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Epidemiology of RSV bronchiolitis among young children in central New York before and after the onset of the COVID-19 pandemic



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Background

- Respiratory syncytial virus (RSV) is the greatest contributor to lower respiratory tract infections (LRTI) in young children
- Non-pharmacologic interventions enacted to slow transmission of SARS-CoV-2 ignited a global disruption to RSV circulation with patterns that remain disrupted today

Objective

To describe differences in testing patterns and clinical characteristics for RSV bronchiolitis among young children in central New York before and after the onset of the COVID-19 pandemic.

Methods

A retrospective, cohort study was conducted using data collected from the EMR of SUNY Upstate Medical Center. Clinical and sociodemographic data were collected between October 2015 and January 2022 for children < 5 years with medical encounters associated with a bronchiolitis ICD-10 code and available testing results for RSV. Weekly data was electronically collected, graphically displayed, and reviewed using the Clinetic NOWcasting platform.

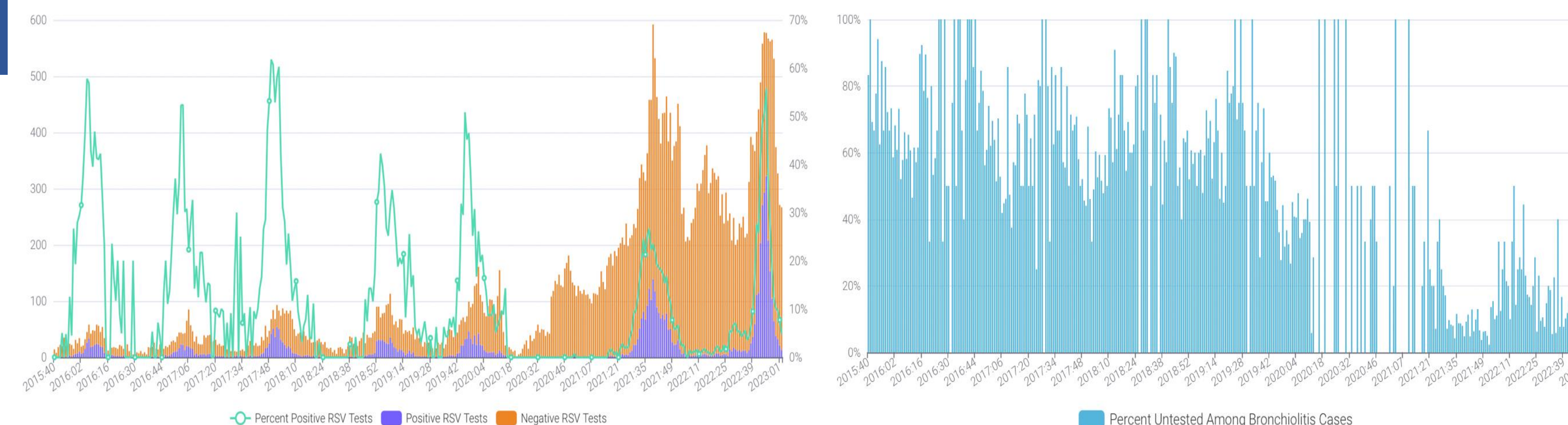


Figure 1. RSV testing patterns among children < 5 years before and after the onset of the COVID-19 pandemic

