



# **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 July 1, 2018 and June 30, 2019.

Variable	Mean	Percent of Residents With Covariate who Triggered the Numerator	Coefficient	P-Value
Female age 18–65	0.0503	27.67	0.0308	0.008
Female age 65–69 (ref)	0.0569	24.23	-	-
Female age 70–74	0.0775	22.95	-0.0233	0.027
Female age 75–79	0.0930	21.80	-0.0360	0.001
Female age 80–84	0.1050	20.63	-0.0597	<0.001
Female age 85–89	0.1069	18.99	-0.1242	<0.001
Female age 9–94	0.0775	17.48	-0.1851	<0.001
Female age GT 94	0.0312	16.00	-0.2784	<0.001
Male age 18–65	0.0547	28.06	0.0079	0.490
Male age 65–69	0.0509	26.18	0.0041	0.719
Male age 70–74	0.0572	25.71	0.0020	0.854
Male age 75–79	0.0648	25.56	0.0369	0.001
Male age 80–84	0.0676	24.83	0.0491	<0.001
Male age 85–89	0.0601	24.01	0.0415	<0.001
Male age 90–94	0.0356	22.16	-0.0205	0.122
Male age GT 94	0.0108	20.48	-0.1042	<0.001
Length of stay 1–3 days (ref)	0.2184	17.48	-	-

<b>Variable</b>	<b>Mean</b>	<b>Percent of Residents With Covariate who Triggered the Numerator</b>	<b>Coefficient</b>	<b>P-Value</b>
Length of stay 4-7 days	0.4738	21.14	0.1303	<0.001
Length of stay 8-14 days	0.2233	27.82	0.3236	<0.001
Length of stay GT 14 days	0.0845	32.02	0.4269	<0.001
0 hospitalizations in prior year (ref)	0.4025	16.44	-	-
1-3 hospitalizations in prior year	0.4839	24.29	0.0954	<0.001
4-6 hospitalizations in prior year	0.0886	35.90	0.3559	<0.001
7-9 hospitalizations in prior year	0.0183	44.87	0.5956	<0.001
10+ hospitalizations in prior year	0.0067	57.04	1.0622	<0.001
Ever disabled	0.2626	26.00	-0.0110	0.044
ESRD	0.0587	39.57	0.3420	<0.001
At least 1 day ICU (y/n)	0.1557	29.42	0.1042	<0.001
1 Tuberculosis	0.0000	40.43	1.0671	0.001
2 Septicemia (except in labor)	0.1173	26.76	0.6816	<0.001
3 Bacterial infection; unspecified site	0.0010	25.02	0.6531	<0.001
4 Mycoses	0.0007	32.03	1.0004	<0.001
5 HIV infection	0.0003	32.74	0.8983	<0.001
6 Hepatitis	0.0003	44.23	1.4449	<0.001
7 Viral infection	0.0010	18.43	0.5237	<0.001
8 Other infections; including parasitic	0.0001	18.63	0.5815	0.002
11 Cancer of head and neck	0.0007	28.08	0.7621	<0.001
12 Cancer of esophagus	0.0003	30.99	1.0474	<0.001
13 Cancer of stomach	0.0005	31.55	1.0817	<0.001
14 Cancer of colon	0.0027	24.51	0.8722	<0.001
15 Cancer of rectum and anus	0.0009	28.84	0.9766	<0.001
16 Cancer of liver and intrahepatic bile duct	0.0004	30.58	1.1125	<0.001

<b>Variable</b>	<b>Mean</b>	<b>Percent of Residents With Covariate who Triggered the Numerator</b>	<b>Coefficient</b>	<b>P-Value</b>
17 Cancer of pancreas	0.0007	29.45	1.1043	<0.001
18 Cancer of other GI organs; peritoneum	0.0004	33.13	1.2839	<0.001
19 Cancer of bronchus; lung	0.0024	30.92	1.0838	<0.001
20 Cancer; other respiratory and intrathoracic	0.0000	32.81	1.1343	<0.001
21 Cancer of bone and connective tissue	0.0003	29.87	1.2276	<0.001
22 Melanomas of skin	0.0000	20.51	0.7893	0.007
23 Other non-epithelial cancer of skin	0.0002	19.00	0.6859	<0.001
24 Cancer of breast	0.0005	21.82	0.8726	<0.001
25 Cancer of uterus	0.0004	24.21	0.9462	<0.001
26 Cancer of cervix	0.0001	46.79	1.7781	<0.001
27 Cancer of ovary	0.0003	29.15	1.1535	<0.001
28 Cancer of other female genital organs	0.0002	25.83	1.1592	<0.001
29 Cancer of prostate	0.0004	27.45	0.9275	<0.001
30 Cancer of testis	0.0000	66.67	2.6712	0.031
32 Cancer of bladder	0.0010	33.57	1.1816	<0.001
33 Cancer of kidney and renal pelvis	0.0006	23.87	0.8348	<0.001
34 Cancer of other urinary organs	0.0001	26.70	0.9769	<0.001
35 Cancer of brain and nervous system	0.0007	26.13	1.0047	<0.001
37 Hodgkin`s disease	0.0000	39.19	1.3345	<0.001
38 Non-Hodgkin`s lymphoma	0.0009	39.54	1.4085	<0.001
39 Leukemias	0.0006	41.93	1.5105	<0.001
40 Multiple myeloma	0.0005	35.55	1.2060	<0.001
41 Cancer; other and unspecified primary	0.0001	29.88	1.1720	<0.001
42 Secondary malignancies	0.0041	32.28	1.1594	<0.001
43 Malignant neoplasm without specification of site	0.0002	35.54	1.2566	<0.001

<b>Variable</b>	<b>Mean</b>	<b>Percent of Residents With Covariate who Triggered the Numerator</b>	<b>Coefficient</b>	<b>P-Value</b>
44 Neoplasms of unspecified nature or uncertain behavior	0.0008	36.26	1.3391	<0.001
45 Maintenance chemotherapy; radiotherapy	0.0006	31.19	0.7227	<0.001
47 Other and unspecified benign neoplasm	0.0014	24.45	0.8961	<0.001
48 Thyroid disorders	0.0006	24.69	0.8375	<0.001
50 Diabetes mellitus with complications	0.0230	26.22	0.6614	<0.001
51 Other endocrine disorders	0.0033	23.04	0.8084	<0.001
52 Nutritional deficiencies	0.0009	24.28	0.7395	<0.001
54 Gout and other crystal arthropathies	0.0010	16.82	0.5150	<0.001
55 Fluid and electrolyte disorders	0.0158	23.55	0.7436	<0.001
57 Immunity disorders	0.0001	27.40	0.7663	<0.001
58 Other nutritional; endocrine; and metabolic disorders	0.0034	24.17	0.7580	<0.001
59 Deficiency and other anemia	0.0048	29.59	0.9296	<0.001
60 Acute post-hemorrhagic anemia	0.0024	28.93	0.8078	<0.001
61 Sickle cell anemia	0.0001	56.12	1.6253	<0.001
62 Coagulation and hemorrhagic disorders	0.0020	28.40	0.8382	<0.001
63 Diseases of white blood cells	0.0005	31.91	1.0143	<0.001
64 Other hematologic conditions	0.0001	29.05	0.7455	<0.001
76 Meningitis	0.0003	27.77	0.8747	<0.001
77 Encephalitis	0.0004	26.15	0.6458	<0.001
78 Other CNS infection and poliomyelitis	0.0004	31.97	0.9967	<0.001
79 Parkinson`s disease	0.0023	15.64	0.4269	<0.001
80 Multiple sclerosis	0.0006	14.01	0.2544	0.009
81 Other hereditary and degenerative nervous system conditions	0.0012	19.04	0.5821	<0.001
82 Paralysis	0.0003	21.53	0.7244	<0.001
83 Epilepsy; convulsions	0.0073	21.40	0.6147	<0.001

