# Evidence Search Service Results of your search request

## Transmissibility of the coronavirus from children to adults (*with a specific focus on teachers of reception age children*).

**ID of request:** 23509  
**Date of request:** 1st June, 2020  
**Date of completion:** 12th June, 2020

If you would like to request any articles or any further help, please contact:  Julia Hallam at [julia.hallam@oxfordhealth.nhs.uk](mailto:julia.hallam@oxfordhealth.nhs.uk)

Please acknowledge this work in any resulting paper or presentation as: Evidence search: Transmissibility of the coronavirus from children to adults. Julia Hallam. (12th June, 2020). OXFORD, UK: Oxford Health Library and Knowledge Service.

**Sources searched**  
CINAHL (2)  
Cochrane Library (1)  
EMBASE (17)  
MEDLINE (60)  
PubMed (58)

**Date range used** (5 years, 10 years): 2019-2020   
**Limits used** (gender, article/study type, etc.): Publication Year   
**Search terms and notes** (full search strategy for database searches below):

I conducted 2 searches on this topic.

Search 1 looked at the teaching/education group specifically. Search 2 looked more generally at child transmission of Covid-19.

**Search 1:**

(Coronavirus OR “Covid-19” OR “C-19” OR Betacoronavirus OR “nCoV\*” OR “2019nCoV” OR “19nCoV” OR “COVID19\*” OR “COVID-19” OR COVID OR “SARS-COV-2” OR “SARSCOV-2” OR “SARSCOV2” OR “Severe Acute Respiratory Syndrome Coronavirus 2” OR “Severe Acute Respiratory Syndrome Corona Virus 2” OR “Severe Acute Respiratory Syndrome Coronavirus 2” OR “SARS-CoV-2" OR Corona OR “2019-nCoV Acute Respiratory Disease” OR “Novel Coronavirus Pneumonia”)

OR    
   
(Wuhan OR Hubei OR China OR Chinese) ADJ4 (Pneumonia OR Pandemic\* OR Epidemic\* OR Outbreak\*)

AND

(Child\* OR Infan\* OR Toddler\* OR Schoolchild\* OR Preschool\* OR “Pre-school\*” OR P?ediatric\* OR Girl\* OR Boy\*)   
   
AND

(School\* OR Reception\* OR “Primary School\*” OR Education OR Kindergarten\* OR Nursery OR Nurseries OR Teacher\* OR “Educational Personnel” OR Educator\* OR “Teaching Assistant\*” OR “Classroom Assistant\*”)

I ran the above keyword search, combined with controlled MeSH searches on: CINAHL, EMCARE, EMBASE, MEDLINE, PsycINFO, PubMed (Native interface) and The Cochrane Library.

**Search 2:**

(Coronavirus OR “Covid-19” OR “C-19” OR Betacoronavirus OR “nCoV\*” OR “2019nCoV” OR “19nCoV” OR “COVID19\*” OR “COVID-19” OR COVID OR “SARS-COV-2” OR “SARSCOV-2” OR “SARSCOV2” OR “Severe Acute Respiratory Syndrome Coronavirus 2” OR “Severe Acute Respiratory Syndrome Corona Virus 2” OR “Severe Acute Respiratory Syndrome Coronavirus 2” OR “SARS-CoV-2" OR Corona OR “2019-nCoV Acute Respiratory Disease” OR “Novel Coronavirus Pneumonia”)

OR    
   
(Wuhan OR Hubei OR China OR Chinese) ADJ4 (Pneumonia OR Pandemic\* OR Epidemic\* OR Outbreak\*)

AND

(Child\* OR Infan\* OR Toddler\* OR Schoolchild\* OR Preschool\* OR “Pre-school\*” OR P?ediatric\* OR Girl\* OR Boy\*)

AND    
   
(Transmissibility OR Transmission\* OR “Disease Transmission” OR “Basic Reproduction Number” OR “Basic Reproduction Ratio” OR “Basic Reproductive Rate" OR “R Number” OR “Communicable Disease Transmission” OR “Horizontal Transmission of Infection” OR “Virus Transmission” OR “Viral Transmission”)

I ran the above keyword search, combined with controlled MeSH searches on the main general medical databases: MEDLINE, PubMed (Native Interface), EMBASE and The Cochrane Library.

I also looked on a variety of specialist Covid resource sites, as well as running controlled searches on Google and NHS Evidence to find grey literature and to top up any resources that may not have been indexed in the main medical databases.

For more information about the resources please go to: <http://www.oxfordhealth.nhs.uk/library/>.

## Summary of Results

There were essentially two elements to this search. One was looking at the transmission of the disease by children in general, and the other element of the search was looking at the risk within the teaching and education setting (primarily reception years). I therefore conducted two separate searches on this topic. I limited all searches to 2019-2020 to ensure the results were focused solely on the 2019 coronavirus. Despite this only being last year, there has been a wealth of published research on this topic already. There are a lot of papers around the effect of covid on children, but they were not specifically relevant to your search question (i.e. mental health, safeguarding, obesity, screen time, social deprivation, managing children who have covid-19 etc). All of these papers have been excluded from the search results, as the search question was primarily asking about transmission risk and the risks within the school setting. I have looked across a broad range of medical databases and have searched for grey literature as well. The NHS does not have access to some educational databases (e.g. British Education Index, ERIC etc), which although they would not provide a specifically medical answer to this question, papers from these databases may be useful to look at, to look at the teachers feelings/perspectives on this topic. Please be aware that searches on individual websites and on Google cannot follow the above search strategies as the functionality of these sites is not as powerful as the main databases, so there is a chance that some relevant papers may have been missed. However, all searches across the medical databases were systematically ran with both keyword and MeSH searches to ensure comprehensibility and therefore hopefully, most relevant papers have been found. I do hope that the papers I have found for you prove useful. If you would like me to run any further refined searches for you, or if you need any assistance obtaining the full text of any of these articles, then please do get back in touch.

## Contents

[A. Original Research](#Content5)

1. [A SARS-CoV-2 familial cluster infection reveals asymptomatic transmission to children.](#Research673718)
2. [A three-generation family cluster with COVID-19 infection: should quarantine be prolonged?](#Research673644)
3. [Age profile of susceptibility, mixing, and social distancing shape the dynamics of the novel coronavirus disease 2019 outbreak in China.](#Research673676)
4. [An infant with a mild SARS-CoV-2 infection detected only by anal swabs: a case report.](#Research673633)
5. [Are Children Most of the Submerged Part of SARS-CoV-2 Iceberg?](#Research673717)
6. [Asymptomatic carrier state, acute respiratory disease, and pneumonia due to severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2): Facts and myths.](#Research673691)
7. [Atypical presentation of COVID-19 in young infants.](#Research673600)
8. [Back to school: Safe for children with underlying medical conditions.](#Research673579)
9. [Changes in contact patterns shape the dynamics of the COVID-19 outbreak in China.](#Research673670)
10. [Characterisation of COVID-19 Pandemic in Paediatric Age Group: A Systematic Review and Meta-Analysis.](#Research673630)
11. [Children are not COVID-19 super spreaders: time to go back to school.](#Research673584)
12. [Children are unlikely to be the main drivers of the COVID-19 pandemic - a systematic review.](#Research673677)
13. [Children of COVID-19: pawns, pathfinders or partners?](#Research673675)
14. [Children with coronavirus disease 2019: A review of demographic, clinical, laboratory, and imaging features in pediatric patients.](#Research673625)
15. [Children's mortality from COVID-19 compared with all-deaths and other relevant causes of death: epidemiological information for decision-making by parents, teachers, clinicians and policymakers.](#Research673687)
16. [Clinical and epidemiological features of 36 children with coronavirus disease 2019 (COVID-19) in Zhejiang, China: an observational cohort study.](#Research673697)
17. [Clinical and transmission dynamics characteristics of 406 children with coronavirus disease 2019 in China: A review.](#Research673667)
18. [Clinical characteristics and diagnostic challenges of pediatric COVID-19: A systematic review and meta-analysis.](#Research673635)
19. [Clinical features of children with SARS-CoV-2 infection: an analysis of 13 cases from Changsha, China](#Research673648)
20. [Cluster of coronavirus disease 2019 (Covid-19) in the French Alps, 2020.](#Research673591)
21. [Contact Tracing Assessment of COVID-19 Transmission Dynamics in Taiwan and Risk at Different Exposure Periods before and after Symptom Onset](#Research673652)
22. [Coronavirus Disease 2019 (COVID-19) in Children - What We Know So Far and What We Do Not.](#Research673626)
23. [Coronavirus Disease 2019 (COVID-19) in Neonates and Children From China: A Review](#Research673646)
24. [Coronavirus Disease 2019 in Children - United States, February 12-April 2, 2020](#Research673647)
25. [Coronavirus disease 2019 in children: Current status.](#Research673614)
26. [COVID-19 and the re-opening of schools: a policy maker's dilemma.](#Research673679)
27. [COVID-19 breakthroughs: separating fact from fiction.](#Research673605)
28. [COVID-19 in Children, Pregnancy and Neonates: A Review of Epidemiologic and Clinical Features.](#Research673608)
29. [COVID-19 in Children: Clinical Approach and Management](#Research673651)
30. [COVID-19 in children: Current status.](#Research673641)
31. [COVID-19 in children: the link in the transmission chain](#Research673657)
32. [COVID-19 infection in children](#Research673658)
33. [COVID-19 schools guidance.](#Research673601)
34. [COVID-19 Transmission and Children: The Child is Not to Blame.](#Research673619)
35. [COVID-19 virus and children: What do we know?](#Research673649)
36. [COVID-19, school closures, and child poverty: a social crisis in the making](#Research673656)
37. [Covid-19: Delaying school reopening by two weeks would halve risks to children, says iSAGE.](#Research673688)
38. [Covid-19: schools set to close across UK except for children of health and social care workers](#Research673598)
39. [Detectable SARS-CoV-2 viral RNA in feces of three children during recovery period of COVID-19 pneumonia.](#Research673603)
40. [Dynamic viral SARS-CoV-2 RNA shedding in in children: preliminary data and clinical consideration of Italian regional center.](#Research673621)
41. [Early CT Findings of Coronavirus Disease 2019 (COVID-19) in Asymptomatic Children: A Single-Center Experience.](#Research673715)
42. [Effects of coronavirus disease 2019 (COVID-19) on maternal, perinatal and neonatal outcomes: a systematic review.](#Research673623)
43. [Epidemiologic and clinical characteristics of 10 children with coronavirus disease 2019 in Changsha, China.](#Research673617)
44. [Epidemiology and clinical features of coronavirus disease 2019 in children](#Research673645)
45. [Epidemiology and transmission of COVID-19 in 391 cases and 1286 of their close contacts in Shenzhen, China: a retrospective cohort study](#Research673654)
46. [Epidemiology of COVID-19 Among Children in China.](#Research673612)
47. [Estimating the burden of United States workers exposed to infection or disease: A key factor in containing risk of COVID-19 infection.](#Research673678)
48. [From SARS to COVID-19: What we have learned about children infected with COVID-19.](#Research673632)
49. [Hand Hygiene, Mask-Wearing Behaviors and Its Associated Factors during the COVID-19 Epidemic: A Cross-Sectional Study among Primary School Students in Wuhan, China.](#Research673665)
50. [Impact of school closures for COVID-19 on the US health-care workforce and net mortality: a modelling study.](#Research673671)
51. [Improving the quality of care in pregnancy and childbirth with coronavirus (COVID-19): a systematic review.](#Research673627)
52. [Infection control practices in children during COVID-19 pandemic: differences from adults.](#Research673684)
53. [Infection prevention guidelines and considerations for paediatric risk groups when reopening primary schools during COVID-19 pandemic, Norway, April 2020.](#Research673716)
54. [Insight into COVID-2019 for pediatricians.](#Research673693)
55. [Interventions to mitigate early spread of SARS-CoV-2 in Singapore: a modelling study.](#Research673668)
56. [Lessons from COVID-19 in children: Key hypotheses to guide preventative and therapeutic strategies.](#Research673708)
57. [Letter to the editor: Evidence on school closure and children's social contact: Useful for coronavirus disease (COVID-19)?](#Research673596)
58. [Managing COVID-19 infection in pediatric patients.](#Research673582)
59. [Mathematical modelling of COVID-19 transmission and mitigation strategies in the population of Ontario, Canada](#Research673653)
60. [No evidence of secondary transmission of COVID-19 from children attending school in Ireland, 2020.](#Research673682)
61. [Pathophysiology of COVID-19: Why Children Fare Better than Adults?](#Research673581)
62. [Projected geographic disparities in healthcare worker absenteeism from COVID-19 school closures and the economic feasibility of child care subsidies: a simulation study.](#Research673680)
63. [Prolonged fecal shedding of SARS-CoV-2 in pediatric patients. A quantitative evidence synthesis.](#Research673622)
64. [Prolonged viral shedding in feces of pediatric patients with coronavirus disease 2019.](#Research673662)
65. [Promoting healthy movement behaviours among children during the COVID-19 pandemic](#Research673659)
66. [Reduction in COVID-19 Infection Using Surgical Facial Masks Outside the Healthcare System](#Research673719)
67. [Review article: gastrointestinal features in COVID-19 and the possibility of faecal transmission.](#Research673696)
68. [SARS-CoV-2 (COVID-19): What do we know about children? A systematic review.](#Research673628)
69. [SARS-COV-2 children transmission: the evidence is that today we do not have enough evidence.](#Research673713)
70. [SARS-CoV-2 infection in children - Understanding the immune responses and controlling the pandemic.](#Research673703)
71. [SARS-CoV-2 infection in children: Transmission dynamics and clinical characteristics.](#Research673695)
72. [SARS-CoV2 infection and primary school closure.](#Research673593)
73. [School closure and management practices during coronavirus outbreaks including COVID-19: a rapid systematic review.](#Research673661)
74. [School Opening Delay Effect on Transmission Dynamics of Coronavirus Disease 2019 in Korea: Based on Mathematical Modeling and Simulation Study.](#Research673673)
75. [Systematic review of COVID-19 in children shows milder cases and a better prognosis than adults.](#Research673692)
76. [The Demographics and Economics of Direct Care Staff Highlight Their Vulnerabilities Amidst the COVID-19 Pandemic.](#Research673685)
77. [The different clinical characteristics of corona virus disease cases between children and their families in China - the character of children with COVID-19.](#Research673602)
78. [The effect of control strategies to reduce social mixing on outcomes of the COVID-19 epidemic in Wuhan, China: a modelling study](#Research673599)
79. [The epidemiology and pathogenesis of coronavirus disease (COVID-19) outbreak.](#Research673690)
80. [The immune system of children: the key to understanding SARS-CoV-2 susceptibility?](#Research673660)
81. [The Importance of Advancing SARS-CoV-2 Vaccines in Children.](#Research673607)
82. [The isolation period should be longer: Lesson from a child infected with SARS-CoV-2 in Chongqing, China.](#Research673613)
83. [The Role of Children in the Dynamics of Intra Family Coronavirus 2019 Spread in Densely Populated Area.](#Research673609)
84. [The role of children in the transmission of mild SARS-CoV-2 infection.](#Research673640)
85. [The transmission and diagnosis of 2019 novel coronavirus infection disease (COVID-19): A Chinese perspective.](#Research673699)
86. [The Unexpected Risks of COVID-19 on Asthma Control in Children.](#Research673681)
87. [To mask or not to mask children to overcome COVID-19.](#Research673583)
88. [Viral RNA Load in Mildly Symptomatic and Asymptomatic Children with COVID-19, Seoul.](#Research673606)
89. [What are the Underlying Transmission Patterns of COVID-19 Outbreak? - An Age-specific Social Contact Characterization.](#Research673683)
90. [[Back to school and COVID-19: It is urgent to control our fears and move forward for the good of children].](#Research673686)
91. [High-density Bacterial Nasal Carriage in Children Is Transient and Associated with Respiratory Viral Infections - Implications for Transmission Dynamics](#Research673650)
92. [A wake-up call: COVID-19 and its impact on children's health and wellbeing](#Research673655)

