



Demographic and Clinical Features of Multisystem Inflammatory Syndrome in Children (MIS-C) cases in North Carolina — March 3, 2020–April 3, 2021

<u>North Carolina MIS-C Cases Meeting CDC Case Definition as of April 3, 2021</u>	
Total NC MIS-C Cases Meeting Case Definition	152
Total NC MIS-C Deaths Meeting Case Definition	1

SUMMARY

- Cases occurred in children and adolescents between the ages of 0 and 19 years, with a median age of 9 years.
- 67.7% (103/152) of reported cases occurred in children who are Black, Non-Hispanic (61) or Hispanic (42).
- 52% (79/152) of reported cases were male.
- Duration of hospital stay was 1–35 days. The average duration of hospitalization was 7.2 days.
- 63.8% (97/152 cases) of reported cases were admitted to the ICU during their hospitalization.
- The average time between COVID-19 exposure or diagnosis and onset of MIS-C symptoms was 4.3 weeks (range: 0.3-9 weeks).

Clinicians should continue to consider MIS-C in children presenting with inflammatory syndromes and report suspected cases to NC DHHS using the [secure online submission form](#). It is important to remember that children may not have a known previous COVID-19 illness prior to presenting with MIS-C and that the time from initial COVID-19 illness to onset of MIS-C symptoms is longer than 4 weeks in many cases.

Background

Multisystem inflammatory syndrome in children (MIS-C) is a serious illness in children and adolescents that has been associated with infection with the SARS-CoV-2 virus, the virus that causes COVID-19. It was first identified in April 2020 by physicians in Europe and was subsequently identified in children in other countries including the United States. The syndrome causes symptoms similar to other inflammatory syndromes such as toxic shock syndrome and Kawasaki disease with children often presenting with fever and involvement of multiple organ systems including skin, cardiac, and gastrointestinal symptoms.

According to CDC, 3,185 cases and 36 deaths meeting MIS-C case definition have been reported from 48 states, New York City, Puerto Rico, and Washington, DC as of March 29, 2021. Most of the MIS-C cases reported were male (59%) and the median age was 9 years (range 0–20 years old). Two-thirds (63%) of cases reported occurred in Hispanic/Latino and non-Hispanic Black children. The most common signs and symptoms reported were abdominal pain, vomiting, skin rash, diarrhea, hypotension, and conjunctival injection.

In North Carolina, cases of MIS-C are reported to North Carolina Department of Health and Human Services, Division of Public Health (DPH) in three different ways:

1. Physicians directly report suspect cases to DPH
2. Public Health Epidemiologists in seven of the state's largest health systems report suspect cases to DPH
3. NC DETECT (North Carolina's statewide syndromic surveillance system) is used to identify potential MIS-C cases presenting to emergency departments.

A case of MIS-C is defined as:

