**Supplemental Tables**

Supplemental Table 1. International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) Codes for variables.

|  |  |
| --- | --- |
| Variable | ICD-9-CM Codes |
| *Explicit Code Severe Sepsis/Septic Shock* | 995.92, 785.52 |
| Urinary Tract Infections | 590.00, 590.01, 590.10, 590.11, 590.2, 590.3, 590.80, 590.81, 590.9, 595.0, 595.2, 595.3, 595.4, 595.89, 595.9, 597.0,597.80, 597.89, 598.00, 598.01, 599.0, 996.64 [8] |
| Pulmonary Infections | 480.0–480.9, 481, 482.0–482.9, 483.0–483.8, 484.1–484.8, 485, 486, 487.0, 510.9, 513.0, 997.31, 415.12 [8] |
| Skin Soft Tissue Infections | 566, 680, 681, 682, 683, 684, 685,686, 707, 728.6, 785.4, 958.3, 996.62, 997.62, 998.5[9] |
| Intra-abdominal Infections | 008.45, 009.0–009.3, 540.0–540.9, 541, 542, 543.9, 562.01, 562.03, 562.11, 562.13, 567.0–567.9, 569.5, 569.61, 569.71, 569.83, 572.0–572.8, 574.00–574.91, 575.0–575.9, 576.0–576.9, 614.0–614.9 [8]  and 008.8, 003.0 |
| Do Not Resuscitate Status | V4986 |
| *Organ Dysfunctions* |  |
| Shock | 785.5, 785.52 |
| Continuous invasive mechanical ventilation | 96.7 (Procedure code) |
| Defibrination syndrome | 286.6 |
| Coagulat defect | 286.9 |
| Thromboycytopenia (or secondary thrombocytopenia) | 287.4, 287.5 |
| Transient mental disorders | 293 |
| Anoxic brain damage | 348.1 |
| Encephalopathy | 348.3 |
| Hypotension | 458 |
| Acute and subacute necrosis of liver or Hepatic infarction | 570 or 573.4 |
| Acute kidney failure | 584 |
| Shock without mention of trauma | 785.5 |
| *Angus Definition* [4,8] | Infection code (001–005, 008–018, 020–027, 030–041,  090–098, 100–104, 110–112, 114–118, 320, 322, 324, 325,  420, 421, 451, 461–465, 481, 482, 485, 486, 491.21, 494, 510,  513, 540–542, 562.01, 562.03, 562.11, 562.13, 566, 567,  569.5, 569.83, 572.0, 572.1, 575.0, 590, 597, 599.0, 601, 614,  615, 616, 681–683, 686, 711.0, 730, 790.7, 996.6, 998.5, 993.3) + organ dysfunction (see above)  *or*  Explicit code for severe sepsis/septic shock |

Supplemental Table 2. Description of patient chronic conditions for each hospitalization in the cohort, and the proportion of each grouping that died at or within seven days of discharge. Chi-square tests for independence were used to assess if mortality varied within each grouping.

|  |  |  |  |
| --- | --- | --- | --- |
| **Patient Characteristics** | ***Overall Sepsis Population*** | **Death at or within 7 days of discharge** | **Test for independence (mortality)** |
| ***N= 422,320*** | **N= 146,729 (35%)** |
| *N (% of sepsis hospitalizations)* | N (% of each grouping who died within 7 days) |
| *Chronic Conditions* |  |  |  |
| Acute Myocardial Infarction | 47,730 (11%) | 18,293 (38%) | <0.001 |
| Alzheimer’s Dementia | 174,364 (41%) | 68,010 (39%) | <0.001 |
| Atrial Fibrillation | 137,925 (33%) | 53,906 (39%) | <0.001 |
| Cataracts | 293,383 (69%) | 104,341 (36%) | <0.001 |
| Chronic Kidney Infection | 254,442 (60%) | 91,260 (36%) | <0.001 |
| Chronic Obstructive Pulmonary Disease | 218,289 (52%) | 79,643 (36%) | <0.001 |
| Heart Failure | 256,036 (61%) | 95,675 (37%) | <0.001 |
| Diabetes | 241,503 (57%) | 82,751 (34%) | <0.001 |
| Glaucoma | 106,259 (25%) | 38,285 (36%) | <0.001 |
| Hip Fracture | 45,569 (11%) | 18,730 (41%) | <0.001 |
| Ischemic Heart | 301,783 (71%) | 108,405 (36%) | <0.001 |
| Depression | 211,265 (50%) | 73,800 (35%) | 0.0099 |
| Rheumatoid Arthritis/Osteoarthritis | 280,446 (66%) | 97,560 (35%) | 0.3997 |
| Stroke/ Transient Ischemic Attack | 132,469 (31%) | 48,146 (36%) | <0.001 |
| Cancer (Breast) | 24,608 (6%) | 9,116 (37%) | <0.001 |
| Cancer (Colorectal) | 23,321 (6%) | 9,065 (39%) | <0.001 |
| Cancer (Prostate) | 35,232 (8%) | 12,931 (37%) | <0.001 |
| Cancer (Lung) | 19,883 (5%) | 9,136 (46%) | <0.001 |
| Cancer (Endometrial) | 6,048 (1%) | 2,117 (35%) | 0.6692 |
| Anemia | 346,035 (82%) | 125,326 (36%) | <0.001 |
| Asthma | 93,094 (22%) | 31,434 (34%) | <0.001 |
| Hyperlipidemia | 344,006 (81%) | 118,543 (34%) | <0.001 |
| Benign Prostatic Hyperplasia | 115,414 (27%) | 40,161 (35%) | 0.6526 |
| Hypertension | 388,668 (92%) | 135,964 (35%) | <0.001 |
| Hypothyroidism | 147,820 (35%) | 52,841 (36%) | <0.001 |

