



# **Nursing Home Compare Quality Measure Technical Specifications**

## **Appendices**

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## APPENDIX TABLE A

### Risk-Adjustment Model for Short-Stay Residents who were Re-hospitalized after a Nursing Home Admission: Risk Variables and Coefficient Estimates

Note: Model C-statistic = 0.694

Note: This model is based on all SNF stays with admission from a hospital between January 1, 2017 and December 31, 2017.

Variable	Mean	Percent of Residents With Covariate who Triggered the Numerator	Coefficient	P-Value
Female age 18–65	0.051	26.8	0.030	0.009
Female age 65–69 (ref)	0.059	23.3	-	-
Female age 70–74	0.077	22.3	-0.013	0.200
Female age 75–79	0.091	21.4	-0.022	0.028
Female age 80–84	0.105	20.1	-0.060	<.0001
Female age 85–89	0.112	19.0	-0.102	<.0001
Female age 9–94	0.079	17.7	-0.159	<.0001
Female age GT 94	0.031	16.2	-0.252	<.0001
Male age 18–65	0.054	27.8	0.027	0.014
Male age 65–69	0.049	25.7	0.009	0.429
Male age 70–74	0.056	25.7	0.037	0.001
Male age 75–79	0.063	25.5	0.065	<.0001
Male age 80–84	0.066	24.4	0.049	<.0001
Male age 85–89	0.062	23.7	0.054	<.0001
Male age 90–94	0.036	22.5	0.009	0.469
Male age GT 94	0.010	21.2	-0.044	0.027
Length of stay 1–3 days (ref)	0.229	16.9	-	-

Variable	Mean	Percent of Residents With Covariate who Triggered the Numerator	Coefficient	P-Value
Length of stay 4-7 days	0.467	21.1	0.132	<.0001
Length of stay 8-14 days	0.221	27.5	0.319	<.0001
Length of stay GT 14 days	0.083	31.8	0.430	<.0001
0 hospitalizations in prior year (ref)	0.410	16.2	-	-
1-3 hospitalizations in prior year	0.481	24.2	0.107	<.0001
4-6 hospitalizations in prior year	0.085	35.4	0.355	<.0001
7-9 hospitalizations in prior year	0.017	45.4	0.648	<.0001
10+ hospitalizations in prior year	0.006	55.8	1.042	<.0001
Ever disabled	0.256	25.8	-0.002	0.707
ESRD	0.055	39.2	0.336	<.0001
At least 1 day ICU (y/n)	0.157	29.3	0.108	<.0001
1 Tuberculosis	0.000	37.0	1.116	0.000
2 Septicemia (except in labor)	0.112	26.9	0.715	<.0001
3 Bacterial infection; unspecified site	0.001	26.6	0.743	<.0001
4 Mycoses	0.001	29.2	0.890	<.0001
5 HIV infection	0.000	31.6	0.793	<.0001
6 Hepatitis	0.000	34.4	1.081	<.0001
7 Viral infection	0.001	20.3	0.683	<.0001
8 Other infections; including parasitic	0.000	13.4	0.215	0.225
11 Cancer of head and neck	0.001	29.0	0.839	<.0001
12 Cancer of esophagus	0.000	33.6	1.111	<.0001
13 Cancer of stomach	0.000	30.9	1.119	<.0001
14 Cancer of colon	0.003	22.7	0.824	<.0001
15 Cancer of rectum and anus	0.001	29.7	1.092	<.0001
16 Cancer of liver and intrahepatic bile duct	0.000	30.7	1.159	<.0001

Variable	Mean	Percent of Residents With Covariate who Triggered the Numerator	Coefficient	P-Value
17 Cancer of pancreas	0.001	32.2	1.283	<.0001
18 Cancer of other GI organs; peritoneum	0.000	31.2	1.188	<.0001
19 Cancer of bronchus; lung	0.003	29.0	1.029	<.0001
20 Cancer; other respiratory and intrathoracic	0.000	34.3	1.171	<.0001
21 Cancer of bone and connective tissue	0.000	26.7	1.107	<.0001
22 Melanomas of skin	0.000	19.0	0.892	0.001
23 Other non-epithelial cancer of skin	0.000	22.3	0.989	<.0001
24 Cancer of breast	0.000	23.4	1.009	<.0001
25 Cancer of uterus	0.000	25.6	1.084	<.0001
26 Cancer of cervix	0.000	24.0	0.844	0.001
27 Cancer of ovary	0.000	30.3	1.243	<.0001
28 Cancer of other female genital organs	0.000	23.5	0.984	<.0001
29 Cancer of prostate	0.000	28.5	1.011	<.0001
31 Cancer of other male genital organs	0.000	25.0	1.120	0.001
32 Cancer of bladder	0.001	32.0	1.101	<.0001
33 Cancer of kidney and renal pelvis	0.001	22.7	0.873	<.0001
34 Cancer of other urinary organs	0.000	26.4	1.005	<.0001
35 Cancer of brain and nervous system	0.001	26.2	1.004	<.0001
36 Cancer of thyroid	0.000	24.0	0.736	0.010
37 Hodgkin`s disease	0.000	38.0	1.519	<.0001
38 Non-Hodgkin`s lymphoma	0.001	37.9	1.350	<.0001
39 Leukemias	0.001	38.7	1.373	<.0001
40 Multiple myeloma	0.001	37.2	1.343	<.0001
41 Cancer; other and unspecified primary	0.000	30.2	1.136	<.0001
42 Secondary malignancies	0.004	32.0	1.167	<.0001

<b>Variable</b>	<b>Mean</b>	<b>Percent of Residents With Covariate who Triggered the Numerator</b>	<b>Coefficient</b>	<b>P-Value</b>
43 Malignant neoplasm without specification of site	0.000	31.4	1.116	<.0001
44 Neoplasms of unspecified nature or uncertain behavior	0.001	34.3	1.268	<.0001
45 Maintenance chemotherapy; radiotherapy	0.001	32.5	0.752	<.0001
47 Other and unspecified benign neoplasm	0.001	22.6	0.816	<.0001
48 Thyroid disorders	0.001	24.4	0.870	<.0001
50 Diabetes mellitus with complications	0.021	25.8	0.674	<.0001
51 Other endocrine disorders	0.003	23.1	0.843	<.0001
52 Nutritional deficiencies	0.001	24.3	0.729	<.0001
54 Gout and other crystal arthropathies	0.001	19.4	0.701	<.0001
55 Fluid and electrolyte disorders	0.016	23.2	0.772	<.0001
56 Cystic fibrosis	0.000	29.2	0.885	0.062
57 Immunity disorders	0.000	26.3	0.703	0.000
58 Other nutritional; endocrine; and metabolic disorders	0.003	23.7	0.781	<.0001
59 Deficiency and other anemia	0.005	28.7	0.924	<.0001
60 Acute post-hemorrhagic anemia	0.002	27.7	0.824	<.0001
61 Sickle cell anemia	0.000	46.7	1.200	<.0001
62 Coagulation and hemorrhagic disorders	0.002	28.7	0.875	<.0001
63 Diseases of white blood cells	0.001	28.3	0.878	<.0001
64 Other hematologic conditions	0.000	23.9	0.759	<.0001
76 Meningitis	0.000	23.7	0.713	<.0001
77 Encephalitis	0.000	26.9	0.821	<.0001
78 Other CNS infection and poliomyelitis	0.000	27.1	0.787	<.0001
79 Parkinson`s disease	0.002	14.9	0.393	<.0001
80 Multiple sclerosis	0.001	15.5	0.429	<.0001
81 Other hereditary and degenerative nervous system conditions	0.001	17.4	0.439	<.0001

<b>Variable</b>	<b>Mean</b>	<b>Percent of Residents With Covariate who Triggered the Numerator</b>	<b>Coefficient</b>	<b>P-Value</b>
82 Paralysis	0.000	21.9	0.768	<.0001
83 Epilepsy; convulsions	0.007	21.1	0.630	<.0001
84 Headache; including migraine	0.000	18.8	0.611	<.0001
85 Coma; stupor; and brain damage	0.000	27.0	0.702	<.0001
88 Glaucoma	0.000	26.8	0.819	0.026
89 Blindness and vision defects	0.000	21.5	0.894	<.0001
90 Inflammation; infection of eye	0.000	19.3	0.612	<.0001
91 Other eye disorders	0.000	19.7	0.645	0.000
92 Otitis media and related conditions	0.000	19.2	0.468	0.015
93 Conditions associated with dizziness or vertigo	0.001	11.8	0.310	<.0001
94 Other ear disorders	0.000	16.4	0.471	0.028
95 Other nervous system disorders	0.016	22.2	0.691	<.0001
96 Heart valve disorders	0.005	25.4	0.830	<.0001
97 Peri-, endo-, and myocarditis; cardiomyopathy	0.001	30.6	0.938	<.0001
98 Essential hypertension	0.000	17.5	0.717	<.0001
99 Hypertension with complications and secondary hypertension	0.052	29.6	0.834	<.0001
100 Acute myocardial infarction	0.016	28.2	0.944	<.0001
101 Coronary atherosclerosis and other heart disease	0.006	25.0	0.819	<.0001
102 Nonspecific chest pain	0.002	23.5	0.711	<.0001
103 Pulmonary heart disease	0.006	22.5	0.690	<.0001
104 Other and ill-defined heart disease	0.000	24.0	0.861	<.0001
105 Conduction disorders	0.003	17.5	0.539	<.0001
106 Cardiac dysrhythmias	0.018	24.7	0.882	<.0001
107 Cardiac arrest and ventricular fibrillation	0.000	26.6	0.542	<.0001
108 Congestive heart failure; non-hypertensive	0.009	27.1	0.786	<.0001

