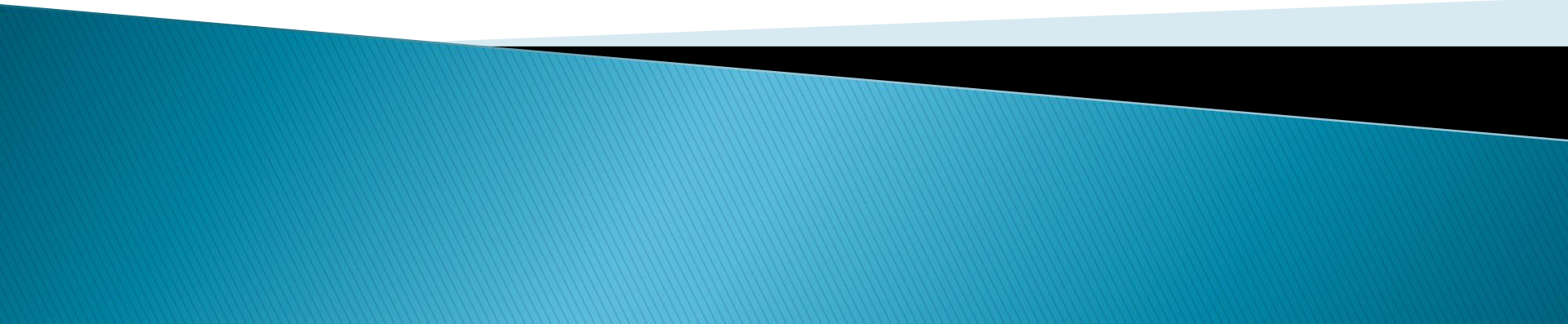
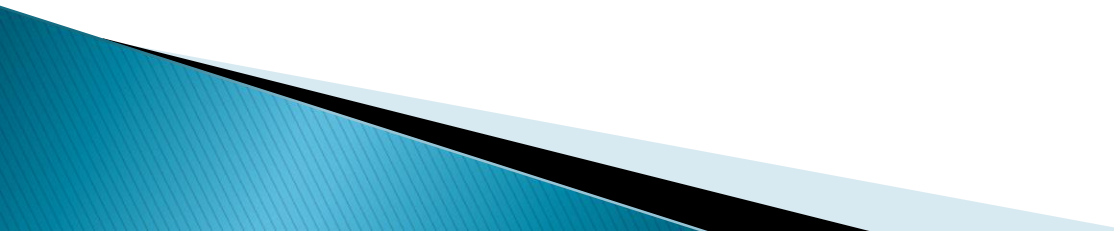


Clinical manifestations of COVID-19 in children



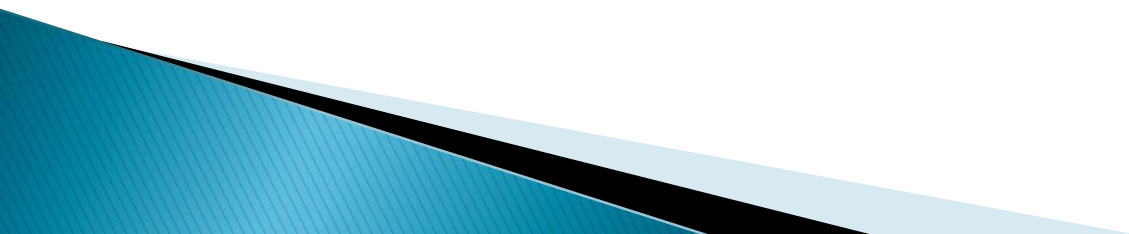
The symptoms of COVID-19 are similar in children and adults, but the frequency of symptoms varies. COVID-19 appears to be milder in children than in adults, but severe cases have been reported in children

In a systematic review of 61 observational studies of persons of all ages, at least one-third of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infections are asymptomatic; symptoms in children may be unrecognized before the diagnosis

