Do hospital performance rankings sufficiently account for underlying patient risk?

The value of information in outcomes-based risk adjustment

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Abstract

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Objective: To determine the optimal amount of information that should be included in a risk adjustment model as it pertains to health care performance based financing.

Data Sources: Health Care Cost and Utilization Project (HCUP) State Inpatient Databases (SID) for New York state 2005-2009

Study Design: Replicated existing hierarchical logistic risk adjustment models for mortality and readmission on a large administrative dataset of patients with a primary diagnosis of acute myocardial infarction (AMI), heart failure (HF), or pneumonia (PN). Machine learning techniques were also applied to incorporate individual patient diagnoses as discrete predictors. All models were run on identical patient populations and evaluated using cross-validation along with comparison of final facility rankings.

Principal Findings: The c-statistic for 30-day mortality using individual 5-digit ICD-9 diagnoses as predictors was .80 for AMI, .76 for HF, and .78 for PN, compared to .75, .73, and .74, respectively for Centers for Medicare and Medicaid Services (CMS) models. Similar improvements were observed for in-facility mortality, however not for 30-day readmission.

Conclusions: Facility performance rankings could be refined by including more patient information, however the marginal return on information appears to be low with CMS models as the point of reference.

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Introduction

Risk adjustment is used extensively in the health care sector to measure the composite risk of groups of patients. Demographics, diagnoses, procedures, vital signs, and test results can all be incorporated to assess patient severity-of-illness. Analysts have traditionally related patient risk with two values of interest: expected cost of care and expected outcomes. For decades the Elixhauser (Elixhauser et al. 1998) and Charlson (Charlson et al. 1987) comorbidity indices have been used to draw associations independent of patient risk. Medicare Advantage utilizes a more tailored model – the Center for Medicare and Medicaid Services (CMS) Hierarchical Condition Categories (HCC) (Pope et al. 2004) – to determine capitated payments to private insurers. Under this system, higher payments are distributed for higher risk patients, lessening the incentive for insurers to crowd out the least healthy consumers (Newhouse J.P et al. 2011). Risk adjustment is also used by actuaries to price risk of individuals enrolled in health plans (Duncan 2011). A recently developed application of risk adjustment pertains to pay-for-performance (P4P). Similar to risk adjustment of costs, risk adjustment for performance seeks to incentivize the efficient, quality delivery of care, but with outcomes as the endogenous variable.

The two most prominent P4P plans introduced to date in the United States are the CMS Hospital Value-Based-Purchasing plan and Hospital Readmissions Reduction Program. Collectively these programs will withhold and reallocate up to five percent of DRG-based reimbursements for inpatient stays by 2017 (Centers for Medicare & Medicaid Services, HHS 2011; Joynt and Jha 2013). Both programs incorporate risk-adjusted outcome-of-care measures, namely 30-day readmission and 30-day mortality, using CMS HCC modeling.

Traditional risk adjustment for outcomes employs logistic regression to predict patient mortality or readmission after condensing diagnostic and demographic indicators into a set of

clinically relevant categories. The predictions from these models are then compared to actual outcomes at the facility level to generate facility performance scores. Past studies have implemented non-linear machine learning techniques for risk adjustment (Austin et al. 2012); (Robinson 2008), particularly as it relates to trauma care (Stephen M DiRusso et al. 2000; Eftekhar et al. 2005). Others have replicated CMS outcome models (Li, Kim, and Doshi 2010; Silber et al. 2010) on external datasets and compared to alternative existing comorbidity indices. This analysis uniquely replicates existing outcome prediction models on a separate administrative dataset, and directly compares the results of those replications to potentially more robust non-linear machine learning techniques. We aim to assess the degree to which additional information improves patient risk assessment by comparing existing and novel risk adjustment processes across a suite of model performance measures.

Research design and methods

Measures for model comparison

Predictive accuracy

Accurate estimation of patient-level risk is a fundamental input to facility-level risk-adjusted outcomes. Discrimination, the ability of a model to assign a higher risk to patient who experiences a negative health outcome relative to a patient with a positive outcome, was measured using the c-statistic. Calibration, the ability of a model to measure the extent to which a group of patients are at risk relative to others, was measured using the Hosmer-Lemeshow test statistic (Hosmer and Lemeshow 1980).

Facility rank order variation

As models add more information, the ranking of facility risk-adjusted outcome rates should converge to some true performance ranking. If information does have diminishing

marginal returns, the shift in rank orders would become less dramatic as more information is added in consecutive models. We calculated the variation in rank orders between each of the models, expecting the optimal risk adjustment model to have little variation between its ranking and those of more informative models.

Socioeconomic bias

Typically, outcomes-based risk adjustment omits socioeconomic characteristics such as race and income. This exclusion is meant to avoid rewarding facilities that discriminate on the basis of socioeconomic status (SES). For instance, if low income patients are more likely to have poor outcomes, and a facility has a disproportionally high frequency of low-income bad outcomes (all other factors constant), those cases will have a smaller impact on the facility's risk-adjusted outcome than would an equal number of mid- or high-income bad outcomes. It could also be the case that socioeconomic characteristics have an impact on outcomes that cannot be controlled by the facility, such as associations between readmission and access to care (Lindenauer et al. 2013).

The argument for including socioeconomic characteristics in risk adjustment is that those characteristics convey information on patient severity that cannot be captured by other covariates in the model (Philbin et al. 2001). For example, black patients are at a greater risk of hypertension-related cardiovascular disease (Ferdinand and Sounders 2006). It is possible that a race covariate in the model would add severity information not captured by cardiovascular covariates. If this is the case, facilities with a disproportionate number of black patients would actually be penalized by a model that does not include race. A proper risk adjustment model would account for all conditions that have SES disparities, such that an SES term in the model would have no impact other than to measure discriminatory practice.

The effect of including SES information will be measured for this analysis by running each risk adjustment model with and without SES covariates. If existing models fully account for risk-related SES differences, the impact of SES terms will not change as more information is added.

Data sources

We identified all cases of acute myocardial infarction (AMI), heart failure (HF), and pneumonia (PN) in New York state from 2006-2007 using the Health Care Cost and Utilization Project (HCUP) State Inpatient Databases (SID). Administrative information in the dataset includes demographic characteristics, diagnoses, and procedures. New York state was chosen due to the combination of a number of features: diagnosis present-on-admission indicators, socioeconomic indicators (including patient residential zip code), patient visit linkage for patient histories, and facility identifiers. We made an attempt to estimate 30-day mortality for each HCUP discharge by probabilistically linking cases to the National Center for Health Statistics (NCHS) National Vital Statistics System Mortality dataset (NVSS-M). In addition to individual-level data, we gathered zip code income information from 2008 public-use IRS Statistics of Income files (Internal Revenue Service 2008) and 2011 American Community Survey estimates compiled by the University of Michigan Population Resource Center (University of Michigan Population Resource Center 2010). Finally, we used CMS Hospital Compare risk-adjusted rates from the reporting period July 2006 – June 2007 to assess the adequacy of our replication (Centers for Medicare and Medicaid Services 2008).

Sample inclusion

Occurrences of each condition were identified by applying CMS diagnostic criteria (Grady et al. 2013a; Grady et al. 2013b) to a patient's primary diagnosis. Transfers were treated

as single observations, where deaths were assigned to the admitting facility and readmissions were assigned to the transferred patient's final site of treatment. Any patients discharged against physician advice were removed from the sample. Inclusion criteria followed CMS methodology where possible. We removed all patients under the age of 66 to simulate a Medicare patient population with at least one year of patient history under enrollment. A full listing of exclusions can be found in **Appendix A**.

Outcomes

In-facility mortality and 30-day readmission outcomes were complete for all patients using the discharge data. In-facility deaths were not counted in the readmission models. Additionally, patient readmissions with a diagnosis or procedure indicating planned visits (e.g. cosmetic surgeries) were not considered readmissions. In-facility mortality has been shown to produce biased facility risk-adjusted outcomes in favor of those facilities with low length-of-stay (Rosenthal et al. 2000). Accordingly, we developed a 30-day mortality outcome using the dataset's visit linkage identifier. We were able to deduce 30-day mortality for 76.4% of 2006 and 73.1% of 2007 index admissions eligible for mortality in our sample all HCUP SID NY inpatient admissions from 2006-2009.

For those patients where 30-day mortality could not be determined, we attempted to estimate a probability of 30-day mortality by cross-referencing the number of deaths that occurred in NVSS-M death certificate data during the patient's post-admission period in the patient's age-sex-race-county group. The estimation model was trained on 2005 data, and applied to 2006-07 patients. Results of the linkage produced an error rate that did not outweigh the benefits of a more complete sample; however such a model could be used in the future for

datasets without visit linkage. We therefore did not capture patients who failed to return to an inpatient setting or died out-of-facility.

Predictors

We compiled several predictor sets incorporating varying levels of patient information. First, age and sex alone were examined as covariates. Second, Elixhauser comorbidities were available in the HCUP dataset, and further populated using one-year inpatient histories from the date of admission. Third, we translated diagnosis codes into CMS Hierarchical Condition Categories (HCC). Finally, we used the full set of discrete 3-digit and 5-digit ICD-9 diagnosis codes as separate predictor sets. The HCC and ICD-9 predictor sets incorporated one-year inpatient histories, and only included diagnoses present on admission for index admissions per previously established standards (Iezzoni 2007).

Socioeconomic characteristics were included in the inpatient data and drawn from external data sources. Race was coded by the facility in the following categories: White, Black, Hispanic, Asian or Pacific Islander, Native American, and Other. Income data was linked to patients using the zip code of residence recorded in the dataset. Median income was taken from 2011 American Community Survey estimates. For each zip code, we also generated a measure of income inequality using the 2008 IRS public-use data files. IRS reports annual gross income and number of tax returns for seven stratifications of income, allowing for the approximation of zip-code specific Gini coefficients. A number of patients for each condition were excluded from analysis due to invalid zip codes or foreign residency. Homeless patients could not be linked to income data using residential zip code, and were represented in socioeconomic models as a separate category.

Methods

A series of classification models were used to estimate risk-adjusted outcomes for facilities in 2007. Mixed effects logistic regression alone sufficed for models where the predictor set was small: age-sex, Elixhauser, and Medicare. An extra step was added prior to logistic modeling for the ICD-9 predictors. We implemented tree-based classification in the randomForest package for R.15.2 (Liaw and Wiener n.d.; R Core Team 2012) on 2006 data to predict a condensed risk score for 2007 patients. Random forests are an ensemble machine learning technique that incorporates randomness by running multiple bootstrapped patient datasets through a series of decisions trees, the nodes of which are those covariates most highly associated with the outcome out of a randomly selected subset of covariates (Breiman 2001). Multiple studies have shown slight to no advantage for such classification and regression trees (CART) over logistic regression when run on the same predictor set (Dreiseitl and Ohno-Machado 2002; Terrin et al. 2003; Austin 2007; Colombet et al. 2000), however CART allowed us to include each possible diagnosis code as a discrete predictor. The rarity of outcomes in our dataset, or class imbalance, presented an issue for tree-based learning that we found to have a particular impact on calibration. We therefore oversampled instances of death and readmission for randomForest in line with suggestions from previous studies (Burez and Van den Poel 2009; Weiss 2004). The outputted risk score from randomForest served as the only covariate for subsequent logistic modeling on 2007 data. To produce model fit statistics (c-statistic and Hosmer-Lemeshow chi-squared), we ran 10-fold cross validation on identical train and test sets without facility-specific random effects – where each test set's size equaled one-tenth of the 2007 sample for a condition. Hosmer-Lemeshow goodness of fit has been shown to be poorly robust to large sample sizes (Paul, Pennell, and Lemeshow 2013), nevertheless we also

calculated chi-squared values using 10 split-sample sets where the test set size equaled one-half of the 2007 sample.

Risk-adjusted mortality and readmission were estimated on the patient severity predictors by dividing predicted outcomes (facility random effect included) by expected outcomes (facility random effect excluded), and multiplying by the mean outcome in the full sample. For the age-sex, Elixhauser, and Medicare models the set of demographic and condensed comorbidity indicators represented patient severity, whereas for the ICD-9 sets patient severity was the 2007 risk predictions outputted by the machine learning model having already been run on demographic and comorbidity indicators for 2006 data. Following CMS methodology, 500 patient datasets were randomly selected with replacement for each condition and outcome using hospital-clustered bootstrapping. Uncertainty was incorporated by drawing a facility-specific random effect from the facility-specific normal distribution within each bootstrapped sample. Results from the bootstrapped datasets allowed for calculation of 95% confidence intervals and overall facility rankings – facilities were ranked using a value p between zero and one, where p represents the proportion of bootstrapped samples where the facility performed better than the bootstrap sample mean. All data processing, regression models, and analysis were conducted in Stata 11.2 (StataCorp 2009).

To investigate the impact of socioeconomic terms, we ran each bootstrapped sample three additional times for each predictor set, including patient race, deciles of zip code mean income, and zip code Gini coefficient as terms. We measured the average absolute value of the change in the performance score p between the two bootstrapped sets (with and without SES) to approximate the influence of socioeconomic information on risk-adjusted rates.

Results

Eligible admissions with a primary diagnosis of AMI, HF, or PN comprised 3.6% of all NY inpatient stays from 2006-07. The average patient in this subset had 8.9 diagnoses and 0.1 E-codes. 62.2% percent of patients had at least one inpatient stay over the year prior to the index admission, allowing for patient history. **Table 1** describes patient characteristics for 2006-07 by condition and outcome, as well as the count of facilities and index admissions per facility. Similar to past findings, we observed the difference between our risk-adjusted 30-day mortality rates and in-facility mortality rates to be associated with facility mean length-of-stay for all conditions.

Table 2 displays the correlation of facility risk-adjusted mortality and readmission rates across models. The facility-level outputs of all models were highly correlated within condition and outcome, especially for 30-day readmission. Despite presumably having overlapping patient populations for the period January-June 2007, our 30-day mortality Medicare replications yielded only modest correlations with the risk-adjusted mortality rates reported by Hospital Compare (.49 .45, .55 for AMI, HF, and PN, respectively). The age-sex, Elixhauser, and machine learning models showed similar or even higher correlations with Hospital Compare rates than our Medicare replication. Between Hospital Compare and our replication, we noted a correlation for the difference in patient counts and difference in mortality rates, indicating that less overlap in patient populations could have driven discrepancies at the facility level. Moreover, those facilities with large discrepancies tended to have a high proportion of patients presenting conditions where odds ratios differed between our replication and CMS reported coefficients (e.g. cardio-respiratory failure and shock). Several aspects of our analysis could further explain shortcomings of our replication: (1) we replicated the 2013 methodology whereas 2007 rates were reported using the 2007 methodology; (2) we utilized solely inpatient

visits for patient histories; and (3) we included only those patients where 30-day mortality could be determined solely from discharge data.

Machine learning outputs outperformed existing models for both in-facility and 30-day mortality – as measured by the c-statistic – while maintaining acceptable calibration. More informative models did not noticeably reduce the importance of SES predictors in determining facility rankings. Patient-level predictions for readmission were not improved upon, despite considerably more information included in the model. **Table 3** displays the performance tests of interest across all outcomes and models: c-statistic, Hosmer-Lemeshow chi-squared, difference in facility rankings after including each SES characteristic, and facility ranking change relative to the next least informative model.

Appendix B lists the odds ratios for covariates across all mixed effects models, including the addition of SES terms, and the "importance scores" for the most influential diagnoses outputted by the randomForest package in R. Across all models SES covariates had the strongest influence on HF, particularly for 30-day mortality – much of this influence seemed to be driven by Hispanic patients tending to have better outcomes, a phenomenon well-documented in the medical literature as the "Hispanic paradox" (Ruiz, Steffen, and Smith 2013). Interestingly, the machine learning models did not introduce diagnostic terms that might explain better outcomes for Hispanic patients, and in fact appeared to be more affected by race covariates. A number of diagnosis codes seemingly unrelated to conditions of interest registered as important determinants in the machine learning models. Still others could be considered "garbage codes", in that they do not indicate the true underlying cause of risk. For instance, cardiac arrest (ICD 427.5) ranked as a top-20 predictor of mortality for both AMI and PN.

Discussion

While we improved upon existing methods for mortality prediction, our readmission predictions at best only matched current models. Existing methods appear to be much more efficient in the use of patient information – raw information must be included on a scale orders of magnitude higher than existing methods to provide returns. Such large inputs may not be worth the marginal gains, as the costs of information can be high for both providers and analysts (Iezzoni 1997).

Aside from the costs of information, these results point to both strengths and weaknesses of a "data driven" approach. The machine learning models in some cases outperformed existing methodologies without imparting any additional parameters on diagnostic information. Very little effort was required on the front-end to produce results at least as good as those from comorbidity indices. However, this lack of parameterization can be a double-edged sword – the appearance of garbage codes and otherwise meaningless diagnoses as important predictors in the machine learning sets denotes a vulnerability to differential coding by facilities. Existing models have excluded this possibility by ignoring irrelevant diagnoses.

Limitations

A number of limitations are apparent in this analysis. First, it is unclear whether our replication of the Medicare models served as a suitable enough basis for comparison. We introduced bias through our 30-day mortality assignment, and only examined the inpatient setting for patient histories. Second, our machine learning algorithms could be further customized to more efficiently process diagnostic information into risk scores. For instance, our models made no distinction between diagnoses over the course of a patient's index admission and those from prior admissions. Further discretizing this information could add value to predictive accuracy.

We were unable to conclude that additional information shifted facility performance scores towards a more valid ranking. The high correlation between facility risk-adjusted outcomes across models would suggest additional information does not add substantial value to the process. We did notice some variation in scores after bootstrapping and ranking the probability of top-half performance. However, any movement in the probability of being a top performer could be attributed to random noise rather than model accuracy. This shortcoming emphasizes the potential usefulness of an alternative gold-standard beyond outcomes, perhaps a composite measure over a number of other domains.

Table 1 – Descriptive statistics

	AMI			HF			PN		
	Mortality		Readmission	Mortality		Readmission	Mortality		Readmission
	In-facility	30-day	30-day	In-facility	30-day	30-day	In-facility	30-day	30-day
Total admissions	29,593	21,187	26,386	71,085	55,456	61,094	64,244	46,897	54,496
Facility count	201	199	202	210	209	212	210	209	213
Admissions per facility	147	106	131	339	265	288	306	224	256
Outcome rate (%)	10.4	16.2	21.6	5.4	8.6	23.4	7.6	12.2	18.1
Mean age	80.2	80.5	79.6	80.9	80.7	80.8	80.8	80.7	80.6
Female (%)	54.0	54.7	52.6	57.3	57	57.1	55.2	54.5	55.3
Race (%)									
White	77.9	77.4	76.9	74.4	73.9	73.7	78.2	78.4	77.9
Black	9.0	9.6	8.5	12.9	13.4	13.3	8.8	9.1	8.8
Hispanic	7.5	7.7	7.9	8.1	8.2	8.3	7.7	7.6	7.9
Asian or Pacific Islander	1.7	1.7	1.6	1.4	1.4	1.4	2.2	2.0	2.2
Native American	0.7	0.7	0.6	0.4	0.4	0.4	0.4	0.4	0.3
Other	3.1	2.9	4.5	2.8	2.7	2.9	2.7	2.6	2.8
Mean zip code median household income (IQR) ('000s 2010 USD)	61.1 (43.3-75.2)	60.9 (43.2-75.2)	61.8 (44.0-76.8)	60.0 (42.4-74.4)	59.9 (42.1-74.5)	59.8 (42.1-74.4)	60.9 (43.0-75.2)	60.9 (42.8-75.2)	60.9 (42.9-75.2)
Mean zip code gini coefficient(IQR)	0.51 (0.46-0.55)	0.51 (0.46-0.55)	0.51 (0.46-0.55)	0.51 (0.46-0.54)	0.51 (0.46-0.54)	0.51 (0.46-0.54)	0.51 (0.46-0.54)	0.51 (0.46-0.54)	0.51 (0.46-0.54)
Index admission mean # diagnoses (max	8.9	9.2	8.8	9.2	9.3	9.1	8.7	8.8	8.5
Index admission mean # e-codes (max 7)	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1
Admission within past year (%)	51.4	56.3	47.5	67.2	71.4	64.6	54.3	60.1	50.1
Mean # admissions within past year	1.1	1.2	1.0	1.7	1.9	1.6	1.2	1.4	1.1

Table 2 – Correlation matrix for facility risk adjusted rates

† Hospital Compare uses patient population from Jul 2006-Jun 2007, whereas all other rates use Jan 2007-Dec 2007

In-facility mortality		Unadjusted	Hosp Compare †	Age-sex	Elixhauser	Medicare	3-digit
AMI	Hosp Compare	0.32					
	Age-sex	0.76	0.43				
	Elixhauser	0.76	0.43	0.97			
	Medicare	0.70	0.41	0.93	0.94		
	3-digit ICD-9	0.67	0.47	0.87	0.89	0.87	
	5-digit ICD-9	0.60	0.37	0.84	0.84	0.88	0.92
HF	CMS reported	0.37					
	Age-sex	0.83	0.35				
	Elixhauser	0.78	0.31	0.94			
	Medicare	0.79	0.31	0.93	0.96		
	3-digit ICD-9	0.77	0.38	0.88	0.84	0.86	
	5-digit ICD-9	0.74	0.36	0.85	0.82	0.84	0.98
PN	CMS reported	0.19					
	Age-sex	0.40	0.49				
	Elixhauser	0.38	0.51	0.95			
	Medicare	0.37	0.50	0.93	0.93		
	3-digit ICD-9	0.36	0.54	0.89	0.86	0.85	
	5-digit ICD-9	0.34	0.53	0.87	0.85	0.86	0.98

30-day mortality		Unadjusted	Hosp Compare †	Age-sex	Elixhauser	Medicare	3-digit
AMI	Hosp Compare	0.35					
	Age-sex	0.73	0.49				
	Elixhauser	0.73	0.48	0.97			
	Medicare	0.72	0.49	0.94	0.95		
	3-digit ICD-9	0.68	0.50	0.87	0.89	0.89	
	5-digit ICD-9	0.60	0.43	0.82	0.84	0.85	0.92
HF	CMS reported	0.43					
	Age-sex	0.83	0.48				
	Elixhauser	0.79	0.45	0.96			
	Medicare	0.80	0.45	0.94	0.97		
	3-digit ICD-9	0.80	0.50	0.90	0.87	0.88	
	5-digit ICD-9	0.77	0.49	0.89	0.87	0.88	0.98
PN	CMS reported	0.28					
	Age-sex	0.55	0.52				
	Elixhauser	0.52	0.56	0.94			
	Medicare	0.52	0.55	0.93	0.94		
	3-digit ICD-9	0.50	0.57	0.89	0.89	0.88	
	5-digit ICD-9	0.48	0.56	0.87	0.87	0.89	0.98

30-day readmission		Unadjusted	Age-sex	Elixhauser	Medicare	3-digit
AMI	Age-sex	0.62				
	Elixhauser	0.59	0.96			
	Medicare	0.59	0.96	0.99		
	3-digit ICD-9	0.60	0.99	0.97	0.98	
	5-digit ICD-9	0.59	0.97	0.98	0.99	0.99
HF	Age-sex	0.51				
	Elixhauser	0.49	0.95			
	Medicare	0.49	0.92	0.98		
	3-digit ICD-9	0.50	0.96	0.98	0.98	
	5-digit ICD-9	0.49	0.94	0.97	0.99	0.99
PN	Age-sex	0.52				
	Elixhauser	0.50	0.93			
	Medicare	0.48	0.92	0.98		
	3-digit ICD-9	0.50	0.96	0.97	0.97	
	5-digit ICD-9	0.49	0.93	0.96	0.98	0.99

Table 3 – Model performance

|αf| represents the average facility absolute change in the probability of being a top-half performer after including SES terms
Δ_{rank} represents the average facility change in performance ranking from the model preceding it

In-facility mortality

Model	Number of predictors			C-statistic			H-L chi-squared (k-fold / split-sample)			$\lvert\alpha_f\rvert$									Δ_{rank}		
										Race			Income			Income inequality					
	AMI	HF	PN	AMI	HF	PN	AMI	HF	PN	AMI	HF	PN	AMI	HF	PN	AMI	HF	PN	AMI	HF	PN
Age-sex	2	2	2	0.623	0.606	0.606	7.1/10.1	10.3/10.3	8.6/13.9	0.009	0.024	0.020	0.010	0.020	0.020	0.009	0.013	0.008	-	-	-
Elixhauser	31	31	31	0.690	0.716	0.700	8.5/15.4	11.1/11.5	12.8/23.9	0.012	0.019	0.018	0.012	0.016	0.019	0.010	0.010	0.008	9.8	12.7	12.9
Medicare	27	24	31	0.766	0.742	0.751	10.1/15.5	9.3/15.8	11.4/30.1	0.013	0.018	0.015	0.015	0.023	0.018	0.008	0.012	0.007	16.3	12.5	14.9
3-digit ICD-9	788	914	895	0.777	0.754	0.760	10.0/18.5	14.0/30.5	19.8/52.2	0.018	0.026	0.028	0.021	0.026	0.023	0.010	0.012	0.007	19.7	18.8	18.2
5-digit ICD-9	3271	4503	4591	0.814	0.776	0.786	8.6/12.2	11.4/24.2	11.7/21.0	0.012	0.028	0.028	0.018	0.026	0.027	0.010	0.012	0.007	15.2	7.8	10.6

30-day mortality

Model	Number of predictors			C-statistic			H-L chi-squared (k-fold / split-sample)			$\lvert\alpha_f\rvert$									Δ_{rank}		
										Race			Income			Income inequality					
	AMI	HF	PN	AMI	HF	PN	AMI	HF	PN	AMI	HF	PN	AMI	HF	PN	AMI	HF	PN	AMI	HF	PN
Age-sex	2	2	2	0.623	0.621	0.603	9.5/13.7	8.2/10.7	7.5/16.3	0.015	0.030	0.021	0.016	0.023	0.031	0.016	0.010	0.009	-	-	-
Elixhauser	31	31	31	0.673	0.704	0.699	9.0/9.8	8.2/11.5	7.7/15.9	0.015	0.136	0.026	0.017	0.145	0.025	0.016	0.149	0.011	9.0	9.3	16.2
Medicare	27	24	31	0.746	0.729	0.738	8.3/9.3	9.9/13.6	7.8/19.9	0.017	0.034	0.019	0.020	0.031	0.027	0.013	0.012	0.010	15.2	40.4	15.2
3-digit ICD-9	752	894	872	0.764	0.742	0.756	7.9/11.6	13.4/26.5	12.4/27.7	0.020	0.050	0.031	0.028	0.035	0.031	0.012	0.012	0.010	17.6	17.9	19.3
5-digit ICD-9	2996	4281	4273	0.797	0.764	0.780	8.4/7.3	9.2/15.3	8.5/13.3	0.011	0.047	0.026	0.022	0.031	0.035	0.010	0.013	0.011	15.9	8.7	12.8

30-day readmission

Model	Number of predictors			C-statistic			H-L chi-squared (k-fold / split-sample)			$\lvert\alpha_f\rvert$									Δ_{rank}		
										Race			Income			Income inequality					
	AMI	HF	PN	AMI	HF	PN	AMI	HF	PN	AMI	HF	PN	AMI	HF	PN	AMI	HF	PN	AMI	HF	PN
Age-sex	2	2	2	0.531	0.502	0.521	9.0/12.8	7.1/8.2	8.3/7.7	0.007	0.017	0.009	0.015	0.019	0.020	0.013	0.011	0.009	-	-	-
Elixhauser	31	31	31	0.604	0.625	0.632	7.2/9.6	7.4/6.4	8.0/10.9	0.007	0.013	0.007	0.016	0.015	0.018	0.011	0.012	0.009	10.9	14.1	15.5
Medicare	31	37	40	0.615	0.630	0.654	11.2/12.1	9.2/9.2	8.6/15.8	0.007	0.019	0.012	0.016	0.018	0.020	0.011	0.011	0.009	7.0	9.6	10.1
3-digit ICD-9	781	887	881	0.595	0.624	0.643	7.8/12.5	9.0/16.0	7.2/16.5	0.007	0.021	0.011	0.016	0.018	0.019	0.011	0.009	0.009	6.8	9.1	11.5
5-digit ICD-9	3091	4247	4307	0.610	0.635	0.655	8.2/11.4	9.6/18.0	8.2/16.5	0.007	0.020	0.008	0.016	0.020	0.019	0.011	0.009	0.008	4.4	6.8	8.4

References

Austin, P. C. 2007. "A Comparison of Regression Trees, Logistic Regression, Generalized Additive Models, and Multivariate Adaptive Regression Splines for Predicting AMI Mortality." *Statistics in Medicine*, 26(15): 2937–2957, doi:10.1002/sim.2770.