<b>Variable</b>	<b>Mean</b>	<b>Percent of Residents With Covariate who Triggered the Numerator</b>	<b>Coefficient</b>	<b>P-Value</b>
109 Acute cerebrovascular disease	0.030	20.9	0.654	<.0001
110 Occlusion or stenosis of pre-cerebral arteries	0.001	23.2	0.799	<.0001
111 Other and ill-defined cerebrovascular disease	0.000	19.9	0.521	<.0001
112 Transient cerebral ischemia	0.004	15.8	0.532	<.0001
113 Late effects of cerebrovascular disease	0.002	19.4	0.461	<.0001
114 Peripheral and visceral atherosclerosis	0.004	28.8	0.952	<.0001
115 Aortic; peripheral; and visceral artery aneurysms	0.002	25.5	0.821	<.0001
116 Aortic and peripheral arterial embolism or thrombosis	0.001	29.1	1.017	<.0001
117 Other circulatory disease	0.005	22.6	0.743	<.0001
118 Phlebitis; thrombophlebitis and thromboembolism	0.004	22.0	0.756	<.0001
119 Varicose veins of lower extremity	0.000	20.9	0.667	<.0001
120 Hemorrhoids	0.001	26.2	0.800	<.0001
121 Other diseases of veins and lymphatics	0.001	20.6	0.612	<.0001
122 Pneumonia (except that caused by tuberculosis or sexually transmitted disease)	0.027	22.6	0.645	<.0001
123 Influenza	0.005	16.2	0.382	<.0001
125 Acute bronchitis	0.002	16.4	0.470	<.0001
126 Other upper respiratory infections	0.001	19.1	0.605	<.0001
127 Chronic obstructive pulmonary disease and bronchiectasis	0.026	26.6	0.745	<.0001
128 Asthma	0.001	19.6	0.569	<.0001
129 Aspiration pneumonitis; food/vomitus	0.013	25.6	0.641	<.0001
130 Pleurisy; pneumothorax; pulmonary collapse	0.003	29.9	0.840	<.0001
131 Respiratory failure; insufficiency	0.021	31.1	0.768	<.0001
132 Lung disease due to external agents	0.000	29.2	0.833	<.0001
133 Other lower respiratory disease	0.002	26.0	0.757	<.0001



<b>Variable</b>	<b>Mean</b>	<b>Percent of Residents With Covariate who Triggered the Numerator</b>	<b>Coefficient</b>	<b>P-Value</b>
134 Other upper respiratory disease	0.001	28.6	0.791	<.0001
135 Intestinal infection	0.007	26.9	0.885	<.0001
136 Disorders of teeth and jaw	0.000	22.1	0.734	<.0001
137 Diseases of mouth; excluding dental	0.000	21.9	0.637	<.0001
138 Esophageal disorders	0.003	25.5	0.762	<.0001
139 Gastroduodenal ulcer (except hemorrhage)	0.001	25.0	0.867	<.0001
140 Gastritis and duodenitis	0.002	26.3	0.801	<.0001
141 Other disorders of stomach and duodenum	0.001	33.0	0.991	<.0001
142 Appendicitis and other appendiceal conditions	0.001	18.4	0.582	<.0001
143 Abdominal hernia	0.004	21.9	0.755	<.0001
144 Regional enteritis and ulcerative colitis	0.001	33.6	1.259	<.0001
145 Intestinal obstruction without hernia	0.008	24.1	0.763	<.0001
146 Diverticulosis and diverticulitis	0.006	24.0	0.776	<.0001
147 Anal and rectal conditions	0.001	26.7	0.885	<.0001
148 Peritonitis and intestinal abscess	0.000	37.3	1.147	<.0001
149 Biliary tract disease	0.005	22.0	0.731	<.0001
151 Other liver diseases	0.004	40.9	1.196	<.0001
152 Pancreatic disorders (not diabetes)	0.002	25.3	0.871	<.0001
153 Gastrointestinal hemorrhage	0.014	27.3	0.781	<.0001
154 Noninfectious gastroenteritis	0.002	22.1	0.779	<.0001
155 Other gastrointestinal disorders	0.005	26.6	0.812	<.0001
156 Nephritis; nephrosis; renal sclerosis	0.000	31.9	0.988	<.0001
157 Acute and unspecified renal failure	0.033	25.3	0.826	<.0001
158 Chronic kidney disease	0.000	33.5	0.731	<.0001
159 Urinary tract infections	0.039	19.2	0.623	<.0001

Variable	Mean	Percent of Residents With Covariate who Triggered the Numerator	Coefficient	P-Value
160 Calculus of urinary tract	0.001	24.7	0.774	<.0001
161 Other diseases of kidney and ureters	0.001	25.9	0.915	<.0001
162 Other diseases of bladder and urethra	0.001	25.9	0.784	<.0001
163 Genitourinary symptoms and ill-defined conditions	0.001	26.4	0.856	<.0001
164 Hyperplasia of prostate	0.001	22.9	0.731	<.0001
165 Inflammatory conditions of male genital organs	0.000	21.4	0.545	<.0001
166 Other male genital disorders	0.000	28.1	0.848	<.0001
167 Nonmalignant breast conditions	0.000	28.3	0.967	<.0001
168 Inflammatory diseases of female pelvic organs	0.000	23.2	0.813	<.0001
173 Menopausal disorders	0.000	18.0	0.294	0.181
175 Other female genital disorders	0.000	26.4	0.893	<.0001
197 Skin and subcutaneous tissue infections	0.015	19.4	0.563	<.0001
198 Other inflammatory condition of skin	0.000	28.7	0.992	<.0001
199 Chronic ulcer of skin	0.003	22.6	0.569	<.0001
200 Other skin disorders	0.000	21.3	0.617	<.0001
201 Infective arthritis and osteomyelitis	0.004	22.2	0.607	<.0001
202 Rheumatoid arthritis and related disease	0.000	13.8	0.353	0.001
203 Osteoarthritis (Ref)	0.049	7.5	-	-
204 Other non-traumatic joint disorders	0.002	15.1	0.472	<.0001
205 Spondylosis; intervertebral disc disorders; other back problems	0.016	15.9	0.565	<.0001
207 Pathological fracture	0.009	17.0	0.591	<.0001
209 Other acquired deformities	0.003	13.5	0.453	<.0001
210 Systemic lupus erythematosus and connective tissue disorders	0.000	31.6	1.028	<.0001
211 Other connective tissue disease	0.006	15.9	0.496	<.0001
212 Other bone disease and musculoskeletal deformities	0.001	16.5	0.570	<.0001

<b>Variable</b>	<b>Mean</b>	<b>Percent of Residents With Covariate who Triggered the Numerator</b>	<b>Coefficient</b>	<b>P-Value</b>
213 Cardiac and circulatory congenital anomalies	0.000	24.9	0.697	<.0001
214 Digestive congenital anomalies	0.000	24.1	0.804	0.016
216 Nervous system congenital anomalies	0.000	18.2	0.520	0.051
225 Joint disorders and dislocations; trauma-related	0.001	15.6	0.533	<.0001
226 Fracture of neck of femur (hip)	0.059	15.1	0.474	<.0001
227 Spinal cord injury	0.000	25.3	0.768	<.0001
228 Skull and face fractures	0.001	17.2	0.573	<.0001
229 Fracture of upper limb	0.010	14.0	0.421	<.0001
230 Fracture of lower limb	0.019	15.0	0.401	<.0001
231 Other fractures	0.027	15.1	0.464	<.0001
232 Sprains and strains	0.001	12.6	0.296	<.0001
233 Intracranial injury	0.010	22.9	0.800	<.0001
234 Crushing injury or internal injury	0.002	20.6	0.636	<.0001
235 Open wounds of head; neck; and trunk	0.001	16.3	0.521	<.0001
236 Open wounds of extremities	0.001	19.9	0.628	<.0001
237 Complication of device; implant or graft	0.033	25.4	0.718	<.0001
238 Complications of surgical procedures or medical care	0.019	27.3	0.753	<.0001
239 Superficial injury; contusion	0.003	18.8	0.657	<.0001
240 Burns	0.000	19.7	0.439	<.0001
241 Poisoning by psychotropic agents	0.000	19.0	0.486	<.0001
242 Poisoning by other medications and drugs	0.002	23.4	0.664	<.0001
243 Poisoning by nonmedicinal substances	0.000	14.5	0.193	0.231
244 Other injuries and conditions due to external causes	0.004	16.7	0.506	<.0001
245 Syncope	0.004	16.3	0.555	<.0001
246 Fever of unknown origin	0.001	23.8	0.765	<.0001

Variable	Mean	Percent of Residents With Covariate who Triggered the Numerator	Coefficient	P-Value
247 Lymphadenitis	0.000	43.3	1.701	<.0001
248 Gangrene	0.002	31.0	0.907	<.0001
249 Shock	0.000	28.3	0.675	<.0001
250 Nausea and vomiting	0.001	25.0	0.848	<.0001
251 Abdominal pain	0.001	25.1	0.861	<.0001
252 Malaise and fatigue	0.003	16.6	0.507	<.0001
253 Allergic reactions	0.000	18.3	0.517	<.0001
254 Rehabilitation care; fitting of prostheses; and adjustment of devices	0.000	25.0	0.924	0.040
257 Other aftercare	0.001	15.6	0.339	<.0001
258 Other screening for suspected conditions (not mental disorders or infectious disease)	0.000	24.8	0.845	<.0001
259 Residual codes; unclassified	0.003	20.4	0.638	<.0001
650 MHA: Adjustment disorders	0.000	19.6	0.608	0.000
651 MHA: Anxiety disorders	0.000	20.4	0.662	<.0001
653 MHA: Delirium, dementia, and amnestic and other cognitive disorders	0.017	17.1	0.523	<.0001
656 MHA: Impulse control disorders, NEC	0.000	21.3	0.708	<.0001
657 MHA: Mood disorders	0.006	18.0	0.434	<.0001
658 MHA: Personality disorders	0.000	29.2	0.911	0.006
659 MHA: Schizophrenia and other psychotic disorders	0.007	20.2	0.556	<.0001
660 MHA: Alcohol-related disorders	0.004	25.1	0.810	<.0001
661 MHA: Substance-related disorders	0.001	19.8	0.551	<.0001
662 MHA: Suicide and intentional self-inflicted injury	0.000	19.5	0.446	0.000
670 MHA: Miscellaneous mental disorders	0.000	21.5	0.693	<.0001

