N30.81	Other cystitis with hematuria
		N34.0	Urethral abscess
C. difficile infection [135 subset]		A04.7	Enterocolitis due to Clostridium difficile
Septicemia (except in labor)[2]		A02.1	Salmonella sepsis
		A20.7	Septicemic plague
		A22.7	Anthrax sepsis
		A39.4	Meningococemia, unspecified
		A40.9	Streptococcal sepsis, unspecified
		A41.2	Sepsis due to unspecified staphylococcus
		A41.01	Sepsis due to Methicillin susceptible Staphylococcus aureus
		A41.02	Sepsis due to Methicillin resistant Staphylococcus aureus
		A41.1	Sepsis due to other specified staphylococcus
		A40.3	Sepsis due to Streptococcus pneumoniae
		A41.4	Sepsis due to anaerobes
		A41.50	Gram-negative sepsis, unspecified
		A41.3	Sepsis due to Hemophilus influenzae
		A41.51	Sepsis due to Escherichia coli [E. coli]
		A41.52	Sepsis due to Pseudomonas
		A41.53	Sepsis due to Serratia
		A41.59	Other Gram-negative sepsis
		A41.89	Other specified sepsis
		A41.9	Sepsis, unspecified organism
		B00.7	Disseminated herpesviral disease
		I76	Septic arterial embolism
	A41.9	Sepsis, unspecified organism	

(continued)

Table 1-1. Preliminary List of Conditions for Defining Potentially Preventable Admissions or Observation Stays with ICD-10 Codes (continued)

Conditions	Subconditions	ICD-10-CM	ICD-10-CM Description	
Septicemia (except in labor) [2], continued		R65.20	Severe sepsis without septic shock	
		R65.21	Severe sepsis with septic shock	
Dehydration/ Electrolyte imbalance [55]	Dehydration*	E860	Dehydration	
		E861	Hypovolemia	
		E869	Volume depletion, unspecified	
	Hyperosmolality and/or hypernatremia~	E870	Hyperosmolality and hypernatremia	
	Gastroenteritis~	A080	Rotaviral enteritis	
		A0811	Acute gastroenteropathy due to Norwalk agent	
		A0819	Acute gastroenteropathy due to other small round	
		A082	Adenoviral enteritis	
		A0831	Calicivirus enteritis	
		A0832	Astrovirus enteritis	
		A0839	Other viral enteritis	
		A084	Viral intestinal infection, unspecified	
		A088	Other specified intestinal infections	
		A09	Infectious gastroenteritis and colitis, unspecified	
		K5289	Other specified noninfective gastroenteritis and colitis	
		K529	Noninfective gastroenteritis and colitis, unspecified	
		Acute kidney failure~	N170	Acute kidney failure with tubular necrosis
			N171	Acute kidney failure with acute cortical necrosis
	N172		Acute kidney failure with medullary necrosis	
	N178		Other acute kidney failure	
	N179		Acute kidney failure, unspecified	
	N19		Unspecified kidney failure	
	N990		Postprocedural (acute) (chronic) kidney failure	
	E87.2		Acidosis	
	E87.3		Alkalosis	
	E87.4		Mixed disorder of acid-base balance	
	E87.70		Fluid overload, unspecified	
	E87.79		Other fluid overload	
	E87.5		Hyperkalemia	
	E87.6		Hypokalemia	
	E87.8		Other disorders of electrolyte and fluid balance, not elsewhere classified	

(continued)

Table 1-1. Preliminary List of Conditions for Defining Potentially Preventable Admissions or Observation Stays with ICD-10 Codes (continued)

Conditions	Subconditions	ICD-10-CM	ICD-10-CM Description
Skin and subcutaneous tissue infections [197]		L03.021	Acute lymphangitis of right finger
		L03.022	Acute lymphangitis of left finger
		L03.029	Acute lymphangitis of unspecified finger
		L03.041	Acute lymphangitis of right toe
		L03.042	Acute lymphangitis of left toe
		L03.049	Acute lymphangitis of unspecified toe
		L03.121	Acute lymphangitis of right axilla
		L03.122	Acute lymphangitis of left axilla
		L03.123	Acute lymphangitis of right upper limb
		L03.124	Acute lymphangitis of left upper limb
		L03.125	Acute lymphangitis of right lower limb
		L03.126	Acute lymphangitis of left lower limb
		L03.129	Acute lymphangitis of unspecified part of limb
		L03.212	Acute lymphangitis of face
		L03.222	Acute lymphangitis of neck
		L03.321	Acute lymphangitis of abdominal wall
		L03.322	Acute lymphangitis of back [any part except buttock]
		L03.323	Acute lymphangitis of chest wall
		L03.324	Acute lymphangitis of groin
		L03.325	Acute lymphangitis of perineum
		L03.326	Acute lymphangitis of umbilicus
		L03.327	Acute lymphangitis of buttock
		L03.329	Acute lymphangitis of trunk, unspecified
		L03.891	Acute lymphangitis of head [any part, except face]
		L03.898	Acute lymphangitis of other sites
		L03.91	Acute lymphangitis, unspecified
		L03.011	Cellulitis of right finger
		L03.012	Cellulitis of left finger
		L03.019	Cellulitis of unspecified finger
		L03.031	Cellulitis of right toe
		L03.032	Cellulitis of left toe
		L03.039	Cellulitis of unspecified toe
		L03.111	Cellulitis of right axilla
		L03.112	Cellulitis of left axilla
		L03.113	Cellulitis of right upper limb
		L03.114	Cellulitis of left upper limb
		L03.115	Cellulitis of right lower limb
		L03.116	Cellulitis of left lower limb
		L03.119	Cellulitis of unspecified part of limb

(continued)

Table 1-1. Preliminary List of Conditions for Defining Potentially Preventable Admissions or Observation Stays with ICD-10 Codes (continued)

Conditions	Subconditions	ICD-10-CM	ICD-10-CM Description
Skin and subcutaneous tissue infections [197], continued		L03.211	Cellulitis of face
		L03.221	Cellulitis of neck
		L03.311	Cellulitis of abdominal wall
		L03.312	Cellulitis of back [any part except buttock]
		L03.313	Cellulitis of chest wall
		L03.314	Cellulitis of groin
		L03.315	Cellulitis of perineum
		L03.316	Cellulitis of umbilicus
		L03.317	Cellulitis of buttock
		L03.319	Cellulitis of trunk, unspecified
		L03.811	Cellulitis of head [any part, except face]
		L03.818	Cellulitis of other sites
		L03.90	Cellulitis, unspecified
		K12.2	Cellulitis and abscess of mouth
		L02.01	Cutaneous abscess of face
		L02.11	Cutaneous abscess of neck
		L02.211	Cutaneous abscess of abdominal wall
		L02.212	Cutaneous abscess of back [any part, except buttock]
		L02.213	Cutaneous abscess of chest wall
		L02.214	Cutaneous abscess of groin
		L02.215	Cutaneous abscess of perineum
		L02.216	Cutaneous abscess of umbilicus
		L02.219	Cutaneous abscess of trunk, unspecified
		L02.31	Cutaneous abscess of buttock
		L02.411	Cutaneous abscess of right axilla
		L02.412	Cutaneous abscess of left axilla
		L02.413	Cutaneous abscess of right upper limb
		L02.414	Cutaneous abscess of left upper limb
		L02.415	Cutaneous abscess of right lower limb
		L02.416	Cutaneous abscess of left lower limb
		L02.419	Cutaneous abscess of limb, unspecified
		L02.511	Cutaneous abscess of right hand
		L02.512	Cutaneous abscess of left hand
		L02.519	Cutaneous abscess of unspecified hand
		L02.611	Cutaneous abscess of right foot
		L02.612	Cutaneous abscess of left foot
		L02.619	Cutaneous abscess of unspecified foot
		L02.811	Cutaneous abscess of head [any part, except face]
		L02.818	Cutaneous abscess of other sites
		L02.91	Cutaneous abscess, unspecified
		L08.89	Other specified local infections of the skin and subcutaneous tissue

(continued)

Table 1-1. Preliminary List of Conditions for Defining Potentially Preventable Admissions or Observation Stays with ICD-10 Codes (continued)

Conditions	Subconditions	ICD-10-CM	ICD-10-CM Description
Skin and subcutaneous tissue infections [197], continued		L08.9	Local infection of the skin and subcutaneous tissue, unspecified
Aspiration pneumonitis; food/vomitus [129]		J69.0	Pneumonitis due to inhalation of food and vomit
Arrhythmia		I48.91	Unspecified atrial fibrillation
		I48.92	Unspecified atrial flutter
		I48.0	Paroxysmal atrial fibrillation
		I48.1	Persistent atrial fibrillation
		I48.3	Typical atrial flutter
		I48.4	Atypical atrial flutter
Intestinal impaction		K56.49	Other impaction of intestine
		K56.41	Fecal impaction
Pressure ulcers		L89.90	Pressure ulcer of unspecified site, unspecified stage
		L89.009	Pressure ulcer of unspecified elbow, unspecified stage
		L89.119	Pressure ulcer of right upper back, unspecified stage
		L89.129	Pressure ulcer of left upper back, unspecified stage
		L89.139	Pressure ulcer of right lower back, unspecified stage
		L89.149	Pressure ulcer of left lower back, unspecified stage
		L89.159	Pressure ulcer of sacral region, unspecified stage
		L89.209	Pressure ulcer of unspecified hip, unspecified stage
		L89.309	Pressure ulcer of unspecified buttock, unspecified stage
		L89.509	Pressure ulcer of unspecified ankle, unspecified stage
		L89.609	Pressure ulcer of unspecified heel, unspecified stage
		L89.819	Pressure ulcer of head, unspecified stage
		L89.899	Pressure ulcer of other site, unspecified stage
		L89.000	Pressure ulcer of unspecified elbow, unstageable
		L89.003	Pressure ulcer of unspecified elbow, stage 3
	L89.004	Pressure ulcer of unspecified elbow, stage 4	
	L89.010	Pressure ulcer of right elbow, unstageable	

(continued)

Table 1-1. Preliminary List of Conditions for Defining Potentially Preventable Admissions or Observation Stays with ICD-10 Codes (continued)

Conditions	Subconditions	ICD-10-CM	ICD-10-CM Description
Pressure ulcers, continued		L89.013	Pressure ulcer of right elbow, stage 3
		L89.014	Pressure ulcer of right elbow, stage 4
		L89.019	Pressure ulcer of right elbow, unspecified stage
		L89.020	Pressure ulcer of left elbow, unstageable
		L89.023	Pressure ulcer of left elbow, stage 3
		L89.024	Pressure ulcer of left elbow, stage 4
		L89.029	Pressure ulcer of left elbow, unspecified stage
		L89.100	Pressure ulcer of unspecified part of back, unstageable
		L89.103	Pressure ulcer of unspecified part of back, stage 3
		L89.104	Pressure ulcer of unspecified part of back, stage 4
		L89.109	Pressure ulcer of unspecified part of back, unspecified stage
		L89.110	Pressure ulcer of right upper back, unstageable
		L89.113	Pressure ulcer of right upper back, stage 3
		L89.114	Pressure ulcer of right upper back, stage 4
		L89.120	Pressure ulcer of left upper back, unstageable
		L89.123	Pressure ulcer of left upper back, stage 3
		L89.124	Pressure ulcer of left upper back, stage 4
		L89.130	Pressure ulcer of right lower back, unstageable
		L89.133	Pressure ulcer of right lower back, stage 3
		L89.134	Pressure ulcer of right lower back, stage 4
		L89.140	Pressure ulcer of left lower back, unstageable
		L89.143	Pressure ulcer of left lower back, stage 3
		L89.144	Pressure ulcer of left lower back, stage 4
		L89.150	Pressure ulcer of sacral region, unstageable
		L89.153	Pressure ulcer of sacral region, stage 3
		L89.154	Pressure ulcer of sacral region, stage 4

(continued)

Table 1-1. Preliminary List of Conditions for Defining Potentially Preventable Admissions or Observation Stays with ICD-10 Codes (continued)