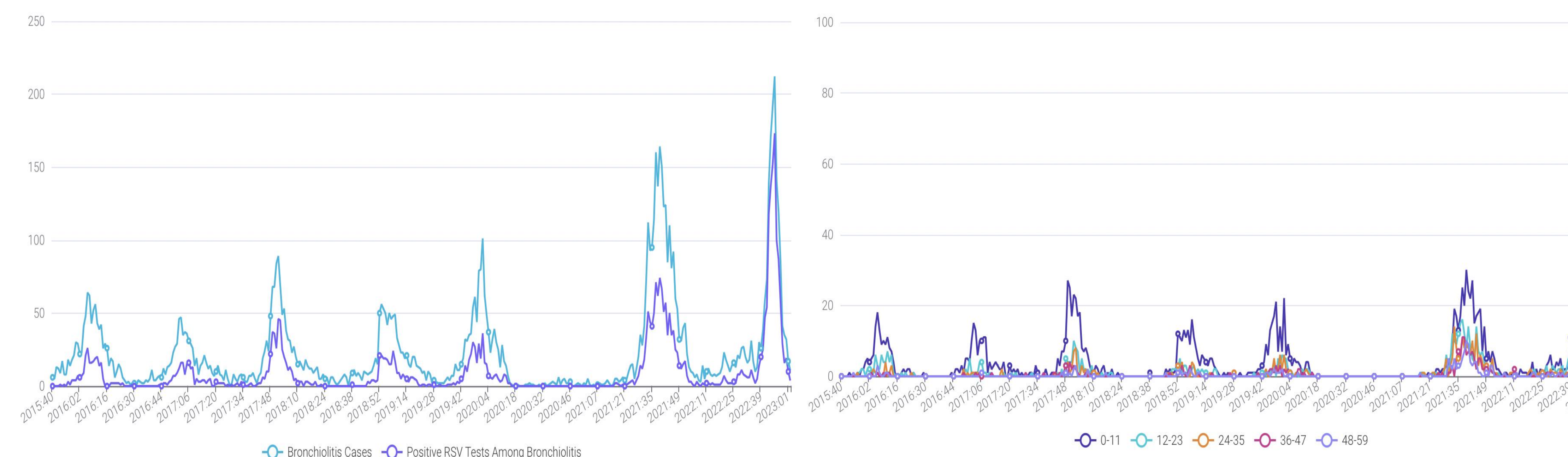


Figure 3. Total bronchiolitis cases and positive RSV tests among bronchiolitis for children <5 years before and after the onset of the COVID-19 pandemic. There was a significant difference in the percentage of positive RSV tests among total bronchiolitis cases between 2021 and 2022 (43.3% in 2021 vs. 69.5% in 2022, $p < 0.05$). The absolute number of RSV+ bronchiolitis cases for each season was 993 in 2021 and 1,141 in 2022