Variable	Mean	Percent of Residents With Covariate who Triggered the Numerator	Coefficient	P-Value
2617 Adverse effects of medical drugs	0.000	20.7	0.601	<.0001
CCS None	0.000	26.6	0.597	<.0001
Nonsignificant CCS w/ protective effect	0.000	5.9	-0.532	0.007
Nonsignificant CCS w/ increased risk	0.000	14.9	0.352	0.000
Re-hospitalizations-specific comorbidity index	-1.283	-	0.458	<.0001
End-stage disease	0.007	13.4	-1.123	<.0001
Return to nursing home after hospitalization	0.238	26.8	0.052	<.0001
Anemia	0.309	25.6	0.064	<.0001
Vascular ulcer	0.027	29.1	0.067	<.0001
Viral hepatitis	0.009	31.3	0.092	<.0001
Internal bleeding	0.009	48.1	0.960	<.0001
Daily pain	0.051	37.8	0.409	<.0001
Ext. assistance/dependence eating	0.548	24.5	0.079	<.0001
Two-person support needed with ADL(s)	0.644	24.0	0.168	<.0001
Cognitive status not intact	0.023	58.5	1.400	<.0001
Cognitive status assessment missing	0.009	48.1	0.960	<.0001
Chemotherapy	0.010	29.5	0.293	<.0001
IV medications	0.511	23.1	-0.035	<.0001
Ostomy	0.026	30.9	0.220	<.0001
Oxygen therapy	0.360	27.6	0.176	<.0001
Radiation	0.003	34.4	0.332	<.0001
Significant change in status assessment	0.035	17.2	-0.520	<.0001
Rarely/never makes self understood	0.024	26.5	-0.132	<.0001
Acute onset mental status change	0.024	35.1	0.546	<.0001
Reject care 4–7 days	0.012	26.3	0.121	<.0001

<b>Variable</b>	<b>Mean</b>	<b>Percent of Residents With Covariate who Triggered the Numerator</b>	<b>Coefficient</b>	<b>P-Value</b>
Wander 1-7 days	0.018	22.4	0.189	<.0001
Walks in room: indep/supervision/limited assistance	0.331	18.0	-0.074	<.0001
Walks in corridor indep/supervision/limited assistance	0.300	17.1	-0.221	<.0001
Wanders * Walks in room or corridor: indep/supervision/limited assistance	0.010	21.0	0.159	<.0001
Alzheimer's disease	0.049	18.1	-0.161	<.0001
Non-Alzheimer's dementia	0.205	20.0	-0.156	<.0001
Cancer	0.065	20.0	-0.312	<.0001
Ulcerative Colitis/Crohn's/inflammatory bowel	0.011	18.6	-0.240	<.0001
Seizure disorder	0.070	24.4	-0.032	<.0001
Shortness of breath with exertion	0.156	28.9	0.055	<.0001
Shortness of breath when sitting at rest	0.057	38.9	0.478	<.0001
Trouble swallowing medications	0.019	24.2	-0.043	0.001
Parenteral/IV feeding	0.010	38.2	0.543	<.0001
Feeding tube	0.039	36.3	0.092	<.0001
Surgical wound	0.268	19.1	-0.036	<.0001
Antibiotics received	0.400	24.1	0.077	<.0001
Ventilator or respirator	0.003	43.6	-0.102	0.001
Transfusion	0.003	33.4	0.273	<.0001
Respiratory therapy	0.065	28.5	0.007	0.356
Constant	-	-	-1.917	<.0001

## APPENDIX TABLE B

### Coefficient Estimates for Short-Stay Residents who were Re-hospitalized after a Nursing Home Admission, Resident-Level Comorbidity Index

Note: Model C-statistic = 0.613

Note: This model is based on all SNF stays with admission from a hospital between January 1, 2017 and December 31, 2017.

Charlson Condition	Coefficient	SE	P-value
Myocardial infarction	0.134	0.006	<0.001
CHF	0.249	0.005	<0.001
Peripheral vascular disease	0.149	0.005	<0.001
Cerebrovascular disease	0.027	0.006	<0.001
Dementia	-0.032	0.005	<0.001
COPD	0.242	0.004	<0.001
Rheumatoid arthritis	0.139	0.009	<0.001
Ulcers	0.185	0.011	<0.001
Mild liver disease	0.255	0.010	<0.001
Diabetes mellitus	0.121	0.005	<0.001
Diabetes with sequelae	0.140	0.006	<0.001
Paralysis	0.131	0.010	<0.001
Chronic renal disease	0.284	0.005	<0.001
Cancer	0.325	0.008	<0.001
Moderate to severe liver disease	0.443	0.016	<0.001
Metastatic cancer	0.327	0.013	<0.001
HIV/AIDS	0.328	0.036	<0.001
Constant	-1.600	0.003	<0.001

## APPENDIX TABLE C

### Risk-Adjustment Model for Hospitalizations per 1,000 Long-Stay Resident Days: Risk Variables and Coefficient Estimates

*Note:* This model assumes a negative binomial distribution for the number of hospitalizations per long-stay resident.

*Note:* This model is based on all days, between January 1, 2017 and December 31, 2017, that residents were in the nursing home after they attained long-term resident status (i.e., after 100 cumulative days in the facility).

Variable	Mean	Mean Number of Hospitalizations Among Those With Covariate	Coefficient	P-Value
Number of long-stay days in target period	240	-	0.016	<.0001
Number of long-stay days in target period, squared	75,970	-	0.000	<.0001
White (ref)	0.824	0.40	-	-
Black	0.126	0.56	0.251	<.0001
Hispanic	0.019	0.55	0.289	<.0001
Asian	0.014	0.49	0.254	<.0001
Other race/ethnicity	0.015	0.47	0.109	<.0001
Unknown race/ethnicity	0.003	0.47	0.038	0.246
Female age 18-65	0.049	0.58	0.015	0.212
Female age 65-69 (ref)	0.041	0.54	-	-
Female age 70-74	0.055	0.51	-0.003	0.776
Female age 75-79	0.074	0.45	-0.051	<.0001
Female age 80-84	0.106	0.40	-0.100	<.0001
Female age 85-89	0.139	0.35	-0.173	<.0001
Female age 9-94	0.126	0.31	-0.260	<.0001
Female age GT 94	0.072	0.25	-0.412	<.0001
Male age 18-65	0.060	0.57	0.046	<.0001
Male age 65-69	0.041	0.52	0.000	0.982
Male age 70-74	0.044	0.52	0.034	0.006
Male age 75-79	0.046	0.51	0.055	<.0001
Male age 80-84	0.051	0.47	0.021	0.083



Variable	Mean	Mean Number of Hospitalizations Among Those With Covariate	Coefficient	P-Value
Male age 85–89	0.050	0.42	-0.025	0.049
Male age 90–94	0.033	0.38	-0.080	<.0001
Male age GT 94	0.012	0.33	-0.191	<.0001
0 hospitalizations in prior year (ref)	0.500	0.31	-	-
1–3 hospitalizations in prior year	0.434	0.48	0.195	<.0001
4–6 hospitalizations in prior year	0.056	0.83	0.478	<.0001
7–9 hospitalizations in prior year	0.009	1.19	0.673	<.0001
10+ hospitalizations in prior year	0.002	1.56	0.869	<.0001
Long-stay hospitalizations-specific comorbidity index	0.118	-	2.543	<.0001
Entered nursing home from a psychiatric facility	0.024	0.45	0.088	<.0001
End-stage disease	0.045	0.10	-0.371	<.0001
Septicemia	0.010	0.76	0.168	<.0001
Respiratory failure	0.032	0.77	0.076	<.0001
Internal bleeding	0.002	0.57	0.092	0.020
Ext. assistance/dependence eating	0.225	0.40	0.042	<.0001
Moderate cognitive impairment	0.217	0.43	-0.047	<.0001
Severe cognitive impairment	0.278	0.35	-0.120	<.0001
Staff assessed cognitive impairment	0.177	0.35	-0.139	<.0001
Cognitive status assessment missing	0.004	0.45	-0.104	0.000
Chemotherapy	0.005	0.50	0.085	0.002
IV medications	0.015	0.78	0.135	<.0001
Oxygen therapy	0.130	0.62	0.169	<.0001
Radiation	0.001	0.54	0.071	0.328
Rarely/never makes self understood	0.072	0.35	-0.012	0.247
Reject care 4–7 days	0.023	0.42	0.019	0.159
Wander 1–7 days	0.048	0.33	-0.047	<.0001
Walks in room: indep/supervision/limited assistance	0.342	0.40	-0.003	0.711
Walks in corridor indep/supervision/limited assistance	0.320	0.40	-0.067	<.0001
Shortness of breath with exertion	0.079	0.60	0.078	<.0001
Shortness of Breath while lying	0.067	0.61	0.071	<.0001

<b>Variable</b>	<b>Mean</b>	<b>Mean Number of Hospitalizations Among Those With Covariate</b>	<b>Coefficient</b>	<b>P-Value</b>
Anticoagulants received	0.157	0.54	0.083	<.0001
Antibiotics received	0.130	0.56	0.143	<.0001
Diuretics received	0.345	0.49	0.136	<.0001
Ulcerative Colitis/Crohn's/inflammatory bowel	0.002	0.45	0.068	0.075
Multi-drug resistant organism (MDRO)	0.007	0.72	0.078	<.0001
Cerebrovascular accident (CVA), Transient Ischemic Attack (TIA) or Stroke	0.115	0.46	0.015	0.011
Quadriplegia	0.007	0.76	0.171	<.0001
Multiple Sclerosis	0.014	0.56	0.101	<.0001
Parkinson's disease	0.068	0.42	0.033	<.0001
Anxiety	0.316	0.44	0.087	<.0001
Gastroesophageal reflux disease (GERD) or ulcer	0.093	0.45	0.128	<.0001
Neurogenic bladder	0.033	0.67	0.224	<.0001
Transfusion	0.001	0.83	0.334	<.0001
Hospice care after nursing home admission	0.057	0.08	-1.354	<.0001
Isolation or quarantine for active infectious disease	0.004	0.61	0.034	0.202
Speech therapy	0.100	0.50	-0.008	0.206
Respiratory therapy	0.039	0.68	0.107	<.0001
Constant	-	-	-2.631	<.0001

## APPENDIX TABLE D

### Coefficient Estimates for Hospitalizations per 1,000 Long-Stay Resident Days, Resident-Level Comorbidity Index

*Note:* This model assumes a negative binomial distribution for the number of hospitalizations per long-stay resident.

*Note:* This model is based on all days, between January 1, 2017 and December 31, 2017, that residents were in the nursing home after they attained long-term resident status (i.e., after 100 cumulative days in the facility).

Charlson Condition	Coefficient	SE	P-value
Myocardial infarction			<0.001
CHF			<0.001
Peripheral vascular disease			<0.001
Cerebrovascular disease			<0.001
Dementia			<0.001
COPD			<0.001
Rheumatoid arthritis			<0.001
Ulcers			<0.001
Mild liver disease			<0.001
Diabetes mellitus			<0.001
Diabetes with sequelae			<0.001
Paralysis			<0.001
Chronic renal disease			<0.001
Cancer			<0.001
Moderate to severe liver disease			<0.001
Metastatic cancer			<0.001
HIV/AIDS			<0.001
Intercept			<0.001

## APPENDIX TABLE E

### Risk-Adjustment Model for Short-Stay Residents who have had an Outpatient Emergency Department Visit: Risk Variables and Coefficient Estimates

Note: Model C-statistic = 0.613

Note: This model is based on all SNF stays with admission from a hospital between January 1, 2017 and December 31, 2017.

