**Supplemental Material for “Deaths Associated with COVID-19 and MIS-C among Persons <21 Years in the US, February-July, 2020” by David W. McCormick, et al.**

**Supplementary Table 1.** Self-reported\* symptoms for all decedents stratified by multisystem inflammatory syndrome in children (MIS-C)† status (*n* = 90)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Overall** **(*n* = 90)** | **MIS-C****(n = 14)** | **Not MIS-C** **(*n* = 67)** |  |
|  | ***N*** | **%** | ***N*** | **%** | ***N*** | **%** | ***p*-value** |
| **Lower Respiratory** | **68** | **76%** | **11** | **79%** | **49** | **73%** | **1.00** |
|  Dyspnea | 50 | 56% | 6 | 43% | 36 | 54% | 0.83 |
|  Cough | 48 | 53% | 10 | 71% | 34 | 51% | 0.21 |
|  Influenza-like Illness | 7 | 8% | 3 | 21% | 4 | 6% | 0.0009 |
|  Wheezing | 5 | 6% | 2 | 14% | 4 | 5% | 0.12 |
| **Constitutional**  | **66** | **73%** | **14** | **100%** | **47** | **70%** | N/A\* |
|  Reported fever | 63 | 70% | 14 | 100% | 44 | 66% | N/A\* |
|  Fatigue | 19 | 21% | 2 | 14% | 17 | 25% | 0.17 |
|  Chills | 9 | 10% | 1 | 7% | 8 | 12% | 0.19 |
|  Sweats | 2 | 2% | 0 | 0% | 2 | 3% | 0.56 |
| **Gastrointestinal** | **46** | **51%** | **12** | **86%** | **30** | **45%** | **0.007** |
|  Nausea or Vomiting | 29 | 32% | 10 | 71% | 18 | 27% | 0.004 |
|  Diarrhea | 20 | 22% | 4 | 29% | 13 | 19% | 0.37 |
|  Loss of Appetite | 15 | 17% | 6 | 43% | 9 | 13% | 0.07 |
|  Abdominal Pain | 14 | 16% | 4 | 29% | 10 | 15% | 0.33 |
|  Dehydration | 11 | 12% | 6 | 43% | 2 | 3% | 0.0003 |
| **Neurologic** | **27** | **30%** | **6** | **43%** | **18** | **27%** | **0.23** |
|  Altered Mental Status | 13 | 14% | 4 | 29% | 6 | 9% | 0.04 |
|  Headache | 12 | 13% | 2 | 14% | 10 | 15% | 0.70 |
|  Seizures | 7 | 8% | 3 | 21% | 4 | 6% | 0.03 |
|  Loss of taste or smell | 2 | 2% | 0 | 0% | 2 | 3% | 1.00 |
| **Upper Respiratory** | **25** | **28%** | **7** | **50%** | **18** | **27%** | **0.09** |
|  Nasal Congestion | 14 | 16% | 5 | 36% | 9 | 13% | 0.01 |
|  Rhinorrhea | 14 | 16% | 3 | 21% | 11 | 16% | 0.06 |
|  Sore Throat | 8 | 9% | 1 | 7% | 7 | 10% | 0.11 |
|  Conjunctivitis | 1 | 1% | 0 | 0% | 1 | 1% | 0.43 |
| **Musculoskeletal** | **15** | **17%** | **3** | **21%** | **12** | **18%** | **0.72** |
|  Myalgia | 15 | 17% | 3 | 21% | 12 | 18% | 0.46 |
|  Neck Pain | 1 | 1% | 1 | 7% | 0 | 0% | 0.13 |
|  Arthritis | 1 | 1% | 0 | 0% | 1 | 1% | 0.45 |
| **Dermatologic** | **11** | **12%** | **5** | **36%** | **5** | **7%** | **0.004** |
|  Rash | 5 | 6% | 3 | 21% | 1 | 1% | 0.001 |
|  Cracked or Red Lips | 3 | 3% | 1 | 7% | 2 | 3% | 0.14 |
|  Swollen Hands/Feet | 3 | 3% | 1 | 7% | 2 | 3% | 0.05 |
|  Mucocutaneous Lesions | 2 | 2% | 2 | 14% | 0 | 0% | 0.004 |
| **Cardiovascular** | **8** | **9%** | **1** | **7%** | **6** | **9%** | **1.00** |
|  Chest Pain | 8 | 9% | 1 | 7% | 6 | 9% | 1.00 |
| **Immunologic** | **2** | **2%** | **0** | **0%** | **2** | **3%** | **1.00** |
|  Lymphadenopathy | 2 | 2% | 0 | 0% | 2 | 3% | 1.00 |