<b>Variable</b>	<b>Mean</b>	<b>Percent of Residents With Covariate who Triggered the Numerator</b>	<b>Coefficient</b>	<b>P-Value</b>
84 Headache; including migraine	0.0003	22.80	0.8443	<0.001
85 Coma; stupor; and brain damage	0.0001	23.03	0.5184	0.010
88 Glaucoma	0.0000	24.49	0.7950	0.021
89 Blindness and vision defects	0.0001	18.18	0.5077	0.008
90 Inflammation; infection of eye	0.0002	18.91	0.5259	<0.001
93 Conditions associated with dizziness or vertigo	0.0013	11.25	0.2189	0.002
94 Other ear disorders	0.0001	20.86	0.7818	<0.001
95 Other nervous system disorders	0.0173	22.42	0.6661	<0.001
96 Heart valve disorders	0.0051	26.61	0.8359	<0.001
97 Peri-, endo-, and myocarditis; cardiomyopathy	0.0013	32.32	0.9785	<0.001
98 Essential hypertension	0.0002	13.46	0.3897	0.022
99 Hypertension with complications and secondary hypertension	0.0599	29.74	0.8141	<0.001
100 Acute myocardial infarction	0.0145	28.64	0.9370	<0.001
101 Coronary atherosclerosis and other heart disease	0.0057	25.06	0.7724	<0.001
102 Nonspecific chest pain	0.0021	26.02	0.8472	<0.001
103 Pulmonary heart disease	0.0059	23.02	0.6917	<0.001
104 Other and ill-defined heart disease	0.0003	25.32	0.8537	<0.001
105 Conduction disorders	0.0026	18.68	0.6072	<0.001
106 Cardiac dysrhythmias	0.0175	24.99	0.8633	<0.001
107 Cardiac arrest and ventricular fibrillation	0.0004	27.50	0.5852	<0.001
108 Congestive heart failure; non-hypertensive	0.0047	27.52	0.8144	<0.001
109 Acute cerebrovascular disease	0.0271	21.01	0.6112	<0.001
110 Occlusion or stenosis of pre-cerebral arteries	0.0010	21.78	0.6986	<0.001
111 Other and ill-defined cerebrovascular disease	0.0004	22.69	0.6267	<0.001
112 Transient cerebral ischemia	0.0031	16.04	0.4904	<0.001

<b>Variable</b>	<b>Mean</b>	<b>Percent of Residents With Covariate who Triggered the Numerator</b>	<b>Coefficient</b>	<b>P-Value</b>
113 Late effects of cerebrovascular disease	0.0017	18.01	0.3379	<0.001
114 Peripheral and visceral atherosclerosis	0.0037	26.97	0.8403	<0.001
115 Aortic; peripheral; and visceral artery aneurysms	0.0019	27.64	0.8976	<0.001
116 Aortic and peripheral arterial embolism or thrombosis	0.0009	30.05	1.0552	<0.001
117 Other circulatory disease	0.0056	21.87	0.6729	<0.001
118 Phlebitis; thrombophlebitis and thromboembolism	0.0039	23.51	0.7819	<0.001
119 Varicose veins of lower extremity	0.0003	17.69	0.4124	0.001
120 Hemorrhoids	0.0007	29.62	0.8563	<0.001
121 Other diseases of veins and lymphatics	0.0008	20.04	0.5465	<0.001
122 Pneumonia (except that caused by tuberculosis or sexually transmitted disease)	0.0314	23.78	0.6341	<0.001
123 Influenza	0.0037	16.86	0.3377	<0.001
124 Acute and chronic tonsillitis	0.0000	27.78	1.2341	0.021
125 Acute bronchitis	0.0018	16.76	0.4418	<0.001
126 Other upper respiratory infections	0.0005	15.94	0.3818	<0.001
127 Chronic obstructive pulmonary disease and bronchiectasis	0.0158	26.98	0.7476	<0.001
128 Asthma	0.0007	18.18	0.4510	<0.001
129 Aspiration pneumonitis; food/vomitus	0.0131	25.40	0.5985	<0.001
130 Pleurisy; pneumothorax; pulmonary collapse	0.0028	30.50	0.8274	<0.001
131 Respiratory failure; insufficiency	0.0185	31.26	0.7453	<0.001
132 Lung disease due to external agents	0.0002	32.35	0.9227	<0.001
133 Other lower respiratory disease	0.0020	27.24	0.7844	<0.001
134 Other upper respiratory disease	0.0006	28.04	0.6896	<0.001
135 Intestinal infection	0.0062	26.29	0.8636	<0.001
136 Disorders of teeth and jaw	0.0002	20.77	0.7259	<0.001



<b>Variable</b>	<b>Mean</b>	<b>Percent of Residents With Covariate who Triggered the Numerator</b>	<b>Coefficient</b>	<b>P-Value</b>
137 Diseases of mouth; excluding dental	0.0003	21.40	0.5078	<0.001
138 Esophageal disorders	0.0031	25.87	0.7638	<0.001
139 Gastroduodenal ulcer (except hemorrhage)	0.0008	24.25	0.7967	<0.001
140 Gastritis and duodenitis	0.0019	28.60	0.8294	<0.001
141 Other disorders of stomach and duodenum	0.0017	33.86	0.9626	<0.001
142 Appendicitis and other appendiceal conditions	0.0002	18.80	0.5819	<0.001
143 Abdominal hernia	0.0039	21.89	0.7153	<0.001
144 Regional enteritis and ulcerative colitis	0.0007	31.65	1.1333	<0.001
145 Intestinal obstruction without hernia	0.0083	24.24	0.7531	<0.001
146 Diverticulosis and diverticulitis	0.0058	24.42	0.7427	<0.001
147 Anal and rectal conditions	0.0012	25.27	0.7255	<0.001
148 Peritonitis and intestinal abscess	0.0005	35.78	1.0391	<0.001
149 Biliary tract disease	0.0053	22.41	0.7330	<0.001
151 Other liver diseases	0.0045	42.61	1.2289	<0.001
152 Pancreatic disorders (not diabetes)	0.0022	24.49	0.7543	<0.001
153 Gastrointestinal hemorrhage	0.0133	26.87	0.7130	<0.001
154 Noninfectious gastroenteritis	0.0021	22.68	0.8027	<0.001
155 Other gastrointestinal disorders	0.0055	27.40	0.8068	<0.001
156 Nephritis; nephrosis; renal sclerosis	0.0002	33.85	0.9827	<0.001
157 Acute and unspecified renal failure	0.0345	25.74	0.8199	<0.001
158 Chronic kidney disease	0.0002	31.83	0.5961	<0.001
159 Urinary tract infections	0.0392	19.27	0.6026	<0.001
160 Calculus of urinary tract	0.0005	24.59	0.8024	<0.001
161 Other diseases of kidney and ureters	0.0011	27.24	0.9338	<0.001
162 Other diseases of bladder and urethra	0.0006	27.69	0.8803	<0.001

