

# Common pediatric respiratory infectious diseases may serve as an early predictor for SARS-CoV-2 new wave of infections

David Dawei YANG, M.D.,<sup>1,2</sup> Naïm OULDALI, M.D., Ph.D.,<sup>3,4,5</sup> Vincent GAJDOS, M.D., Ph.D.,<sup>6,7</sup> Roxane Thomas-Sertillanges,<sup>1</sup> Loganayagi VASANTE, Msc.,<sup>8,9</sup> David SKURNIK, M.D., Ph.D.,<sup>10,11,12£</sup> François ANGOULVANT, M.D., Ph.D.,<sup>1,2\*£</sup>  
£ author François Angoulvant, and author David Skurnik contributed equally to this manuscript.

- 1) Assistance Publique - Hôpitaux de Paris, Pediatric Emergency Department, Necker-Enfants Malades University Hospital, Université de Paris, Paris, France.
- 2) INSERM, Centre de Recherche des Cordeliers, UMRS 1138, Sorbonne Université, Université de Paris, Paris, France.
- 3) Assistance Publique-Hôpitaux de Paris, Department of general pediatrics, pediatric infectious disease and internal medicine, Robert Debré university hospital, Université de Paris, Paris, France.
- 4) Assistance Publique-Hôpitaux de Paris, Clinical epidemiology unit, Robert Debré university hospital, ECEVE INSERM UMR 1123, Université de Paris, Paris, France.
- 5) ACTIV, Association Clinique et Thérapeutique Infantile du Val-de-Marne, Créteil, France
- 6) Assistance Publique - Hôpitaux de Paris, Pediatric Department, Antoine Bécclère University hospital, Université de Paris Saclay, Clamart, France.
- 7) Centre for Research in Epidemiology and Population Health, INSERM UMR1018, Villejuif, France.
- 8) Assistance Publique-Hôpitaux de Paris, Strategy and Transformation Management Department - Emergencies and Intensive Cares, Paris, France
- 9) Assistance Publique-Hôpitaux de Paris, Patient Quality Medical Organisation Département - Health Crisis Management, Paris France
- 10) Assistance Publique-Hôpitaux de Paris, Department of Clinical Microbiology, Necker-Enfants Malades University Hospital, Université de Paris, Paris, France.
- 11) INSERM U1151-Equipe 11, Institut Necker-Enfants Malades, Université de Paris, Paris, France
- 12) Division of Infectious Diseases, Harvard Medical School, Boston, Massachusetts, United States of America.

## \* Corresponding author:

Pr François ANGOULVANT  
Pediatric Emergency Department,  
Hôpital Necker Enfants-Malades,  
149, Rue de Sèvres 75015 Paris  
E-mail: [francois.angoulvant@aphp.fr](mailto:francois.angoulvant@aphp.fr)  
Tel : +33 1 71 39 69 68  
Fax : +33 1 44 49 42 99

Dear editor,

We reported the significant decrease in infectious diseases disseminated through airborne or fecal-oral transmissions in children in France, after the start of the COVID-19 national lockdown (week 12)[1]. The decrease of common cold, bronchiolitis, acute otitis media and acute gastroenteritis (AGE) preceded the fall of SARS-CoV-2 infectious by several weeks (Figure S1)[1, 2]. Eight weeks later, the government decided a progressive end of the lockdown. On June 2<sup>nd</sup> schools reopen, and on June 22<sup>st</sup> the lockdown officially ended[3].

Conducting a new a quasi-experimental interrupted time series, we tested the hypothesis that a significant increase of the same infectious diseases could be observed at the end of the lockdown, and that it might precede SARS-CoV-2 new wave of infections.

A total of 908,887 pediatric emergency visits from January 1<sup>st</sup>, 2017 to August 2<sup>nd</sup>, 2020 were included from 6 academic hospitals[1]. Data collected in 2017, 2018, and 2019 were used to generate a model fitting the observed values and to project the numbers that could have been expected without lockdown[1, 4].

As shown Figure 1A, Table S1, and Figure S2a, there was no increase of the AGE following the end of the lockdown. As the message in the general media to regularly wash its hands and use alcohol-based sanitizers never stopped, nor encountered any hostility, by contrast to other measures such as wearing a face mask, this result might infer a positive impact on the rate of infectious diseases transmitted via a fecal-oral route in children.

In a sharp contrast with AGE, (See Figure 1 and Table S1 and Figure S2b,c,d,e) the major decrease concerning airborne transmitted diseases between expected and observed values after lockdown (weeks 13 to weeks 23), was followed by a significant increase two weeks after the lockdown was lifted. Observed values reached back expected values for common cold, bronchiolitis and acute asthma exacerbation (AAE), and remain at this level thereafter. We added AAE because person-to-person transmission of respiratory viruses have been shown to be a strong driver of asthma exacerbations and a collapse of pediatric cases have been observed in other countries[5, 6]. As found in our previous study, the start or the end of the lockdown had no impact of urinary tract infections (Figure S2f, TableS1).

This increase of AAE but also common cold, bronchiolitis, and acute otitis media strongly suggests an increase of respiratory virus transmission in children since week 26. Interestingly, a few weeks later, an increase of COVID-19 transmission was observed, confirming that surveillance of other viral diseases might be used as sentinel for the SARS-CoV-2 epidemic (Figure S1)[2]. Increase of COVID-19 cases while the number of AGE remained low post lockdown is not in favor of a fecal-route of infection for SARS-CoV-2, but as this is a new pathogen and numerous intestinal cells express the ACE2 receptor, no conclusion can be made on this matter from our data.

Overall the positive lessons learned from the lockdown, handwashing and social distancing should not be forgotten considering their benefits on children health.

## NOTES

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## FIGURE LEGENDS

### Figure 1

Weekly pediatric infectious diseases emergency visits during the weeks 5 to 32 of the calendar year. Weeks 5 to 32 of 2020 were compared with the average for the three previous years (2017, 2018, 2019). Start of lockdown begin on March 17<sup>th</sup>, 2020. End of lockdown Step 1 begin on May 11<sup>th</sup>, 2020; Step 2 begin on June 2<sup>nd</sup>, 2020; Step 3 begin on June 22<sup>th</sup>, 2020.

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Figure 1