\* Caregivers could also report symptoms for the decedent.

† Cases met MIS-C criteria if they fulfilled the case definition published in the CDC Health Alert Network Health Advisory on May 14, 2020.17

**Supplementary Table 2.** Demographic characteristics comparing non-hospitalized and hospitalized persons

|  |  |  |
| --- | --- | --- |
|  | **Not Hospitalized (*n* = 41)** | **Hospitalized****(*n* = 69)** |
|  | ***N*** | **%** | ***N*** | **%** | ***p*-value** |
| **Gender**  |  |  |  |  |  |
|  Male | 25 | 61 | 45 | 65 | 0.65 |
|  Female | 16 | 39 | 24 | 35 |
| **Age in years (Median, Interquartile Range)** | 17, 9-19 |  | 16, 9-19 |  | 0.67 |
|  <1  | 5 | 12 | 3 | 4 | 0.20 |
|  1-4 | 5 | 12 | 5 | 7 |
|  5-9 | 2 | 5 | 10 | 15 |
|  10-13 | 2 | 5 | 10 | 15 |
|  14-17 | 8 | 20 | 12 | 17 |
|  18-20 | 19 | 46 | 29 | 42 |
| **Race/Ethnicity** |  |  |  |  |  |
|  White (non-Hispanic) | 8 | 20 | 6 | 9 | 0.14 |
|  Black, non-Hispanic | 13 | 32 | 18 | 26 |
|  Hispanic | 14 | 34 | 38 | 55 |
|  American Indian or Alaska Native (non-Hispanic) | 3 | 7 | 2 | 3 |
|  Asian or Pacific Islander (non-Hispanic) | 2 | 5 | 3 | 4 |
|  Other | 0 | 0 | 2 | 3 |
|  Unknown | 1 | 2 | 0 | 0 |
| **Geographic Region\*** |  |  |  |  |  |
|  Midwest | 6 | 15 | 7 | 10 | 0.71 |
|  Northeast | 11 | 27 | 23 | 33 |
|  South | 17 | 41 | 24 | 35 |
|  West | 7 | 17 | 15 | 22 |

\* Regions based on US Census Bureau regions (<https://www2.census.gov/geo/pdfs/maps-data/maps/reference/us_regdiv.pdf>). US territories assigned to Census regions based on their geographic proximity to states assigned to those regions and based on their assignment to standard federal regions (<https://www.gsa.gov/about-us/gsa-regions>).

**Supplementary Table 3.** Vital signs at the time of admission and initial laboratory studies for hospitalized patients from whom data were available (*n* = 53), stratified by age group