Supplemental Table 3. Hierarchical logistic regression model adjusted odds ratios. Characteristics are listed in ranked order by absolute value of their parameter estimate. For continuous fixed effects the comparison is equivalent to the distance of the interquartile range.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Characteristics** | **Comparison** | **Adjusted Odds Ratio** | **95% Confidence** | |
| POA Other continuous invasive mechanical ventilation | Any vs None | 3.382 | 3.323 | 3.441 |
| POA Do not resuscitate status | Any vs None | 3.327 | 3.268 | 3.387 |
| POA Anoxic brain damage | Any vs None | 2.802 | 2.628 | 2.988 |
| POA Defibrination syndrome | Any vs None | 2.558 | 2.399 | 2.729 |
| POA Acute and subacute necrosis of liver or hepatic infarction | Any vs None | 2.097 | 2.015 | 2.182 |
| POA Coagulate defect | Any vs None | 1.940 | 1.837 | 2.048 |
| No Potential source of infection identified | None vs Any | 1.787 | 1.740 | 1.835 |
| POA Shock | Any vs None | 1.786 | 1.759 | 1.814 |
| Age | 14 year increase | 1.752 | 1.040 | 1.042 |
| Cancer (Lung) | Any vs None | 1.712 | 1.657 | 1.770 |
| Hospitalization in previous 30 days | Any vs None | 1.406 | 1.380 | 1.432 |
| POA Intra-abdominal infection | Any vs None | 1.332 | 1.303 | 1.361 |
| POA Urinary Tract infection | Any vs None | 0.759 | 0.745 | 0.773 |
| POA Pulmonary infection | Any vs None | 1.312 | 1.288 | 1.337 |
| POA Transient mental disorders | Any vs None | 0.801 | 0.751 | 0.855 |
| Number of hospitalizations in previous year | 4+ vs 0 | 1.211 | 1.178 | 1.245 |
| POA Skin-soft-tissue infection | Any vs None | 1.194 | 1.171 | 1.217 |
| Anemia | Any vs None | 1.188 | 1.161 | 1.215 |
| Admission source | SNF vs Home | 1.179 | 1.149 | 1.210 |
| Number of hospitalizations in previous year | 2-3 vs 0 | 1.174 | 1.149 | 1.200 |
| Rheumatoid Arthritis/Osteoarthritis | Any vs None | 0.855 | 0.840 | 0.870 |
| Hyperlipidemia | Any vs None | 0.864 | 0.846 | 0.883 |
| Hospital implicit/explicit coding ratio | 10% increase | 0.871 | 0.985 | 0.988 |
| Asthma | Any vs None | 0.882 | 0.866 | 0.899 |
| POA Acute kidney failure | Any vs None | 1.128 | 1.111 | 1.145 |
| Gagne Score | 4 point increase | 1.123 | 1.027 | 1.032 |
| Number of hospitalizations in previous year | 1 vs 0 | 1.114 | 1.092 | 1.137 |
| Atrial Fibrillation | Any vs None | 1.110 | 1.092 | 1.129 |
| Provider claim in previous 7 days | Any vs None | 1.107 | 1.090 | 1.125 |
| Alzheimer’s or Dementia | Any vs None | 1.103 | 1.084 | 1.122 |
| Hypertension | Any vs None | 0.909 | 0.881 | 0.938 |
| Hip fracture | Any vs None | 1.096 | 1.071 | 1.121 |
| Benign Prostatic Hyperplasia | Any vs None | 0.915 | 0.896 | 0.936 |
| Cancer (Colorectal) | Any vs None | 1.083 | 1.051 | 1.117 |
| Heart Failure | Any vs None | 1.074 | 1.055 | 1.094 |
| Cancer (Endometrial) | Any vs None | 1.074 | 1.011 | 1.141 |
| Cancer (Breast) | Any vs None | 1.071 | 1.038 | 1.105 |
| Cancer (Prostate) | Any vs None | 1.060 | 1.031 | 1.089 |
| Race | Other vs White | 0.948 | 0.920 | 0.977 |
| POA Hypotension | Any vs None | 1.054 | 1.017 | 1.092 |
| Acute Myocardial Infarction | Any vs None | 1.050 | 1.026 | 1.074 |
| Stroke/ Transient Ischemic Attack | Any vs None | 0.953 | 0.937 | 0.968 |
| Cataracts | Any vs None | 0.957 | 0.940 | 0.974 |
| POA Thromboycytopenia | Any vs None | 1.042 | 1.018 | 1.066 |
| Depression | Any vs None | 0.961 | 0.946 | 0.977 |
| Diabetes | Any vs None | 0.965 | 0.950 | 0.981 |
| Race | Black vs White | 0.974 | 0.950 | 0.998 |
| Chronic Kidney Infection | Any vs None | 0.975 | 0.958 | 0.992 |
| Sex | Male vs Female | 0.975 | 0.955 | 0.995 |
| POA Encephalopathy | Any vs None | 1.020 | 1.001 | 1.040 |
| Hypothyroidism | Any vs None | 0.982 | 0.967 | 0.998 |
| Ischemic Heart | Any vs None | 0.984 | 0.965 | 1.003 |
| Glaucoma | Any vs None | 0.987 | 0.970 | 1.004 |
| Chronic Obstructive Pulmonary Disease | Any vs None | 1.010 | 0.994 | 1.027 |

Supplemental Figure 1. Distribution of Risk Standardized Mortality Rates by decile. 

Supplemental Figure 2. Correlation between Risk Standardized Mortality Rates for full and sub analysis (excluding hospitals with 50 or fewer included hospitalizations). Pearsons correlation coefficient > 0.99.

