**Supplemental Materials**

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

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| --- | --- | --- | --- |
| **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** |  |
| 0-2 years | Reference |
| 3-7 years | 0.97 (0.75, 1.26) |
| 8-12 years | 1.04 (0.74, 1.45) |
| 13-17 years | 1.34 (0.94, 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 | 1.76 (1.43, 2.15)\* |
| Major loss of function | 3.93 (3.19, 4.85)\* |
| Extreme loss of function | 5.53 (4.35, 7.04)\* |
| **Age group** |  |
| 0-2 years | Reference |
| 3-7 years | 0.86 (0.74, 1.00) |
| 8-12 years | 0.91 (0.76, 1.10) |
| 13-17 years | 1.15 (0.95, 1.39) |
| **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