Conditions	Subconditions	ICD-10-CM	ICD-10-CM Description
Pressure ulcers, continued		L89.200	Pressure ulcer of unspecified hip, unstageable
		L89.203	Pressure ulcer of unspecified hip, stage 3
		L89.204	Pressure ulcer of unspecified hip, stage 4
		L89.210	Pressure ulcer of right hip, unstageable
		L89.213	Pressure ulcer of right hip, stage 3
		L89.214	Pressure ulcer of right hip, stage 4
		L89.219	Pressure ulcer of right hip, unspecified stage
		L89.220	Pressure ulcer of left hip, unstageable
		L89.223	Pressure ulcer of left hip, stage 3
		L89.224	Pressure ulcer of left hip, stage 4
		L89.229	Pressure ulcer of left hip, unspecified stage
		L89.300	Pressure ulcer of unspecified buttock, unstageable
		L89.303	Pressure ulcer of unspecified buttock, stage 3
		L89.304	Pressure ulcer of unspecified buttock, stage 4
		L89.309	Pressure ulcer of unspecified buttock, unspecified stage
		L89.310	Pressure ulcer of right buttock, unstageable
		L89.313	Pressure ulcer of right buttock, stage 3
		L89.314	Pressure ulcer of right buttock, stage 4
		L89.319	Pressure ulcer of right buttock, unspecified stage
		L89.320	Pressure ulcer of left buttock, unstageable
		L89.323	Pressure ulcer of left buttock, stage 3
		L89.324	Pressure ulcer of left buttock, stage 4
		L89.329	Pressure ulcer of left buttock, unspecified stage
		L89.40	Pressure ulcer of contiguous site of back, buttock and hip, unspecified stage
		L89.43	Pressure ulcer of contiguous site of back, buttock and hip, stage 3
		L89.44	Pressure ulcer of contiguous site of back, buttock and hip, stage 4
		L89.45	Pressure ulcer of contiguous site of back, buttock and hip, unstageable
		L89.500	Pressure ulcer of unspecified ankle, unstageable

(continued)

Table 1-1. Preliminary List of Conditions for Defining Potentially Preventable Admissions or Observation Stays with ICD-10 Codes (continued)

Conditions	Subconditions	ICD-10-CM	ICD-10-CM Description
Pressure ulcers, continued		L89.503	Pressure ulcer of unspecified ankle, stage 3
		L89.504	Pressure ulcer of unspecified ankle, stage 4
		L89.509	Pressure ulcer of unspecified ankle, unspecified stage
		L89.510	Pressure ulcer of right ankle, unstageable
		L89.513	Pressure ulcer of right ankle, stage 3
		L89.514	Pressure ulcer of right ankle, stage 4
		L89.519	Pressure ulcer of right ankle, unspecified stage
		L89.520	Pressure ulcer of left ankle, unstageable
		L89.523	Pressure ulcer of left ankle, stage 3
		L89.524	Pressure ulcer of left ankle, stage 4
		L89.529	Pressure ulcer of left ankle, unspecified stage
		L89.600	Pressure ulcer of unspecified heel, unstageable
		L89.603	Pressure ulcer of unspecified heel, stage 3
		L89.604	Pressure ulcer of unspecified heel, stage 4
		L89.610	Pressure ulcer of right heel, unstageable
		L89.613	Pressure ulcer of right heel, stage 3
		L89.614	Pressure ulcer of right heel, stage 4
		L89.619	Pressure ulcer of right heel, unspecified stage
		L89.620	Pressure ulcer of left heel, unstageable
		L89.623	Pressure ulcer of left heel, stage 3
		L89.624	Pressure ulcer of left heel, stage 4
		L89.629	Pressure ulcer of left heel, unspecified stage
		L89.629	Pressure ulcer of left heel, unspecified stage
		L89.810	Pressure ulcer of head, unstageable
		L89.813	Pressure ulcer of head, stage 3
		L89.814	Pressure ulcer of head, stage 4
		L89.890	Pressure ulcer of other site, unstageable
		L89.893	Pressure ulcer of other site, stage 3
		L89.894	Pressure ulcer of other site, stage 4
		L89.90	Pressure ulcer of unspecified site, unspecified stage
		L89.93	Pressure ulcer of unspecified site, stage 3

(continued)

Table 1-1. Preliminary List of Conditions for Defining Potentially Preventable Admissions or Observation Stays with ICD-10 Codes (continued)

Conditions	Subconditions	ICD-10-CM	ICD-10-CM Description
Pressure ulcers, continued		L89.94	Pressure ulcer of unspecified site, stage 4
		L89.95	Pressure ulcer of unspecified site, unstageable

NOTES: [###] indicates CCS code; * AHRQ PQI ICD-10 v5 specifications

Table 1-2. Preliminary Logistic Regression Model Results for the Home Health Within-stay Potentially Preventable Hospitalization Measure (2016)

Number of stays included in the model = 3,266,928

Observed number (percentage) of stays that resulted in a potentially preventable hospitalization = 363,498 (11.1%)

Model c-statistic = 0.727

Characteristic	Stays	% Stays	PPHs	PPH Rate	Estimate	Odds Ratio	95% CI	P-value
All Home Health Stays	3,266,928	100%	363,498	11.1%				
Demographic Characteristics								
Age & Sex								
18-34, Female	5,970	0.2%	710	11.9%	-0.222	0.80	(0.74, 0.87)	<.0001
18-34, Male	6,037	0.2%	646	10.7%	-0.341	0.71	(0.65, 0.78)	<.0001
35-44, Female	16,698	0.5%	2,057	12.3%	-0.125	0.88	(0.84, 0.93)	<.0001
35-44, Male	14,871	0.5%	1,797	12.1%	-0.175	0.84	(0.79, 0.89)	<.0001
45-54, Female	50,046	1.5%	5,900	11.8%	-0.108	0.90	(0.87, 0.93)	<.0001
45-54, Male	43,285	1.3%	5,369	12.4%	-0.101	0.90	(0.87, 0.94)	<.0001
55-59, Female	53,922	1.7%	6,540	12.1%	-0.041	0.96	(0.93, 0.99)	0.0136
55-59, Male	44,583	1.4%	5,706	12.8%	-0.048	0.95	(0.92, 0.99)	0.0064
60-64, Female	73,408	2.2%	9,005	12.3%	-0.017	0.98	(0.95, 1.01)	0.2574
60-64, Male	58,122	1.8%	7,482	12.9%	-0.017	0.98	(0.95, 1.01)	0.2799
65-69, Female	214,924	6.6%	21,086	9.8%	0.021	1.02	(1.00, 1.05)	0.0763
65-69, Male (Reference)	153,059	4.7%	15,481	10.1%	-	-	-	-
70-74, Female	271,864	8.3%	27,424	10.1%	0.079	1.08	(1.06, 1.11)	<.0001
70-74, Male	183,951	5.6%	19,919	10.8%	0.101	1.11	(1.08, 1.13)	<.0001
75-79, Female	310,779	9.5%	32,381	10.4%	0.117	1.12	(1.10, 1.15)	<.0001
75-79, Male	197,829	6.1%	22,921	11.6%	0.161	1.17	(1.15, 1.20)	<.0001
80-84, Female	349,175	10.7%	37,695	10.8%	0.158	1.17	(1.15, 1.20)	<.0001
80-84, Male	202,458	6.2%	24,457	12.1%	0.217	1.24	(1.22, 1.27)	<.0001
85-89, Female	364,586	11.2%	39,353	10.8%	0.182	1.20	(1.17, 1.23)	<.0001

Characteristic	Stays	% Stays	PPHs	PPH Rate	Estimate	Odds Ratio	95% CI	P-value
85-89, Male	185,426	5.7%	23,007	12.4%	0.272	1.31	(1.28, 1.34)	<.0001
90-94, Female	244,890	7.5%	27,414	11.2%	0.247	1.28	(1.25, 1.31)	<.0001
90-94, Male	104,811	3.2%	13,551	12.9%	0.365	1.44	(1.40, 1.48)	<.0001
95+, Female	86,905	2.7%	9,690	11.2%	0.258	1.29	(1.26, 1.33)	<.0001
95+, Male	29,329	0.9%	3,907	13.3%	0.440	1.55	(1.49, 1.62)	<.0001
Original Medicare Enrollment								
Age (Reference)	2,464,333	75.4%	258,413	10.5%	-	-	-	-
Disability	764,038	23.4%	97,862	12.8%	0.139	1.15	(1.14, 1.16)	<.0001
ESRD	38,557	1.2%	7,223	18.7%	0.252	1.29	(1.25, 1.33)	<.0001
Activities of Daily Living (ADL) Scores								
ADL Score 1	3,266,928	100%	363,498	11.1%	0.079	1.08	(1.06, 1.10)	<.0001
ADL Score 2	3,266,928	100%	363,498	11.1%	0.188	1.21	(1.19, 1.23)	<.0001
ADL Score 3	3,266,928	100%	363,498	11.1%	-0.013	0.99	(0.97, 1.01)	0.2275
ADL Score 4	3,266,928	100%	363,498	11.1%	-0.031	0.97	(0.95, 0.99)	0.0008
Care Received during Prior Proximal Hospitalization								
Length of Prior Proximal Hospitalization								
0-7 Days (Reference)	2,863,131	87.6%	295,858	10.3%	-	-	-	-
≥ 8 Days	403,797	12.4%	67,640	16.8%	0.199	1.22	(1.21, 1.24)	<.0001
Prior Proximal Hospitalization in ICU/CCU								
No (Reference)	2,673,749	81.8%	275,077	10.3%	-	-	-	-
Yes	593,179	18.2%	88,421	14.9%	0.059	1.06	(1.05, 1.07)	<.0001
Other Care Received within One Year of Stay								
Number of Prior Acute Discharges (Excludes Prior Proximal)								
0 (Reference)	2,200,512	67.4%	174,344	7.9%	-	-	-	-
1	561,204	17.2%	74,689	13.3%	0.395	1.48	(1.47, 1.50)	<.0001
2	249,023	7.6%	45,374	18.2%	0.639	1.89	(1.87, 1.92)	<.0001
3	119,944	3.7%	27,058	22.6%	0.833	2.30	(2.26, 2.34)	<.0001
4	60,727	1.9%	16,132	26.6%	1.000	2.72	(2.66, 2.78)	<.0001

Characteristic	Stays	% Stays	PPHs	PPH Rate	Estimate	Odds Ratio	95% CI	P-value
5	32,197	1.0%	9,695	30.1%	1.149	3.16	(3.07, 3.24)	<.0001
6	17,691	0.5%	6,028	34.1%	1.309	3.70	(3.58, 3.83)	<.0001
7	9,956	0.3%	3,569	35.8%	1.388	4.01	(3.83, 4.19)	<.0001
8	5,775	0.2%	2,219	38.4%	1.481	4.40	(4.16, 4.66)	<.0001
9	3,494	0.1%	1,429	40.9%	1.584	4.87	(4.54, 5.24)	<.0001
10+	6,405	0.2%	2,961	46.2%	1.873	6.51	(6.17, 6.87)	<.0001
Number of Outpatient Emergency Department Visits								
0 (Reference)	338,125	10.3%	24,552	7.3%	-	-	-	-
≥ 1	2,928,803	89.7%	338,946	11.6%	0.274	1.32	(1.30, 1.33)	<.0001
Number of Skilled Nursing Facility (SNF) Visits								
0 (Reference)	2,280,353	69.8%	222,872	9.8%	-	-	-	-
≥ 1	986,575	30.2%	140,626	14.3%	0.092	1.10	(1.09, 1.11)	<.0001
Number of Inpatient Rehabilitation Facility (IRF) Visits								
0 (Reference)	2,984,254	91.3%	326,255	10.9%	-	-	-	-
≥ 1	282,674	8.7%	37,243	13.2%	-	-	-	-
Number of Long-Term Care Hospital (LTCH) Visits								
0 (Reference)	3,212,391	98.3%	349,564	10.9%	-	-	-	-
≥ 1	54,537	1.7%	13,934	25.5%	0.258	1.29	(1.27, 1.32)	<.0001