Austin, P. C., D. S. Lee, E. W. Steyerberg, and J. V. Tu. 2012. "Regression Trees for Predicting Mortality in Patients with Cardiovascular Disease: What Improvement Is Achieved by Using Ensemble-based Methods?" *Biometrical Journal. Biometrische Zeitschrift*, 54(5): 657–673, doi:10.1002/bimj.201100251.

Breiman, L. 2001. "Random Forests." *Machine Learning*, 45(1): 5–32, doi:10.1023/A:1010933404324.

Burez, J. and D. Van den Poel. 2009. "Handling Class Imbalance in Customer Churn Prediction." *Expert Systems with Applications*, 36(3, Part 1): 4626–4636, doi:10.1016/j.eswa.2008.05.027.

Centers for Medicare & Medicaid Services (CMS), HHS. 2011. "Medicare Program Hospital Inpatient Value-based Purchasing Program. Final Rule." *Federal register*, 76(88): 26490–547.

Centers for Medicare and Medicaid Services. 2008. "Hospital Compare Risk Adjusted Mortality," Centers for Medicare and Medicaid Services Available at: http://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/HospitalQualityInits/HospitalCompare.html.

Charlson, M. E., P. Pompei, K. L. Ales, and C. R. MacKenzie. 1987. "A New Method of Classifying Prognostic Comorbidity in Longitudinal Studies: Development and Validation." *Journal of Chronic Diseases*, 40(5): 373–383, doi:10.1016/0021-9681(87)90171-8.

Colombet, I., A. Ruelland, G. Chatellier, F. Gueyffier, P. Degoulet, and M. C. Jaulent. 2000. "Models to Predict Cardiovascular Risk: Comparison of CART, Multilayer Perceptron and Logistic Regression." *Proceedings of the AMIA Symposium*: 156–160.

DiRusso, S. M., T. Sullivan, C. Holly, S. N. Cuff, and J. Savino. 2000. "An Artificial Neural Network as a Model for Prediction of Su... : The Journal of Trauma and Acute Care Surgery." *The Journal of Trauma - Injury Infection And Critical Care*, 49(2): 212–220.

Dreiseitl, S. and L. Ohno-Machado. 2002. "Logistic Regression and Artificial Neural Network Classification Models: a Methodology Review." *Journal of Biomedical Informatics*, 35(5–6): 352–359, doi:10.1016/S1532-0464(03)00034-0.

Duncan, I. G. 2011. Healthcare Risk Adjustment and Predictive Modeling, ACTEX Publications.

Eftekhar, B., K. Mohammad, H. E. Ardebili, M. Ghodsi, and E. Ketabchi. 2005. "Comparison of Artificial Neural Network and Logistic Regression Models for Prediction of Mortality in Head Trauma Based on Initial Clinical Data." *BMC Medical Informatics and Decision Making*, 5(1): 3, doi:10.1186/1472-6947-5-3.

Elixhauser, A., C. Steiner, D. R. Harris, and R. M. Coffey. 1998. "Comorbidity Measures for Use with Administrative Data." *Medical care*, 36(1): 8–27.

Ferdinand, K. C. and E. Sounders. 2006. "Hypertension-Related Morbidity and Mortality in African Americans—Why We Need to Do Better." *The Journal of Clinical Hypertension*, 8: 21–30, doi:10.1111/j.1524-6175.2006.05295.x.

Grady, J. N., Z. Lin, Y. Wang, M. Keenan, K. R. Bhat, H. M. Krumholtz, and S. M. Bernheim. 2013. "2013 Condition-Based Measure Updates and Specifications: Acute Myocardial Infarction, Heart Failure, and Pneumonia 30-Day Risk-Standardized Mortality Measures," Yale New Haven Health Services Corporation/Center for Outcomes Research & Evaluation Available at: https://www.qualitynet.org/dcs/ContentServer?c=Page&pagename=QnetPublic%2FPage%2FQnetTier4&cid=1163010421830.

Hosmer, D. W. and S. Lemeshow. 1980. "Goodness of Fit Tests for the Multiple Logistic Regression Model." *Communications in Statistics - Theory and Methods*, 9(10): 1043–1069, doi:10.1080/03610928008827941.

Iezzoni, L. I. 2007. "Finally Present on Admission but Needs Attention." *Medical Care*, 45(4): 280–282, doi:10.1097/01.mlr.0000259078.54902.fe.

Iezzoni, L. I. 1997. "How Much Are We Willing To Pay for Information About Quality of Care." *Annals of Internal Medicine*, 126(5): 391–393, doi:10.7326/0003-4819-126-5-199703010-00009.

Internal Revenue Service. 2008. “SOI Tax Stats - Individual Income Tax Statistics - Free ZIP Code Data (SOI),” Internal Revenue Service Available at: http://www.irs.gov/uac/SOI-Tax-Stats-Individual-Income-Tax-Statistics-Free-ZIP-Code-data-(SOI).

Joynt, K. E. and A. K. Jha. 2013. “A Path Forward on Medicare Readmissions.” *New England Journal of Medicine*, 368(13): 1175–1177, doi:10.1056/NEJMp1300122.

Li, P., M. M. Kim, and J. A. Doshi. 2010. “Comparison of the Performance of the CMS Hierarchical Condition Category (CMS-HCC) Risk Adjuster with the Charlson and Elixhauser Comorbidity Measures in Predicting Mortality.” *BMC Health Services Research*, 10(1): 245, doi:10.1186/1472-6963-10-245.

Liaw, A. and M. Wiener. “Classification and Regression by randomForest.” *R News*, 2(3): 18–22.

Lindenauer, P. K., T. Lagu, M. B. Rothberg, J. Avrunin, P. S. Pekow, Y. Wang, and H. M. Krumholz. 2013. “Income Inequality and 30 Day Outcomes after Acute Myocardial Infarction, Heart Failure, and Pneumonia: Retrospective Cohort Study.” *BMJ*, 346(feb14 3): f521–f521, doi:10.1136/bmj.f521.

Newhouse J.P, Hsu J, Huang J, Fung V, and Brand R.J. 2011. “The Structure of Risk Adjustment for Private Plans in Medicare.” *Am. J. Managed Care American Journal of Managed Care*, 17(6): e231–e240.

Paul, P., M. L. Pennell, and S. Lemeshow. 2013. “Standardizing the Power of the Hosmer-Lemeshow Goodness of Fit Test in Large Data Sets.” *Statistics in medicine*, 32(1): 67–80, doi:10.1002/sim.5525.

Philbin, E. F., G. W. Dec, P. L. Jenkins, and T. G. DiSalvo. 2001. “Socioeconomic Status as an Independent Risk Factor for Hospital Readmission for Heart Failure.” *The American Journal of Cardiology*, 87(12): 1367–1371, doi:10.1016/S0002-9149(01)01554-5.

Pope, G., J. Kautter, R. Ellis, A. Ash, J. Ayanian, L. Iezzoni, M. Ingber, J. Levy, and J. Robst. 2004. “Risk Adjustment of Medicare Capitation Payments Using the CMS-HCC Model.” *Quantitative*

Health Sciences Publications and Presentations Available at: http://escholarship.umassmed.edu/qhs_pp/723.

R Core Team. 2012. R: A Language and Environment for Statistical Computing, Vienna, Austria: R Foundation for Statistical Computing.

Robinson, J. W. 2008. "Regression Tree Boosting to Adjust Health Care Cost Predictions for Diagnostic Mix." *Health Services Research*, 43(2): 755–772, doi:10.1111/j.1475-6773.2007.00761.x.

Rosenthal, G. E., D. W. Baker, D. G. Norris, L. E. Way, D. L. Harper, and R. J. Snow. 2000. "Relationships Between In-hospital and 30-day Standardized Hospital Mortality: Implications for Profiling Hospitals." *Health Services Research*, 34(7): 1449–1468.

Ruiz, J. M., P. Steffen, and T. B. Smith. 2013. "Hispanic Mortality Paradox: A Systematic Review and Meta-Analysis of the Longitudinal Literature." *American Journal of Public Health*, 103(3): e52–e60, doi:10.2105/AJPH.2012.301103.

Silber, J. H., P. R. Rosenbaum, T. J. Brachet, R. N. Ross, L. J. Bressler, O. Even-Shoshan, S. A. Lorch, and K. G. Volpp. 2010. "The Hospital Compare Mortality Model and the Volume–Outcome Relationship." *Health Services Research*, 45(5p1): 1148–1167, doi:10.1111/j.1475-6773.2010.01130.x.

StataCorp. 2009. Stata Statistical Software: Release 11, College Station, TX: StataCorp LP.

Terrin, N., C. H. Schmid, J. L. Griffith, R. B. D'Agostino, and H. P. Selker. 2003. "External Validity of Predictive Models: a Comparison of Logistic Regression, Classification Trees, and Neural Networks." *Journal of Clinical Epidemiology*, 56(8): 721–729.

University of Michigan Population Resource Center. 2010. "Zip Code Characteristics: Mean and Median Household Income," American Community Survey (ACS), University of Michigan Population Resource Center Available at: http://www.psc.isr.umich.edu/dis/census/Features/tract2zip/index.html.

Weiss, G. M. 2004. "Mining with Rarity: a Unifying Framework." *SIGKDD Explor. Newsl.*, 6(1): 7–19, doi:10.1145/1007730.1007734.

Appendix A – Sample inclusion criteria

Values in parentheses represent the number of observations excluded for each rule (note that the sum of these values subtracted from total observations will be less than the final sample, as some observations do not meet multiple criteria).

	AMI	HF	PN
All NY admissions 2006-07	5,163,298	5,163,298	5,163,298
Admissions with condition as primary diagnosis at originating facility	75,904	141,842	132,882
Age > 65	45,034	104,627	78,279
Transferred patient w/o matching diagnosis at transfer-to facility	(254)	(252)	(289)
No visit linkage (patient history not available)	(111)	(264)	(150)
Discharged against physician advice	(301)	(866)	(411)
Age, sex, race, admission source missing	(4,023)	(7,886)	(5,467)
Residential zip code invalid or n/a	(328)	(579)	(480)
Missing income data	(3,135)	(3,455)	(3,313)
Admitted and discharged on same day (likely not clinically significant)	(1,237)	(732)	(685)
In-facility mortality exclusions			
Deaths assigned only to original facility in case of transfer	(7,972)	(2,060)	(717)
Only 1 visit randomly selected for patients w/ >1 admission	(2,112)	(21,259)	(5,991)
Total sample	**29,593**	**71,085**	**64,244**
Total sample - ML train set (2006)	**16,387**	**38,213**	**34,993**
Total sample - Model set (2007)	**13,206**	**32,872**	**29,251**
30-day mortality exclusions			
Deaths assigned only to original facility in case of transfer	(7,972)	(2,060)	(717)
Only 1 visit randomly selected for patients w/ >1 admission	(2,112)	(21,259)	(5,991)
Indeterminate 30-day mortality	(8,406)	(15,629)	(17,347)
Total sample	**21,187**	**55,456**	**46,897**
Total sample - ML train set (2006)	**12,000**	**30,275**	**26,203**
Total sample - Model set (2007)	**9,187**	**25,181**	**20,694**
30-day readmission exclusions			
Readmissions cannot be considered index admissions	(5,251)	(22,592)	(11,455)
In-facility deaths not considered for readmission outcome	(4,397)	(5,346)	(6,218)
Readmissions assigned only to second facility in case of transfer	(6,654)	(3,545)	(1,597)
Readmissions occurring within 1 day of discharge considered transfers	(1,914)	(460)	(351)
Only 1 visit randomly selected for patients w/ >1 admission	(699)	(9,646)	(2,783)
Total sample	**26,386**	**61,094**	**54,496**
Total sample - ML train set (2006)	**14,417**	**32,865**	**29,647**
Total sample - Model set (2007)	**11,969**	**28,229**	**24,849**

Appendix B.1 – Mixed effects odds ratios – full 2007 sample

Age-sex (In-facility mortality)

AMI in-facility mortality	No SES	Race	Income	Inequality
Age	1.05 [1.05, 1.06]	1.05 [1.05, 1.06]	1.05 [1.05, 1.06]	1.05 [1.05, 1.06]
Female	0.90 [0.80, 1.01]	0.90 [0.80, 1.02]	0.90 [0.80, 1.01]	0.89 [0.79, 1.01]
Race (White as reference)				
Black		0.97 [0.77, 1.20]		
Hispanic		0.87 [0.67, 1.12]		
Asian or Pacific Islander		1.01 [0.66, 1.54]		
Native American		0.69 [0.37, 1.28]		
Other		0.87 [0.61, 1.24]		
Zip Code Income decile (Homeless as reference)				
1			1.30 [0.75, 2.24]	
2			1.39 [0.80, 2.39]	
3			1.28 [0.74, 2.22]	
4			1.25 [0.72, 2.16]	
5			1.42 [0.82, 2.46]	
6			1.27 [0.73, 2.20]	
7			1.37 [0.79, 2.37]	
8			1.32 [0.76, 2.28]	
9			1.33 [0.77, 2.31]	
10			1.30 [0.75, 2.27]	
Zip Code Gini				1.35 [0.55, 3.34]

HF in-facility mortality	No SES	Race	Income	Inequality
Age	1.05 [1.04, 1.06]	1.05 [1.04, 1.06]	1.05 [1.04, 1.06]	1.05 [1.04, 1.06]
Female	0.87 [0.78, 0.96]	0.87 [0.79, 0.97]	0.87 [0.79, 0.96]	0.87 [0.78, 0.96]
Race (White as reference)				
Black		0.90 [0.76, 1.07]		
Hispanic		0.61 [0.48, 0.78]		
Asian or Pacific Islander		0.74 [0.47, 1.17]		
Native American		0.96 [0.51, 1.80]		
Other		1.05 [0.77, 1.43]		
Zip Code Income decile (Homeless as reference)				
1			1.75 [1.06, 2.90]	
2			1.52 [0.92, 2.50]	
3			1.88 [1.15, 3.09]	
4			1.85 [1.13, 3.04]	
5			2.11 [1.29, 3.45]	
6			1.70 [1.03, 2.79]	
7			1.97 [1.20, 3.24]	
8			1.78 [1.08, 2.92]	
9			1.72 [1.05, 2.83]	
10			1.88 [1.14, 3.09]	
Zip Code Gini				1.27 [0.58, 2.76]

PN in-facility mortality	No SES	Race	Income	Inequality
Age	1.05 [1.04, 1.05]	1.05 [1.04, 1.05]	1.05 [1.04, 1.05]	1.05 [1.04, 1.05]
Female	0.89 [0.81, 0.97]	0.89 [0.81, 0.98]	0.89 [0.81, 0.97]	0.88 [0.80, 0.96]
Race (White as reference)				
Black		0.83 [0.69, 1.00]		
Hispanic		0.78 [0.64, 0.96]		
Asian or Pacific Islander		0.94 [0.69, 1.29]		
Native American		0.65 [0.33, 1.30]		
Other		0.81 [0.60, 1.09]		
Zip Code Income decile (Homeless as reference)				
1			0.74 [0.49, 1.10]	
2			0.97 [0.65, 1.44]	
3			1.02 [0.68, 1.51]	
4			0.89 [0.60, 1.32]	
5			1.02 [0.69, 1.51]	
6			0.92 [0.62, 1.37]	
7			0.89 [0.59, 1.32]	
8			0.86 [0.58, 1.28]	
9			0.95 [0.63, 1.42]	
10			0.95 [0.64, 1.43]	
Zip Code Gini				0.95 [0.46, 1.93]

Age-sex (30-day mortality)

AMI 30-day mortality	No SES	Race	Income	Inequality
Age	1.06 [1.05, 1.07]	1.06 [1.05, 1.07]	1.06 [1.05, 1.07]	1.06 [1.05, 1.07]
Female	0.88 [0.78, 0.99]	0.88 [0.79, 0.99]	0.88 [0.78, 0.99]	0.87 [0.78, 0.98]
Race (White as reference)				
Black		0.82 [0.66, 1.02]		
Hispanic		0.91 [0.71, 1.16]		
Asian or Pacific Islander		1.01 [0.67, 1.53]		
Native American		0.73 [0.41, 1.31]		
Other		0.88 [0.62, 1.25]		
Zip Code Income decile (Homeless as reference)				
1			1.16 [0.70, 1.94]	
2			1.28 [0.77, 2.13]	
3			1.24 [0.74, 2.07]	
4			1.10 [0.66, 1.83]	
5			1.36 [0.81, 2.26]	
6			1.28 [0.77, 2.14]	
7			1.38 [0.83, 2.29]	
8			1.36 [0.81, 2.28]	
9			1.20 [0.72, 2.01]	
10			1.26 [0.75, 2.12]	
Zip Code Gini				1.73 [0.70, 4.27]

HF 30-day mortality	No SES	Race	Income	Inequality
Age	1.06 [1.05, 1.06]	1.06 [1.05, 1.06]	1.06 [1.05, 1.06]	1.06 [1.05, 1.06]
Female	0.84 [0.77, 0.92]	0.86 [0.78, 0.94]	0.85 [0.77, 0.93]	0.85 [0.77, 0.93]
Race (White as reference)				
Black		0.78 [0.66, 0.91]		
Hispanic		0.55 [0.44, 0.69]		
Asian or Pacific Islander		0.56 [0.36, 0.89]		
Native American		1.07 [0.63, 1.85]		
Other		0.87 [0.64, 1.17]		
Zip Code Income decile (Homeless as reference)				
1			1.36 [0.87, 2.13]	
2			1.34 [0.86, 2.09]	
3			1.69 [1.09, 2.61]	
4			1.75 [1.13, 2.70]	
5			1.94 [1.26, 3.00]	
6			1.58 [1.02, 2.45]	
7			1.72 [1.12, 2.67]	
8			1.65 [1.07, 2.55]	
9			1.57 [1.02, 2.43]	
10			1.67 [1.07, 2.59]	
Zip Code Gini				1.29 [0.63, 2.64]

PN 30-day mortality	No SES	Race	Income	Inequality
Age	1.05 [1.04, 1.05]	1.05 [1.04, 1.05]	1.05 [1.04, 1.05]	1.05 [1.04, 1.05]
Female	0.91 [0.83, 0.99]	0.92 [0.84, 1.00]	0.91 [0.84, 0.99]	0.90 [0.83, 0.99]
Race (White as reference)				
Black		0.86 [0.73, 1.01]		
Hispanic		0.75 [0.62, 0.90]		
Asian or Pacific Islander		1.00 [0.74, 1.35]		
Native American		0.68 [0.36, 1.29]		
Other		0.80 [0.59, 1.07]		
Zip Code Income decile (Homeless as reference)				
1			0.80 [0.54, 1.19]	
2			1.00 [0.68, 1.47]	
3			1.08 [0.73, 1.58]	
4			1.01 [0.69, 1.49]	
5			1.18 [0.81, 1.73]	
6			0.99 [0.67, 1.46]	
7			1.00 [0.68, 1.47]	
8			0.99 [0.67, 1.46]	
9			1.05 [0.71, 1.54]	
10			0.97 [0.65, 1.43]	
Zip Code Gini				1.01 [0.51, 2.02]

Age-sex (30-day readmission)

AMI 30-day readmission	No SES	Race	Income	Inequality
Age	1.01 [1.01, 1.02]	1.01 [1.01, 1.02]	1.01 [1.01, 1.02]	1.01 [1.01, 1.02]
Female	1.01 [0.93, 1.11]	1.01 [0.93, 1.11]	1.01 [0.93, 1.11]	1.02 [0.93, 1.12]
Race (White as reference)				
Black		0.96 [0.81, 1.14]		
Hispanic		1.10 [0.92, 1.32]		
Asian or Pacific Islander		1.14 [0.83, 1.57]		
Native American		1.33 [0.87, 2.02]		
Other		0.92 [0.73, 1.16]		
Zip Code Income decile (Homeless as reference)				
1			0.70 [0.48, 1.04]	
2			0.73 [0.50, 1.08]	
3			0.69 [0.46, 1.02]	
4			0.68 [0.46, 1.01]	
5			0.73 [0.49, 1.07]	
6			0.89 [0.61, 1.32]	
7			0.66 [0.45, 0.98]	
8			0.65 [0.44, 0.96]	
9			0.82 [0.55, 1.21]	
10			0.70 [0.47, 1.04]	
Zip Code Gini				0.65 [0.32, 1.29]

HF 30-day readmission	No SES	Race	Income	Inequality
Age	1.00 [1.00, 1.01]	1.00 [1.00, 1.01]	1.00 [1.00, 1.01]	1.00 [1.00, 1.01]
Female	0.96 [0.91, 1.02]	0.96 [0.91, 1.02]	0.96 [0.91, 1.02]	0.97 [0.92, 1.03]
Race (White as reference)				
Black		1.08 [0.99, 1.18]		
Hispanic		1.11 [1.00, 1.23]		
Asian or Pacific Islander		1.08 [0.87, 1.36]		
Native American		0.85 [0.58, 1.22]		
Other		1.08 [0.91, 1.28]		
Zip Code Income decile (Homeless as reference)				
1			1.14 [0.91, 1.42]	
2			1.03 [0.83, 1.29]	
3			1.00 [0.80, 1.25]	
4			1.01 [0.81, 1.26]	
5			1.12 [0.90, 1.40]	
6			1.03 [0.83, 1.29]	
7			1.04 [0.83, 1.30]	
8			0.98 [0.79, 1.23]	
9			1.00 [0.80, 1.25]	
10			0.98 [0.78, 1.23]	
Zip Code Gini				1.20 [0.77, 1.87]

