



# Risk Factors Associated With Hospitalization due to COVID-19 Among Pediatric Patients With Asthma/Reactive Airway Disease: Preliminary Findings From A Multi-center Registry Across United States.

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## BACKGROUND

More data are needed to understand risk for COVID-19 severity among pediatric asthma patients. We present findings from a national registry characterizing COVID-19 hospitalizations among pediatric Asthma/Reactive Airway Disease (RAD) patients.

## OBJECTIVE

To characterize the clinical course and outcomes of COVID-19 among pediatric patients aged less than 21 years old with pre-existing Asthma/RAD in a national surveillance registry.

## METHODS

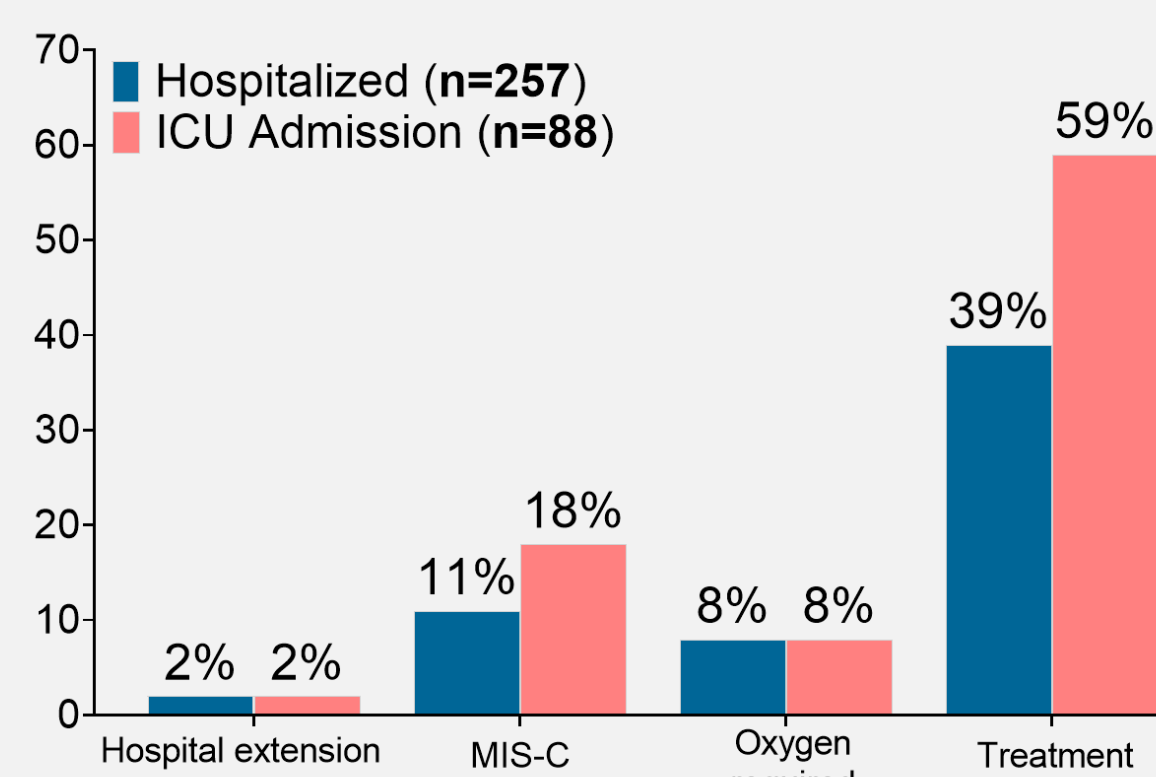
- Demographic, clinical and COVID-19-related data obtained from the Pediatric COVID-19 U.S. Registry.
- Among all cases submitted to the registry, 1,089 cases met study eligibility criteria:
  - Cases with pre-existing asthma or RAD diagnosis
  - Completed both Days +7 & +28 registry surveys
  - Immunocompromised and those with history of transplant were excluded
- Clinical characteristics were summarized descriptively. Chi-square tests ( $P=0.05$ ) were used to compare the COVID-19 clinical course and outcomes among patients with Asthma.

**13,141 Registry cases submitted to the COVID-19 U.S. Pediatric Registry**  
[www.pedscovid19registry.com](http://www.pedscovid19registry.com)

- Passive surveillance registry of laboratory confirmed pediatric (<21 years old) COVID-19 cases from May 2020 through April 2021 across U.S.
- Clinical information from 170 U.S. centers abstracted from medical records.
- Deidentified data submitted by clinicians or researchers via REDCap survey at Days +7 and +28 post-diagnosis.
- Cases eligible for the registry regardless of underlying conditions, hospitalization status, disease severity.

