

Supplemental Materials

Table S1. ICD-10 diagnosis and procedure codes for pneumonia and relevant comorbidities

Diagnosis/Procedure		ICD-10 code type	ICD-10-CM/ICD-10-PCS codes
Pneumonia		ICD-10-CM	J09X1, J100, J1000, J1001, J1008, J110, J1100, J1108, J120, J121, J122, J123, J1281, J1282, J1289, J129, J13, J14, J15, J16, J17, J18, A221, A3701, A3711, A3781, A3791, A481, B250, B440, B7781
Severe pneumonia	Respiratory failure	ICD-10-CM	Newborn: P220, P285, P2881 Pediatric: J96, J80, R0603
	Sepsis	ICD-10-CM	A40, A41, R651, R6511, R6520, R6521
	Mechanical ventilation	ICD-10-PCS	5A09357, 5A09457, 5A09557, 5A1935Z, 5A1945Z, 5A1955Z
	Dependence on supplemental oxygen, long-term	ICD-10-CM	Z9981
	Respiratory intubation	ICD-10-CM	09HN7BZ, 09HN8BZ, 0BH13EZ, 0BH17EZ, 0BH18EZ, 0CHY7BZ, 0CHY8BZ, 0DH57BZ, 0DH58BZ, 0WHQ73Z, 0WHQ7YZ
Asthma		ICD-10-CM	J45
Acute bronchitis/bronchiolitis		ICD-10-CM	J20, J21
Cancer (any type)		ICD-10-CM	C00-C96
Chronic pulmonary disease		ICD-10-CM	J410, J411, J418, J42, J430, J431, J432, J438, J439, J440, J441, J449, J4520, J4521, J4522, J4530, J4531, J4532, J4540, J4541, J4542, J4550, J4551, J4552, J45901, J45902, J45909, J45990, J45991, J45998, J470, J471, J479, J60, J61, J620, J628, J630, J631, J632, J633, J634, J635, J636, J64, J65, J660, J661, J662, J668, J670, J671, J672, J673, J674, J675, J676, J677, J678, J679, J684, J701, J703
Cystic fibrosis		ICD-10-CM	E84
Sickle cell disease (SCD)		ICD-10-CM	D5700, D5701, D5702, D5703, D5709, D571, D5720, D57211, D57212, D57213, D57218, D57219, D5740, D57411, D57412, D57413, D57418, D57419, D5742, D57431, D57432, D57433, D57438, D57439, D5744, D57451, D57452, D57453, D57458, D57459, D5780, D57811, D57812, D57813, D57818, D57819

Table S2. Sensitivity analysis 1 – Risk factors associated with 30-day pneumonia-specific readmission for pediatric pneumonia

Covariate	Adjusted Odds Ratio (95% CI)
Severe pneumonia	1.48 (1.16, 1.86)*
Age group	
< 1 year	Reference
1-4 years	0.87 (0.61, 1.22)
5-12 years	0.95 (0.66, 1.38)
13-17 years	1.23 (0.80, 1.90)
Female	1.27 (1.03, 1.58)*
Expected primary payer	
Private insurance	Reference
Medicare	0.55 (0.08, 3.99)
Medicaid	1.15 (0.91, 1.45)
Self-pay	1.64 (0.24, 1.76)
No charge	1.50 (0.82, 2.75)
Length of stay	1.01 (0.99, 1.04)
Daily cost	
0-25th percentile	Reference
26th-50th percentile (median)	0.90 (0.65, 1.23)
51st-75th percentile	0.99 (0.72, 1.35)
76th-100th percentile	0.83 (0.59, 1.15)
Asthma	0.83 (0.66, 1.06)
Cancer, any type	1.40 (0.57, 3.48)
Cystic fibrosis	1.50 (0.82, 2.73)
Sickle cell disease	1.68 (0.78, 3.61)
Hospital size	
Small	Reference
Medium	1.26 (0.87, 1.84)
Large	1.00 (0.72, 1.40)
Hospital teaching status	
Non-metropolitan hospital	Reference
Metropolitan non-teaching	0.51 (0.26, 1.00)
Metropolitan teaching	0.92 (0.59, 1.44)
Hospital case volume	
0-25th percentile	Reference
26th-50th percentile (median)	1.37 (0.94, 2.00)
51st-75th percentile	1.61 (1.09, 2.38)*
76th-100th percentile	2.03 (1.38, 2.99)*

*Odds ratio is statistically significant

Table S3. Sensitivity analysis 2 – Risk factors associated with 30-day all-cause readmission for pediatric pneumonia using HCUP severity class

Covariate	Adjusted Odds Ratio (95% CI)
HCUP severity class	
Minor loss of function	Reference
Moderate loss of function	1.75 (1.42, 2.14)*
Major loss of function	3.92 (3.18, 4.83)*
Extreme loss of function	5.48 (4.31, 6.98)*
Age group	
< 1 year	Reference
1-4 years	0.83 (0.68, 1.00)
5-12 years	0.83 (0.68, 1.02)
13-17 years	1.06 (0.84, 1.33)
Female	1.02 (0.91, 1.15)
Expected primary payer	
Private insurance	Reference
Medicare	1.89 (1.02, 3.42)*
Medicaid	1.15 (1.01, 1.31)*
Self-pay	0.44 (0.22, 0.86)*
No charge	1.29 (0.90, 1.84)
Length of stay	1.01 (1.00, 1.03)
Daily cost	
0-25th percentile	Reference
26th-50th percentile (median)	1.04 (0.86, 1.26)
51st-75th percentile	1.09 (0.91, 1.32)
76th-100th percentile	1.06 (0.87, 1.28)
Asthma	0.76 (0.66, 0.86)*
Cancer, any type	3.93 (2.79, 5.52)*
Cystic fibrosis	0.66 (0.47, 0.93)*
Sickle cell disease	1.87 (1.26, 2.78)*
Hospital size	
Small	Reference
Medium	0.99 (0.80, 1.23)
Large	1.04 (0.87, 1.25)
Hospital teaching status	
Non-metropolitan hospital	Reference
Metropolitan non-teaching	0.77 (0.52, 1.14)
Metropolitan teaching	1.20 (0.90, 1.60)
Hospital case volume	
0-25th percentile	Reference
26th-50th percentile (median)	1.26 (1.02, 1.55)*
51st-75th percentile	1.26 (1.02, 1.57)*
76th-100th percentile	1.28 (1.03, 1.58)*

*Odds ratio is statistically significant