Table 1-2. Preliminary Logistic Regression Model Results for the Home Health Within-stay Potentially Preventable Hospitalization Measure (2016) (continued)

CCS Diagnosis Group	Stays	% Stays	PPHs	PPH Rate	Estimate	Odds Ratio	95% CI	P-value
All Home Health Stays	3,266,928	100%	363,498	11.1%				
No CCS								
No Prior Proximal Hospitalization (Reference)	1,632,597	50.0%	162,830	10.0%	-	-	-	-
Infectious and Parasitic Diseases								
1 - Tuberculosis	87	0.0%	11	12.6%	-	-	-	-
2 - Septicemia (except in labor)	110,261	3.4%	19,416	17.6%	0.276	1.32	(1.29,1.34)	<.0001
3 - Bacterial infection; unspecified site	1,342	0.0%	185	13.8%	-	-	-	-
4 - Mycoses	971	0.0%	204	21.0%	-	-	-	-
5 - HIV infection	365	0.0%	50	13.7%	-	-	-	-
6 - Hepatitis	550	0.0%	92	16.7%	-	-	-	-
7 - Viral infection	1,906	0.1%	222	11.6%	-	-	-	-
8 - Other infections; including parasitic	274	0.0%	13	4.7%	-	-	-	-
9 - Sexually transmitted infections (not HIV or hepatitis)	97	0.0%	6	6.2%	-	-	-	-
10 - Immunizations and screening for infectious disease	10	0.0%	1	10.0%	-	-	-	-
Neoplasms								
11 - Cancer of head and neck	2,214	0.1%	256	11.6%	-	-	-	-
12 - Cancer of esophagus	1,109	0.0%	155	14.0%	-	-	-	-
13 - Cancer of stomach	1,410	0.0%	191	13.5%	-	-	-	-
14 - Cancer of colon	6,647	0.2%	623	9.4%	-	-	-	-
15 - Cancer of rectum and anus	3,400	0.1%	429	12.6%	0.309	1.36	(1.22, 1.52)	<.0001
16 - Cancer of liver and intrahepatic bile duct	851	0.0%	105	12.3%	-	-	-	-
17 - Cancer of pancreas	2,051	0.1%	316	15.4%	0.465	1.59	(1.40, 1.81)	<.0001

CCS Diagnosis Group	Stays	% Stays	PPHs	PPH Rate	Estimate	Odds Ratio	95% CI	P-value
18 - Cancer of other GI organs; peritoneum	1,294	0.0%	146	11.3%	-	-	-	-
19 - Cancer of bronchus; lung	8,972	0.3%	1,150	12.8%	0.534	1.71	(1.58, 1.84)	<.0001
20 - Cancer; other respiratory and intrathoracic	305	0.0%	35	11.5%	-	-	-	-
21 - Cancer of bone and connective tissue	860	0.0%	70	8.1%	-	-	-	-
22 - Melanomas of skin	163	0.0%	16	9.8%	-	-	-	-
23 - Other non-epithelial cancer of skin	552	0.0%	40	7.2%	-	-	-	-
24 - Cancer of breast	2,362	0.1%	145	6.1%	-	-	-	-
25 - Cancer of uterus	1,094	0.0%	105	9.6%	-	-	-	-
26 - Cancer of cervix	134	0.0%	23	17.2%	-	-	-	-
27 - Cancer of ovary	1,216	0.0%	137	11.3%	-	-	-	-
28 - Cancer of other female genital organs	465	0.0%	41	8.8%	-	-	-	-
29 - Cancer of prostate	1,195	0.0%	127	10.6%	-	-	-	-
30 - Cancer of testis	9	0.0%	1	11.1%	-	-	-	-
31 - Cancer of other male genital organs	77	0.0%	11	14.3%	-	-	-	-
32 - Cancer of bladder	3,580	0.1%	634	17.7%	0.503	1.65	(1.50, 1.83)	<.0001
33 - Cancer of kidney and renal pelvis	1,948	0.1%	197	10.1%	-	-	-	-
34 - Cancer of other urinary organs	378	0.0%	40	10.6%	-	-	-	-
35 - Cancer of brain and nervous system	1,550	0.0%	195	12.6%	-	-	-	-
36 - Cancer of thyroid	172	0.0%	13	7.6%	-	-	-	-
37 - Hodgkin's disease	55	0.0%	13	23.6%	-	-	-	-
38 - Non-Hodgkin's lymphoma	1,738	0.1%	357	20.5%	0.513	1.67	(1.47, 1.89)	<.0001
39 - Leukemias	1,228	0.0%	234	19.1%	-	-	-	-
40 - Multiple myeloma	932	0.0%	181	19.4%	0.411	1.51	(1.27, 1.79)	<.0001

CCS Diagnosis Group	Stays	% Stays	PPHs	PPH Rate	Estimate	Odds Ratio	95% CI	P-value
41 - Cancer; other and unspecified primary	285	0.0%	44	15.4%	-	-	-	-
42 - Secondary malignancies	8,326	0.3%	1,352	16.2%	0.446	1.56	(1.47, 1.66)	<.0001
43 - Malignant neoplasm without specification of site	511	0.0%	89	17.4%	0.597	1.82	(1.43, 2.31)	<.0001
44 - Neoplasms of unspecified nature or uncertain behavior	1,682	0.1%	251	14.9%	-	-	-	-
45 - Maintenance chemotherapy; radiotherapy	1,258	0.0%	236	18.8%	-	-	-	-
46 - Benign neoplasm of uterus	159	0.0%	3	1.9%	-	-	-	-
47 - Other and unspecified benign neoplasm	4,101	0.1%	285	6.9%	-0.316	0.73	(0.65, 0.83)	<.0001
Endocrine, Nutritional, and Metabolic Diseases and Immunity Disorders								
48 - Thyroid disorders	682	0.0%	87	12.8%	-	-	-	-
49 - Diabetes mellitus without complication	84	0.0%	11	13.1%	-	-	-	-
50 - Diabetes mellitus with complications	25,535	0.8%	4,642	18.2%	0.376	1.46	(1.41, 1.51)	<.0001
51 - Other endocrine disorders	4,171	0.1%	559	13.4%	-	-	-	-
52 - Nutritional deficiencies	745	0.0%	105	14.1%	-	-	-	-
53 - Disorders of lipid metabolism	30	0.0%	2	6.7%	-	-	-	-
54 - Gout and other crystal arthropathies	1,609	0.0%	178	11.1%	-	-	-	-
55 - Fluid and electrolyte disorders	20,211	0.6%	3,373	16.7%	0.276	1.32	(1.27, 1.37)	<.0001
56 - Cystic fibrosis	159	0.0%	15	9.4%	-	-	-	-
57 - Immunity disorders	203	0.0%	29	14.3%	-	-	-	-
58 - Other nutritional; endocrine; and metabolic disorders	3,556	0.1%	487	13.7%	-	-	-	-

CCS Diagnosis Group	Stays	% Stays	PPHs	PPH Rate	Estimate	Odds Ratio	95% CI	P-value
Diseases of the Blood and Blood-Forming Organs								
59 - Deficiency and other anemia	6,912	0.2%	1,195	17.3%	0.204	1.23	(1.15, 1.31)	<.0001
60 - Acute posthemorrhagic anemia	2,803	0.1%	426	15.2%	-	-	-	-
61 - Sickle cell anemia	293	0.0%	38	13.0%	-	-	-	-
62 - Coagulation and hemorrhagic disorders	1,293	0.0%	212	16.4%	-	-	-	-
63 - Diseases of white blood cells	1,341	0.0%	224	16.7%	-	-	-	-
64 - Other hematologic conditions	181	0.0%	25	13.8%	-	-	-	-
Diseases of the Nervous System and Sense Organs								
76 - Meningitis (except that caused by tuberculosis or sexually transmitted disease)	493	0.0%	47	9.5%	-	-	-	-
77 - Encephalitis (except that caused by tuberculosis or sexually transmitted disease)	476	0.0%	53	11.1%	-	-	-	-
78 - Other CNS infection and poliomyelitis	437	0.0%	31	7.1%	-	-	-	-
79 - Parkinson`s disease	1,947	0.1%	175	9.0%	-	-	-	-
80 - Multiple sclerosis	1,101	0.0%	87	7.9%	-	-	-	-
81 - Other hereditary and degenerative nervous system conditions	1,412	0.0%	135	9.6%	-	-	-	-
82 - Paralysis	555	0.0%	59	10.6%	-	-	-	-
83 - Epilepsy; convulsions	8,468	0.3%	822	9.7%	-0.324	0.72	(0.67, 0.78)	<.0001
84 - Headache; including migraine	852	0.0%	62	7.3%	-	-	-	-
85 - Coma; stupor; and brain damage	105	0.0%	14	13.3%	-	-	-	-
86 - Cataract	7	0.0%	1	14.3%	-	-	-	-

CCS Diagnosis Group	Stays	% Stays	PPHs	PPH Rate	Estimate	Odds Ratio	95% CI	P-value
87 - Retinal detachments; defects; vascular occlusion; and retinopathy	95	0.0%	6	6.3%	-	-	-	-
88 - Glaucoma	23	0.0%	4	17.4%	-	-	-	-
89 - Blindness and vision defects	205	0.0%	23	11.2%	-	-	-	-
90 - Inflammation; infection of eye (except that caused by tuberculosis or sexually transmitted disease)	276	0.0%	34	12.3%	-	-	-	-
91 - Other eye disorders	215	0.0%	17	7.9%	-	-	-	-
92 - Otitis media and related conditions	177	0.0%	16	9.0%	-	-	-	-
93 - Conditions associated with dizziness or vertigo	3,178	0.1%	206	6.5%	-0.493	0.61	(0.53, 0.71)	<.0001
94 - Other ear and sense organ disorders	196	0.0%	15	7.7%	-	-	-	-
95 - Other nervous system disorders	17,415	0.5%	2,020	11.6%	-	-	-	-
Diseases of the Circulatory System								
96 - Heart valve disorders	21,580	0.7%	2,036	9.4%	-	-	-	-
97 - Peri-; endo-; and myocarditis; cardiomyopathy (except that caused by tuberculosis or sexually transmitted disease)	2,997	0.1%	442	14.7%	-	-	-	-
98 - Essential hypertension	2,569	0.1%	273	10.6%	-	-	-	-
99 - Hypertension with complications and secondary hypertension	31,544	1.0%	7,545	23.9%	0.668	1.95	(1.90, 2.01)	<.0001
100 - Acute myocardial infarction	33,895	1.0%	4,723	13.9%	0.240	1.27	(1.22, 1.32)	<.0001
101 - Coronary atherosclerosis and other heart disease	25,439	0.8%	2,251	8.8%	-	-	-	-
102 - Nonspecific chest pain	5,221	0.2%	704	13.5%	-	-	-	-
103 - Pulmonary heart disease	11,650	0.4%	1,455	12.5%	-	-	-	-

CCS Diagnosis Group	Stays	% Stays	PPHs	PPH Rate	Estimate	Odds Ratio	95% CI	P-value
104 - Other and ill-defined heart disease	632	0.0%	67	10.6%	-	-	-	-
105 - Conduction disorders	5,242	0.2%	475	9.1%	-	-	-	-
106 - Cardiac dysrhythmias	39,507	1.2%	6,496	16.4%	0.378	1.46	(1.42, 1.50)	<.0001
107 - Cardiac arrest and ventricular fibrillation	569	0.0%	89	15.6%	-	-	-	-
108 - Congestive heart failure; nonhypertensive	75,748	2.3%	19,033	25.1%	0.630	1.88	(1.84, 1.91)	<.0001
109 - Acute cerebrovascular disease	51,855	1.6%	3,926	7.6%	-0.359	0.70	(0.68,0.72)	<.0001
110 - Occlusion or stenosis of precerebral arteries	3,388	0.1%	247	7.3%	-0.365	0.69	(0.59, 0.82)	<.0001
111 - Other and ill-defined cerebrovascular disease	957	0.0%	76	7.9%	-	-	-	-
112 - Transient cerebral ischemia	9,373	0.3%	818	8.7%	-0.273	0.76	(0.71, 0.82)	<.0001
113 - Late effects of cerebrovascular disease	1,701	0.1%	167	9.8%	-	-	-	-
114 - Peripheral and visceral atherosclerosis	9,424	0.3%	1,055	11.2%	-	-	-	-
115 - Aortic; peripheral; and visceral artery aneurysms	5,678	0.2%	492	8.7%	-	-	-	-
116 - Aortic and peripheral arterial embolism or thrombosis	2,001	0.1%	201	10.0%	-	-	-	-
117 - Other circulatory disease	8,185	0.3%	1,157	14.1%	-	-	-	-
118 - Phlebitis; thrombophlebitis and thromboembolism	7,505	0.2%	1,038	13.8%	-	-	-	-
119 - Varicose veins of lower extremity	349	0.0%	64	18.3%	-	-	-	-
120 - Hemorrhoids	1,095	0.0%	154	14.1%	-	-	-	-
121 - Other diseases of veins and lymphatics	1,226	0.0%	228	18.6%	0.390	1.48	(1.27, 1.72)	<.0001

