

BRIEF REPORT

COVID-19 restrictions probably brought the 2019–2020 Finnish influenza season to an early end and led to fewer respiratory viruses among infants

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Respiratory infections are the most common issues handled by children's health services.¹ Influenza A and B viruses and respiratory syncytial virus (RSV) cause acute respiratory illnesses that are very common during a child's first years of life.^{1,2} Mild influenza and RSV cases can be treated at home, but severe cases require hospitalisation.^{1,2}

This prospective, population-based epidemiological study determined the incidence of moderate or severe influenza and RSV in infants under 12 months of age who presented to Tays Tampere University Hospital, Finland, with respiratory symptoms and fever. Tays serves as both a primary and tertiary care centre for paediatric patients under 16 years of age, and this study was conducted in the hospital's emergency department.

At the end of 2019, there were 4386 infants under 12 months of age living in the hospital's catchment area. Our study comprised those who visited the ED from 27 December 2019 to 6 May 2020, which would normally be the main season for these viruses. However, 2020 was unusual. The first COVID-19 case was recorded in Finland in late January and the numbers started escalating in March and had reached nearly 300 when a state of national emergency was declared on 16 March. Numerous social distancing measures were introduced at this point. The study comprised infants with a fever of at least 38°C and at least one symptom of a respiratory infection, namely, a cough, fatigue, running nose, coryza or general discomfort.

Nasopharyngeal swab specimens were collected from eligible infants and tested for RSV and influenza A and B viruses using a

Cobas Influenza A/B and RSV polymerase chain reaction test (Roche Diagnostics). Other data collected from the hospital patient records were the infant's age, prematurity of less than 37 weeks of gestation, gender, diagnosis, hospitalisation and length of hospital stay. The study was approved by the Ethics Committee of Pirkanmaa Hospital District (ETL R19086M).

Non-normally distributed continuous data across age groups and length of hospitalisation were compared using the Mann-Whitney *U* test. The chi-square test or Fisher's exact test were used to compare categorical variables. Numbers and percentages or medians and interquartile ranges (IQRs) were used to describe the data. Two-sided *p* values of <0.05 were considered statistically significant. The statistical analyses were performed using SPSS Statistics, version 26 (IBM Corp.).

A total of 117 patients (55.5% boys) met the inclusion criteria, and two patients were included twice because they had two separate infection episodes. We found that RSV and influenza infections stopped abruptly after week 11/2020, ending Sunday 15 March (Figure 1). The overall incidence of influenza was 2.5/1000, and it was 2.3/1000 for the influenza A virus, 0.2/1000 for influenza B and 15.1/1000 for RSV (Table S1). In 44 cases, the aetiology remained unclear. Most of the 42.0% patients who were hospitalised had an RSV infection (60.0%) and the median length of hospitalisation was also highest for this cohort (median 2.5 days), but not statistically significant. Hospitalised infants were younger (median 5.7 months, IQR 2.2–8.6) than those treated at home (7.1 months, IQR 4.1–9.3, *p* = 0.124), regardless of aetiology. Infants with influenza A were

Abbreviations: ED, emergency department; IQR, interquartile range; RSV, respiratory syncytial virus.

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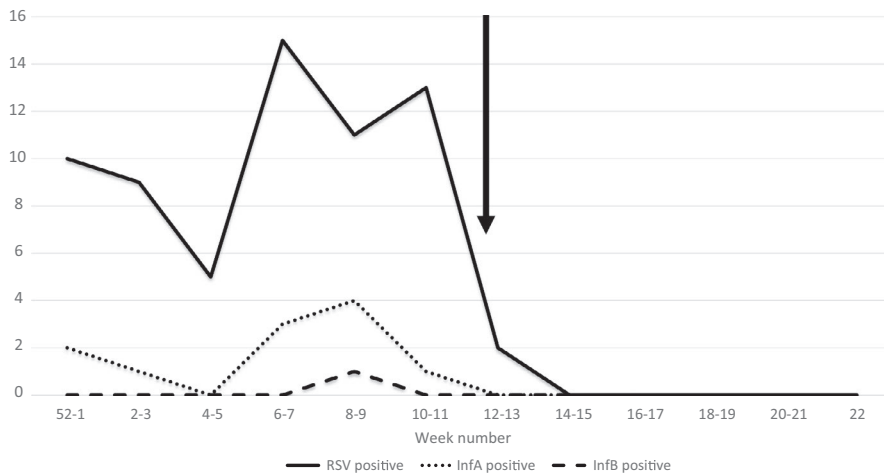


FIGURE 1 Number of patients with positive results in nasopharyngeal swab specimens collected prospectively from 117 infants under 12 months of age treated in the Paediatric Emergency Department of Tampere University Hospital during weeks 52/2019 to 22/2020. We used a Cobas Influenza A/B & RSV polymerase chain reaction test. The arrow indicates the start of the COVID-19 lockdown in Finland

younger (2.6 months, IQR 1.2–7.4) than those with other respiratory viruses (6.6 months, IQR 2.8–9.2, $p = 0.029$) (Table S1).

Our main finding was that the epidemic seasons for these viruses were short in 2020 and this was probably due to the social distancing measures implemented in response to the COVID-19 pandemic. RSV and influenza infections went down abruptly (Figure 1), and ED visits reduced in line with other countries.³

The incidence of influenza in our study infants was as low as 2.5/1000 during the 2019–2020 epidemic season but another Finnish study reported a remarkably higher incidence of 135/1000,⁴ possibly due to differences in the study designs. In that study, parents were asked to bring their children to the study clinic as soon as any signs of a respiratory infection emerged,⁴ but we only included infants who came to the ED because their condition worsened. Our second finding was that the incidence of RSV was 15.1/1000, and annual variations among epidemic seasons may explain that lower incidence rate. For example, a 2015 review reported higher rates of RSV-associated lower respiratory tract infections in high-income countries: 66.1/1000 in infants under 6 months old and 35.6/1000 in children aged 0–4 years.⁵

This study had a few limitations. The COVID-19 pandemic negatively affected our prospective data collection, and the overall incidence of respiratory infections was lower than during more usual epidemic seasons. In addition, our small patient catchment areas and the relatively low number of participants made it more difficult to demonstrate statistically significant differences. We did not know whether the infants had been vaccinated for influenza, but our data describe a real-world situation. Key strengths were the study's prospective design and the fact that the study hospital had the region's only ED.

In conclusion, the epidemic season ended very quickly in 2020, probably because of social distancing due to the COVID-19 pandemic.

CONFLICT OF INTEREST

The authors have no conflicts of interest.

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SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section.

How to cite this article: Kelloniemi S, Heikkilä P, Palmu S. COVID-19 restrictions probably brought the 2019–2020 Finnish influenza season to an early end and led to fewer respiratory viruses among infants. *Acta Paediatr.* 2021;00:1–2. <https://doi.org/10.1111/apa.16061>