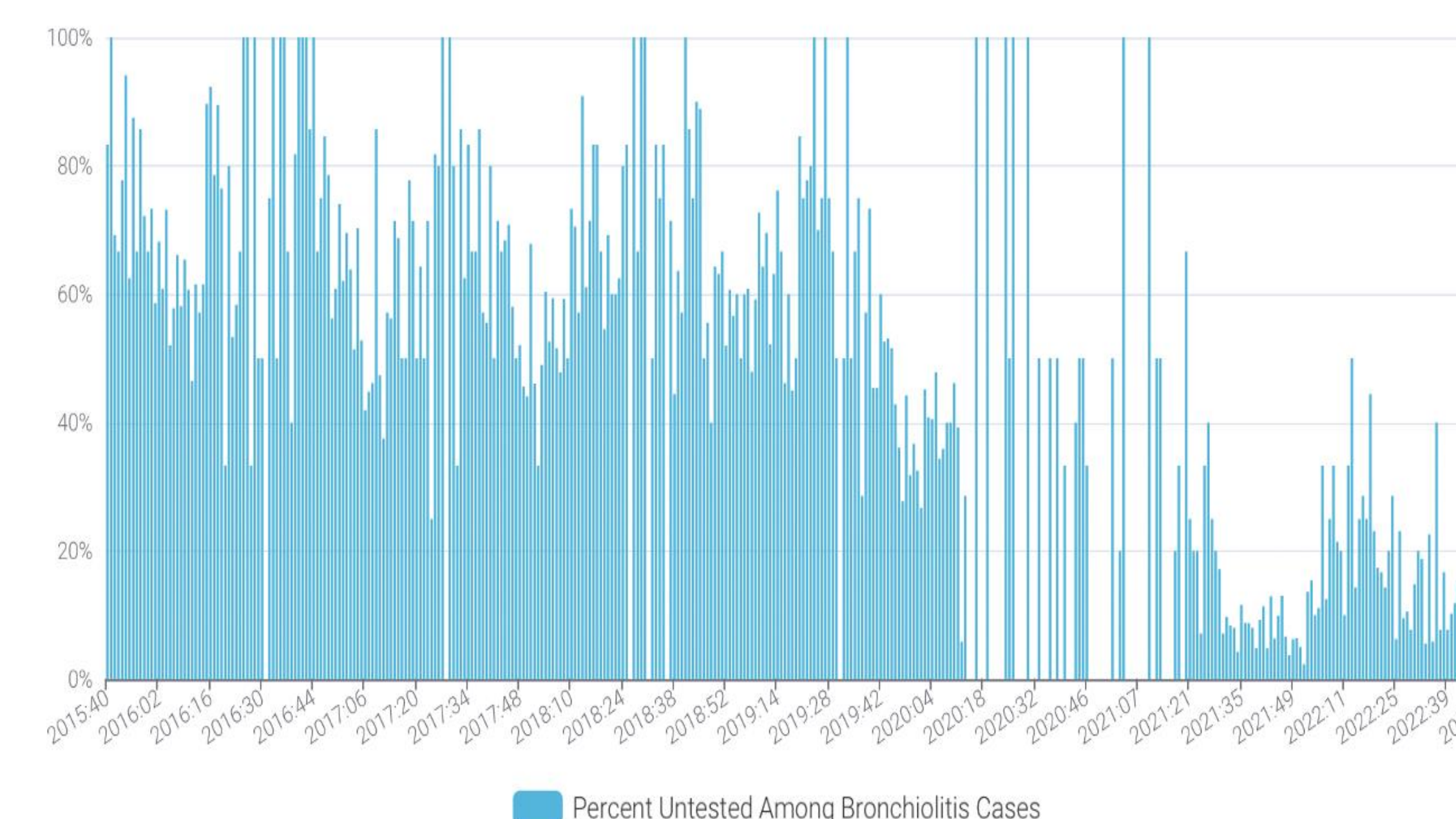


Figure 2. Percent of weekly bronchiolitis cases untested for RSV among children <5 years before and after the onset of the COVID-19 pandemic