<b>Variable</b>	<b>Mean</b>	<b>Percent of Residents With Covariate who Triggered the Numerator</b>	<b>Coefficient</b>	<b>P-Value</b>
163 Genitourinary symptoms and ill-defined conditions	0.0010	25.97	0.7979	<0.001
164 Hyperplasia of prostate	0.0007	22.31	0.6754	<0.001
165 Inflammatory conditions of male genital organs	0.0005	19.60	0.4259	<0.001
166 Other male genital disorders	0.0001	23.59	0.5659	0.001
167 Nonmalignant breast conditions	0.0001	24.85	0.7295	<0.001
168 Inflammatory diseases of female pelvic organs	0.0002	25.71	0.8828	<0.001
173 Menopausal disorders	0.0001	22.73	0.5802	0.008
175 Other female genital disorders	0.0003	24.59	0.7205	<0.001
197 Skin and subcutaneous tissue infections	0.0152	19.51	0.5338	<0.001
198 Other inflammatory condition of skin	0.0003	28.44	0.9924	<0.001
199 Chronic ulcer of skin	0.0035	23.24	0.5342	<0.001
200 Other skin disorders	0.0002	25.08	0.7713	<0.001
201 Infective arthritis and osteomyelitis	0.0042	21.28	0.5201	<0.001
202 Rheumatoid arthritis and related disease	0.0004	18.13	0.6184	<0.001
203 Osteoarthritis (Ref)	0.0382	7.86	-	-
204 Other non-traumatic joint disorders	0.0020	13.74	0.3419	<0.001
205 Spondylosis; intervertebral disc disorders; other back problems	0.0163	15.77	0.5190	<0.001
207 Pathological fracture	0.0104	16.37	0.5196	<0.001
209 Other acquired deformities	0.0023	13.11	0.3735	<0.001
210 Systemic lupus erythematosus and connective tissue disorders	0.0003	29.54	0.9424	<0.001
211 Other connective tissue disease	0.0063	15.66	0.4576	<0.001
212 Other bone disease and musculoskeletal deformities	0.0011	17.86	0.5711	<0.001
213 Cardiac and circulatory congenital anomalies	0.0002	27.10	0.8626	<0.001
214 Digestive congenital anomalies	0.0000	43.64	1.6972	<0.001
215 Genitourinary congenital anomalies	0.0000	44.00	1.3718	0.001

<b>Variable</b>	<b>Mean</b>	<b>Percent of Residents With Covariate who Triggered the Numerator</b>	<b>Coefficient</b>	<b>P-Value</b>
216 Nervous system congenital anomalies	0.0001	26.21	0.9070	<0.001
225 Joint disorders and dislocations; trauma-related	0.0009	13.75	0.3379	<0.001
226 Fracture of neck of femur (hip)	0.0602	14.99	0.4402	<0.001
227 Spinal cord injury	0.0003	26.12	0.7914	<0.001
228 Skull and face fractures	0.0010	15.74	0.4602	<0.001
229 Fracture of upper limb	0.0102	14.32	0.4196	<0.001
230 Fracture of lower limb	0.0207	14.91	0.3666	<0.001
231 Other fractures	0.0278	14.77	0.4060	<0.001
232 Sprains and strains	0.0014	12.48	0.2265	<0.001
233 Intracranial injury	0.0104	23.06	0.7796	<0.001
234 Crushing injury or internal injury	0.0023	20.06	0.6027	<0.001
235 Open wounds of head; neck; and trunk	0.0007	16.43	0.5370	<0.001
236 Open wounds of extremities	0.0007	19.10	0.5977	<0.001
237 Complication of device; implant or graft	0.0363	26.52	0.7221	<0.001
238 Complications of surgical procedures or medical care	0.0157	27.33	0.6786	<0.001
239 Superficial injury; contusion	0.0032	17.97	0.5661	<0.001
240 Burns	0.0004	20.03	0.4903	<0.001
241 Poisoning by psychotropic agents	0.0004	19.48	0.5212	<0.001
242 Poisoning by other medications and drugs	0.0020	22.47	0.5933	<0.001
244 Other injuries and conditions due to external causes	0.0043	16.62	0.4769	<0.001
245 Syncope	0.0038	16.14	0.5036	<0.001
246 Fever of unknown origin	0.0006	22.56	0.5988	<0.001
247 Lymphadenitis	0.0000	27.45	1.0385	0.001
248 Gangrene	0.0019	29.89	0.8577	<0.001
249 Shock	0.0002	32.42	0.7755	<0.001

<b>Variable</b>	<b>Mean</b>	<b>Percent of Residents With Covariate who Triggered the Numerator</b>	<b>Coefficient</b>	<b>P-Value</b>
250 Nausea and vomiting	0.0005	29.43	1.0264	<0.001
251 Abdominal pain	0.0006	25.57	0.8459	<0.001
252 Malaise and fatigue	0.0033	16.84	0.5106	<0.001
253 Allergic reactions	0.0003	24.29	0.8197	<0.001
254 Rehabilitation care; fitting of prostheses; and adjustment of devices	0.0000	29.41	1.1221	0.040
257 Other aftercare	0.0010	14.87	0.2778	<0.001
258 Other screening for suspected conditions (not mental disorders or infectious disease)	0.0003	21.01	0.5571	<0.001
259 Residual codes; unclassified	0.0025	20.27	0.6287	<0.001
651 MHA: Anxiety disorders	0.0003	20.61	0.6457	<0.001
653 MHA: Delirium, dementia, and amnestic and other cognitive disorders	0.0156	17.34	0.5274	<0.001
656 MHA: Impulse control disorders, NEC	0.0001	18.92	0.5558	0.004
657 MHA: Mood disorders	0.0056	17.75	0.3930	<0.001
658 MHA: Personality disorders	0.0000	25.58	0.7766	0.033
659 MHA: Schizophrenia and other psychotic disorders	0.0067	19.93	0.5085	<0.001
660 MHA: Alcohol-related disorders	0.0043	26.45	0.8295	<0.001
661 MHA: Substance-related disorders	0.0005	24.50	0.8099	<0.001
662 MHA: Suicide and intentional self-inflicted injury	0.0003	20.52	0.5108	<0.001
670 MHA: Miscellaneous mental disorders	0.0003	20.73	0.5969	<0.001
2617 Adverse effects of medical drugs	0.0001	20.35	0.5042	0.039
CCS None	0.0071	23.50	0.6834	<0.001
Nonsignificant CCS w/ protective effect	0.0004	9.42	-0.0764	0.593
Nonsignificant CCS w/ increased risk	0.0009	16.56	0.3613	<0.001

<b>Variable</b>	<b>Mean</b>	<b>Percent of Residents With Covariate who Triggered the Numerator</b>	<b>Coefficient</b>	<b>P-Value</b>
Re-hospitalizations-specific comorbidity index	-1.2647	-	0.4681	<0.001
End-stage prognosis	0.0068	12.24	-1.2543	<0.001
Returned to nursing home following hospitalization	0.2396	27.24	0.0571	<0.001
Anemia	0.3239	26.26	0.0803	<0.001
Venous/Arterial ulcer present	0.0291	29.23	0.0690	<0.001
Viral hepatitis	0.0096	30.78	0.0411	0.025
Internal bleeding	0.0086	50.00	1.0220	<0.001
Extensive assistance/dependence in eating	0.0491	38.90	0.4562	<0.001
Two-person support needed with one or more ADL(s)	0.5515	24.77	0.0816	<0.001
Cognitive status not completely intact	0.6523	24.23	0.1724	<0.001
Cognitive assessment missing	0.0230	59.49	1.4125	<0.001
Chemotherapy for cancer	0.0094	29.91	0.2608	<0.001
IV medications	0.5143	23.45	-0.0326	<0.001
Ostomy care	0.0272	31.39	0.2276	<0.001
Oxygen therapy	0.3486	27.92	0.1642	<0.001
Radiation for cancer	0.0030	33.58	0.2849	<0.001
First assessment is for significant change in status	0.0346	17.50	-0.4981	<0.001
Rarely/never makes self understood by others	0.0226	27.32	-0.1146	<0.001
Acute mental status change	0.0211	36.82	0.6031	<0.001
Rejected care for past 4–7 days	0.0110	26.12	0.0801	<0.001
Wandering once or more in the past week	0.0178	22.08	0.1566	<0.001
Walks in room indep/supervision/limited assistance	0.3344	18.55	-0.0604	<0.001
Walks in corridor indep/supervision/limited assistance	0.3006	17.56	-0.2247	<0.001
Wanders and Walks in room or corridor indep/supervision/limited assistance	0.0104	20.78	0.1552	<0.001