PN 30-day readmission	No SES	Race	Income	Inequality
Age	1.01 [1.00, 1.01]	1.01 [1.00, 1.01]	1.01 [1.00, 1.01]	1.01 [1.00, 1.01]
Female	0.90 [0.85, 0.97]	0.90 [0.85, 0.97]	0.90 [0.85, 0.96]	0.91 [0.85, 0.97]
Race (White as reference)				
Black		1.13 [1.00, 1.27]		
Hispanic		0.94 [0.83, 1.07]		
Asian or Pacific Islander		1.00 [0.80, 1.25]		
Native American		1.21 [0.79, 1.87]		
Other		0.92 [0.74, 1.13]		
Zip Code Income decile (Homeless as reference)				
1			0.96 [0.72, 1.28]	
2			0.92 [0.69, 1.23]	
3			0.98 [0.73, 1.30]	
4			0.95 [0.71, 1.27]	
5			0.98 [0.73, 1.31]	
6			0.91 [0.68, 1.21]	
7			0.96 [0.72, 1.29]	
8			0.91 [0.68, 1.22]	
9			0.95 [0.71, 1.27]	
10			0.80 [0.59, 1.07]	
Zip Code Gini				0.85 [0.51, 1.44]

Elixhauser (In-facility mortality)

AMI in-facility mortality	No SES	Race	Income	Inequality
Age	1.05 [1.04, 1.06]	1.05 [1.04, 1.06]	1.05 [1.04, 1.06]	1.05 [1.04, 1.06]
Female	0.97 [0.86, 1.10]	0.98 [0.86, 1.11]	0.97 [0.86, 1.10]	0.97 [0.85, 1.10]
acquired immune deficiency syndrome	1.00 [1.00, 1.00]	1.00 [1.00, 1.00]	1.00 [1.00, 1.00]	1.00 [1.00, 1.00]
alcohol abuse	1.05 [0.63, 1.73]	1.06 [0.64, 1.75]	1.05 [0.64, 1.74]	1.07 [0.65, 1.77]
deficiency anemias	0.73 [0.63, 0.84]	0.73 [0.63, 0.84]	0.73 [0.63, 0.84]	0.73 [0.63, 0.84]
rheumatoid arthritis/collagen vascular	0.89 [0.61, 1.28]	0.88 [0.61, 1.28]	0.88 [0.61, 1.28]	0.90 [0.62, 1.31]
chronic blood loss anemia	0.84 [0.58, 1.21]	0.84 [0.58, 1.21]	0.84 [0.59, 1.21]	0.81 [0.56, 1.17]
congestive heart failure	1.16 [0.96, 1.40]	1.17 [0.97, 1.41]	1.16 [0.96, 1.41]	1.16 [0.96, 1.40]
chronic pulmonary disease	1.12 [0.98, 1.29]	1.12 [0.98, 1.28]	1.12 [0.98, 1.29]	1.14 [1.00, 1.31]
coagulopathy	1.90 [1.53, 2.37]	1.91 [1.53, 2.38]	1.90 [1.53, 2.37]	1.89 [1.52, 2.37]
depression	0.77 [0.62, 0.94]	0.76 [0.62, 0.93]	0.76 [0.62, 0.94]	0.75 [0.61, 0.93]
diabetes, uncomplicated	1.03 [0.91, 1.17]	1.04 [0.91, 1.18]	1.03 [0.91, 1.17]	1.03 [0.90, 1.17]
diabetes with chronic complications	1.02 [0.83, 1.27]	1.03 [0.83, 1.27]	1.03 [0.83, 1.27]	1.03 [0.83, 1.28]
drug abuse	0.67 [0.16, 2.88]	0.68 [0.16, 2.93]	0.67 [0.16, 2.88]	0.69 [0.16, 2.94]
hypertension	0.65 [0.56, 0.74]	0.65 [0.57, 0.75]	0.65 [0.57, 0.74]	0.65 [0.57, 0.74]
hypothyroidism	0.93 [0.78, 1.10]	0.92 [0.77, 1.09]	0.92 [0.78, 1.10]	0.93 [0.78, 1.10]
liver disease	0.80 [0.42, 1.52]	0.80 [0.42, 1.54]	0.80 [0.42, 1.52]	0.82 [0.43, 1.58]
lymphoma	1.10 [0.60, 2.00]	1.10 [0.61, 2.01]	1.10 [0.61, 2.01]	1.12 [0.61, 2.04]
fluid and electrolyte disorders	2.06 [1.82, 2.33]	2.06 [1.81, 2.33]	2.06 [1.81, 2.33]	2.04 [1.80, 2.32]
metastatic cancer	2.15 [1.53, 3.01]	2.14 [1.53, 3.00]	2.15 [1.53, 3.01]	2.18 [1.55, 3.05]
other neurological disorders	1.58 [1.35, 1.86]	1.59 [1.35, 1.86]	1.59 [1.36, 1.87]	1.59 [1.35, 1.87]
obesity	0.80 [0.57, 1.12]	0.80 [0.57, 1.12]	0.80 [0.57, 1.12]	0.79 [0.56, 1.10]
paralysis	1.38 [1.06, 1.80]	1.40 [1.07, 1.82]	1.39 [1.07, 1.81]	1.41 [1.08, 1.85]
peripheral vascular disorders	1.07 [0.91, 1.26]	1.07 [0.91, 1.26]	1.07 [0.90, 1.26]	1.07 [0.90, 1.26]
psychoses	1.15 [0.80, 1.65]	1.15 [0.80, 1.65]	1.16 [0.81, 1.66]	1.19 [0.82, 1.71]
pulmonary circulation disorders	0.76 [0.41, 1.39]	0.76 [0.41, 1.39]	0.76 [0.41, 1.39]	0.76 [0.41, 1.39]
renal failure	1.32 [1.15, 1.52]	1.33 [1.16, 1.53]	1.33 [1.16, 1.53]	1.33 [1.16, 1.54]
solid tumor without metastasis	1.32 [0.98, 1.78]	1.34 [0.99, 1.81]	1.32 [0.98, 1.78]	1.36 [1.00, 1.83]
peptic ulcer disease excluding bleeding	0.32 [0.04, 2.44]	0.32 [0.04, 2.45]	0.32 [0.04, 2.45]	0.32 [0.04, 2.43]
valvular disease	1.02 [0.78, 1.34]	1.01 [0.77, 1.33]	1.02 [0.78, 1.34]	1.03 [0.78, 1.35]
weight loss	1.37 [1.03, 1.82]	1.38 [1.03, 1.83]	1.37 [1.03, 1.83]	1.34 [1.01, 1.79]
Race (White as reference)				
Black		0.89 [0.70, 1.11]		
Hispanic		0.85 [0.66, 1.11]		
Asian or Pacific Islander		0.98 [0.63, 1.51]		
Native American		0.62 [0.32, 1.19]		
Other		0.91 [0.63, 1.31]		
Zip Code Income decile (Homeless as reference)				
1			1.35 [0.77, 2.36]	
2			1.49 [0.85, 2.61]	
3			1.40 [0.80, 2.46]	
4			1.29 [0.73, 2.26]	
5			1.50 [0.86, 2.63]	
6			1.34 [0.76, 2.35]	
7			1.45 [0.83, 2.53]	
8			1.41 [0.80, 2.47]	
9			1.40 [0.79, 2.46]	
10			1.38 [0.78, 2.44]	
Zip Code Gini				1.27 [0.50, 3.22]

HF in-facility mortality	**No SES**	**Race**	**Income**	**Inequality**
Age	1.05 [1.04, 1.06]	1.05 [1.04, 1.06]	1.05 [1.04, 1.06]	1.05 [1.04, 1.06]
Female	0.96 [0.86, 1.07]	0.97 [0.87, 1.08]	0.97 [0.87, 1.08]	0.95 [0.86, 1.06]
acquired immune deficiency syndrome	1.00 [1.00, 1.00]	1.00 [1.00, 1.00]	1.00 [1.00, 1.00]	1.00 [1.00, 1.00]
alcohol abuse	1.15 [0.77, 1.70]	1.15 [0.78, 1.71]	1.16 [0.78, 1.73]	1.19 [0.80, 1.76]
deficiency anemias	0.89 [0.79, 0.99]	0.89 [0.79, 0.99]	0.88 [0.79, 0.99]	0.89 [0.79, 0.99]
rheumatoid arthritis/collagen vascular	1.26 [0.98, 1.63]	1.25 [0.96, 1.62]	1.25 [0.97, 1.62]	1.28 [0.99, 1.65]
chronic blood loss anemia	1.05 [0.81, 1.36]	1.05 [0.81, 1.35]	1.05 [0.81, 1.36]	1.04 [0.81, 1.35]
congestive heart failure	1.24 [1.10, 1.40]	1.25 [1.10, 1.41]	1.25 [1.10, 1.41]	1.24 [1.10, 1.40]
chronic pulmonary disease	1.16 [1.05, 1.29]	1.16 [1.04, 1.28]	1.16 [1.04, 1.29]	1.16 [1.04, 1.29]
coagulopathy	2.37 [2.04, 2.76]	2.37 [2.04, 2.75]	2.36 [2.03, 2.75]	2.33 [2.00, 2.71]
depression	0.98 [0.85, 1.14]	0.97 [0.84, 1.13]	0.98 [0.84, 1.13]	0.99 [0.86, 1.15]
diabetes, uncomplicated	0.83 [0.74, 0.93]	0.84 [0.75, 0.94]	0.84 [0.75, 0.94]	0.84 [0.75, 0.94]
diabetes with chronic complications	1.07 [0.91, 1.25]	1.07 [0.91, 1.26]	1.07 [0.91, 1.25]	1.06 [0.90, 1.25]
drug abuse	1.51 [0.79, 2.88]	1.52 [0.80, 2.90]	1.55 [0.81, 2.95]	1.58 [0.83, 3.02]
hypertension	0.56 [0.50, 0.64]	0.57 [0.50, 0.64]	0.57 [0.50, 0.64]	0.56 [0.50, 0.64]
hypothyroidism	0.96 [0.85, 1.09]	0.95 [0.84, 1.08]	0.96 [0.84, 1.09]	0.96 [0.85, 1.09]
liver disease	1.36 [1.00, 1.85]	1.38 [1.01, 1.87]	1.36 [1.00, 1.85]	1.35 [0.99, 1.84]
lymphoma	1.28 [0.87, 1.87]	1.27 [0.87, 1.85]	1.27 [0.87, 1.85]	1.30 [0.89, 1.90]
fluid and electrolyte disorders	1.94 [1.74, 2.16]	1.93 [1.73, 2.16]	1.93 [1.73, 2.16]	1.95 [1.75, 2.18]
metastatic cancer	2.75 [2.09, 3.63]	2.72 [2.06, 3.59]	2.74 [2.07, 3.61]	2.61 [1.97, 3.47]
other neurological disorders	1.23 [1.06, 1.43]	1.24 [1.07, 1.45]	1.23 [1.06, 1.43]	1.22 [1.05, 1.42]
obesity	0.96 [0.78, 1.18]	0.95 [0.77, 1.17]	0.96 [0.78, 1.18]	0.97 [0.79, 1.20]
paralysis	1.34 [1.06, 1.70]	1.35 [1.07, 1.72]	1.35 [1.07, 1.71]	1.33 [1.05, 1.69]
peripheral vascular disorders	1.02 [0.89, 1.17]	1.01 [0.88, 1.16]	1.01 [0.89, 1.16]	1.02 [0.89, 1.17]
psychoses	1.41 [1.08, 1.84]	1.40 [1.08, 1.83]	1.42 [1.09, 1.85]	1.43 [1.09, 1.86]
pulmonary circulation disorders	1.28 [1.01, 1.64]	1.28 [1.00, 1.63]	1.27 [1.00, 1.62]	1.26 [0.99, 1.61]
renal failure	1.56 [1.39, 1.74]	1.56 [1.39, 1.74]	1.56 [1.39, 1.74]	1.58 [1.41, 1.77]
solid tumor without metastasis	1.24 [0.98, 1.57]	1.24 [0.99, 1.57]	1.25 [0.99, 1.58]	1.26 [1.00, 1.59]
peptic ulcer disease excluding bleeding	0.80 [0.25, 2.63]	0.82 [0.25, 2.69]	0.80 [0.25, 2.62]	0.80 [0.25, 2.62]
valvular disease	1.01 [0.86, 1.19]	1.00 [0.86, 1.18]	1.01 [0.86, 1.18]	1.00 [0.85, 1.17]
weight loss	2.26 [1.87, 2.73]	2.24 [1.86, 2.71]	2.26 [1.87, 2.73]	2.24 [1.85, 2.70]
Race (White as reference)				
Black		0.90 [0.75, 1.07]		
Hispanic		0.68 [0.53, 0.87]		
Asian or Pacific Islander		0.72 [0.45, 1.17]		
Native American		0.81 [0.39, 1.69]		
Other		1.14 [0.83, 1.57]		
Zip Code Income decile (Homeless as reference)				
1			1.51 [0.90, 2.53]	
2			1.33 [0.80, 2.22]	
3			1.58 [0.95, 2.63]	
4			1.61 [0.97, 2.67]	
5			1.79 [1.08, 2.97]	
6			1.46 [0.87, 2.43]	
7			1.71 [1.03, 2.84]	
8			1.50 [0.90, 2.49]	
9			1.47 [0.89, 2.45]	
10			1.64 [0.98, 2.73]	
Zip Code Gini				1.18 [0.53, 2.63]

PN in-facility mortality	No SES	Race	Income	Inequality
Age	1.04 [1.04, 1.05]	1.04 [1.04, 1.05]	1.04 [1.04, 1.05]	1.04 [1.04, 1.05]
Female	1.01 [0.91, 1.11]	1.02 [0.92, 1.12]	1.01 [0.92, 1.11]	1.00 [0.91, 1.10]
acquired immune deficiency syndrome	1.00 [1.00, 1.00]	1.00 [1.00, 1.00]	1.00 [1.00, 1.00]	1.00 [1.00, 1.00]
alcohol abuse	1.27 [0.90, 1.80]	1.29 [0.91, 1.82]	1.28 [0.91, 1.81]	1.28 [0.90, 1.81]
deficiency anemias	0.95 [0.86, 1.05]	0.96 [0.86, 1.06]	0.95 [0.86, 1.05]	0.95 [0.86, 1.05]
rheumatoid arthritis/collagen vascular	0.87 [0.67, 1.13]	0.87 [0.67, 1.13]	0.87 [0.67, 1.13]	0.85 [0.65, 1.10]
chronic blood loss anemia	1.23 [0.94, 1.62]	1.23 [0.94, 1.61]	1.22 [0.93, 1.60]	1.17 [0.89, 1.54]
congestive heart failure	1.58 [1.43, 1.74]	1.57 [1.42, 1.73]	1.57 [1.42, 1.74]	1.59 [1.44, 1.76]
chronic pulmonary disease	0.87 [0.79, 0.96]	0.86 [0.79, 0.95]	0.87 [0.79, 0.96]	0.87 [0.79, 0.96]
coagulopathy	1.59 [1.35, 1.87]	1.59 [1.35, 1.87]	1.59 [1.35, 1.88]	1.62 [1.37, 1.91]
depression	0.97 [0.86, 1.11]	0.96 [0.85, 1.10]	0.97 [0.85, 1.11]	0.98 [0.86, 1.11]
diabetes, uncomplicated	1.06 [0.95, 1.18]	1.07 [0.97, 1.19]	1.06 [0.95, 1.18]	1.05 [0.94, 1.17]
diabetes with chronic complications	1.02 [0.85, 1.22]	1.03 [0.86, 1.23]	1.02 [0.85, 1.23]	1.01 [0.84, 1.21]
drug abuse	0.84 [0.40, 1.75]	0.86 [0.41, 1.80]	0.84 [0.40, 1.76]	0.87 [0.41, 1.81]
hypertension	0.71 [0.64, 0.79]	0.72 [0.64, 0.79]	0.71 [0.64, 0.79]	0.71 [0.64, 0.79]
hypothyroidism	0.81 [0.72, 0.92]	0.80 [0.71, 0.91]	0.81 [0.72, 0.92]	0.81 [0.72, 0.93]
liver disease	0.90 [0.61, 1.33]	0.91 [0.62, 1.34]	0.91 [0.61, 1.34]	0.86 [0.57, 1.28]
lymphoma	1.29 [0.97, 1.73]	1.29 [0.96, 1.72]	1.29 [0.96, 1.73]	1.27 [0.94, 1.70]
fluid and electrolyte disorders	1.82 [1.65, 2.00]	1.81 [1.64, 2.00]	1.82 [1.65, 2.00]	1.83 [1.66, 2.02]
metastatic cancer	2.77 [2.32, 3.31]	2.78 [2.33, 3.31]	2.77 [2.32, 3.31]	2.73 [2.29, 3.27]
other neurological disorders	1.13 [1.01, 1.27]	1.14 [1.01, 1.28]	1.13 [1.01, 1.27]	1.13 [1.01, 1.27]
obesity	0.72 [0.54, 0.95]	0.72 [0.54, 0.94]	0.72 [0.54, 0.95]	0.71 [0.53, 0.94]
paralysis	1.08 [0.88, 1.33]	1.10 [0.89, 1.35]	1.09 [0.88, 1.33]	1.05 [0.85, 1.30]
peripheral vascular disorders	1.27 [1.10, 1.45]	1.26 [1.10, 1.45]	1.27 [1.10, 1.45]	1.27 [1.10, 1.46]
psychoses	0.80 [0.63, 1.02]	0.79 [0.62, 1.01]	0.80 [0.63, 1.02]	0.79 [0.62, 1.00]
pulmonary circulation disorders	1.22 [1.01, 1.48]	1.22 [1.01, 1.48]	1.23 [1.01, 1.48]	1.22 [1.01, 1.48]
renal failure	1.39 [1.24, 1.56]	1.40 [1.25, 1.57]	1.40 [1.25, 1.57]	1.40 [1.25, 1.57]
solid tumor without metastasis	1.39 [1.17, 1.64]	1.39 [1.17, 1.65]	1.39 [1.17, 1.64]	1.39 [1.17, 1.65]
peptic ulcer disease excluding bleeding	1.04 [0.42, 2.57]	1.04 [0.42, 2.59]	1.07 [0.43, 2.64]	1.04 [0.42, 2.58]
valvular disease	1.00 [0.87, 1.14]	0.99 [0.86, 1.13]	0.99 [0.87, 1.13]	1.00 [0.87, 1.14]
weight loss	2.06 [1.77, 2.40]	2.07 [1.77, 2.40]	2.05 [1.76, 2.39]	2.09 [1.80, 2.44]
Race (White as reference)				
Black		0.79 [0.66, 0.96]		
Hispanic		0.81 [0.66, 1.00]		
Asian or Pacific Islander		0.87 [0.63, 1.21]		
Native American		0.72 [0.34, 1.51]		
Other		0.83 [0.61, 1.14]		
Zip Code Income decile (Homeless as reference)				
1			0.70 [0.46, 1.07]	
2			0.91 [0.60, 1.38]	
3			0.95 [0.62, 1.44]	
4			0.82 [0.54, 1.25]	
5			0.95 [0.62, 1.44]	
6			0.84 [0.55, 1.28]	
7			0.81 [0.53, 1.23]	
8			0.80 [0.52, 1.21]	
9			0.91 [0.59, 1.39]	
10			0.90 [0.59, 1.38]	
Zip Code Gini				0.94 [0.44, 1.99]

Elixhauser (30-day mortality)

AMI 30-day mortality	No SES	Race	Income	Inequality
Age	1.06 [1.05, 1.07]	1.06 [1.05, 1.06]	1.06 [1.05, 1.07]	1.06 [1.05, 1.07]
Female	0.93 [0.82, 1.05]	0.94 [0.83, 1.06]	0.93 [0.82, 1.05]	0.92 [0.82, 1.05]
acquired immune deficiency syndrome	1.00 [1.00, 1.00]	1.00 [1.00, 1.00]	1.00 [1.00, 1.00]	1.00 [1.00, 1.00]
alcohol abuse	1.05 [0.64, 1.74]	1.08 [0.65, 1.78]	1.06 [0.64, 1.74]	1.03 [0.62, 1.72]
deficiency anemias	0.76 [0.66, 0.87]	0.76 [0.66, 0.87]	0.76 [0.66, 0.87]	0.75 [0.65, 0.87]
rheumatoid arthritis/collagen vascular	1.02 [0.72, 1.45]	1.02 [0.71, 1.44]	1.01 [0.71, 1.44]	1.04 [0.73, 1.49]
chronic blood loss anemia	0.71 [0.49, 1.04]	0.71 [0.49, 1.04]	0.71 [0.49, 1.04]	0.68 [0.46, 1.00]
congestive heart failure	1.04 [0.86, 1.25]	1.05 [0.87, 1.27]	1.05 [0.87, 1.26]	1.04 [0.86, 1.25]
chronic pulmonary disease	1.09 [0.95, 1.24]	1.08 [0.95, 1.23]	1.09 [0.95, 1.24]	1.10 [0.97, 1.26]
coagulopathy	1.62 [1.29, 2.03]	1.62 [1.29, 2.03]	1.62 [1.29, 2.03]	1.61 [1.28, 2.03]
depression	0.80 [0.66, 0.97]	0.78 [0.64, 0.96]	0.80 [0.65, 0.97]	0.78 [0.64, 0.96]
diabetes, uncomplicated	0.96 [0.84, 1.09]	0.96 [0.85, 1.09]	0.96 [0.84, 1.09]	0.95 [0.84, 1.09]
diabetes with chronic complications	0.94 [0.76, 1.16]	0.94 [0.77, 1.16]	0.94 [0.77, 1.16]	0.95 [0.77, 1.17]
drug abuse	1.31 [0.43, 4.00]	1.38 [0.45, 4.23]	1.33 [0.43, 4.06]	1.38 [0.45, 4.25]
hypertension	0.64 [0.56, 0.74]	0.65 [0.56, 0.74]	0.64 [0.56, 0.74]	0.64 [0.55, 0.73]
hypothyroidism	0.97 [0.82, 1.14]	0.95 [0.81, 1.13]	0.96 [0.82, 1.14]	0.96 [0.81, 1.13]
liver disease	0.71 [0.37, 1.35]	0.72 [0.38, 1.37]	0.72 [0.38, 1.36]	0.75 [0.39, 1.42]
lymphoma	1.45 [0.84, 2.52]	1.46 [0.84, 2.53]	1.46 [0.84, 2.53]	1.48 [0.85, 2.56]
fluid and electrolyte disorders	1.93 [1.70, 2.18]	1.93 [1.70, 2.18]	1.93 [1.70, 2.18]	1.93 [1.71, 2.19]
metastatic cancer	2.84 [2.02, 4.00]	2.83 [2.01, 3.99]	2.84 [2.02, 4.00]	2.93 [2.08, 4.14]
other neurological disorders	1.49 [1.27, 1.76]	1.50 [1.27, 1.76]	1.50 [1.27, 1.77]	1.50 [1.27, 1.77]
obesity	0.83 [0.61, 1.14]	0.83 [0.60, 1.14]	0.83 [0.61, 1.14]	0.82 [0.60, 1.13]
paralysis	1.40 [1.08, 1.83]	1.44 [1.10, 1.88]	1.42 [1.09, 1.85]	1.41 [1.08, 1.85]
peripheral vascular disorders	1.13 [0.96, 1.32]	1.13 [0.96, 1.32]	1.12 [0.96, 1.32]	1.13 [0.96, 1.33]
psychoses	1.24 [0.87, 1.75]	1.24 [0.87, 1.76]	1.24 [0.88, 1.77]	1.25 [0.87, 1.79]
pulmonary circulation disorders	0.81 [0.43, 1.50]	0.81 [0.44, 1.51]	0.81 [0.43, 1.50]	0.81 [0.43, 1.51]
renal failure	1.18 [1.03, 1.35]	1.19 [1.03, 1.36]	1.18 [1.03, 1.36]	1.19 [1.04, 1.37]
solid tumor without metastasis	1.26 [0.93, 1.71]	1.29 [0.95, 1.74]	1.27 [0.94, 1.71]	1.31 [0.97, 1.77]
peptic ulcer disease excluding bleeding	0.24 [0.03, 1.87]	0.24 [0.03, 1.88]	0.24 [0.03, 1.89]	0.24 [0.03, 1.86]
valvular disease	0.87 [0.66, 1.14]	0.85 [0.65, 1.12]	0.86 [0.66, 1.13]	0.87 [0.66, 1.14]
weight loss	1.42 [1.06, 1.91]	1.43 [1.06, 1.93]	1.42 [1.05, 1.91]	1.39 [1.03, 1.88]
Race (White as reference)				
Black		0.77 [0.61, 0.98]		
Hispanic		0.94 [0.73, 1.20]		
Asian or Pacific Islander		0.97 [0.63, 1.48]		
Native American		0.66 [0.36, 1.23]		
Other		0.91 [0.64, 1.31]		
Zip Code Income decile (Homeless as reference)				
1			1.26 [0.74, 2.12]	
2			1.37 [0.81, 2.31]	
3			1.36 [0.80, 2.31]	
4			1.14 [0.67, 1.94]	
5			1.49 [0.88, 2.53]	
6			1.36 [0.80, 2.30]	
7			1.44 [0.85, 2.44]	
8			1.44 [0.85, 2.45]	
9			1.28 [0.75, 2.18]	
10			1.32 [0.77, 2.26]	
Zip Code Gini				1.50 [0.59, 3.80]

