

## **Estimating the number of hospital admissions due to respiratory syncytial virus in children**

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Dear Editors,

We read with great interest the paper by Bardsley et al<sup>1</sup> describing the epidemiology of respiratory syncytial virus (RSV) in England during the COVID-19 pandemic. We fully support the aim of estimating the health service impact of the temporary suppression and subsequent resurgence of RSV circulation in 2020-2021.

However, we question the methods used to determine RSV hospital burden. Bardsley et al attribute all hospital admissions with a primary diagnosis of bronchiolitis, pneumonia, unspecified lower respiratory infection, bronchitis, or upper respiratory infection to RSV. They cite our paper<sup>2</sup> as justification for their definition of an RSV-attributable hospital admission.

This is not the definition we used. We fitted time series regression models to national virological testing and hospital data to estimate the number of RSV-related hospital admissions in children <5 years old in England. We concluded that whilst 70%-82% of bronchiolitis admissions could be attributed to RSV, only 7%-11% of upper respiratory infection admissions were RSV-related. Consequently, the expected number of RSV hospital admissions provided by Bardsley et al for the winter of 2020/21 is likely vastly overestimated, even after allowing for increasing paediatric hospital admission rates<sup>3</sup> since 2012 (the last year in our dataset).

Further, Bardsley et al expect over 70,000 RSV-related hospital admissions in summer 2021 despite minimal RSV circulation during summer months in England (figures 2A-2B). The authors consequently estimate only an 11% increase in RSV-attributed hospital admissions in summer 2021 compared to in a pre-pandemic summer season. This is a substantial underestimate, particularly as they present virological surveillance data indicating 500-1300% higher RSV circulation in summer 2021 relative to pre-pandemic summers.

The methods used by Bardsley et al leads to incorrect inferences regarding the RSV hospital burden in children. Referencing our paper as a justification for their chosen methodology is misleading readers.

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<sup>1</sup> Bardsley, M, Morbey RA, Hughes HE, et al. Epidemiology of respiratory syncytial virus in children younger than 5 years in England during the COVID-19 pandemic, measured by laboratory, clinical, and syndromic surveillance: a retrospective observational study. *Lancet Infectious Diseases*. 2022. Online first. [https://doi.org/10.1016/S1473-3099\(22\)00525-4](https://doi.org/10.1016/S1473-3099(22)00525-4)

<sup>2</sup> Reeves, RM, Hardelid, P, Gilbert, R, et al., Estimating the burden of respiratory syncytial virus (RSV) on respiratory hospital admissions in children less than five years of age in England, 2007-2012. *Influenza Other Respir Viruses* 2017; 11, 122– 129. doi: 10.1111/irv.12443

<sup>3</sup> Lewis K, De Stavola B, Hardelid P. Is socioeconomic position associated with bronchiolitis seasonality? A cohort study. *J Epidemiol Community Health*. 2021;75(1):76-83. doi: 10.1136/jech-2019-213056.