<b>Variable</b>	<b>Mean</b>	<b>Percent of Residents With Covariate who Triggered the Numerator</b>	<b>Coefficient</b>	<b>P-Value</b>
Alzheimer's disease	0.0463	18.29	-0.1404	<0.001
Non-Alzheimer's dementia	0.2064	20.05	-0.1496	<0.001
Cancer	0.0699	20.15	-0.3066	<0.001
Ulcerative Colitis/Crohn's/inflammatory bowel disease	0.0159	20.32	-0.1995	<0.001
Seizure disorder or epilepsy	0.0741	24.62	-0.0389	<0.001
Shortness of breath with exertion	0.1452	29.33	0.0603	<0.001
Shortness of breath when sitting at rest	0.0535	39.60	0.4935	<0.001
Choke/cough during meals or swallowing medications	0.0188	24.04	-0.0413	0.003
Parenteral/IV feeding	0.0099	38.05	0.5337	<0.001
Feeding tube	0.0378	36.31	0.0678	<0.001
Surgical wound	0.2626	19.70	-0.0356	<0.001
Antibiotic received	0.3909	24.29	0.0741	<0.001
Ventilator or respirator	0.0032	43.02	-0.1791	<0.001
Transfusion	0.0026	36.25	0.3307	<0.001
Respiratory therapy	0.0576	28.98	0.0198	0.013
Constant	-	-	-1.8657	<0.001

## 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 = 0.614

Note: This model is based on all SNF stays with admission from a hospital between July 1, 2018 and June 30, 2019.

Charlson Condition	Coefficient	SE	P-value
Myocardial infarction	0.1265	0.0058	<0.001
CHF	0.2589	0.0049	<0.001
Peripheral vascular disease	0.1494	0.0058	<0.001
Cerebrovascular disease	0.0374	0.0062	<0.001
Dementia	-0.0492	0.0051	<0.001
COPD	0.2196	0.0045	<0.001
Rheumatoid arthritis	0.1239	0.0094	<0.001
Ulcers	0.1718	0.0112	<0.001
Mild liver disease	0.2482	0.0097	<0.001
Diabetes mellitus	0.1395	0.0052	<0.001
Diabetes with sequelae	0.1104	0.0061	<0.001
Paralysis	0.1446	0.0099	<0.001
Chronic renal disease	0.2957	0.0053	<0.001
Cancer	0.3255	0.0079	<0.001
Moderate to severe liver disease	0.4580	0.0155	<0.001
Metastatic cancer	0.3254	0.0131	<0.001
HIV/AIDS	0.3166	0.0357	<0.001
Constant	-1.5898	0.0026	<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 April 1, 2018 and March 31, 2019, 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	243.27	-	0.0171	<0.001
Number of long-stay days in target period, squared	76,885.25	-	0.0000	<0.001
White (ref)	0.8179	0.401	-	-
Black	0.1276	0.569	0.2547	<0.001
Hispanic	0.0194	0.547	0.2808	<0.001
Asian	0.0155	0.482	0.2274	<0.001
Other race/ethnicity	0.0157	0.470	0.1037	<0.001
Unknown race/ethnicity	0.0039	0.479	0.0287	0.359
Female age 18–65	0.0501	0.602	0.0254	0.037
Female age 65–69 (ref)	0.0413	0.559	-	-
Female age 70–74	0.0574	0.521	-0.0179	0.136
Female age 75–79	0.0764	0.444	-0.1039	<0.001
Female age 80–84	0.1038	0.398	-0.1452	<0.001
Female age 85–89	0.1320	0.349	-0.2131	<0.001
Female age 9–94	0.1212	0.298	-0.3144	<0.001
Female age GT 94	0.0710	0.238	-0.4774	<0.001
Male age 18–65	0.0622	0.597	0.0488	<0.001
Male age 65–69	0.0439	0.536	-0.0007	0.959
Male age 70–74	0.0468	0.517	0.0048	0.703
Male age 75–79	0.0489	0.502	0.0114	0.363
Male age 80–84	0.0512	0.467	-0.0080	0.525



Variable	Mean	Mean Number of Hospitalizations Among Those With Covariate	Coefficient	P-Value
Male age 85–89	0.0485	0.426	-0.0507	<0.001
Male age 90–94	0.0331	0.372	-0.1346	<0.001
Male age GT 94	0.0120	0.323	-0.2433	<0.001
0 hospitalizations in prior year (ref)	0.4931	0.308	-	-
1–3 hospitalizations in prior year	0.4381	0.484	0.2332	<0.001
4–6 hospitalizations in prior year	0.0576	0.852	0.5203	<0.001
7–9 hospitalizations in prior year	0.0091	1.219	0.7148	<0.001
10+ hospitalizations in prior year	0.0022	1.675	0.9331	<0.001
Long-stay hospitalizations-specific comorbidity index	0.1080	-	2.6319	<0.001
Entered nursing home from a psychiatric facility	0.0232	0.442	0.0501	<0.001
End-stage prognosis	0.0520	0.092	-0.4393	<0.001
Septicemia	0.0125	0.750	0.1266	<0.001
Respiratory failure	0.0397	0.782	0.0985	<0.001
Internal bleeding	0.0018	0.589	0.1146	0.008
Extensive assistance/dependence in eating	0.2171	0.412	0.0347	<0.001
Moderate cognitive impairment	0.2210	0.435	-0.0567	<0.001
Severe cognitive impairment	0.2835	0.351	-0.1234	<0.001
Staff assessed cognitive status	0.1648	0.356	-0.1504	<0.001
Cognitive status assessment missing	0.0054	0.452	-0.0943	<0.001
Chemotherapy for cancer	0.0048	0.525	0.1213	<0.001
IV medications	0.0152	0.782	0.1037	<0.001
Oxygen therapy	0.1308	0.635	0.1777	<0.001
Radiation for cancer	0.0006	0.475	-0.0774	0.328
Rarely/never makes self understood by others	0.0689	0.363	-0.0117	0.272
Rejected care for past 4–7 days	0.0210	0.431	0.0240	0.090
Wandering once or more in the past week	0.0456	0.323	-0.0612	<0.001
Walks in room indep/supervision/limited assistance	0.3442	0.397	-0.0145	0.079
Walks in corridor indep/supervision/limited assistance	0.3204	0.391	-0.0687	<0.001
Shortness of breath with exertion	0.0736	0.594	0.0755	<0.001
Shortness of Breath when lying flat	0.0687	0.606	0.0505	<0.001
Anticoagulant received	0.1724	0.546	0.0919	<0.001

<b>Variable</b>	<b>Mean</b>	<b>Mean Number of Hospitalizations Among Those With Covariate</b>	<b>Coefficient</b>	<b>P-Value</b>
Antibiotic received	0.1300	0.570	0.1450	<0.001
Diuretic received	0.3387	0.493	0.1234	<0.001
Ulcerative Colitis/Crohn's/inflammatory bowel disease	0.0035	0.482	0.0202	0.546
Multi-drug resistant organism (MDRO)	0.0073	0.789	0.1499	<0.001
Cerebrovascular accident, transient ischemic attack or stroke	0.1187	0.472	0.0266	<0.001
Quadriplegia	0.0067	0.763	0.1122	<0.001
Multiple Sclerosis	0.0143	0.566	0.0764	<0.001
Parkinson's disease	0.0675	0.421	0.0221	0.007
Anxiety disorder	0.3116	0.449	0.0901	<0.001
Gastroesophageal reflux disease (GERD) or ulcer	0.0967	0.462	0.1452	<0.001
Neurogenic bladder	0.0360	0.694	0.2389	<0.001
Transfusion	0.0010	0.869	0.3549	<0.001
Hospice care after nursing home admission	0.0620	0.082	-1.2787	<0.001
Isolation or quarantine for active infectious disease	0.0049	0.617	0.0778	0.003
Speech therapy	0.1057	0.506	0.0020	0.759
Respiratory therapy	0.0386	0.685	0.1055	<0.001
Constant	-	-	-2.7071	<0.001

## 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 April 1, 2018 and March 31, 2019, that residents were in the nursing home after they attained long-term resident status (i.e., after 100 cumulative days in the facility).