## RESULTS

**Figure 4: Clinical characteristics among COVID-19 cases hospitalized & admitted to the ICU.**



**Table 1: COVID-19 directed treatment, n(%)**

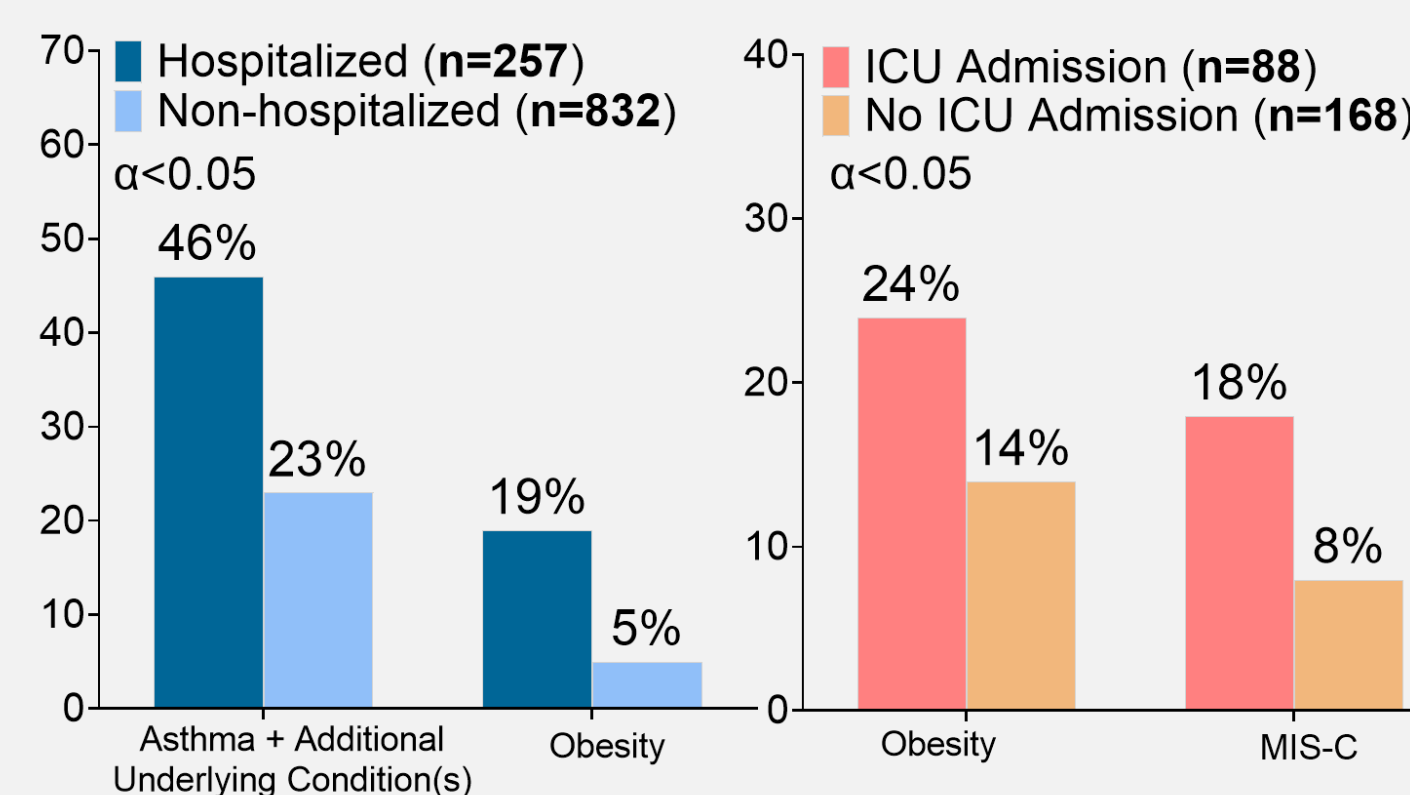
	Hospitalized, n=106	ICU admitted, n=52
Remdesivir	48(45)	35(67)
Azithromycin	26(25)	18(35)
IVIG	23(22)	18(35)
Hydroxychloroquine	17(16)	13(25)
Others	24(22)	22(42)