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **<1 year****(*n* = 2)** | **1-5 years****(*n* = 6)** | **6-12 years****(*n* = 13)** | **13-18 years****(*n* = 15)** | **>18 years****(*n* = 17)** |
|  | **Median, IQR** | **Median, IQR** | **Median, IQR** | **Median, IQR** | **Median, IQR** |
| **Vital Signs at Admission** |  |  |  |  |  |
|  Temperature (°F) | 101.5, 100-103 | 99.6, 98.6-101 | 100.6, 98.6-102.5 | 98.6, 98-100.5 | 100.8, 98.7-102.7 |
|  Febrile\* (*n*, %) | 1, 50% | 2, 33% | 6, 46% | 3, 20% | 8, 47% |
|  Heart Rate, beats per minute | 164, 161-167 | 143, 104-163 | 131, 108-147 | 122, 104-131 | 122, 103-133 |
|  Tachycardic† (*n*, %) | 0, 0% | 4, 67% | 8, 62% | 10, 67% | 15, 88% |
|  Respiratory Rate, breaths per minute | 65, 60-70 | 34, 28-35 | 25, 20-34 | 26, 24-32 | 20, 20-30 |
|  Tachypneic† (*n*, %) | 2, 100% | 1, 17% | 8, 62% | 10, 67% | 8, 47% |
|  Oxygen Saturation, percent | 87, 85-88 | 94, 91-96 | 92, 80-97 | 92, 87-97% | 96, 91-100 |
|  Hypoxemia‡ (*n*, %) | 1, 50% | 2, 33% | 5, 38% | 3, 20% | 5, 29% |
|  Body Mass Index, m/kg2 | -- | 14.8, 14.6-16.7 | 18.9, 16.3-19.9 | 35.2, 20.9-50.6 | 44.9, 29.7-55.4 |
|  Obesity† (*n*, %) | -- | 1, 17% | 4, 31% | 8, 53% | 12, 71% |

Abbreviation: IQR, interquartile range

\* Defined as temperature >100.4° Fahrenheit

† Based on age-adjusted ranges.

‡ Defined as <92% oxygen saturation on room air or supplemental oxygen requirement.

**Supplementary Table 4.** Laboratory studies at the time of admission and initial laboratory studies for hospitalized patients from whom data were available (*n* = 54), stratified by age group