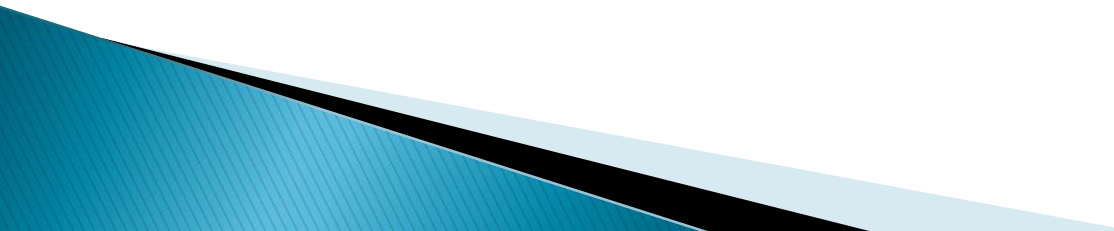


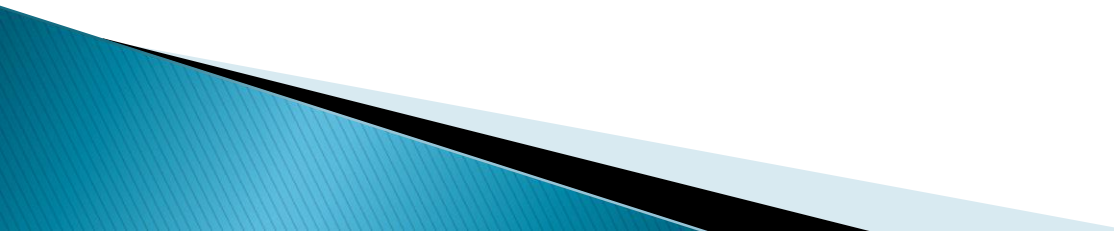
Although the clinical findings in children with COVID-19 are diverse, fever or chills and cough are the most common reported symptoms. The clinical findings overlap with those of multiple other clinical syndromes (eg, pneumonia, bronchiolitis, e-cigarette or vaping product use-associated lung injury, gastroenteritis).

In case surveillance in the United States (through May 30, 2020), information about symptoms was available for 51 888 children age 0 through 9 years and 12,689 children age 10 through 19 years

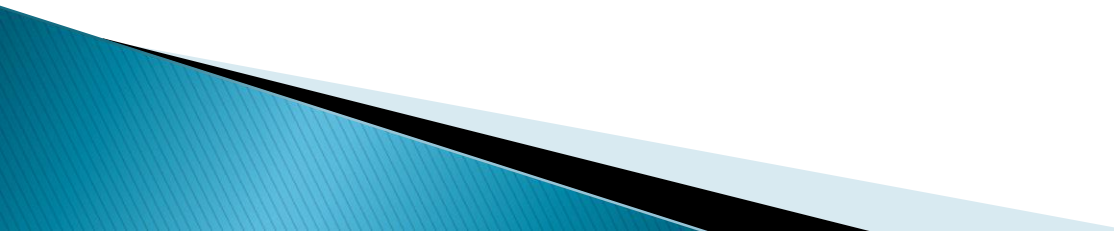


Among children age 0 through 9 years, the frequency of symptoms was as follows:

- Fever, cough, or shortness of breath – 63 percent
 - Fever – 46 percent
 - Cough – 37 percent
 - Shortness of breath – 7 percent
 - Myalgia – 10 percent
 - Rhinorrhea – 7 percent
 - Sore throat – 13 percent
 - Headache – 15 percent
- 

- Nausea/vomiting – 10 percent
 - Abdominal pain – 7 percent
 - Diarrhea – 14 percent
 - Loss of smell or taste – 1 percent
- 

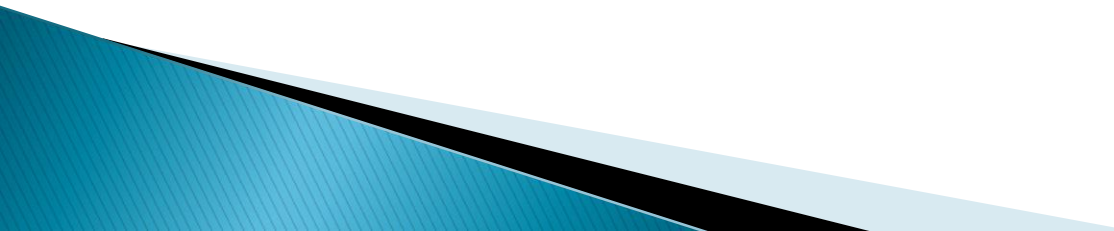
Among children age 10 through 19 years, the frequency of symptoms was as follows:

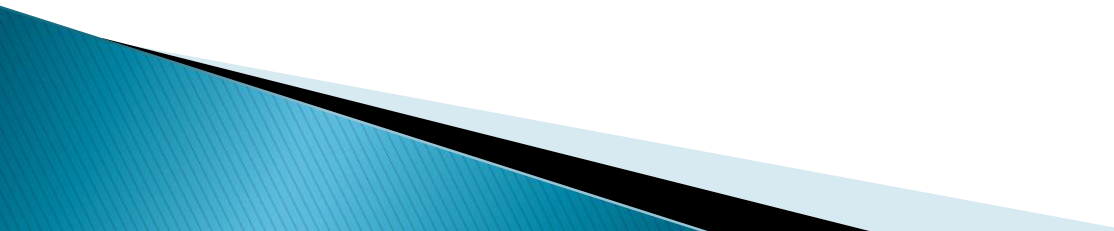
- Fever, cough, or shortness of breath – 60 percent
 - Fever – 35 percent
 - Cough – 41 percent
 - Shortness of breath – 16 percent
 - Myalgia – 30 percent
 - Rhinorrhea – 8 percent
 - Sore throat – 29 percent
- 

- Nausea/vomiting – 10 percent
- Abdominal pain – 8 percent
- Diarrhea – 14 percent
- Loss of smell or taste – 10 percent

In a meta-analysis that included 9335 children (0 to 19 years) from 31 countries with documented SARS-CoV-2 infection (including 1208 children with multisystem inflammatory syndrome in children [MIS-C]), the mean proportion of asymptomatic children was 13 percent .

The mean proportion of other symptoms was as follows:

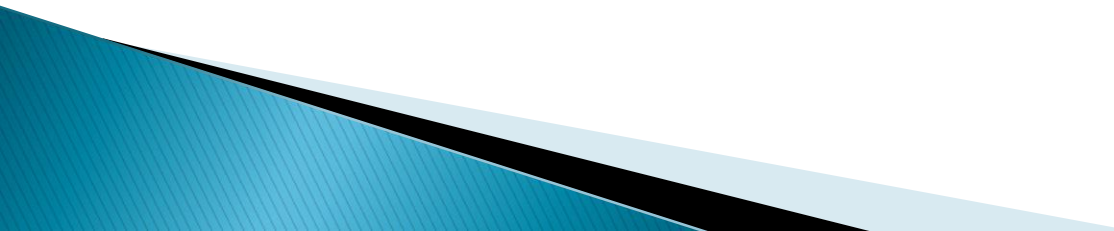
- Fever – 63 percent
 - Cough – 34 percent
 - Nausea/vomiting – 20 percent
 - Diarrhea – 20 percent
 - Dyspnea – 18 percent
 - Nasal symptoms – 17 percent
 - Rashes – 16 percent
- 

- Fatigue – 16 percent
 - Abdominal pain – 15 percent
 - Kawasaki-like signs – 13 percent
 - Asymptomatic – 13 percent
 - Neurologic symptoms – 12 percent
 - Conjunctivitis – 11 percent
 - Pharyngeal erythema – 9 percent
- 

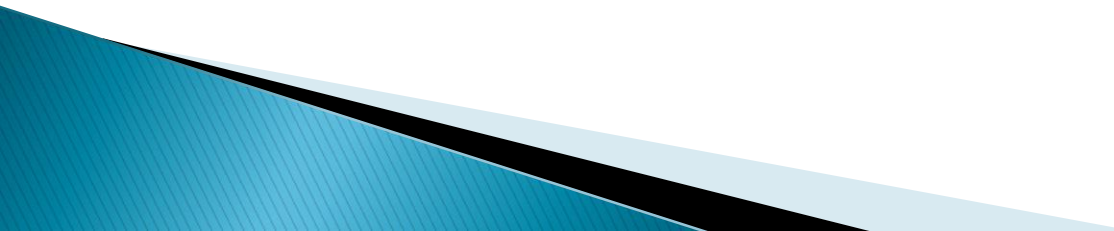
Cardiovascular abnormalities (eg, heart failure, arrhythmias, myocarditis, pericarditis, cardiogenic shock, pulmonary embolism) have been reported in smaller case series