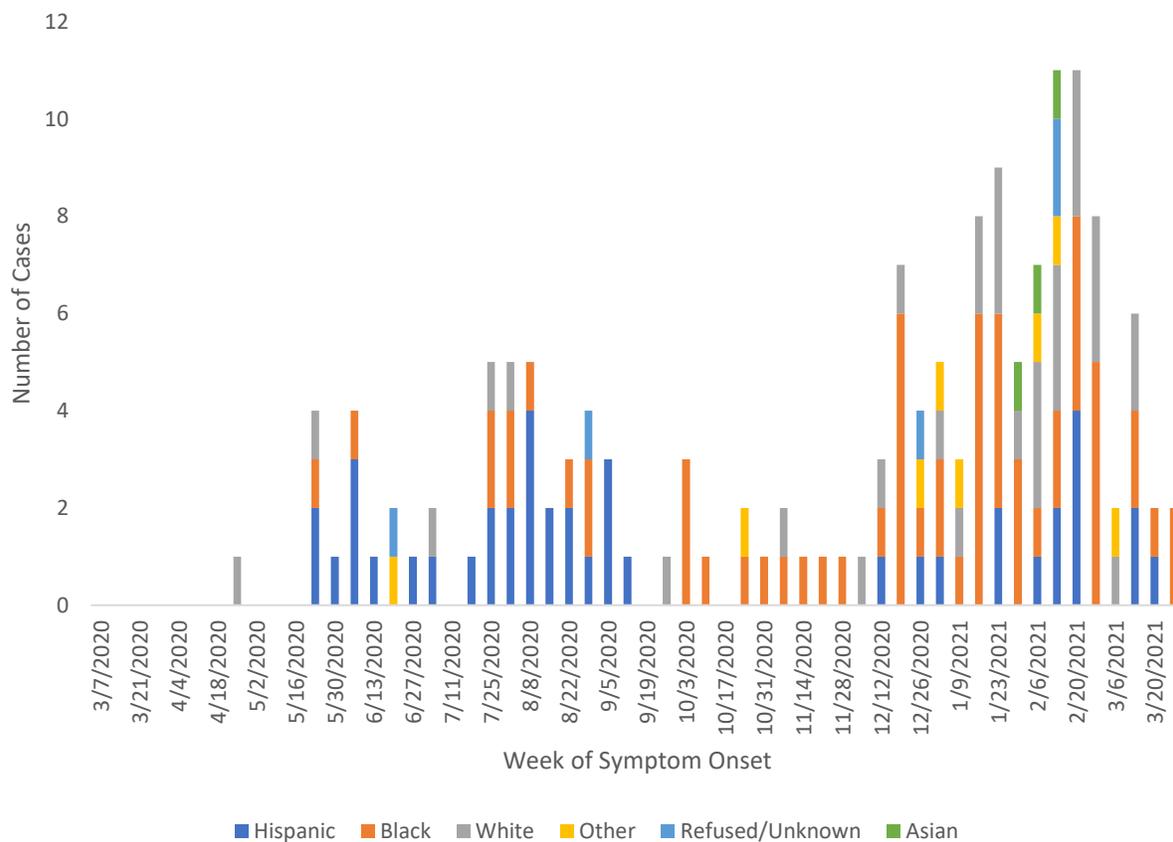
- An individual aged <21 years presenting with fever (>38.0°C or subjective fever for ≥24 hours), laboratory evidence of inflammation (including, but not limited to, one or more of the following: an elevated C-reactive protein (CRP), erythrocyte sedimentation rate (ESR), fibrinogen, procalcitonin, d-dimer, ferritin, lactic acid dehydrogenase (LDH), or interleukin 6 (IL-6), elevated neutrophils, reduced lymphocytes and low albumin) and evidence of clinically severe illness requiring hospitalization, with multisystem (>2) organ involvement (cardiac, renal, respiratory, hematologic, gastrointestinal, dermatologic or neurological); AND
- No alternative plausible diagnoses; AND
- Positive for current or recent SARS-CoV-2 infection by RT-PCR, serology, or antigen test; or COVID-19 exposure within the 4 weeks prior to the onset of symptoms

This report summarizes basic characteristics of MIS-C cases reported to NC DPH as of April 3, 2021.

Case Demographics

Race and Ethnicity

The majority of cases of MIS-C were in Hispanic and non-Hispanic Black children.

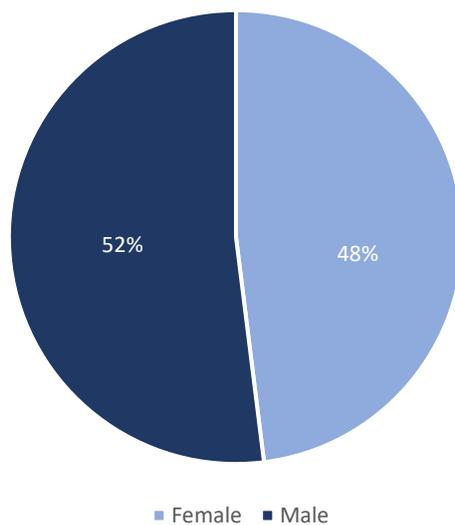


The graph above shows cases of MIS-C by week of symptom onset and race/ethnicity. In the first part of the pandemic, cases occurred primarily in Hispanic children, however, starting in October 2020 the trends shifted, and the majority of cases since then have occurred in non-Hispanic Black children. Overall, 40.1% of cases were in non-Hispanic Black children, 27.6% in Hispanic children, and 21.7% in non-Hispanic White children.