### B. Grey Literature and Published Literature Found via Other Sources (e.g. Google, NHS Evidence etc).

### CEBM: <https://www.cebm.net/covid-19/covid-19-have-we-forgotten-our-children-in-all-this/>

**Up to Date:**   
<https://www.uptodate.com/contents/coronavirus-disease-2019-covid-19-considerations-in-children>

**Children and schools:**

[Summary: What is the evidence for transmission of COVID-19 by children [or in schools]? (851.46 KB PDF)](https://www.ed.ac.uk/files/atoms/files/uncover_001-03_summary_-_children_transmission_of_sars-cov-2.pdf)

[**COVID‐19 is milder in children possibly due to cross immunity**](https://onlinelibrary.wiley.com/doi/10.1111/apa.15407)

[Chandra Sekhar Devulapalli](https://novel-coronavirus.onlinelibrary.wiley.com/action/doSearch?ContribAuthorStored=Sekhar+Devulapalli%2C+Chandra)

[Acta Paediatrica](https://onlinelibrary.wiley.com/journal/16512227)

DOI: [10.1111/apa.15407](https://onlinelibrary.wiley.com/doi/10.1111/apa.15407)

[**What we know so far about Coronavirus Disease 2019 in children: A meta‐analysis of 551 laboratory‐confirmed cases**](https://onlinelibrary.wiley.com/doi/10.1002/ppul.24869)

[Linjie Zhang MD, PhD](https://novel-coronavirus.onlinelibrary.wiley.com/action/doSearch?ContribAuthorStored=Zhang%2C+Linjie)  
[Tyele G. Peres](https://novel-coronavirus.onlinelibrary.wiley.com/action/doSearch?ContribAuthorStored=Peres%2C+Tyele+G)   
[Marcus V. F. Silva](https://novel-coronavirus.onlinelibrary.wiley.com/action/doSearch?ContribAuthorStored=Silva%2C+Marcus+V+F)  
[Paulo Camargos MD, PhD](https://novel-coronavirus.onlinelibrary.wiley.com/action/doSearch?ContribAuthorStored=Camargos%2C+Paulo)

[Pediatric Pulmonology](https://onlinelibrary.wiley.com/journal/10990496)

DOI: [10.1002/ppul.24869](https://onlinelibrary.wiley.com/doi/10.1002/ppul.24869)

[**Ofsted: coronavirus (COVID-19) rolling update**](https://www.gov.uk/guidance/ofsted-coronavirus-covid-19-rolling-update)

Source:  [Ofsted](https://www.evidence.nhs.uk/search?om=%5b%7b%22srn%22:%5b%22Ofsted%22%5d%7d%5d&q=(%22Covid+19%22+OR+Coronavirus+OR+Betacoronavirus)+AND+(Child*+OR+Infant*+OR+Toddler*+OR+Boy*+OR+Girl*+OR+Preschool*)&sp=on) - 17 April 2020 - Publisher: Ofsted

Ofsted guidance and information relating to coronavirus (COVID-19) for schools, early years, children's social care and further education and skills providers.

[**COVID-19 in children: the link in the transmission chain - The ...**](https://www.thelancet.com/journals/laninf/article/PIIS1473-3099(20)30236-X/fulltext)

[www.thelancet.com › journals › laninf › article › fulltext](https://www.thelancet.com/journals/laninf/article/PIIS1473-3099(20)30236-X/fulltext)

25 Mar 2020 - Severe acute respiratory syndrome **coronavirus** 2 (SARS-CoV-2), which causes **coronavirus** disease 2019 (**COVID-19**), emerged from Wuhan, ...

by AA Kelvin - ‎[Cited by 39](https://scholar.google.co.uk/scholar?lr&safe=active&as_qdr=all&gs_lcp=CgZwc3ktYWIQDFD32gFY99oBYNjpAWgAcAB4AIABmAKIAZgCkgEDMi0xmAEBoAEBqgEHZ3dzLXdpeg&um=1&ie=UTF-8&lr&cites=238269434560009535)

[**How do children spread the coronavirus? The science still isn't ...**](https://www.nature.com/articles/d41586-020-01354-0)

[www.nature.com › news](https://www.nature.com/articles/d41586-020-01354-0)

7 May 2020 - **Children** represent a small fraction of confirmed **COVID-19** cases ... They are not responsible for the majority of **transmission** and the data ...

[**C. Search History**](#SearchHistory)

## A. Original Research

1. **A SARS-CoV-2 familial cluster infection reveals asymptomatic transmission to children.**  
   Chen M. Journal of infection and public health 2020;13(6):883-886.

Information on SARS-CoV-2 asymptomatic infection and infectivity in children is limited. In this study, we aimed to report the epidemiological and clinical characteristics of a familial cluster infection including children with SARS-CoV-2. On February 1, 2020, two children(case 1 and case 2), an 8-year-old girl and a 9-year-old boy, were admitted to the isolation ward in Xiangyang Central Hospital, Hubei province, China, with the diagnosis of COVID-19. Before admission, they had been staying at home with their father and never contacted with any confirmed patients except their mother (case 3) who returned from Wuhan on January 22. Both case 1 and case 2 got mild symptoms. Case 3 did not develop any symptoms until February 6, 2020, with an asymptomatic period of 15 days. She was transferred to ICU and administered multiple treatment according to the disease progression and chest CT manifestations. Her nucleic acid test turned positive until Feb 21, 2020, 15 days after symptoms onset, 30 days after her return from Wuhan. Our data showed that patients with SARS-CoV-2 may have the ability to transmit during their asymptomatic period even with the negative of viral nucleic acid in pharyngeal swabs.

1. **A three-generation family cluster with COVID-19 infection: should quarantine be prolonged?**  
   Yang M.-C. Public Health 2020;185:31-33.

Objectives: Families are a transmission route for severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) because of the close contact. Monitoring of the viral load will be a valuable method to reduce the optimal number of quarantine days, especially in presymptomatic and symptomatic carriers of their households. The traditional three-generation families living together are seen frequently in East Asia, including in Taiwan. Study design: We report on a family cluster with six individuals infected with coronavirus disease in Taiwan. <br/>Method(s): The current public policy in Taiwan is quarantine for at least 14 days, based on the incubation period, or until the patient has tested negative three days in a row using the SARS-CoV-2 reverse transcription polymerase chain reaction. Details on the onset date of clinical symptoms, throat swab conversion, and course of disease were collected from medical records retrospectively. <br/>Result(s): In the household of this three-generation Taiwanese family, the infection rate was 60%. The ratio of males to females was 4:2, and the age range was 11-85 years. The prevalence of asymptomatic disease was 33.3% (2/6). The longest throat swab conversion time was 37 days, and the estimated course of disease from symptoms to first conversion of throat swab was 59 days. <br/>Conclusion(s): Large families, including three-generation families in a single dwelling, should be monitored when the index case is found. Presymptomatic and symptomatic family members could be quarantined for an appropriate duration which, in our experience, is 2 months.<br/>Copyright &#xa9; 2020 The Royal Society for Public Health

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=442d311847c694d7da3d46c5cdeac802)

1. **Age profile of susceptibility, mixing, and social distancing shape the dynamics of the novel coronavirus disease 2019 outbreak in China.**  
   Zhang J. medRxiv : the preprint server for health sciences 2020;:No page numbers.

Strict interventions were successful to control the novel coronavirus (COVID-19) outbreak in China. As transmission intensifies in other countries, the interplay between age, contact patterns, social distancing, susceptibility to infection and disease, and COVID-19 dynamics remains unclear. To answer these questions, we analyze contact surveys data for Wuhan and Shanghai before and during the outbreak and contact tracing information from Hunan Province. Daily contacts were reduced 7-9 fold during the COVID-19 social distancing period, with most interactions restricted to the household. Children 0-14 years were 59% (95% CI 7-82%) less susceptible than individuals 65 years and over. A transmission model calibrated against these data indicates that social distancing alone, as implemented in China during the outbreak, is sufficient to control COVID-19. While proactive school closures cannot interrupt transmission on their own, they reduce peak incidence by half and delay the epidemic. These findings can help guide global intervention policies.

