

# Risk factors associated with hospitalization and disease progression among adolescents presenting with symptomatic COVID-19

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## Background

- Most adolescents (age 12-17 years) with COVID-19 experience mild disease, but certain comorbidities may predispose to severe disease
- Adolescents with mild-to-moderate COVID-19 are eligible for monoclonal antibody therapy to prevent disease progression and hospitalization
- Identifying comorbidities associated with severe disease in adolescents would guide allocation of monoclonal antibody therapy to patients most likely to benefit

## Objective

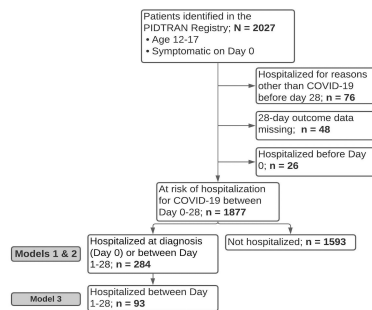
Evaluate the relationship between comorbidities and need for hospitalization in US adolescents presenting with mild-to-moderate symptomatic COVID-19

## Methods

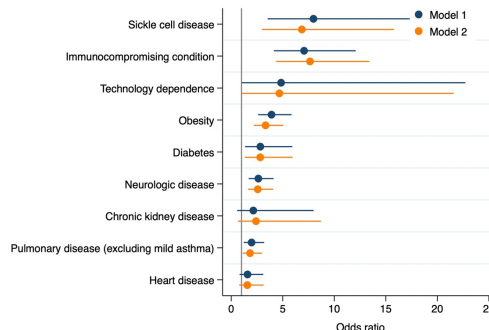
- Design:** Retrospective cohort study investigating associations between comorbidities and need for hospitalization within 28 days of COVID-19 diagnosis in adolescents (age 12-17 years)
- Data source:** The Pediatric COVID-19 U.S. Registry, a multicenter case series of US pediatric patients with COVID-19
- Data analysis:** Multivariable logistic regression
- Comorbidities assessed:** Obesity, chronic kidney disease (CKD), diabetes, immunosuppressive disease or treatment, sickle cell disease (SCD), heart disease, neurologic disease/neurodevelopmental disorders, medical-related technology dependence, and pulmonary disease (excluding mild asthma)

## Results

**Figure 1:** Diagram of included patients and models evaluated



**Figure 2.** Association between comorbidities and hospitalization



Model 1: adjusted for comorbidities  
 Model 2: adjusted for comorbidities and race/ethnicity  
 (White, non-Hispanic 37%; Hispanic 21%, Black, non-Hispanic 21%, Asian, non-Hispanic 2%; other, non-Hispanic 2%, missing 17%)

**Table 1** (Model 3): Associations between comorbidities and hospitalization status between day 1-28, adjusted for race/ethnicity

Comorbidity	Adjusted odds ratio
Immunocompromising condition	11.6 (5.6 – 23.5)
Sickle cell disease	7.9 (2.6 – 24.5)
Chronic kidney disease	5.2 (1.2 – 23.2)
Neurologic disease	3.8 (2.0 – 7.2)
Diabetes	3.3 (1.1 – 9.7)
Obesity	3.1 (1.6 – 6.1)
Technology dependence	2.1 (0.2 – 24.3)
Pulmonary disease (excluding mild asthma)	2.0 (0.9 – 4.2)
Heart disease	1.9 (0.7 – 4.8)

## Conclusions

- Immunocompromising conditions, SCD, technology dependence, obesity, diabetes, neurologic disease, and pulmonary disease (excluding mild asthma) were associated with hospitalization for symptomatic COVID-19
- The same conditions, with the exclusion of technology dependence and pulmonary disease (excluding mild asthma) and the addition of CKD, were associated with **progression to hospitalization on Day 1-28 after COVID-19 diagnosis**
- Adolescents with these comorbidities should be prioritized for consideration of treatment with monoclonal antibodies

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