



Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.



Contents lists available at ScienceDirect

Public Health

journal homepage: www.elsevier.com/locate/puhe

Letter to the Editor

Is Omicron the game changer of COVID-19 infection in children?

Since the emergence of the Omicron variant (B.1.1.529) of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) in late 2021, it has rapidly become the predominant variant across the world. A recent survey in the United States found that approximately 77% of children aged between 5 and 11 years were infected with SARS-CoV-2 in February 2022.¹ Between 1 January and 15 May 2022, the total number of COVID-19 cases in children aged <15 years was 1,118,059,362 worldwide, accounting for 16.34% of all infections; this is double the number of cases in children aged <15 years recorded during the same period in 2021.²

Infection rates in children have exceeded those observed in adults during the recent Omicron surge.¹ COVID-19-associated hospitalisations have also increased in children aged 5–11 years, reaching a peak of 2.8 per 100,000 children.³ It is noteworthy that many paediatric patients are undiagnosed, and the existing data are only the tip of the iceberg. To make the situation worse, vaccination among children has not yet reached recommended levels. A case–control study during the Omicron wave found that protection provided by two doses of BNT162b2 COVID-19 vaccine in children and adolescents has declined rapidly.⁴ During the peak of the Omicron wave in the United States, the number of children aged <5 years who were hospitalised for COVID-19 was five times higher than at the peak of Delta wave; in addition, the number of intensive care unit admissions was 3.5 times higher during the Delta wave.¹ Moreover, the possible long-COVID consequences caused by the SARS-CoV-2 are also gradually emerging; for instance, children aged ≤18 years who contracted COVID-19 are 2.5 times more likely to develop diabetes mellitus.³

Although there is no clear evidence to prove a link between hepatitis of unknown aetiology in children and the Omicron variant, some studies suggest that exposure to Omicron might increase the risk of developing severe hepatitis in children.⁵ In addition, there have been several studies of childhood multisystem inflammatory syndrome, a rare but serious disease associated with SARS-CoV-2. As of 2 May 2022, the US Centers for Disease Control and Prevention have reported 8210 cases of childhood multisystem inflammatory syndrome, including 68 deaths. Among them, children aged <5 years accounted for more than 20% of the total cases.³

COVID-19 vaccination has not been approved for children aged <5 years in most countries, and it is difficult for young children and toddlers to wear face masks and practice correct social distancing, especially in schools. As a result, infections in this age group increased from 33% to 68% between December 2021 and February 2022; this is the most significant increase in infection rates of any age group during the Omicron wave.¹ In the 5- to 11-year-old age group, unvaccinated children had a 1.7-fold increased risk of infection and hospitalisation compared with vaccinated children.³ Therefore, unvaccinated children in a society with overall

high vaccination rates are still likely to face a higher risk of COVID-19 infection.

Although many people believe that the negative health impact of COVID-19 on the general population is declining with spread of Omicron variant, the impact on the health of children cannot be ignored. It is encouraging that COVID-19 vaccination booster doses will provide additional protection. One study found increased vaccination effectiveness after a booster dose in adolescents. Subsequent dose adjustments may be warranted to optimise protection against symptomatic infection of the Omicron variant in children.⁴ In addition, universal mask wearing in schools and other public areas can effectively reduce the risk of Omicron infection in children.

In summary, it remains necessary to encourage vaccination and mask wearing for children. Any changes to policies regarding SARS-CoV-2 infection control measures should be made with caution to prevent children from severe illness and associated complications.

References

- Mallapaty S. Most US kids have caught the coronavirus, antibody survey finds. *Nature* 2022;**605**:207. <https://doi.org/10.1038/d41586-022-01231-y>.
- World Health Organization. COVID-19 cases and deaths with age and sex reported. 2022. <https://app.powerbi.com/view?r=eyJrIjoiYWVWZlZlZWVkbWUtdmM0Ni00MDAwLTJjYWVWMTN2EwNTM3YjZyYmRmlwiwidCI6ImY2MTBjMGJ3LWJkMjQNGlZ0S04MTBiLTNkYzI4MGFmYjU5MCIslmMiOjIh9.> [Accessed 30 May 2022].
- CENTER for DISEASE CONTROL and PREVENTION. COVID data tracker. 2022. <https://covid.cdc.gov/covid-data-tracker/#datatracker-home>. [Accessed 30 May 2022].
- Fleming-Dutra KE, Britton A, Shang N, Derado G, Link-Gelles R, Accorsi EK, et al. Association of prior BNT162b2 COVID-19 vaccination with symptomatic SARS-CoV-2 infection in children and adolescents during Omicron predominance. *JAMA* 2022;**327**(22):2210–9.
- Nishiura H, Jung SM, Hayashi K. High population burden of Omicron variant (B.1.1.529) is associated with the emergence of severe hepatitis of unknown etiology in children. *Int J Infect Dis* 2022;**122**:30–2.

Qiwei Liang

Children's Hospital of Anhui Medical University, No. 39 Wangjiang Road, Hefei, 230051 Anhui, China

Department of Epidemiology and Health Statistics, School of Public Health, Anhui Medical University, No. 81 Meishan Road, Hefei, 230032 Anhui, China

Xiuping Zhang

Children's Hospital of Anhui Medical University, No. 39 Wangjiang Road, Hefei, 230051 Anhui, China

Scott Lowe

College of Osteopathic Medicine, Kansas City University, 1750 Independence Ave, Kansas City, MO 64106, USA

<https://doi.org/10.1016/j.puhe.2022.07.002>

0033-3506/© 2022 The Royal Society for Public Health. Published by Elsevier Ltd. All rights reserved.

Yaru Li

Internal Medicine, Swedish Hospital, 5140 N California Ave, Chicago,
IL 60625, USA

Rachel Bentley

College of Osteopathic Medicine, Kansas City University, 1750
Independence Ave, Kansas City, MO 64106, USA

Bethany King

Internal Medicine, MercyOne Des Moines Medical Center, 1111 6th
Avenue, Des Moines, IA 50314, USA

John Patrick Nanola Uy

Infectious Disease and International Health, Dartmouth-Hitchcock
Medical Center, 1 Medical Center Drive, Lebanon, NH 03756, USA

Chenyu Sun*

AMITA Health Saint Joseph Hospital Chicago, 2900 N. Lake Shore
Drive, Chicago 60657, Illinois, USA

* Corresponding author. AMITA Health Saint Joseph Hospital
Chicago, 2900 N. Lake Shore Drive, Chicago 60657, Illinois, USA.
E-mail address: drsunchenyu@yeah.net (C. Sun).

7 June 2022

Available online xxx