HF 30-day mortality	No SES	Race	Income	Inequality
Age	1.06 [1.05, 1.07]	1.06 [1.05, 1.06]	1.06 [1.05, 1.07]	1.06 [1.05, 1.07]
Female	0.91 [0.83, 1.00]	0.93 [0.84, 1.02]	0.92 [0.83, 1.01]	0.91 [0.83, 1.01]
acquired immune deficiency syndrome	1.00 [1.00, 1.00]	1.00 [1.00, 1.00]	1.00 [1.00, 1.00]	1.00 [1.00, 1.00]
alcohol abuse	1.25 [0.88, 1.79]	1.28 [0.89, 1.82]	1.28 [0.90, 1.83]	1.31 [0.92, 1.88]
deficiency anemias	0.98 [0.89, 1.09]	0.99 [0.89, 1.09]	0.98 [0.89, 1.09]	0.98 [0.88, 1.08]
rheumatoid arthritis/collagen vascular	1.23 [0.97, 1.56]	1.20 [0.95, 1.53]	1.22 [0.97, 1.55]	1.25 [0.99, 1.59]
chronic blood loss anemia	0.97 [0.77, 1.23]	0.96 [0.76, 1.21]	0.97 [0.76, 1.23]	0.96 [0.75, 1.22]
congestive heart failure	1.17 [1.05, 1.31]	1.18 [1.06, 1.32]	1.18 [1.05, 1.32]	1.18 [1.05, 1.32]
chronic pulmonary disease	1.09 [0.99, 1.20]	1.08 [0.98, 1.19]	1.09 [0.99, 1.20]	1.08 [0.98, 1.19]
coagulopathy	1.91 [1.65, 2.22]	1.91 [1.64, 2.21]	1.90 [1.64, 2.20]	1.90 [1.64, 2.21]
depression	1.03 [0.90, 1.18]	1.01 [0.88, 1.16]	1.02 [0.89, 1.17]	1.03 [0.90, 1.18]
diabetes, uncomplicated	0.84 [0.76, 0.93]	0.86 [0.77, 0.95]	0.85 [0.76, 0.94]	0.85 [0.76, 0.94]
diabetes with chronic complications	0.96 [0.83, 1.12]	0.97 [0.84, 1.12]	0.96 [0.83, 1.12]	0.96 [0.82, 1.11]
drug abuse	1.77 [1.01, 3.08]	1.84 [1.05, 3.21]	1.84 [1.05, 3.20]	1.86 [1.06, 3.25]
hypertension	0.57 [0.51, 0.64]	0.58 [0.52, 0.65]	0.57 [0.51, 0.64]	0.57 [0.51, 0.64]
hypothyroidism	1.05 [0.93, 1.17]	1.02 [0.91, 1.15]	1.04 [0.93, 1.16]	1.05 [0.93, 1.18]
liver disease	1.36 [1.02, 1.82]	1.39 [1.04, 1.87]	1.37 [1.02, 1.83]	1.33 [0.99, 1.79]
lymphoma	1.31 [0.92, 1.85]	1.29 [0.91, 1.83]	1.29 [0.91, 1.84]	1.34 [0.95, 1.90]
fluid and electrolyte disorders	1.79 [1.62, 1.98]	1.79 [1.62, 1.97]	1.79 [1.62, 1.98]	1.80 [1.63, 1.99]
metastatic cancer	3.08 [2.36, 4.02]	3.02 [2.31, 3.94]	3.06 [2.34, 3.99]	2.97 [2.27, 3.89]
other neurological disorders	1.23 [1.07, 1.42]	1.25 [1.09, 1.44]	1.23 [1.07, 1.42]	1.23 [1.07, 1.42]
obesity	0.95 [0.78, 1.14]	0.93 [0.77, 1.13]	0.95 [0.78, 1.14]	0.97 [0.80, 1.17]
paralysis	1.42 [1.14, 1.76]	1.45 [1.17, 1.80]	1.43 [1.15, 1.77]	1.40 [1.13, 1.75]
peripheral vascular disorders	1.06 [0.94, 1.20]	1.05 [0.93, 1.19]	1.06 [0.94, 1.19]	1.05 [0.93, 1.19]
psychoses	1.43 [1.12, 1.83]	1.42 [1.11, 1.82]	1.44 [1.12, 1.85]	1.45 [1.13, 1.86]
pulmonary circulation disorders	1.05 [0.83, 1.33]	1.05 [0.83, 1.33]	1.04 [0.82, 1.32]	1.04 [0.81, 1.32]
renal failure	1.48 [1.34, 1.64]	1.49 [1.34, 1.65]	1.48 [1.34, 1.64]	1.50 [1.35, 1.66]
solid tumor without metastasis	1.21 [0.98, 1.50]	1.22 [0.99, 1.51]	1.22 [0.98, 1.51]	1.22 [0.99, 1.52]
peptic ulcer disease excluding bleeding	0.84 [0.29, 2.41]	0.90 [0.31, 2.58]	0.85 [0.29, 2.42]	0.84 [0.30, 2.41]
valvular disease	1.10 [0.95, 1.28]	1.08 [0.93, 1.25]	1.09 [0.95, 1.27]	1.09 [0.94, 1.26]
weight loss	2.10 [1.75, 2.53]	2.09 [1.74, 2.52]	2.09 [1.74, 2.52]	2.08 [1.72, 2.51]
Race (White as reference)				
Black		0.77 [0.65, 0.91]		
Hispanic		0.60 [0.48, 0.76]		
Asian or Pacific Islander		0.58 [0.36, 0.92]		
Native American		1.03 [0.56, 1.89]		
Other		0.95 [0.69, 1.29]		
Zip Code Income decile (Homeless as reference)				
1			1.23 [0.78, 1.94]	
2			1.20 [0.77, 1.89]	
3			1.47 [0.94, 2.30]	
4			1.58 [1.02, 2.47]	
5			1.69 [1.09, 2.64]	
6			1.44 [0.92, 2.25]	
7			1.54 [0.98, 2.40]	
8			1.45 [0.93, 2.27]	
9			1.41 [0.90, 2.20]	
10			1.50 [0.96, 2.36]	
Zip Code Gini				1.14 [0.55, 2.39]

PN 30-day mortality	No SES	Race	Income	Inequality
Age	1.05 [1.04, 1.06]	1.05 [1.04, 1.06]	1.05 [1.04, 1.06]	1.05 [1.04, 1.06]
Female	1.00 [0.91, 1.10]	1.01 [0.92, 1.11]	1.01 [0.92, 1.10]	1.00 [0.91, 1.09]
acquired immune deficiency syndrome	1.00 [1.00, 1.00]	1.00 [1.00, 1.00]	1.00 [1.00, 1.00]	1.00 [1.00, 1.00]
alcohol abuse	1.02 [0.73, 1.44]	1.03 [0.73, 1.46]	1.03 [0.73, 1.46]	1.02 [0.72, 1.45]
deficiency anemias	0.94 [0.85, 1.03]	0.94 [0.85, 1.03]	0.94 [0.85, 1.03]	0.94 [0.85, 1.03]
rheumatoid arthritis/collagen vascular	0.83 [0.65, 1.07]	0.83 [0.65, 1.07]	0.84 [0.65, 1.07]	0.81 [0.63, 1.05]
chronic blood loss anemia	1.30 [1.00, 1.69]	1.30 [1.00, 1.69]	1.29 [1.00, 1.68]	1.25 [0.96, 1.63]
congestive heart failure	1.35 [1.23, 1.49]	1.35 [1.22, 1.48]	1.35 [1.23, 1.49]	1.36 [1.24, 1.50]
chronic pulmonary disease	0.84 [0.76, 0.92]	0.83 [0.76, 0.91]	0.83 [0.76, 0.91]	0.83 [0.76, 0.91]
coagulopathy	1.56 [1.33, 1.83]	1.56 [1.33, 1.83]	1.56 [1.33, 1.83]	1.58 [1.35, 1.86]
depression	1.00 [0.89, 1.13]	0.99 [0.88, 1.12]	1.00 [0.88, 1.13]	1.00 [0.89, 1.13]
diabetes, uncomplicated	0.96 [0.87, 1.06]	0.98 [0.88, 1.08]	0.96 [0.87, 1.07]	0.95 [0.86, 1.06]
diabetes with chronic complications	1.05 [0.89, 1.24]	1.06 [0.89, 1.25]	1.05 [0.89, 1.25]	1.04 [0.88, 1.24]
drug abuse	0.64 [0.30, 1.36]	0.66 [0.31, 1.40]	0.65 [0.31, 1.38]	0.67 [0.32, 1.41]
hypertension	0.70 [0.63, 0.78]	0.71 [0.64, 0.79]	0.70 [0.64, 0.78]	0.71 [0.64, 0.78]
hypothyroidism	0.90 [0.80, 1.02]	0.89 [0.79, 1.01]	0.90 [0.80, 1.01]	0.90 [0.80, 1.02]
liver disease	1.16 [0.82, 1.63]	1.17 [0.83, 1.65]	1.16 [0.82, 1.64]	1.13 [0.80, 1.61]
lymphoma	1.28 [0.97, 1.69]	1.27 [0.97, 1.68]	1.28 [0.97, 1.68]	1.25 [0.95, 1.65]
fluid and electrolyte disorders	1.87 [1.71, 2.06]	1.87 [1.70, 2.05]	1.87 [1.70, 2.05]	1.89 [1.72, 2.07]
metastatic cancer	4.06 [3.41, 4.83]	4.06 [3.41, 4.83]	4.05 [3.40, 4.82]	3.99 [3.35, 4.76]
other neurological disorders	1.14 [1.02, 1.27]	1.14 [1.02, 1.28]	1.14 [1.02, 1.27]	1.14 [1.02, 1.27]
obesity	0.74 [0.57, 0.96]	0.74 [0.57, 0.95]	0.74 [0.57, 0.95]	0.73 [0.56, 0.94]
paralysis	1.07 [0.88, 1.30]	1.09 [0.90, 1.33]	1.08 [0.89, 1.31]	1.06 [0.87, 1.29]
peripheral vascular disorders	1.27 [1.11, 1.44]	1.26 [1.11, 1.44]	1.26 [1.11, 1.44]	1.26 [1.10, 1.43]
psychoses	0.79 [0.63, 0.99]	0.78 [0.63, 0.98]	0.79 [0.63, 0.99]	0.78 [0.62, 0.98]
pulmonary circulation disorders	1.27 [1.06, 1.52]	1.27 [1.06, 1.52]	1.28 [1.07, 1.53]	1.27 [1.06, 1.52]
renal failure	1.31 [1.17, 1.46]	1.32 [1.18, 1.47]	1.32 [1.18, 1.47]	1.32 [1.18, 1.47]
solid tumor without metastasis	1.57 [1.33, 1.84]	1.57 [1.34, 1.85]	1.56 [1.33, 1.84]	1.56 [1.32, 1.83]
peptic ulcer disease excluding bleeding	1.09 [0.47, 2.51]	1.11 [0.48, 2.57]	1.13 [0.49, 2.59]	1.09 [0.47, 2.52]
valvular disease	0.90 [0.79, 1.03]	0.89 [0.78, 1.01]	0.89 [0.78, 1.02]	0.90 [0.79, 1.03]
weight loss	1.99 [1.71, 2.32]	1.99 [1.71, 2.33]	1.98 [1.70, 2.31]	2.01 [1.73, 2.35]
Race (White as reference)				
Black		0.81 [0.68, 0.97]		
Hispanic		0.76 [0.62, 0.93]		
Asian or Pacific Islander		0.88 [0.64, 1.21]		
Native American		0.76 [0.38, 1.53]		
Other		0.79 [0.58, 1.08]		
Zip Code Income decile (Homeless as reference)				
1			0.80 [0.52, 1.21]	
2			0.98 [0.65, 1.48]	
3			1.04 [0.69, 1.56]	
4			0.96 [0.64, 1.45]	
5			1.16 [0.77, 1.75]	
6			0.95 [0.63, 1.44]	
7			0.94 [0.62, 1.41]	
8			0.94 [0.62, 1.43]	
9			1.02 [0.67, 1.55]	
10			0.93 [0.61, 1.42]	
Zip Code Gini				0.85 [0.41, 1.75]

Elixhauser (30-day readmission)

AMI 30-day readmission	No SES	Race	Income	Inequality
Age	1.01 [1.01, 1.02]	1.01 [1.01, 1.02]	1.01 [1.01, 1.02]	1.01 [1.01, 1.02]
Female	0.99 [0.90, 1.09]	1.00 [0.91, 1.10]	1.00 [0.90, 1.10]	1.00 [0.91, 1.10]
acquired immune deficiency syndrome	1.00 [1.00, 1.00]	1.00 [1.00, 1.00]	1.00 [1.00, 1.00]	1.00 [1.00, 1.00]
alcohol abuse	0.93 [0.64, 1.37]	0.95 [0.65, 1.40]	0.93 [0.64, 1.37]	0.90 [0.61, 1.34]
deficiency anemias	1.23 [1.10, 1.37]	1.23 [1.10, 1.37]	1.23 [1.11, 1.37]	1.23 [1.10, 1.37]
rheumatoid arthritis/collagen vascular	1.29 [1.00, 1.66]	1.28 [0.99, 1.66]	1.28 [0.99, 1.65]	1.26 [0.97, 1.63]
chronic blood loss anemia	0.90 [0.67, 1.22]	0.90 [0.67, 1.22]	0.89 [0.66, 1.21]	0.91 [0.67, 1.23]
congestive heart failure	1.40 [1.20, 1.63]	1.40 [1.20, 1.63]	1.40 [1.20, 1.63]	1.40 [1.20, 1.63]
chronic pulmonary disease	1.23 [1.11, 1.36]	1.23 [1.11, 1.36]	1.23 [1.11, 1.37]	1.25 [1.12, 1.38]
coagulopathy	1.06 [0.86, 1.30]	1.06 [0.86, 1.30]	1.06 [0.86, 1.31]	1.06 [0.86, 1.31]
depression	1.10 [0.95, 1.28]	1.10 [0.94, 1.28]	1.11 [0.95, 1.29]	1.11 [0.95, 1.29]
diabetes, uncomplicated	1.16 [1.05, 1.28]	1.16 [1.05, 1.28]	1.16 [1.06, 1.28]	1.15 [1.04, 1.27]
diabetes with chronic complications	1.28 [1.10, 1.50]	1.28 [1.10, 1.50]	1.28 [1.09, 1.49]	1.28 [1.09, 1.50]
drug abuse	2.01 [0.92, 4.39]	2.04 [0.93, 4.47]	2.03 [0.93, 4.44]	2.12 [0.96, 4.66]
hypertension	1.19 [1.06, 1.34]	1.19 [1.06, 1.34]	1.18 [1.05, 1.33]	1.19 [1.05, 1.34]
hypothyroidism	1.05 [0.92, 1.20]	1.05 [0.92, 1.19]	1.05 [0.92, 1.20]	1.07 [0.94, 1.22]
liver disease	1.31 [0.86, 1.99]	1.31 [0.86, 1.99]	1.31 [0.86, 1.99]	1.37 [0.89, 2.09]
lymphoma	1.38 [0.88, 2.18]	1.38 [0.87, 2.17]	1.38 [0.87, 2.17]	1.37 [0.86, 2.17]
fluid and electrolyte disorders	1.20 [1.09, 1.33]	1.20 [1.09, 1.33]	1.21 [1.09, 1.33]	1.20 [1.08, 1.32]
metastatic cancer	1.86 [1.36, 2.56]	1.87 [1.36, 2.57]	1.86 [1.36, 2.56]	1.84 [1.34, 2.54]
other neurological disorders	0.96 [0.82, 1.12]	0.96 [0.82, 1.12]	0.95 [0.82, 1.11]	0.98 [0.84, 1.14]
obesity	1.12 [0.92, 1.36]	1.12 [0.92, 1.36]	1.12 [0.92, 1.36]	1.10 [0.90, 1.34]
paralysis	1.08 [0.85, 1.37]	1.09 [0.86, 1.38]	1.07 [0.85, 1.36]	1.08 [0.85, 1.37]
peripheral vascular disorders	1.18 [1.04, 1.33]	1.18 [1.04, 1.34]	1.18 [1.05, 1.34]	1.17 [1.04, 1.33]
psychoses	1.47 [1.12, 1.93]	1.48 [1.12, 1.95]	1.44 [1.10, 1.90]	1.43 [1.08, 1.89]
pulmonary circulation disorders	0.89 [0.56, 1.41]	0.90 [0.57, 1.42]	0.89 [0.56, 1.40]	0.89 [0.56, 1.41]
renal failure	1.19 [1.07, 1.32]	1.19 [1.07, 1.33]	1.19 [1.07, 1.33]	1.19 [1.07, 1.33]
solid tumor without metastasis	1.08 [0.85, 1.39]	1.09 [0.85, 1.39]	1.08 [0.85, 1.39]	1.05 [0.81, 1.35]
peptic ulcer disease excluding bleeding	0.83 [0.32, 2.16]	0.84 [0.32, 2.19]	0.84 [0.33, 2.18]	0.83 [0.32, 2.16]
valvular disease	1.20 [0.96, 1.49]	1.20 [0.96, 1.49]	1.19 [0.96, 1.49]	1.20 [0.97, 1.50]
weight loss	0.93 [0.70, 1.25]	0.93 [0.69, 1.25]	0.93 [0.69, 1.24]	0.94 [0.70, 1.27]
Race (White as reference)				
Black		0.90 [0.75, 1.07]		
Hispanic		1.03 [0.86, 1.24]		
Asian or Pacific Islander		1.19 [0.86, 1.64]		
Native American		1.38 [0.89, 2.13]		
Other		0.91 [0.72, 1.16]		
Zip Code Income decile (Homeless as reference)				
1			0.67 [0.45, 0.99]	
2			0.73 [0.49, 1.08]	
3			0.69 [0.46, 1.03]	
4			0.68 [0.46, 1.01]	
5			0.74 [0.50, 1.10]	
6			0.90 [0.61, 1.34]	
7			0.66 [0.45, 0.98]	
8			0.67 [0.45, 0.99]	
9			0.83 [0.56, 1.23]	
10			0.73 [0.49, 1.10]	
Zip Code Gini				0.80 [0.40, 1.63]

HF 30-day readmission	No SES	Race	Income	Inequality
Age	1.01 [1.00, 1.01]	1.01 [1.00, 1.01]	1.01 [1.00, 1.01]	1.01 [1.00, 1.01]
Female	0.97 [0.91, 1.03]	0.96 [0.91, 1.02]	0.97 [0.91, 1.03]	0.97 [0.91, 1.03]
acquired immune deficiency syndrome	1.00 [1.00, 1.00]	1.00 [1.00, 1.00]	1.00 [1.00, 1.00]	1.00 [1.00, 1.00]
alcohol abuse	1.16 [0.94, 1.44]	1.16 [0.94, 1.44]	1.16 [0.94, 1.43]	1.13 [0.91, 1.41]
deficiency anemias	1.25 [1.17, 1.33]	1.25 [1.17, 1.33]	1.25 [1.17, 1.33]	1.25 [1.17, 1.33]
rheumatoid arthritis/collagen vascular	1.05 [0.89, 1.23]	1.05 [0.90, 1.24]	1.05 [0.89, 1.23]	1.05 [0.89, 1.23]
chronic blood loss anemia	1.15 [0.98, 1.35]	1.15 [0.98, 1.35]	1.15 [0.98, 1.35]	1.15 [0.98, 1.35]
congestive heart failure	1.41 [1.31, 1.51]	1.41 [1.31, 1.51]	1.41 [1.31, 1.51]	1.39 [1.29, 1.50]
chronic pulmonary disease	1.26 [1.19, 1.34]	1.26 [1.19, 1.34]	1.26 [1.19, 1.34]	1.25 [1.18, 1.33]
coagulopathy	1.28 [1.14, 1.43]	1.28 [1.14, 1.43]	1.28 [1.14, 1.43]	1.28 [1.14, 1.43]
depression	1.12 [1.03, 1.22]	1.13 [1.04, 1.23]	1.13 [1.03, 1.22]	1.12 [1.03, 1.22]
diabetes, uncomplicated	1.07 [1.01, 1.14]	1.06 [1.00, 1.13]	1.07 [1.00, 1.13]	1.07 [1.01, 1.14]
diabetes with chronic complications	1.16 [1.06, 1.26]	1.16 [1.06, 1.26]	1.16 [1.06, 1.26]	1.14 [1.05, 1.25]
drug abuse	2.03 [1.42, 2.91]	2.01 [1.40, 2.88]	2.01 [1.41, 2.89]	2.16 [1.49, 3.12]
hypertension	1.16 [1.08, 1.26]	1.16 [1.07, 1.25]	1.16 [1.08, 1.26]	1.16 [1.08, 1.26]
hypothyroidism	1.11 [1.03, 1.19]	1.11 [1.04, 1.20]	1.11 [1.03, 1.19]	1.10 [1.03, 1.19]
liver disease	1.18 [0.97, 1.44]	1.18 [0.97, 1.43]	1.18 [0.97, 1.43]	1.17 [0.96, 1.43]
lymphoma	0.96 [0.74, 1.25]	0.96 [0.75, 1.25]	0.96 [0.74, 1.25]	0.98 [0.76, 1.27]
fluid and electrolyte disorders	1.24 [1.17, 1.32]	1.24 [1.17, 1.32]	1.24 [1.17, 1.32]	1.25 [1.17, 1.32]
metastatic cancer	1.53 [1.22, 1.92]	1.54 [1.23, 1.93]	1.54 [1.23, 1.92]	1.48 [1.18, 1.86]
other neurological disorders	1.01 [0.91, 1.11]	1.01 [0.91, 1.11]	1.01 [0.91, 1.11]	1.01 [0.92, 1.11]
obesity	0.96 [0.86, 1.06]	0.96 [0.86, 1.06]	0.96 [0.86, 1.06]	0.95 [0.86, 1.06]
paralysis	1.03 [0.89, 1.20]	1.03 [0.89, 1.19]	1.03 [0.89, 1.20]	1.02 [0.87, 1.18]
peripheral vascular disorders	1.04 [0.96, 1.13]	1.04 [0.96, 1.13]	1.04 [0.96, 1.13]	1.04 [0.96, 1.12]
psychoses	1.36 [1.15, 1.61]	1.36 [1.15, 1.61]	1.36 [1.15, 1.61]	1.34 [1.13, 1.59]
pulmonary circulation disorders	1.02 [0.87, 1.20]	1.02 [0.87, 1.20]	1.02 [0.86, 1.20]	1.03 [0.87, 1.21]
renal failure	1.28 [1.20, 1.36]	1.28 [1.20, 1.36]	1.28 [1.20, 1.36]	1.27 [1.19, 1.36]
solid tumor without metastasis	1.27 [1.10, 1.47]	1.27 [1.10, 1.47]	1.27 [1.10, 1.47]	1.25 [1.08, 1.44]
peptic ulcer disease excluding bleeding	1.88 [1.08, 3.27]	1.86 [1.07, 3.23]	1.86 [1.07, 3.23]	1.89 [1.09, 3.27]
valvular disease	1.07 [0.97, 1.18]	1.07 [0.97, 1.19]	1.07 [0.97, 1.18]	1.07 [0.97, 1.18]
weight loss	1.23 [1.05, 1.45]	1.23 [1.05, 1.45]	1.23 [1.05, 1.45]	1.23 [1.05, 1.44]
Race (White as reference)				
Black		1.05 [0.95, 1.15]		
Hispanic		1.08 [0.97, 1.21]		
Asian or Pacific Islander		1.06 [0.84, 1.34]		
Native American		0.91 [0.62, 1.35]		
Other		1.09 [0.92, 1.30]		
Zip Code Income decile (Homeless as reference)				
1			1.04 [0.83, 1.31]	
2			0.97 [0.77, 1.21]	
3			0.95 [0.75, 1.19]	
4			0.95 [0.76, 1.20]	
5			1.06 [0.84, 1.33]	
6			0.97 [0.77, 1.22]	
7			0.98 [0.78, 1.24]	
8			0.93 [0.74, 1.17]	
9			0.95 [0.76, 1.20]	
10			0.96 [0.76, 1.21]	
Zip Code Gini				1.40 [0.89, 2.20]