\* Coefficients for the number of long-stay days excluded from the comorbidity construct.

<b>Charlson Condition</b>	<b>Coefficient</b>	<b>SE</b>	<b>P-value</b>
Myocardial infarction	0.0476	0.0078	<0.001
CHF	0.2279	0.0059	<0.001
Peripheral vascular disease	0.1241	0.0076	<0.001
Cerebrovascular disease	0.0422	0.0067	<0.001
Dementia	-0.0119	0.0048	0.014
COPD	0.3388	0.0056	<0.001
Rheumatoid arthritis	0.0804	0.0135	<0.001
Ulcers	0.1820	0.0148	<0.001
Mild liver disease	0.1592	0.0141	<0.001
Diabetes mellitus	0.2328	0.0060	<0.001
Diabetes with sequelae	0.2330	0.0075	<0.001
Paralysis	0.2296	0.0097	<0.001
Chronic renal disease	0.2410	0.0065	<0.001
Cancer	0.0790	0.0130	<0.001
Moderate to severe liver disease	0.2499	0.0244	<0.001
Metastatic cancer	-0.0677	0.0259	0.009
HIV/AIDS	0.3688	0.0448	<0.001
<i>Number of long-stay days in target period*</i>	<i>0.0171</i>	<i>0.0001</i>	<i>&lt;0.001</i>
<i>Number of long-stay days in target period, squared*</i>	<i>0.0000</i>	<i>0.0000</i>	<i>&lt;0.001</i>
Intercept	-2.5386	0.0083	<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 = 0.610

Note: This model is based on all SNF stays with admission from a hospital between July 1, 2018 and June 30, 2019.

Variable	Mean	Percent of Residents With Covariate who Triggered the Numerator	Coefficient	P-Value
Female age 18–65	0.0503	14.61	0.2002	<0.001
Female age 65–69 (ref)	0.0569	10.82	-	-
Female age 70–74	0.0775	9.89	-0.0652	<0.001
Female age 75–79	0.0930	9.35	-0.0947	<0.001
Female age 80–84	0.1050	8.88	-0.1269	<0.001
Female age 85–89	0.1069	8.28	-0.1788	<0.001
Female age 90–94	0.0775	7.71	-0.2331	<0.001
Female age GT 94	0.0312	7.13	-0.2992	<0.001
Male age 18–65	0.0547	15.01	0.1913	<0.001
Male age 65–69	0.0509	12.01	0.0464	0.002
Male age 70–74	0.0572	11.16	-0.0053	0.714
Male age 75–79	0.0648	11.07	0.0148	0.304
Male age 80–84	0.0676	10.78	0.0114	0.432
Male age 85–89	0.0601	10.22	-0.0216	0.154
Male age 90–94	0.0356	9.75	-0.0397	0.025
Male age GT 94	0.0108	8.99	-0.1042	<0.001
Length of stay 1–3 days (ref)	0.2184	9.32	-	-
Length of stay 4–7 days	0.4738	9.75	0.0076	0.279
Length of stay 8–14 days	0.2233	11.09	0.0474	<0.001
Length of stay GT 14 days	0.0845	12.62	0.0778	<0.001
0 hospitalizations in prior year (ref)	0.4025	8.20	-	-

<b>Variable</b>	<b>Mean</b>	<b>Percent of Residents With Covariate who Triggered the Numerator</b>	<b>Coefficient</b>	<b>P-Value</b>
1-3 hospitalizations in prior year	0.4839	10.64	0.1531	<0.001
4-6 hospitalizations in prior year	0.0886	14.23	0.3446	<0.001
7-9 hospitalizations in prior year	0.0183	17.79	0.5128	<0.001
10+ hospitalizations in prior year	0.0067	24.74	0.8488	<0.001
Ever disabled	0.2626	12.67	0.1020	<0.001
ESRD	0.0587	16.44	0.3135	<0.001
At least 1 day ICU (y/n)	0.1557	11.73	0.0474	<0.001
2 Septicemia (except in labor)	0.1173	10.27	0.1059	<0.001
3 Bacterial infection; unspecified site	0.0010	13.02	0.3662	<0.001
4 Mycoses	0.0007	11.61	0.2735	0.002
6 Hepatitis	0.0003	14.47	0.4550	0.001
10 Immunizations and screening for infectious disease	0.0000	19.15	0.8615	0.022
11 Cancer of head and neck	0.0007	19.57	0.5414	<0.001
12 Cancer of esophagus	0.0003	17.11	0.5727	<0.001
13 Cancer of stomach	0.0005	13.84	0.4777	<0.001
14 Cancer of colon	0.0027	9.69	0.2243	<0.001
15 Cancer of rectum and anus	0.0009	12.27	0.3956	<0.001
16 Cancer of liver and intrahepatic bile duct	0.0004	10.49	0.2619	0.041
17 Cancer of pancreas	0.0007	11.39	0.3807	<0.001
18 Cancer of other GI organs; peritoneum	0.0004	11.19	0.3510	0.005
19 Cancer of bronchus; lung	0.0024	10.58	0.3153	<0.001
20 Cancer; other respiratory and intrathoracic	0.0000	18.75	0.9511	0.003
21 Cancer of bone and connective tissue	0.0003	11.56	0.3460	0.013
23 Other non-epithelial cancer of skin	0.0002	13.19	0.5195	0.001
24 Cancer of breast	0.0005	9.58	0.2814	0.019
26 Cancer of cervix	0.0001	22.02	1.1560	<0.001
27 Cancer of ovary	0.0003	9.66	0.2748	0.051
29 Cancer of prostate	0.0004	11.50	0.3616	0.004
32 Cancer of bladder	0.0010	13.23	0.4783	<0.001
35 Cancer of brain and nervous system	0.0007	11.93	0.3502	<0.001

