**Supplemental Digital Content 1.**  Consort diagram

**Supplemental Digital Content 2.** ICD-10 CM codes for SARS-CoV-2 sequelae by condition category and subcategory

|  |  |  |
| --- | --- | --- |
| Category | Subcategory\* | ICD-10 codes |
| Cardiovascular | - | i10, i15, i25, i28, i30, i31, i34, i35, i36, i37, i40, i42, i44, i45, i47, i49, i50, i51, i52, i95, r00, r01, r07 |
| Cardiovascular | cardiac dysrhythmias | i49, i47, r00 |
| Cardiovascular | heart valve disorders | i34, r01, i35, i36, i37 |
| Cardiovascular | Other and ill-defined heart disease | i517, i519, i2541, i5181, i5189, i52 |
| Cardiovascular | peri- and myocarditis | i31, i42, i30, i40, b3322, i514 |
| Endocrinology | - | e03, e06, e88, r73 |
| Endocrinology | Other nutritional; endocrine; and metabolic disorders | e881, r63, e8809, e8840, e8881, r62 |
| ENT | - | h65, h66, h69, h73, j03 |
| Gastrointestinal | - | a41, a68, b08, b19, b34, b35, b94, b97, b99, i73, i77, i80, i82, i87, i88, i99, k20, k22, k29, k30, k31, k35, k37, k52, k55, k56, k59, k63, k64, k65, k73, k75, k76, k80, k82, k83, k85, k86, k92, r03, r10, r11, r13, r16, r17, r18, r19, r53, r55, r57, r59, r74 |
| Gastrointestinal | abdominal pain | r10 |
| Gastrointestinal | other gastrointestinal disorders | r197, r1909, r1902, r161, r195, r198, r1900, r1901, k59, r13, k55, r18, k63 |
| Genitourinary | - | n45, n47, n50 |
| Hematologic | - | d59, d62, d63, d68, d69, d72, d73, d76, r70 |
| Infectious Disease | - | a08, b33, j09, j10, r50, u07, z11, z20 |
| Infectious Disease | fever of unknown origin | r509, r5081 |
| Infectious Disease | Immunizations and screening for infectious disease | z20, z11 |
| Infectious Disease | Other infections | b99, b94, a68 |
| Infectious Disease | viral infection | b97, b34, b338, b08, u07 |
| Infectious Disease | Contact with and (suspected) exposure to COVID-19 | z20 |
| Inflammatory | - | m30, m31, m33, m35, m36, m60, m67, m76, m79, r29, r65 |
| Inflammatory | Multisystem inflammatory syndrome | m3581, m3589 |
| Inflammatory | other connective tissue diseases | m358, m6281, m62421, m62422, m62122, m67, m6289, m62461, m357, m76, r252, m79, m60, m6282, r29, m62838 |
| Inflammatory | systemic lupus erythematosus | m359, m3501, m30, m33, m36, m31, m3500, m351 |
| Mental Health | - | f06, f29, f32, f33, f34, f39, f40, f41, f42, f43, f48, f51, f54, f98, f99, r45, r46 |
| Mental Health | anxiety disorders | r456, f4311, f4310, f4312, f41, r4582, r454, f40, f48, f430, f42 |
| Mental Health | mood disorders | f0630, f33, f39, f34, r4586, f32 |
| MSK | - | m19, m21, m24, m25, m53, m54, m62, m93, m94, m95, m99 |
| Mucocutaneous | - | k05, k08, k12, l03, l08, l25, l27, l30, l50, l72, l73, l81, l89, l90, l92, l95, l98, n76, n91, n92, n93, n94, r21, r22, r23 |
| Mucocutaneous | other skin disorders | l73, l90, l989, r238, l301, r239, l81, l72, r22, r21, l988, l92 |
| Neurologic | - | a87, g03, g04, g08, g24, g25, g43, g44, g47, g62, g89, g90, g93, h90, h91, h92, h93, i62, i63, i65, i67, r20, r25, r26, r27, r40, r41, r42, r43, r47, r48, r51, r56, r90, w18 |
| Neurologic | other nervous system disorder | r4189, g932, g935, g4720, r41841, g08, r251, r258, g9340, r41844, r47, g939, r27, r41840, g89, g62, r9082, r48, g930, g9349, r253, r43, r259, g9389, g909, r26, r20 |
| Ophthalmologic | - | b30, h00, h01, h02, h04, h10, h11, h15, h17, h35, h43, h44, h46, h47, h50, h53, h54, h57, r44 |
| Renal | - | -- |
| Respiratory | - | j00, j01, j02, j04, j05, j06, j12, j18, j20, j21, j30, j31, j32, j34, j38, j39, j43, j44, j45, j47, j69, j80, j81, j84, j90, j91, j93, j94, j96, j98, r04, r05, r06, r09, r49, r91 |
| Respiratory | asthma | j45 |
| Respiratory | other lower respiratory diseases | r91, r0683, j84, j989, r0602, r230, r063, r0600, r0902, r05, j988, j986, r093, r0682, j984, r0781, r069, r0609, r0689, r071, r0603, r042, j81, r0681, r062 |
| Respiratory | other upper respiratory diseases | r49, j302, r061, j3089, j38, j309, j39, j9801, j31, r0981, j34, j9809, j9859, j3081, r196, j301, j300, r070, r040 |
| Respiratory | other upper respiratory infections | j04, j32, j01, j05, j0301, j06, j00, j02, r0982 |
| Systemic | - | e16, e27, e43, e44, e46, e87, m04, r52, r60, r62, r63, r68, r69, r79, r83, r89, r93, r94 |
| Systemic | Other nutritional; endocrine; and metabolic disorders | e881, r63, e8809, e8840, e8881, r62 |
| Systemic | other screening for suspected conditions (not mental disorders or infectious diseases) | r79, r9081, r83, r9089, r94, r89, r93 |
| Systemic | residual codes; unclassified | r4182, r410, r411, r440, r52, g4731, r451, g4761, g478, r448, g4736, r6881, g4709, g4719, g4730, g4701, r443, g4710, g4700, g4733, r413, r60, r6889, r449, r404, g479, r450, r6883, r69, r419 |