Nationally, as of March 29, 2021, 29% of cases have occurred in non-Hispanic Black children and 34% of cases have occurred in Hispanic children.¹

¹ <https://www.cdc.gov/mis-c/cases/index.html>

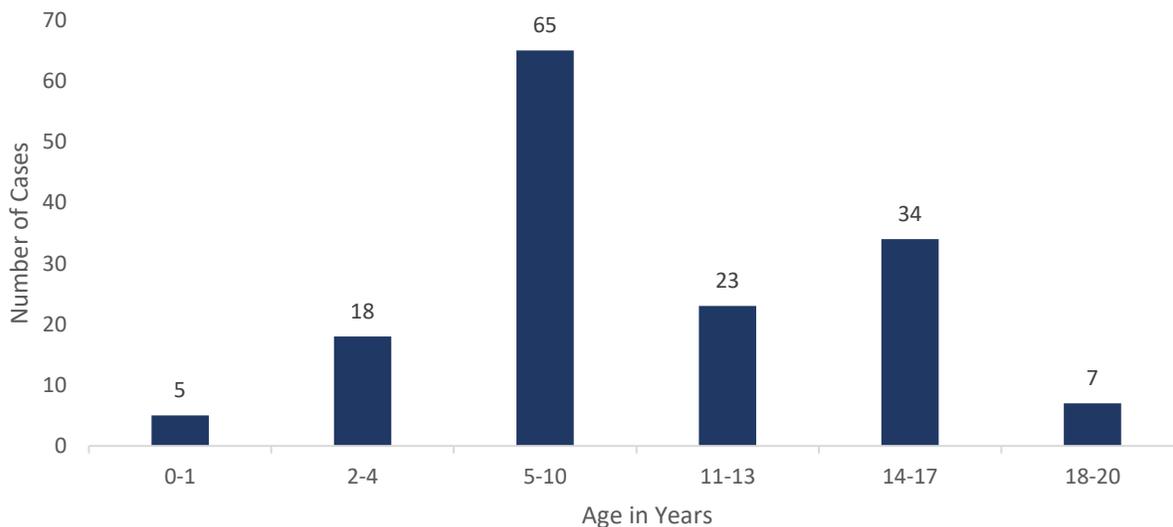
Gender



The majority of NC cases (52%) occurred in males.

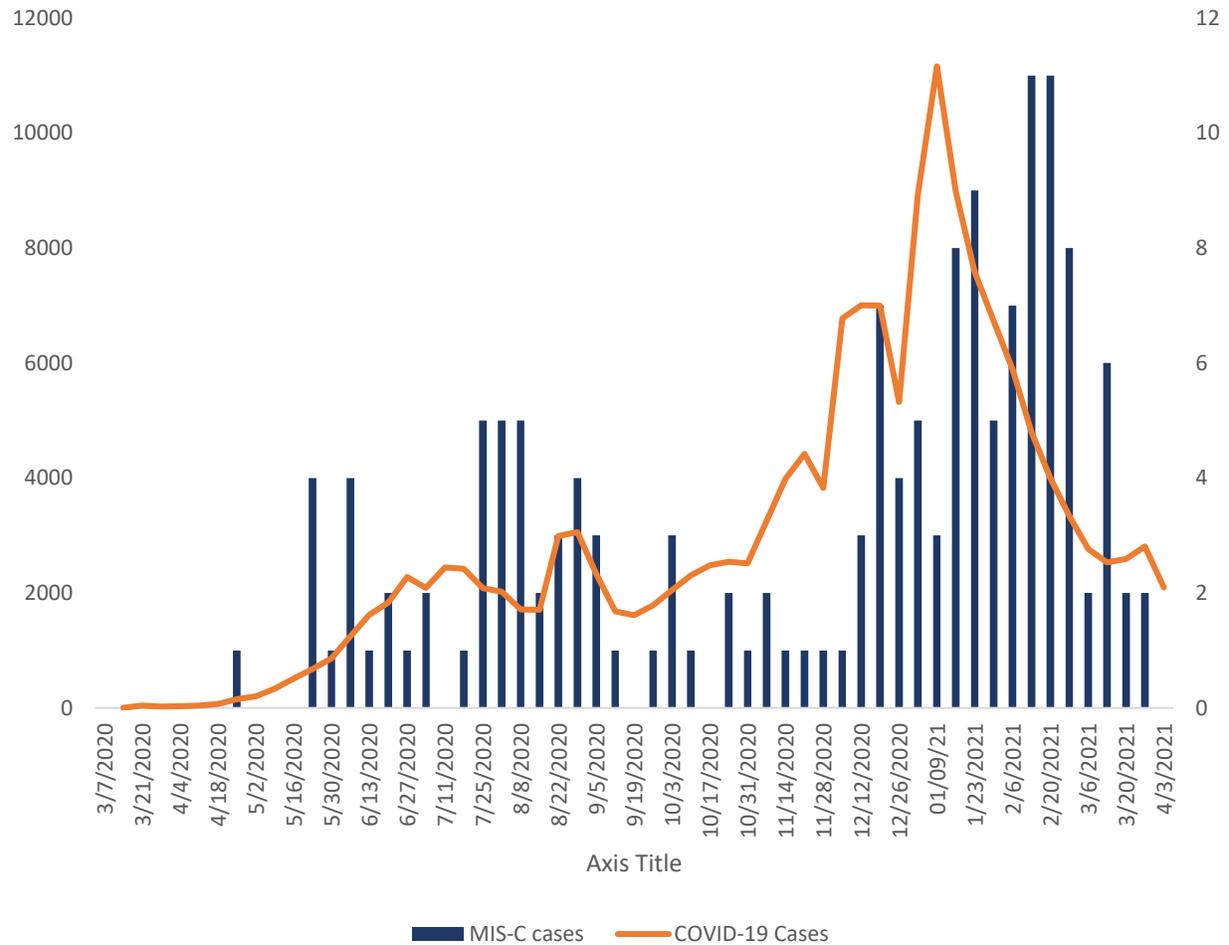
Nationally, as of March 29, 2021, the majority of cases (59%) occurred in males.