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **<1 year****(*n* = 2)** | **1-5 years****(*n* = 6)** | **6-12 years****(*n* = 13)** | **13-18 years****(*n* = 14)** | **>18 years****(*n* = 19)** |
|  | **Median, IQR** | **Median, IQR** | **Median, IQR** | **Median, IQR** | **Median, IQR** |
| **Laboratory Studies at the Time of** **Admission** |  |  |  |  |  |
|  White Blood Cell Count (cells \* 109/mL) | 24.7, 20.8-28.5 | 10.6, 4.7-18.3 | 11.2, 6.9-14.8 | 11, 7-17.1 | 10.1, 6.2-15.4 |
|  Lymphopenia\* (*n*, %) | 1, 50% | 2, 33% | 7, 54% | 7, 50% | 10, 53% |
|  Neutropenia\* (*n*, %) | 1, 50% | 2, 33% | 6, 46% | 7, 50% | 6, 32% |
|  Hemoglobin (g/dL) | 10.2, 8.1-12.2 | 9.9, 6.8-10.7 | 12, 10.8-13 | 12.1, 10.9-13.4 | 14.1, 10.3-15.8 |
|  Anemia\* (*n*, %) | 2, 100% | 5, 83% | 12, 92% | 11, 79% | 14, 74% |
|  Platelets (100,000 cells/mL) | 344, 344-344 | 157, 78-235 | 128, 114-199 | 275, 206-384 | 222, 148-280 |
|  Thrombocytopenia\* (*n*, %) | 1, 50% | 2, 33% | 8, 89% | 7, 64% | 14, 82% |
|  Sodium (mEq/dL) | 136, 135-137 | 142, 141-144 | 139, 135-143 | 137, 132-138 | 135, 130-138 |
|  Potassium (mEq/dL) | 6.3, 5.7-6.8 | 3.6, 3.4-3.8 | 4.3, 3.9-4.8 | 4.2, 3.5-5.0 | 3.9, 3.6-4.4 |
|  Creatinine (mg/dL) | 0.3, 0.2-0.4 | 0.4, 0.3-0.8 | 0.6, 0.5-1.0 | 0.9, 0.8-3.3 | 1.1, 0.7-1.6 |
|  Glucose (mg/dL) | 70, 53-86 | 92, 76-163 | 126, 84-134 | 130, 97-214 | 133, 107-422 |
|  Albumin (g/dL) | 4.3, 4.3-4.3 | 3.1, 2.1-3.6 | 4.2, 2.8-4.5 | 3.7, 2.9-4.2 | 3.3, 3.0-3.9 |
|  Aspartate aminotransferase (U/L) | 23, 23-23 | 48, 33-249 | 44, 31-76 | 53, 41-113 | 86, 45-152 |
|  Alanine aminotransferase (U/L) | 11, 11-11 | 28, 17-88 | 34, 14-73 | 37, 19-62 | 49, 29-119 |
|  Total bilirubin (mg/dL) | 0.3, 0.3-0.3 | 0.4, 0.2-0.5 | 0.5, 0.3-0.8 | 0.4, 0.3-0.6 | 0.6, 0.4-0.7 |
|  Alkaline Phosphatase (IU/L) | 298, 298-298 | 146, 104-168 | 244, 132-292 | 78, 59-165 | 77, 52-113 |
|  LDH (U/L) | -- | -- | 474, 364-987 | 1193, 822-1564 | 618, 394-754 |
|  Elevated LDH\* (*n*, %) | -- | -- | 3, 23% | 2, 14% | 10, 53% |
|  ESR, mm/hr | -- | 19, 9-28 | 29, 19-38 | 50, 44-71 | 83, 83-83 |
|  Elevated ESR\* (*n*, %) | -- | 1, 17% | 2, 15% | 5, 36% | 1, 5% |
|  C-Reactive Protein (mg/L)  | 7, 7-7 | 4, 4-4 | 191, 97-230 | 163, 102-190 | 147, 136-221 |
|  Elevated C-Reactive Protein\* (*n*, %) | 1, 50% | 1, 50% | 4, 44% | 7, 64% | 9, 53% |
|  D-Dimer (mg/L) | -- | 10, 10-10 | 8.3, 3.5-8.8 | 3.4, 0.3-14.5 | 0.9, 0.8-25.3 |
|  Elevated D-Dimer\* (*n*, %) | -- | 1, 50% | 5, 56% | 5, 46% | 10, 59% |
|  Procalcitonin (ng/mL) | 0.1, 0.1-0.1 | 0.9, 0.9-0.9 | 4.8, 1.7-10.8 | 2.9, 1.5-4.3 | 6.2, 0.4-12 |
|  Elevated procalcitonin\* (*n*, %) | 0, 0% | 1, 50% | 4, 44% | 6, 55% | 7, 41% |
|  Ferritin (ng/mL) | -- | -- | 1172, 496-15242 | 594, 293-1130 | 1129, 614-20371 |
|  Elevated ferritin\* (*n*, %) | -- | -- | 4, 44% | 7, 64% | 10, 59% |
|  Interleukin-6 (pg/mL) | -- | -- | 79, 79-79 | 173, 52-684 | 52, 47-56 |
|  Elevated interleukin-6\* (*n*, %) | -- | -- | 1, 11% | 3, 27% | 2, 12% |
|  Lactate (mg/dL) | -- | 10.5, 10.5-10.5 | 1.8, 1.4-2.2 | 2.2, 1.0-4.0 | 2.2, 1.5-1.8 |
|  Elevated Lactate\* (*n*, %) | -- | 1, 50% | 0, 0% | 4, 36% | 3, 18% |

Abbreviations: IQR, interquartile range; ESR, erythrocyte sedimentation rate; LDH, lactate dehydrogenase

\* Based on age-adjusted ranges.



**Supplementary Figure 1.** Deaths associated with SARS-CoV-2 by week of death among persons <21 years of age, February 1-July 31, 2020.



**Supplementary Figure 2.** Frequency of the most common underlying medical conditions for all decedents.