Notes: If the ICD-10-CM diagnosis codes appeared as one of the first three diagnosis codes listed on any medical claim for a post-discharge visit then it was counted as a SARS-CoV2 sequelae.

\*Subcategories and their titles were mapped based on the AHRQ Clinical Classification Software (CCS) categories.

**Supplemental Digital Content 3.** Medical conditions associated with higher risk for severe COVID-19 illness\*

|  |
| --- |
| **Risk Factors** |
| Asthma |
| Cancer |
| Cerebrovascular Disease |
| Chronic Kidney Disease |
| Chronic obstructive pulmonary disease |
| Congenital Heart Disease |
| Down Syndrome |
| Genetic Disorders |
| Heart Conditions |
| Hypertension |
| Immunocompromised state |
| Inherited Metabolic Disorders |
| Liver Disease |
| Neurologic Disorders |
| Obesity |
| Sickle Cell Disease |
| Transplant |
| Type 1 Diabetes |
| Type 2 diabetes |

Notes: Measured using all available claims data in the 18 months prior to the hospital admission date

\* Adapted from Centers for Disease Control and Prevention (CDC) Accessed at [https://www.cdc.gov/coronavirus/2019-ncov/need-extra-precautions/people-with-medical-conditions.html on March 2](https://www.cdc.gov/coronavirus/2019-ncov/need-extra-precautions/people-with-medical-conditions.html%20on%20March%202), 2021.

**Supplemental Digital Content 4.** Sociodemographic characteristics of the final study sample compared to overall population and all children hospitalized with COVID-19 or MIS-C

|  |  |  |
| --- | --- | --- |
|  | All Children in Dataset | Final Study Sample: Children Hospitalized with COVID-19 or MIS-C in Dataset Meeting Continuous Enrollment Requirement |
| All Commercially Insured Children in Sample(N= 7,049,084) | Children hospitalized with COVID-19 and five months continuous enrollment pre-admission and post-discharge(N=372) | Children hospitalized with and five months continuous enrollment pre-admission and post-discharge MIS-C(N=183) |
| Age, Mean (SD) | 8.99 (5.17) | 11.10 (5.82) | 9.12 (4.62) |
| 0 - 4y | 1726723 (24.5%) | 82 (22.0%) | 32 (17.5%) |
| 5 - 11y | 2696640 (38.3%) | 71 (19.1%) | 92 (50.3%) |
| 12 - 17y | 2625721 (37.2%) | 219 (58.9%) | 59 (32.2%) |
| Gender |  |  |  |
| Female | 3448705 (48.9%) | 196 (52.7%) | 52 (38.4%) |
| Male | 3600379 (51.1%) | 176 (47.3%) | 131 (71.6%) |
| Region |  |  |  |
| Midwest | 1788752 (25.4%) | 102 (27.4%) | 71 (38.8%) |
| Northeast | 1015972 (14.4%) | 35 (9.4%) | 11 (6.0%) |
| South | 2736476 (38.8%) | 176 (47.3%) | 73 (39.9%) |
| West | 1506598 (21.4%) | 59 (15.9%) | 28 (15.3%) |
| Urban | 2451129 (34.8%) | 140 (37.6%) | 49 (26.8%) |
| Median annual household income by zip code [IQR] | $60,739 [$52,583 - $73,577] | $58,580[$52,017 - $72,004] | $58,580[$50,933 - $72,513] |
| Under $40,000, N (%)  | 195341 (2.8%) | 13 (3.5%) | 5 (2.7%) |
| $40,001- $60,000, N (%) | 3208829 (45.5%) | 192 (51.6%) | 94 (51.4%) |
| $60,001- $80,000, N (%) | 2402051 (34.1%) | 104 (28.0%) | 60 (32.8%) |
| Above $80,000, N (%) | 1242863 (17.6%) | 63 (16.9%) | 24 (13.1%) |