Age



MIS-C was most common in children aged 5-10 years (range: 0-19 years) with a median age of 9 years. Nationally, the median age of MIS-C cases was 9 years.

Clinical Presentation and Hospital Course

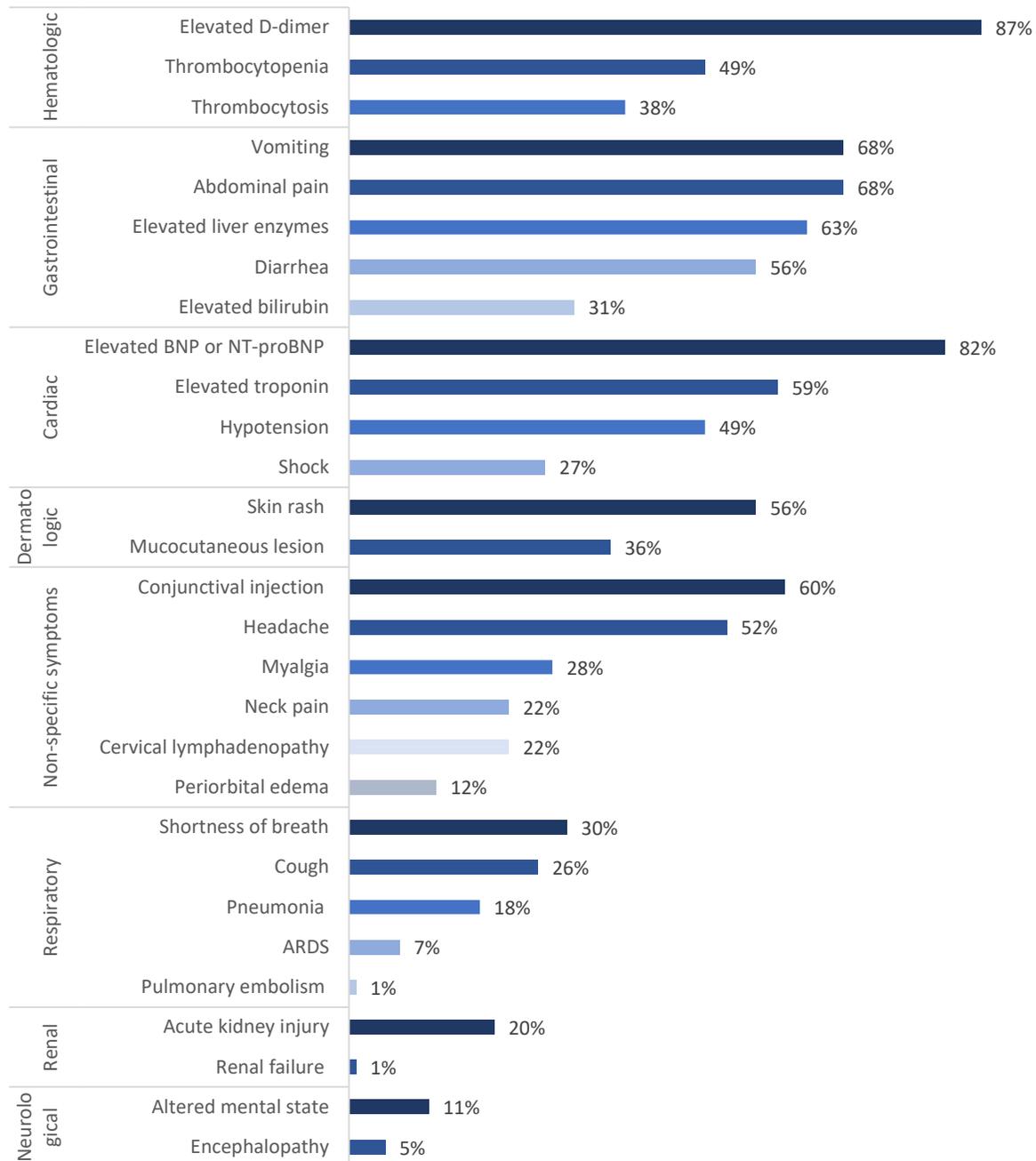


An increase in the number of cases of MIS-C were seen with the peaks of COVID-19 cases in July and December of 2020. The peak in MIS-C cases followed the peak in pediatric COVID-19 cases in both instances. The peak in pediatric cases in late August/early September was predominantly in college and university students and was not followed by an increase in MIS-C cases.

According to CDC guidelines, exposure to a suspected or confirmed COVID-19 case should occur within 2- 4 weeks prior to the onset of symptoms; however, in NC cases where date of initial COVID-19 exposure or diagnosis was established (N=75), the average time between COVID-19 exposure or diagnosis and onset of MIS-C symptoms was 4.3 weeks (range: 0.3–9 weeks).

The average length of hospital stay was 7.2 days (range: 1-35 days) with 97 patients (63.8%) requiring treatment in the intensive care unit (ICU).

Clinical and Laboratory Features