1. **An infant with a mild SARS-CoV-2 infection detected only by anal swabs: a case report.**  
   Li Juan The Brazilian journal of infectious diseases : an official publication of the Brazilian Society of Infectious Diseases 2020;:No page numbers.

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) emerged in Wuhan, China and has spread rapidly worldwide. We present a mild SARS-CoV-2 infection in a baby with non-productive cough and normal chest computed tomography, in whom only anal swabs tested positive by real-time PCR testing for SARS-CoV-2. She was given atomization inhalation therapy with recombinant human interferon alfa-1b for 10 days. Her anal swabs remained positive for eight days, whereas her throat swabs were persistently negative by real-time PCR testing. Mild and asymptomatic cases, especially in children, might present with PCR negative pharyngeal/nasal swabs and PCR positive anal swabs. Those patients are potential sources of infection via fecal-oral transmission for COVID-19.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=112a8e395d34d0cb8d119c9fed566590)

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=fc1bfb30ce5619c7288f438e12894766)

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=76a9485738ad150863799a3f7a233791)

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=76a9485738ad150863799a3f7a233791)

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=c4becf7afebbb91b89b45ec29131d322)

1. **Are Children Most of the Submerged Part of SARS-CoV-2 Iceberg?**  
   Passanisi S. Frontiers in pediatrics 2020;8:213.

1. **Asymptomatic carrier state, acute respiratory disease, and pneumonia due to severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2): Facts and myths.**  
   Lai CC Journal of microbiology, immunology, and infection = Wei mian yu gan ran za zhi 2020;53(3):404-412.

Since the emergence of coronavirus disease 2019 (COVID-19) (formerly known as the 2019 novel coronavirus [2019-nCoV]) in Wuhan, China in December 2019, which is caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), more than 75,000 cases have been reported in 32 countries/regions, resulting in more than 2000 deaths worldwide. Despite the fact that most COVID-19 cases and mortalities were reported in China, the WHO has declared this outbreak as the sixth public health emergency of international concern. The COVID-19 can present as an asymptomatic carrier state, acute respiratory disease, and pneumonia. Adults represent the population with the highest infection rate; however, neonates, children, and elderly patients can also be infected by SARS-CoV-2. In addition, nosocomial infection of hospitalized patients and healthcare workers, and viral transmission from asymptomatic carriers are possible. The most common finding on chest imaging among patients with pneumonia was ground-glass opacity with bilateral involvement. Severe cases are more likely to be older patients with underlying comorbidities compared to mild cases. Indeed, age and disease severity may be correlated with the outcomes of COVID-19. To date, effective treatment is lacking; however, clinical trials investigating the efficacy of several agents, including remdesivir and chloroquine, are underway in China. Currently, effective infection control intervention is the only way to prevent the spread of SARS-CoV-2.

1. **Atypical presentation of COVID-19 in young infants.**  
   Nathan Lancet 2020;395(10235):1481-1481.

As of April 27, 2020, more than two million people worldwide have been diagnosed with coronavirus disease 2019 (COVID-19), with Europe being one of the current major clusters of the pandemic.[1] Despite an absence of evidence, children have been targeted as a potential source of children-to-adult virus dissemination, and schools have been closed in most countries. In our paediatric hospital, patients presenting with fever or respiratory symptoms, or both, and requiring admission to hospital are admitted to a dedicated SARS-CoV-2 infection unit. Supplementary Material Supplementary appendix Graph References 1 WHO Coronavirus disease 2019 (COVID-19) situation report - 93. https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200422-sitrep-93-covid-19.pdf?sfvrsn=35cf80d7%5f4 April 22, 2020, 2 X Lu, L Zhang, H Du, SARS-CoV-2 infection in children.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=ff5902fff34286fb629f34783671cc94)

1. **Back to school: Safe for children with underlying medical conditions.**  
   Starr Mike Australian journal of general practice 2020;49:No page numbers.

As schools reopen as a result of low community transmission rates of COVID-19, parents and teachers will have understandable concerns about the risks to students and staff.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=d34490b47257f844d6f9386409ba037f)

1. **Changes in contact patterns shape the dynamics of the COVID-19 outbreak in China.**  
   Zhang J. Science (New York, N.Y.) 2020;:No page numbers.

Intense non-pharmaceutical interventions were put in place in China to stop transmission of the novel coronavirus disease (COVID-19). As transmission intensifies in other countries, the interplay between age, contact patterns, social distancing, susceptibility to infection, and COVID-19 dynamics remains unclear. To answer these questions, we analyze contact surveys data for Wuhan and Shanghai before and during the outbreak and contact tracing information from Hunan Province. Daily contacts were reduced 7-8-fold during the COVID-19 social distancing period, with most interactions restricted to the household. We find that children 0-14 years are less susceptible to SARS-CoV-2 infection than adults 15-64 years of age (odds ratio 0.34, 95%CI 0.24-0.49), while in contrast, individuals over 65 years are more susceptible to infection (odds ratio 1.47, 95%CI: 1.12-1.92). Based on these data, we build a transmission model to study the impact of social distancing and school closure on transmission. We find that social distancing alone, as implemented in China during the outbreak, is sufficient to control COVID-19. While proactive school closures cannot interrupt transmission on their own, they can reduce peak incidence by 40-60% and delay the epidemic.

1. **Characterisation of COVID-19 Pandemic in Paediatric Age Group: A Systematic Review and Meta-Analysis.**  
   Mustafa Naira M. Journal of clinical virology : the official publication of the Pan American Society for Clinical Virology 2020;128:104395.

BACKGROUNDCoronavirus disease 2019 (COVID-19) is a pandemic first originated in Wuhan the capital of Hubei province, China in December 2019 and then spread globally. It is caused by SARS-CoV-2. Until 1st April 2020, the number of cases worldwide was recorded to be 823,626 with 40,598 deaths. Most of the reported cases were adults with few cases described in children and neonates.OBJECTIVESWe performed a systematic review and meta-analysis to analyse the disease characterisation in paediatric age group including the possibility of vertical transmission to the neonates.METHODSArticles published up to 2nd April 2020 in PubMed and google Scholar were considered for this study.FINDINGSThe most frequently reported symptoms were cough 49% (95% CI: 42 - 55%) and fever 47% (95% CI: 41- 53%). Lymphopenia and increased Procalcitonin were recorded in (21%, 95% CI: 12 - 30%) and (28%, 95% CI: 18 - 37%) respectively. No sex difference for COVID-19 was found in paediatric age group (p = 0.7). Case fatality rate was 0%. Four out of 58 neonates (6.8%) born to COVID-19 confirmed mothers tested positive for the disease.CONCLUSIONThe disease trajectory in Paediatric patients has good prognosis compared to adults. Intensive care unit and death are rare. Vertical transmission and virus shedding in breast milk are yet to be established.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=95f8c325aa60ea09caf6c940a7155aff)

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=49bc7c292507d50d0b68bbb4966af665)

1. **Children are not COVID-19 super spreaders: time to go back to school.**  
   Munro Alasdair P. S Archives of disease in childhood 2020;:No page numbers.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=40ca938cd66a4df18cc341d2ae3d80ae)

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=e54f40e87eb32c2db0b6cb7dce6fb7f4)

1. **Children are unlikely to be the main drivers of the COVID-19 pandemic - a systematic review.**  
   Ludvigsson JF Acta paediatrica (Oslo, Norway : 1992) 2020;:No page numbers.

AIM: Many countries have closed schools and kindergartens to minimise COVID-19, but the role that children play in disease transmission is unclear. METHODS: A systematic literature review of the MEDLINE and EMBASE databases and medRxiv/bioRxiv preprint servers to 11 May 2020 identified published and unpublished papers on COVID-19 transmission by children. RESULTS: We identified 700 scientific papers and letters and 47 full texts were studied in detail. Children accounted for a small fraction of COVID-19 cases and mostly had social contacts with peers or parents, rather than older people at risk of severe disease. Data on viral loads were scarce, but indicated that children may have lower levels than adults, partly because they often have fewer symptoms, and this should decrease the transmission risk. Household transmission studies showed that children were rarely the index case and case studies suggested that children with COVID-19 seldom caused outbreaks. However, it is highly likely that children can transmit the SARS-COV-2 virus, which causes COVID-19, and even asymptomatic children can have viral loads. CONCLUSION: Children are unlikely to be the main drivers of the pandemic. Opening up schools and kindergartens is unlikely to impact COVID-19 mortality rates in older people.

1. **Children of COVID-19: pawns, pathfinders or partners?**  
   Larcher V. Journal of medical ethics 2020;:No page numbers.

Countries throughout the world are counting the health and socioeconomic costs of the COVID-19 pandemic, including the strategies necessary to contain it. Profound consequences from social isolation are beginning to emerge, and there is an urgency about charting a path to recovery, albeit to a 'new normal' that mitigates them. Children have not suffered as much from the direct effects of COVID-19 infection as older adults. Still, there is mounting evidence that their health and welfare are being adversely affected. Closure of schools has been a critical component of social isolation but has a far broader impact than the diminution of educational opportunities, as important as these are. Reopening of schools is therefore essential to recovery, with some countries already tentatively implementing it. Children's interests are vital considerations in any recovery plan, but the question remains as to how to address them within the context of how society views children; should they be regarded as pawns, pathfinders or partners in this enterprise?

1. **Children with coronavirus disease 2019: A review of demographic, clinical, laboratory, and imaging features in pediatric patients.**  
   Cui Xiaojian Journal of medical virology 2020;:No page numbers.

There is a current outbreak of coronavirus disease 2019 (COVID-19), with a global spread. With the rapid increase in the number of infections, an increase is observed in the number of children with COVID-19. Most research findings are regarding adult cases, which are not always transferrable to children. Evidence-based studies are still expected to formulate clinical decisions for pediatric patients. In this review, we included 2597 pediatric patients that reported recently and evaluated the demographic, clinical, laboratory, and imaging features of children with COVID-19. We found that even lymphopenia was the most common lab finding in adults; it infrequently occurred in children (9.8%). Moreover, elevated creatine kinase MB isoenzyme was much more commonly observed in children (27.0%) than that in adults, suggesting that heart injury would be more likely to occur in pediatric patients. Our analysis may contribute to determine the spectrum of disease in children and to develop strategies to control the disease transmission.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=6ecde6e0a1b0f949d83266886d27e706)

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=b99b03ec67026e4f5a367ef1aeda070a)

1. **Children's mortality from COVID-19 compared with all-deaths and other relevant causes of death: epidemiological information for decision-making by parents, teachers, clinicians and policymakers.**  
   Bhopal S. Public health 2020;185:19-20.

1. **Clinical and epidemiological features of 36 children with coronavirus disease 2019 (COVID-19) in Zhejiang, China: an observational cohort study.**  
   Qiu H. The Lancet. Infectious diseases 2020;20(6):689-696.

