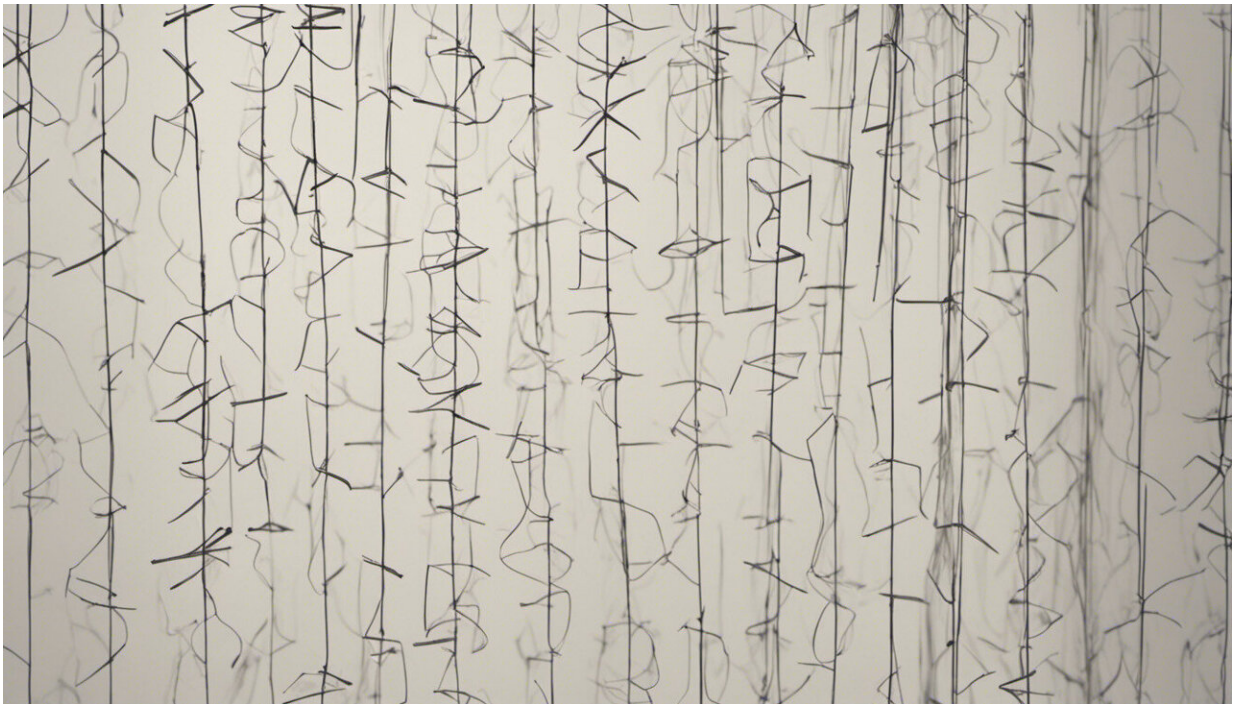


Evidence review confirms COVID-19 is generally 'mild' in young children

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Credit: AI-generated image ([disclaimer](#))

A systematic review and meta-analysis of international COVID-19 literature, led by UNSW Sydney, has confirmed that while children under five years old were likely to recover from the infection, half of those infected were infants and almost half of the infected under-fives were asymptomatic.

These findings will help to inform future policy and decision-making about potential COVID-19 vaccination for young children and maternal immunization programs during pregnancy—but the scientists say future research is needed to explore the potential risk of transmission from infants to their mothers, families and other caregivers, and to find out more about whether asymptomatic under-fives can spread the disease.

The collaborative study between researchers from UNSW Sydney, Telethon Kids Institute Perth, The University of Sydney, International Centre for Diarrhoeal Disease Research Bangladesh (icddr,b) and The Royal Veterinary College University of London was published in the journal *Vaccine* recently.

Senior author Dr. Nusrat Homaira, of the Discipline of Paediatrics at UNSW Medicine and Sydney Children's Hospital, is a medically trained respiratory epidemiologist with more than 14 years' experience in the field of pediatric respiratory diseases.

Dr. Homaira said the research filled a key knowledge gap on the epidemiology and clinical characteristics of COVID-19 in children under five.

"There have been systematic reviews published for the whole population—including all children aged under 18 years and adult populations—but not specifically on the under-five age group," she said.

"We chose to focus on the under-fives because they are the most at-risk age group for respiratory infections and respiratory infections are one of the most common reasons children are hospitalized—so, it is important to have a clearer understanding of COVID-19 infection and its severity in children under five.