**Supplemental Digital Content 5.** Proportion of children hospitalized with COVID-19 and MIS-C with SARS-Cov2-related diagnoses codes, overall and for whom the diagnosis is new, and median time to final visit with the related diagnoses over 5 month follow-up post discharge.

|  |  |  |  |
| --- | --- | --- | --- |
| **Category** | **Subcategory\*** | **Children hospitalized with COVID-19****(N=372)** | **Children hospitalized with MIS-C****(N=183)** |
| **Proportion of children with diagnosis post-discharge****(%)** | **Proportion of children for whom the post-discharge diagnosis is new****(%)** | **Days to final visit with this code post-discharge, Median [IQR]** | **Proportion of children with diagnosis post-discharge****(%)** | **Proportion of children for whom the post-discharge diagnosis is new****(%)** | **Days to final visit with this code post-discharge, Median [IQR]** |
| **Cardiovascular** |  | 22.6% | 16.4% | 56 [33,93] | 49.7% | 49.2% | 44.5 [17.25,86.5] |
| Cardiovascular | Cardiac dysrhythmias | 8.1% | 6.2% | 19 [0,95] | 19.1% | 19.1% | 36 [12,76] |
| Cardiovascular | Heart valve disorders | 2.7% | 2.2% | 20.5 [0,76.75] | 14.8% | 14.2% | 33 [16.5,51] |
| Cardiovascular | Other and ill-defined heart disease | 3.0% | 2.7% | 42 [0,65.75] | 13.1% | 13.1% | 41 [13.75,64.25] |
| Cardiovascular | Peri- and myocarditis | 4.6% | 4.0% | 42 [11,60] | 16.9% | 16.9% | 46 [22.5,81.5] |
| **Endocrinology** | - | 4.0% | 2.0% | 56 [29.75,108.25] | 3.3% | 3.3% | 28 [14.25, 44] |
| Endocrinology | Other nutritional; endocrine; and metabolic disorders | 14.0% | 5.6% | 95.5 [1,134.5] | 0.0% | 0.0% | - |
| **ENT** | - | 7.0% | 5.0% | 92 [23.25,125.75] | 6.0% | 4.4% | 110.5 [62.25, 128.25] |
| **Gastrointestinal** | - | 39.2% | 19.9% | 67 [35,112] | 53.0% | 46.4% | 45 [18, 85] |
| Gastrointestinal | Abdominal pain | 12.6% | 8.9% | 35 [0,98.5] | 9.8% | 9.3% | 38 [10,61] |
| Gastrointestinal | Other gastrointestinal disorders | 14.8% | 9.1% | 20 [0,125] | 7.7% | 5.5% | 12 [7,16] |
| **Genitourinary** | - | 0.0% | 0.0% | 27 [27,27] | 0.0% | 0.0% | - |
| **Hematologic** | - | 8.0% | 5.0% | 63 [18.5,101.25] | 9.8% | 9.8% | 17 [7, 44.75] |
| **Infectious Disease** | - | 55.0% | 37.0% | 46 [13,117] | 73.8% | 47.5% | 43 [13, 103] |
| Infectious Disease | Fever of unknown origin | 13.4% | 9.9% | 12 [0,93] | 20.2% | 16.9% | 10 [1,39] |
| Infectious Disease | Immunizations and screening for infectious disease | 20.2% | 15.6% | 7 [0,69.5] | 7.1% | 4.4% | 0 [0,2] |
| Infectious Disease | Other infections | 1.9% | 1.9% | 103 [28.5,125.5] | 24.0% | 24.0% | 47.5 [26.75,88.75] |
| Infectious Disease | Viral infection | 40.1% | 36.3% | 15 [3,59] | 62.3% | 51.4% | 26 [8,51] |
| Infectious Disease | Contact with and (suspected) Exposure to COVID-19 | 12.9% | 12.6% | 98 [52,122] | 14.8% | 14.8% | 84.5 [56.5,116.75] |