PN 30-day readmission	No SES	Race	Income	Inequality
Age	1.01 [1.01, 1.01]	1.01 [1.01, 1.02]	1.01 [1.01, 1.01]	1.01 [1.01, 1.01]
Female	0.92 [0.86, 0.99]	0.92 [0.86, 0.99]	0.92 [0.86, 0.99]	0.93 [0.86, 0.99]
acquired immune deficiency syndrome	1.00 [1.00, 1.00]	1.00 [1.00, 1.00]	1.00 [1.00, 1.00]	1.00 [1.00, 1.00]
alcohol abuse	1.19 [0.93, 1.51]	1.18 [0.92, 1.51]	1.19 [0.93, 1.52]	1.17 [0.91, 1.50]
deficiency anemias	1.26 [1.17, 1.36]	1.26 [1.17, 1.36]	1.26 [1.17, 1.36]	1.27 [1.18, 1.37]
rheumatoid arthritis/collagen vascular	1.13 [0.95, 1.34]	1.13 [0.96, 1.34]	1.13 [0.96, 1.34]	1.14 [0.96, 1.35]
chronic blood loss anemia	1.37 [1.10, 1.70]	1.37 [1.10, 1.70]	1.37 [1.10, 1.70]	1.37 [1.10, 1.71]
congestive heart failure	1.28 [1.19, 1.38]	1.28 [1.19, 1.38]	1.28 [1.19, 1.38]	1.28 [1.19, 1.38]
chronic pulmonary disease	1.22 [1.14, 1.30]	1.22 [1.14, 1.31]	1.22 [1.14, 1.31]	1.22 [1.13, 1.30]
coagulopathy	1.33 [1.16, 1.54]	1.33 [1.16, 1.54]	1.33 [1.16, 1.54]	1.31 [1.14, 1.52]
depression	1.18 [1.08, 1.29]	1.19 [1.08, 1.30]	1.18 [1.08, 1.29]	1.19 [1.08, 1.30]
diabetes, uncomplicated	1.13 [1.05, 1.22]	1.13 [1.05, 1.22]	1.13 [1.05, 1.22]	1.14 [1.05, 1.23]
diabetes with chronic complications	1.26 [1.11, 1.43]	1.26 [1.11, 1.43]	1.26 [1.11, 1.43]	1.25 [1.10, 1.42]
drug abuse	1.83 [1.21, 2.77]	1.81 [1.20, 2.74]	1.83 [1.21, 2.77]	1.82 [1.20, 2.77]
hypertension	1.10 [1.02, 1.20]	1.10 [1.02, 1.19]	1.10 [1.02, 1.19]	1.10 [1.01, 1.19]
hypothyroidism	1.10 [1.01, 1.20]	1.10 [1.01, 1.21]	1.10 [1.01, 1.21]	1.10 [1.01, 1.20]
liver disease	1.38 [1.07, 1.77]	1.38 [1.07, 1.78]	1.38 [1.07, 1.78]	1.35 [1.04, 1.74]
lymphoma	1.32 [1.06, 1.64]	1.32 [1.06, 1.65]	1.32 [1.06, 1.65]	1.34 [1.07, 1.67]
fluid and electrolyte disorders	1.25 [1.17, 1.34]	1.25 [1.17, 1.34]	1.25 [1.17, 1.34]	1.24 [1.16, 1.33]
metastatic cancer	1.91 [1.63, 2.24]	1.91 [1.63, 2.23]	1.92 [1.63, 2.25]	1.89 [1.61, 2.21]
other neurological disorders	1.15 [1.05, 1.25]	1.14 [1.05, 1.25]	1.15 [1.05, 1.25]	1.13 [1.04, 1.24]
obesity	0.95 [0.81, 1.11]	0.95 [0.81, 1.11]	0.94 [0.80, 1.11]	0.96 [0.82, 1.13]
paralysis	1.28 [1.10, 1.48]	1.27 [1.10, 1.48]	1.28 [1.10, 1.48]	1.27 [1.09, 1.47]
peripheral vascular disorders	1.30 [1.18, 1.44]	1.30 [1.17, 1.44]	1.30 [1.18, 1.45]	1.30 [1.17, 1.44]
psychoses	1.35 [1.16, 1.56]	1.35 [1.16, 1.56]	1.35 [1.16, 1.56]	1.35 [1.16, 1.57]
pulmonary circulation disorders	1.22 [1.06, 1.41]	1.22 [1.06, 1.41]	1.22 [1.06, 1.41]	1.22 [1.05, 1.41]
renal failure	1.24 [1.13, 1.35]	1.24 [1.13, 1.35]	1.24 [1.14, 1.35]	1.24 [1.13, 1.35]
solid tumor without metastasis	1.34 [1.17, 1.53]	1.34 [1.17, 1.53]	1.34 [1.17, 1.53]	1.32 [1.16, 1.51]
peptic ulcer disease excluding bleeding	0.59 [0.24, 1.44]	0.59 [0.24, 1.45]	0.59 [0.24, 1.45]	0.59 [0.24, 1.45]
valvular disease	1.09 [0.98, 1.20]	1.09 [0.98, 1.21]	1.09 [0.98, 1.21]	1.09 [0.98, 1.21]
weight loss	1.39 [1.21, 1.60]	1.39 [1.21, 1.60]	1.39 [1.21, 1.60]	1.39 [1.20, 1.60]
Race (White as reference)				
Black		1.07 [0.95, 1.22]		
Hispanic		0.98 [0.86, 1.13]		
Asian or Pacific Islander		1.03 [0.81, 1.30]		
Native American		1.22 [0.76, 1.95]		
Other		0.98 [0.79, 1.21]		
Zip Code Income decile (Homeless as reference)				
1			0.85 [0.63, 1.15]	
2			0.85 [0.63, 1.15]	
3			0.90 [0.66, 1.21]	
4			0.86 [0.64, 1.17]	
5			0.91 [0.67, 1.22]	
6			0.82 [0.61, 1.10]	
7			0.90 [0.67, 1.22]	
8			0.87 [0.64, 1.17]	
9			0.91 [0.67, 1.23]	
10			0.76 [0.56, 1.03]	
Zip Code Gini				1.01 [0.59, 1.73]

Medicare (In-facility mortality)

AMI in-facility mortality	No SES	Race	Income	Inequality
Age	1.05 [1.04, 1.06]	1.05 [1.04, 1.06]	1.05 [1.04, 1.06]	1.05 [1.04, 1.06]
Female	0.89 [0.78, 1.01]	0.89 [0.79, 1.02]	0.89 [0.78, 1.01]	0.88 [0.78, 1.01]
Acute myocardial infarction (CC 81)	1.19 [0.26, 5.35]	1.20 [0.27, 5.40]	1.23 [0.27, 5.56]	1.19 [0.26, 5.37]
COPD (CC 108)	1.00 [0.86, 1.15]	0.99 [0.85, 1.14]	0.99 [0.86, 1.15]	1.01 [0.87, 1.17]
Renal failure (CC 131)	1.58 [1.39, 1.81]	1.60 [1.40, 1.82]	1.60 [1.40, 1.82]	1.59 [1.40, 1.82]
Protein-calorie malnutrition (CC 21)	1.19 [0.88, 1.60]	1.20 [0.89, 1.62]	1.20 [0.89, 1.61]	1.18 [0.87, 1.60]
Cardio-respiratory failure and shock (CC 79)	4.38 [3.81, 5.05]	4.40 [3.82, 5.07]	4.40 [3.82, 5.07]	4.31 [3.74, 4.97]
Congestive heart failure (CC 80)	1.29 [1.13, 1.49]	1.29 [1.12, 1.48]	1.29 [1.12, 1.48]	1.30 [1.13, 1.49]
Valvular and rheumatic heart disease (CC 86)	0.91 [0.79, 1.06]	0.91 [0.78, 1.05]	0.91 [0.79, 1.06]	0.91 [0.79, 1.06]
Other acute/subacute forms of ischemic heart disease (CC 82)	0.81 [0.60, 1.08]	0.81 [0.60, 1.09]	0.81 [0.60, 1.09]	0.79 [0.59, 1.07]
Chronic atherosclerosis (CC 83, 84)	0.58 [0.51, 0.67]	0.58 [0.51, 0.66]	0.58 [0.51, 0.66]	0.58 [0.51, 0.66]
Hypertension (CC 89, 91)	0.71 [0.62, 0.81]	0.71 [0.62, 0.81]	0.71 [0.62, 0.81]	0.71 [0.62, 0.81]
Stroke (CC 95, 96)	2.42 [1.87, 3.13]	2.43 [1.88, 3.14]	2.42 [1.87, 3.13]	2.48 [1.91, 3.21]
Cerebrovascular disease (CC 97-99, 103)	0.84 [0.67, 1.06]	0.84 [0.66, 1.06]	0.84 [0.66, 1.06]	0.83 [0.65, 1.05]
Pneumonia (CC 111-113)	1.19 [1.03, 1.39]	1.19 [1.03, 1.39]	1.19 [1.02, 1.38]	1.21 [1.04, 1.40]
Diabetes mellitus (DM) or DM complications (CC 15-20, 119-120)	1.00 [0.88, 1.14]	1.01 [0.89, 1.16]	1.00 [0.88, 1.15]	1.00 [0.88, 1.15]
Dementia and senility (CC 49, 50)	1.46 [1.26, 1.70]	1.46 [1.26, 1.70]	1.47 [1.26, 1.71]	1.46 [1.26, 1.71]
Hemiplegia, paraplegia, paralysis, functional disability (CC 67-69, 100-102, 177, 178)	1.07 [0.84, 1.37]	1.08 [0.84, 1.38]	1.08 [0.85, 1.38]	1.10 [0.86, 1.41]
Peripheral vascular disease (CC 104, 105)	1.02 [0.87, 1.20]	1.02 [0.87, 1.20]	1.02 [0.87, 1.20]	1.02 [0.86, 1.20]
Metastatic cancer, acute leukemia, and other severe cancers (CC 7, 8)	1.85 [1.38, 2.48]	1.86 [1.38, 2.49]	1.85 [1.38, 2.49]	1.88 [1.40, 2.53]
Trauma in last year (CC 154-156, 158-162)	0.84 [0.69, 1.02]	0.83 [0.69, 1.02]	0.84 [0.69, 1.02]	0.81 [0.66, 0.99]
Major psychiatric disorders (CC 54-56)	1.28 [0.90, 1.82]	1.28 [0.90, 1.81]	1.28 [0.91, 1.82]	1.31 [0.92, 1.87]
Chronic liver disease (CC 25-27)	1.04 [0.53, 2.04]	1.04 [0.53, 2.04]	1.04 [0.53, 2.04]	1.07 [0.54, 2.11]
Anterior myocardial infarction (ICD-9 codes 410.00 410.19)	1.82 [1.50, 2.21]	1.81 [1.49, 2.20]	1.81 [1.49, 2.20]	1.82 [1.49, 2.20]
Other location of myocardial infarction (ICD-9 codes 410.20-410.69)	1.76 [1.45, 2.13]	1.75 [1.44, 2.12]	1.75 [1.44, 2.12]	1.75 [1.44, 2.12]
History of CABG	0.69 [0.32, 1.48]	0.69 [0.32, 1.48]	0.70 [0.33, 1.50]	0.73 [0.34, 1.57]
History of PTCA	0.73 [0.49, 1.10]	0.74 [0.50, 1.11]	0.74 [0.49, 1.11]	0.73 [0.48, 1.10]
Race (White as reference)				
Black		0.87 [0.69, 1.10]		
Hispanic		0.84 [0.64, 1.09]		
Asian or Pacific Islander		0.88 [0.55, 1.38]		
Native American		0.60 [0.31, 1.17]		
Other		0.90 [0.61, 1.31]		
Zip Code Income (Homeless as reference)				
1			1.42 [0.81, 2.52]	
2			1.59 [0.90, 2.81]	
3			1.51 [0.85, 2.68]	
4			1.44 [0.81, 2.55]	
5			1.76 [0.99, 3.11]	
6			1.47 [0.83, 2.61]	
7			1.55 [0.88, 2.74]	
8			1.57 [0.88, 2.78]	
9			1.59 [0.90, 2.83]	
10			1.45 [0.81, 2.59]	
Zip Code Gini				1.18 [0.46, 3.02]

HF in-facility mortality	No SES	Race	Income	Inequality
Age	1.05 [1.04, 1.06]	1.05 [1.04, 1.06]	1.05 [1.04, 1.06]	1.05 [1.04, 1.06]
Female	0.93 [0.84, 1.03]	0.94 [0.84, 1.04]	0.94 [0.84, 1.04]	0.93 [0.83, 1.03]
Acute myocardial infarction (CC 81)	1.31 [1.12, 1.53]	1.31 [1.12, 1.53]	1.32 [1.12, 1.54]	1.31 [1.11, 1.53]
COPD (CC 108)	1.09 [0.98, 1.21]	1.08 [0.97, 1.20]	1.08 [0.97, 1.21]	1.09 [0.98, 1.21]
Renal failure (CC 131)	1.92 [1.73, 2.14]	1.93 [1.73, 2.15]	1.93 [1.73, 2.14]	1.94 [1.74, 2.16]
Protein-calorie malnutrition (CC 21)	2.06 [1.71, 2.48]	2.05 [1.70, 2.47]	2.06 [1.71, 2.49]	2.05 [1.70, 2.47]
Cardio-respiratory failure and shock (CC 79)	2.65 [2.36, 2.99]	2.65 [2.35, 2.98]	2.66 [2.36, 3.00]	2.61 [2.32, 2.94]
Congestive heart failure (CC 80)*	-	-	-	-
Valvular and rheumatic heart disease (CC 86)	1.02 [0.92, 1.14]	1.01 [0.91, 1.13]	1.01 [0.91, 1.13]	1.01 [0.91, 1.13]
Other acute/subacute forms of ischemic heart disease (CC 82)	1.01 [0.81, 1.25]	1.02 [0.82, 1.26]	1.01 [0.82, 1.25]	1.03 [0.83, 1.27]
Chronic atherosclerosis (CC 83, 84)	0.75 [0.67, 0.84]	0.75 [0.67, 0.84]	0.75 [0.67, 0.84]	0.74 [0.66, 0.83]
Hypertension (CC 89, 91)	0.56 [0.50, 0.63]	0.57 [0.51, 0.63]	0.56 [0.51, 0.63]	0.57 [0.51, 0.63]
Stroke (CC 95, 96)	1.58 [1.20, 2.08]	1.58 [1.20, 2.08]	1.58 [1.20, 2.08]	1.54 [1.16, 2.04]
Pneumonia (CC 111-113)	1.43 [1.28, 1.60]	1.43 [1.28, 1.60]	1.43 [1.28, 1.60]	1.43 [1.28, 1.60]
Diabetes mellitus (DM) or DM complications (CC 15-20, 119-120)	0.82 [0.74, 0.92]	0.83 [0.75, 0.93]	0.83 [0.74, 0.92]	0.83 [0.74, 0.93]
Dementia and senility (CC 49, 50)	1.29 [1.14, 1.46]	1.30 [1.15, 1.47]	1.30 [1.15, 1.47]	1.30 [1.15, 1.47]
Hemiplegia, paraplegia, paralysis, functional disability (CC 67-69, 100-102, 177, 178)	1.19 [0.97, 1.45]	1.20 [0.98, 1.46]	1.20 [0.98, 1.46]	1.17 [0.95, 1.43]
Peripheral vascular disease (CC 104, 105)	1.08 [0.96, 1.23]	1.08 [0.95, 1.23]	1.08 [0.95, 1.23]	1.08 [0.95, 1.22]
Metastatic cancer, acute leukemia, and other severe cancers (CC 7, 8)	2.52 [2.02, 3.15]	2.50 [2.00, 3.12]	2.51 [2.01, 3.13]	2.46 [1.96, 3.07]
Trauma in last year (CC 154-156, 158-162)	1.18 [1.02, 1.36]	1.17 [1.01, 1.35]	1.17 [1.01, 1.35]	1.19 [1.03, 1.37]
Major psychiatric disorders (CC 54-56)	1.36 [1.04, 1.77]	1.35 [1.04, 1.75]	1.36 [1.05, 1.77]	1.38 [1.06, 1.79]
Chronic liver disease (CC 25-27)	1.96 [1.42, 2.72]	1.98 [1.43, 2.75]	1.97 [1.42, 2.73]	1.95 [1.40, 2.71]
History of CABG	0.70 [0.45, 1.10]	0.70 [0.45, 1.10]	0.69 [0.44, 1.09]	0.71 [0.45, 1.11]
History of PTCA	0.43 [0.28, 0.65]	0.43 [0.29, 0.65]	0.43 [0.28, 0.64]	0.43 [0.29, 0.65]
Race (White as reference)				
Black		0.92 [0.77, 1.10]		
Hispanic		0.68 [0.53, 0.87]		
Asian or Pacific Islander		0.68 [0.42, 1.09]		
Native American		1.11 [0.58, 2.12]		
Other		1.08 [0.78, 1.48]		
Zip Code Income (Homeless as reference)				
1			1.67 [0.99, 2.81]	
2			1.43 [0.85, 2.41]	
3			1.88 [1.13, 3.15]	
4			1.83 [1.09, 3.04]	
5			2.01 [1.21, 3.36]	
6			1.61 [0.96, 2.70]	
7			1.96 [1.17, 3.28]	
8			1.73 [1.03, 2.90]	
9			1.64 [0.98, 2.76]	
10			1.76 [1.05, 2.96]	
Zip Code Gini				0.99 [0.44, 2.23]

*Odds ratios were insignificant with unrealistically high point estimates, potentially due to collinearity

PN in-facility mortality	No SES	Race	Income	Inequality
Age	1.05 [1.04, 1.05]	1.05 [1.04, 1.05]	1.05 [1.04, 1.05]	1.05 [1.04, 1.05]
Female	0.97 [0.88, 1.07]	0.97 [0.88, 1.07]	0.97 [0.88, 1.07]	0.96 [0.87, 1.06]
Acute myocardial infarction (CC 81)	1.95 [1.63, 2.33]	1.95 [1.63, 2.33]	1.95 [1.63, 2.33]	1.98 [1.66, 2.37]
COPD (CC 108)	0.84 [0.76, 0.93]	0.83 [0.75, 0.92]	0.84 [0.76, 0.93]	0.84 [0.76, 0.93]
Renal failure (CC 131)	1.58 [1.42, 1.75]	1.60 [1.44, 1.77]	1.59 [1.43, 1.76]	1.58 [1.42, 1.75]
Protein-calorie malnutrition (CC 21)	2.12 [1.83, 2.46]	2.13 [1.84, 2.47]	2.13 [1.83, 2.46]	2.16 [1.86, 2.50]
Cardio-respiratory failure and shock (CC 79)	2.95 [2.67, 3.27]	2.95 [2.66, 3.27]	2.96 [2.67, 3.28]	2.91 [2.62, 3.23]
Congestive heart failure (CC 80)	1.47 [1.33, 1.63]	1.46 [1.32, 1.62]	1.47 [1.33, 1.63]	1.48 [1.34, 1.65]
Other acute/subacute forms of ischemic heart disease (CC 82)	0.80 [0.60, 1.08]	0.81 [0.60, 1.09]	0.80 [0.60, 1.08]	0.78 [0.58, 1.06]
Chronic atherosclerosis (CC 83, 84)	0.91 [0.82, 1.01]	0.90 [0.82, 1.00]	0.91 [0.82, 1.00]	0.90 [0.82, 1.00]
Hypertension (CC 89, 91)	0.70 [0.63, 0.77]	0.70 [0.64, 0.78]	0.70 [0.63, 0.77]	0.70 [0.63, 0.78]
Stroke (CC 95, 96)	1.49 [1.17, 1.91]	1.50 [1.18, 1.92]	1.50 [1.17, 1.91]	1.50 [1.18, 1.93]
Cerebrovascular disease (CC 97-99, 103)	0.93 [0.77, 1.12]	0.92 [0.77, 1.11]	0.93 [0.77, 1.12]	0.90 [0.74, 1.09]
Pneumonia (CC 111-113)	0.52 [0.41, 0.68]	0.52 [0.41, 0.68]	0.52 [0.41, 0.68]	0.53 [0.41, 0.68]
Dementia and senility (CC 49, 50)	1.27 [1.14, 1.41]	1.27 [1.14, 1.42]	1.27 [1.14, 1.41]	1.27 [1.14, 1.41]
Hemiplegia, paraplegia, paralysis, functional disability (CC 67-69, 100-102, 177, 178)	0.93 [0.77, 1.12]	0.94 [0.78, 1.13]	0.93 [0.77, 1.12]	0.92 [0.76, 1.11]
Peripheral vascular disease (CC 104, 105)	1.22 [1.08, 1.38]	1.22 [1.08, 1.38]	1.22 [1.08, 1.38]	1.23 [1.09, 1.40]
Metastatic cancer, acute leukemia, and other severe cancers (CC 7, 8)	3.21 [2.77, 3.71]	3.21 [2.78, 3.72]	3.21 [2.77, 3.71]	3.22 [2.78, 3.73]
Trauma in last year (CC 154-156, 158-162)	1.20 [1.05, 1.37]	1.19 [1.04, 1.36]	1.19 [1.05, 1.36]	1.21 [1.06, 1.38]
Major psychiatric disorders (CC 54-56)	0.79 [0.62, 1.00]	0.78 [0.62, 0.99]	0.79 [0.62, 1.00]	0.78 [0.61, 0.99]
Chronic liver disease (CC 25-27)	0.96 [0.61, 1.51]	0.96 [0.61, 1.51]	0.96 [0.61, 1.51]	0.93 [0.59, 1.47]
History of CABG	0.45 [0.21, 0.94]	0.45 [0.21, 0.94]	0.45 [0.21, 0.94]	0.45 [0.21, 0.94]
History of PTCA	0.58 [0.35, 0.94]	0.58 [0.35, 0.95]	0.58 [0.35, 0.95]	0.58 [0.35, 0.96]
Fibrosis of lung and other chronic lung disorders (CC109)	1.14 [0.95, 1.36]	1.13 [0.95, 1.36]	1.13 [0.94, 1.35]	1.13 [0.94, 1.35]
Asthma (CC 110)	0.58 [0.44, 0.76]	0.59 [0.45, 0.78]	0.58 [0.44, 0.76]	0.55 [0.41, 0.73]
Vertebral fractures (CC 157)	1.03 [0.77, 1.38]	1.02 [0.76, 1.36]	1.03 [0.77, 1.37]	1.03 [0.77, 1.38]
Iron deficiency or other anemias and blood disease (CC 47)	0.95 [0.86, 1.05]	0.95 [0.86, 1.05]	0.95 [0.86, 1.05]	0.94 [0.85, 1.04]
Seizure disorders and convulsions (CC 74)	1.07 [0.87, 1.31]	1.09 [0.89, 1.33]	1.08 [0.88, 1.32]	1.08 [0.88, 1.32]
Severe hematological disorders (CC 44)	0.89 [0.60, 1.32]	0.89 [0.60, 1.32]	0.89 [0.60, 1.32]	0.90 [0.61, 1.33]
Depression (CC 58)	0.92 [0.81, 1.05]	0.91 [0.80, 1.04]	0.92 [0.80, 1.05]	0.92 [0.80, 1.05]
Parkinson's/Huntington's diseases (CC 73)	1.14 [0.92, 1.42]	1.13 [0.92, 1.41]	1.14 [0.92, 1.41]	1.15 [0.93, 1.43]
Race (White as reference)				
Black		0.79 [0.65, 0.96]		
Hispanic		0.90 [0.73, 1.11]		
Asian or Pacific Islander		0.92 [0.67, 1.28]		
Native American		0.64 [0.31, 1.29]		
Other		0.80 [0.58, 1.10]		
Zip Code Income (Homeless as reference)				
1			0.71 [0.46, 1.09]	
2			0.98 [0.64, 1.50]	
3			0.99 [0.65, 1.52]	
4			0.85 [0.56, 1.31]	
5			1.00 [0.66, 1.53]	
6			0.88 [0.57, 1.35]	
7			0.84 [0.55, 1.29]	
8			0.86 [0.56, 1.33]	
9			0.94 [0.61, 1.44]	
10			0.93 [0.61, 1.44]	
Zip Code Gini				0.92 [0.43, 1.96]

Medicare (30-day mortality)