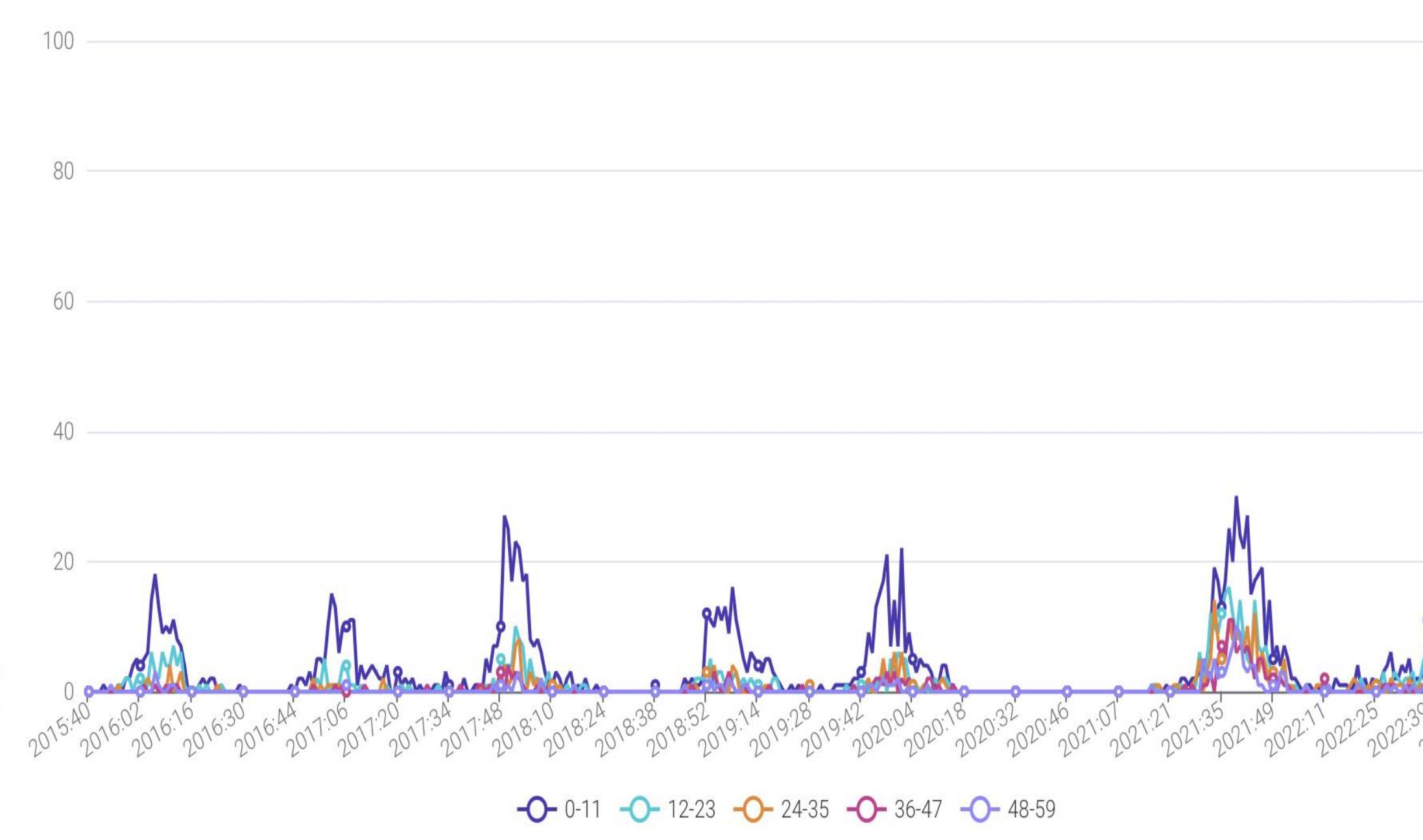


Figure 4. RSV+ Bronchiolitis cases by age cohort before and after the onset of the COVID-19 pandemic. Cohorts are reported in months

Results

Following the onset of the COVID-19 pandemic, RSV testing increased (figure 1). To date, a sustained increase in RSV testing is observed among children with bronchiolitis (figure 2). Even among inpatient encounters, the average percentage of bronchiolitis cases untested for RSV decreased from 25% (pre-pandemic) to 8% (post-pandemic).

During the 2022 bronchiolitis peak:

- RSV predominated, more so than during previous seasons (figure 3)
- The proportion of children ≥ 12 months old with RSV bronchiolitis increased, with the largest increase observed in the older age cohorts (figure 4)
- RSV+ bronchiolitis hospitalizations increased by 124%, ICU stays by 246%, and mechanical ventilation by 186% compared to pre-pandemic peaks
- RSV+ bronchiolitis hospitalizations increased by 63%, ICU stays by 50%, and mechanical ventilation by 140% compared to the 2021 peak

Conclusions

- Increased testing practices have unveiled the true burden of RSV disease
- The disease burden is greatest among children <12 months, however extension beyond the first year is increasingly recognized and deserves ongoing surveillance
- Indices of severe disease suggest higher acuity of illness during the 2022 RSV bronchiolitis season
- Ongoing surveillance to identify vulnerable populations and shifting patterns is necessary to ensure appropriate distribution of preventative agents once available