Variable	Mean	Percent of Residents With Covariate who Triggered the Numerator	Coefficient	P-Value
Female age 18–65	0.051	16.68	0.205	<.0001
Female age 65–69 (ref)	0.059	12.20	-	-
Female age 70–74	0.077	11.46	-0.032	0.010
Female age 75–79	0.091	10.98	-0.048	0.000
Female age 80–84	0.105	10.28	-0.097	<.0001
Female age 85–89	0.112	9.98	-0.108	<.0001
Female age 90–94	0.079	9.20	-0.178	<.0001
Female age GT 94	0.031	8.60	-0.234	<.0001
Male age 18–65	0.054	17.25	0.194	<.0001
Male age 65–69	0.049	13.95	0.070	<.0001
Male age 70–74	0.056	13.24	0.049	0.000
Male age 75–79	0.063	12.92	0.052	<.0001
Male age 80–84	0.066	12.35	0.031	0.020
Male age 85–89	0.062	11.90	0.019	0.170
Male age 90–94	0.036	11.14	-0.030	0.066
Male age GT 94	0.010	11.11	-0.009	0.725
Length of stay 1–3 days (ref)	0.229	10.85	-	-
Length of stay 4–7 days	0.467	11.44	0.001	0.913

Variable	Mean	Percent of Residents With Covariate who Triggered the Numerator	Coefficient	P-Value
Length of stay 8–14 days	0.221	12.93	0.037	<.0001
Length of stay GT 14 days	0.083	14.23	0.039	<.0001
0 hospitalizations in prior year (ref)	0.410	9.49	-	-
1–3 hospitalizations in prior year	0.481	12.44	0.168	<.0001
4–6 hospitalizations in prior year	0.085	16.78	0.375	<.0001
7–9 hospitalizations in prior year	0.017	21.64	0.588	<.0001
10+ hospitalizations in prior year	0.006	29.56	0.919	<.0001
Ever disabled	0.256	14.76	0.112	<.0001
ESRD	0.055	19.92	0.369	<.0001
At least 1 day ICU (y/n)	0.157	13.75	0.059	<.0001
2 Septicemia (except in labor)	0.112	11.96	0.123	<.0001
3 Bacterial infection; unspecified site	0.001	15.91	0.413	<.0001
4 Mycoses	0.001	13.94	0.312	<.0001
5 HIV infection	0.000	17.65	0.236	0.028
6 Hepatitis	0.000	14.96	0.313	0.018
7 Viral infection	0.001	10.65	0.184	0.020
11 Cancer of head and neck	0.001	21.43	0.534	<.0001
12 Cancer of esophagus	0.000	20.13	0.653	<.0001
13 Cancer of stomach	0.000	15.23	0.463	<.0001
14 Cancer of colon	0.003	10.58	0.198	<.0001
15 Cancer of rectum and anus	0.001	14.38	0.482	<.0001
16 Cancer of liver and intrahepatic bile duct	0.000	12.50	0.265	0.025
17 Cancer of pancreas	0.001	12.88	0.370	<.0001
18 Cancer of other GI organs; peritoneum	0.000	16.67	0.648	<.0001
19 Cancer of bronchus; lung	0.003	11.18	0.231	<.0001
24 Cancer of breast	0.000	10.00	0.198	0.080
25 Cancer of uterus	0.000	10.68	0.231	0.047

Variable	Mean	Percent of Residents With Covariate who Triggered the Numerator	Coefficient	P-Value
27 Cancer of ovary	0.000	11.66	0.347	0.003
28 Cancer of other female genital organs	0.000	11.92	0.355	0.048
29 Cancer of prostate	0.000	14.95	0.523	<.0001
32 Cancer of bladder	0.001	13.85	0.376	<.0001
33 Cancer of kidney and renal pelvis	0.001	11.97	0.295	0.002
34 Cancer of other urinary organs	0.000	14.35	0.497	0.011
35 Cancer of brain and nervous system	0.001	12.57	0.278	0.002
36 Cancer of thyroid	0.000	18.67	0.652	0.030
38 Non-Hodgkin`s lymphoma	0.001	10.69	0.119	0.133
39 Leukemias	0.001	14.37	0.423	<.0001
40 Multiple myeloma	0.001	12.86	0.319	0.001
42 Secondary malignancies	0.004	12.31	0.322	<.0001
43 Malignant neoplasm without specification of site	0.000	11.85	0.281	0.061
44 Neoplasms of unspecified nature or uncertain behavior	0.001	13.63	0.361	<.0001
47 Other and unspecified benign neoplasm	0.001	11.64	0.238	0.000
48 Thyroid disorders	0.001	13.19	0.407	<.0001
50 Diabetes mellitus with complications	0.021	13.51	0.174	<.0001
51 Other endocrine disorders	0.003	12.04	0.311	<.0001
52 Nutritional deficiencies	0.001	14.23	0.304	<.0001
54 Gout and other crystal arthropathies	0.001	10.37	0.202	0.009
55 Fluid and electrolyte disorders	0.016	12.73	0.292	<.0001
58 Other nutritional; endocrine; and metabolic disorders	0.003	11.72	0.208	<.0001
59 Deficiency and other anemia	0.005	12.49	0.246	<.0001
60 Acute post-hemorrhagic anemia	0.002	12.79	0.255	<.0001
61 Sickle cell anemia	0.000	23.70	0.428	0.040
62 Coagulation and hemorrhagic disorders	0.002	13.99	0.379	<.0001
63 Diseases of white blood cells	0.001	11.52	0.119	0.225

Variable	Mean	Percent of Residents With Covariate who Triggered the Numerator	Coefficient	P-Value
76 Meningitis	0.000	15.31	0.448	0.000
77 Encephalitis	0.000	14.43	0.380	0.001
78 Other CNS infection and poliomyelitis	0.000	15.75	0.370	0.000
79 Parkinson`s disease	0.002	12.53	0.368	<.0001
81 Other hereditary and degenerative nervous system conditions	0.001	13.96	0.400	<.0001
82 Paralysis	0.000	18.98	0.786	<.0001
83 Epilepsy; convulsions	0.007	14.99	0.356	<.0001
84 Headache; including migraine	0.000	16.43	0.595	<.0001
85 Coma; stupor; and brain damage	0.000	15.31	0.347	0.086
89 Blindness and vision defects	0.000	15.59	0.648	0.002
91 Other eye disorders	0.000	15.27	0.526	0.008
95 Other nervous system disorders	0.016	13.06	0.300	<.0001
96 Heart valve disorders	0.005	11.96	0.293	<.0001
97 Peri-, endo-, and myocarditis; cardiomyopathy	0.001	13.69	0.277	<.0001
98 Essential hypertension	0.000	13.03	0.509	0.000
99 Hypertension with complications and secondary hypertension	0.052	12.43	0.230	<.0001
100 Acute myocardial infarction	0.016	13.87	0.435	<.0001
101 Coronary atherosclerosis and other heart disease	0.006	14.90	0.491	<.0001
102 Nonspecific chest pain	0.002	17.34	0.586	<.0001
103 Pulmonary heart disease	0.006	13.08	0.413	<.0001
104 Other and ill-defined heart disease	0.000	13.67	0.495	0.001
105 Conduction disorders	0.003	10.87	0.246	<.0001
106 Cardiac dysrhythmias	0.018	12.87	0.405	<.0001
107 Cardiac arrest and ventricular fibrillation	0.000	16.61	0.449	<.0001
108 Congestive heart failure; non-hypertensive	0.009	12.27	0.282	<.0001
109 Acute cerebrovascular disease	0.030	13.22	0.394	<.0001
110 Occlusion or stenosis of pre-cerebral arteries	0.001	14.01	0.420	<.0001

Variable	Mean	Percent of Residents With Covariate who Triggered the Numerator	Coefficient	P-Value
111 Other and ill-defined cerebrovascular disease	0.000	17.15	0.595	<.0001
112 Transient cerebral ischemia	0.004	11.16	0.290	<.0001
113 Late effects of cerebrovascular disease	0.002	13.14	0.230	<.0001
114 Peripheral and visceral atherosclerosis	0.004	12.72	0.294	<.0001
115 Aortic; peripheral; and visceral artery aneurysms	0.002	13.38	0.384	<.0001
116 Aortic and peripheral arterial embolism or thrombosis	0.001	14.89	0.525	<.0001
117 Other circulatory disease	0.005	13.38	0.374	<.0001
118 Phlebitis; thrombophlebitis and thromboembolism	0.004	12.34	0.348	<.0001
120 Hemorrhoids	0.001	11.40	0.142	0.126
122 Pneumonia (except that caused by tuberculosis or sexually transmitted disease)	0.027	11.31	0.169	<.0001
123 Influenza	0.005	9.09	0.062	0.106
125 Acute bronchitis	0.002	9.60	0.126	0.049
126 Other upper respiratory infections	0.001	11.91	0.288	0.005
127 Chronic obstructive pulmonary disease and bronchiectasis	0.026	12.05	0.207	<.0001
128 Asthma	0.001	11.64	0.281	0.003
129 Aspiration pneumonitis; food/vomitus	0.013	12.02	0.111	<.0001
130 Pleurisy; pneumothorax; pulmonary collapse	0.003	13.30	0.259	<.0001
131 Respiratory failure; insufficiency	0.021	12.26	0.131	<.0001
133 Other lower respiratory disease	0.002	11.80	0.183	0.001
134 Other upper respiratory disease	0.001	15.05	0.327	0.000
135 Intestinal infection	0.007	11.88	0.164	<.0001
137 Diseases of mouth; excluding dental	0.000	12.18	0.214	0.069
138 Esophageal disorders	0.003	14.19	0.336	<.0001
139 Gastroduodenal ulcer (except hemorrhage)	0.001	13.19	0.367	<.0001
140 Gastritis and duodenitis	0.002	13.13	0.285	<.0001
141 Other disorders of stomach and duodenum	0.001	14.57	0.328	<.0001