BACKGROUND: Since December, 2019, an outbreak of coronavirus disease 2019 (COVID-19) has spread globally. Little is known about the epidemiological and clinical features of paediatric patients with COVID-19. METHODS: We retrospectively retrieved data for paediatric patients (aged 0-16 years) with confirmed COVID-19 from electronic medical records in three hospitals in Zhejiang, China. We recorded patients' epidemiological and clinical features. FINDINGS: From Jan 17 to March 1, 2020, 36 children (mean age 8·3 [SD 3·5] years) were identified to be infected with severe acute respiratory syndrome coronavirus 2. The route of transmission was by close contact with family members (32 [89%]) or a history of exposure to the epidemic area (12 [33%]); eight (22%) patients had both exposures. 19 (53%) patients had moderate clinical type with pneumonia; 17 (47%) had mild clinical type and either were asymptomatic (ten [28%]) or had acute upper respiratory symptoms (seven [19%]). Common symptoms on admission were fever (13 [36%]) and dry cough (seven [19%]). Of those with fever, four (11%) had a body temperature of 38·5°C or higher, and nine (25%) had a body temperature of 37·5-38·5°C. Typical abnormal laboratory findings were elevated creatine kinase MB (11 [31%]), decreased lymphocytes (11 [31%]), leucopenia (seven [19%]), and elevated procalcitonin (six [17%]). Besides radiographic presentations, variables that were associated significantly with severity of COVID-19 were decreased lymphocytes, elevated body temperature, and high levels of procalcitonin, D-dimer, and creatine kinase MB. All children received interferon alfa by aerosolisation twice a day, 14 (39%) received lopinavir-ritonavir syrup twice a day, and six (17%) needed oxygen inhalation. Mean time in hospital was 14 (SD 3) days. By Feb 28, 2020, all patients were cured. INTERPRETATION: Although all paediatric patients in our cohort had mild or moderate type of COVID-19, the large proportion of asymptomatic children indicates the difficulty in identifying paediatric patients who do not have clear epidemiological information, leading to a dangerous situation in community-acquired infections. FUNDING: Ningbo Clinical Research Center for Children's Health and Diseases, Ningbo Reproductive Medicine Centre, and Key Scientific and Technological Innovation Projects of Wenzhou.

1. **Clinical and transmission dynamics characteristics of 406 children with coronavirus disease 2019 in China: A review.**  
   Zhen-Dong Y. The Journal of infection 2020;:No page numbers.

OBJECTIVE: Chinese pediatricians are working on the front line to fight COVID-19. They have published a great amount of first-hand clinical data. Collecting their data and forming a large sample for analysis is more conducive to the recognition, prevention and treatment of coronavirus disease 2019 in children. The epidemic prevention and control experience of Chinese pediatricians should be shared with the world. METHODS: By searching Chinese and English literature, the data of 406 children with COVID-19 in China were analyzed. RESULTS: It was found that the clustered incidence of children's families is a dynamic transmission feature; the incidence is low; asymptomatic infections and mild cases account for 44.8%, with only 7 cases of critical illness; laboratory examination of lymphocyte counts is not reduced, as it is for adults; chest CT findings are less severe than those for adults. These presentations are the clinical features of COVID-19 in children. Only 55 of the 406 cases were tested by anal swab for virus nucleic acid, 45 of which were positive, accounting for 81.8% of stool samples. CONCLUSION: There are more children than adults with asymptomatic infections, milder conditions, faster recovery, and a better prognosis. Some concealed morbidity characteristics also bring difficulties to the early identification, prevention and control of COVID-19. COVID-19 screening is needed in the pediatric fever clinic, and respiratory and digestive tract nucleic acid tests should be performed. Efforts should be made to prevent children from becoming a hidden source of transmission in kindergartens, schools or families. Furthermore, China's experience in treating COVID-19 in children has led to faster recovery of sick children.

1. **Clinical characteristics and diagnostic challenges of pediatric COVID-19: A systematic review and meta-analysis.**  
   Chang Tu-Hsuan Journal of the Formosan Medical Association = Taiwan yi zhi 2020;119(5):982-989.

BACKGROUND/PURPOSECurrent studies on pediatric coronavirus disease 2019 (COVID-19) are rare. The clinical characteristics and spectrum are still unknown. Facing this unknown and emerging pathogen, we aimed to collect current evidence about COVID-19 in children.METHODSWe performed a systematic review in PubMed and Embase to find relevant case series. Because some reports were published in Chinese journals, the journals and publications of the Chinese Medical Association related to COVID-19 were completely reviewed. A random effects model was used to pool clinical data in the meta-analysis.RESULTSNine case series were included. In the pooled data, most of patients (75%) had a household contact history. The disease severity was mainly mild to moderate (98%). Only 2 children (2%) received intensive care. Fever occurred in 59% of the patients, while cough in 46%. Gastrointestinal symptoms (12%) were uncommon. There are 26% children are asymptomatic. The most common radiographic finding was ground glass opacities (48%). Currently, there is no evidence of vertical transmission to neonates born to mothers with COVID-19. Compared with the most relevant virus, SARS-CoV, SARS-CoV-2 causes less severe disease.CONCLUSIONCOVID-19 has distinct features in children. The disease severity is mild. Current diagnosis is based mainly on typical ground glass opacities on chest CT, epidemiological suspicion and contact tracing.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=0326e16170c974b04a337ca503623fd0)

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=9639352c4caf0fd639a61afc2afbc3e3)

1. **Clinical features of children with SARS-CoV-2 infection: an analysis of 13 cases from Changsha, China**  
   Tan X. Zhongguo dang dai er ke za zhi = Chinese journal of contemporary pediatrics 2020;22(4):294-298.

OBJECTIVE: To study the clinical features of children with severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection. <br/>METHOD(S): A retrospective analysis was performed for the clinical data of 13 children with SARS-CoV-2 infection who hospitalized in a Changsha hospital. <br/>RESULT(S): All 13 children had the disease onset due to family aggregation. Of the 13 children, 2 had no symptoms, and the other 11 children had the clinical manifestations of fever, cough, pharyngeal discomfort, abdominal pain, diarrhea, convulsions, or vomiting. As for clinical typing, 7 had mild type, 5 had common type, and 1 had severe type. The median duration of fever was 2 days in 6 children. All 13 children had normal levels of peripheral blood lymphocyte counts, immunoglobulins, CD4, CD8, and interleukin-6. The median time to clearance of SARS-CoV-2 was 13 days in the nasopharyngeal swabs of the 13 children. Three children presented false negatives for RT-PCR of SARS-CoV-2. SARS-CoV-2 RNA remained detectable in stools for 12 days after the nasopharyngeal swab test yielded a negative result. Abnormal CT findings were observed in 6 children. All 13 children were cured and discharged and they were normal at 2 weeks after discharge. <br/>CONCLUSION(S): Intra-family contact is the main transmission route of SARS-CoV-2 infection in children, and there is also a possibility of fecal-oral transmission. Mild and common types are the major clinical types in children with SARS-CoV-2 infection, and cytokine storm is not observed. Children with SARS-CoV-2 infection tend to have a good short-term prognosis, and follow-up is needed to observe their long-term prognosis. Multiple nucleic acid tests should be performed for patients with SARS-CoV-2 infection and their close contacts by multiple site sampling.

1. **Cluster of coronavirus disease 2019 (Covid-19) in the French Alps, 2020.**  
   Danis Kostas Clinical infectious diseases : an official publication of the Infectious Diseases Society of America 2020;:No page numbers.

BACKGROUNDOn 07/02/2020, French Health authorities were informed of a confirmed case of SARS-CoV-2 coronavirus in an Englishman infected in Singapore who had recently stayed in a chalet in the French Alps. We conducted an investigation to identify secondary cases and interrupt transmission.METHODSWe defined as a confirmed case a person linked to the chalet with a positive RT-PCR sample for SARS-CoV-2.RESULTSThe index case stayed 4 days in the chalet with 10 English tourists and a family of 5 French residents; SARS-CoV-2 was detected in 5 individuals in France, 6 in England (including the index case), and 1 in Spain (overall attack rate in the chalet: 75%). One pediatric case, with picornavirus and influenza A coinfection, visited 3 different schools while symptomatic. One case was asymptomatic, with similar viral load as that of a symptomatic case. Seven days after the first cases were diagnosed, one tertiary case was detected in a symptomatic patient with a positive endotracheal aspirate; all previous and concurrent nasopharyngeal specimens were negative. Additionally, 172 contacts were monitored, including 73 tested negative for SARS-CoV-2.CONCLUSIONSThe occurrence in this cluster of one asymptomatic case with similar viral load as a symptomatic patient, suggests transmission potential of asymptomatic individuals. The fact that an infected child did not transmit the disease despite close interactions within schools suggests potential different transmission dynamics in children. Finally, the dissociation between upper and lower respiratory tract results underscores the need for close monitoring of the clinical evolution of suspect Covid-19 cases.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=9248b1bb536d015bfe17fc9df12b00cb)

1. **Contact Tracing Assessment of COVID-19 Transmission Dynamics in Taiwan and Risk at Different Exposure Periods before and after Symptom Onset**  
   Cheng H.-Y. JAMA Internal Medicine 2020;:No page numbers.

Importance: The dynamics of coronavirus disease 2019 (COVID-19) transmissibility are yet to be fully understood. Better understanding of the transmission dynamics is important for the development and evaluation of effective control policies. <br/>Objective(s): To delineate the transmission dynamics of COVID-19 and evaluate the transmission risk at different exposure window periods before and after symptom onset. <br/>Design, Setting, and Participant(s): This prospective case-ascertained study in Taiwan included laboratory-confirmed cases of COVID-19 and their contacts. The study period was from January 15 to March 18, 2020. All close contacts were quarantined at home for 14 days after their last exposure to the index case. During the quarantine period, any relevant symptoms (fever, cough, or other respiratory symptoms) of contacts triggered a COVID-19 test. The final follow-up date was April 2, 2020. <br/>Main Outcomes and Measures: Secondary clinical attack rate (considering symptomatic cases only) for different exposure time windows of the index cases and for different exposure settings (such as household, family, and health care). <br/>Result(s): We enrolled 100 confirmed patients, with a median age of 44 years (range, 11-88 years), including 56 men and 44 women. Among their 2761 close contacts, there were 22 paired index-secondary cases. The overall secondary clinical attack rate was 0.7% (95% CI, 0.4%-1.0%). The attack rate was higher among the 1818 contacts whose exposure to index cases started within 5 days of symptom onset (1.0% [95% CI, 0.6%-1.6%]) compared with those who were exposed later (0 cases from 852 contacts; 95% CI, 0%-0.4%). The 299 contacts with exclusive presymptomatic exposures were also at risk (attack rate, 0.7% [95% CI, 0.2%-2.4%]). The attack rate was higher among household (4.6% [95% CI, 2.3%-9.3%]) and nonhousehold (5.3% [95% CI, 2.1%-12.8%]) family contacts than that in health care or other settings. The attack rates were higher among those aged 40 to 59 years (1.1% [95% CI, 0.6%-2.1%]) and those aged 60 years and older (0.9% [95% CI, 0.3%-2.6%]). <br/>Conclusions and Relevance: In this study, high transmissibility of COVID-19 before and immediately after symptom onset suggests that finding and isolating symptomatic patients alone may not suffice to contain the epidemic, and more generalized measures may be required, such as social distancing.<br/>Copyright &#xa9; 2020 BMJ Publishing Group. All rights reserved.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=2117c57e0b52c18ccae9f2fb52ee98a9)

1. **Coronavirus Disease 2019 (COVID-19) in Children - What We Know So Far and What We Do Not.**  
   Balasubramanian S. Indian pediatrics 2020;57(5):435-442.

Pediatric coronavirus disease-19 (COVID-19) infection is relatively mild when compared to adults, and children are reported to have a better prognosis. Mortality in children appears rare. Clinical features of COVID-19 in children include fever and cough, but a large proportion of infected children appears to be asymptomatic and may contribute to transmission. It remains unclear why children and young adults are less severely affected than older individuals, but this might involve differences in immune system function in the elderly and/or differences in the expression/function of the cellular receptor for Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2)- Angiotensin converting enzyme 2 (ACE2). Laboratory findings and chest imaging may not be specific in children with COVID-19. Diagnosis is by Reverse transcriptase-Polymerase chain reaction (RT-PCR) testing of upper or lower respiratory tract secretions. This review additionally considers COVID-19 in immunosuppressed children, and also suggests a management algorithm for the few children who appear to present with life threatening infection, including the potential use of antiviral and immunomodulatory treatment. The most significant threat to global child health from SARS-CoV-2 is unlikely to be related to COVID 19 in children, but rather the socio-economic consequences of a prolonged pandemic.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=08811af4e4cf5e7564e40d0b1145fac6)

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=e0f5d31091f7f37f1fa9af9ba3a427b6)

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=2c00f71d7f43c013976220c8e995d975)

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=bc42b9b04c043dc9b0a4621f1a3f8281)

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=361d7d96be81ded64875694dd12e8128)

1. **Coronavirus Disease 2019 (COVID-19) in Neonates and Children From China: A Review**  
   Yu Y. Frontiers in Pediatrics 2020;8:No page numbers.