CCS Diagnosis Group	Stays	% Stays	PPHs	PPH Rate	Estimate	Odds Ratio	95% CI	P-value
Diseases of the Respiratory System								
122 - Pneumonia (except that caused by tuberculosis or sexually transmitted disease)	55,983	1.7%	9,240	16.5%	0.231	1.26	(1.23,1.29)	<.0001
123 - Influenza	3,113	0.1%	329	10.6%	-	-	-	-
124 - Acute and chronic tonsillitis	28	0.0%	2	7.1%	-	-	-	-
125 - Acute bronchitis	3,712	0.1%	451	12.1%	-	-	-	-
126 - Other upper respiratory infections	1,017	0.0%	94	9.2%	-	-	-	-
127 - Chronic obstructive pulmonary disease and bronchiectasis	48,215	1.5%	10,856	22.5%	0.593	1.81	(1.77, 1.85)	<.0001
128 - Asthma	2,498	0.1%	399	16.0%	0.358	1.43	(1.28, 1.60)	<.0001
129 - Aspiration pneumonitis; food/vomitus	11,321	0.3%	2,414	21.3%	0.405	1.50	(1.43, 1.57)	<.0001
130 - Pleurisy; pneumothorax; pulmonary collapse	6,089	0.2%	1,005	16.5%	-	-	-	-
131 - Respiratory failure; insufficiency; arrest (adult)	28,636	0.9%	5,780	20.2%	0.328	1.39	(1.34, 1.44)	<.0001
132 - Lung disease due to external agents	441	0.0%	79	17.9%	-	-	-	-
133 - Other lower respiratory disease	4,935	0.2%	717	14.5%	-	-	-	-
134 - Other upper respiratory disease	1,272	0.0%	173	13.6%	-	-	-	-
Diseases of the Digestive System								
135 - Intestinal infection	9,588	0.3%	1,999	20.8%	0.465	1.59	(1.51, 1.68)	<.0001
136 - Disorders of teeth and jaw	439	0.0%	30	6.8%	-	-	-	-
137 - Diseases of mouth; excluding dental	446	0.0%	65	14.6%	-	-	-	-
138 - Esophageal disorders	4,038	0.1%	530	13.1%	-	-	-	-
139 - Gastroduodenal ulcer (except hemorrhage)	1,563	0.0%	159	10.2%	-	-	-	-

CCS Diagnosis Group	Stays	% Stays	PPHs	PPH Rate	Estimate	Odds Ratio	95% CI	P-value
140 - Gastritis and duodenitis	2,581	0.1%	368	14.3%	-	-	-	-
141 - Other disorders of stomach and duodenum	2,589	0.1%	425	16.4%	-	-	-	-
142 - Appendicitis and other appendiceal conditions	1,647	0.1%	102	6.2%	-	-	-	-
143 - Abdominal hernia	9,714	0.3%	720	7.4%	-0.324	0.72	(0.66, 0.79)	<.0001
144 - Regional enteritis and ulcerative colitis	1,795	0.1%	268	14.9%	-	-	-	-
145 - Intestinal obstruction without hernia	14,508	0.4%	1,490	10.3%	-0.231	0.79	(0.75, 0.84)	<.0001
146 - Diverticulosis and diverticulitis	13,710	0.4%	1,318	9.6%	-0.218	0.80	(0.76, 0.85)	<.0001
147 - Anal and rectal conditions	2,097	0.1%	210	10.0%	-	-	-	-
148 - Peritonitis and intestinal abscess	956	0.0%	118	12.3%	-	-	-	-
149 - Biliary tract disease	11,815	0.4%	1,166	9.9%	-	-	-	-
151 - Other liver diseases	4,924	0.2%	793	16.1%	-	-	-	-
152 - Pancreatic disorders (not diabetes)	5,067	0.2%	550	10.9%	-	-	-	-
153 - Gastrointestinal hemorrhage	18,380	0.6%	2,573	14.0%	-	-	-	-
154 - Noninfectious gastroenteritis	4,200	0.1%	609	14.5%	-	-	-	-
155 - Other gastrointestinal disorders	10,540	0.3%	1,390	13.2%	-	-	-	-
Diseases of the Genitourinary System								
156 - Nephritis; nephrosis; renal sclerosis	300	0.0%	54	18.0%	-	-	-	-
157 - Acute and unspecified renal failure	37,620	1.2%	7,578	20.1%	0.462	1.59	(1.54, 1.63)	<.0001
158 - Chronic kidney disease	577	0.0%	112	19.4%	-	-	-	-
159 - Urinary tract infections	41,372	1.3%	6,923	16.7%	0.262	1.30	(1.26, 1.34)	<.0001
160 - Calculus of urinary tract	853	0.0%	110	12.9%	-	-	-	-

CCS Diagnosis Group	Stays	% Stays	PPHs	PPH Rate	Estimate	Odds Ratio	95% CI	P-value
161 - Other diseases of kidney and ureters	2,637	0.1%	404	15.3%	0.221	1.25	(1.11, 1.40)	0.0001
162 - Other diseases of bladder and urethra	1,233	0.0%	155	12.6%	-	-	-	-
163 - Genitourinary symptoms and ill-defined conditions	1,774	0.1%	281	15.8%	-	-	-	-
164 - Hyperplasia of prostate	1,534	0.0%	168	11.0%	-	-	-	-
165 - Inflammatory conditions of male genital organs	958	0.0%	105	11.0%	-	-	-	-
166 - Other male genital disorders	226	0.0%	32	14.2%	-	-	-	-
167 - Nonmalignant breast conditions	416	0.0%	27	6.5%	-	-	-	-
168 - Inflammatory diseases of female pelvic organs	356	0.0%	38	10.7%	-	-	-	-
169 - Endometriosis	19	0.0%	0	0.0%	-	-	-	-
170 - Prolapse of female genital organs	328	0.0%	22	6.7%	-	-	-	-
171 - Menstrual disorders	20	0.0%	0	0.0%	-	-	-	-
172 - Ovarian cyst	87	0.0%	7	8.0%	-	-	-	-
173 - Menopausal disorders	98	0.0%	11	11.2%	-	-	-	-
174 - Female infertility	0	0.0%	0	0.0%	-	-	-	-
175 - Other female genital disorders	704	0.0%	82	11.6%	-	-	-	-
Complications of Pregnancy, Childbirth, and the Puerperium								
176 - Contraceptive and procreative management	1	0.0%	0	0.0%	-	-	-	-
177 - Spontaneous abortion	0	0.0%	0	0.0%	-	-	-	-
178 - Induced abortion	1	0.0%	0	0.0%	-	-	-	-
179 - Postabortion complications	0	0.0%	0	0.0%	-	-	-	-
180 - Ectopic pregnancy	0	0.0%	0	0.0%	-	-	-	-
181 - Other complications of pregnancy	40	0.0%	2	5.0%	-	-	-	-

CCS Diagnosis Group	Stays	% Stays	PPHs	PPH Rate	Estimate	Odds Ratio	95% CI	P-value
182 - Hemorrhage during pregnancy; abruptio placenta; placenta previa	2	0.0%	0	0.0%	-	-	-	-
183 - Hypertension complicating pregnancy; childbirth and the puerperium	23	0.0%	0	0.0%	-	-	-	-
184 - Early or threatened labor	5	0.0%	0	0.0%	-	-	-	-
185 - Prolonged pregnancy	2	0.0%	0	0.0%	-	-	-	-
186 - Diabetes or abnormal glucose tolerance complicating pregnancy; childbirth; or the puerperium	10	0.0%	0	0.0%	-	-	-	-
187 - Malposition; malpresentation	5	0.0%	0	0.0%	-	-	-	-
188 - Fetopelvic disproportion; obstruction	0	0.0%	0	0.0%	-	-	-	-
189 - Previous C-section	13	0.0%	0	0.0%	-	-	-	-
190 - Fetal distress and abnormal forces of labor	4	0.0%	0	0.0%	-	-	-	-
191 - Polyhydramnios and other problems of amniotic cavity	9	0.0%	0	0.0%	-	-	-	-
192 - Umbilical cord complication	1	0.0%	0	0.0%	-	-	-	-
193 - OB-related trauma to perineum and vulva	2	0.0%	0	0.0%	-	-	-	-
194 - Forceps delivery	0	0.0%	0	0.0%	-	-	-	-
195 - Other complications of birth; puerperium affecting management of mother	62	0.0%	4	6.5%	-	-	-	-
196 - Normal pregnancy and/or delivery	0	0.0%	0	0.0%	-	-	-	-
Diseases of the Skin and Subcutaneous Tissue								
197 - Skin and subcutaneous tissue infections	31,598	1.0%	5,408	17.1%	0.420	1.52	(1.47, 1.57)	<.0001
198 - Other inflammatory condition of skin	438	0.0%	79	18.0%	-	-	-	-

CCS Diagnosis Group	Stays	% Stays	PPHs	PPH Rate	Estimate	Odds Ratio	95% CI	P-value
199 - Chronic ulcer of skin	3,242	0.1%	782	24.1%	0.489	1.63	(1.50, 1.78)	<.0001
200 - Other skin disorders	468	0.0%	71	15.2%	-	-	-	-
Diseases of the Musculoskeletal System and Connective Tissue								
201 - Infective arthritis and osteomyelitis (except that caused by tuberculosis or sexually transmitted disease)	6,932	0.2%	861	12.4%	-	-	-	-
202 - Rheumatoid arthritis and related disease	1,193	0.0%	60	5.0%	-	-	-	-
203 - Osteoarthritis	220,829	6.8%	3,313	1.5%	-0.941	0.39	(0.37, 0.42)	<.0001
204 - Other non-traumatic joint disorders	3,596	0.1%	213	5.9%	-0.394	0.68	(0.59, 0.78)	<.0001
205 - Spondylosis; intervertebral disc disorders; other back problems	41,086	1.3%	1,718	4.2%	-0.435	0.65	(0.61, 0.69)	<.0001
206 - Osteoporosis	24	0.0%	3	12.5%	-	-	-	-
207 - Pathological fracture	7,585	0.2%	653	8.6%	-	-	-	-
208 - Acquired foot deformities	329	0.0%	18	5.5%	-	-	-	-
209 - Other acquired deformities	8,703	0.3%	237	2.7%	-0.588	0.56	(0.48, 0.64)	<.0001
210 - Systemic lupus erythematosus and connective tissue disorders	711	0.0%	116	16.3%	-	-	-	-
211 - Other connective tissue disease	9,101	0.3%	754	8.3%	-0.195	0.82	(0.76, 0.89)	<.0001
212 - Other bone disease and musculoskeletal deformities	3,407	0.1%	143	4.2%	-0.392	0.68	(0.57, 0.80)	<.0001
Congenital Anomalies								
213 - Cardiac and circulatory congenital anomalies	1,063	0.0%	93	8.7%	-	-	-	-
214 - Digestive congenital anomalies	89	0.0%	14	15.7%	-	-	-	-
215 - Genitourinary congenital anomalies	92	0.0%	10	10.9%	-	-	-	-