Variable	Mean	Percent of Residents With Covariate who Triggered the Numerator	Coefficient	P-Value
142 Appendicitis and other appendiceal conditions	0.001	11.11	0.212	0.037
143 Abdominal hernia	0.004	12.48	0.344	<.0001
144 Regional enteritis and ulcerative colitis	0.001	13.96	0.338	<.0001
145 Intestinal obstruction without hernia	0.008	11.84	0.249	<.0001
146 Diverticulosis and diverticulitis	0.006	11.55	0.237	<.0001
147 Anal and rectal conditions	0.001	14.25	0.406	<.0001
148 Peritonitis and intestinal abscess	0.000	18.38	0.501	<.0001
149 Biliary tract disease	0.005	11.82	0.272	<.0001
151 Other liver diseases	0.004	16.62	0.322	<.0001
152 Pancreatic disorders (not diabetes)	0.002	14.27	0.423	<.0001
153 Gastrointestinal hemorrhage	0.014	12.24	0.193	<.0001
154 Noninfectious gastroenteritis	0.002	11.76	0.240	<.0001
155 Other gastrointestinal disorders	0.005	13.94	0.325	<.0001
157 Acute and unspecified renal failure	0.033	11.85	0.239	<.0001
158 Chronic kidney disease	0.000	18.99	0.361	0.009
159 Urinary tract infections	0.039	11.14	0.205	<.0001
160 Calculus of urinary tract	0.001	14.18	0.347	0.000
161 Other diseases of kidney and ureters	0.001	13.63	0.384	<.0001
162 Other diseases of bladder and urethra	0.001	16.93	0.581	<.0001
163 Genitourinary symptoms and ill-defined conditions	0.001	15.54	0.506	<.0001
164 Hyperplasia of prostate	0.001	18.99	0.762	<.0001
165 Inflammatory conditions of male genital organs	0.000	13.75	0.249	0.012
166 Other male genital disorders	0.000	17.97	0.590	0.001
172 Ovarian cyst	0.000	20.45	0.995	0.008
175 Other female genital disorders	0.000	14.75	0.495	<.0001
197 Skin and subcutaneous tissue infections	0.015	10.66	0.110	<.0001
198 Other inflammatory condition of skin	0.000	12.80	0.275	0.029

Variable	Mean	Percent of Residents With Covariate who Triggered the Numerator	Coefficient	P-Value
199 Chronic ulcer of skin	0.003	10.96	0.029	0.507
200 Other skin disorders	0.000	17.18	0.531	0.001
201 Infective arthritis and osteomyelitis	0.004	13.11	0.206	<.0001
203 Osteoarthritis (Ref)	0.049	7.56	-	-
204 Other non-traumatic joint disorders	0.002	9.42	0.120	0.041
205 Spondylosis; intervertebral disc disorders; other back problems	0.016	10.78	0.269	<.0001
207 Pathological fracture	0.009	9.59	0.183	<.0001
209 Other acquired deformities	0.003	10.32	0.235	<.0001
210 Systemic lupus erythematosus and connective tissue disorders	0.000	15.58	0.437	0.000
211 Other connective tissue disease	0.006	9.88	0.145	<.0001
212 Other bone disease and musculoskeletal deformities	0.001	12.74	0.382	<.0001
225 Joint disorders and dislocations; trauma-related	0.001	10.15	0.195	0.026
226 Fracture of neck of femur (hip)	0.059	9.82	0.199	<.0001
227 Spinal cord injury	0.000	15.17	0.519	<.0001
228 Skull and face fractures	0.001	11.98	0.339	<.0001
229 Fracture of upper limb	0.010	9.25	0.159	<.0001
231 Other fractures	0.027	9.64	0.203	<.0001
233 Intracranial injury	0.010	14.76	0.519	<.0001
234 Crushing injury or internal injury	0.002	12.83	0.391	<.0001
235 Open wounds of head; neck; and trunk	0.001	14.07	0.524	<.0001
237 Complication of device; implant or graft	0.033	14.30	0.290	<.0001
238 Complications of surgical procedures or medical care	0.019	14.92	0.298	<.0001
239 Superficial injury; contusion	0.003	11.04	0.291	<.0001
240 Burns	0.000	13.16	0.218	0.079
241 Poisoning by psychotropic agents	0.000	14.99	0.406	<.0001
242 Poisoning by other medications and drugs	0.002	13.56	0.265	<.0001
244 Other injuries and conditions due to external causes	0.000	13.29	0.296	0.071

Variable	Mean	Percent of Residents With Covariate who Triggered the Numerator	Coefficient	P-Value
245 Syncope	0.004	11.00	0.249	<.0001
248 Gangrene	0.002	12.59	0.168	0.001
250 Nausea and vomiting	0.001	12.88	0.303	0.002
251 Abdominal pain	0.001	16.53	0.570	<.0001
252 Malaise and fatigue	0.003	10.52	0.177	<.0001
258 Other screening for suspected conditions (not mental disorders or infectious disease)	0.000	12.96	0.341	0.009
259 Residual codes; unclassified	0.003	13.59	0.371	<.0001
650 MHSA: Adjustment disorders	0.000	16.52	0.587	0.001
651 MHSA: Anxiety disorders	0.000	16.27	0.605	<.0001
652 MHSA: Attention-deficit, conduct, and disruptive behavior disorders	0.000	19.40	0.736	0.018
653 MHSA: Delirium, dementia, and amnestic and other cognitive disorders	0.017	11.72	0.229	<.0001
655 MHSA: Disorders usually diagnosed in infancy, childhood, or adolescence	0.000	27.27	0.894	0.067
656 MHSA: Impulse control disorders, NEC	0.000	16.43	0.469	0.014
657 MHSA: Mood disorders	0.006	12.84	0.232	<.0001
658 MHSA: Personality disorders	0.000	29.17	1.159	0.000
660 MHSA: Alcohol-related disorders	0.004	16.25	0.442	<.0001
661 MHSA: Substance-related disorders	0.001	18.01	0.607	<.0001
662 MHSA: Suicide and intentional self-inflicted injury	0.000	14.11	0.321	0.016
670 MHSA: Miscellaneous mental disorders	0.000	23.86	0.931	<.0001
Nonsignificant CCS w/ protective effect	0.003	8.33	-0.098	0.041
Nonsignificant CCS w/ increased risk	0.035	9.58	0.020	0.303
ED-specific Comorbidity Index	-2.024	-	0.217	<.0001
End-stage disease	0.007	7.53	-0.573	<.0001

Variable	Mean	Percent of Residents With Covariate who Triggered the Numerator	Coefficient	P-Value
Return to nursing home after hospitalization	0.238	13.30	-0.021	0.001
Respiratory failure	0.071	13.20	-0.025	0.008
Vascular ulcer	0.027	12.12	-0.104	<.0001
Viral hepatitis	0.009	17.99	0.137	<.0001
Internal bleeding	0.009	20.15	0.535	<.0001
Ext. assistance/dependence eating	0.051	15.72	0.050	<.0001
Two-person support needed with ADL(s)	0.548	12.26	0.041	<.0001
Cognitive status not intact	0.644	12.36	0.115	<.0001
Cognitive status assessment missing	0.023	18.69	0.423	<.0001
IV medications	0.511	12.06	0.016	0.001
Ostomy	0.026	14.37	0.074	<.0001
Oxygen therapy	0.360	12.41	0.010	0.083
Tracheostomy care	0.008	18.93	0.209	<.0001
Significant change in status assessment	0.035	11.77	-0.072	<.0001
Rarely/never makes self understood	0.024	12.20	-0.208	<.0001
Acute onset mental status change	0.024	15.16	0.221	<.0001
Reject care 4-7 days	0.012	16.17	0.239	<.0001
Wander 1-7 days	0.018	16.56	0.464	<.0001
Walks in room: indep/supervision/limited assistance	0.331	11.50	0.056	<.0001
Walks in corridor indep/supervision/limited assistance	0.300	11.26	-0.037	<.0001
Wanders * Walks in room or corridor: indep/supervision/limited assistance	0.010	15.95	-0.100	0.001
Cancer	0.065	11.60	-0.034	0.001
Seizure disorder	0.070	14.50	0.054	<.0001
Shortness of breath with exertion	0.156	12.74	0.037	<.0001
Shortness of breath when sitting at rest	0.057	14.35	0.134	<.0001
Trouble swallowing medications	0.019	12.58	0.007	0.657

<b>Variable</b>	<b>Mean</b>	<b>Percent of Residents With Covariate who Triggered the Numerator</b>	<b>Coefficient</b>	<b>P-Value</b>
Parenteral/IV feeding	0.010	14.49	0.121	<.0001
Feeding tube	0.039	18.52	0.365	<.0001
Surgical wound	0.268	11.38	0.052	<.0001
Burns	0.002	13.46	0.048	0.414
Anticoagulants	0.352	11.49	-0.019	0.000
Antibiotics	0.400	12.64	0.125	<.0001
Ventilator	0.003	14.84	-0.455	<.0001
Transfusion	0.003	23.48	0.712	<.0001
Speech Therapy	0.352	12.60	0.071	<.0001
Respiratory therapy	0.065	12.21	-0.070	<.0001
Constant	-	-	-2.266	<.0001

## APPENDIX TABLE F

### Coefficient Estimates for Short-Stay Residents who have had an Outpatient Emergency Department Visit, Resident-Level Comorbidity Index

Note: Model C-statistic = 0.565

Note: This model is based on all SNF stays with admission from a hospital between January 1, 2017 and December 31, 2017.

Charlson Condition	Coefficient	SE	P-Value
Myocardial infarction	0.134	0.007	<0.001
CHF	0.039	0.006	<0.001
Peripheral vascular disease	0.067	0.007	<0.001
Cerebrovascular disease	0.086	0.008	<0.001
Dementia	0.044	0.006	<0.001
COPD	0.142	0.006	<0.001
Rheumatoid arthritis	0.059	0.012	<0.001
Ulcers	0.106	0.014	<0.001
Mild liver disease	0.265	0.012	<0.001
Diabetes mellitus	0.101	0.006	<0.001
Diabetes with sequelae	0.123	0.008	<0.001
Paralysis	0.161	0.012	<0.001
Chronic renal disease	0.118	0.007	<0.001
Cancer	0.094	0.010	<0.001
Moderate to severe liver disease	0.128	0.020	<0.001
Metastatic cancer	0.066	0.018	<0.001
HIV/AIDS	0.328	0.043	<0.001
Intercept	-2.202	0.003	<0.001

## APPENDIX TABLE G

### Risk-Adjustment Model for Short-Stay Residents who were Successfully Discharged to the Community: Risk Variables and Coefficient Estimates

Note: Model C-statistic = 0.762

Note: This model is based on all SNF episodes with admission from a hospital between October 1, 2016 and September 30, 2017.