At the end of 2019, a novel coronavirus began to spread in Wuhan, Hubei Province, China. The confirmed cases increased nationwide rapidly, in part due to the increased population mobility during the Chinese Lunar New Year festival. The World Health Organization (WHO) subsequently named the novel coronavirus pneumonia Coronavirus Disease 2019 (COVID-19) and named the virus Severe Acute Respiratory Syndrome Coronavirus-2 (SARS-CoV-2). Soon, transmission from person to person was confirmed and the virus spread to many other countries. To date, many cases have been reported in the pediatric age group, most of which were from China. The management and treatment strategies have also been improved, which we believe would be helpful to pediatric series in other countries as well. However, the characteristics of neonatal and childhood infection still have not been evaluated in detail. This review summarizes the current understanding of SARS-CoV-2 infection in neonates and children from January 24 to May 1, as an experience from China.<br/>&#xa9; Copyright &#xa9; 2020 Yu and Chen.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=10e2c8b76245ed2d17d27840774ef699)

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=1e255efd90f582d0e90c7e4f5d1853cc)

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=199eb9614e25559213bace5326abc0a3)

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=b0742fe5d07753646364477d1e0f65ef)

1. **Coronavirus Disease 2019 in Children - United States, February 12-April 2, 2020**  
   Anon. MMWR. Morbidity and mortality weekly report 2020;69(14):422-426.

As of April 2, 2020, the coronavirus disease 2019 (COVID-19) pandemic has resulted in &gt;890,000 cases and &gt;45,000 deaths worldwide, including 239,279 cases and 5,443 deaths in the United States (1,2). In the United States, 22% of the population is made up of infants, children, and adolescents aged &lt;18 years (children) (3). Data from China suggest that pediatric COVID-19 cases might be less severe than cases in adults and that children might experience different symptoms than do adults (4,5); however, disease characteristics among pediatric patients in the United States have not been described. Data from 149,760 laboratory-confirmed COVID-19 cases in the United States occurring during February 12-April 2, 2020 were analyzed. Among 149,082 (99.6%) reported cases for which age was known, 2,572 (1.7%) were among children aged &lt;18 years. Data were available for a small proportion of patients on many important variables, including symptoms (9.4%), underlying conditions (13%), and hospitalization status (33%). Among those with available information, 73% of pediatric patients had symptoms of fever, cough, or shortness of breath compared with 93% of adults aged 18-64 years during the same period; 5.7% of all pediatric patients, or 20% of those for whom hospitalization status was known, were hospitalized, lower than the percentages hospitalized among all adults aged 18-64 years (10%) or those with known hospitalization status (33%). Three deaths were reported among the pediatric cases included in this analysis. These data support previous findings that children with COVID-19 might not have reported fever or cough as often as do adults (4). Whereas most COVID-19 cases in children are not severe, serious COVID-19 illness resulting in hospitalization still occurs in this age group. Social distancing and everyday preventive behaviors remain important for all age groups as patients with less serious illness and those without symptoms likely play an important role in disease transmission (6,7).

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=f69f608f0dac5a3d3fbb98ff02615ba2)

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=dd82f59161c7fb8ed53037378efba08a)

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=d01a553828144885536d3f6306cf7cba)

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=8bfdcda1ed205536842ee6a8524e3596)

1. **Coronavirus disease 2019 in children: Current status.**  
   Jeng Mei-Jy Journal of the Chinese Medical Association : JCMA 2020;83(6):527-533.

Coronavirus disease 2019 (COVID-19), caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), emerged from China in December 2019. The outbreak further exploded in Europe and America in mid-March 2020 to become a global health emergency. We reviewed recent published articles and on-line open messages on SARS-CoV-2-positive infants and children younger than 20 years of age. Symptoms are usually less severe in children than in adults. Twelve critically or mortally ill children were found in the published or news reports before April 6, 2020. Vertical transmission from the mother to her fetus or neonate has not been proven definitively. However, six early-onset (<7 days) and 3 late-onset neonatal SARS-CoV-2 infections were found in the literature. We also summarized the presentations and contact information of 24 SARS-CoV-2-positive children announced by the Taiwan Centers for Disease Control. Early identification and isolation, adequate management, prevention, and vaccine development are the keys to controlling the disease spread. Clinical physicians should be alert to asymptomatic children with COVID-19. Multidirectional investigations are crucial in the global fight against COVID-19.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=3515a4f66b7c3b428ca99efcd9b90bf6)

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=7d21a07546826c9f9f9f457b64c3e500)

1. **COVID-19 and the re-opening of schools: a policy maker's dilemma.**  
   Fantini MP Italian journal of pediatrics 2020;46(1):79.

The epidemic of coronavirus disease 2019 (COVID-19) broke out in Wuhan, China, in December 2019 and rapidly spread across the world. In order to counter this epidemic, several countries put in place different restrictive measures, such as the school's closure and a total lockdown. However, as the knowledge on the disease progresses, clinical evidence showed that children mainly have asymptomatic or mild disease and it has been suggested that they are also less likely to spread the virus. Moreover, the lockdown and the school closure could have negative consequences on children, affecting their social life, their education and their mental health. As many countries have already entered or are planning a phase of gradual lifting of the containment measures of social distancing, it seems plausible that the re-opening of nursery schools and primary schools could be considered a policy to be implemented at an early stage of recovery efforts, putting in place measures to do it safely, such as the maintenance of social distance, the reorganisation of classes into smaller groups, the provision of adequate sanitization of spaces, furniture and toys, the prompt identification of cases in the school environment and their tracing. Therefore, policy makers have the task of balancing pros and cons of the school re-opening strategy, taking into account psychological, educational and social consequences for children and their families. Another issue to be considered is represented by socio-economic disparities and inequalities which could be amplified by school's closure.

1. **COVID-19 breakthroughs: separating fact from fiction.**  
   Dhillon Paraminder The FEBS journal 2020;:No page numbers.

The newly recognised coronavirus SARS-CoV-2, causative agent of COVID-19, has caused a pandemic with huge ramifications for human interactions around the globe. As expected, research efforts to understand the virus and curtail the disease are moving at a frantic pace alongside the spread of rumours, speculations and falsehoods. In this article, we aim to clarify the current scientific view behind several claims or controversies related to COVID-19. Starting with the origin of the virus, we then discuss the effect of ibuprofen and nicotine on the severity of the disease. We highlight the knowledge on fomites and SARS-CoV-2 and discuss the evidence and explications for a disproportionately stronger impact of COVID-19 on ethnic minorities, including a potential protective role for vitamin D. We further review what is known about the effects of SARS-CoV-2 infection in children, including their role in transmission of the disease, and conclude with the science on different mortality rates between different countries and whether this hints at the existence of more pathogenic cohorts of SARS-CoV-2.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=a95e2dab3d28419e8a2723af0bb0b257)

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=1fd6cc363487afd6b2ced651d0bda02a)

1. **COVID-19 in Children, Pregnancy and Neonates: A Review of Epidemiologic and Clinical Features.**  
   Zimmermann Petra The Pediatric infectious disease journal 2020;39(6):469-477.

The novel severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) pandemic has spread rapidly across the globe. In contrast to initial reports, recent studies suggest that children are just as likely as adults to become infected with the virus but have fewer symptoms and less severe disease. In this review, we summarize the epidemiologic and clinical features of children infected with SARS-CoV-2 reported in pediatric case series to date. We also summarize the perinatal outcomes of neonates born to women infected with SARS-CoV-2 in pregnancy. We found 11 case series including a total of 333 infants and children. Overall, 83% of the children had a positive contact history, mostly with family members. The incubation period varied between 2 and 25 days with a mean of 7 days. The virus could be isolated from nasopharyngeal secretions for up to 22 days and from stool for more than 30 days. Co-infections were reported in up to 79% of children (mainly mycoplasma and influenza). Up to 35% of children were asymptomatic. The most common symptoms were cough (48%; range 19%-100%), fever (42%; 11%-100%) and pharyngitis (30%; 11%-100%). Further symptoms were nasal congestion, rhinorrhea, tachypnoea, wheezing, diarrhea, vomiting, headache and fatigue. Laboratory test parameters were only minimally altered. Radiologic findings were unspecific and included unilateral or bilateral infiltrates with, in some cases, ground-glass opacities or consolidation with a surrounding halo sign. Children rarely needed admission to intensive care units (3%), and to date, only a small number of deaths have been reported in children globally. Nine case series and 2 case reports described outcomes of maternal SARS-CoV-2 infection during pregnancy in 65 women and 67 neonates. Two mothers (3%) were admitted to intensive care unit. Fetal distress was reported in 30% of pregnancies. Thirty-seven percent of women delivered preterm. Neonatal complications included respiratory distress or pneumonia (18%), disseminated intravascular coagulation (3%), asphyxia (2%) and 2 perinatal deaths. Four neonates (3 with pneumonia) have been reported to be SARS-CoV-2 positive despite strict infection control and prevention procedures during delivery and separation of mother and neonates, meaning vertical transmission could not be excluded.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=705f847b6121e719e2afda915ca5b3ef)

1. **COVID-19 in Children: Clinical Approach and Management**  
   Sankar J. Indian Journal of Pediatrics 2020;87(6):433-442.

COVID-19 pandemic caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is a major public health crisis threatening humanity at this point in time. Transmission of the infection occurs by inhalation of infected droplets or direct contact with soiled surfaces and fomites. It should be suspected in all symptomatic children who have undertaken international travel in the last 14 d, all hospitalized children with severe acute respiratory illness, and asymptomatic direct and high-risk contacts of a confirmed case. Clinical symptoms are similar to any acute respiratory viral infection with less pronounced nasal symptoms. Disease seems to be milder in children, but situation appears to be changing. Infants and young children had relatively more severe illness than older children. The case fatality rate is low in children. Diagnosis can be confirmed by Reverse transcriptase - Polymerase chain reaction (RT-PCR) on respiratory specimen (commonly nasopharyngeal and oropharyngeal swab). Rapid progress is being made to develop rapid diagnostic tests, which will help ramp up the capacity to test and also reduce the time to getting test results. Management is mainly supportive care. In severe pneumonia and critically ill children, trial of hydroxychloroquine or lopinavir/ritonavir should be considered. As per current policy, children with mild disease also need to be hospitalized; if this is not feasible, these children may be managed on ambulatory basis with strict home isolation. Pneumonia, severe disease and critical illness require admission and aggressive management for acute lung injury and shock and/or multiorgan dysfunction, if present. An early intubation is preferred over non-invasive ventilation or heated, humidified, high flow nasal cannula oxygen, as these may generate aerosols increasing the risk of infection in health care personnel. To prevent post discharge dissemination of infection, home isolation for 1-2 wk may be advised. As of now, no vaccine or specific chemotherapeutic agents are approved for children.<br/>Copyright &#xa9; 2020, Dr. K C Chaudhuri Foundation.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=3711882ff4855eef94d7f2f12b54e671)

1. **COVID-19 in children: Current status.**  
   Jeng Mei-Jy Journal of the Chinese Medical Association : JCMA 2020;:No page numbers.