<b>Variable</b>	<b>Mean</b>	<b>Percent of Residents With Covariate who Triggered the Numerator</b>	<b>Coefficient</b>	<b>P-Value</b>
38 Non-Hodgkin`s lymphoma	0.0009	10.55	0.2576	0.002
39 Leukemias	0.0006	12.44	0.3858	<0.001
40 Multiple myeloma	0.0005	10.86	0.2740	0.010
42 Secondary malignancies	0.0041	9.73	0.1956	<0.001
43 Malignant neoplasm without specification of site	0.0002	11.52	0.3708	0.018
44 Neoplasms of unspecified nature or uncertain behavior	0.0008	12.48	0.4431	<0.001
47 Other and unspecified benign neoplasm	0.0014	11.14	0.3372	<0.001
48 Thyroid disorders	0.0006	9.69	0.2010	0.052
50 Diabetes mellitus with complications	0.0230	11.76	0.1827	<0.001
51 Other endocrine disorders	0.0033	9.89	0.2652	<0.001
52 Nutritional deficiencies	0.0009	11.85	0.2801	0.001
54 Gout and other crystal arthropathies	0.0010	8.53	0.1766	0.048
55 Fluid and electrolyte disorders	0.0158	10.82	0.2705	<0.001
58 Other nutritional; endocrine; and metabolic disorders	0.0034	9.61	0.1285	0.008
59 Deficiency and other anemia	0.0048	10.45	0.2133	<0.001
60 Acute post-hemorrhagic anemia	0.0024	11.32	0.2638	<0.001
62 Coagulation and hemorrhagic disorders	0.0020	10.17	0.2052	0.001
64 Other hematologic conditions	0.0001	17.32	0.7109	<0.001
76 Meningitis	0.0003	13.48	0.4505	0.001
77 Encephalitis	0.0004	14.53	0.4891	<0.001
78 Other CNS infection and poliomyelitis	0.0004	14.83	0.4406	<0.001
79 Parkinson`s disease	0.0023	10.68	0.3476	<0.001
81 Other hereditary and degenerative nervous system conditions	0.0012	10.72	0.2763	0.000
83 Epilepsy; convulsions	0.0073	12.31	0.2769	<0.001
84 Headache; including migraine	0.0003	14.20	0.5914	<0.001
92 Otitis media and related conditions	0.0001	13.95	0.5082	0.023
95 Other nervous system disorders	0.0173	11.06	0.2837	<0.001
96 Heart valve disorders	0.0051	10.09	0.2640	<0.001
97 Peri-, endo-, and myocarditis; cardiomyopathy	0.0013	12.73	0.3410	<0.001
98 Essential hypertension	0.0002	10.90	0.4753	0.010

<b>Variable</b>	<b>Mean</b>	<b>Percent of Residents With Covariate who Triggered the Numerator</b>	<b>Coefficient</b>	<b>P-Value</b>
99 Hypertension with complications and secondary hypertension	0.0599	10.38	0.2175	<0.001
100 Acute myocardial infarction	0.0145	11.43	0.3836	<0.001
101 Coronary atherosclerosis and other heart disease	0.0057	11.43	0.3441	<0.001
102 Nonspecific chest pain	0.0021	14.43	0.5589	<0.001
103 Pulmonary heart disease	0.0059	11.21	0.4062	<0.001
105 Conduction disorders	0.0026	8.69	0.1697	0.002
106 Cardiac dysrhythmias	0.0175	10.16	0.3053	<0.001
107 Cardiac arrest and ventricular fibrillation	0.0004	15.16	0.5050	<0.001
108 Congestive heart failure; non-hypertensive	0.0047	9.89	0.2345	<0.001
109 Acute cerebrovascular disease	0.0271	11.46	0.3814	<0.001
110 Occlusion or stenosis of pre-cerebral arteries	0.0010	10.42	0.2513	0.002
111 Other and ill-defined cerebrovascular disease	0.0004	11.55	0.2735	0.020
112 Transient cerebral ischemia	0.0031	10.29	0.3557	<0.001
114 Peripheral and visceral atherosclerosis	0.0037	11.61	0.3638	<0.001
115 Aortic; peripheral; and visceral artery aneurysms	0.0019	11.34	0.3645	<0.001
116 Aortic and peripheral arterial embolism or thrombosis	0.0009	13.70	0.6023	<0.001
117 Other circulatory disease	0.0056	11.18	0.3509	<0.001
118 Phlebitis; thrombophlebitis and thromboembolism	0.0039	11.11	0.3815	<0.001
120 Hemorrhoids	0.0007	12.44	0.3970	<0.001
122 Pneumonia (except that caused by tuberculosis or sexually transmitted disease)	0.0314	9.84	0.1570	<0.001
125 Acute bronchitis	0.0018	8.66	0.1633	0.013
127 Chronic obstructive pulmonary disease and bronchiectasis	0.0158	10.17	0.1909	<0.001
128 Asthma	0.0007	10.33	0.3233	0.001
129 Aspiration pneumonitis; food/vomitus	0.0131	10.14	0.0662	0.022
130 Pleurisy; pneumothorax; pulmonary collapse	0.0028	12.19	0.3273	<0.001
131 Respiratory failure; insufficiency	0.0185	10.72	0.1573	<0.001
133 Other lower respiratory disease	0.0020	10.28	0.2110	<0.001
134 Other upper respiratory disease	0.0006	14.61	0.4575	<0.001
135 Intestinal infection	0.0062	10.67	0.2137	<0.001

<b>Variable</b>	<b>Mean</b>	<b>Percent of Residents With Covariate who Triggered the Numerator</b>	<b>Coefficient</b>	<b>P-Value</b>
137 Diseases of mouth; excluding dental	0.0003	13.38	0.4240	0.001
138 Esophageal disorders	0.0031	11.74	0.2907	<0.001
139 Gastroduodenal ulcer (except hemorrhage)	0.0008	11.32	0.3634	<0.001
140 Gastritis and duodenitis	0.0019	10.13	0.1429	0.018
141 Other disorders of stomach and duodenum	0.0017	12.12	0.2888	<0.001
142 Appendicitis and other appendiceal conditions	0.0002	11.72	0.4212	0.010
143 Abdominal hernia	0.0039	10.11	0.2630	<0.001
144 Regional enteritis and ulcerative colitis	0.0007	12.04	0.3587	<0.001
145 Intestinal obstruction without hernia	0.0083	9.78	0.1855	<0.001
146 Diverticulosis and diverticulitis	0.0058	9.91	0.2170	<0.001
148 Peritonitis and intestinal abscess	0.0005	17.34	0.5786	<0.001
149 Biliary tract disease	0.0053	10.34	0.2740	<0.001
151 Other liver diseases	0.0045	12.90	0.1973	<0.001
152 Pancreatic disorders (not diabetes)	0.0022	11.35	0.3258	<0.001
153 Gastrointestinal hemorrhage	0.0133	10.35	0.1849	<0.001
154 Noninfectious gastroenteritis	0.0021	9.35	0.1714	0.005
155 Other gastrointestinal disorders	0.0055	11.07	0.2163	<0.001
156 Nephritis; nephrosis; renal sclerosis	0.0002	12.73	0.3787	0.026
157 Acute and unspecified renal failure	0.0345	10.30	0.2479	<0.001
158 Chronic kidney disease	0.0002	21.11	0.7054	<0.001
159 Urinary tract infections	0.0392	9.76	0.2151	<0.001
160 Calculus of urinary tract	0.0005	12.53	0.3955	<0.001
161 Other diseases of kidney and ureters	0.0011	11.61	0.3517	<0.001
162 Other diseases of bladder and urethra	0.0006	12.75	0.4055	<0.001
163 Genitourinary symptoms and ill-defined conditions	0.0010	13.74	0.5334	<0.001
164 Hyperplasia of prostate	0.0007	14.33	0.5952	<0.001
197 Skin and subcutaneous tissue infections	0.0152	9.37	0.1172	<0.001
199 Chronic ulcer of skin	0.0035	10.47	0.1113	0.015
201 Infective arthritis and osteomyelitis	0.0042	11.89	0.2534	<0.001
203 Osteoarthritis (Ref)	0.0382	6.53	-	-



