COVID: Risks of severe illness in children shown to be very low in largest study yet

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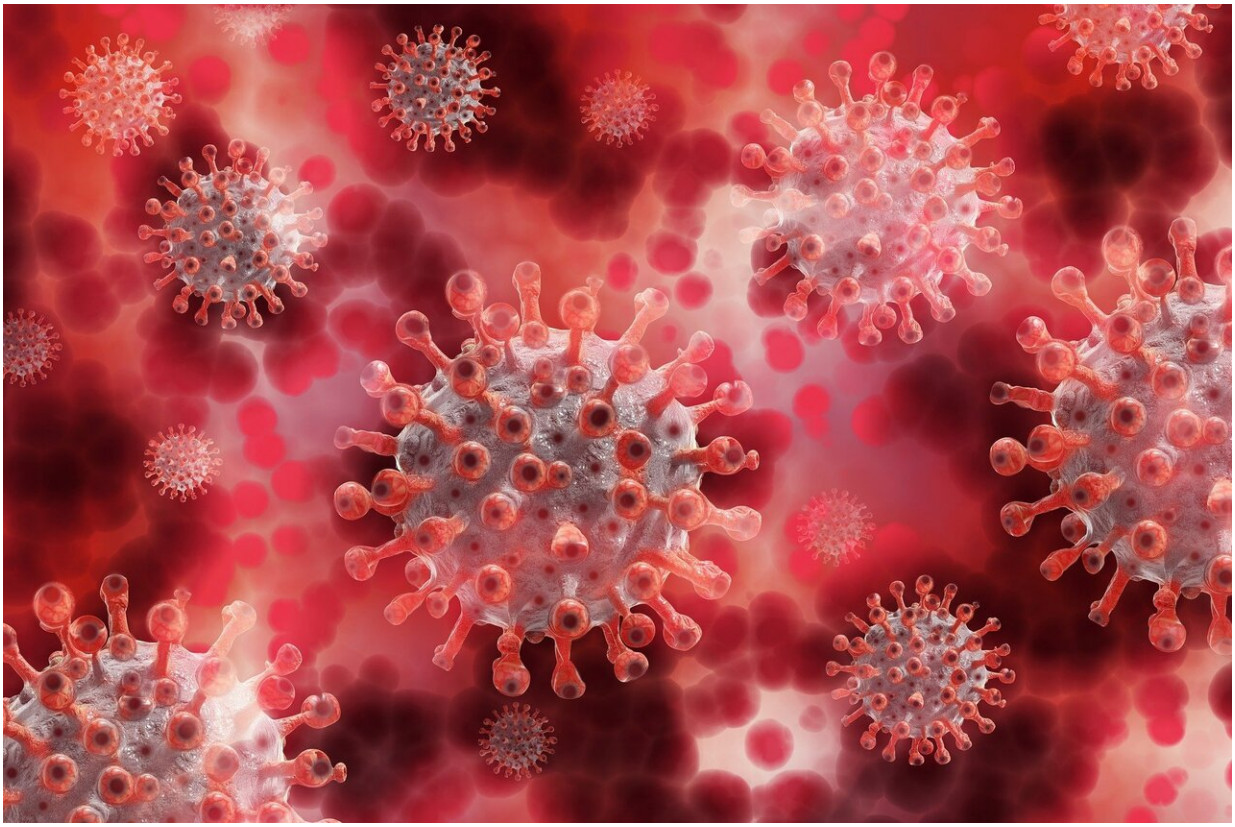

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The risk of severe illness and death from SARS-CoV-2, the virus that causes COVID-19, is extremely low in children and teenagers, according to the most comprehensive analyses of public health data, led by a team

of researchers including Dr. Rachel Harwood from the University of Liverpool.

However, catching COVID-19 increases the likelihood of serious illness in the most vulnerable young people, those with pre-existing medical conditions and severe disabilities, although these risks remain low overall.

The preliminary findings, published in three new pre-print studies from UCL and the Universities of Liverpool, Bristol and York, will be submitted to the UK's Joint Committee on Vaccination and Immunization (JCVI), the Department for Health and Social Care (DHSC) and the World Health Organization (WHO), to inform vaccine and shielding policy for the under-18s. The studies did not look at the impact of long COVID.

One preprint study, published on the medRxiv server, found that 251 young people aged under 18 in England were admitted to intensive care with COVID-19 during the first year of the pandemic (until the end of February 2021).