Coronavirus disease 2019 (COVID-19), caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), emerged from China in December 2019. The outbreak further exploded in Europe and America in mid-March 2020 to become a global health emergency. We reviewed recent published articles and on-line open messages on SARS-CoV-2-positive infants and children younger than 20 years of age. Symptoms are usually less severe in children than in adults. Twelve critically or mortally ill children were found in the published or news reports before April 6, 2020. Vertical transmission from the mother to her fetus or neonate has not been proven definitively. However, six early-onset (<7 days) and 3 late-onset neonatal SARS-CoV-2 infections were found in the literature. We also summarized the presentations and contact information of 24 SARS-CoV-2-positive children announced by the Taiwan Centers for Disease Control. Early identification and isolation, adequate management, prevention, and vaccine development are the keys to controlling the disease spread. Clinical physicians should be alert to asymptomatic children with COVID-19. Multi-directional investigations are crucial in the global fight against COVID-19.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=3515a4f66b7c3b428ca99efcd9b90bf6)

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=7d21a07546826c9f9f9f457b64c3e500)

1. **COVID-19 in children: the link in the transmission chain**  
   Kelvin Alyson A. The Lancet Infectious Diseases 2020;20:633.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=1c7102b799e826ec3a67750d3cd111fb)

1. **COVID-19 infection in children**  
   Sinha Ian P. The Lancet Respiratory Medicine 2020;8:446.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=c51170b36f593741758c3cbd775c5950)

1. **COVID-19 schools guidance.**  
   Anon. Bulletin of the World Health Organization 2020;98(4):236-236.

The article reports on the guidance issued by the World Health Organization, the International Federation of the Red Cross (IFRC), and the United Nations Children's Fund (UNICEF) to help protect children and schools from transmission of the COVID-19 virus.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=5682a541c98a2a4b04ff27cbb972f492)

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=13726cb2af6b4129b6a695868d8ba261)

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=bd7aef1c996c1c71c76cc736c46980a1)

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=8689e3f5b5a69a7a651375d12fc03e5e)

1. **COVID-19 Transmission and Children: The Child is Not to Blame.**  
   Lee Benjamin Pediatrics 2020;:No page numbers.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=c39684ec09976b69095dcec93dfb6191)

1. **COVID-19 virus and children: What do we know?**  
   Morand A. Archives de Pediatrie 2020;27(3):117-118.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=01979a973cdfafd8eee0af6c18624f90)

1. **COVID-19, school closures, and child poverty: a social crisis in the making**  
   Van Lancker Wim The Lancet Public Health 2020;5:e243.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=9dc9fb6ceaf49619e5ea42c7a94c72bc)

1. **Covid-19: Delaying school reopening by two weeks would halve risks to children, says iSAGE.**  
   Wise J. BMJ (Clinical research ed.) 2020;369:m2079.

1. **Covid-19: schools set to close across UK except for children of health and social care workers**  
   Mahase E. BMJ (Clinical research ed.) 2020;368:No page numbers.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=7519228b7a9d003ada0cf0a70071a1b3)

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=89d7504d33c534a7f1c3d32e1ff4e8a6)

1. **Detectable SARS-CoV-2 viral RNA in feces of three children during recovery period of COVID-19 pneumonia.**  
   Zhang Tongqiang Journal of medical virology 2020;92(7):909-914.

Coronavirus Disease 2019 (COVID-19) is a newly emerging infectious disease caused by a novel coronavirus, severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). After its first occurrence in Wuhan of China from December 2019, COVID-19 rapidly spread around the world. According to the World Health Organization statement on 13 March 2020, there had been over 132 500 confirmed cases globally. Nevertheless, the case reports of children are rare, which results in the lack of evidence for preventing and controlling of children's infection. Here, we report three cases of SARS-CoV-2 infected children diagnosed from 3 February to 17 February 2020 in Tianjin, China. All of these three cases experienced mild illness and recovered soon after the treatment, with the nucleic acid of throat swab turning negative within 14, 11, and 7 days after diagnosis, respectively. However, after been discharged, all three cases were tested SARS-CoV-2 positive in the stool samples within 10 days, in spite of their remained negative nucleic acid in throat swab specimens. Therefore, it is necessary to be aware of the possibility of fecal-oral transmission of SARS-CoV-2 infection, especially for children cases.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=46ee644296062a90105d3833664abb45)

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=71c3bfd746fe9eca56d85472755ef91e)

1. **Dynamic viral SARS-CoV-2 RNA shedding in in children: preliminary data and clinical consideration of Italian regional center.**  
   De Ioris Maria A. Journal of the Pediatric Infectious Diseases Society 2020;:No page numbers.

We evaluated SARS-CoV-2-RNA clearance in 22 children . The estimation of positivity at day 14 from symptom onset is 52% for nasopharyngeal swab and 31% for stool swab. These data underline the significance of nasopharyngeal and stool swab for detecting infected children; further studies are needed for transmissibility.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=7ee88d604a7eb0b88dce57c2e568e425)

1. **Early CT Findings of Coronavirus Disease 2019 (COVID-19) in Asymptomatic Children: A Single-Center Experience.**  
   Lan L. Korean journal of radiology 2020;21(7):919-924.

OBJECTIVE: The current study reported a case series to illustrate the early computed tomography (CT) findings of coronavirus disease 2019 (COVID-19) in pediatric patients. MATERIALS AND METHODS: All pediatric patients who were diagnosed with COVID-19 and who underwent CT scan in Zhongnan Hospital of Wuhan University from January 20, 2020 to February 28, 2020 were included in the current study. Data on clinical and CT features were collected and analyzed. RESULTS: Four children were included in the current study. All of them were asymptomatic throughout the disease course (ranging from 7 days to 15 days), and none of them showed abnormalities in blood cell counts. Familial cluster was the main transmission pattern. Thin-section CT revealed abnormalities in three patients, and one patient did not present with any abnormal CT findings. Unilateral lung involvement was observed in two patients, and one patient showed bilateral lung involvement. In total, five small lesions were identified, including ground-glass opacity (n = 4) and consolidation (n = 1). All lesions had ill-defined margins with peripheral distribution and predilection of lower lobe. CONCLUSION: Small patches of ground-glass opacity with subpleural distribution and unilateral lung involvement were common findings on CT scans of pediatric patients in the early stage of the disease.

1. **Effects of coronavirus disease 2019 (COVID-19) on maternal, perinatal and neonatal outcomes: a systematic review.**  
   Juan J. Ultrasound in obstetrics & gynecology : the official journal of the International Society of Ultrasound in Obstetrics and Gynecology 2020;:No page numbers.

OBJECTIVETo evaluate the effects of coronavirus disease 2019 (COVID-19) on maternal, perinatal and neonatal outcomes by performing a systematic review of available published literature on pregnancies affected by COVID-19.METHODSWe performed a systematic review to evaluate the effects of COVID-19 on pregnancy, perinatal and neonatal outcomes. We conducted a comprehensive literature search using PubMed, EMBASE, the Cochrane Library, China National Knowledge Infrastructure Database and Wan Fang Data until 20 April 2020 (studies were identified through PubMed alert after that date). For the research strategy, combinations of the following keywords and MeSH terms were used: SARS-CoV-2, COVID-19, coronavirus disease 2019, pregnancy, gestation, maternal, mothers, vertical transmission, maternal-fetal transmission, intrauterine transmission, neonates, infant, delivery. Eligibility criteria included laboratory-confirmed and/or clinically diagnosed COVID-19, patient being pregnant on admission and availability of clinical characteristics, including at least one maternal, perinatal or neonatal outcome. Exclusion criteria were non-peer-reviewed or unpublished reports, unspecified date and location of the study, suspicion of duplicate reporting, and unreported maternal or perinatal outcomes. No language restrictions were applied.RESULTSWe identified a high number of relevant case reports and case series, but only 24 studies, including a total of 324 pregnant women with COVID-19, met the eligibility criteria and were included in the systematic review. These comprised nine case series (eight consecutive) and 15 case reports. A total of 20 pregnant patients with laboratory-confirmed COVID-19 were included in the case reports. In the combined data from the eight consecutive case series, including 211 (71.5%) cases of laboratory-confirmed and 84 (28.5%) of clinically diagnosed COVID-19, the maternal age ranged from 20 to 44 years and the gestational age on admission ranged from 5 to 41 weeks. The most common symptoms at presentation were fever, cough, dyspnea/shortness of breath, fatigue and myalgia. The rate of severe pneumonia reported amongst the case series ranged from 0 to 14%, with the majority of the cases requiring admission to the intensive care unit. Almost all cases from the case series had positive computer tomography chest findings. All six and 22 cases that had nucleic-acid testing in vaginal mucus and breast milk samples, respectively, were negative for SARS-CoV-2. Only four cases of spontaneous miscarriage or abortion were reported. In the consecutive case series, 219/295 women had delivered at the time of reporting, and the majority of these had Cesarean section. The gestational age at delivery ranged from 28 to 41 weeks. Apgar scores at 1 and 5 min ranged from 7 to 10 and 7 to 10, respectively. Only eight neonates had birth weight <2500 g and nearly one-third of cases were transferred to the neonatal intensive care unit. There was one case each of neonatal asphyxia and neonatal death. In 155 neonates that had nucleic-acid testing in throat swab, all, except three cases, were negative for SARS-CoV-2. There were seven maternal deaths, four intrauterine fetal deaths (one with twin pregnancy) and two neonatal deaths (twin pregnancy) reported in a non-consecutive case series of nine cases with severe COVID-19. From the case reports, two maternal deaths, one neonatal death and two cases of neonatal SARS-CoV-2 infection were reported.CONCLUSIONSDespite the increasing number of published studies on COVID-19 in pregnancy, there are insufficient good-quality data to draw unbiased conclusions with regard to the severity of the disease or specific complications of COVID-19 in pregnant women, as well as vertical transmission, perinatal and neonatal complications. In order to answer specific questions in relation to the impact of COVID-19 on pregnant women and their fetuses through meaningful good-quality research, we urge researchers and investigators to present complete outcome data and reference previously published cases in their publications, and to record such reporting when the data of a case are entered into a registry or several registries. This article is protected by copyright. All rights reserved.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=adfcfe7e97fe3aaa0924278f9c3557f1)

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=a138e350f7399aa1fd30a0759f85ab44)

1. **Epidemiologic and clinical characteristics of 10 children with coronavirus disease 2019 in Changsha, China.**  
   Tan Yu-Pin Journal of clinical virology : the official publication of the Pan American Society for Clinical Virology 2020;127:104353.

BACKGROUNDThe outbreak of a new coronavirus, first reported in Wuhan, China, is spreading around the world. Information on the characteristics of children with Coronavirus Disease 2019 (COVID-19) is limited.METHODSIn this retrospective study, we recruited 10 children infected with SARS-COV-2 from January 27 to March 10, 2020, in Changsha, China. We report the epidemiological, clinical, laboratory, and high-resolution CT findings for these children. Qualitative descriptive analysis was used to describe the key results.RESULTSTen children were included. Three were male and seven were female. Three were from Wuhan, Hubei Province, and seven were from Changsha. All had a history of close contact with adults with COVID-19 before the onset of disease. Clinical manifestations included fever in four cases, respiratory symptoms in three cases, febrile convulsions in one case, vomiting in one case, abdominal pain in one case, and asymptomatic infection in two cases. All the children tested positive for nucleic acid in throat swabs at admission. Stool swabs of three cases were positive for nucleic acid after several days of fever. In nine children, blood routine results were normal, whereas in one case the white blood cell count was elevated. In four cases, CT findings of the lungs showed light ground-glass opacities, one case showed changes similar to bronchopneumonia, and the remaining cases were normal. All were treated with symptomatic support without complications.CONCLUSIONOur findings indicate that intrafamily transmission may be the main form of transmission of COVID-19 in children, and persistent intestinal excretion of virus is another characteristic among children. The results of stool swab tests should be considered for discharge and release from isolation.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=e7e0c563190e88e763b0758768d71ebb)

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=cf3be8692ef1673cea7cf4f08bbdebe0)

1. **Epidemiology and clinical features of coronavirus disease 2019 in children**  
   Choi S.-H. Pediatric Infection and Vaccine 2020;27(1):11-23.