AMI 30-day mortality	No SES	Race	Income	Inequality
Age	1.06 [1.05, 1.07]	1.06 [1.05, 1.07]	1.06 [1.05, 1.07]	1.06 [1.05, 1.07]
Female	0.87 [0.77, 0.99]	0.88 [0.77, 1.00]	0.87 [0.77, 0.99]	0.87 [0.76, 0.98]
Acute myocardial infarction (CC 81)	1.35 [0.29, 6.31]	1.38 [0.30, 6.47]	1.39 [0.30, 6.51]	1.34 [0.29, 6.28]
COPD (CC 108)	0.94 [0.82, 1.08]	0.93 [0.81, 1.07]	0.94 [0.81, 1.08]	0.95 [0.83, 1.10]
Renal failure (CC 131)	1.38 [1.21, 1.57]	1.40 [1.23, 1.59]	1.39 [1.22, 1.58]	1.40 [1.22, 1.59]
Protein-calorie malnutrition (CC 21)	1.25 [0.92, 1.70]	1.26 [0.93, 1.72]	1.24 [0.91, 1.69]	1.23 [0.90, 1.69]
Cardio-respiratory failure and shock (CC 79)	3.72 [3.22, 4.30]	3.73 [3.23, 4.32]	3.74 [3.24, 4.33]	3.69 [3.18, 4.27]
Congestive heart failure (CC 80)	1.31 [1.14, 1.50]	1.31 [1.14, 1.50]	1.31 [1.14, 1.50]	1.31 [1.14, 1.50]
Valvular and rheumatic heart disease (CC 86)	0.88 [0.76, 1.02]	0.87 [0.75, 1.01]	0.88 [0.76, 1.01]	0.88 [0.76, 1.02]
Other acute/subacute forms of ischemic heart disease (CC 82)	0.74 [0.56, 0.98]	0.75 [0.56, 0.99]	0.74 [0.56, 0.98]	0.73 [0.55, 0.98]
Chronic atherosclerosis (CC 83, 84)	0.59 [0.52, 0.67]	0.59 [0.51, 0.67]	0.59 [0.51, 0.67]	0.59 [0.51, 0.67]
Hypertension (CC 89, 91)	0.74 [0.64, 0.84]	0.74 [0.65, 0.85]	0.74 [0.64, 0.84]	0.73 [0.64, 0.84]
Stroke (CC 95, 96)	2.24 [1.73, 2.91]	2.28 [1.75, 2.96]	2.24 [1.72, 2.90]	2.28 [1.75, 2.96]
Cerebrovascular disease (CC 97-99, 103)	0.80 [0.64, 1.00]	0.79 [0.63, 0.99]	0.79 [0.64, 0.99]	0.78 [0.62, 0.98]
Pneumonia (CC 111-113)	1.22 [1.05, 1.42]	1.22 [1.05, 1.41]	1.22 [1.05, 1.41]	1.24 [1.06, 1.43]
Diabetes mellitus (DM) or DM complications (CC 15-20, 119-120)	0.90 [0.79, 1.02]	0.91 [0.80, 1.04]	0.90 [0.79, 1.02]	0.90 [0.79, 1.03]
Dementia and senility (CC 49, 50)	1.56 [1.34, 1.81]	1.57 [1.35, 1.82]	1.56 [1.34, 1.81]	1.56 [1.34, 1.81]
Hemiplegia, paraplegia, paralysis, functional disability (CC 67-69, 100-102, 177, 178)	1.13 [0.89, 1.43]	1.14 [0.90, 1.46]	1.14 [0.90, 1.45]	1.14 [0.89, 1.45]
Peripheral vascular disease (CC 104, 105)	1.09 [0.93, 1.28]	1.09 [0.93, 1.28]	1.09 [0.93, 1.28]	1.10 [0.94, 1.29]
Metastatic cancer, acute leukemia, and other severe cancers (CC 7, 8)	2.44 [1.82, 3.27]	2.45 [1.83, 3.29]	2.44 [1.82, 3.28]	2.53 [1.88, 3.40]
Trauma in last year (CC 154-156, 158-162)	0.89 [0.73, 1.08]	0.88 [0.73, 1.07]	0.89 [0.73, 1.08]	0.87 [0.71, 1.06]
Major psychiatric disorders (CC 54-56)	1.32 [0.94, 1.85]	1.31 [0.94, 1.84]	1.32 [0.94, 1.86]	1.32 [0.93, 1.86]
Chronic liver disease (CC 25-27)	1.14 [0.61, 2.13]	1.15 [0.61, 2.15]	1.16 [0.62, 2.16]	1.18 [0.63, 2.22]
Anterior myocardial infarction (ICD-9 codes 410.00 410.19)	1.67 [1.37, 2.04]	1.65 [1.35, 2.01]	1.67 [1.37, 2.04]	1.69 [1.38, 2.06]
Other location of myocardial infarction (ICD-9 codes 410.20-410.69)	1.75 [1.43, 2.13]	1.74 [1.43, 2.12]	1.74 [1.43, 2.12]	1.75 [1.43, 2.14]
History of CABG	0.71 [0.34, 1.49]	0.72 [0.34, 1.50]	0.74 [0.35, 1.54]	0.76 [0.36, 1.61]
History of PTCA	0.68 [0.46, 0.99]	0.68 [0.47, 1.01]	0.68 [0.46, 1.00]	0.67 [0.46, 1.00]
Race (White as reference)				
Black		0.74 [0.58, 0.94]		
Hispanic		0.89 [0.69, 1.16]		
Asian or Pacific Islander		0.89 [0.57, 1.40]		
Native American		0.65 [0.35, 1.21]		
Other		0.92 [0.64, 1.35]		
Zip Code Income (Homeless as reference)				
1			1.30 [0.76, 2.21]	
2			1.44 [0.85, 2.46]	
3			1.43 [0.83, 2.44]	
4			1.27 [0.74, 2.17]	
5			1.71 [1.00, 2.92]	
6			1.54 [0.90, 2.63]	
7			1.55 [0.91, 2.65]	
8			1.58 [0.92, 2.70]	
9			1.40 [0.82, 2.41]	
10			1.38 [0.80, 2.37]	
Zip Code Gini				1.47 [0.57, 3.79]

HF 30-day mortality	**No SES**	**Race**	**Income**	**Inequality**
Age	1.06 [1.05, 1.06]	1.05 [1.05, 1.06]	1.06 [1.05, 1.06]	1.06 [1.05, 1.06]
Female	0.89 [0.81, 0.98]	0.90 [0.82, 0.99]	0.90 [0.81, 0.99]	0.89 [0.81, 0.98]
Acute myocardial infarction (CC 81)	1.33 [1.15, 1.54]	1.32 [1.14, 1.53]	1.34 [1.16, 1.55]	1.33 [1.15, 1.54]
COPD (CC 108)	1.06 [0.96, 1.17]	1.05 [0.95, 1.15]	1.05 [0.96, 1.16]	1.05 [0.95, 1.16]
Renal failure (CC 131)	1.74 [1.58, 1.91]	1.75 [1.59, 1.93]	1.74 [1.58, 1.92]	1.74 [1.58, 1.92]
Protein-calorie malnutrition (CC 21)	2.03 [1.69, 2.44]	2.03 [1.69, 2.44]	2.03 [1.69, 2.44]	2.02 [1.68, 2.43]
Cardio-respiratory failure and shock (CC 79)	2.34 [2.09, 2.62]	2.33 [2.08, 2.61]	2.35 [2.10, 2.63]	2.34 [2.09, 2.62]
Congestive heart failure (CC 80)*	-	-	-	-
Valvular and rheumatic heart disease (CC 86)	1.13 [1.03, 1.25]	1.11 [1.01, 1.23]	1.12 [1.02, 1.24]	1.12 [1.02, 1.24]
Other acute/subacute forms of ischemic heart disease (CC 82)	0.98 [0.81, 1.19]	0.99 [0.82, 1.20]	0.99 [0.81, 1.19]	1.00 [0.83, 1.22]
Chronic atherosclerosis (CC 83, 84)	0.81 [0.73, 0.90]	0.80 [0.72, 0.89]	0.80 [0.72, 0.89]	0.79 [0.72, 0.88]
Hypertension (CC 89, 91)	0.59 [0.54, 0.66]	0.60 [0.54, 0.66]	0.60 [0.54, 0.66]	0.60 [0.54, 0.66]
Stroke (CC 95, 96)	1.30 [0.99, 1.69]	1.30 [0.99, 1.69]	1.29 [0.99, 1.68]	1.27 [0.97, 1.66]
Pneumonia (CC 111-113)	1.27 [1.14, 1.41]	1.27 [1.14, 1.41]	1.27 [1.14, 1.41]	1.28 [1.15, 1.42]
Diabetes mellitus (DM) or DM complications (CC 15-20, 119-120)	0.80 [0.72, 0.88]	0.82 [0.74, 0.90]	0.80 [0.73, 0.89]	0.80 [0.72, 0.89]
Dementia and senility (CC 49, 50)	1.46 [1.31, 1.64]	1.48 [1.32, 1.66]	1.47 [1.31, 1.65]	1.49 [1.33, 1.67]
Hemiplegia, paraplegia, paralysis, functional disability (CC 67-69, 100-102, 177, 178)	1.33 [1.11, 1.60]	1.36 [1.13, 1.63]	1.34 [1.12, 1.61]	1.30 [1.09, 1.57]
Peripheral vascular disease (CC 104, 105)	1.11 [0.99, 1.24]	1.10 [0.98, 1.23]	1.10 [0.98, 1.23]	1.10 [0.98, 1.23]
Metastatic cancer, acute leukemia, and other severe cancers (CC 7, 8)	2.85 [2.30, 3.52]	2.81 [2.28, 3.47]	2.83 [2.29, 3.50]	2.81 [2.27, 3.48]
Trauma in last year (CC 154-156, 158-162)	1.19 [1.04, 1.36]	1.17 [1.02, 1.33]	1.18 [1.03, 1.35]	1.20 [1.05, 1.37]
Major psychiatric disorders (CC 54-56)	1.40 [1.10, 1.79]	1.39 [1.09, 1.78]	1.41 [1.11, 1.80]	1.43 [1.12, 1.83]
Chronic liver disease (CC 25-27)	1.73 [1.26, 2.38]	1.76 [1.28, 2.43]	1.75 [1.27, 2.41]	1.70 [1.23, 2.35]
History of CABG	0.64 [0.42, 0.97]	0.64 [0.42, 0.96]	0.63 [0.42, 0.96]	0.64 [0.43, 0.97]
History of PTCA	0.51 [0.36, 0.71]	0.51 [0.37, 0.72]	0.51 [0.36, 0.71]	0.52 [0.37, 0.72]
Race (White as reference)				
Black		0.78 [0.66, 0.92]		
Hispanic		0.60 [0.48, 0.76]		
Asian or Pacific Islander		0.51 [0.32, 0.82]		
Native American		1.16 [0.66, 2.03]		
Other		0.88 [0.64, 1.20]		
Zip Code Income (top decile as reference)				
Homeless			0.65 [0.41, 1.02]	
1			0.84 [0.66, 1.07]	
2			0.82 [0.65, 1.05]	
3			1.09 [0.88, 1.37]	
4			1.12 [0.90, 1.40]	
5			1.20 [0.96, 1.49]	
6			0.97 [0.78, 1.22]	
7			1.09 [0.88, 1.35]	
8			1.03 [0.83, 1.27]	
9			0.97 [0.79, 1.20]	
Zip Code Gini				0.93 [0.44, 1.98]

*Odds ratios were insignificant with unrealistically high point estimates, potentially due to collinearity

PN 30-day mortality	No SES	Race	Income	Inequality
Age	1.05 [1.05, 1.06]	1.05 [1.05, 1.06]	1.05 [1.05, 1.06]	1.05 [1.05, 1.06]
Female	0.95 [0.87, 1.04]	0.96 [0.87, 1.05]	0.96 [0.87, 1.05]	0.95 [0.86, 1.04]
Acute myocardial infarction (CC 81)	1.86 [1.56, 2.23]	1.87 [1.56, 2.23]	1.86 [1.56, 2.23]	1.88 [1.58, 2.25]
COPD (CC 108)	0.84 [0.76, 0.92]	0.83 [0.75, 0.91]	0.83 [0.76, 0.91]	0.84 [0.76, 0.92]
Renal failure (CC 131)	1.48 [1.34, 1.64]	1.49 [1.35, 1.65]	1.49 [1.34, 1.64]	1.48 [1.34, 1.64]
Protein-calorie malnutrition (CC 21)	2.09 [1.80, 2.42]	2.09 [1.80, 2.43]	2.08 [1.79, 2.42]	2.10 [1.80, 2.44]
Cardio-respiratory failure and shock (CC 79)	2.62 [2.37, 2.90]	2.62 [2.36, 2.89]	2.61 [2.36, 2.89]	2.59 [2.34, 2.87]
Congestive heart failure (CC 80)*	1.32 [1.20, 1.46]	1.32 [1.20, 1.46]	1.32 [1.20, 1.46]	1.33 [1.21, 1.47]
Other acute/subacute forms of ischemic heart disease (CC 82)	0.82 [0.62, 1.09]	0.83 [0.62, 1.10]	0.82 [0.62, 1.09]	0.81 [0.61, 1.08]
Chronic atherosclerosis (CC 83, 84)	0.86 [0.78, 0.95]	0.85 [0.77, 0.94]	0.86 [0.78, 0.95]	0.86 [0.78, 0.94]
Hypertension (CC 89, 91)	0.73 [0.66, 0.80]	0.73 [0.66, 0.81]	0.73 [0.66, 0.80]	0.73 [0.66, 0.81]
Stroke (CC 95, 96)	1.22 [0.95, 1.56]	1.22 [0.96, 1.56]	1.22 [0.95, 1.55]	1.23 [0.96, 1.57]
Pneumonia (CC 111-113)	0.51 [0.39, 0.66]	0.51 [0.40, 0.66]	0.51 [0.39, 0.66]	0.51 [0.40, 0.66]
Dementia and senility (CC 49, 50)	1.44 [1.30, 1.59]	1.45 [1.31, 1.61]	1.45 [1.30, 1.60]	1.44 [1.30, 1.60]
Hemiplegia, paraplegia, paralysis, functional disability (CC 67-69, 100-102, 177, 178)	0.98 [0.83, 1.17]	1.00 [0.84, 1.19]	0.99 [0.83, 1.18]	0.98 [0.82, 1.17]
Peripheral vascular disease (CC 104, 105)	1.19 [1.06, 1.34]	1.19 [1.05, 1.34]	1.19 [1.05, 1.34]	1.20 [1.06, 1.35]
Metastatic cancer, acute leukemia, and other severe cancers (CC 7, 8)	4.44 [3.85, 5.13]	4.44 [3.85, 5.13]	4.44 [3.84, 5.12]	4.41 [3.82, 5.10]
Trauma in last year (CC 154-156, 158-162)	1.26 [1.11, 1.44]	1.25 [1.10, 1.42]	1.26 [1.11, 1.44]	1.26 [1.11, 1.43]
Major psychiatric disorders (CC 54-56)	0.77 [0.61, 0.96]	0.76 [0.61, 0.95]	0.77 [0.61, 0.96]	0.76 [0.61, 0.96]
Chronic liver disease (CC 25-27)	1.16 [0.78, 1.74]	1.17 [0.78, 1.75]	1.16 [0.77, 1.74]	1.14 [0.76, 1.72]
History of CABG	0.47 [0.23, 0.95]	0.47 [0.23, 0.94]	0.47 [0.23, 0.95]	0.46 [0.23, 0.94]
History of PTCA	0.76 [0.49, 1.16]	0.76 [0.50, 1.17]	0.76 [0.50, 1.16]	0.77 [0.50, 1.17]
Fibrosis of lung and other chronic lung disorders (CC109)		1.12 [0.94, 1.34]	1.12 [0.94, 1.34]	1.12 [0.94, 1.33]
Asthma (CC 110)		0.64 [0.50, 0.81]	0.66 [0.52, 0.84]	0.64 [0.50, 0.81]
Vertebral fractures (CC 157)		1.04 [0.79, 1.37]	1.03 [0.78, 1.36]	1.03 [0.79, 1.36]
Iron deficiency or other anemias and blood disease (CC 47)		0.96 [0.88, 1.06]	0.97 [0.88, 1.06]	0.97 [0.88, 1.06]
Seizure disorders and convulsions (CC 74)		0.97 [0.80, 1.18]	0.98 [0.81, 1.20]	0.98 [0.80, 1.19]
Severe hematological disorders (CC 44)		0.77 [0.52, 1.13]	0.76 [0.52, 1.12]	0.76 [0.52, 1.12]
Depression (CC 58)		0.96 [0.85, 1.09]	0.95 [0.84, 1.08]	0.96 [0.85, 1.09]
Parkinson's/Huntington's diseases (CC 73)		1.08 [0.88, 1.33]	1.07 [0.87, 1.32]	1.08 [0.88, 1.33]
Cerebrovascular disease (CC 97-99, 103)		0.94 [0.79, 1.12]	0.94 [0.79, 1.12]	0.94 [0.79, 1.12]
Race (White as reference)				
Black		0.81 [0.68, 0.97]		
Hispanic		0.82 [0.67, 1.00]		
Asian or Pacific Islander		0.93 [0.68, 1.28]		
Native American		0.64 [0.33, 1.24]		
Other		0.76 [0.55, 1.04]		
Zip Code Income (Homeless as reference)				
1			0.79 [0.52, 1.20]	
2			1.03 [0.68, 1.55]	
3			1.05 [0.69, 1.58]	
4			0.98 [0.65, 1.48]	
5			1.17 [0.78, 1.76]	
6			0.98 [0.65, 1.47]	
7			0.94 [0.62, 1.42]	
8			1.00 [0.66, 1.52]	
9			1.04 [0.69, 1.58]	
10			0.93 [0.61, 1.41]	
Zip Code Gini				0.84 [0.41, 1.74]

Medicare (30-day readmission)

AMI 30-day readmission	No SES	Race	Income	Inequality
Age	1.01 [1.00, 1.01]	1.01 [1.00, 1.01]	1.01 [1.00, 1.01]	1.01 [1.00, 1.01]
Female	1.04 [0.95, 1.15]	1.05 [0.95, 1.15]	1.04 [0.95, 1.15]	1.05 [0.95, 1.16]
COPD (CC 108)	1.16 [1.04, 1.30]	1.16 [1.04, 1.30]	1.17 [1.05, 1.30]	1.17 [1.05, 1.31]
Renal failure (CC 131)	1.22 [1.10, 1.36]	1.23 [1.10, 1.36]	1.22 [1.10, 1.36]	1.23 [1.11, 1.37]
Protein-calorie malnutrition (CC 21)	0.98 [0.73, 1.33]	0.98 [0.73, 1.33]	0.98 [0.73, 1.33]	1.01 [0.74, 1.37]
Congestive heart failure (CC 80)	1.25 [1.13, 1.38]	1.25 [1.13, 1.38]	1.25 [1.13, 1.38]	1.25 [1.13, 1.39]
Coronary atherosclerosis (CC 84)	1.15 [1.02, 1.29]	1.15 [1.02, 1.29]	1.15 [1.02, 1.29]	1.15 [1.02, 1.30]
Valvular and rheumatic heart disease (CC 86)	1.00 [0.90, 1.12]	1.00 [0.90, 1.12]	1.01 [0.91, 1.13]	1.00 [0.90, 1.12]
Iron deficiency or other anemias and blood disease (CC 47)	1.20 [1.08, 1.33]	1.20 [1.08, 1.33]	1.20 [1.08, 1.33]	1.20 [1.08, 1.34]
Metastatic cancer or acute leukemia (CC 7)	1.71 [1.23, 2.39]	1.72 [1.23, 2.40]	1.71 [1.22, 2.39]	1.71 [1.22, 2.40]
Other urinary tract disorders (CC 136)	1.27 [1.10, 1.48]	1.28 [1.10, 1.48]	1.28 [1.10, 1.48]	1.28 [1.10, 1.48]
Asthma (CC 110)	1.43 [1.15, 1.78]	1.42 [1.14, 1.77]	1.43 [1.15, 1.78]	1.42 [1.14, 1.78]
Chronic atherosclerosis (CC 83, 84)	1.12 [0.89, 1.41]	1.12 [0.89, 1.41]	1.12 [0.89, 1.42]	1.11 [0.88, 1.41]
Acute coronary syndrome (CC 81-82)	1.00 [1.00, 1.00]	1.00 [1.00, 1.00]	1.00 [1.00, 1.00]	1.00 [1.00, 1.00]
Specified arrhythmias (CC 92-93)	1.15 [1.05, 1.27]	1.15 [1.05, 1.26]	1.15 [1.05, 1.27]	1.15 [1.04, 1.26]
History of infection (CC 1, 3-6)	1.16 [1.05, 1.29]	1.16 [1.05, 1.29]	1.16 [1.05, 1.29]	1.15 [1.04, 1.28]
Cancer (CC 8-12)	1.18 [0.98, 1.41]	1.17 [0.98, 1.41]	1.18 [0.98, 1.41]	1.15 [0.96, 1.38]
Diabetes mellitus (DM) or DM complications (CC 15-20, 119-120)	1.13 [1.02, 1.24]	1.13 [1.02, 1.24]	1.13 [1.02, 1.24]	1.12 [1.01, 1.23]
Disorders of fluid, electrolyte, acid base (CC 22-23)	1.20 [1.08, 1.33]	1.20 [1.08, 1.34]	1.20 [1.08, 1.34]	1.20 [1.08, 1.33]
Dementia and senility (CC 49, 50)	1.05 [0.92, 1.19]	1.05 [0.92, 1.20]	1.04 [0.91, 1.19]	1.04 [0.91, 1.18]
Hemiplegia, paraplegia, paralysis, functional disability (CC 67-69, 100-102, 177-178)	1.13 [0.93, 1.37]	1.13 [0.93, 1.38]	1.12 [0.92, 1.36]	1.14 [0.94, 1.39]
Stroke (CC 95, 96)	0.88 [0.67, 1.15]	0.89 [0.67, 1.16]	0.88 [0.67, 1.15]	0.86 [0.65, 1.14]
Cerebrovascular disease (CC 97-99, 103)	1.03 [0.87, 1.21]	1.03 [0.87, 1.21]	1.03 [0.87, 1.22]	1.03 [0.87, 1.22]
Vascular or circulatory disease (CC 104-106)	1.18 [1.07, 1.32]	1.19 [1.07, 1.32]	1.19 [1.07, 1.32]	1.19 [1.07, 1.32]
Pneumonia (CC 111-113)	1.04 [0.92, 1.18]	1.04 [0.91, 1.18]	1.04 [0.91, 1.18]	1.04 [0.92, 1.18]
End stage renal disease or dialysis (CC 129-130)	1.35 [1.00, 1.83]	1.35 [1.00, 1.82]	1.34 [0.99, 1.81]	1.34 [0.99, 1.83]
Decubitus ulcer or chronic skin ulcer (CC 148-149)	1.08 [0.89, 1.31]	1.08 [0.90, 1.31]	1.08 [0.89, 1.30]	1.06 [0.87, 1.28]
Anterior myocardial infarction (ICD-9 codes 410.00 410.19)	1.15 [0.98, 1.34]	1.15 [0.98, 1.34]	1.14 [0.98, 1.33]	1.13 [0.97, 1.33]
Other location of myocardial infarction (ICD-9 codes 410.20-410.69)	1.01 [0.87, 1.18]	1.01 [0.86, 1.18]	1.01 [0.86, 1.17]	1.00 [0.86, 1.17]
History of CABG	0.71 [0.54, 0.95]	0.72 [0.54, 0.95]	0.71 [0.53, 0.94]	0.70 [0.52, 0.93]
History of PTCA	1.33 [1.13, 1.57]	1.34 [1.14, 1.57]	1.34 [1.14, 1.57]	1.32 [1.12, 1.56]
Race (White as reference)				
Black		0.90 [0.75, 1.07]		
Hispanic		1.05 [0.87, 1.27]		
Asian or Pacific Islander		1.14 [0.83, 1.58]		
Native American		1.35 [0.88, 2.08]		
Other		0.93 [0.73, 1.18]		
Zip Code Income (Homeless as reference)				
1			0.68 [0.46, 1.01]	
2			0.74 [0.50, 1.10]	
3			0.69 [0.46, 1.02]	
4			0.68 [0.45, 1.01]	
5			0.75 [0.50, 1.11]	
6			0.90 [0.61, 1.34]	
7			0.65 [0.44, 0.97]	
8			0.65 [0.43, 0.97]	
9			0.81 [0.54, 1.21]	
10			0.73 [0.49, 1.09]	
Zip Code Gini				0.86 [0.42, 1.74]