Gastrointestinal symptoms may occur without respiratory symptoms .Diarrhea, vomiting, and abdominal pain are the most common gastrointestinal symptoms reported in children .Acute cholestasis, pancreatitis, and hepatitis have been reported in children and adolescents .Gastrointestinal bleeding has been reported in adults but has not been reported in children

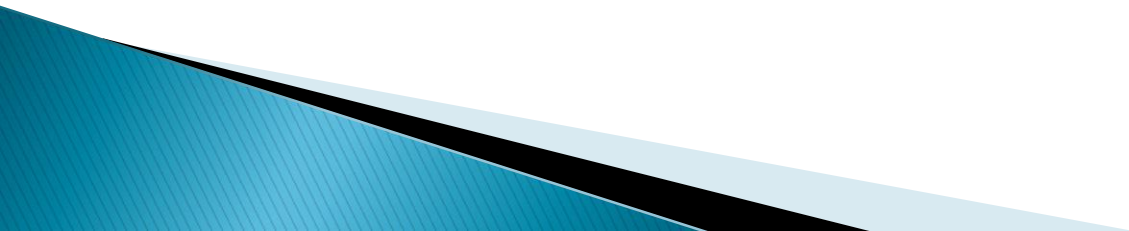
Neurologic manifestations are common in children hospitalized with SARS-CoV-2 infection. In a multicenter case series of 1695 children (age <21 years) hospitalized with documented SARS-CoV-2 infection (36 percent with MIS-C), 365 (22 percent) had neurologic involvement, which was transient in 88 percent




Among the 43 children with life-threatening neurologic involvement (eg, severe encephalopathy, stroke, central nervous system infection/demyelination, Guillain-Barré syndrome/variants, acute fulminant cerebral edema), 17 had new neurologic deficits at discharge and 11 died.



Cutaneous findings have been reported infrequently and are not well characterized; they include maculopapular, urticarial, and vesicular eruptions; transient livedo reticularis; and acral peeling




In a cohort of 2463 Canadian children tested for SARS-CoV-2 in the community setting (ie, not in the emergency department), 64 percent had symptoms. Among symptomatic children, altered smell or taste, nausea or vomiting, and headache were more strongly associated with SARS-CoV-2 than other symptoms. Cough, rhinorrhea, nasal congestion, sore throat, and fever were common in children with and without SARS-CoV-2.



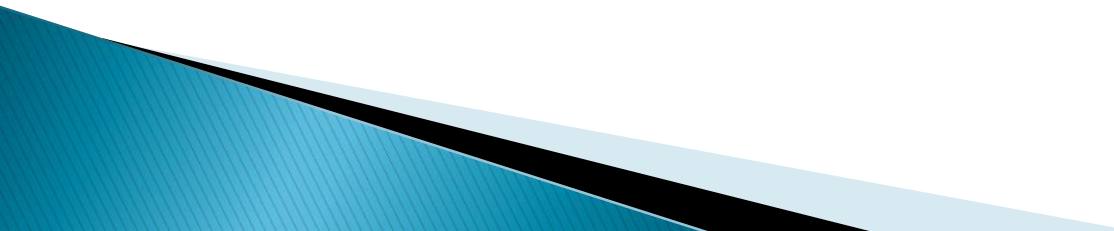
In infants <12 months of age

In studies limited to infants <12 months of age, additional clinical findings include feeding difficulty and fever without an obvious source .Respiratory symptoms may be minimal; when present, respiratory symptoms are similar to those caused by other coronaviruses and influenza, although cough may be less prominent .Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2)-associated bronchiolitis has also been reported in infants



Infants <12 months

In a series of 46 infants <12 months from Wuhan Children's Hospital, disease was asymptomatic or mild in 4, moderate in 40, and severe or critical in 2 patients. Only four infants had underlying comorbidities (atrial septal defect, intussusception, hypogammaglobulinemia, brain trauma).