Coronavirus disease 2019 (COVID-19), which started in Wuhan, China, in December 2019 and declared a worldwide pandemic on March 11, 2020, is a novel infectious disease that causes respiratory illness and death. Pediatric COVID-19 accounts for a small percentage of patients and is often milder than that in adults; however, it can progress to severe disease in some cases. Even neonates can suffer from COVID-19, and children may spread the disease in the community. This review summarizes what is currently known about COVID-19 in children and adolescents.<br/>Copyright &#xa9; 2020 The Korean Society of Pediatric Infectious Diseases.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=b1a49a379784b78ce56f93475f0dc6b2)

1. **Epidemiology and transmission of COVID-19 in 391 cases and 1286 of their close contacts in Shenzhen, China: a retrospective cohort study**  
   Bi Q. The Lancet Infectious Diseases 2020;:No page numbers.

Background: Rapid spread of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) in Wuhan, China, prompted heightened surveillance in Shenzhen, China. The resulting data provide a rare opportunity to measure key metrics of disease course, transmission, and the impact of control measures. <br/>Method(s): From Jan 14 to Feb 12, 2020, the Shenzhen Center for Disease Control and Prevention identified 391 SARS-CoV-2 cases and 1286 close contacts. We compared cases identified through symptomatic surveillance and contact tracing, and estimated the time from symptom onset to confirmation, isolation, and admission to hospital. We estimated metrics of disease transmission and analysed factors influencing transmission risk. <br/>Finding(s): Cases were older than the general population (mean age 45 years) and balanced between males (n=187) and females (n=204). 356 (91%) of 391 cases had mild or moderate clinical severity at initial assessment. As of Feb 22, 2020, three cases had died and 225 had recovered (median time to recovery 21 days; 95% CI 20-22). Cases were isolated on average 4.6 days (95% CI 4.1-5.0) after developing symptoms; contact tracing reduced this by 1.9 days (95% CI 1.1-2.7). Household contacts and those travelling with a case were at higher risk of infection (odds ratio 6.27 [95% CI 1.49-26.33] for household contacts and 7.06 [1.43-34.91] for those travelling with a case) than other close contacts. The household secondary attack rate was 11.2% (95% CI 9.1-13.8), and children were as likely to be infected as adults (infection rate 7.4% in children &lt;10 years vs population average of 6.6%). The observed reproductive number (R) was 0.4 (95% CI 0.3-0.5), with a mean serial interval of 6.3 days (95% CI 5.2-7.6). <br/>Interpretation(s): Our data on cases as well as their infected and uninfected close contacts provide key insights into the epidemiology of SARS-CoV-2. This analysis shows that isolation and contact tracing reduce the time during which cases are infectious in the community, thereby reducing the R. The overall impact of isolation and contact tracing, however, is uncertain and highly dependent on the number of asymptomatic cases. Moreover, children are at a similar risk of infection to the general population, although less likely to have severe symptoms; hence they should be considered in analyses of transmission and control. <br/>Funding(s): Emergency Response Program of Harbin Institute of Technology, Emergency Response Program of Peng Cheng Laboratory, US Centers for Disease Control and Prevention.<br/>Copyright &#xa9; 2020 Elsevier Ltd

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=29390a19439fe370714db77c89afba10)

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=6b49801eca2d05bff95b12790b594133)

1. **Epidemiology of COVID-19 Among Children in China.**  
   Dong Yuanyuan Pediatrics 2020;145(6):No page numbers.

OBJECTIVETo identify the epidemiological characteristics and transmission patterns of pediatric patients with the 2019 novel coronavirus disease (COVID-19) in China.METHODSNationwide case series of 2135 pediatric patients with COVID-19 reported to the Chinese Center for Disease Control and Prevention from January 16, 2020, to February 8, 2020, were included. The epidemic curves were constructed by key dates of disease onset and case diagnosis. Onset-to-diagnosis curves were constructed by fitting a log-normal distribution to data on both onset and diagnosis dates.RESULTSThere were 728 (34.1%) laboratory-confirmed cases and 1407 (65.9%) suspected cases. The median age of all patients was 7 years (interquartile range: 2-13 years), and 1208 case patients (56.6%) were boys. More than 90% of all patients had asymptomatic, mild, or moderate cases. The median time from illness onset to diagnoses was 2 days (range: 0-42 days). There was a rapid increase of disease at the early stage of the epidemic, and then there was a gradual and steady decrease. The disease rapidly spread from Hubei province to surrounding provinces over time. More children were infected in Hubei province than any other province.CONCLUSIONSChildren of all ages appeared susceptible to COVID-19, and there was no significant sex difference. Although clinical manifestations of children's COVID-19 cases were generally less severe than those of adult patients, young children, particularly infants, were vulnerable to infection. The distribution of children's COVID-19 cases varied with time and space, and most of the cases were concentrated in Hubei province and surrounding areas. Furthermore, this study provides strong evidence of human-to-human transmission.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=e5269629a01a08a907f22567051e4d72)

1. **Estimating the burden of United States workers exposed to infection or disease: A key factor in containing risk of COVID-19 infection.**  
   Baker MG PloS one 2020;15(4):e0232452.

INTRODUCTION: With the global spread of COVID-19, there is a compelling public health interest in quantifying who is at increased risk of contracting disease. Occupational characteristics, such as interfacing with the public and being in close quarters with other workers, not only put workers at high risk for disease, but also make them a nexus of disease transmission to the community. This can further be exacerbated through presenteeism, the term used to describe the act of coming to work despite being symptomatic for disease. Quantifying the number of workers who are frequently exposed to infection and disease in the workplace, and understanding which occupational groups they represent, can help to prompt public health risk response and management for COVID-19 in the workplace, and subsequent infectious disease outbreaks. METHODS: To estimate the number of United States workers frequently exposed to infection and disease in the workplace, national employment data (by Standard Occupational Classification) maintained by the Bureau of Labor Statistics (BLS) was merged with a BLS O\*NET survey measure reporting how frequently workers in each occupation are exposed to infection or disease at work. This allowed us to estimate the number of United States workers, across all occupations, exposed to disease or infection at work more than once a month. RESULTS: Based on our analyses, approximately 10% (14.4 M) of United States workers are employed in occupations where exposure to disease or infection occurs at least once per week. Approximately 18.4% (26.7 M) of all United States workers are employed in occupations where exposure to disease or infection occurs at least once per month. While the majority of exposed workers are employed in healthcare sectors, other occupational sectors also have high proportions of exposed workers. These include protective service occupations (e.g. police officers, correctional officers, firefighters), office and administrative support occupations (e.g. couriers and messengers, patient service representatives), education occupations (e.g. preschool and daycare teachers), community and social services occupations (community health workers, social workers, counselors), and even construction and extraction occupations (e.g. plumbers, septic tank installers, elevator repair). CONCLUSIONS: The large number of persons employed in occupations with frequent exposure to infection and disease underscore the importance of all workplaces developing risk response plans for COVID-19. Given the proportion of the United States workforce exposed to disease or infection at work, this analysis also serves as an important reminder that the workplace is a key locus for public health interventions, which could protect both workers and the communities they serve.

1. **From SARS to COVID-19: What we have learned about children infected with COVID-19.**  
   Zhou Meng-Yao International journal of infectious diseases : IJID : official publication of the International Society for Infectious Diseases 2020;:No page numbers.

Coronaviruses, both SARS-CoV and SARS-CoV-2 were firstly appeared in China. They have certain similarities in biological, epidemiological and pathological. To data, the researches have shown that their gene exhibit 79% of identical sequence and the receptor-binding domain structure is also very similar. There have been extensive research performed on SARS, however, the understanding of pathophysiology impact of Corona Virus Disease 2019(COVID-19) is still limited. In the review, we draw upon the lessons learnt from SARS in the epidemiology, clinical characteristics and pathogenesis for further understand the features of COVID-19. By comparing these two diseases, we found, COVID-19 has quicker and wider transmission, obvious family agglomeration, higher morbidity and mortality. Newborns, asymptomatic children and normal chest imaging cases were emerged in COVID-19. Children started with gastrointestinal symptoms may progress to severe condition and newborn whose mother was infected with COVID-19 could have severe complications. The laboratory test data showed, the percentage of neutrophils and the level of LDH is higher, otherwise the number of CD4+ and CD8+T cells is decreased in children's COVID-19 cases. Based on these early observations, as pediatrician, we put forward some thoughts on children's COVID-19 and give some recommendations to contain the disease.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=954c186d12a7e0eca7ccc44bd4bca2ec)

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=047137c34b0b0e51d4962a3753622719)

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=1c15d8c177595059ff63f96cb59bdf88)

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=b9f30dcf6e6ba451af30453ab814ccf4)

1. **Hand Hygiene, Mask-Wearing Behaviors and Its Associated Factors during the COVID-19 Epidemic: A Cross-Sectional Study among Primary School Students in Wuhan, China.**  
   Chen X. International journal of environmental research and public health 2020;17(8):No page numbers.

Although the emphasis on behaviors of hand-washing and mask-wearing was repeated during the pandemic of Coronavirus Disease 2019 (COVID-19), not everyone paid enough attention to this. A descriptive statistic was used to make sense of the status of hand hygiene and mask-wearing among primary school students in Wuhan, China. A binary logistic regression analysis was conducted to identify the risk factors affecting the behaviors of hand-washing and mask-wearing. p < 0.05 (two-sides) was considered as significant at statistics. 42.05% of the primary school students showed a good behavior of hand-washing, while 51.60% had a good behavior of mask-wearing. Gender, grade, out-going history, father's occupation, mother's educational background, and the time filling out the survey were significantly associated with hand hygiene, whereas grade, mother's educational background, and residence were associated with mask-wearing. The behaviors of hand-washing and mask-wearing among primary school students were influenced by gender, grade, shady is back tell a friendand other factors, therefore, parents should make efforts of behavior guidance whereas governments should enlarge medium publicity.

1. **Impact of school closures for COVID-19 on the US health-care workforce and net mortality: a modelling study.**  
   Bayham J. The Lancet. Public health 2020;5(5):e271-e278.

BACKGROUND: The coronavirus disease 2019 (COVID-19) pandemic is leading to social (physical) distancing policies worldwide, including in the USA. Some of the first actions taken by governments are the closing of schools. The evidence that mandatory school closures reduce the number of cases and, ultimately, mortality comes from experience with influenza or from models that do not include the effect of school closure on the health-care labour force. The potential benefits from school closures need to be weighed against costs of health-care worker absenteeism associated with additional child-care obligations. In this study, we aimed to measure child-care obligations for US health-care workers arising from school closures when these are used as a social distancing measure. We then assessed how important the contribution of health-care workers would have to be in reducing mortality for their absenteeism due to child-care obligations to undo the benefits of school closures in reducing the number of cases. METHODS: For this modelling analysis, we used data from the monthly releases of the US Current Population Survey to characterise the family structure and probable within-household child-care options of US health-care workers. We accounted for the occupation within the health-care sector, state, and household structure to identify the segments of the health-care workforce that are most exposed to child-care obligations from school closures. We used these estimates to identify the critical level at which the importance of health-care labour supply in increasing the survival probability of a patient with COVID-19 would undo the benefits of school closures and ultimately increase cumulative mortality. FINDINGS: Between January, 2018, and January, 2020, the US Current Population Survey included information on more than 3·1 million individuals across 1·3 million households. We found that the US health-care sector has some of the highest child-care obligations in the USA, with 28·8% (95% CI 28·5-29·1) of the health-care workforce needing to provide care for children aged 3-12 years. Assuming non-working adults or a sibling aged 13 years or older can provide child care, 15·0% (14·8-15·2) of the health-care workforce would still be in need of child care during a school closure. We observed substantial variation within the health-care system. We estimated that, combined with reasonable parameters for COVID-19 such as a 15·0% case reduction from school closings and 2·0% baseline mortality rate, a 15·0% decrease in the health-care labour force would need to decrease the survival probability per percent health-care worker lost by 17·6% for a school closure to increase cumulative mortality. Our model estimates that if the infection mortality rate of COVID-19 increases from 2·00% to 2·35% when the health-care workforce declines by 15·0%, school closures could lead to a greater number of deaths than they prevent. INTERPRETATION: School closures come with many trade-offs, and can create unintended child-care obligations. Our results suggest that the potential contagion prevention from school closures needs to be carefully weighted with the potential loss of health-care workers from the standpoint of reducing cumulative mortality due to COVID-19, in the absence of mitigating measures. FUNDING: None.

