

After the COVID-19 Pandemic Pediatric Respiratory Syncytial Virus Hospitalizations and Respiratory Support

Researchers examined the demographics, clinical outcomes, and respiratory support modes of children infected with [respiratory syncytial virus](#) (RSV) between 2017 and 2023.

RSV is the leading cause of pediatric hospitalizations due to respiratory complications of bronchiolitis, pneumonia, and apnea. Before the [coronavirus disease 2019](#) (COVID-19) pandemic, over two million children aged ≤ 5 in the United States (US) required medical care for RSV. However, pediatric RSV hospitalizations declined markedly during the pandemic but resurged in 2022. Emerging reports suggest a shift in the pediatric RSV demographic due to non-exposure to the virus in early life and altered virus seasonality during the pandemic.



Study

In the present study, researchers compared the clinical outcomes of RSV-infected children aged ≤ 5 pre- and post-COVID-19 pandemic. Patients from 48 children's hospitals participating in the US [Pediatric Health Information System](#) (PHIS) were evaluated. Patients with an RSV infection between July 2017 and June 2023 were identified from the PHIS database. Demographic details, such as age, sex, child opportunity index score, and race/ethnicity, were collected.

Clinical characteristics included hospital admission, service level (emergency, inpatient, or intensive care), and complex chronic conditions. Outcomes included length of stay (LOS), respiratory support, [extracorporeal membrane oxygenation](#) (ECMO), cardiopulmonary resuscitation (CPR), inhaled nitric oxide (iNO), and in-hospital death.

Respiratory support modes were queried for high-frequency nasal cannula (HFNC), [invasive mechanical ventilation](#) (IMV), non-invasive ventilation (NIV), and high-frequency ventilation (HFV). The RSV season was defined from July 1 to June 30. The pre-pandemic period included three RSV seasons before COVID-19 – 2017-18, 2018-19, and 2019-20.

The post-pandemic period was defined as 2022-23. Statistical differences were evaluated using the Cochran-Armitage or Pearson chi-squared test for categorical variables and the Kruskal-Wallis test for continuous variables. The Wilcoxon rank sum test compared pre-pandemic and post-pandemic RSV seasons. The total number of hospital, [intensive care](#), and respiratory support days was estimated.

Results

Overall, 288,816 pediatric patients presented to children's hospitals for RSV during the study period. The median age was 8.9 months; 55.2% were male and 42.2% were non-Hispanic White. There was a marked reduction in RSV infections in the early pandemic, with 82% fewer hospital presentations in 2020-21 than before the [pandemic](#).

However, RSV [infections](#) resurged significantly in 2022-23 compared to pre-pandemic seasons. During the post-pandemic seasons, RSV hospitalizations and intensive care admissions increased by 86.7% and 43.5%, respectively. Besides, the cumulative number of hospital and intensive care days was substantially higher in 2022-23 than the pre-pandemic seasonal mean.

RSV-infected children and those hospitalized for RSV in the post-pandemic season were older than in pre-pandemic seasons. In all seasons, hospitalized patients were younger than those discharged from the [emergency department](#) (ED). Notably, while more patients required hospitalization or intensive care in the post-pandemic season, the proportion of hospitalized patients was lower in 2022-23 than in pre-pandemic seasons.

Similarly, fewer hospitalized patients required intensive care in 2022-23 compared to pre-pandemic seasons. LOS in hospital or intensive care was also shorter post-pandemic than pre-pandemic. While the total number of deaths in 2022-23 increased compared to pre-pandemic seasons, the mortality rate among [hospitalized patients](#) actually decreased. However, deaths in 2022-23 increased relative to pre-pandemic seasons. The mortality rate was not significantly different in patients admitted to intensive care between pre- and post-pandemic seasons.

A lower proportion of intensive care patients required CPR in 2022-23 than in pre-pandemic seasons. Overall, advanced respiratory support was needed for 21.6% of hospitalized patients. Patients requiring advanced [respiratory support](#) were 70% higher in 2022-23 than before the pandemic. NIV and IMV use increased by more than 47% and 28% in 2022-23 relative to pre-pandemic seasons. Notably, HFNC use nearly doubled in 2022-23 than pre-pandemic levels.

Nevertheless, the proportion of patients supported with HFNC was similar between pre- (14.5%) and post-pandemic (14.2%) seasons. ECMO use was not different between seasons. iNO use was significantly reduced in 2022-23. Across seasons, children supported with IMV were younger than those requiring NIV or HFNC. More invasive respiratory support was associated with a [higher prevalence](#) of comorbidities.

Conclusion

The findings were consistent with national and regional data indicating a sharp decline in pediatric RSV infections during COVID-19 and a resurgence post-pandemic. The resurgence caused over 3.5-fold more ED visits than in pre-pandemic seasons. Although the proportion of patients requiring hospitalization or intensive care was lower in 2022-23 than in typical RSV seasons, the strain on [hospital systems](#) was 50% higher post-pandemic.

Notably, the study population might not represent the entire pediatric population in the US, as only 48 hospitals were included. Coinfections impact RSV severity, but data were unavailable. In addition, HFNC data were limited to 33 hospitals. Together, the study highlighted a post-pandemic resurgence of pediatric RSV infections, with significant increases in ED presentations, cumulative hospital or [intensive care days](#), and advanced respiratory support requirements.

Source:

<https://www.news-medical.net/news/20240618/Pediatric-RSV-infections-surged-2017-23-straining-US-hospitals.aspx>