| **Inflammatory** | - | 15.3% | 11.8% | 85 [44.5,134] | 85.8% | 83.1% | 61 [38.75, 105.25] |
| Inflammatory | Multisystem inflammatory syndrome | 1.6% | 1.6% | 70 [33.5,126] | 68.9% | 68.9% | 73 [41.25,109.75] |
| Inflammatory | Other connective tissue diseases | 14.2% | 9.1% | 72.5 [0,131.25] | 30.6% | 29.0% | 14 [5,34.5] |
| Inflammatory | Systemic lupus erythematosus | 3.8% | 3.8% | 56 [33,127] | 16.9% | 16.9% | 45 [18,52.5] |
| **Mental Health** | - | 28.0% | 8.1% | 99 [49.25,123.75] | 6.6% | 4.4% | 74 [31.5, 118.5] |
| Mental Health | Anxiety disorders | 19.6% | 8.3% | 101.5 [9.25,141] | 4.4% | 3.3% | 18 [0,115] |
| Mental Health | Mood disorders | 19.9% | 7.3% | 126 [51.5,146] | 1.6% | 1.6% | 18 [0,36] |
| **MSK** | - | 16.0% | 10.0% | 95 [41.5,130] | 13.1% | 9.3% | 48 [13, 109] |
| **Mucocutaneous** | - | 21.0% | 16.0% | 71 [23.75,115.75] | 13.7% | 12.0% | 51 [8.25, 132.5] |
| Mucocutaneous | Other skin disorders | 8.9% | 7.5% | 23 [0,78] | 10.4% | 9.3% | 37 [6,89] |
| **Neurologic** | - | 31.5% | 15.6% | 74 [32,112.75] | 10.9% | 10.9% | 21 [12.75, 101] |
| Neurologic | Other nervous system disorder | 12.1% | 7.3% | 44 [0,135] | 2.2% | 2.2% | 16 [3,20] |
| **Ophthalmologic** | - | 8.0% | 6.0% | 102 [55.5,132] | 4.9% | 3.8% | 41 [10, 76] |
| **Renal** | - | 5.0% | 3.0% | 49 [21.75,78.5] | 2.7% | 2.7% | 66 [4, 120] |
| **Respiratory** | - | 42.7% | 19.4% | 67.5 [32.5,117.75] | 37.2% | 26.2% | 77.5 [25, 117.25] |
| Respiratory | Asthma | 11.6% | 7.3% | 72 [40.75,125.75] | 3.8% | 3.8% | 13 [0,64.5] |
| Respiratory | Other lower respiratory diseases | 20.7% | 12.6% | 42 [0,111.5] | 14.8% | 13.7% | 9.5 [0,89] |
| Respiratory | Other upper respiratory diseases | 14.0% | 9.4% | 60 [0,104.75] | 8.7% | 7.7% | 28 [0,113] |
| Respiratory | Other upper respiratory infections | 13.7% | 8.3% | 12 [0,101.5] | 15.3% | 9.8% | 44.5 [0,117.75] |
| **Systemic** | - | 26.6% | 15.3% | 62 [23,129] | 35.0% | 32.2% | 37 [13.5, 74] |
| Systemic | Other nutritional; endocrine; and metabolic disorders | 14.0% | 5.6% | 95.5 [1,134.5] | 7.7% | 6.0% | 33 [14.25,72] |
| Systemic | Other screening for suspected conditions (not mental disorders or infectious disease) | 12.4% | 11.3% | 17 [0,55] | 27.3% | 27.3% | 26.5 [11,47] |
| Systemic | Residual codes; unclassified | 14.0% | 8.1% | 61 [6.5,124.5] | 2.7% | 2.7% | 30 [0,62] |

Notes: Only those subcategories shown where rate for either the COVID-19 or MIS-C group was at least 10 percent. The diagnoses on medical claims in the 5-month pre-admission period were used to assess whether sequelae were new diagnoses (i.e., not observed in the -5 months to -14 day period before admission).

\* Subcategories and their titles were mapped based on the AHRQ Clinical Classification Software (CCS) categories**.**