vaccination schedule, and caregivers concerned their child had COVID-19 at the time of survey completion.

In both influenza and future COVID-19 vaccines, and in both the international COVID-19 Parental Attitude Study sample and the one from Kuwait, prior immunization of children against influenza predicted willingness to vaccinate in the future. Although many parents are not planning to vaccinate their children (or themselves), others told us that they are eager to see approved COVID-19 vaccines, and were even willing to accept less rigorous testing and postresearch approval of a new inoculation.[2]

Vaccine hesitancy, the delay in acceptance and/or refusal of vaccination despite availability, is complex and crosses geographic locations and cultures. Convenience and confidence may contribute to a compromised ability to mitigate the rapid spread of COVID-19 and may amplify the deleterious effects on the "global village."

We agree with AlHajri et al that developing public health strategies to educate all parents with regard to the importance of vaccinating children (against influenza, COVID-19, and all other available vaccines), as well as increased parental knowledge on the safety of vaccines, are 2 critical steps in ensuring herd immunity during this pandemic. A global effort, by governments, healthcare providers, and country-specific public health offices, must take action to identify barriers to vaccinating, in order to establish a foundation on which we improve vaccination rates. This will allow our global community to move forward and enter the post-COVID era.

Data Statement

Data sharing statement available at www.jpeds.com.

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Pediatric acute respiratory distress syndrome associated with respiratory viruses

To the Editor:

A report of pediatric patients with severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection in New York City included 21 patients with pediatric acute respiratory distress syndrome (PARDS).[1] A diagnosis of PARDS mandates the presence of respiratory failure, defined as the use of positive pressure mechanical ventilation, either invasive or noninvasive. Therefore, it might be helpful to determine the incidence of PARDS in patients with respiratory failure and various respiratory viruses, as it is possible that specific viruses are more frequently associated with the development of PARDS.

Historical data for the incidence of PARDS in patients with respiratory failure and human metapneumovirus,[2] human rhinovirus/enterovirus,[3] pandemic 2009 H1N1 influenza A,[4] and respiratory syncytial virus[2] in New York City were compared with data for the SARS-CoV-2 in New York City[1] (**Table**). The proportion of patients with PARDS was not similar between viruses ($P < .0001$), and post-testing with the Bonferroni correction revealed that PARDS was more likely with SARS-CoV-2 vs either respiratory syncytial virus ($P < .0001$) or human rhinovirus/enterovirus ($P < .0001$). Assuming that no patient with SARS-CoV-2 treated with noninvasive ventilation alone was included in the PARDS severity stratification, the incidence of severe PARDS was similar between viruses ($P = .38$; human rhinovirus/enterovirus excluded as data not available).

Table. PARDS and respiratory viruses in New York City

	SARS-CoV-2	Human metapneumovirus[2]	Human rhinovirus/ enterovirus[3]	Pandemic 2009 H1N1 influenza A[4]*	Respiratory syncytial virus[2]
Patients with respiratory failure, n	27	32	97	28	107
Patients with PARDS, n (%)	21 (78)	13 (41)	22 (23)	12 (43)	33 (31)
Patients with severe PARDS, n (%)	5 (19)	5 (16)	Not available	6 (21)	11 (10)

*Historical data reviewed and PARDS classification determined by author.

This suggests that SARS-CoV-2 is associated with an increased risk of PARDS, but not severe PARDS, in children with respiratory failure compared with several other common respiratory viruses. Additional data could help better assess the impact and contribute to our understanding of the pathophysiology of respiratory virus infections in critically ill children.

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Reply

To the Editor:

The acute respiratory distress syndrome (ARDS) was originally described by Ashbaugh et al in 1967 as a syndrome of acute onset of tachypnea, hypoxemia, and loss of lung compliance.[1] In 2015, the Pediatric Acute Lung Injury Consensus Conference introduced a definition of ARDS specific for pediatric patients (PARDS) that includes invasive and noninvasive mechanical ventilation and uses invasive and noninvasive markers of oxygenation to diagnose and classify the severity of PARDS.[2]

Dr Baird astutely observes that in pediatric patients with respiratory failure because of infection with severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) (coronavirus disease 2019 [COVID-19]), the incidence of PARDS is significantly higher than previously reported for patients with respiratory syncytial virus, human metapneumovirus, human rhinovirus/enterovirus infections, and pandemic 2009 H1N1 influenza A. Baird points out further that the incidence of severe PARDS because of SARS-CoV-2 infection appears similar to that reported for human metapneumovirus, pandemic 2009 H1N1 influenza A, and respiratory syncytial virus.

The increased incidence of PARDS correlates with an increased intubation rate in COVID-19 that we observed compared with other respiratory viruses. We pointed out that this may be due, at least in part, to an early recommendation to limit use of noninvasive ventilation because of the risk of aerosolization of the virus. Thus, limited use of noninvasive positive pressure ventilation may have led to higher rates of endotracheal intubation and invasive mechanical ventilation, thus, explaining, to some extent, the higher rate of PARDS seen with COVID-19 compared with that observed with other viral infections.

Whether or not pulmonary infection with SARS-CoV-2 results in a unique or different pathophysiologic state than other respiratory viruses is yet to be elucidated. Relatively well preserved pulmonary compliance in COVID-19 ARDS has been reported by others[3,4] and observed by us. This high compliance type of ARDS may represent a very early stage or possible differences in the pathophysiology of ARDS in COVID-19 compared with that caused by other viral illnesses.

In addition, a substantial proportion of patients with PARDS in our study met criteria for severe sepsis and required vasoactive support, thus, indicating increased severity of illness. The presence of sepsis may be an additional risk factor for the development of PARDS and need for mechanical ventilation in this group, perhaps explaining the higher rate of PARDS in this cohort.

It is also worthy of note, though not explanatory, that the average age in our study cohort of patients who developed ARDS was 14 years, significantly higher than the average ages in the other virus studies noted by Baird, which were approximately 4-5 years.[5]

Although COVID-19 appears to confer a higher risk of PARDS in pediatric patients, mortality seems to be lower than that reported in the literature for PARDS of various etiologies; 28-day mortality in our cohort was 2.9%, whereas 90-day mortality in patients with PARDS has been reported at 17%.[6] Further characterization of the pathophysiology of PARDS in COVID-19 may help explain this difference in mortality. Longer term follow-up and larger sample size will be paramount to determining the true mortality and morbidity associated with development of PARDS in children with COVID-19.

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