**Table 2: Top 5 reported COVID-19 complications, n(%)**

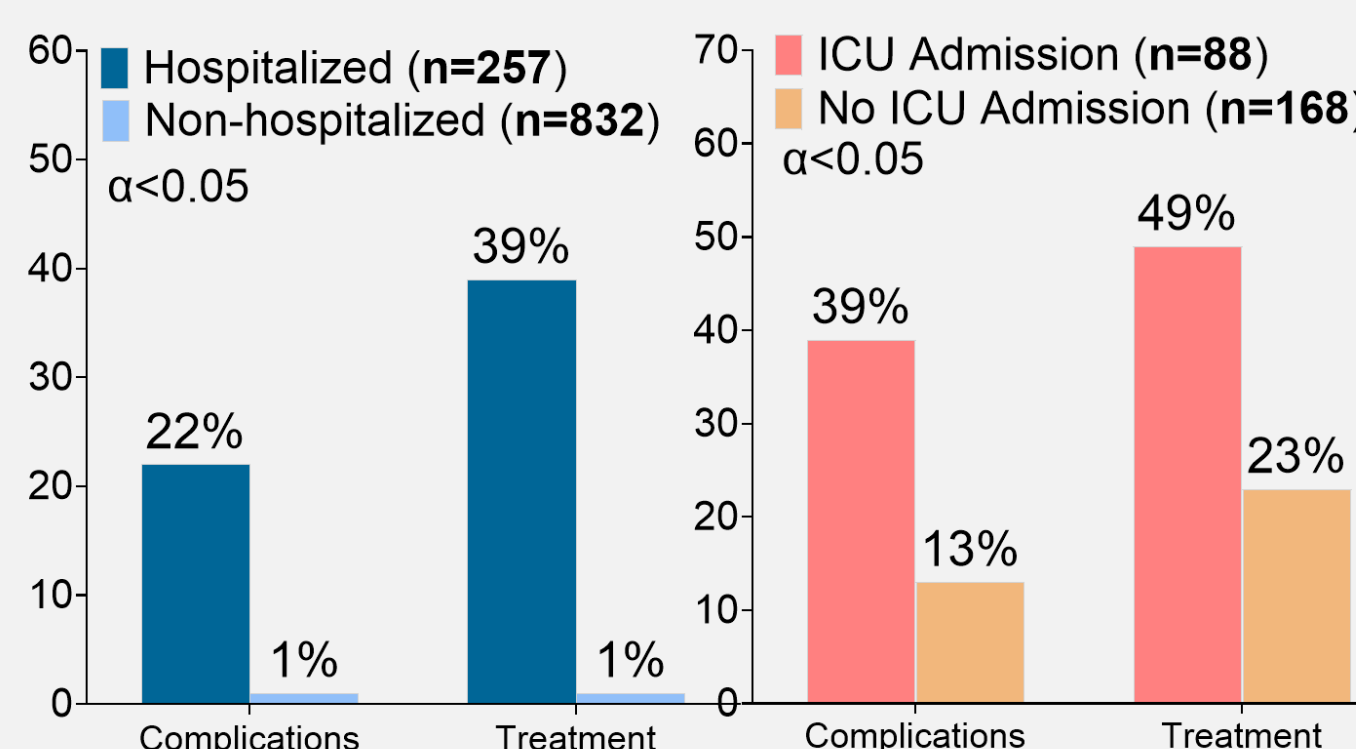
	Hospitalized, n=56	ICU admitted, n=34
Respiratory failure	10(18)	9(29)
Pneumonia	4(7)	3(9)
Status asthmaticus	2(4)	2(6)
Acute Chest Syndrome	3(5)	0(0)
Acute Kidney Injury	3(5)	2(6)

**Note:** MIS-C: Multisystem Inflammatory Syndrome in Children; Oxygen required: Required baseline oxygen prior to the onset of COVID-19; Treatment: Received COVID-19 directed therapy; Asthma + Additional Underlying Condition(s): Cases with conditions other than Asthma plus additional Underlying Conditions include Congenital pulmonary anomaly, Bronchopulmonary dysplasia, Cystic fibrosis, Tracheostomy dependence, Ventilator dependence, Pulmonary hypertension, Congenital cardiac disease, Cardiomyopathy, Lymphatic disorder, Cardiovascular disease, Hypertension, Coronary artery disease, Nephrotic syndrome, Chronic kidney disease, Dialysis dependence, Renal failure, G/J Tube dependence, TPN dependence, History of biliary atresia, History of SGS, Liver disease, Liver failure, Cirrhosis, Diabetes mellitus, Adrenal Insufficiency, Hypoxic-ischemic encephalopathy, Neurodegenerative disease, Seizure disorder, Sickle Cell Anemia, Hemophilia, Pregnancy)