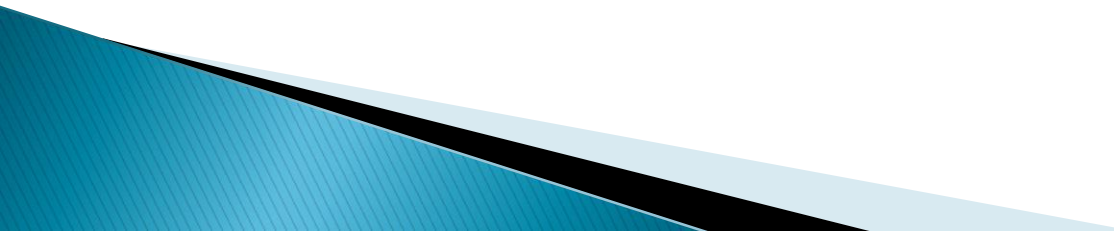
Infants <3 months

In a systematic review of 63 infants ≤ 3 months of age with laboratory-confirmed SARS-CoV-2 infection, 3 were asymptomatic, 58 were hospitalized, 13 were admitted to the intensive care unit (ICU), and 2 required mechanical ventilation. Symptoms included fever (73 percent), cough (38 percent), rhinitis (36 percent), respiratory distress (26 percent), poor feeding (24 percent), vomiting (14 percent), and diarrhea (14 percent).

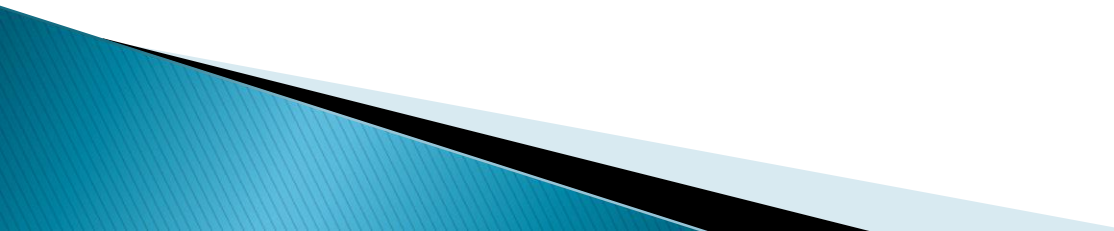
Severe disease in children

Although severe cases of COVID-19 in children, including fatal cases, have been reported, most children appear to have asymptomatic, mild, or moderate disease and recover within one to two weeks of disease onset

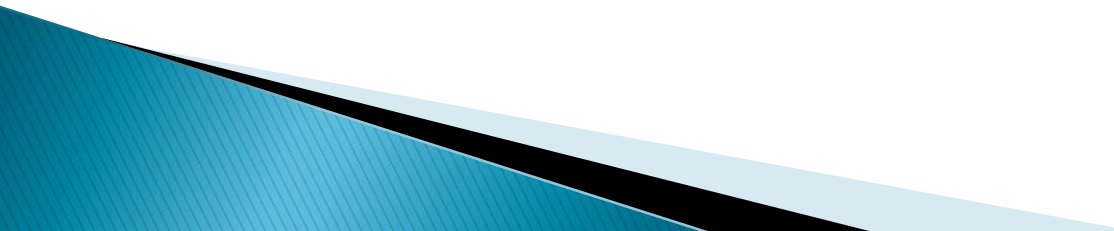
In a systematic review of 7480 children <18 years of age with laboratory-confirmed COVID-19 infection, information about symptoms and severity was available for 1475. Among these, 15 percent of cases were asymptomatic, 42 percent were mild, 39 percent were moderate (clinical or radiographic evidence of pneumonia without hypoxemia),