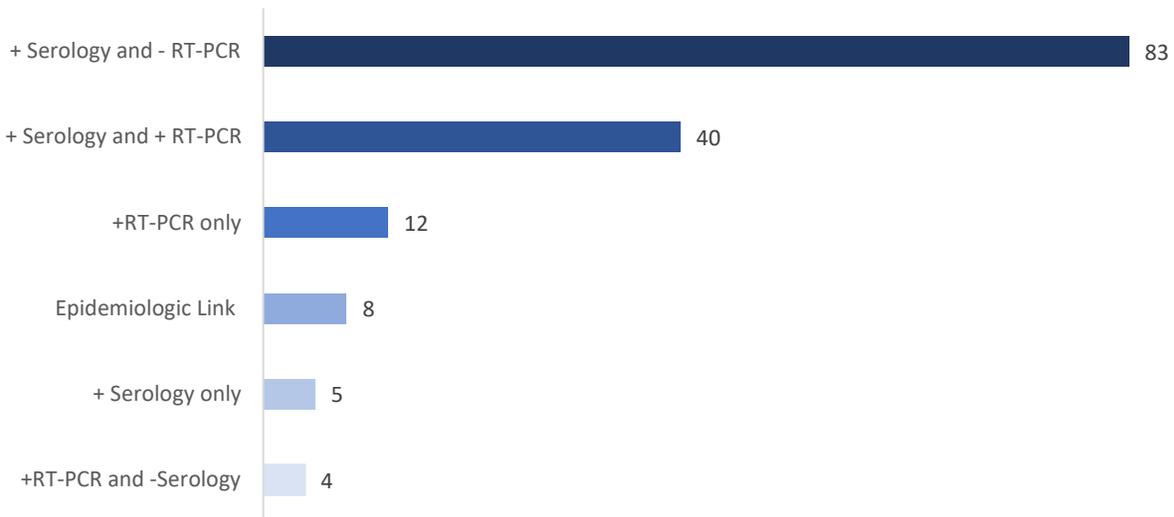


The chart above shows percentage of children presenting with each sign or symptom out of all reported MIS-C cases.

The most commonly involved organ systems on presentation were the hematologic, gastrointestinal and cardiac systems, followed by dermatologic and non-specific symptoms. Involvement of the respiratory, renal, and neurological systems were less common. Involvement of at least two organ systems is required for diagnosis of MIS-C.

SARS-CoV-2 Testing

At presentation, most patients with MIS-C had positive serology but negative RT-PCR testing



A total of 144 (94.7%) patients had positive SARS-CoV-2 test, 83 (54.6%) had only serologic evidence of disease, 40 (26.3%) had positive serology and RT-PCR results, and 8 (5.3%) had no laboratory evidence of SARS-CoV-2 infection but had a positive exposure history. Nationally, 99% of cases of MIS-C had laboratory evidence of SARS-CoV-2 infection, and 1% had a positive history of exposure with no laboratory evidence.

46 (43%) of the 107 (70.4%) cases for which data was available had a history of COVID-like illness 0.1-9.3 weeks before the onset of MIS-C symptoms.