The researchers, seeking to determine absolute risk, said this equated to young people of that age group in England having a one in approximately 50,000 chance of being admitted to intensive care with COVID-19 during that time.

Looking separately at PIMS-TS, a rare inflammatory syndrome in children caused by COVID-19, the researchers found that 309 young people were admitted to intensive care with this condition—equating to an absolute risk of one in 38,911.

A linked preprint study, published on the ResearchSquare server and looking at data for England, concluded that 25 children and young

people had died as a result of COVID-19, equating to an absolute risk of death from COVID-19 of one in 481,000, or approximately two in a million.

Senior author on two of the studies, Professor Russell Viner (UCL Great Ormond Street Institute of Child Health), said: "These new studies show that the risks of severe illness or death from SARS-CoV-2 are extremely low in children and young people.

"Those young people at higher risk are those who are also at higher risk from any winter virus or other illness—that is, young people with multiple health conditions and complex disabilities. COVID-19 does however increase the risks for people in these groups to a higher degree than for illnesses such as influenza (seasonal flu).

"Our new findings are important as they will inform shielding guidance for young people as well as decisions about the vaccination of teenagers and children, not just in the UK but internationally."

Lead author Dr. Joseph Ward (UCL Great Ormond Street Institute of Child Health) said: "Factors linked to a higher risk of severe COVID-19 appear to be broadly consistent for both children and adults. Our study found a higher risk of admission to intensive care among young people of Black ethnicity compared to white, as well as among young people with health conditions such as diabetes, asthma and cardiovascular disease. Young people with multiple conditions had the highest risk.

"These conditions were also risk factors for other illnesses leading to admission to intensive care, but to a lesser degree than for COVID-19."

Lead author of the third pre-print study, Dr. Rachel Harwood (University of Liverpool) said: "Our meta-analysis found similar risk factors to the other studies, although we also found that obesity

increased the risk of severe COVID-19 illness, something we've known for some time in adults but is only now becoming evident as an important risk in children and young people too."

Lead author Dr. Clare Smith (University of Bristol) said: "We found that only 40% of children and young people who had a positive COVID-19 test at the time of death actually died from COVID-19, emphasizing that the risks are lower than simple numbers might suggest. Children and young people with complex neurodisability were at the highest risk of death."

Senior author Professor Lorna Fraser (University of York) said: "It's important to remember that the risks are very low for all children and young people. Even when we found higher risks for some groups with severe medical problems, these risks were still very small compared to risks seen in adults."

Dr. Elizabeth Whittaker (Imperial College London) said: "It is reassuring that these findings reflect our clinical experience in hospital—we see very few seriously unwell children. Although this data covers up to February 2021, this hasn't changed recently with the Delta variant. We hope this data will be reassuring for children and young people and their families."

The UCL-led study looked at England's hospital admissions data for young people between 2015 and 2021 and linked this to data on admissions to intensive care, deaths, and PCR testing.

By looking at pre-pandemic data, the researchers were able to compare young people's risks of severe disease from SARS-CoV-2 to their risks of severe illness from all other causes and influenza specifically.

In a separate preprint study, researchers looked at data from the National

Child Mortality Database (NCMD), a mandatory reporting system in England, to identify all children and young people who died following SARS-CoV-2 infection until the end of February 2021. Sixty-one children died following a positive diagnosis, but the researchers reviewed clinical records to determine that only 25 of these children (41%) died as a result of COVID-19.

Meanwhile, a third linked preprint paper published this week looked at 81 existing studies assessing risk factors for severe illness and death from COVID-19 among young people. It found higher risks among young people who were obese, had more than one health condition, or had a cardiac or neurological condition. Risk, particularly risk of death, was higher in these analyses than in the national English data. The authors suggested this was likely reflecting biases in the published literature but also the inclusion of studies from resource-poor settings with higher mortality.

More information: J L Ward et al, Risk factors for intensive care admission and death amongst children and young people admitted to hospital with COVID-19 and PIMS-TS in England during the first pandemic year, *medRxiv* (2021). DOI: 10.1101/2021.07.01.21259785

Clare Smith et al, Deaths in Children and Young People in England following SARS-CoV-2 infection during the first pandemic year: a national study using linked mandatory child death reporting data, *medRxiv* (2021). DOI: 10.21203/rs.3.rs-689684/v1

Rachel Harwood et al, Which children and young people are at higher risk of severe disease and death after SARS-CoV-2 infection: a systematic review and individual patient meta-analysis, *medRxiv* (2021). DOI: 10.1101/2021.06.30.21259763

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