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Adjudicating Reasons for Hospitalization Shows That Severe Illness From COVID-19 in Children Is Rare

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Kushner et al conducted an extensive chart review of 117 pediatric hospitalizations with a positive SARS-CoV-2 PCR from May 10, 2020 to February 10, 2021 at a quaternary care academic children's hospital in Northern California. Study authors used a set of pre-determined criteria to characterize each hospitalization as either "likely" or "unlikely" for COVID-19 disease. They found that 53 hospitalizations (45%) were *unlikely* to be due to disease caused by SARS-CoV-2. Rather, patients were hospitalized for a wide range of other diagnoses, including bacterial infections, scheduled surgical procedures, appendicitis, ingestions, anaphylaxis, and neurologic conditions. Of the 64 patients who were likely to have been hospitalized for COVID-19, 3 were asymptomatic and 27 had mild to moderate symptoms, with 20 characterized as either severe or critical (the remaining 14 were diagnosed with MIS-C).

Webb et al reviewed the charts of 146 children hospitalized with a positive SARS-CoV-2 PCR at another large children's hospital in California from May 1st, 2020 to September 30, 2020 (17 children with MIS-C were excluded from the analysis). Each hospitalization was characterized as either 1) "incidental" if describing patients who had no symptoms of COVID-19 and had an alternate diagnosis that led to admission; 2) "potentially symptomatic" describing patients with COVID-19 symptoms (fever, respiratory symptoms, GI symptoms) but who were primarily admitted for another reason and did not require any respiratory support; or 3) "significantly symptomatic" defined as patients with respiratory or cardiac symptoms consistent with COVID-19 disease and requiring respiratory or ICU level support. Of 146 non-MISC patients with a positive PCR, 40% were found to be incidentally infected, 47% were deemed "potentially symptomatic" and 14% were significantly symptomatic.

Notably, the percentage of hospitalized children with an incidental finding of a positive SARS-CoV-2 PCR was remarkably similar between the two studies (45% Matthew et al; 40% Webb et al). Further, the percent of children deemed with severe or critical COVID-19 in the Kushner et al study was close to percent of children deemed "significantly symptomatic" in Webb et al (17% versus 14%). Taken together, these studies underscore the importance of clearly distinguishing between children hospitalized *with* SARS-CoV-2 found on universal testing versus those hospitalized *for COVID-19* disease. Both demonstrate that reported hospitalization rates greatly overestimate the true burden of COVID-19 disease in children.

Collecting and publicizing accurate estimates of the impact of COVID-19 disease on children is critical for informing public policy and allowing parents to make informed decisions about risk. Despite abundant data showing low transmission of SARS-CoV-2 in educational settings,¹⁻³ many children remain in virtual learning, either because school districts have not provided an in-person option or because parents have opted to keep children at home.⁴ While some parents may be keeping children at home due to logistical challenges with hybrid models or a lack of after-care options, others are doing so out of fear that their children will be infected and fall seriously ill. This is concerning given the tremendous health risks that children and families face as a result of not attending in-person school, including worsening mental health for children and parents,^{5,6} lack of therapy and appropriate support for children with specialized learning needs,⁷

increased risk for obesity,⁸⁻¹⁰ and lower academic achievement^{11,12} leading to long-term detrimental impacts on quality of life and longevity.

Particularly as we are now in a phase where all adults have access to COVID-19 vaccines but children under the age of 12 do not, it is critical that the risks of COVID-19 to children be portrayed accurately and also contextualized in comparison to other common respiratory illnesses (i.e. influenza and RSV). Children have suffered tremendously due to policies that have kept schools and recreational facilities closed to them, and the burden has been greatest on children who are low-income and English language learners.^{4,11,12} Scientific and media reports that inaccurately portray the risk of COVID-19 to children can do harm by alarming parents and providing justification for ongoing restrictions to in-person education and other programming (i.e. summer camps). Kushner et al and Webb et al have contributed greatly to the field by careful work to understand the true burden of COVID-19 disease among children. Via these studies, parents and policy makers should be reassured that pediatric hospitalization for severe COVID-19 disease is indeed rare.

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