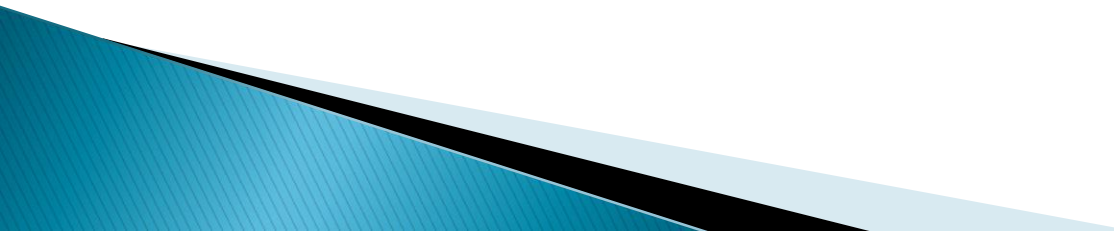
2 percent were severe (dyspnea, central cyanosis, hypoxemia), and 0.7 percent were critical (acute respiratory distress syndrome, respiratory failure, shock). There were six deaths in the entire study population (0.08 percent).



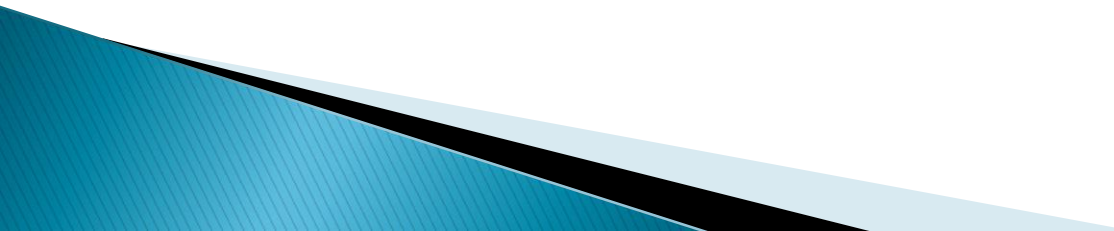
SARS-CoV-2-related death in children and adolescents is rare. In pooled analysis from seven countries (France, Germany, Italy, Spain, South Korea, the United Kingdom, and the United States), the COVID-19-related death rate among children (age 0 to 19 years) was 0.17 per 100,000 as of February 2021



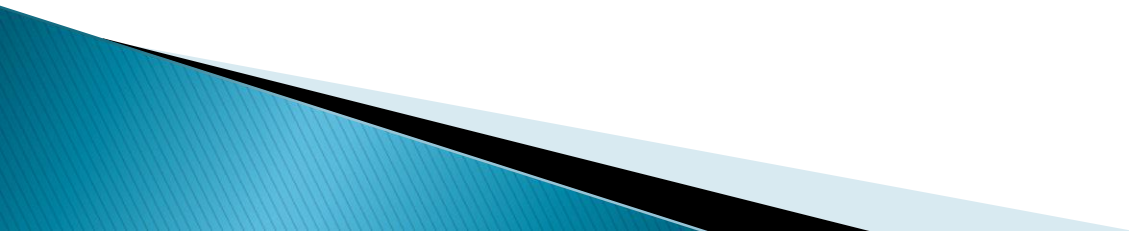
Why COVID-19 appears to be less common and less severe in children than in adults is unclear. One possibility is that children have a less intense immune response to the virus than adults; cytokine release syndrome is thought to be important in the pathogenesis of severe COVID-19 infections



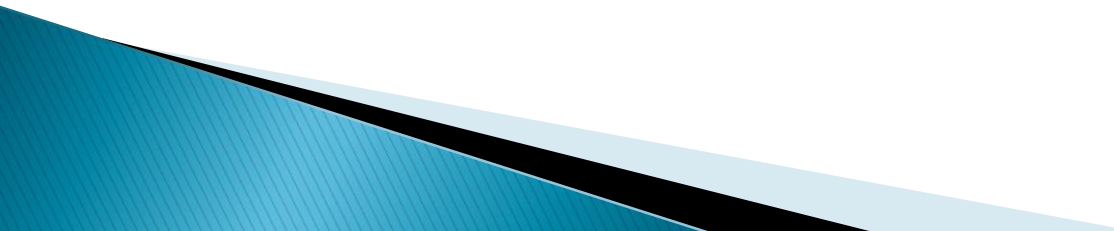
Other possibilities include viral interference in the respiratory tract of young children, which may lead to a lower SARS-CoV-2 viral load; different expression of the angiotensin converting enzyme 2 receptor (the receptor for SARS-CoV-2) in the respiratory tracts of children and adults