Variable	Mean	Percent of Residents With Covariate who Triggered the Numerator	Coefficient	P-Value
Female age 18-65	0.048	55.8	-0.045	0.000
Female age 65-69 (ref)	0.061	63.8	-	-
Female age 70-74	0.079	64.5	0.010	0.353
Female age 75-79	0.094	63.9	-0.007	0.527
Female age 80-84	0.108	62.5	-0.022	0.037
Female age 85-89	0.114	60.0	-0.067	<.0001
Female age 90-94	0.079	57.5	-0.110	<.0001
Female age GT 94	0.029	53.0	-0.206	<.0001
Male age 18-65	0.048	50.4	-0.138	<.0001
Male age 6-69	0.047	55.9	-0.136	<.0001
Male age 70-74	0.055	57.2	-0.079	<.0001
Male age 75-79	0.062	56.4	-0.092	<.0001
Male age 80-84	0.067	55.7	-0.095	<.0001
Male age 85-89	0.063	54.4	-0.127	<.0001
Male age 90-94	0.035	51.7	-0.206	<.0001
Male age GT 94	0.010	48.9	-0.253	<.0001
Length of stay 1-3 days (ref)	0.216	70.0	-	-
Length of stay 4-7 days	0.468	60.6	-0.088	<.0001

Variable	Mean	Percent of Residents With Covariate who Triggered the Numerator	Coefficient	P-Value
Length of stay 8–14 days	0.225	51.1	-0.283	<.0001
Length of stay GT 14 days	0.091	39.2	-0.544	<.0001
0 hospitalizations in prior year (ref)	0.495	65.0		
1–3 hospitalizations in prior year	0.428	55.0	-0.066	<.0001
4–6 hospitalizations in prior year	0.060	39.9	-0.424	<.0001
7–9 hospitalizations in prior year	0.012	29.5	-0.826	<.0001
10+ hospitalizations in prior year	0.005	18.4	-1.522	<.0001
Ever disabled	0.231	54.0	-0.073	<.0001
ESRD	0.043	40.8	-0.403	<.0001
At least 1 day ICU (y/n)	0.157	53.1	0.064	<.0001
1 Tuberculosis	0.000	48.3	-0.665	0.112
2 Septicemia (except in labor)	0.091	51.8	-0.780	<.0001
3 Bacterial infection; unspecified site	0.001	53.7	-0.863	<.0001
4 Mycoses	0.001	46.3	-0.973	<.0001
5 HIV infection	0.000	40.3	-1.144	<.0001
6 Hepatitis	0.000	43.4	-1.346	<.0001
7 Viral infection	0.001	61.7	-0.691	<.0001
8 Other infections; including parasitic	0.000	77.5	-0.003	0.987
9 Sexually transmitted infections (not HIV or hepatitis)	0.000	59.8	-0.863	<.0001
10 Immunizations and screening for infectious disease	0.000	25.0	-1.829	0.028
11 Cancer of head and neck	0.001	48.3	-0.993	<.0001
12 Cancer of esophagus	0.000	44.1	-1.266	<.0001
13 Cancer of stomach	0.001	51.8	-1.154	<.0001
14 Cancer of colon	0.003	65.6	-0.732	<.0001
15 Cancer of rectum and anus	0.001	53.4	-1.218	<.0001
16 Cancer of liver and intrahepatic bile duct	0.000	40.5	-1.725	<.0001
17 Cancer of pancreas	0.001	44.2	-1.548	<.0001



Variable	Mean	Percent of Residents With Covariate who Triggered the Numerator	Coefficient	P-Value
18 Cancer of other GI organs; peritoneum	0.001	57.1	-1.042	<.0001
19 Cancer of bronchus; lung	0.003	42.4	-1.564	<.0001
20 Cancer; other respiratory and intrathoracic	0.000	45.9	-1.397	<.0001
21 Cancer of bone and connective tissue	0.000	57.3	-1.128	<.0001
22 Melanomas of skin	0.000	63.9	-1.117	<.0001
23 Other non-epithelial cancer of skin	0.000	60.9	-0.928	<.0001
24 Cancer of breast	0.001	51.7	-1.423	<.0001
25 Cancer of uterus	0.000	59.1	-1.204	<.0001
26 Cancer of cervix	0.000	41.8	-1.534	<.0001
27 Cancer of ovary	0.000	56.6	-1.285	<.0001
28 Cancer of other female genital organs	0.000	70.6	-0.563	0.000
29 Cancer of prostate	0.000	45.9	-1.208	<.0001
31 Cancer of other male genital organs	0.000	63.6	-0.789	0.039
32 Cancer of bladder	0.001	51.4	-1.092	<.0001
33 Cancer of kidney and renal pelvis	0.001	69.9	-0.659	<.0001
34 Cancer of other urinary organs	0.000	70.2	-0.549	0.001
35 Cancer of brain and nervous system	0.001	35.9	-1.857	<.0001
36 Cancer of thyroid	0.000	51.6	-0.983	0.001
37 Hodgkin`s disease	0.000	48.5	-1.193	0.001
38 Non-Hodgkin`s lymphoma	0.001	32.4	-1.781	<.0001
39 Leukemias	0.001	35.2	-1.595	<.0001
40 Multiple myeloma	0.001	36.6	-1.662	<.0001
41 Cancer; other and unspecified primary	0.000	44.0	-1.677	<.0001
42 Secondary malignancies	0.004	30.5	-1.944	<.0001
43 Malignant neoplasm without specification of site	0.000	33.9	-1.778	<.0001
44 Neoplasms of unspecified nature or uncertain behavior	0.001	47.9	-1.301	<.0001
45 Maintenance chemotherapy; radiotherapy	0.000	37.0	-1.404	<.0001

Variable	Mean	Percent of Residents With Covariate who Triggered the Numerator	Coefficient	P-Value
46 Benign neoplasm of uterus	0.000	73.2	-0.420	0.160
47 Other and unspecified benign neoplasm	0.002	63.7	-0.866	<.0001
48 Thyroid disorders	0.001	51.0	-1.083	<.0001
49 Diabetes mellitus without complication	0.000	50.0	-1.119	0.002
50 Diabetes mellitus with complications	0.020	51.1	-1.028	<.0001
51 Other endocrine disorders	0.003	60.2	-0.851	<.0001
52 Nutritional deficiencies	0.001	44.8	-1.142	<.0001
53 Disorders of lipid metabolism	0.000	57.1	-1.084	0.057
54 Gout and other crystal arthropathies	0.001	66.4	-0.715	<.0001
55 Fluid and electrolyte disorders	0.015	52.6	-1.026	<.0001
57 Immunity disorders	0.000	49.1	-1.103	<.0001
58 Other nutritional; endocrine; and metabolic disorders	0.003	45.8	-1.208	<.0001
59 Deficiency and other anemia	0.003	48.5	-1.164	<.0001
60 Acute post-hemorrhagic anemia	0.001	54.7	-0.943	<.0001
61 Sickle cell anemia	0.000	42.6	-0.911	0.001
62 Coagulation and hemorrhagic disorders	0.001	53.2	-0.939	<.0001
63 Diseases of white blood cells	0.001	51.8	-0.989	<.0001
64 Other hematologic conditions	0.000	59.7	-0.910	<.0001
76 Meningitis	0.000	64.1	-0.441	<.0001
77 Encephalitis	0.000	53.7	-0.687	<.0001
78 Other CNS infection and poliomyelitis	0.000	52.9	-0.981	<.0001
79 Parkinson`s disease	0.002	52.8	-0.960	<.0001
80 Multiple sclerosis	0.001	58.4	-1.050	<.0001
81 Other hereditary and degenerative nervous system conditions	0.001	52.1	-1.021	<.0001
82 Paralysis	0.000	55.8	-0.992	<.0001
83 Epilepsy; convulsions	0.006	54.9	-0.795	<.0001
84 Headache; including migraine	0.000	68.9	-0.613	<.0001

Variable	Mean	Percent of Residents With Covariate who Triggered the Numerator	Coefficient	P-Value
85 Coma; stupor; and brain damage	0.000	42.4	-0.743	0.000
86 Other hernia repair	0.000	50.0	-1.355	0.112
87 Retinal detachments; defects; vascular occlusion; and retinopathy	0.000	60.0	-0.794	0.011
88 Glaucoma	0.000	64.3	-0.323	0.443
89 Blindness and vision defects	0.000	65.7	-0.657	0.001
90 Inflammation; infection of eye	0.000	59.3	-0.765	<.0001
91 Other eye disorders	0.000	63.6	-0.702	0.000
92 Otitis media and related conditions	0.000	57.9	-0.874	<.0001
93 Conditions associated with dizziness or vertigo	0.002	75.4	-0.499	<.0001
94 Other ear and sense organ disorders	0.000	63.0	-0.953	<.0001
95 Other nervous system disorders	0.016	53.7	-0.904	<.0001
96 Heart valve disorders	0.007	67.7	-0.741	<.0001
97 Peri-, endo-, and myocarditis; cardiomyopathy	0.001	56.2	-0.890	<.0001
98 Essential hypertension	0.000	56.0	-1.184	<.0001
99 Hypertension with complications and secondary hypertension	0.044	49.3	-1.003	<.0001
100 Acute myocardial infarction	0.017	55.3	-0.988	<.0001
101 Coronary atherosclerosis and other heart disease	0.008	70.7	-0.667	<.0001
102 Nonspecific chest pain	0.002	53.3	-1.067	<.0001
103 Pulmonary heart disease	0.005	58.4	-0.810	<.0001
104 Other and ill-defined heart disease	0.000	63.5	-0.857	<.0001
105 Conduction disorders	0.003	69.1	-0.593	<.0001
106 Cardiac dysrhythmias	0.018	55.7	-1.045	<.0001
107 Cardiac arrest and ventricular fibrillation	0.000	54.6	-0.727	<.0001
108 Congestive heart failure; non-hypertensive	0.011	48.4	-1.054	<.0001
109 Acute cerebrovascular disease	0.034	50.1	-0.930	<.0001
110 Occlusion or stenosis of pre-cerebral arteries	0.001	64.7	-0.750	<.0001