CCS Diagnosis Group	Stays	% Stays	PPHs	PPH Rate	Estimate	Odds Ratio	95% CI	P-value
216 - Nervous system congenital anomalies	122	0.0%	7	5.7%	-	-	-	-
217 - Other congenital anomalies	175	0.0%	9	5.1%	-	-	-	-
Certain Conditions Originating in the Perinatal Period								
218 - Liveborn	0	0.0%	0	0.0%	-	-	-	-
219 - Short gestation; low birth weight; and fetal growth retardation	0	0.0%	0	0.0%	-	-	-	-
220 - Intrauterine hypoxia and birth asphyxia	0	0.0%	0	0.0%	-	-	-	-
221 - Respiratory distress syndrome	0	0.0%	0	0.0%	-	-	-	-
222 - Hemolytic jaundice and perinatal jaundice	0	0.0%	0	0.0%	-	-	-	-
223 - Birth trauma	0	0.0%	0	0.0%	-	-	-	-
224 - Other perinatal conditions	0	0.0%	0	0.0%	-	-	-	-
Injury and Poisoning								
225 - Joint disorders and dislocations; trauma-related	1,122	0.0%	56	5.0%	-	-	-	-
226 - Fracture of neck of femur (hip)	47,416	1.5%	3,051	6.4%	-	-	-	-
227 - Spinal cord injury	290	0.0%	19	6.6%	-	-	-	-
228 - Skull and face fractures	1,463	0.0%	115	7.9%	-	-	-	-
229 - Fracture of upper limb	9,713	0.3%	659	6.8%	-0.214	0.81	(0.74, 0.89)	<.0001
230 - Fracture of lower limb	14,590	0.4%	921	6.3%	-0.300	0.74	(0.68, 0.81)	<.0001
231 - Other fractures	27,075	0.8%	2,088	7.7%	-0.325	0.72	(0.69, 0.76)	<.0001
232 - Sprains and strains	1,685	0.1%	99	5.9%	-0.567	0.57	(0.46, 0.70)	<.0001
233 - Intracranial injury	12,297	0.4%	1,213	9.9%	-	-	-	-
234 - Crushing injury or internal injury	2,681	0.1%	214	8.0%	-0.415	0.66	(0.57, 0.76)	<.0001
235 - Open wounds of head; neck; and trunk	1,113	0.0%	102	9.2%	-	-	-	-

CCS Diagnosis Group	Stays	% Stays	PPHs	PPH Rate	Estimate	Odds Ratio	95% CI	P-value
236 - Open wounds of extremities	1,372	0.0%	171	12.5%	-	-	-	-
237 - Complication of device; implant or graft	51,713	1.6%	4,972	9.6%	-0.083	0.92	(0.89, 0.95)	<.0001
238 - Complications of surgical procedures or medical care	27,976	0.9%	3,183	11.4%	-0.240	0.79	(0.76, 0.82)	<.0001
239 - Superficial injury; contusion	3,827	0.1%	413	10.8%	-	-	-	-
240 - Burns	905	0.0%	74	8.2%	-	-	-	-
241 - Poisoning by psychotropic agents	686	0.0%	82	12.0%	-	-	-	-
242 - Poisoning by other medications and drugs	3,669	0.1%	526	14.3%	-	-	-	-
243 - Poisoning by nonmedicinal substances	297	0.0%	27	9.1%	-	-	-	-
244 - Other injuries and conditions due to external causes	3,913	0.1%	445	11.4%	-	-	-	-
Symptoms, Signs, and Ill-Defined Conditions and Factors Influencing Health Status								
245 - Syncope	8,482	0.3%	784	9.2%	-0.221	0.80	(0.74, 0.87)	<.0001
246 - Fever of unknown origin	1,021	0.0%	141	13.8%	-	-	-	-
247 - Lymphadenitis	93	0.0%	10	10.8%	-	-	-	-
248 - Gangrene	2,691	0.1%	453	16.8%	-	-	-	-
249 - Shock	616	0.0%	131	21.3%	-	-	-	-
250 - Nausea and vomiting	1,159	0.0%	188	16.2%	-	-	-	-
251 - Abdominal pain	1,621	0.0%	228	14.1%	-	-	-	-
252 - Malaise and fatigue	3,460	0.1%	439	12.7%	-	-	-	-
253 - Allergic reactions	472	0.0%	70	14.8%	-	-	-	-
254 - Rehabilitation care; fitting of prostheses; and adjustment of devices	27	0.0%	1	3.7%	-	-	-	-
255 - Administrative/social admission	2	0.0%	1	50.0%	-	-	-	-

CCS Diagnosis Group	Stays	% Stays	PPHs	PPH Rate	Estimate	Odds Ratio	95% CI	P-value
256 - Medical examination/evaluation	8	0.0%	0	0.0%	-	-	-	-
257 - Other aftercare	1,980	0.1%	109	5.5%	-0.519	0.60	(0.49, 0.73)	<.0001
258 - Other screening for suspected conditions (not mental disorders or infectious disease)	503	0.0%	84	16.7%	-	-	-	-
Other Unclassified Conditions								
259 - Residual codes; unclassified	3,932	0.1%	495	12.6%	-	-	-	-
261 - E Codes: Transport; not MVT	760	0.0%	125	16.4%	-	-	-	-
Mental Illness								
650 - Adjustment disorders	155	0.0%	17	11.0%	-	-	-	-
651 - Anxiety disorders	470	0.0%	39	8.3%	-	-	-	-
652 - Attention-deficit, conduct, and disruptive behavior disorders	14	0.0%	1	7.1%	-	-	-	-
653 - Delirium, dementia, and amnestic and other cognitive disorders	10,101	0.3%	1,201	11.9%	-	-	-	-
654 - Developmental disorders	11	0.0%	1	9.1%	-	-	-	-
655 - Disorders usually diagnosed in infancy, childhood, or adolescence	6	0.0%	0	0.0%	-	-	-	-
656 - Impulse control disorders, NEC	42	0.0%	1	2.4%	-	-	-	-
657 - Mood disorders	7,402	0.2%	770	10.4%	-0.454	0.64	(0.59, 0.69)	<.0001
658 - Personality disorders	26	0.0%	3	11.5%	-	-	-	-
659 - Schizophrenia and other psychotic disorders	3,918	0.1%	310	7.9%	-0.673	0.51	(0.45, 0.58)	<.0001
660 - Alcohol-related disorders	3,175	0.1%	296	9.3%	-0.355	0.70	(0.62, 0.79)	<.0001
661 - Substance-related disorders	735	0.0%	78	10.6%	-	-	-	-

CCS Diagnosis Group	Stays	% Stays	PPHs	PPH Rate	Estimate	Odds Ratio	95% CI	P-value
662 - Suicide and intentional self-inflicted injury	415	0.0%	39	9.4%	-	-	-	-
663 - Screening and history of mental health and substance abuse codes	0	0.0%	0	0.0%	-	-	-	-
670 - Miscellaneous disorders	382	0.0%	31	8.1%	-	-	-	-
Miscellaneous Diagnosis Groups								
Composite of all excluded CCS Diagnosis groups	534,181	16.4%	57,896	10.8%	-0.003	1.00	(0.98, 1.01)	0.6286

Notes: CCS diagnosis groups are defined using principal diagnosis codes from the prior proximal hospitalization. Logistic regression model includes the random effects of 10,976 home health agencies represented in the patient population. The PPH measure calculation includes the acute delirium condition, which makes up less than 1% of potentially preventable hospitalizations and observation stays.

Table 1-2. Preliminary Logistic Regression Model Results for the Home Health Within-stay Potentially Preventable Hospitalization Measure (2016) (continued)

CCS Procedure Group	Stays	% Stays	PPHs	PPH Rate	Estimate	Odds Ratio	95% CI	P-value
All Home Health Stays	3,266,928	100%	363,498	11.1%				
Operations on the Nervous System								
1 - Incision and excision of CNS	5,356	0.2%	504	9.4%	-	-	-	-
2 - Insertion; replacement; or removal of extracranial ventricular shunt	1,581	0.0%	97	6.1%	-0.618	0.54	(0.44, 0.66)	<.0001
3 - Laminectomy; excision intervertebral disc	19,759	0.6%	608	3.1%	-	-	-	-
4 - Diagnostic spinal tap	7,623	0.2%	845	11.1%	-0.253	0.78	(0.72, 0.84)	<.0001
5 - Insertion of catheter or spinal stimulator and injection into spinal canal	5,818	0.2%	411	7.1%	-	-	-	-
6 - Decompression peripheral nerve	12,311	0.4%	404	3.3%	-0.332	0.72	(0.64, 0.80)	<.0001
7 - Other diagnostic nervous system procedures	2,172	0.1%	206	9.5%	-	-	-	-
8 - Other non-OR or closed therapeutic nervous system procedures	30,051	0.9%	874	2.9%	-	-	-	-
9 - Other OR therapeutic nervous system procedures	12,937	0.4%	644	5.0%	-0.268	0.77	(0.70, 0.83)	<.0001
Operations on the Endocrine System								
10 - Thyroidectomy; partial or complete	463	0.0%	40	8.6%	-	-	-	-
11 - Diagnostic endocrine procedures	457	0.0%	72	15.8%	-	-	-	-
12 - Other therapeutic endocrine procedures	757	0.0%	81	10.7%	-	-	-	-
Operations on the Eye								
13 - Corneal transplant	13	0.0%	4	30.8%	-	-	-	-
14 - Glaucoma procedures	32	0.0%	5	15.6%	-	-	-	-
15 - Lens and cataract procedures	51	0.0%	7	13.7%	-	-	-	-
16 - Repair of retinal tear; detachment	15	0.0%	1	6.7%	-	-	-	-
17 - Destruction of lesion of retina and choroid	3	0.0%	0	0.0%	-	-	-	-

CCS Procedure Group	Stays	% Stays	PPHs	PPH Rate	Estimate	Odds Ratio	95% CI	P-value
18 - Diagnostic procedures on eye	67	0.0%	8	11.9%	-	-	-	-
19 - Other therapeutic procedures on eyelids; conjunctiva; cornea	637	0.0%	59	9.3%	-	-	-	-
20 - Other intraocular therapeutic procedures	103	0.0%	13	12.6%	-	-	-	-
21 - Other extraocular muscle and orbit therapeutic procedures	85	0.0%	5	5.9%	-	-	-	-
Operations on the Ear								
22 - Tympanoplasty	8	0.0%	1	12.5%	-	-	-	-
23 - Myringotomy	113	0.0%	15	13.3%	-	-	-	-
24 - Mastoidectomy	26	0.0%	4	15.4%	-	-	-	-
25 - Diagnostic procedures on ear	395	0.0%	45	11.4%	-	-	-	-
26 - Other therapeutic ear procedures	1,525	0.0%	151	9.9%	-	-	-	-
Operations on the Nose, Mouth, and Pharynx								
27 - Control of epistaxis	1,006	0.0%	138	13.7%	-	-	-	-
28 - Plastic procedures on nose	41	0.0%	2	4.9%	-	-	-	-
29 - Dental procedures	938	0.0%	108	11.5%	-	-	-	-
30 - Tonsillectomy and/or adenoidectomy	83	0.0%	11	13.3%	-	-	-	-
31 - Diagnostic procedures on nose; mouth and pharynx	3,715	0.1%	548	14.8%	-	-	-	-
32 - Other non-OR therapeutic procedures on nose; mouth and pharynx	592	0.0%	49	8.3%	-	-	-	-
33 - Other OR therapeutic procedures on nose; mouth and pharynx	2,333	0.1%	169	7.2%	-	-	-	-
Operations on the Respiratory System								
34 - Tracheostomy; temporary and permanent	3,146	0.1%	433	13.8%	-	-	-	-
35 - Tracheoscopy and laryngoscopy with biopsy	871	0.0%	151	17.3%	-	-	-	-
36 - Lobectomy or pneumonectomy	5,878	0.2%	408	6.9%	-0.830	0.44	(0.39, 0.49)	<.0001