**Figure 5: Risk factors significantly associated with hospitalization & ICU admission due to COVID-19.**

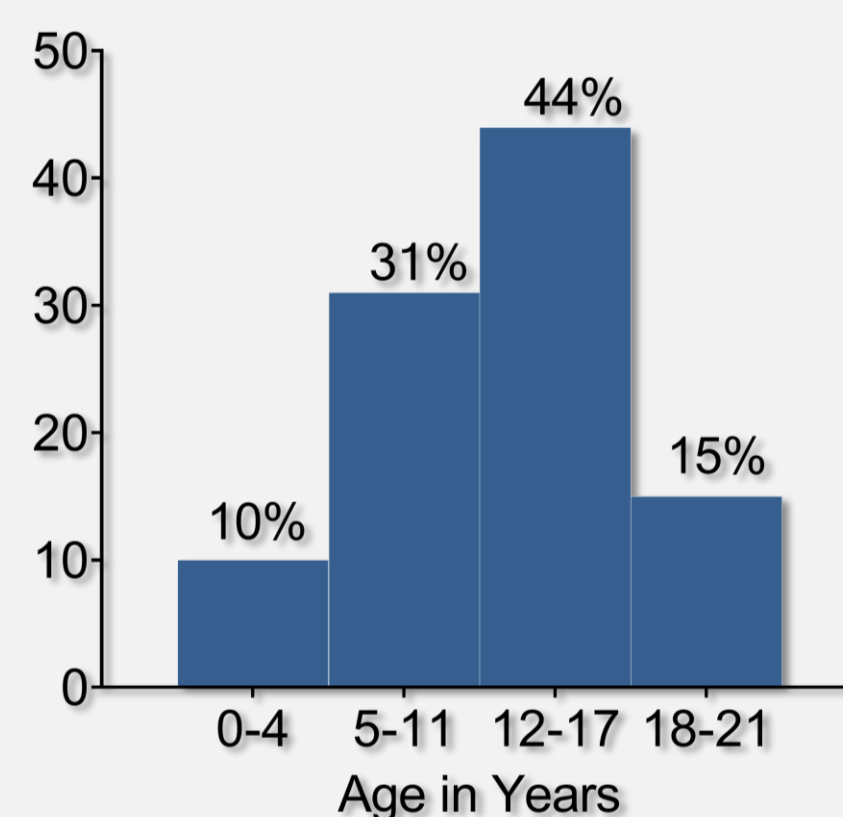


**Figure 6: Outcomes significantly associated with hospitalization & ICU admission due to COVID-19.**



## RESULTS

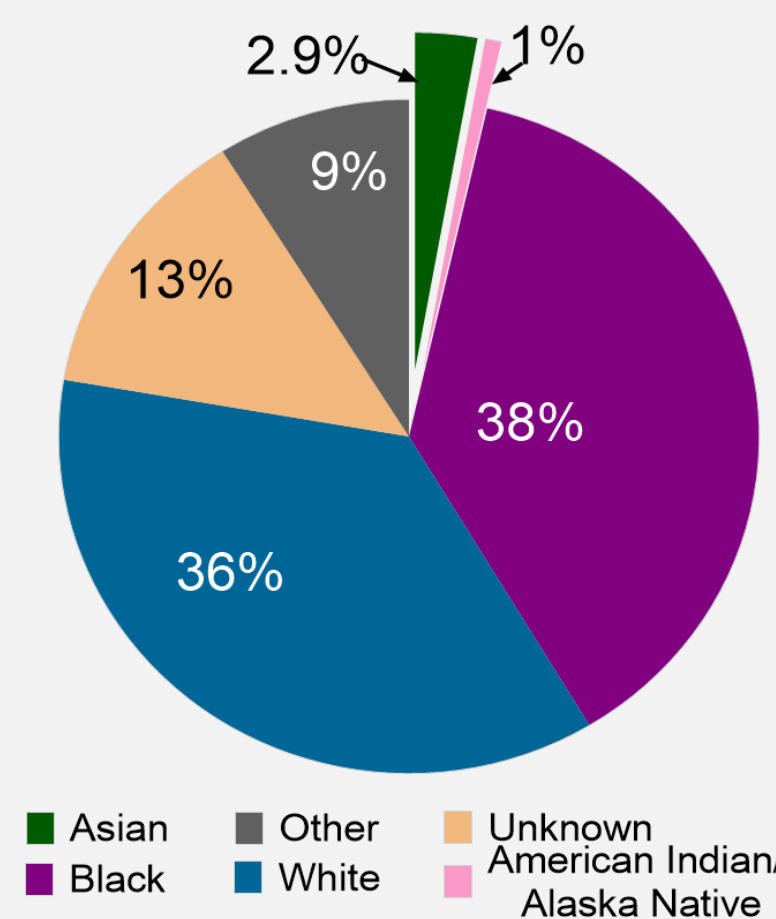
**Figure 1: Age**  
N=1089



**Figure 2: Sex**  
N=1089



**Figure 3: Race**  
N=1089



## LIMITATIONS

Voluntary surveillance data utilizing data abstracted from medical records. Missing information from medical records. Possible selection bias towards those with severe disease or from larger medical centers. Changing policies/guidelines, testing, and clinical care during the pandemic.

## CONCLUSIONS/FUTURE DIRECTIONS

This is one of the first national studies examining COVID-19 among pediatric cases with asthma/RAD. Our data suggest children with asthma/RAD who have multiple pre-existing conditions and/or are obese have a higher risk for COVID-19-related hospitalization. These early data may aid clinicians in developing future prospective studies to understand COVID-19 risk among this vulnerable population.