Variable	Mean	Percent of Residents With Covariate who Triggered the Numerator	Coefficient	P-Value
111 Other and ill-defined cerebrovascular disease	0.000	54.9	-0.947	<.0001
112 Transient cerebral ischemia	0.004	64.3	-0.750	<.0001
113 Late effects of cerebrovascular disease	0.002	52.1	-0.839	<.0001
114 Peripheral and visceral atherosclerosis	0.004	56.8	-0.995	<.0001
115 Aortic; peripheral; and visceral artery aneurysms	0.002	64.9	-0.785	<.0001
116 Aortic and peripheral arterial embolism or thrombosis	0.001	56.0	-1.012	<.0001
117 Other circulatory disease	0.005	60.5	-0.854	<.0001
118 Phlebitis; thrombophlebitis and thromboembolism	0.004	55.5	-0.942	<.0001
119 Varicose veins of lower extremity	0.000	58.4	-0.919	<.0001
120 Hemorrhoids	0.000	54.4	-0.904	<.0001
121 Other diseases of veins and lymphatics	0.001	54.2	-1.092	<.0001
122 Pneumonia (except that caused by tuberculosis or sexually transmitted disease)	0.022	56.1	-0.828	<.0001
123 Influenza	0.005	69.2	-0.282	<.0001
125 Acute bronchitis	0.002	66.6	-0.494	<.0001
126 Other upper respiratory infections	0.001	65.9	-0.495	<.0001
127 Chronic obstructive pulmonary disease and bronchiectasis	0.025	54.2	-0.941	<.0001
128 Asthma	0.001	64.1	-0.674	<.0001
129 Aspiration pneumonitis; food/vomitus	0.009	44.9	-0.806	<.0001
130 Pleurisy; pneumothorax; pulmonary collapse	0.003	49.2	-1.068	<.0001
131 Respiratory failure; insufficiency	0.017	49.9	-0.881	<.0001
132 Lung disease due to external agents	0.000	53.1	-1.034	<.0001
133 Other lower respiratory disease	0.002	52.6	-1.069	<.0001
134 Other upper respiratory disease	0.000	54.1	-0.898	<.0001
135 Intestinal infection	0.007	53.0	-0.940	<.0001
136 Disorders of teeth and jaw	0.000	63.5	-0.656	<.0001
137 Diseases of mouth; excluding dental	0.000	53.9	-0.793	<.0001

Variable	Mean	Percent of Residents With Covariate who Triggered the Numerator	Coefficient	P-Value
138 Esophageal disorders	0.002	53.5	-0.919	<.0001
139 Gastroduodenal ulcer (except hemorrhage)	0.001	61.6	-0.831	<.0001
140 Gastritis and duodenitis	0.001	53.6	-0.959	<.0001
141 Other disorders of stomach and duodenum	0.001	53.1	-0.936	<.0001
142 Appendicitis and other appendiceal conditions	0.001	73.7	-0.451	<.0001
143 Abdominal hernia	0.004	70.6	-0.563	<.0001
144 Regional enteritis and ulcerative colitis	0.001	50.5	-1.287	<.0001
145 Intestinal obstruction without hernia	0.007	61.2	-0.671	<.0001
146 Diverticulosis and diverticulitis	0.005	63.9	-0.756	<.0001
147 Anal and rectal conditions	0.001	60.6	-0.792	<.0001
148 Peritonitis and intestinal abscess	0.000	49.9	-1.022	<.0001
149 Biliary tract disease	0.005	65.6	-0.650	<.0001
151 Other liver diseases	0.003	40.3	-1.371	<.0001
152 Pancreatic disorders (not diabetes)	0.002	59.2	-0.815	<.0001
153 Gastrointestinal hemorrhage	0.009	53.9	-0.897	<.0001
154 Noninfectious gastroenteritis	0.002	57.8	-0.877	<.0001
155 Other gastrointestinal disorders	0.005	54.6	-0.930	<.0001
156 Nephritis; nephrosis; renal sclerosis	0.000	47.1	-1.092	<.0001
157 Acute and unspecified renal failure	0.031	50.0	-1.039	<.0001
158 Chronic kidney disease	0.000	39.1	-1.231	<.0001
159 Urinary tract infections	0.036	52.9	-0.903	<.0001
160 Calculus of urinary tract	0.000	57.0	-0.778	<.0001
161 Other diseases of kidney and ureters	0.001	56.7	-0.877	<.0001
162 Other diseases of bladder and urethra	0.001	55.5	-0.778	<.0001
163 Genitourinary symptoms and ill-defined conditions	0.001	54.5	-0.785	<.0001
164 Hyperplasia of prostate	0.001	58.3	-0.681	<.0001
165 Inflammatory conditions of male genital organs	0.000	60.6	-0.562	<.0001

Variable	Mean	Percent of Residents With Covariate who Triggered the Numerator	Coefficient	P-Value
166 Other male genital disorders	0.000	57.0	-0.563	0.005
167 Nonmalignant breast conditions	0.000	53.9	-1.136	<.0001
168 Inflammatory diseases of female pelvic organs	0.000	60.7	-0.845	<.0001
170 Prolapse of female genital organs	0.000	76.7	-0.429	0.069
172 Ovarian cyst	0.000	72.5	-0.581	0.136
173 Menopausal disorders	0.000	52.1	-1.231	0.000
175 Other female genital disorders	0.000	61.7	-0.929	<.0001
197 Skin and subcutaneous tissue infections	0.016	58.2	-0.879	<.0001
198 Other inflammatory condition of skin	0.000	51.3	-1.024	<.0001
199 Chronic ulcer of skin	0.003	40.2	-0.992	<.0001
200 Other skin disorders	0.000	54.4	-1.051	<.0001
201 Infective arthritis and osteomyelitis	0.004	57.7	-0.829	<.0001
202 Rheumatoid arthritis and related disease	0.001	74.3	-0.589	<.0001
203 Osteoarthritis (Ref)	0.069	90.1	-	-
204 Other non-traumatic joint disorders	0.003	70.9	-0.535	<.0001
205 Spondylosis; intervertebral disc disorders; other back problems	0.021	74.4	-0.617	<.0001
206 Osteoporosis	0.000	62.5	-0.824	0.040
207 Pathological fracture	0.011	63.4	-0.860	<.0001
208 Acquired foot deformities	0.000	83.1	-0.169	0.223
209 Other acquired deformities	0.004	81.7	-0.446	<.0001
210 Systemic lupus erythematosus and connective tissue disorders	0.000	49.3	-1.211	<.0001
211 Other connective tissue disease	0.008	63.1	-0.823	<.0001
212 Other bone disease and musculoskeletal deformities	0.001	76.0	-0.594	<.0001
213 Cardiac and circulatory congenital anomalies	0.000	69.3	-0.596	<.0001
214 Digestive congenital anomalies	0.000	70.7	-0.366	0.331
215 Genitourinary congenital anomalies	0.000	40.0	-1.705	<.0001
216 Nervous system congenital anomalies	0.000	59.0	-0.882	0.000

Variable	Mean	Percent of Residents With Covariate who Triggered the Numerator	Coefficient	P-Value
217 Other congenital anomalies	0.000	77.1	-0.349	0.168
225 Joint disorders and dislocations; trauma-related	0.001	67.4	-0.766	<.0001
226 Fracture of neck of femur (hip)	0.070	65.6	-0.737	<.0001
227 Spinal cord injury	0.000	44.2	-1.163	<.0001
228 Skull and face fractures	0.001	61.6	-0.821	<.0001
229 Fracture of upper limb	0.012	68.2	-0.676	<.0001
230 Fracture of lower limb	0.024	64.1	-0.757	<.0001
231 Other fractures	0.034	66.8	-0.643	<.0001
232 Sprains and strains	0.002	72.8	-0.546	<.0001
233 Intracranial injury	0.011	54.3	-0.926	<.0001
234 Crushing injury or internal injury	0.003	66.1	-0.598	<.0001
235 Open wounds of head; neck; and trunk	0.001	58.9	-0.935	<.0001
236 Open wounds of extremities	0.001	60.8	-0.895	<.0001
237 Complication of device; implant or graft	0.028	60.6	-0.766	<.0001
238 Complications of surgical procedures or medical care	0.015	59.0	-0.845	<.0001
239 Superficial injury; contusion	0.003	63.2	-0.745	<.0001
240 Burns	0.000	57.2	-0.762	<.0001
241 Poisoning by psychotropic agents	0.001	61.7	-0.715	<.0001
242 Poisoning by other medications and drugs	0.002	60.2	-0.749	<.0001
243 Poisoning by nonmedicinal substances	0.000	61.7	-0.722	<.0001
244 Other injuries and conditions due to external causes	0.005	58.3	-0.878	<.0001
245 Syncope	0.004	64.1	-0.777	<.0001
246 Fever of unknown origin	0.000	61.8	-0.549	<.0001
247 Lymphadenitis	0.000	36.2	-1.881	<.0001
248 Gangrene	0.002	41.3	-1.293	<.0001
249 Shock	0.000	47.4	-0.900	<.0001
250 Nausea and vomiting	0.000	57.4	-0.921	<.0001

Variable	Mean	Percent of Residents With Covariate who Triggered the Numerator	Coefficient	P-Value
251 Abdominal pain	0.001	55.8	-0.926	<.0001
252 Malaise and fatigue	0.004	55.4	-1.032	<.0001
253 Allergic reactions	0.000	61.1	-0.803	<.0001
254 Rehabilitation care; fitting of prostheses; and adjustment of devices	0.000	46.7	-1.595	0.003
257 Other aftercare	0.001	74.8	-0.434	<.0001
258 Other screening for suspected conditions (not mental disorders or infectious disease)	0.000	52.4	-0.987	<.0001
259 Residual codes; unclassified	0.003	52.0	-0.957	<.0001
650 MHA: Adjustment disorders	0.000	36.7	-1.708	<.0001
651 MHA: Anxiety disorders	0.000	48.5	-1.259	<.0001
653 MHA: Delirium, dementia, and amnestic and other cognitive disorders	0.015	28.8	-1.644	<.0001
654 MHA: Developmental disorders	0.000	25.0	-2.016	0.001
655 MHA: Disorders usually diagnosed in infancy, childhood, or adolescence	0.000	21.4	-2.239	0.001
656 MHA: Impulse control disorders, NEC	0.000	7.6	-3.081	<.0001
657 MHA: Mood disorders	0.005	31.9	-1.784	<.0001
658 MHA: Personality disorders	0.000	25.8	-1.811	<.0001
659 MHA: Schizophrenia and other psychotic disorders	0.005	19.7	-2.075	<.0001
660 MHA: Alcohol-related disorders	0.005	58.0	-0.937	<.0001
661 MHA: Substance-related disorders	0.001	56.3	-1.023	<.0001
662 MHA: Suicide and intentional self-inflicted injury	0.000	53.4	-0.997	<.0001
670 MHA: Miscellaneous mental disorders	0.000	64.2	-0.648	<.0001
2617 Adverse effects of medical drugs	0.000	59.8	-0.809	<.0001
CCS None	0.000	34.6	-1.289	<.0001
Nonsignificant CCS w/ protective effect	0.000	45.3	-1.300	<.0001