CCS Procedure Group	Stays	% Stays	PPHs	PPH Rate	Estimate	Odds Ratio	95% CI	P-value
37 - Diagnostic bronchoscopy and biopsy of bronchus	20,606	0.6%	3,303	16.0%	-	-	-	-
38 - Other diagnostic procedures on lung and bronchus	961	0.0%	74	7.7%	-	-	-	-
39 - Incision of pleura; thoracentesis; chest drainage	34,156	1.0%	6,115	17.9%	0.107	1.11	(1.08,1.15)	<.0001
40 - Other diagnostic procedures of respiratory tract and mediastinum	3,482	0.1%	428	12.3%	-	-	-	-
41 - Other non-OR therapeutic procedures on respiratory system	14,200	0.4%	2,313	16.3%	-	-	-	-
42 - Other OR Rx procedures on respiratory system and mediastinum	8,408	0.3%	945	11.2%	-0.174	0.84	(0.78, 0.90)	<.0001
Operations on the Cardiovascular System								
43 - Heart valve procedures	25,205	0.8%	2,274	9.0%	-0.066	0.94	(0.89, 0.99)	0.0171
44 - Coronary artery bypass graft (CABG)	31,583	1.0%	2,238	7.1%	-0.326	0.72	(0.67, 0.77)	<.0001
45 - Percutaneous transluminal coronary angioplasty (PTCA)	18,167	0.6%	2,658	14.6%	-	-	-	-
46 - Coronary thrombolysis	328	0.0%	38	11.6%	-	-	-	-
47 - Diagnostic cardiac catheterization; coronary arteriography	62,331	1.9%	8,845	14.2%	0.050	1.05	(1.02, 1.08)	0.0005
48 - Insertion; revision; replacement; removal of cardiac pacemaker or cardioverter/defibrillator	22,653	0.7%	2,827	12.5%	-0.207	0.81	(0.78, 0.85)	<.0001
49 - Other OR heart procedures	18,825	0.6%	2,821	15.0%	-	-	-	-
50 - Extracorporeal circulation auxiliary to open heart procedures	41,920	1.3%	3,244	7.7%	-0.204	0.82	(0.77, 0.87)	<.0001
51 - Endarterectomy; vessel of head and neck	4,659	0.1%	330	7.1%	-0.159	0.85	(0.74, 0.99)	0.0304
52 - Aortic resection; replacement or anastomosis	535	0.0%	38	7.1%	-	-	-	-
53 - Varicose vein stripping; lower limb	26	0.0%	4	15.4%	-	-	-	-
54 - Other vascular catheterization; not heart	122,001	3.7%	20,609	16.9%	0.037	1.04	(1.02, 1.06)	<.0001
55 - Peripheral vascular bypass	8,417	0.3%	920	10.9%	-0.315	0.73	(0.68, 0.79)	<.0001

CCS Procedure Group	Stays	% Stays	PPHs	PPH Rate	Estimate	Odds Ratio	95% CI	P-value
56 - Other vascular bypass and shunt; not heart	367	0.0%	44	12.0%	-	-	-	-
57 - Creation; revision and removal of arteriovenous fistula or vessel-to-vessel cannula for dialysis	0	0.0%	0	0.0%	-	-	-	-
59 - Other OR procedures on vessels of head and neck	4,033	0.1%	302	7.5%	-	-	-	-
60 - Embolectomy and endarterectomy of lower limbs	7,893	0.2%	889	11.3%	-0.127	0.88	(0.81, 0.95)	0.0015
61 - Other OR procedures on vessels other than head and neck	62,243	1.9%	6,640	10.7%	-0.019	0.98	(0.95, 1.02)	0.2840
62 - Other diagnostic cardiovascular procedures	8,571	0.3%	1,189	13.9%	-	-	-	-
63 - Other non-OR therapeutic cardiovascular procedures	16,597	0.5%	2,117	12.8%	-	-	-	-
Operations on the Hemic and Lymphatic System								
64 - Bone marrow transplant	369	0.0%	32	8.7%	-	-	-	-
65 - Bone marrow biopsy	3,997	0.1%	797	19.9%	0.275	1.32	(1.21, 1.43)	<.0001
66 - Procedures on spleen	1,231	0.0%	153	12.4%	-	-	-	-
67 - Other therapeutic procedures; hemic and lymphatic system	22,680	0.7%	1,959	8.6%	-	-	-	-
Operations on the Digestive System								
68 - Injection or ligation of esophageal varices	0	0.0%	0	0.0%	-	-	-	-
69 - Esophageal dilatation	3,299	0.1%	551	16.7%	-	-	-	-
70 - Upper gastrointestinal endoscopy; biopsy	51,865	1.6%	8,120	15.7%	0.037	1.04	(1.01, 1.07)	0.0064
71 - Gastrostomy; temporary and permanent	9,242	0.3%	1,702	18.4%	0.225	1.25	(1.18, 1.33)	<.0001
72 - Colostomy; temporary and permanent	8,797	0.3%	842	9.6%	-	-	-	-
73 - Ileostomy and other enterostomy	6,949	0.2%	1,307	18.8%	0.747	2.11	(1.97, 2.26)	<.0001
74 - Gastrectomy; partial and total	3,202	0.1%	291	9.1%	-0.384	0.68	(0.60, 0.77)	<.0001
75 - Small bowel resection	1,586	0.0%	153	9.6%	-	-	-	-

CCS Procedure Group	Stays	% Stays	PPHs	PPH Rate	Estimate	Odds Ratio	95% CI	P-value
76 - Colonoscopy and biopsy	10,866	0.3%	1,620	14.9%	-	-	-	-
77 - Proctoscopy and anorectal biopsy	3,037	0.1%	478	15.7%	-	-	-	-
78 - Colorectal resection	15,269	0.5%	1,454	9.5%	-0.252	0.78	(0.73, 0.83)	<.0001
79 - Local excision of large intestine lesion (not endoscopic)	6,812	0.2%	662	9.7%	-	-	-	-
80 - Appendectomy	3,643	0.1%	310	8.5%	-	-	-	-
81 - Hemorrhoid procedures	160	0.0%	23	14.4%	-	-	-	-
82 - Fluoroscopy of the biliary and pancreatic ducts (ERCP, ERC and ERP)	3,729	0.1%	476	12.8%	-	-	-	-
83 - Biopsy of liver	3,624	0.1%	564	15.6%	0.267	1.31	(1.19, 1.44)	<.0001
84 - Cholecystectomy and common duct exploration	12,125	0.4%	1,038	8.6%	-0.416	0.66	(0.62, 0.71)	<.0001
85 - Inguinal and femoral hernia repair	2,289	0.1%	160	7.0%	-	-	-	-
86 - Other hernia repair	6,000	0.2%	442	7.4%	-0.184	0.83	(0.74, 0.93)	0.0018
87 - Laparoscopy (GI only)	4,084	0.1%	374	9.2%	-	-	-	-
88 - Abdominal paracentesis	10,106	0.3%	1,705	16.9%	-	-	-	-
89 - Exploratory laparotomy	833	0.0%	76	9.1%	-	-	-	-
90 - Excision; lysis peritoneal adhesions	15,331	0.5%	1,471	9.6%	-0.125	0.88	(0.83, 0.94)	<.0001
92 - Other bowel diagnostic procedures	19,568	0.6%	2,740	14.0%	-	-	-	-
93 - Other non-OR upper GI therapeutic procedures	7,590	0.2%	1,249	16.5%	-	-	-	-
94 - Other OR upper GI therapeutic procedures	12,831	0.4%	1,587	12.4%	-	-	-	-
95 - Other non-OR lower GI therapeutic procedures	6,769	0.2%	998	14.7%	-	-	-	-
96 - Other OR lower GI therapeutic procedures	18,730	0.6%	1,880	10.0%	-0.216	0.81	(0.76, 0.85)	<.0001
97 - Other gastrointestinal diagnostic procedures	10,744	0.3%	1,495	13.9%	-	-	-	-
98 - Other non-OR gastrointestinal therapeutic procedures	13,348	0.4%	1,628	12.2%	-	-	-	-
99 - Other OR gastrointestinal therapeutic procedures	23,604	0.7%	2,522	10.7%	-0.124	0.88	(0.84, 0.93)	<.0001

CCS Procedure Group	Stays	% Stays	PPHs	PPH Rate	Estimate	Odds Ratio	95% CI	P-value
Operations on the Urinary System								
100 - Endoscopy and endoscopic biopsy of the urinary tract	4,818	0.1%	741	15.4%	-	-	-	-
101 - Transurethral excision; drainage; or removal urinary obstruction	4,783	0.1%	748	15.6%	-	-	-	-
102 - Ureteral catheterization	10,226	0.3%	1,625	15.9%	0.103	1.11	(1.04, 1.18)	0.0007
103 - Nephrotomy and nephrostomy	517	0.0%	67	13.0%	-	-	-	-
104 - Nephrectomy; partial or complete	2,670	0.1%	242	9.1%	-	-	-	-
105 - Kidney transplant	1,920	0.1%	237	12.3%	-	-	-	-
106 - Genitourinary incontinence procedures	22	0.0%	1	4.5%	-	-	-	-
107 - Extracorporeal lithotripsy; urinary	362	0.0%	62	17.1%	-	-	-	-
108 - Indwelling catheter	12,282	0.4%	1,837	15.0%	-	-	-	-
109 - Procedures on the urethra	2,536	0.1%	328	12.9%	-	-	-	-
110 - Other diagnostic procedures of urinary tract	2,182	0.1%	387	17.7%	-	-	-	-
111 - Other non-OR therapeutic procedures of urinary tract	6,078	0.2%	1,207	19.9%	0.210	1.23	(1.15, 1.32)	<.0001
112 - Other OR therapeutic procedures of urinary tract	10,078	0.3%	1,699	16.9%	0.163	1.18	(1.10, 1.25)	<.0001
Operations on the Male Genital Organs								
113 - Transurethral resection of prostate (TURP)	1,681	0.1%	223	13.3%	-	-	-	-
114 - Open prostatectomy	2,613	0.1%	382	14.6%	-	-	-	-
115 - Circumcision	97	0.0%	10	10.3%	-	-	-	-
116 - Diagnostic procedures; male genital	423	0.0%	60	14.2%	-	-	-	-
117 - Other non-OR therapeutic procedures; male genital	746	0.0%	78	10.5%	-	-	-	-
118 - Other OR therapeutic procedures; male genital	1,346	0.0%	159	11.8%	-	-	-	-

CCS Procedure Group	Stays	% Stays	PPHs	PPH Rate	Estimate	Odds Ratio	95% CI	P-value
Operations on the Female Genital Organs								
119 - Oophorectomy; unilateral and bilateral	3,828	0.1%	326	8.5%	-	-	-	-
120 - Other operations on ovary	259	0.0%	22	8.5%	-	-	-	-
121 - Ligation or occlusion of fallopian tubes	4	0.0%	0	0.0%	-	-	-	-
123 - Other operations on fallopian tubes	3,810	0.1%	301	7.9%	-	-	-	-
124 - Hysterectomy; abdominal and vaginal	2,997	0.1%	230	7.7%	-	-	-	-
125 - Other excision of cervix and uterus	2,694	0.1%	211	7.8%	-	-	-	-
126 - Abortion (termination of pregnancy)	1	0.0%	0	0.0%	-	-	-	-
127 - Dilatation and curettage (D&C); aspiration after delivery or abortion	1	0.0%	0	0.0%	-	-	-	-
128 - Diagnostic dilatation and curettage (D&C)	244	0.0%	40	16.4%	-	-	-	-
129 - Repair of cystocele and rectocele; obliteration of vaginal vault	78	0.0%	5	6.4%	-	-	-	-
130 - Other diagnostic procedures; female organs	798	0.0%	126	15.8%	-	-	-	-
131 - Other non-OR therapeutic procedures; female organs	178	0.0%	16	9.0%	-	-	-	-
132 - Other OR therapeutic procedures; female organs	2,130	0.1%	202	9.5%	-	-	-	-
Obstetrical Procedures								
122 - Removal of ectopic pregnancy	1	0.0%	0	0.0%	-	-	-	-
133 - Episiotomy	3	0.0%	0	0.0%	-	-	-	-
134 - Cesarean section	77	0.0%	1	1.3%	-	-	-	-
135 - Forceps; vacuum; and breech delivery	3	0.0%	0	0.0%	-	-	-	-
136 - Artificial rupture of membranes to assist delivery	13	0.0%	0	0.0%	-	-	-	-
137 - Other procedures to assist delivery	12	0.0%	0	0.0%	-	-	-	-