<b>Variable</b>	<b>Mean</b>	<b>Percent of Residents With Covariate who Triggered the Numerator</b>	<b>Coefficient</b>	<b>P-Value</b>
205 Spondylosis; intervertebral disc disorders; other back problems	0.0163	9.19	0.2601	<0.001
207 Pathological fracture	0.0104	8.23	0.1784	<0.001
209 Other acquired deformities	0.0023	9.79	0.3368	<0.001
210 Systemic lupus erythematosus and connective tissue disorders	0.0003	13.03	0.4479	0.001
211 Other connective tissue disease	0.0063	8.73	0.1749	<0.001
212 Other bone disease and musculoskeletal deformities	0.0011	9.99	0.2557	0.001
213 Cardiac and circulatory congenital anomalies	0.0002	12.20	0.3994	0.013
226 Fracture of neck of femur (hip)	0.0602	8.52	0.1991	<0.001
227 Spinal cord injury	0.0003	14.74	0.6430	<0.001
228 Skull and face fractures	0.0010	10.99	0.4111	<0.001
229 Fracture of upper limb	0.0102	7.96	0.1703	<0.001
231 Other fractures	0.0278	7.90	0.1599	<0.001
233 Intracranial injury	0.0104	12.62	0.5030	<0.001
234 Crushing injury or internal injury	0.0023	10.55	0.3616	<0.001
235 Open wounds of head; neck; and trunk	0.0007	9.94	0.3169	0.001
236 Open wounds of extremities	0.0007	9.60	0.2266	0.027
237 Complication of device; implant or graft	0.0363	12.64	0.2973	<0.001
238 Complications of surgical procedures or medical care	0.0157	13.03	0.2817	<0.001
239 Superficial injury; contusion	0.0032	9.26	0.2722	<0.001
241 Poisoning by psychotropic agents	0.0004	13.56	0.4752	<0.001
242 Poisoning by other medications and drugs	0.0020	10.46	0.1750	0.003
244 Other injuries and conditions due to external causes	0.0043	8.61	0.1506	0.001
245 Syncope	0.0038	9.49	0.2781	<0.001
247 Lymphadenitis	0.0000	23.53	1.1895	<0.001
248 Gangrene	0.0019	10.80	0.1601	0.007
250 Nausea and vomiting	0.0005	12.85	0.4296	<0.001
251 Abdominal pain	0.0006	14.75	0.6121	<0.001
252 Malaise and fatigue	0.0033	9.03	0.1990	<0.001
258 Other screening for suspected conditions (not mental disorders or infectious disease)	0.0003	12.91	0.5016	<0.001

<b>Variable</b>	<b>Mean</b>	<b>Percent of Residents With Covariate who Triggered the Numerator</b>	<b>Coefficient</b>	<b>P-Value</b>
259 Residual codes; unclassified	0.0025	12.01	0.4123	<0.001
651 MHA: Anxiety disorders	0.0003	13.82	0.5652	<0.001
653 MHA: Delirium, dementia, and amnesic and other cognitive disorders	0.0156	10.98	0.3055	<0.001
656 MHA: Impulse control disorders, NEC	0.0001	14.59	0.4922	0.019
657 MHA: Mood disorders	0.0056	11.58	0.2659	<0.001
659 MHA: Schizophrenia and other psychotic disorders	0.0067	10.74	0.0716	0.046
660 MHA: Alcohol-related disorders	0.0043	13.28	0.3618	<0.001
661 MHA: Substance-related disorders	0.0005	15.67	0.6186	<0.001
662 MHA: Suicide and intentional self-inflicted injury	0.0003	12.96	0.4216	0.003
670 MHA: Miscellaneous mental disorders	0.0003	21.64	0.9594	<0.001
2617 Adverse effects of medical drugs	0.0001	17.70	0.7995	0.001
No CCS code	0.0071	11.85	0.2956	<0.001
Nonsignificant CCS w/ protective effect	0.0056	7.43	-0.1247	0.003
Nonsignificant CCS w/ increased risk	0.0410	8.19	0.0687	0.002
ED-specific Comorbidity Index	-2.1938	-	0.2380	<0.001
End-stage prognosis	0.0068	6.19	-0.6026	<0.001
Returned to the nursing home following hospitalization	0.2396	11.51	-0.0180	0.008
Respiratory failure	0.0894	11.17	-0.0296	0.002
Venous/Arterial ulcer present	0.0291	10.59	-0.0783	<0.001
Viral hepatitis	0.0096	14.68	0.0888	<0.001
Internal bleeding	0.0086	16.50	0.4769	<0.001
Extensive assistance/dependence in eating	0.0491	13.65	0.0548	<0.001
Two-person support needed with one or more ADLs	0.5515	10.59	0.0604	<0.001
Cognitive status not completely intact	0.6523	10.63	0.1351	<0.001
Cognitive status assessment missing	0.0230	13.32	0.1887	<0.001
IV medications	0.5143	10.40	0.0121	0.025
Ostomy care	0.0272	12.94	0.1242	<0.001
Oxygen therapy	0.3486	10.61	0.0047	0.452
Tracheostomy care	0.0076	16.45	0.1853	<0.001

<b>Variable</b>	<b>Mean</b>	<b>Percent of Residents With Covariate who Triggered the Numerator</b>	<b>Coefficient</b>	<b>P-Value</b>
First assessment was for significant change in status	0.0346	11.05	0.0280	0.051
Rarely/never makes self understood by others	0.0226	11.15	-0.1661	<0.001
Acute change in mental status	0.0211	12.99	0.1963	<0.001
Rejected care for past 4–7 days	0.0110	14.24	0.2460	<0.001
Wandering once or more in the past week	0.0178	14.98	0.4801	<0.001
Walks in room indep/supervision/limited assistance	0.3344	9.99	0.0788	<0.001
Walks in corridor indep/supervision/limited assistance	0.3006	9.78	-0.0276	0.002
Wanders <i>and</i> walks in room or corridor indp/sprv/lmtd assistance	0.0104	14.77	-0.0577	0.083
Cancer	0.0699	10.41	0.0143	0.167
Seizure disorder or epilepsy	0.0741	12.59	0.0648	<0.001
Shortness of breath with exertion	0.1452	11.01	0.0662	<0.001
Shortness of breath when sitting at rest	0.0535	12.03	0.0997	<0.001
Choke/cough during meals or when swallowing medications	0.0188	11.03	0.0240	0.189
Parenteral/IV feeding	0.0099	12.82	0.1510	<0.001
Feeding tube	0.0378	16.41	0.3765	<0.001
Surgical wound	0.2626	10.03	0.0715	<0.001
Burn(s)	0.0016	12.15	0.1509	0.010
Anticoagulant received	0.3658	10.02	-0.0043	0.442
Antibiotic received	0.3909	11.09	0.1561	<0.001
Ventilator or respirator	0.0032	13.04	-0.4308	<0.001
Transfusion	0.0026	21.74	0.7650	<0.001
Speech Therapy	0.3652	10.94	0.0958	<0.001
Respiratory therapy	0.0576	10.30	-0.0955	<0.001
Constant	-	-	-2.3698	<0.001

## 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 = 0.561

Note: This model is based on all SNF stays with admission from a hospital between July 1, 2018 and June 30, 2019.