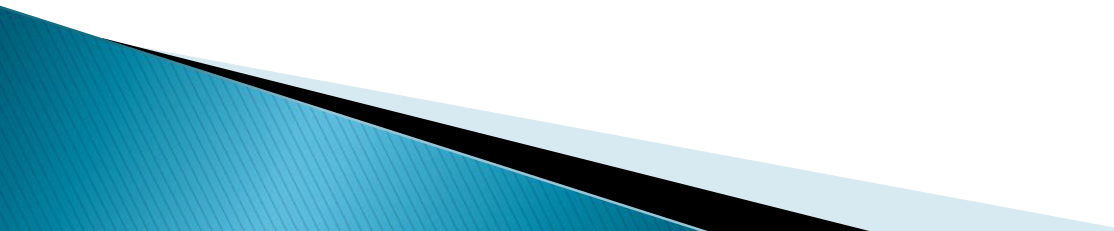
In addition, the possibility of decreased exposure and decreased rates of testing in children may play a role

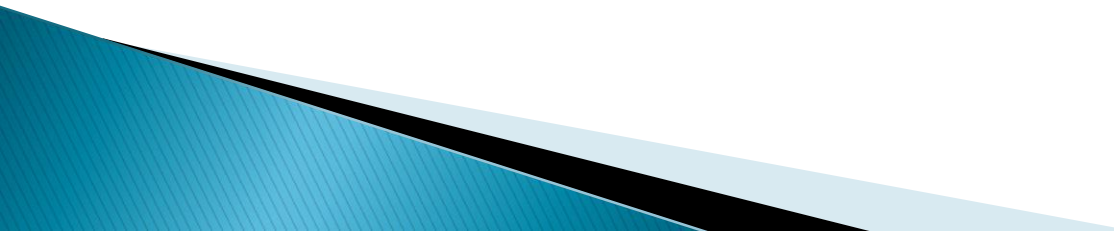


**Risk factors for severe disease :
children with underlying medical
conditions are at greater risk for
severe disease (hospitalization,
need for intensive care or
mechanical ventilation, death) than
children without underlying
conditions**

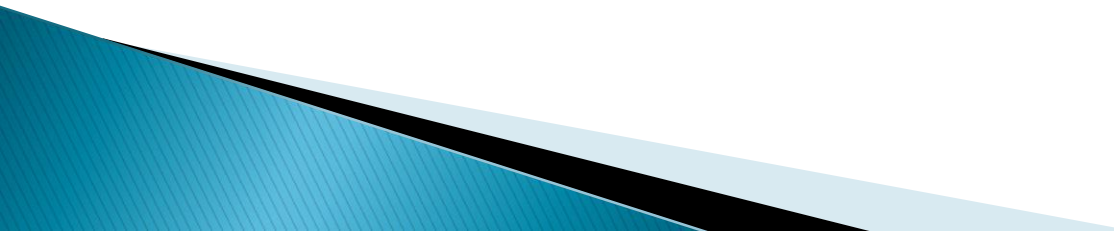


conditions may be associated with increased risk of severe disease in children:


- Genetic conditions
 - Neurologic conditions
 - Metabolic conditions
- 

- Congenital heart disease
 - Obesity (body mass index [BMI] >95th percentile for age and sex)
 - Diabetes
 - Asthma or other chronic pulmonary diseases
 - Sickle cell disease
 - Immunosuppression
- 

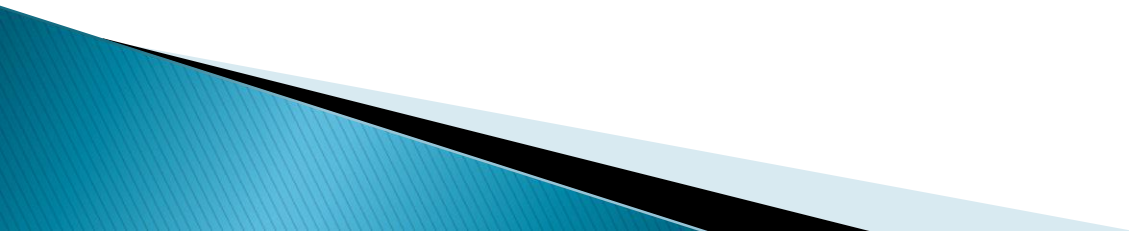
The head of the World Health Organization stated that the Covid-19 delta variant first seen in India, is the most transmissible of the variants identified so far and warned it is now spreading in at least 85 countries