Variable	Mean	Percent of Residents With Covariate who Triggered the Numerator	Coefficient	P-Value
Nonsignificant CCS w/ increased risk	0.000	89.5	1.220	0.126
Community discharge-specific Comorbidity Index	0.352	-	0.306	<.0001
RUG IV: low nursing, no therapy (ref)	0.052	37.9	-	-
RUG IV: moderate/high nursing, no therapy	0.026	24.6	-0.015	0.384
RUG IV: very low nursing and therapy	0.033	60.4	0.358	<.0001
RUG IV: lower nursing and therapy, but both	0.063	37.2	0.231	<.0001
RUG IV: moderate nursing, moderate/high therapy (RVA)	0.071	70.5	0.634	<.0001
RUG IV: moderate nursing, moderate/high therapy (RVB)	0.088	59.9	0.702	<.0001
RUG IV: moderate nursing, moderate/high therapy (RVC)	0.077	44.2	0.560	<.0001
RUG IV: moderate nursing, moderate/high therapy (RUA)	0.138	75.4	0.801	<.0001
RUG IV: moderate nursing, high therapy (RUB)	0.261	67.7	0.929	<.0001
RUG IV: moderate nursing, high therapy (RUC)	0.181	52.0	0.769	<.0001
RUG IV: high nursing, low therapy	0.002	36.6	0.393	<.0001
RUG IV: high nursing, high therapy	0.009	47.5	0.674	<.0001
Vision impaired	0.099	51.2	-0.089	<.0001
Vision moderately/highly/severely impaired	0.047	43.5	-0.094	<.0001
Makes self understood usually	0.083	42.7	-0.066	<.0001
Makes self understood sometimes/rarely/never	0.050	29.2	-0.019	0.279
Understands usually	0.108	45.2	-0.079	<.0001
Understands sometimes/rarely/never	0.054	30.4	-0.092	<.0001
Moderate cognitive impairment	0.175	53.8	-0.445	<.0001
Severe cognitive impairment	0.111	42.5	-1.040	<.0001
Staff assessed cognitive impairment	0.084	32.1	-0.559	<.0001
Cognitive status assessment missing	0.026	32.2	-1.132	<.0001
Any potential indicators of psychosis or behavioral symptoms	0.058	35.5	-0.317	<.0001
Alzheimer's disease	0.037	44.6	-0.019	0.071
Non-Alzheimer's Dementia	0.164	46.7	-0.033	<.0001

Variable	Mean	Percent of Residents With Covariate who Triggered the Numerator	Coefficient	P-Value
Ext. assistance/dependence transfer	0.727	54.5	0.001	0.954
Transfer missing	0.001	38.3	0.045	0.790
Ext. assistance/dependence walking in room	0.623	51.6	-0.049	<.0001
Walking in room missing	0.002	43.1	-0.197	0.024
Ext. assistance/dependence walking in corridor	0.654	51.9	-0.171	<.0001
Walking in corridor missing	0.002	42.6	-0.071	0.424
Ext. assistance/dependence locomotion on unit	0.647	53.3	0.018	0.003
Locomotion on unit missing	0.002	45.0	-0.033	0.746
Ext. assistance/dependence dressing	0.723	54.2	0.006	0.434
Dressing missing	0.001	40.0	0.069	0.567
Ext. assistance/dependence eating	0.127	34.2	-0.076	<.0001
Eating missing	0.001	38.1	0.116	0.423
Ext. assistance/dependence toilet use	0.757	54.8	-0.012	0.191
Toilet use missing	0.001	38.5	0.256	0.146
Ext. assistance/dependence personal hygiene	0.583	50.6	-0.128	<.0001
Personal hygiene missing	0.001	40.5	-0.177	0.147
ADL summary * Mild cognitive impairment	9.633	-	-0.024	<.0001
ADL summary * Moderate cognitive impairment	3.050	-	-0.014	<.0001
ADL summary * Severe cognitive impairment	2.109	-	0.009	<.0001
ADL summary * Staff assessed cognitive impairment	1.628	51.0	-0.025	<.0001
ADL summary missing	0.002	44.6	-0.180	0.055
Bathing: supervision	0.034	72.9	-0.041	0.056
Bathing: help transferring	0.067	71.6	-0.059	0.004
Bathing: physical help in part	0.579	62.4	-0.106	<.0001
Bathing: Dependent/activity did not occur	0.302	46.0	-0.233	<.0001
Bathing assessment missing	0.004	50.3	-0.144	0.000

Variable	Mean	Percent of Residents With Covariate who Triggered the Numerator	Coefficient	P-Value
Balance seated to standing: steady, stabilizes without staff assistance	0.160	70.4	-0.017	0.356
Balance seated to standing: not steady, stabilizes with staff assistance	0.718	58.6	-0.075	<.0001
Balance seated to standing: activity did not occur	0.073	28.3	-0.363	<.0001
Balance seated to standing: missing	0.007	41.1	-0.095	0.057
Balance walking: steady, stabilizes with staff assistance	0.190	71.125	0.013	0.487
Balance walking: not steady, stabilizes with staff assistance	0.506	62.605	-0.040	0.037
Balance walking: activity did not occur	0.256	39.995	-0.370	<.0001
Balance walking: missing	0.008	0.434	-0.114	0.013
Urinary incontinence: frequently/always	0.282	44.3	-0.259	<.0001
Urinary incontinence: not rated	0.078	41.2	-0.384	<.0001
Maximum number of injections	2.227	-	0.007	<.0001
Swallowing disorder	0.039	44.9	-0.051	<.0001
Weight loss	0.036	57.1	0.050	<.0001
Shortness of breath with exertion	0.148	52.1	-0.071	<.0001
Shortness of breath while seated	0.049	39.6	-0.280	<.0001
Shortness of Breath while lying	0.083	45.8	-0.075	<.0001
Wound infection	0.010	55.9	-0.049	0.013
Hemiplegia	0.031	46.5	0.072	<.0001
Paraplegia	0.003	44.0	0.441	<.0001
Oxygen therapy	0.239	48.6	-0.211	<.0001
Tracheostomy	0.004	22.6	0.005	0.936
Ventilator	0.001	11.1	-0.068	0.477
Dialysis	0.036	41.7	0.132	<.0001
Chemotherapy	0.006	53.1	-0.146	<.0001
Radiation	0.002	33.4	-0.597	<.0001

Variable	Mean	Percent of Residents With Covariate who Triggered the Numerator	Coefficient	P-Value
Suction	0.004	19.0	-0.409	<.0001
Transfusion	0.003	51.9	-0.167	<.0001
Anemia	0.270	55.7	-0.052	<.0001
Heart failure	0.231	51.2	-0.111	<.0001
Pneumonia	0.098	53.2	0.083	<.0001
Hypertension	0.762	58.8	0.044	<.0001
Viral hepatitis	0.008	48.8	-0.171	<.0001
Diabetes mellitus	0.331	55.1	-0.059	<.0001
Hyperkalemia	0.012	48.2	-0.153	<.0001
Hip fracture	0.078	64.2	0.061	<.0001
Other fracture	0.106	63.2	0.096	<.0001
Huntington's disease	0.000	37.3	-0.329	0.005
Malnutrition	0.039	46.4	-0.149	<.0001
Anxiety	0.191	56.6	-0.054	<.0001
Manic Depression	0.024	52.0	-0.059	<.0001
Psychotic	0.018	38.6	-0.150	<.0001
Schizophrenia	0.020	39.0	-0.364	<.0001
Asthma/COPD	0.254	55.4	-0.024	<.0001
Quadriplegia	0.001	33.8	0.339	<.0001
Multiple Sclerosis	0.006	58.2	0.240	<.0001
Seizure disorder	0.053	51.3	0.055	<.0001
ID/DD condition	0.005	49.5	0.203	<.0001
Acute onset mental status change	0.018	38.7	-0.224	<.0001
Wander 1-7 days	0.017	38.3	-0.308	<.0001
Parenteral/IV feeding, feeding tube, or mechanically altered diet	0.211	42.3	-0.206	<.0001
Foot infection	0.012	53.7	-0.049	0.009
Diabetic foot ulcer	0.011	47.9	-0.138	<.0001

Variable	Mean	Percent of Residents With Covariate who Triggered the Numerator	Coefficient	P-Value
Surgical wound	0.308	70.7	0.299	<.0001
Constant	-	-	2.119	<.0001

## APPENDIX TABLE H

### Coefficient Estimates for Short-Stay Residents who were Successfully Discharged to the Community, Resident-Level Comorbidity Index

Note: Model C-statistic = 0.596

Note: This model is based on all SNF episodes with admission from a hospital between October 1, 2016 and September 30, 2017.

\* Coefficients with probabilities greater than 0.05 excluded from the comorbidity construct.

Charlson Condition	Coefficient	SE	P-Value
Myocardial infarction	-0.040	0.007	<0.001
CHF	-0.256	0.006	<0.001
Peripheral vascular disease	-0.108	0.007	<0.001
Cerebrovascular disease	-0.050	0.007	<0.001
Dementia	-0.510	0.006	<0.001
COPD	-0.140	0.005	<0.001
<i>Rheumatoid arthritis*</i>	<i>0.006</i>	<i>0.011</i>	<i>0.535</i>
Ulcers	-0.104	0.014	<0.001
Mild liver disease	-0.213	0.012	<0.001
Diabetes mellitus	-0.126	0.005	<0.001
Diabetes with sequelae	-0.115	0.007	<0.001
Paralysis	-0.317	0.013	<0.001
Chronic renal disease	-0.227	0.006	<0.001
Cancer	-0.273	0.009	<0.001
Moderate to severe liver disease	-0.404	0.021	<0.001
Metastatic cancer	-0.636	0.016	<0.001
HIV/AIDS	-0.498	0.045	<0.001
Intercept	0.621	0.002	<0.001