Charlson Condition	Coefficient	SE	P-Value
Myocardial infarction	0.1207	0.0080	<0.001
CHF	0.0205	0.0068	0.003
Peripheral vascular disease	0.0623	0.0080	<0.001
Cerebrovascular disease	0.0859	0.0083	<0.001
Dementia	0.0504	0.0069	<0.001
COPD	0.1357	0.0063	<0.001
Rheumatoid arthritis	0.0556	0.0130	<0.001
Ulcers	0.0942	0.0154	<0.001
Mild liver disease	0.2486	0.0130	<0.001
Diabetes mellitus	0.1108	0.0071	<0.001
Diabetes with sequelae	0.0953	0.0085	<0.001
Paralysis	0.1767	0.0130	<0.001
Chronic renal disease	0.1216	0.0074	<0.001
Cancer	0.0846	0.0113	<0.001
Moderate to severe liver disease	0.1216	0.0209	<0.001
<i>Metastatic cancer*</i>	<i>0.0181</i>	<i>0.0191</i>	<i>0.343</i>
HIV/AIDS	0.1339	0.0487	0.006
Intercept	-2.3660	0.0036	<0.001

## APPENDIX TABLE G

### Risk-Adjustment Model for Outpatient Emergency Department Visits per 1,000 Long-Stay Resident Days: Risk Variables and Coefficient Estimates

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

*Note:* This model is based on all days, between April 1, 2018 and March 31, 2019, 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 Outpatient ED Visits Among Those With Covariate	Coefficient	P-Value
Number of long-stay days in target period	241	-	0.016	<0.001
Number of long-stay days in target period, squared	75645	-	0.000	<0.001
White (ref)	0.821	0.38	-	-
Black	0.126	0.46	0.109	<0.001
Hispanic	0.019	0.41	0.032	0.047
Asian	0.015	0.29	-0.234	<0.001
Other race/ethnicity	0.015	0.42	0.045	0.013
Unknown race/ethnicity	0.004	0.39	-0.068	0.069
Female age 18–65	0.050	0.57	0.188	<0.001
Female age 65–69 (ref)	0.041	0.47	-	-
Female age 70–74	0.056	0.44	-0.024	0.081
Female age 75–79	0.075	0.40	-0.074	<0.001
Female age 80–84	0.105	0.38	-0.111	<0.001
Female age 85–89	0.136	0.34	-0.177	<0.001
Female age 9–94	0.124	0.30	-0.253	<0.001
Female age GT 94	0.072	0.26	-0.335	<0.001
Male age 18–65	0.061	0.55	0.147	<0.001
Male age 65–69	0.042	0.46	-0.009	0.547
Male age 70–74	0.045	0.44	-0.017	0.252

Variable	Mean	Mean Number of Outpatient ED Visits Among Those With Covariate	Coefficient	P-Value
Male age 75–79	0.047	0.43	-0.008	0.559
Male age 80–84	0.051	0.39	-0.051	<0.001
Male age 85–89	0.050	0.37	-0.074	<0.001
Male age 90–94	0.033	0.33	-0.130	<0.001
Male age GT 94	0.012	0.30	-0.159	<0.001
0 hospitalizations in prior year (ref)	0.495	0.33	-	-
1–3 hospitalizations in prior year	0.436	0.42	0.245	<0.001
4–6 hospitalizations in prior year	0.057	0.61	0.556	<0.001
7–9 hospitalizations in prior year	0.009	0.77	0.748	<0.001
10+ hospitalizations in prior year	0.002	1.14	1.118	<0.001
Long-stay outpatient ED visits-specific comorbidity index	0.067	-	4.013	<0.001
Entered nursing home from a psychiatric facility	0.024	0.47	0.030	0.031
Rarely/never makes self understood by others	0.071	0.33	0.068	<0.001
Rarely/never able to understand others	0.059	0.32	-0.093	<0.001
Moderate cognitive impairment	0.217	0.40	0.013	0.041
Severe cognitive impairment	0.283	0.35	-0.004	0.502
Staff assessed cognitive impairment	0.172	0.34	-0.030	<0.001
Cognitive status assessment missing	0.005	0.43	0.090	0.004
Rejected care for past 4–7 days	0.022	0.42	0.043	0.004
Wandering once or more in the past week	0.047	0.43	0.196	<0.001
Walks in room indep/supervision/limited assistance	0.341	0.44	0.182	<0.001
Shortness of breath with exertion	0.076	0.51	0.177	<0.001
Shortness of Breath when lying flat	0.067	0.49	0.031	0.001
End-stage prognosis	0.049	0.12	-0.276	<0.001
Internal bleeding	0.002	0.47	0.119	0.012
Surgical wound	0.025	0.44	-0.023	0.109
Respiratory failure	0.036	0.50	-0.035	0.007
Antibiotic received	0.128	0.47	0.155	<0.001
Diuretic received	0.342	0.42	0.082	<0.001

<b>Variable</b>	<b>Mean</b>	<b>Mean Number of Outpatient ED Visits Among Those With Covariate</b>	<b>Coefficient</b>	<b>P-Value</b>
Chemotherapy for cancer	0.005	0.37	-0.063	0.060
Radiation for cancer	0.001	0.47	0.087	0.321
Oxygen therapy	0.132	0.47	0.104	<0.001
IV medications	0.015	0.53	0.054	0.002
Transfusion	0.001	0.57	0.346	<0.001
Hospice care after nursing home admission	0.060	0.11	-0.824	<0.001
Speech therapy	0.104	0.43	0.061	<0.001
Respiratory therapy	0.039	0.47	-0.016	0.173
Tracheostomy care	0.010	0.59	0.256	<0.001
Ventilator or respirator	0.005	0.48	-0.418	<0.001
Septicemia	0.011	0.50	0.026	0.195
Cerebrovascular accident , transient ischemic attack, or stroke	0.117	0.43	0.062	<0.001
Quadriplegia	0.007	0.63	0.178	<0.001
Multiple Sclerosis	0.014	0.44	-0.109	<0.001
Parkinson's disease	0.067	0.41	0.110	<0.001
Gastroesophageal reflux disease (GERD) or ulcer	0.095	0.44	0.150	<0.001
Neurogenic bladder	0.035	0.56	0.232	<0.001
Cancer	0.017	0.32	-0.053	0.005
Constant	-	-	-3.256	<0.001

## APPENDIX TABLE H

### Coefficient Estimates for Outpatient Emergency Department Visits per 1,000 Long-Stay Resident Days, Resident-Level Comorbidity Index

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

*Note:* This model is based on all days, between April 1, 2018 and March 31, 2019, that residents were in the nursing home after they attained long-term resident status (i.e., after 100 cumulative days in the facility).

\* Coefficients with p-value greater than 0.05 excluded from the comorbidity construct, as are coefficients for the number of long-stay days.

<b>Charlson Condition</b>	<b>Coefficient</b>	<b>SE</b>	<b>P-Value</b>
Myocardial infarction	0.0850	0.0097	<0.001
CHF	0.1107	0.0073	<0.001
Peripheral vascular disease	0.0657	0.0095	<0.001
Cerebrovascular disease	0.0724	0.0081	<0.001
Dementia	0.0414	0.0057	<0.001
COPD	0.2586	0.0068	<0.001
Rheumatoid arthritis	0.0524	0.0168	0.002
Ulcers	0.0750	0.0189	<0.001
Mild liver disease	0.1997	0.0175	<0.001
Diabetes mellitus	0.1869	0.0073	<0.001
Diabetes with sequelae	0.1596	0.0093	<0.001
Paralysis	0.2159	0.0118	<0.001
Chronic renal disease	0.1489	0.0080	<0.001
<i>Cancer*</i>	<i>0.0117</i>	<i>0.0164</i>	<i>0.479</i>
Moderate to severe liver disease	0.1804	0.0312	<0.001
<i>Metastatic cancer*</i>	<i>-0.0608</i>	<i>0.0329</i>	<i>0.065</i>
HIV/AIDS	0.1531	0.0590	0.009
<i>Number of long-stay days in target period*</i>	<i>0.0162</i>	<i>0.0001</i>	<i>&lt;0.001</i>
<i>Number of long-stay days in target period, squared*</i>	<i>0.0000</i>	<i>0.0000</i>	<i>&lt;0.001</i>
Intercept	-2.9954	0.0108	<0.001