"Secondly, children often have asymptomatic infection generally and

play a significant role in transmission of respiratory infections within the community—which is why immunization is often targeted at that age group for infections like the flu—so, we wanted to understand all those issues in light of COVID-19."

First wave of COVID-19 investigated

The researchers whittled down an initial shortlist of almost 2000 papers to 65 studies which they examined in their systematic review.

These studies represented 1214 children younger than five years old with laboratory-confirmed COVID-19 infection.

The systematic review showed young children aged less than five years generally developed mild COVID-19 disease and these infections were often acquired through community sources.

The researchers selected 31 of the 65 studies (representing 1181 infected children) for their more detailed meta-analysis.

The 65 studies were conducted in 11 countries—primarily China (49 studies) and the United States (six studies) – and spanned four World Health Organization (WHO) regions: Western Pacific, Pacific American, Eastern Mediterranean and European.

The researchers did not identify any study from the South-East Asian Region (SEARO) which tends to have a higher burden of childhood acute respiratory infections (ARI).

Dr. Homaira said the research was current as at 4 June 2020 and covered the first wave of COVID-19 in most countries.

"In our meta-analysis, the pooled estimates showed that among children

aged under five years with COVID-19 infection, half were infants (aged less than one year) and like COVID-19 infection in adults, 53 percent were male," she said.

"In the studies that reported both symptomatic and asymptomatic COVID-19 cases, the pooled prevalence showed 43 percent of cases were asymptomatic and seven percent had severe disease that required intensive-care-unit admission.

"Only one death was recorded—a 10-month-old female infant with no underlying medical conditions or no history of preceding exposure to a known COVID-19 case."

Dr. Homaira acknowledged the researchers submitted their paper in August and the peer-review process took until December for publication.

"New primary papers have since emerged on COVID-19 in the under-fives but those findings are not dissimilar to what our study has already reported," she said.

Potential risk of COVID-19 vertical transmission

Dr. Homaira said the researchers also looked into the important but little understood issue of potential vertical transmission of COVID-19 from pregnant women to their newborns.

"In our findings, of 139 newborns from confirmed COVID-19-infected mothers, five (3.6 percent) had laboratory-confirmed COVID-19 infection within several hours to days of birth," she said.

"However, whether the newborns acquired it from their mothers or not was unclear because none of those studies could persuasively claim mother to neonate transmission.

"So, more research is needed to understand if children born to women who have COVID-19 during pregnancy have an increased risk of acquiring the infection and what the long-term outcomes are for newborns with the disease."

Dr. Homaira said the potential risk of vertical transmission from mothers to newborns had ramifications for possible COVID-19 vaccination of young children and maternal immunization programs.

"Vaccination remains one of the most effective public health interventions to prevent transmission of infectious diseases. However, the immature immune system of newborns also makes them unsuitable for many vaccines," she said.

"Maternal immunization in pregnancy has been proven to be an effective strategy in providing protection to infants, against many vaccine-preventable diseases including whooping cough, tetanus and influenza during the first few months of life.

"When we wrote our paper in July, there was no COVID-19 vaccine available but now several countries have started administering multiple COVID-19 vaccines which are being offered to healthcare workers, people over 80 years old, and residents and staff of nursing homes in the first phase.

"As the vaccine is being rolled out to the whole population and other parts of the world, maternal immunization could be a viable preventive approach—particularly given we found half of COVID-19 infections in the under-fives were among infants."

Laying the groundwork for future research on under-fives

Dr. Homaira said as far as the researchers were aware, their study was the most comprehensive systematic review and meta-analysis of the literature, specifically for children aged under five with laboratory-confirmed COVID-19 infection.

"Our systematic review suggests the prognosis of COVID-19 in this age group aligns with current published research, with more than 90 percent of children developing mild to moderate disease," she said.

"But our meta-analysis shows almost half of young COVID-19 cases were asymptomatic and half were infants, illustrating the need for ongoing monitoring to better understand the epidemiology, clinical pattern and transmission of COVID-19 in order to develop effective preventive strategies against the disease in young children.

"So, while it's unlikely for COVID-19 to be a severe disease for the under-fives, it's still important for children to be tested if they develop respiratory symptoms and then standard precautions should be followed if they are positive."

"Epidemiology of COVID-19 [infection](#) in young [children](#) under five years: a [systematic review](#) and meta-analysis" will be published in *Vaccine*.

More information: Mejbah Uddin Bhuiyan et al. Epidemiology of COVID-19 infection in young children under five years: A systematic review and meta-analysis, *Vaccine* (2020). [DOI: 10.1016/j.vaccine.2020.11.078](#)

Provided by University of New South Wales

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