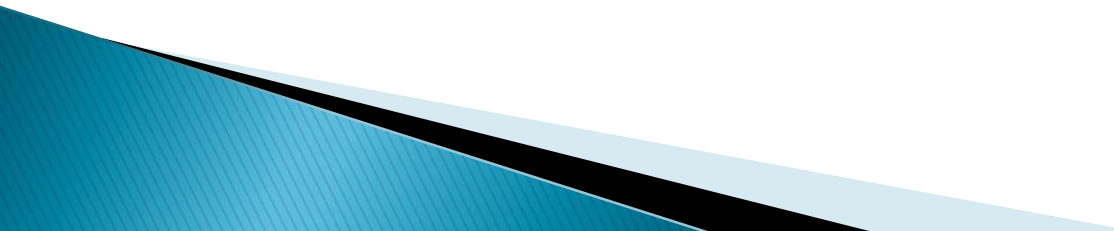
The **Delta variant** is a highly contagious variant of COVID-19. Health authorities are particularly concerned by it because it appears to be more infectious than other variants, more resistant to health controls and preventions such as isolation, causing more varied and severe symptoms among patients, spreading more easily among children



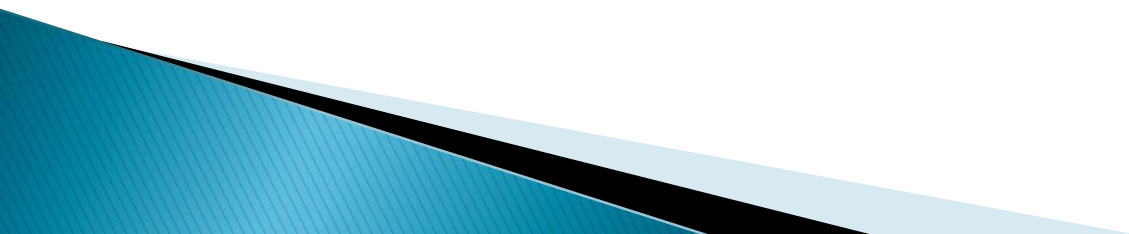
This variant of the Covid-19 virus is more common in children than other mutations in the virus.




The delta corona has several characteristics compared to the original virus as well as the alpha virus (the English variant of the corona virus); One of its features is that it is much faster and has a 60% higher transmission power than the alpha virus.



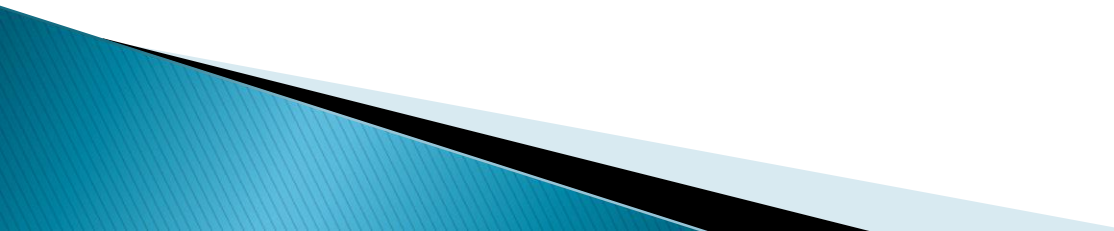
In the English version of the corona or alpha virus, one person could infect between two and four people, but in the delta virus, one person can infect eight others.



Children are more likely to be infected with the delta coronavirus, and as a result, are caught in the transmission chain and can easily pass the disease on to others; Therefore, both the rate of transmission of the coronavirus, its severity, and the number of people involved are higher in the Delta species.



The symptoms of coronavirus are generally similar, but symptoms such as colds, sore throats, diarrhea, vomiting, body aches and headaches may be seen in children with coronary heart disease. Of course, cough is less common



However, if the symptoms worsen, it can involve other organs and even cause lung problems and inflammatory effects.