CCS Procedure Group	Stays	% Stays	PPHs	PPH Rate	Estimate	Odds Ratio	95% CI	P-value
138 - Diagnostic amniocentesis	0	0.0%	0	0.0%	-	-	-	-
139 - Fetal monitoring	27	0.0%	0	0.0%	-	-	-	-
140 - Repair of current obstetric laceration	0	0.0%	0	0.0%	-	-	-	-
141 - Other therapeutic obstetrical procedures	2	0.0%	0	0.0%	-	-	-	-
Operations of the Musculoskeletal System								
142 - Partial excision bone	15,394	0.5%	1,353	8.8%	-0.085	0.92	(0.86, 0.98)	0.0069
143 - Bunionectomy or repair of toe deformities	0	0.0%	0	0.0%	-	-	-	-
144 - Treatment; facial fracture or dislocation	442	0.0%	29	6.6%	-	-	-	-
145 - Treatment; fracture or dislocation of radius and ulna	3,370	0.1%	193	5.7%	-0.291	0.75	(0.64, 0.88)	0.0003
146 - Treatment; fracture or dislocation of hip and femur	36,387	1.1%	2,289	6.3%	-0.509	0.60	(0.58, 0.63)	<.0001
147 - Treatment; fracture or dislocation of lower extremity (other than hip or femur)	10,683	0.3%	606	5.7%	-0.381	0.68	(0.61, 0.76)	<.0001
148 - Other fracture and dislocation procedure	13,272	0.4%	869	6.5%	-0.135	0.87	(0.81, 0.95)	0.0013
149 - Arthroscopy	130	0.0%	2	1.5%	-	-	-	-
150 - Division of joint capsule; ligament or cartilage	1,627	0.0%	43	2.6%	-	-	-	-
151 - Excision of semilunar cartilage of knee	0	0.0%	0	0.0%	-	-	-	-
152 - Arthroplasty knee	155,002	4.7%	2,380	1.5%	-0.799	0.45	(0.42, 0.48)	<.0001
153 - Hip replacement; total and partial	99,778	3.1%	2,603	2.6%	-0.677	0.51	(0.48, 0.54)	<.0001
154 - Arthroplasty other than hip or knee	14,304	0.4%	348	2.4%	-0.691	0.50	(0.45, 0.56)	<.0001
155 - Arthrocentesis	3,668	0.1%	368	10.0%	-	-	-	-
156 - Injections and aspirations of muscles; tendons; bursa; joints and soft tissue	7,816	0.2%	593	7.6%	-	-	-	-
157 - Amputation of lower extremity	14,289	0.4%	2,206	15.4%	-0.336	0.72	(0.68, 0.75)	<.0001

CCS Procedure Group	Stays	% Stays	PPHs	PPH Rate	Estimate	Odds Ratio	95% CI	P-value
158 - Spinal fusion	37,920	1.2%	1,211	3.2%	-0.547	0.58	(0.54, 0.63)	<.0001
159 - Other diagnostic procedures on musculoskeletal system	13,874	0.4%	1,493	10.8%	-	-	-	-
160 - Other therapeutic procedures on muscles and tendons	16,430	0.5%	1,378	8.4%	-0.053	0.95	(0.89, 1.01)	0.0895
161 - Other OR therapeutic procedures on bone	16,009	0.5%	958	6.0%	-0.118	0.89	(0.82, 0.96)	0.0025
162 - Other OR therapeutic procedures on joints	33,479	1.0%	1,277	3.8%	-0.416	0.66	(0.62, 0.70)	<.0001
163 - Other non-OR therapeutic procedures on musculoskeletal system	8,694	0.3%	645	7.4%	-0.281	0.76	(0.69, 0.82)	<.0001
164 - Other OR therapeutic procedures on musculoskeletal system	3,530	0.1%	332	9.4%	-	-	-	-
Operations on the Integumentary System								
165 - Breast biopsy and other diagnostic procedures on breast	607	0.0%	74	12.2%	-	-	-	-
166 - Lumpectomy; quadrantectomy of breast	480	0.0%	25	5.2%	-	-	-	-
167 - Mastectomy	1,619	0.0%	62	3.8%	-0.807	0.45	(0.35, 0.58)	<.0001
168 - Incision and drainage; skin and subcutaneous tissue	11,374	0.3%	1,367	12.0%	-0.182	0.83	(0.79, 0.89)	<.0001
169 - Debridement of wound; infection or burn	0	0.0%	0	0.0%	-	-	-	-
170 - Excision of skin lesion	6,540	0.2%	850	13.0%	-	-	-	-
171 - Suture of skin and subcutaneous tissue	10,647	0.3%	1,016	9.5%	-	-	-	-
172 - Skin graft	4,614	0.1%	506	11.0%	-0.219	0.80	(0.73, 0.89)	<.0001
173 - Other diagnostic procedures on skin and subcutaneous tissue	5,397	0.2%	727	13.5%	-	-	-	-
174 - Other non-OR therapeutic procedures on skin and breast	13,635	0.4%	2,155	15.8%	-	-	-	-
175 - Other OR therapeutic procedures on skin and breast	22,866	0.7%	3,096	13.5%	-	-	-	-

CCS Procedure Group	Stays	% Stays	PPHs	PPH Rate	Estimate	Odds Ratio	95% CI	P-value
Miscellaneous Diagnostic and Therapeutic Procedures								
176 - Organ transplantation (other than bone marrow, corneal or kidney)	943	0.0%	116	12.3%	-	-	-	-
177 - Computerized axial tomography (CT) scan head	5,107	0.2%	553	10.8%	-	-	-	-
178 - CT scan chest	2,200	0.1%	285	13.0%	-	-	-	-
179 - CT scan abdomen	3,369	0.1%	434	12.9%	-	-	-	-
180 - Other CT scan	3,459	0.1%	383	11.1%	-	-	-	-
181 - Myelogram	2,062	0.1%	184	8.9%	-	-	-	-
182 - Mammography	9	0.0%	1	11.1%	-	-	-	-
183 - Routine chest X-ray	597	0.0%	98	16.4%	-	-	-	-
184 - Intraoperative cholangiogram	295	0.0%	34	11.5%	-	-	-	-
185 - Upper gastrointestinal X-ray	785	0.0%	134	17.1%	-	-	-	-
186 - Lower gastrointestinal X-ray	26	0.0%	7	26.9%	-	-	-	-
187 - Intravenous pyelogram	4,215	0.1%	768	18.2%	-	-	-	-
188 - Cerebral arteriogram	3,673	0.1%	336	9.1%	-	-	-	-
189 - Contrast aortogram	11,915	0.4%	1,682	14.1%	-	-	-	-
190 - Contrast arteriogram of femoral and lower extremity arteries	9,076	0.3%	1,288	14.2%	-	-	-	-
191 - Arterio- or venogram (not heart and head)	16,177	0.5%	2,603	16.1%	-	-	-	-
192 - Diagnostic ultrasound of head and neck	8,711	0.3%	1,577	18.1%	-	-	-	-
193 - Diagnostic ultrasound of heart (echocardiogram)	56,252	1.7%	7,264	12.9%	-	-	-	-
194 - Diagnostic ultrasound of gastrointestinal tract	761	0.0%	98	12.9%	-	-	-	-
195 - Diagnostic ultrasound of urinary tract	953	0.0%	145	15.2%	-	-	-	-
196 - Diagnostic ultrasound of abdomen or retroperitoneum	730	0.0%	112	15.3%	-	-	-	-
197 - Other diagnostic ultrasound	32,391	1.0%	5,400	16.7%	-	-	-	-
198 - Magnetic resonance imaging	5,317	0.2%	510	9.6%	-	-	-	-

CCS Procedure Group	Stays	% Stays	PPHs	PPH Rate	Estimate	Odds Ratio	95% CI	P-value
199 - Electroencephalogram (EEG)	8,131	0.2%	803	9.9%	-0.098	0.91	(0.84, 0.98)	0.0128
200 - Nonoperative urinary system measurements	446	0.0%	70	15.7%	-	-	-	-
201 - Cardiac stress tests	1,500	0.0%	235	15.7%	-	-	-	-
202 - Electrocardiogram	5,494	0.2%	741	13.5%	-	-	-	-
203 - Electrographic cardiac monitoring	4,062	0.1%	559	13.8%	-	-	-	-
204 - Swan-Ganz catheterization for monitoring	9,028	0.3%	1,339	14.8%	-	-	-	-
205 - Arterial blood gases	2,327	0.1%	459	19.7%	-	-	-	-
206 - Microscopic examination (bacterial smear; culture; toxicology)	0	0.0%	0	0.0%	-	-	-	-
207 - Nuclear medicine imaging of bone	74	0.0%	14	18.9%	-	-	-	-
208 - Nuclear medicine imaging of pulmonary	381	0.0%	78	20.5%	-	-	-	-
209 - Non-imaging nuclear medicine probe or assay	8	0.0%	1	12.5%	-	-	-	-
210 - Other nuclear medicine imaging	975	0.0%	154	15.8%	-	-	-	-
211 - Radiation therapy	1,834	0.1%	317	17.3%	0.247	1.28	(1.12, 1.46)	0.0002
212 - Diagnostic physical therapy	969	0.0%	68	7.0%	-	-	-	-
213 - Physical therapy exercises; manipulation; and other procedures	4,217	0.1%	373	8.8%	-0.215	0.81	(0.72, 0.91)	0.0002
214 - Traction; splints; and other wound care	6,506	0.2%	647	9.9%	-	-	-	-
215 - Other physical therapy and rehabilitation	2,128	0.1%	187	8.8%	-	-	-	-
216 - Respiratory intubation and mechanical ventilation	74,275	2.3%	13,619	18.3%	0.023	1.02	(1.00, 1.05)	0.0452
217 - Other respiratory therapy	1,369	0.0%	281	20.5%	-	-	-	-
218 - Psychological and psychiatric evaluation and therapy	1,524	0.0%	104	6.8%	-	-	-	-
219 - Alcohol and drug rehabilitation/detoxification	2,079	0.1%	185	8.9%	-	-	-	-
220 - Ophthalmologic and otologic diagnosis and treatment	12	0.0%	1	8.3%	-	-	-	-

CCS Procedure Group	Stays	% Stays	PPHs	PPH Rate	Estimate	Odds Ratio	95% CI	P-value
221 - Nasogastric tube	5,061	0.2%	575	11.4%	-	-	-	-
222 - Blood transfusion	120,130	3.7%	17,391	14.5%	0.094	1.10	(1.08, 1.12)	<.0001
223 - Enteral and parenteral nutrition	15,516	0.5%	2,445	15.8%	-	-	-	-
224 - Cancer chemotherapy	4,254	0.1%	854	20.1%	0.239	1.27	(1.17, 1.38)	<.0001
225 - Conversion of cardiac rhythm	12,690	0.4%	2,133	16.8%	0.137	1.15	(1.09, 1.21)	<.0001
226 - Other diagnostic radiology and related techniques	26,733	0.8%	2,464	9.2%	-	-	-	-
227 - Other diagnostic procedures	19,663	0.6%	1,903	9.7%	-	-	-	-
228 - Prophylactic vaccinations and inoculations	16,643	0.5%	1,997	12.0%	-	-	-	-
229 - Nonoperative removal of foreign body	3,567	0.1%	593	16.6%	-	-	-	-
230 - Extracorporeal shock wave other than urinary	2	0.0%	0	0.0%	-	-	-	-
231 - Other therapeutic procedures	43,405	1.3%	5,139	11.8%	-0.059	0.94	(0.91, 0.97)	0.0003
Dialysis								
58 - Hemodialysis	51,126	1.6%	10,987	21.5%	-	-	-	-
91 - Peritoneal dialysis	2,742	0.1%	523	19.1%	-	-	-	-

Notes: CCS procedure groups are defined using procedure codes recorded during the prior proximal hospitalization. Logistic regression model includes the random effects of 10,976 home health agencies represented in the patient population.