HF 30-day readmission	**No SES**	**Race**	**Income**	**Inequality**
Age	1.01 [1.00, 1.01]	1.01 [1.00, 1.01]	1.01 [1.00, 1.01]	1.00 [1.00, 1.01]
Female	0.99 [0.93, 1.05]	0.98 [0.93, 1.05]	0.99 [0.93, 1.05]	0.99 [0.93, 1.05]
COPD (CC 108)	1.23 [1.16, 1.31]	1.23 [1.16, 1.31]	1.23 [1.16, 1.31]	1.22 [1.14, 1.29]
Renal failure (CC 131)	1.30 [1.22, 1.39]	1.30 [1.22, 1.38]	1.30 [1.22, 1.38]	1.30 [1.22, 1.38]
Protein-calorie malnutrition (CC 21)	1.14 [0.97, 1.33]	1.13 [0.97, 1.33]	1.13 [0.97, 1.33]	1.12 [0.96, 1.32]
Congestive heart failure (CC 80)*	-	-	-	-
Valvular and rheumatic heart disease (CC 86)	1.14 [1.07, 1.22]	1.15 [1.08, 1.22]	1.15 [1.08, 1.22]	1.14 [1.07, 1.22]
Iron deficiency or other anemias and blood disease (CC 47)	1.19 [1.12, 1.27]	1.19 [1.12, 1.27]	1.19 [1.12, 1.27]	1.19 [1.12, 1.27]
Metastatic cancer or acute leukemia (CC 7)	1.55 [1.24, 1.94]	1.56 [1.24, 1.95]	1.55 [1.24, 1.95]	1.52 [1.21, 1.91]
Other urinary tract disorders (CC 136)	1.14 [1.05, 1.23]	1.14 [1.05, 1.23]	1.14 [1.05, 1.23]	1.13 [1.04, 1.23]
Asthma (CC 110)	1.27 [1.13, 1.43]	1.25 [1.11, 1.41]	1.27 [1.13, 1.42]	1.27 [1.12, 1.43]
Acute coronary syndrome (CC 81-82)	1.17 [1.08, 1.27]	1.17 [1.08, 1.27]	1.17 [1.08, 1.27]	1.18 [1.09, 1.28]
Specified arrhythmias (CC 92-93)	1.10 [1.04, 1.17]	1.11 [1.04, 1.18]	1.10 [1.04, 1.17]	1.10 [1.04, 1.17]
Cancer (CC 8-12)	1.05 [0.95, 1.17]	1.05 [0.95, 1.17]	1.05 [0.95, 1.17]	1.04 [0.94, 1.16]
Diabetes mellitus (DM) or DM complications (CC 15-20, 119-120)	1.06 [1.00, 1.13]	1.06 [0.99, 1.12]	1.06 [1.00, 1.13]	1.07 [1.00, 1.14]
Disorders of fluid, electrolyte, acid base (CC 22-23)	1.25 [1.18, 1.33]	1.25 [1.18, 1.33]	1.25 [1.18, 1.33]	1.25 [1.17, 1.33]
Dementia and senility (CC 49, 50)	1.08 [1.00, 1.17]	1.08 [1.00, 1.17]	1.08 [1.00, 1.17]	1.09 [1.00, 1.18]
Hemiplegia, paraplegia, paralysis, functional disability (CC 67-69, 100-102, 177-178)	1.05 [0.93, 1.18]	1.05 [0.93, 1.18]	1.05 [0.93, 1.18]	1.04 [0.92, 1.18]
Stroke (CC 95, 96)	0.95 [0.79, 1.16]	0.95 [0.78, 1.16]	0.96 [0.79, 1.16]	0.98 [0.80, 1.19]
Vascular or circulatory disease (CC 104-106)	1.05 [0.99, 1.12]	1.05 [0.99, 1.13]	1.05 [0.99, 1.13]	1.05 [0.98, 1.13]
Pneumonia (CC 111-113)	1.12 [1.04, 1.20]	1.12 [1.04, 1.20]	1.12 [1.04, 1.20]	1.12 [1.05, 1.20]
End stage renal disease or dialysis (CC 129-130)	1.34 [1.13, 1.58]	1.32 [1.12, 1.56]	1.33 [1.13, 1.58]	1.36 [1.15, 1.60]
Decubitus ulcer or chronic skin ulcer (CC 148-149)	1.27 [1.15, 1.40]	1.27 [1.15, 1.41]	1.27 [1.15, 1.40]	1.26 [1.14, 1.40]
History of CABG	0.96 [0.77, 1.19]	0.96 [0.77, 1.19]	0.96 [0.77, 1.19]	0.96 [0.77, 1.20]
Fibrosis of lung and other chronic lung disorders (CC 109)	1.15 [0.99, 1.32]	1.15 [0.99, 1.32]	1.15 [0.99, 1.33]	1.15 [0.99, 1.33]
Nephritis (CC 132)	1.03 [0.90, 1.19]	1.03 [0.90, 1.19]	1.03 [0.89, 1.19]	1.00 [0.86, 1.16]
Peptic ulcer, hemorrhage, other specified gastrointestinal disorders (CC 34)	1.20 [1.09, 1.33]	1.20 [1.09, 1.32]	1.20 [1.09, 1.33]	1.21 [1.09, 1.33]
Other gastrointestinal disorders (CC 36)	1.15 [1.08, 1.22]	1.15 [1.08, 1.22]	1.15 [1.08, 1.22]	1.15 [1.08, 1.22]
Severe hematological disorders (CC 44)	1.36 [1.11, 1.66]	1.36 [1.12, 1.66]	1.36 [1.11, 1.66]	1.36 [1.12, 1.67]
Depression (CC 58)	1.08 [0.99, 1.18]	1.09 [1.00, 1.19]	1.08 [0.99, 1.18]	1.08 [0.99, 1.18]
Other psychiatric disorders (CC 60)	1.21 [1.08, 1.36]	1.22 [1.08, 1.37]	1.21 [1.08, 1.36]	1.21 [1.08, 1.36]
Cardio-respiratory failure and shock (CC 79)	1.11 [1.02, 1.21]	1.11 [1.02, 1.21]	1.11 [1.02, 1.21]	1.11 [1.02, 1.20]
Other or unspecified heart disease (CC 94)	1.12 [0.98, 1.28]	1.12 [0.97, 1.28]	1.12 [0.98, 1.28]	1.10 [0.96, 1.26]
Chronic atherosclerosis (CC 83, 84)	1.20 [1.13, 1.28]	1.21 [1.13, 1.29]	1.20 [1.13, 1.29]	1.20 [1.12, 1.28]
Liver or biliary disease (CC 25-30)	1.01 [0.88, 1.16]	1.01 [0.88, 1.16]	1.01 [0.88, 1.17]	1.00 [0.86, 1.15]
Drug/alcohol abuse/dependence/psychosis (CC 51-53)	1.10 [0.99, 1.23]	1.10 [0.98, 1.23]	1.10 [0.98, 1.23]	1.08 [0.96, 1.21]
Major psychiatric disorders (CC 54-56)	1.34 [1.14, 1.58]	1.35 [1.14, 1.59]	1.35 [1.14, 1.59]	1.33 [1.12, 1.57]
Race (White as reference)				
Black		1.11 [1.01, 1.23]		
Hispanic		1.12 [1.00, 1.26]		
Asian or Pacific Islander		1.10 [0.87, 1.38]		
Native American		0.89 [0.61, 1.31]		
Other		1.14 [0.95, 1.35]		
Zip Code Income (Homeless as reference)				
1			1.05 [0.83, 1.33]	
2			0.95 [0.75, 1.20]	
3			0.93 [0.73, 1.18]	
4			0.93 [0.73, 1.17]	
5			1.02 [0.80, 1.29]	

	6	0.95 [0.75, 1.20]	
	7	0.96 [0.76, 1.22]	
	8	0.90 [0.71, 1.14]	
	9	0.92 [0.72, 1.17]	
	10	0.91 [0.71, 1.16]	
Zip Code Gini			1.34 [0.84, 2.13]

*Odds ratios were insignificant with unrealistically high point estimates, potentially due to collinearity

PN 30-day readmission	**No SES**	**Race**	**Income**	**Inequality**
Age	1.01 [1.00, 1.01]	1.01 [1.00, 1.01]	1.01 [1.00, 1.01]	1.01 [1.00, 1.01]
Female	0.93 [0.87, 1.00]	0.93 [0.86, 0.99]	0.93 [0.86, 0.99]	0.93 [0.87, 1.00]
COPD (CC 108)	1.21 [1.13, 1.30]	1.22 [1.13, 1.31]	1.21 [1.13, 1.30]	1.21 [1.12, 1.30]
Renal failure (CC 131)	1.18 [1.09, 1.28]	1.18 [1.08, 1.28]	1.18 [1.09, 1.28]	1.18 [1.09, 1.29]
Protein-calorie malnutrition (CC 21)	1.16 [1.00, 1.34]	1.16 [1.00, 1.34]	1.16 [1.00, 1.34]	1.16 [1.01, 1.35]
Congestive heart failure (CC 80)	1.21 [1.12, 1.31]	1.21 [1.12, 1.31]	1.21 [1.12, 1.31]	1.21 [1.12, 1.31]
Valvular and rheumatic heart disease (CC 86)	1.16 [1.05, 1.28]	1.16 [1.05, 1.28]	1.16 [1.05, 1.28]	1.16 [1.05, 1.28]
Iron deficiency or other anemias and blood disease (CC 47)	1.18 [1.09, 1.27]	1.18 [1.09, 1.27]	1.18 [1.09, 1.27]	1.19 [1.11, 1.28]
Metastatic cancer or acute leukemia (CC 7)	1.57 [1.32, 1.86]	1.57 [1.32, 1.86]	1.58 [1.33, 1.87]	1.55 [1.31, 1.85]
Other urinary tract disorders (CC 136)	1.11 [1.00, 1.24]	1.11 [1.00, 1.24]	1.11 [1.00, 1.24]	1.12 [1.01, 1.25]
Asthma (CC 110)	1.08 [0.93, 1.25]	1.07 [0.92, 1.24]	1.08 [0.93, 1.25]	1.11 [0.95, 1.28]
Acute coronary syndrome (CC 81-82)	1.35 [1.15, 1.58]	1.35 [1.15, 1.58]	1.35 [1.15, 1.57]	1.35 [1.16, 1.58]
Specified arrhythmias (CC 92-93)	1.15 [1.07, 1.24]	1.16 [1.07, 1.24]	1.16 [1.07, 1.24]	1.15 [1.07, 1.24]
History of infection (CC 1, 3-6)	1.08 [1.00, 1.17]	1.09 [1.00, 1.17]	1.08 [1.00, 1.17]	1.08 [1.00, 1.17]
Diabetes mellitus (DM) or DM complications (CC 15-20, 119-120)	1.12 [1.04, 1.20]	1.11 [1.03, 1.20]	1.11 [1.03, 1.20]	1.12 [1.04, 1.21]
Disorders of fluid, electrolyte, acid base (CC 22-23)	1.20 [1.12, 1.29]	1.20 [1.12, 1.29]	1.20 [1.12, 1.29]	1.19 [1.11, 1.28]
Dementia and senility (CC 49, 50)	1.09 [1.00, 1.18]	1.09 [1.00, 1.18]	1.09 [1.00, 1.18]	1.08 [0.99, 1.17]
Hemiplegia, paraplegia, paralysis, functional disability (CC 67-69, 100-102, 177-178)	1.10 [0.96, 1.25]	1.09 [0.96, 1.24]	1.10 [0.96, 1.25]	1.08 [0.94, 1.23]
Stroke (CC 95, 96)	1.33 [1.08, 1.63]	1.32 [1.08, 1.62]	1.32 [1.08, 1.62]	1.32 [1.07, 1.63]
Vascular or circulatory disease (CC 104-106)	1.14 [1.05, 1.24]	1.14 [1.05, 1.24]	1.14 [1.05, 1.24]	1.14 [1.05, 1.24]
Pneumonia (CC 111-113)	0.80 [0.62, 1.03]	0.80 [0.62, 1.03]	0.80 [0.62, 1.03]	0.81 [0.63, 1.04]
End stage renal disease or dialysis (CC 129-130)	1.43 [1.11, 1.84]	1.42 [1.10, 1.82]	1.43 [1.11, 1.83]	1.38 [1.07, 1.78]
Decubitus ulcer or chronic skin ulcer (CC 148-149)	1.47 [1.31, 1.65]	1.47 [1.31, 1.64]	1.47 [1.32, 1.65]	1.47 [1.31, 1.65]
History of CABG	0.80 [0.52, 1.22]	0.80 [0.52, 1.22]	0.80 [0.52, 1.23]	0.80 [0.52, 1.23]
Fibrosis of lung and other chronic lung disorders (CC 109)	1.03 [0.89, 1.18]	1.02 [0.89, 1.18]	1.03 [0.89, 1.18]	1.01 [0.88, 1.17]
Other gastrointestinal disorders (CC 36)	1.19 [1.10, 1.27]	1.19 [1.10, 1.27]	1.18 [1.10, 1.27]	1.18 [1.10, 1.27]
Severe hematological disorders (CC 44)	1.18 [0.96, 1.45]	1.18 [0.96, 1.45]	1.18 [0.96, 1.45]	1.19 [0.97, 1.47]
Other psychiatric disorders (CC 60)	1.31 [1.15, 1.48]	1.31 [1.16, 1.49]	1.30 [1.15, 1.48]	1.30 [1.15, 1.48]
Cardio-respiratory failure and shock (CC 79)	1.10 [1.01, 1.21]	1.10 [1.01, 1.21]	1.10 [1.01, 1.20]	1.10 [1.00, 1.20]
Chronic atherosclerosis (CC 83, 84)	1.05 [0.97, 1.13]	1.05 [0.98, 1.13]	1.05 [0.97, 1.13]	1.05 [0.97, 1.13]
Drug/alcohol abuse/dependence/psychosis (CC 51-53)	1.16 [1.03, 1.31]	1.16 [1.03, 1.31]	1.16 [1.02, 1.30]	1.16 [1.03, 1.31]
Major psychiatric disorders (CC 54-56)	1.24 [1.07, 1.44]	1.25 [1.08, 1.45]	1.25 [1.07, 1.44]	1.25 [1.08, 1.45]
Pleural effusion/pneumothorax (CC 114)	1.14 [1.01, 1.28]	1.14 [1.01, 1.28]	1.14 [1.01, 1.28]	1.12 [0.99, 1.26]
Other lung disorders (CC 115)	1.15 [1.03, 1.28]	1.15 [1.03, 1.28]	1.15 [1.03, 1.28]	1.14 [1.03, 1.27]
Urinary tract infection (CC 135)	1.15 [1.05, 1.25]	1.14 [1.05, 1.25]	1.14 [1.05, 1.25]	1.15 [1.05, 1.25]
Vertebral fractures (CC 157)	1.24 [1.01, 1.53]	1.25 [1.01, 1.54]	1.25 [1.01, 1.54]	1.25 [1.01, 1.55]
Other injuries (CC 162)	1.10 [0.98, 1.22]	1.10 [0.99, 1.22]	1.10 [0.99, 1.22]	1.10 [0.98, 1.22]
Lung or other severe cancers (CC 8)	1.65 [1.37, 1.99]	1.64 [1.36, 1.98]	1.65 [1.37, 1.99]	1.66 [1.37, 2.00]
Septicemia/shock (CC 2)	1.01 [0.76, 1.35]	1.01 [0.76, 1.35]	1.01 [0.76, 1.35]	1.03 [0.77, 1.38]
Other major cancers (CC 9-10)	1.20 [1.07, 1.36]	1.21 [1.07, 1.36]	1.20 [1.07, 1.36]	1.20 [1.06, 1.35]
Race (White as reference)				
Black		1.11 [0.98, 1.26]		
Hispanic		1.05 [0.92, 1.21]		

Asian or Pacific Islander		1.12 [0.88, 1.41]	
Native American		1.27 [0.81, 1.99]	
Other		1.01 [0.81, 1.25]	
Zip Code Income (Homeless as reference)			
	1	0.87 [0.64, 1.18]	
	2	0.87 [0.64, 1.18]	
	3	0.87 [0.64, 1.19]	
	4	0.86 [0.63, 1.17]	
	5	0.90 [0.66, 1.22]	
	6	0.81 [0.60, 1.10]	
	7	0.88 [0.65, 1.20]	
	8	0.86 [0.63, 1.16]	
	9	0.88 [0.64, 1.19]	
	10	0.74 [0.54, 1.01]	
Zip Code Gini			0.95 [0.56, 1.64]

ICD-9 3-digit (in-facility mortality)

AMI in-facility mortality	No SES	Race	Income	Inequality
Machine learning risk output (0-1 continuous)	670.6 [456.80 984.5]	671.31 [457.2, 985.8]	691.58 [470.7, 1016.0]	660.44 [448.0, 973.5]
Race (White as reference)				
Black		0.87 [0.69, 1.09]		
Hispanic		0.80 [0.62, 1.05]		
Asian or Pacific Islander		0.83 [0.52, 1.32]		
Native American		0.58 [0.30, 1.11]		
Other		0.80 [0.55, 1.17]		
Zip Code Income (Homeless as reference)				
1			1.50 [0.84, 2.66]	
2			1.84 [1.03, 3.26]	
3			1.85 [1.04, 3.29]	
4			1.60 [0.90, 2.86]	
5			2.02 [1.13, 3.58]	
6			1.68 [0.94, 3.00]	
7			1.82 [1.02, 3.23]	
8			1.63 [0.91, 2.90]	
9			1.68 [0.94, 3.00]	
10			1.64 [0.91, 2.93]	
Zip Code Gini				0.86 [0.34, 2.21]

HF in-facility mortality	No SES	Race	Income	Inequality
Machine learning risk output (0-1 continuous)	9140.09 [5637.9, 14817.8]	8613.93 [5305.7, 13985.0]	9246.59 [5696.5, 15009.1]	8368.52 [5138.8, 13628.1]
Race (White as reference)				
Black		0.90 [0.76, 1.08]		
Hispanic		0.64 [0.50, 0.83]		
Asian or Pacific Islander		0.65 [0.40, 1.04]		
Native American		0.94 [0.49, 1.82]		
Other		0.95 [0.69, 1.31]		
Zip Code Income (Homeless as reference)				
1			1.62 [0.97, 2.72]	
2			1.39 [0.83, 2.32]	
3			1.85 [1.12, 3.06]	
4			1.83 [1.11, 3.03]	
5			2.05 [1.24, 3.38]	
6			1.59 [0.96, 2.65]	
7			1.92 [1.16, 3.18]	
8			1.69 [1.02, 2.80]	
9			1.52 [0.92, 2.53]	
10			1.75 [1.05, 2.92]	
Zip Code Gini				0.90 [0.40, 2.01]

PN in-facility mortality	No SES	Race	Income	Inequality
Machine learning risk output (0-1 continuous)	1832.1 [1270.5, 2641.9]	1891.8 [1310.8, 2730.3]	1844.3 [1279.0, 2659.5]	1795.6 [1240.9, 2598.1]
Race (White as reference)				
Black		0.68 [0.57, 0.83]		
Hispanic		0.81 [0.66, 1.00]		
Asian or Pacific Islander		0.84 [0.60, 1.16]		
Native American		0.44 [0.21, 0.93]		
Other		0.71 [0.51, 0.98]		
Zip Code Income (Homeless as reference)				
1			0.70 [0.46, 1.07]	
2			0.98 [0.64, 1.50]	
3			1.07 [0.70, 1.62]	
4			0.95 [0.62, 1.45]	
5			1.07 [0.70, 1.62]	
6			0.93 [0.61, 1.42]	
7			0.88 [0.58, 1.34]	
8			0.87 [0.57, 1.33]	
9			0.98 [0.64, 1.50]	
10			0.98 [0.64, 1.49]	
Zip Code Gini				0.94 [0.44, 2.00]

ICD-9 3-digit (30-day mortality)

AMI 30-day mortality	No SES	Race	Income	Inequality
Machine learning risk output (0-1 continuous)	471.5 [320.9, 692.8]	468.08 [318.5, 687.8]	482.08 [328.0, 708.5]	470.55 [318.7, 694.7]
Race (White as reference)				
Black		0.73 [0.58, 0.92]		
Hispanic		0.90 [0.69, 1.16]		
Asian or Pacific Islander		0.85 [0.54, 1.34]		
Native American		0.70 [0.38, 1.29]		
Other		0.85 [0.58, 1.25]		
Zip Code Income (Homeless as reference)				
1			1.31 [0.76, 2.25]	
2			1.57 [0.92, 2.70]	
3			1.64 [0.96, 2.82]	
4			1.36 [0.79, 2.34]	
5			1.84 [1.07, 3.16]	
6			1.64 [0.96, 2.83]	
7			1.70 [0.99, 2.92]	
8			1.62 [0.94, 2.78]	
9			1.44 [0.84, 2.49]	
10			1.41 [0.82, 2.45]	
Zip Code Gini				0.91 [0.35, 2.37]

HF 30-day mortality	No SES	Race	Income	Inequality
Machine learning risk output (0-1 continuous)	2449.9 [1628.7, 3685.0]	2231.1 [1481.3, 3360.4]	2451.4 [1628.0, 3691.2]	2421.6 [1601.8, 3661.0]
Race (White as reference)				
Black		0.77 [0.66, 0.91]		
Hispanic		0.58 [0.46, 0.72]		
Asian or Pacific Islander		0.49 [0.30, 0.79]		
Native American		1.06 [0.61, 1.86]		
Other		0.77 [0.57, 1.06]		
Zip Code Income (Homeless as reference)				
1			1.26 [0.80, 1.99]	
2			1.24 [0.79, 1.94]	
3			1.69 [1.09, 2.63]	
4			1.72 [1.11, 2.67]	
5			1.90 [1.22, 2.95]	
6			1.48 [0.95, 2.31]	
7			1.67 [1.07, 2.59]	
8			1.59 [1.02, 2.47]	
9			1.44 [0.92, 2.24]	
10			1.55 [0.99, 2.42]	
Zip Code Gini				0.86 [0.41, 1.81]

PN 30-day mortality	No SES	Race	Income	Inequality
Machine learning risk output (0-1 continuous)	1117.3 [798.3, 1563.6]	1127.9 [805.6, 1579.1]	1123.6 [802.9, 1572.3]	1082.2 [771.5, 1518.0]
Race (White as reference)				
Black		0.74 [0.62, 0.88]		
Hispanic		0.77 [0.63, 0.94]		
Asian or Pacific Islander		0.87 [0.63, 1.20]		
Native American		0.45 [0.23, 0.92]		
Other		0.74 [0.54, 1.02]		
Zip Code Income (Homeless as reference)				
1			0.77 [0.51, 1.17]	
2			1.04 [0.68, 1.57]	
3			1.11 [0.73, 1.67]	
4			1.05 [0.69, 1.58]	
5			1.26 [0.84, 1.90]	
6			1.00 [0.66, 1.52]	
7			0.99 [0.66, 1.50]	
8			0.99 [0.65, 1.50]	
9			1.09 [0.72, 1.65]	
10			0.96 [0.63, 1.47]	
Zip Code Gini				0.92 [0.44, 1.93]

ICD-9 3-digit (30-day readmission)

AMI 30-day readmission	No SES	Race	Income	Inequality
Machine learning risk output (0-1 continuous)	21.39 [13.88, 32.96]	21.54 [13.98, 33.19]	21.58 [14.00, 33.26]	21.12 [13.66, 32.65]
Race (White as reference)				
Black		0.92 [0.78, 1.10]		
Hispanic		1.06 [0.89, 1.27]		
Asian or Pacific Islander		1.15 [0.84, 1.58]		
Native American		1.37 [0.89, 2.08]		
Other		0.90 [0.71, 1.13]		
Zip Code Income (Homeless as reference)				
1			0.70 [0.48, 1.03]	
2			0.74 [0.50, 1.09]	
3			0.70 [0.48, 1.03]	
4			0.70 [0.48, 1.03]	
5			0.75 [0.51, 1.10]	
6			0.92 [0.63, 1.36]	
7			0.68 [0.46, 1.00]	
8			0.67 [0.45, 0.98]	
9			0.84 [0.57, 1.24]	
10			0.75 [0.50, 1.10]	
Zip Code Gini				0.77 [0.39, 1.54]

HF 30-day readmission	No SES	Race	Income	Inequality
Machine learning risk output (0-1 continuous)	65.68 [49.71, 86.78]	65.74 [49.77, 86.82]	65.56 [49.63, 86.61]	62.79 [47.36, 83.26]
Race (White as reference)				
Black		1.09 [1.00, 1.20]		
Hispanic		1.11 [1.00, 1.24]		
Asian or Pacific Islander		1.08 [0.86, 1.35]		
Native American		0.89 [0.61, 1.31]		
Other		1.11 [0.94, 1.32]		
Zip Code Income (Homeless as reference)				
1			1.08 [0.86, 1.36]	
2			0.97 [0.77, 1.22]	
3			0.94 [0.75, 1.19]	
4			0.95 [0.75, 1.19]	
5			1.06 [0.84, 1.33]	
6			0.97 [0.77, 1.22]	
7			0.98 [0.78, 1.24]	
8			0.93 [0.74, 1.17]	
9			0.95 [0.75, 1.20]	
10			0.95 [0.75, 1.20]	
Zip Code Gini				1.28 [0.82, 2.01]

PN 30-day readmission	No SES	Race	Income	Inequality
Machine learning risk output (0-1 continuous)	137.8 [98.3, 193.2]	137.92 [98.4, 193.4]	138.9 [99.1, 194.8]	129.0 [91.7, 181.3]
Race (White as reference)				
Black		1.11 [0.98, 1.25]		
Hispanic		1.03 [0.90, 1.17]		
Asian or Pacific Islander		1.09 [0.87, 1.38]		
Native American		1.24 [0.80, 1.91]		
Other		1.02 [0.82, 1.26]		
Zip Code Income (Homeless as reference)				
1			0.84 [0.62, 1.12]	
2			0.84 [0.62, 1.13]	
3			0.86 [0.64, 1.16]	
4			0.84 [0.63, 1.13]	
5			0.87 [0.65, 1.17]	
6			0.79 [0.59, 1.07]	
7			0.86 [0.64, 1.16]	
8			0.82 [0.61, 1.10]	
9			0.86 [0.64, 1.16]	
10			0.72 [0.53, 0.97]	
Zip Code Gini				0.92 [0.54, 1.55]

ICD-9 5-digit (in-facility mortality)

AMI in-facility mortality	No SES	Race	Income	Inequality
Machine learning risk output (0-1 continuous)	1061.1 [733.8, 1534.5]	1068.7 [738.3, 1546.9]	1075.5 [743.5, 1555.6]	1060.3 [730.5, 1538.9]
Race (White as reference)				
Black		0.96 [0.76, 1.21]		
Hispanic		0.87 [0.66, 1.13]		
Asian or Pacific Islander		0.78 [0.49, 1.27]		
Native American		0.54 [0.28, 1.07]		
Other		0.89 [0.60, 1.31]		
Zip Code Income (Homeless as reference)				
1			1.48 [0.83, 2.65]	
2			1.79 [1.00, 3.20]	
3			1.73 [0.97, 3.09]	
4			1.61 [0.90, 2.88]	
5			1.92 [1.07, 3.43]	
6			1.70 [0.95, 3.05]	
7			1.78 [1.00, 3.19]	
8			1.70 [0.95, 3.04]	
9			1.65 [0.92, 2.96]	
10			1.63 [0.91, 2.93]	
Zip Code Gini				0.91 [0.35, 2.39]

