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BRIEF REPORT

# See-sawing COVID-19 and RSV bronchiolitis in children under 2 years of age in Northern Italy

A few papers[1,2] reported a greater number of children hospitalised due to respiratory syncytial virus (RSV) bronchiolitis in 2020–2021 compared with the pre-COVID-19 pandemic period. They hypothesised that this was due either to 'immunity debt'[1] or RSV genomic sequencing restriction.[2] Younger children missing the 2020–2021 seasonal exposure to RSV due to the strict health measures imposed for COVID-19 containment lacked acquired RSV immunity, rendering them more susceptible to more severe RSV infections requiring hospitalisation.[1] Indeed, a 98% reduction in RSV infection was reported worldwide during the first phase of the COVID-19 pandemic,[3] most likely due to COVID-19 mitigation measures leading to a global reduction in the circulation of respiratory viruses. Moreover, there is evidence that respiratory pathogens can rebound quickly, even leading to unseasonal epidemics.[2] Delayed or forgone RSV seasons may increase the cohort of young children susceptible to subsequent RSV infection.[2]

We observed a similar unusual increase in hospitalisations due to RSV bronchiolitis at the beginning of October 2021, at least two months ahead of the peak usually seen in December. We evaluated hospitalisations for RSV bronchiolitis in two paediatric centres in Northern Italy (Novara, Piedmont and Cremona, Lombardy, the first epicentre of the COVID-19 pandemic) in 2021, comparing data with the two pre-pandemic years (2018, 2019) and the first year of the pandemic in 2020. Eighty-eight children were hospitalised in October–December 2021 for RSV bronchiolitis compared with 2, 21 and 12 in 2020, 2019 and 2018, respectively ($p < 0.0001$). Figure 1 shows the trend in RSV bronchiolitis in children in Novara and Cremona compared with daily COVID-19 cases observed in Italy over the same period. The seasonal RSV infection peak typically seen between December and April stopped abruptly at the beginning of the COVID-19 pandemic in March 2020 (first wave), was completely absent in the winter season 2020–2021 (second and third waves), and suddenly reappeared in October–December 2021, when COVID-19 containment rules were stopped at the beginning of the cold season. This peak started to decline in the second half of December when COVID-19 case rates soared in the fourth wave.

A similar alternating trend was observed in 2009, when a delay in RSV infection onset was observed during the H1N1 influenza pandemic; again, there was subsequently a more pronounced peak the following year.[4,5] It is likely that the most recent decrease in RSV bronchiolitis hospitalisations overlapping with the rapid rise in COVID-19 in the fourth wave reflects the global turnover of RSV and SARS-CoV-2. Out-of-season preparedness for RSV infection during the ongoing COVID-19 pandemic and future pandemics is essential.

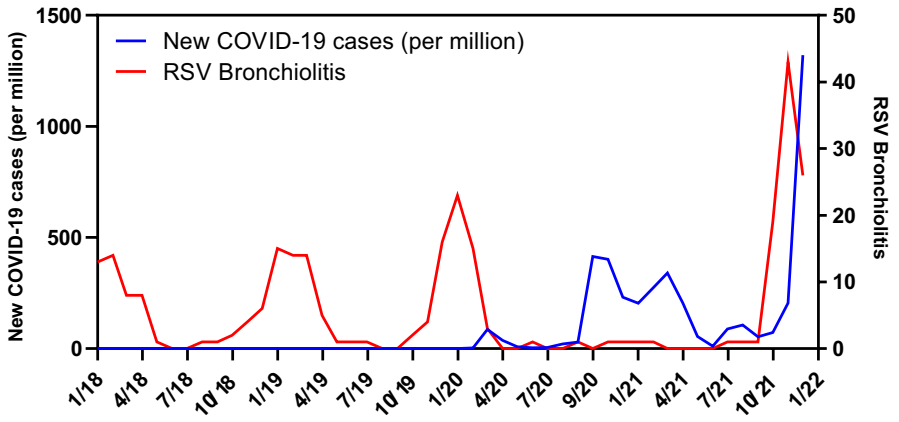


FIGURE 1 Paediatric hospitalisations due to RSV bronchiolitis in Novara and Cremona paediatric centres (2018–2021) compared with COVID-19 case rates in Italy over the same time period (COVID-19 Data Repository by the Center for Systems Science and Engineering at Johns Hopkins University, https://github.com/CSSEGISandData/COVID-19—accessed 5 May 2022)

## AUTHORS CONTRIBUTION

IR and AES conceived the study. AM and AES collected data. AM performed the statistical analysis. AM drafted the paper. IR, AM, AES and CC critically discussed results. AES drafted the final version of the paper.

## CONFLICT OF INTEREST

All authors have no conflict of interest to declare regarding the present paper.

Ivana Rabbone[1]
Alice Monzani[1]
Andrea E. Scaramuzza[2]
Claudio Cavalli[2]

[1]*Division of Paediatrics, Department of Health Sciences, University of Piemonte Orientale, Novara, Italy*
[2]*Paediatric Unit, ASST Cremona, Ospedale Maggiore, Cremona, Italy*

**Correspondence**
Andrea E. Scaramuzza, Clinica Pediatrica, ASST Cremona – Ospedale Maggiore di Cremona, Viale Concordia 1, 26100 Cremona, Italy.
Email: andrea.scaramuzza@asst-cremona.it

## ORCID

*Alice Monzani* https://orcid.org/0000-0002-6676-5773
*Andrea E. Scaramuzza* https://orcid.org/0000-0002-1518-8515

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