Table 1-2. Preliminary Logistic Regression Model Results for the Home Health Within-stay Potentially Preventable Hospitalization Measure (2016) (continued)

HCC Comorbidity	Stays	% Stays	PPHs	PPH Rate	Estimate	Odds Ratio	95% CI	P-value
All Home Health Stays	3,266,928	100%	363,498	11.1%				
Infection								
1 - HIV/AIDS	6,931	0.2%	821	11.8%	-	-	-	-
2 - Septicemia, Sepsis, Systemic Inflammatory Response Syndrome/Shock	84,000	2.6%	18,535	22.1%	-	-	-	-
6 - Opportunistic Infections	9,237	0.3%	1,726	18.7%	-	-	-	-
Neoplasm								
8 - Metastatic Cancer and Acute Leukemia	36,196	1.1%	5,652	15.6%	0.148	1.16	(1.12, 1.20)	<.0001
9 - Lung and Other Severe Cancers	41,844	1.3%	6,707	16.0%	0.107	1.11	(1.08, 1.14)	<.0001
10 - Lymphoma and Other Cancers	36,866	1.1%	4,942	13.4%	-	-	-	-
11 - Colorectal, Bladder, and Other Cancers	51,654	1.6%	6,851	13.3%	-	-	-	-
12 - Breast, Prostate, and Other Cancers and Tumors	111,631	3.4%	11,798	10.6%	-0.097	0.91	(0.89, 0.93)	<.0001
Diabetes								
17 - Diabetes with Acute Complications	12,999	0.4%	2,760	21.2%	0.228	1.26	(1.20, 1.32)	<.0001
18 - Diabetes with Chronic Complications	379,473	11.6%	60,180	15.9%	0.144	1.16	(1.14, 1.17)	<.0001
19 - Diabetes without Complication	410,129	12.6%	50,416	12.3%	0.053	1.05	(1.04, 1.07)	<.0001
Metabolic								
21 - Protein-Calorie Malnutrition	59,672	1.8%	12,458	20.9%	-	-	-	-
22 - Morbid Obesity	110,988	3.4%	19,291	17.4%	-	-	-	-
23 - Other Significant Endocrine and Metabolic Disorders	144,828	4.4%	25,174	17.4%	-	-	-	-
Liver								
27 - End-Stage Liver Disease	12,968	0.4%	2,322	17.9%	-	-	-	-
28 - Cirrhosis of Liver	16,490	0.5%	2,817	17.1%	-	-	-	-
29 - Chronic Hepatitis	11,226	0.3%	1,500	13.4%	-	-	-	-

HCC Comorbidity	Stays	% Stays	PPHs	PPH Rate	Estimate	Odds Ratio	95% CI	P-value
Gastrointestinal								
33 - Intestinal Obstruction/Perforation	42,553	1.3%	7,294	17.1%	-0.153	0.86	(0.84, 0.88)	<.0001
34 - Chronic Pancreatitis	6,577	0.2%	1,136	17.3%	-	-	-	-
35 - Inflammatory Bowel Disease	19,998	0.6%	2,845	14.2%	-	-	-	-
Musculoskeletal								
39 - Bone/Joint/Muscle Infections/Necrosis	41,596	1.3%	7,561	18.2%	-	-	-	-
40 - Rheumatoid Arthritis and Inflammatory Connective Tissue Disease	163,277	5.0%	20,604	12.6%	-	-	-	-
Blood								
46 - Severe Hematological Disorders	19,925	0.6%	3,559	17.9%	0.096	1.10	(1.06, 1.15)	<.0001
47 - Disorders of Immunity	41,497	1.3%	7,236	17.4%	-	-	-	-
48 - Coagulation Defects and Other Specified Hematological Disorders	127,232	3.9%	20,152	15.8%	-0.034	0.97	(0.95, 0.98)	<.0001
Substance Abuse								
54 - Drug/Alcohol Psychosis	14,934	0.5%	2,200	14.7%	-0.199	0.82	(0.78, 0.86)	<.0001
55 - Drug/Alcohol Dependence	44,636	1.4%	6,548	14.7%	-	-	-	-
Psychiatric								
57 - Schizophrenia	32,133	1.0%	3,297	10.3%	-0.214	0.81	(0.78, 0.84)	<.0001
58 - Major Depressive, Bipolar, and Paranoid Disorders	157,403	4.8%	18,898	12.0%	-0.090	0.91	(0.90, 0.93)	<.0001
Spinal								
70 - Quadriplegia	9,052	0.3%	2,001	22.1%	-	-	-	-
71 - Paraplegia	10,259	0.3%	2,129	20.8%	-	-	-	-
72 - Spinal Cord Disorders/Injuries	21,165	0.6%	2,819	13.3%	-	-	-	-
Neurological								
73 - Amyotrophic Lateral Sclerosis and Other Motor Neuron Disease	2,593	0.1%	284	11.0%	-	-	-	-
74 - Cerebral Palsy	6,203	0.2%	697	11.2%	-	-	-	-

HCC Comorbidity	Stays	% Stays	PPHs	PPH Rate	Estimate	Odds Ratio	95% CI	P-value
75 - Myasthenia Gravis/Myoneural Disorders and Guillain-Barre Syndrome/Inflammatory and Toxic Neuropathy	26,033	0.8%	3,740	14.4%	-	-	-	-
76 - Muscular Dystrophy	1,906	0.1%	202	10.6%	-	-	-	-
77 - Multiple Sclerosis	18,555	0.6%	2,315	12.5%	-	-	-	-
78 - Parkinson's and Huntington's Diseases	74,808	2.3%	8,891	11.9%	-	-	-	-
79 - Seizure Disorders and Convulsions	87,729	2.7%	12,040	13.7%	-0.078	0.93	(0.91, 0.95)	<.0001
80 - Coma, Brain Compression/Anoxic Damage	8,061	0.2%	1,378	17.1%	-	-	-	-
Arrest								
82 - Respirator Dependence/Tracheostomy Status	8,873	0.3%	2,006	22.6%	-0.159	0.85	(0.81, 0.90)	<.0001
83 - Respiratory Arrest	1,504	0.0%	392	26.1%	-	-	-	-
84 - Cardio-Respiratory Failure and Shock	106,891	3.3%	25,092	23.5%	0.012	1.01	(1.00, 1.03)	0.1663
Heart								
85 - Congestive Heart Failure	474,942	14.5%	89,531	18.9%	0.235	1.27	(1.25, 1.28)	<.0001
86 - Acute Myocardial Infarction	27,049	0.8%	5,670	21.0%	-0.155	0.86	(0.83, 0.88)	<.0001
87 - Unstable Angina and Other Acute Ischemic Heart Disease	45,489	1.4%	7,980	17.5%	-0.065	0.94	(0.91, 0.96)	<.0001
88 - Angina Pectoris	50,232	1.5%	7,010	14.0%	-	-	-	-
96 - Specified Heart Arrhythmias	501,841	15.4%	79,498	15.8%	0.095	1.10	(1.09, 1.11)	<.0001
Cerebrovascular Disease								
99 - Cerebral Hemorrhage	18,047	0.6%	2,409	13.3%	-0.171	0.84	(0.80, 0.89)	<.0001
100 - Ischemic or Unspecified Stroke	129,118	4.0%	18,110	14.0%	-0.090	0.91	(0.90, 0.93)	<.0001
103 - Hemiplegia/Hemiparesis	53,193	1.6%	7,669	14.4%	-0.127	0.88	(0.86, 0.91)	<.0001
104 - Monoplegia, Other Paralytic Syndromes	4,854	0.1%	714	14.7%	-	-	-	-
Vascular								
106 - Atherosclerosis of the Extremities with Ulceration or Gangrene	25,789	0.8%	5,423	21.0%	-	-	-	-

HCC Comorbidity	Stays	% Stays	PPHs	PPH Rate	Estimate	Odds Ratio	95% CI	P-value
107 - Vascular Disease with Complications	75,592	2.3%	12,711	16.8%	-	-	-	-
108 - Vascular Disease	443,488	13.6%	60,878	13.7%	-0.014	0.99	(0.98, 1.00)	0.0092
Lung								
110 - Cystic Fibrosis	608	0.0%	69	11.3%	-	-	-	-
111 - Chronic Obstructive Pulmonary Disease	439,928	13.5%	77,407	17.6%	0.209	1.23	(1.22, 1.25)	<.0001
112 - Fibrosis of Lung and Other Chronic Lung Disorders	29,401	0.9%	3,987	13.6%	-	-	-	-
114 - Aspiration and Specified Bacterial Pneumonias	30,346	0.9%	7,135	23.5%	-	-	-	-
115 - Pneumococcal Pneumonia, Emphysema, Lung Abscess	7,329	0.2%	1,516	20.7%	-	-	-	-
Eye								
122 - Proliferative Diabetic Retinopathy and Vitreous Hemorrhage	24,601	0.8%	4,254	17.3%	0.096	1.10	(1.06, 1.14)	<.0001
124 - Exudative Macular Degeneration	62,236	1.9%	6,971	11.2%	-	-	-	-
Kidney								
134 - Dialysis Status	56,519	1.7%	11,599	20.5%	-	-	-	-
135 - Acute Renal Failure	140,553	4.3%	30,041	21.4%	0.052	1.05	(1.04, 1.07)	<.0001
136 - Chronic Kidney Disease (Stage 5)	23,844	0.7%	4,077	17.1%	0.175	1.19	(1.15, 1.24)	<.0001
137 - Chronic Kidney Disease, Severe (Stage 4)	34,506	1.1%	6,315	18.3%	0.292	1.34	(1.30, 1.38)	<.0001
Skin								
157 - Pressure Ulcer of Skin with Necrosis Through to Muscle, Tendon, or Bone	7,090	0.2%	2,076	29.3%	0.372	1.45	(1.37, 1.54)	<.0001
158 - Pressure Ulcer of Skin with Full Thickness Skin Loss	14,257	0.4%	3,392	23.8%	0.235	1.27	(1.21, 1.32)	<.0001
161 - Chronic Ulcer of Skin, Except Pressure	101,640	3.1%	17,715	17.4%	0.234	1.26	(1.24, 1.29)	<.0001
162 - Severe Skin Burn or Condition	400	0.0%	76	19.0%	-	-	-	-

Injury								
166 - Severe Head Injury	358	0.0%	52	14.5%	-	-	-	-
HCC Comorbidity	Stays	% Stays	PPHs	PPH Rate	Estimate	Odds Ratio	95% CI	P-value
167 - Major Head Injury	17,820	0.5%	2,330	13.1%	-0.109	0.90	(0.85, 0.94)	<.0001
169 - Vertebral Fractures without Spinal Cord Injury	47,149	1.4%	6,639	14.1%	-	-	-	-
170 - Hip Fracture/Dislocation	45,715	1.4%	6,216	13.6%	-0.147	0.86	(0.84, 0.89)	<.0001
173 - Traumatic Amputations and Complications	15,044	0.5%	2,915	19.4%	-	-	-	-
Complications								
176 - Complications of Specified Implanted Device or Graft	63,303	1.9%	10,863	17.2%	-0.094	0.91	(0.89, 0.93)	<.0001
Transplant								
186 - Major Organ Transplant or Replacement Status	7,923	0.2%	1,349	17.0%	-	-	-	-
Openings								
188 - Artificial Openings for Feeding or Elimination	33,125	1.0%	7,018	21.2%	0.148	1.16	(1.13, 1.20)	<.0001
Amputation								
189 - Amputation Status, Lower Limb/Amputation Complications	19,561	0.6%	4,140	21.2%	-	-	-	-