HF in-facility mortality	No SES	Race	Income	Inequality
Machine learning risk output (0-1 continuous)	7599.4 [4913.2, 11754.0]	7275.9 [4699.5, 11264.8]	7820.7 [5049.0, 12114.0]	7000.6 [4505.0, 10878.7]
Race (White as reference)				
Black		0.89 [0.75, 1.06]		
Hispanic		0.67 [0.53, 0.86]		
Asian or Pacific Islander		0.60 [0.37, 0.97]		
Native American		0.94 [0.49, 1.81]		
Other		0.92 [0.66, 1.27]		
Zip Code Income (Homeless as reference)				
1			1.69 [1.00, 2.84]	
2			1.41 [0.84, 2.36]	
3			1.94 [1.16, 3.22]	
4			1.92 [1.15, 3.19]	
5			2.09 [1.26, 3.47]	
6			1.59 [0.95, 2.66]	
7			1.98 [1.19, 3.29]	
8			1.73 [1.04, 2.88]	
9			1.57 [0.94, 2.62]	
10			1.76 [1.06, 2.94]	
Zip Code Gini				0.81 [0.36, 1.80]

PN in-facility mortality	No SES	Race	Income	Inequality
Machine learning risk output (0-1 continuous)	2745.5 [1932.1, 3901.4]	2849.2 [2002.8, 4053.3]	2772.2 [1950.9, 3939.3]	2675.1 [1876.3, 3814.0]
Race (White as reference)				
Black		0.68 [0.56, 0.82]		
Hispanic		0.82 [0.67, 1.01]		
Asian or Pacific Islander		0.82 [0.59, 1.14]		
Native American		0.43 [0.21, 0.91]		
Other		0.73 [0.53, 1.00]		
Zip Code Income (Homeless as reference)				
1			0.68 [0.45, 1.04]	
2			1.00 [0.66, 1.52]	
3			1.05 [0.69, 1.59]	
4			0.94 [0.62, 1.42]	
5			1.09 [0.72, 1.65]	
6			0.93 [0.61, 1.41]	
7			0.88 [0.58, 1.34]	
8			0.88 [0.58, 1.34]	
9			0.95 [0.62, 1.45]	
10			0.97 [0.64, 1.49]	
Zip Code Gini				0.93 [0.44, 1.97]

ICD-9 5-digit (30-day mortality)

AMI 30-day mortality	No SES	Race	Income	Inequality
Machine learning risk output (0-1 continuous)	651.4 [448.3, 946.4]	649.0 [446.4, 943.5]	660.0 [454.2, 959.0]	672.4 [460.5, 982.0]
Race (White as reference)				
Black		0.82 [0.64, 1.04]		
Hispanic		0.98 [0.75, 1.27]		
Asian or Pacific Islander		0.78 [0.48, 1.27]		
Native American		0.63 [0.33, 1.22]		
Other		0.90 [0.61, 1.34]		
Zip Code Income (Homeless as reference)				
1			1.27 [0.73, 2.21]	
2			1.55 [0.89, 2.70]	
3			1.62 [0.93, 2.82]	
4			1.34 [0.77, 2.34]	
5			1.80 [1.04, 3.14]	
6			1.63 [0.94, 2.85]	
7			1.69 [0.97, 2.94]	
8			1.66 [0.95, 2.90]	
9			1.42 [0.81, 2.48]	
10			1.49 [0.85, 2.61]	
Zip Code Gini				0.93 [0.34, 2.48]

HF 30-day mortality	No SES	Race	Income	Inequality
Machine learning risk output (0-1 continuous)	2139.3 [1482.7, 3086.6]	2002.8 [1386.3, 2893.4]	2147.8 [1486.6, 3103.2]	2137.9 [1474.1, 3100.6]
Race (White as reference)				
Black		0.79 [0.67, 0.92]		
Hispanic		0.60 [0.48, 0.75]		
Asian or Pacific Islander		0.47 [0.29, 0.76]		
Native American		1.15 [0.66, 2.02]		
Other		0.78 [0.57, 1.07]		
Zip Code Income (Homeless as reference)				
1			1.26 [0.80, 1.99]	
2			1.21 [0.77, 1.90]	
3			1.65 [1.06, 2.57]	
4			1.71 [1.10, 2.66]	
5			1.81 [1.17, 2.82]	
6			1.43 [0.91, 2.23]	
7			1.61 [1.03, 2.51]	
8			1.49 [0.96, 2.32]	
9			1.41 [0.90, 2.19]	
10			1.49 [0.95, 2.32]	
Zip Code Gini				0.73 [0.35, 1.53]

PN 30-day mortality	No SES	Race	Income	Inequality
Machine learning risk output (0-1 continuous)	1007.6 [737.4, 1377.0]	1022.7 [748.0, 1398.3]	1024.5 [749.7, 1400.2]	1000.4 [730.1, 1370.8]
Race (White as reference)				
Black		0.72 [0.60, 0.87]		
Hispanic		0.81 [0.66, 0.99]		
Asian or Pacific Islander		0.85 [0.61, 1.18]		
Native American		0.56 [0.26, 1.17]		
Other		0.69 [0.50, 0.96]		
Zip Code Income (Homeless as reference)				
1			0.83 [0.54, 1.27]	
2			1.14 [0.74, 1.74]	
3			1.20 [0.79, 1.83]	
4			1.13 [0.74, 1.71]	
5			1.40 [0.92, 2.13]	
6			1.11 [0.73, 1.69]	
7			1.08 [0.71, 1.65]	
8			0.99 [0.65, 1.52]	
9			1.14 [0.74, 1.74]	
10			1.04 [0.68, 1.59]	
Zip Code Gini				0.70 [0.33, 1.48]

ICD-9 5-digit (30-day readmission)

AMI 30-day readmission	No SES	Race	Income	Inequality
Machine learning risk output (0-1 continuous)	21.92 [15.06, 31.91]	22.15 [15.21, 32.27]	22.08 [15.16, 32.15]	22.04 [15.08, 32.21]
Race (White as reference)				
Black		0.92 [0.78, 1.10]		
Hispanic		1.05 [0.88, 1.26]		
Asian or Pacific Islander		1.22 [0.88, 1.68]		
Native American		1.38 [0.90, 2.11]		
Other		0.91 [0.72, 1.15]		
Zip Code Income (Homeless as reference)				
1			0.69 [0.47, 1.01]	
2			0.73 [0.50, 1.08]	
3			0.70 [0.47, 1.03]	
4			0.69 [0.47, 1.02]	
5			0.74 [0.50, 1.09]	
6			0.91 [0.62, 1.34]	
7			0.66 [0.45, 0.98]	
8			0.66 [0.45, 0.97]	
9			0.83 [0.56, 1.22]	
10			0.73 [0.50, 1.09]	
Zip Code Gini				0.80 [0.40, 1.60]

HF 30-day readmission	No SES	Race	Income	Inequality
Machine learning risk output (0-1 continuous)	43.91 [34.93, 55.20]	43.85 [34.89, 55.12]	43.91 [34.93, 55.20]	42.21 [33.48, 53.22]
Race (White as reference)				
Black		1.08 [0.99, 1.18]		
Hispanic		1.09 [0.98, 1.22]		
Asian or Pacific Islander		1.12 [0.89, 1.41]		
Native American		0.91 [0.62, 1.33]		
Other		1.12 [0.95, 1.34]		
Zip Code Income (Homeless as reference)				
1			1.07 [0.85, 1.34]	
2			0.95 [0.76, 1.20]	
3			0.93 [0.74, 1.17]	
4			0.94 [0.75, 1.18]	
5			1.04 [0.83, 1.31]	
6			0.96 [0.76, 1.21]	
7			0.97 [0.77, 1.23]	
8			0.90 [0.72, 1.14]	
9			0.94 [0.75, 1.19]	
10			0.93 [0.73, 1.17]	
Zip Code Gini				1.32 [0.84, 2.07]

PN 30-day readmission	No SES	Race	Income	Inequality
Machine learning risk output (0-1 continuous)	63.84 [49.34, 82.62]	63.65 [49.18, 82.38]	64.11 [49.53, 82.97]	61.02 [47.04, 79.15]
Race (White as reference)				
Black		1.07 [0.95, 1.21]		
Hispanic		1.01 [0.88, 1.15]		
Asian or Pacific Islander		1.07 [0.85, 1.35]		
Native American		1.26 [0.81, 1.96]		
Other		1.00 [0.81, 1.24]		
Zip Code Income (Homeless as reference)				
1			0.86 [0.64, 1.16]	
2			0.87 [0.64, 1.17]	
3			0.89 [0.66, 1.20]	
4			0.87 [0.65, 1.18]	
5			0.91 [0.68, 1.23]	
6			0.82 [0.61, 1.11]	
7			0.90 [0.66, 1.21]	
8			0.85 [0.63, 1.15]	
9			0.90 [0.67, 1.21]	
10			0.74 [0.55, 1.01]	
Zip Code Gini				0.97 [0.57, 1.65]

Appendix B.2 – Machine learning important predictors (in descending order of importance) – full 2006 sample

3-digit ICD-9 AMI

Rank	In-facility mortality	30-day mortality	30-day readmission
1	785 - Unspecified tachycardia	785 - Unspecified tachycardia	428 - Congestive heart failure, unspecified
2	272 - Pure hypercholesterolemia	272 - Pure hypercholesterolemia	276 - Hyperosmolality and/or hypernatremia
3	518 - Pulmonary collapse	518 - Pulmonary collapse	250 - Diabetes mellitus without mention of complic
4	584 - Acute renal failure with lesion of tubular n	584 - Acute renal failure with lesion of tubular n	272 - Pure hypercholesterolemia
5	276 - Hyperosmolality and/or hypernatremia	414 - Coronary atherosclerosis of unspecified type	427 - Paroxysmal supraventricular tachycardia
6	428 - Congestive heart failure, unspecified	276 - Hyperosmolality and/or hypernatremia	401 - Essential hypertension, malignant
7	414 - Coronary atherosclerosis of unspecified type	428 - Congestive heart failure, unspecified	V45 - Unspecified cardiac device in situ
8	348 - Cerebral cysts	348 - Cerebral cysts	285 - Sideroblastic anemia
9	427 - Paroxysmal supraventricular tachycardia	458 - Orthostatic hypotension	414 - Coronary atherosclerosis of unspecified type
10	401 - Essential hypertension, malignant	427 - Paroxysmal supraventricular tachycardia	496 - Chronic airway obstruction, not elsewhere cl
11	250 - Diabetes mellitus without mention of complic	401 - Essential hypertension, malignant	424 - Mitral valve disorders
12	458 - Orthostatic hypotension	250 - Diabetes mellitus without mention of complic	599 - Urinary tract infection, site not specified
13	486 - Pneumonia, organism unspecified	486 - Pneumonia, organism unspecified	412 - Old myocardial infarction
14	285 - Sideroblastic anemia	294 - Amnestic disorder in conditions classified e	530 - Achalasia and cardiospasm
15	V45 - Unspecified cardiac device in situ	V45 - Unspecified cardiac device in situ	244 - Postsurgical hypothyroidism
16	294 - Amnestic disorder in conditions classified e	285 - Sideroblastic anemia	403 - Hypertensive chronic kidney disease, maligna
17	496 - Chronic airway obstruction, not elsewhere cl	424 - Mitral valve disorders	V10 - Personal history of malignant neoplasm of un
18	424 - Mitral valve disorders	Female ages 90-94	585 - Chronic kidney disease, Stage I
19	Female	496 - Chronic airway obstruction, not elsewhere cl	Female
20	530 - Achalasia and cardiospasm	530 - Achalasia and cardiospasm	486 - Pneumonia, organism unspecified

3-digit ICD-9 HF

Rank	In-facility mortality	30-day mortality	30-day readmission
1	276 - Hyperosmolality and/or hypernatremia	276 - Hyperosmolality and/or hypernatremia	276 - Hyperosmolality and/or hypernatremia
2	584 - Acute renal failure with lesion of tubular n	584 - Acute renal failure with lesion of tubular n	285 - Sideroblastic anemia
3	518 - Pulmonary collapse	272 - Pure hypercholesterolemia	272 - Pure hypercholesterolemia
4	486 - Pneumonia, organism unspecified	486 - Pneumonia, organism unspecified	427 - Paroxysmal supraventricular tachycardia
5	272 - Pure hypercholesterolemia	518 - Pulmonary collapse	250 - Diabetes mellitus without mention of complic
6	707 - Pressure ulcer, unspecified site	401 - Essential hypertension, malignant	414 - Coronary atherosclerosis of unspecified type
7	427 - Paroxysmal supraventricular tachycardia	427 - Paroxysmal supraventricular tachycardia	V45 - Unspecified cardiac device in situ
8	401 - Essential hypertension, malignant	707 - Pressure ulcer, unspecified site	401 - Essential hypertension, malignant
9	V45 - Unspecified cardiac device in situ	250 - Diabetes mellitus without mention of complic	585 - Chronic kidney disease, Stage I
10	250 - Diabetes mellitus without mention of complic	294 - Amnestic disorder in conditions classified e	496 - Chronic airway obstruction, not elsewhere cl
11	599 - Urinary tract infection, site not specified	V45 - Unspecified cardiac device in situ	486 - Pneumonia, organism unspecified
12	294 - Amnestic disorder in conditions classified e	599 - Urinary tract infection, site not specified	424 - Mitral valve disorders
13	585 - Chronic kidney disease, Stage I	414 - Coronary atherosclerosis of unspecified type	403 - Hypertensive chronic kidney disease, maligna
14	414 - Coronary atherosclerosis of unspecified type	424 - Mitral valve disorders	599 - Urinary tract infection, site not specified
15	496 - Chronic airway obstruction, not elsewhere cl	585 - Chronic kidney disease, Stage I	584 - Acute renal failure with lesion of tubular n
16	424 - Mitral valve disorders	496 - Chronic airway obstruction, not elsewhere cl	425 - Endomyocardial fibrosis
17	285 - Sideroblastic anemia	285 - Sideroblastic anemia	412 - Old myocardial infarction
18	458 - Orthostatic hypotension	410 - Acute myocardial infarction of anterolateral	244 - Postsurgical hypothyroidism
19	410 - Acute myocardial infarction of anterolateral	403 - Hypertensive chronic kidney disease, maligna	Female
20	403 - Hypertensive chronic kidney disease, maligna	V58 - Radiotherapy	V58 - Radiotherapy

3-digit ICD-9 PN

Rank	In-facility mortality	30-day mortality	30-day readmission
1	518 - Pulmonary collapse	276 - Hyperosmolality and/or hypernatremia	428 - Congestive heart failure, unspecified
2	276 - Hyperosmolality and/or hypernatremia	518 - Pulmonary collapse	285 - Sideroblastic anemia
3	410 - Acute myocardial infarction of anterolateral	410 - Acute myocardial infarction of anterolateral	276 - Hyperosmolality and/or hypernatremia
4	428 - Congestive heart failure, unspecified	428 - Congestive heart failure, unspecified	401 - Essential hypertension, malignant
5	584 - Acute renal failure with lesion of tubular n	272 - Pure hypercholesterolemia	427 - Paroxysmal supraventricular tachycardia
6	427 - Paroxysmal supraventricular tachycardia	427 - Paroxysmal supraventricular tachycardia	414 - Coronary atherosclerosis of unspecified type
7	707 - Pressure ulcer, unspecified site	707 - Pressure ulcer, unspecified site	272 - Pure hypercholesterolemia
8	038 - Streptococcal septicemia	584 - Acute renal failure with lesion of tubular n	491 - Simple chronic bronchitis
9	272 - Pure hypercholesterolemia	401 - Essential hypertension, malignant	496 - Chronic airway obstruction, not elsewhere cl
10	995 - Other anaphylactic shock not elsewhere class	162 - Malignant neoplasm of trachea	250 - Diabetes mellitus without mention of complic
11	401 - Essential hypertension, malignant	197 - Secondary malignant neoplasm of lung	599 - Urinary tract infection, site not specified
12	285 - Sideroblastic anemia	414 - Coronary atherosclerosis of unspecified type	530 - Achalasia and cardiospasm
13	250 - Diabetes mellitus without mention of complic	250 - Diabetes mellitus without mention of complic	V45 - Unspecified cardiac device in situ
14	414 - Coronary atherosclerosis of unspecified type	285 - Sideroblastic anemia	294 - Amnestic disorder in conditions classified e
15	496 - Chronic airway obstruction, not elsewhere cl	496 - Chronic airway obstruction, not elsewhere cl	244 - Postsurgical hypothyroidism
16	491 - Simple chronic bronchitis	294 - Amnestic disorder in conditions classified e	female -
17	599 - Urinary tract infection, site not specified	V45 - Unspecified cardiac device in situ	V10 - Personal history of malignant neoplasm of un
18	486 - Pneumonia, organism unspecified	491 - Simple chronic bronchitis	780 - Coma
19	V45 - Unspecified cardiac device in situ	038 - Streptococcal septicemia	518 - Pulmonary collapse
20	294 - Amnestic disorder in conditions classified e	995 - Other anaphylactic shock not elsewhere class	585 - Chronic kidney disease, Stage I

5-digit ICD-9 AMI

Rank	In-facility mortality	30-day mortality	30-day readmission
1	51881 - Acute respiratory failure	78551 - Cardiogenic shock	4280 - Congestive heart failure, unspecified
2	78551 - Cardiogenic shock	51881 - Acute respiratory failure	25000 - Diabetes mellitus without mention of compl
3	41071 - Acute myocardial infarction, subendocardia	41071 - Acute myocardial infarction, subendocardia	41400 - Coronary atherosclerosis of unspecified ty
4	5849 - Unspecified acute renal failure	41401 - Coronary atherosclerosis of native coronar	496 - Chronic airway obstruction, not elsewhere cl
5	4280 - Congestive heart failure, unspecified	5849 - Unspecified acute renal failure	42731 - Atrial fibrillation
6	41401 - Coronary atherosclerosis of native coronar	4275 - Cardiac arrest	2720 - Pure hypercholesterolemia
7	4275 - Cardiac arrest	2724 - Other and unspecified hyperlipidemia	41401 - Coronary atherosclerosis of native coronar
8	2724 - Other and unspecified hyperlipidemia	4280 - Congestive heart failure, unspecified	412 - Old myocardial infarction
9	3481 - Anoxic brain damage	3481 - Anoxic brain damage	4019 - Unspecified essential hypertension
10	27651 - Dehydration	2720 - Pure hypercholesterolemia	2724 - Other and unspecified hyperlipidemia
11	486 - Pneumonia, organism unspecified	27651 - Dehydration	27651 - Dehydration
12	41091 - Acute myocardial infarction, unspecified s	4589 - Unspecified hypotension	5859 - Chronic kidney disease, unspecified
13	2720 - Pure hypercholesterolemia	41091 - Acute myocardial infarction, unspecified s	2859 - Unspecified anemia
14	4019 - Unspecified essential hypertension	486 - Pneumonia, organism unspecified	40391 - Hypertensive chronic kidney disease, unspe
15	42731 - Atrial fibrillation	4019 - Unspecified essential hypertension	5849 - Unspecified acute renal failure
16	2762 - Acidosis	25000 - Diabetes mellitus without mention of compl	2449 - Unspecified hypothyroidism
17	25000 - Diabetes mellitus without mention of compl	Female ages 90-94	486 - Pneumonia, organism unspecified
18	4589 - Unspecified hypotension	2762 - Acidosis	Female
19	0389 - Unspecified septicemia	42731 - Atrial fibrillation	5990 - Urinary tract infection, site not specified
20	2767 - Hyperpotassemia	V4582 - Postprocedural percutaneous transluminal c	2768 - Hypopotassemia

5-digit ICD-9 HF

Rank	In-facility mortality	30-day mortality	30-day readmission
1	486 - Pneumonia, organism unspecified	27651 - Dehydration	41401 - Coronary atherosclerosis of native coronar
2	5849 - Unspecified acute renal failure	486 - Pneumonia, organism unspecified	2859 - Unspecified anemia
3	27651 - Dehydration	5849 - Unspecified acute renal failure	40391 - Hypertensive chronic kidney disease, unspe
4	51881 - Acute respiratory failure	51881 - Acute respiratory failure	496 - Chronic airway obstruction, not elsewhere cl
5	42731 - Atrial fibrillation	4019 - Unspecified essential hypertension	27651 - Dehydration
6	5990 - Urinary tract infection, site not specified	42731 - Atrial fibrillation	486 - Pneumonia, organism unspecified
7	4019 - Unspecified essential hypertension	2720 - Pure hypercholesterolemia	5990 - Urinary tract infection, site not specified
8	2724 - Other and unspecified hyperlipidemia	2948 - Other persistent mental disorders due to co	5849 - Unspecified acute renal failure
9	V667 - Encounter for palliative care	2767 - Hyperpotassemia	4019 - Unspecified essential hypertension
10	70703 - Pressure ulcer, lower back	5990 - Urinary tract infection, site not specified	5939 - Unspecified disorder of kidney and ureter
11	2720 - Pure hypercholesterolemia	25000 - Diabetes mellitus without mention of compl	5859 - Chronic kidney disease, unspecified
12	25000 - Diabetes mellitus without mention of compl	V667 - Encounter for palliative care	41400 - Coronary atherosclerosis of unspecified ty
13	2767 - Hyperpotassemia	2724 - Other and unspecified hyperlipidemia	25000 - Diabetes mellitus without mention of compl
14	5119 - Unspecified pleural effusion	4241 - Aortic valve disorders	2767 - Hyperpotassemia
15	41071 - Acute myocardial infarction, subendocardia	5119 - Unspecified pleural effusion	42731 - Atrial fibrillation
16	41401 - Coronary atherosclerosis of native coronar	5859 - Chronic kidney disease, unspecified	49121 - Obstructive chronic bronchitis, with (acut
17	496 - Chronic airway obstruction, not elsewhere cl	4589 - Unspecified hypotension	2720 - Pure hypercholesterolemia
18	5859 - Chronic kidney disease, unspecified	496 - Chronic airway obstruction, not elsewhere cl	2724 - Other and unspecified hyperlipidemia
19	4589 - Unspecified hypotension	70703 - Pressure ulcer, lower back	412 - Old myocardial infarction
20	49121 - Obstructive chronic bronchitis, with (acut	41401 - Coronary atherosclerosis of native coronar	V4581 - Postprocedural aortocoronary bypass status

5-digit ICD-9 PN

Rank	In-facility mortality	30-day mortality	30-day readmission
1	51881 - Acute respiratory failure	51881 - Acute respiratory failure	4280 - Congestive heart failure, unspecified
2	27651 - Dehydration	27651 - Dehydration	2859 - Unspecified anemia
3	5849 - Unspecified acute renal failure	4280 - Congestive heart failure, unspecified	49121 - Obstructive chronic bronchitis, with (acut
4	4280 - Congestive heart failure, unspecified	41091 - Acute myocardial infarction, unspecified s	41401 - Coronary atherosclerosis of native coronar
5	41091 - Acute myocardial infarction, unspecified s	5849 - Unspecified acute renal failure	496 - Chronic airway obstruction, not elsewhere cl
6	0389 - Unspecified septicemia	42731 - Atrial fibrillation	42731 - Atrial fibrillation
7	42731 - Atrial fibrillation	70703 - Pressure ulcer, lower back	27651 - Dehydration
8	99592 - Severe sepsis	2720 - Pure hypercholesterolemia	2948 - Other persistent mental disorders due to co
9	5119 - Unspecified pleural effusion	0389 - Unspecified septicemia	25000 - Diabetes mellitus without mention of compl
10	4589 - Unspecified hypotension	2762 - Acidosis	5990 - Urinary tract infection, site not specified
11	486 - Pneumonia, organism unspecified	4019 - Unspecified essential hypertension	4019 - Unspecified essential hypertension
12	70703 - Pressure ulcer, lower back	5119 - Unspecified pleural effusion	5119 - Unspecified pleural effusion
13	V667 - Encounter for palliative care	99592 - Severe sepsis	Female
14	4019 - Unspecified essential hypertension	486 - Pneumonia, organism unspecified	2720 - Pure hypercholesterolemia
15	496 - Chronic airway obstruction, not elsewhere cl	2724 - Other and unspecified hyperlipidemia	2768 - Hypopotassemia
16	5990 - Urinary tract infection, site not specified	4589 - Unspecified hypotension	2449 - Unspecified hypothyroidism
17	4275 - Cardiac arrest	Female ages 90-94	V4501 - Cardiac pacemaker in situ
18	2720 - Pure hypercholesterolemia	V667 - Encounter for palliative care	41400 - Coronary atherosclerosis of unspecified ty
19	2859 - Unspecified anemia	2639 - Unspecified protein-calorie malnutrition	42789 - Other specified cardiac dysrhythmias
20	78552 - Septic shock	4275 - Cardiac arrest	2724 - Other and unspecified hyperlipidemia