1. **Improving the quality of care in pregnancy and childbirth with coronavirus (COVID-19): a systematic review.**  
   Abdollahpour Sedigheh The journal of maternal-fetal & neonatal medicine : the official journal of the European Association of Perinatal Medicine, the Federation of Asia and Oceania Perinatal Societies, the International Society of Perinatal Obstetricians 2020;:1-9.

In the context of serious coronavirus epidemic, it is critical that pregnant women not be ignored potentially life-saving interventions. So, this study was designed to improve the quality of care by health providers through what they need to know about coronavirus during pregnancy and childbirth. We conducted a systematic review of electronic databases was performed for published in English, before 25 March 2020. Finally, 29 papers which had covered the topic more appropriately were included in the study. The results of the systematic review of the existing literature are presented in the following nine sections: Symptoms of the COVID-19 in pregnancy, Pregnancy management, Delivery Management, Mode of delivery, Recommendations for health care provider in delivery, Neonatal outcomes, Neonatal care, Vertical Transmission, Breastfeeding. In conclusion, improving quality of care in maternal health, as well as educating, training, and supporting healthcare providers in infection management to be prioritized. Sharing data can help to countries that to prevent maternal and neonatal morbidity associated with the COVID-19.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=fe523982ee8c15b26c2fb4496bb5762c)

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=724587c4643c093db33555eb3c3e2651)

1. **Infection control practices in children during COVID-19 pandemic: differences from adults.**  
   Devrim İ American journal of infection control 2020;:No page numbers.

BACKGROUND: Limited studies have been published on practices and management of COVID-19 in children. Despite the fact that COVID-19 rarely caused any severe disease in children, the asymptomatic children might be playing an important role for spreading COVID-19 in healthcare facilities. This review aimed at sharing our experience of how to handle patients with COVID-19 in a pediatric referral and tertiary care hospital to prevent the possible transmissions to the healthcare workers (HCWs). METHODS: This review sought to identify infection control practices measures during COVID-19 pandemic comes from our daily practice combined with the most recent guidelines with the new experience and information. RESULTS: Prevention the transmission of COVID-19 to the HCWs, four primary themes should be taken into consideration; (1) ongoing education and importance of the organization of the healthcare facility, (2) proper clinical triage and isolation of the suspected or confirmed COVID-19 patients in the outpatient clinics and in the emergency departments, (3) necessity of the organization of the COVID-19 wards, and (4) utilization of personal protective equipment. CONCLUSIONS: Infection control precautions to prevent the possible transmissions to HCWs as well as the other patients and their caregivers from children with COVID-19 are very critical. If sufficient precautions are not taken, healthcare settings may serve as additional source of transmission and spread of COVID-19 in the society.

1. **Infection prevention guidelines and considerations for paediatric risk groups when reopening primary schools during COVID-19 pandemic, Norway, April 2020.**  
   Johansen TB Euro surveillance : bulletin Europeen sur les maladies transmissibles = European communicable disease bulletin 2020;25(22):No page numbers.

In response to the coronavirus disease (COVID-19) pandemic, most countries implemented school closures. In Norway, schools closed on 13 March 2020. The evidence of effect on disease transmission was limited, while negative consequences were evident. Before reopening, risk-assessment for paediatric risk groups was performed, concluding that most children can attend school with few conditions requiring preventative homeschooling. We here present infection prevention and control guidelines for primary schools and recommendations for paediatric risk groups.

1. **Insight into COVID-2019 for pediatricians.**  
   Li Y. Pediatric pulmonology 2020;55(5):E1-E4.

Since December 2019, patients with unexplained pneumonia have been found in Wuhan City, Hubei Province, China. The pathogen in these cases is a new type of coronavirus. The World Health Organization confirmed this diagnosis and named the pathogen SARSCoV-2. The disease caused by SARSCoV-2 is called Corona Virus Disease (COVID-2019). The virus is highly infectious and pathogenic, causing human-to-human transmission. At present, SARSCoV-2 is still rampant in the world. Zhengzhou City in Henan Province serves as an example, 102 people have been confirmed to be infected with SARSCoV-2 (at 24:00 on February 5th, 2020), including three children, the youngest is 4 years old. From the perspective of clinical pediatricians as the first line fighting the epidemic, this paper will discuss the clinical characteristics, prevention and control measures, outcomes, diagnosis, and treatment of pediatric cases.

1. **Interventions to mitigate early spread of SARS-CoV-2 in Singapore: a modelling study.**  
   Koo JR The Lancet. Infectious diseases 2020;20(6):678-688.

BACKGROUND: Since the coronavirus disease 2019 outbreak began in the Chinese city of Wuhan on Dec 31, 2019, 68 imported cases and 175 locally acquired infections have been reported in Singapore. We aimed to investigate options for early intervention in Singapore should local containment (eg, preventing disease spread through contact tracing efforts) be unsuccessful. METHODS: We adapted an influenza epidemic simulation model to estimate the likelihood of human-to-human transmission of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) in a simulated Singaporean population. Using this model, we estimated the cumulative number of SARS-CoV-2 infections at 80 days, after detection of 100 cases of community transmission, under three infectivity scenarios (basic reproduction number [R(0)] of 1·5, 2·0, or 2·5) and assuming 7·5% of infections are asymptomatic. We first ran the model assuming no intervention was in place (baseline scenario), and then assessed the effect of four intervention scenarios compared with a baseline scenario on the size and progression of the outbreak for each R(0) value. These scenarios included isolation measures for infected individuals and quarantining of family members (hereafter referred to as quarantine); quarantine plus school closure; quarantine plus workplace distancing; and quarantine, school closure, and workplace distancing (hereafter referred to as the combined intervention). We also did sensitivity analyses by altering the asymptomatic fraction of infections (22·7%, 30·0%, 40·0%, and 50·0%) to compare outbreak sizes under the same control measures. FINDINGS: For the baseline scenario, when R(0) was 1·5, the median cumulative number of infections at day 80 was 279 000 (IQR 245 000-320 000), corresponding to 7·4% (IQR 6·5-8·5) of the resident population of Singapore. The median number of infections increased with higher infectivity: 727 000 cases (670 000-776 000) when R(0) was 2·0, corresponding to 19·3% (17·8-20·6) of the Singaporean population, and 1 207 000 cases (1 164 000-1 249 000) when R(0) was 2·5, corresponding to 32% (30·9-33·1) of the Singaporean population. Compared with the baseline scenario, the combined intervention was the most effective, reducing the estimated median number of infections by 99·3% (IQR 92·6-99·9) when R(0) was 1·5, by 93·0% (81·5-99·7) when R(0) was 2·0, and by 78·2% (59·0 -94·4) when R(0) was 2·5. Assuming increasing asymptomatic fractions up to 50·0%, up to 277 000 infections were estimated to occur at day 80 with the combined intervention relative to 1800 for the baseline at R(0) of 1·5. INTERPRETATION: Implementing the combined intervention of quarantining infected individuals and their family members, workplace distancing, and school closure once community transmission has been detected could substantially reduce the number of SARS-CoV-2 infections. We therefore recommend immediate deployment of this strategy if local secondary transmission is confirmed within Singapore. However, quarantine and workplace distancing should be prioritised over school closure because at this early stage, symptomatic children have higher withdrawal rates from school than do symptomatic adults from work. At higher asymptomatic proportions, intervention effectiveness might be substantially reduced requiring the need for effective case management and treatments, and preventive measures such as vaccines. FUNDING: Singapore Ministry of Health, Singapore Population Health Improvement Centre.

1. **Lessons from COVID-19 in children: Key hypotheses to guide preventative and therapeutic strategies.**  
   Singh T. Clinical infectious diseases : an official publication of the Infectious Diseases Society of America 2020;:No page numbers.

The current pandemic of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), the causative agent of coronavirus disease 2019 (COVID-19), reveals a peculiar trend of milder disease and lower case fatality in children compared to adults. Consistent epidemiologic evidence of reduced severity of infection in children across different populations and countries suggests there are underlying biologic differences between children and adults that mediate differential disease pathogenesis. This presents a unique opportunity to learn about disease modifying host factors from pediatric populations. Our review summarizes the current knowledge of pediatric clinical disease, role in transmission, risks for severe disease, protective immunity, as well as novel therapies and vaccine trials for children. We then define key hypotheses and areas for future research that can use the pediatric model of disease, transmission, and immunity to develop preventive and therapeutic strategies for people of all age groups.

1. **Letter to the editor: Evidence on school closure and children's social contact: Useful for coronavirus disease (COVID-19)?**  
   Poletti M. Eurosurveillance 2020;25(17):No page numbers.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=ebab45dfc8e083bc3e29f5fcc7a4909d)

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=3404dcaee80cd0f37533fbbf747847c7)

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=3404dcaee80cd0f37533fbbf747847c7)

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=c436005651e996fe271fde3a1b2bd1f9)

1. **Managing COVID-19 infection in pediatric patients.**  
   Mon Ei Ye Cleveland Clinic journal of medicine 2020;:No page numbers.

Children are less likely to be infected with SARS-CoV-2 than adults and often have a milder course of illness and a lower case fatality rate. Children account for an estimated 1% to 5% of those diagnosed with COVID-19.1 Even so, pre-school-aged children, infants, and children with underlying health conditions may still be at risk for severe disease and complications.2 Unique aspects of COVID-19 presentation and course in children and possible vertical transmission to newborns from COVID-19-positive mothers are discussed.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=55d0a7122d022289e0a3f213d6e202b4)

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=8376bf17cc0928a421f829c8906940ec)

1. **Mathematical modelling of COVID-19 transmission and mitigation strategies in the population of Ontario, Canada**  
   Tuite A.R. CMAJ 2020;192(19):No page numbers.

BACKGROUND: Physical-distancing interventions are being used in Canada to slow the spread of severe acute respiratory syndrome coronavirus 2, but it is not clear how effective they will be. We evaluated how different nonpharmaceutical interventions could be used to control the coronavirus disease 2019 (COVID-19) pandemic and reduce the burden on the health care system. <br/>METHOD(S): We used an age-structured compartmental model of COVID-19 transmission in the population of Ontario, Canada. We compared a base case with limited testing, isolation and quarantine to scenarios with the following: enhanced case finding, restrictive physical-distancing measures, or a combination of enhanced case finding and less restrictive physical distancing. Interventions were either implemented for fixed durations or dynamically cycled on and off, based on projected occupancy of intensive care unit (ICU) beds. We present medians and credible intervals from 100 replicates per scenario using a 2-year time horizon. <br/>RESULT(S): We estimated that 56% (95% credible interval 42%-63%) of the Ontario population would be infected over the course of the epidemic in the base case. At the epidemic peak, we projected 107 000 (95% credible interval 60 760-149 000) cases in hospital (non-ICU) and 55 500 (95% credible interval 32 700-75 200) cases in ICU. For fixed-duration scenarios, all interventions were projected to delay and reduce the height of the epidemic peak relative to the base case, with restrictive physical distancing estimated to have the greatest effect. Longer duration interventions were more effective. Dynamic interventions were projected to reduce the proportion of the population infected at the end of the 2-year period and could reduce the median number of cases in ICU below current estimates of Ontario's ICU capacity. INTERPRETATION: Without substantial physical distancing or a combination of moderate physical distancing with enhanced case finding, we project that ICU resources would be overwhelmed. Dynamic physical distancing could maintain health-system capacity and also allow periodic psychological and economic respite for populations.<br/>Copyright &#xa9; 2020 Joule Inc. or its licensors

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=38263e0f7ab243caa92b29f9df2ca68a)

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=94792b67fe88fa5be47568ec7f36e45f)

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=172fea3dafdc180087699d0a9be6d5e2)

1. **No evidence of secondary transmission of COVID-19 from children attending school in Ireland, 2020.**  
   Heavey Laura Euro surveillance : bulletin Europeen sur les maladies transmissibles = European communicable disease bulletin 2020;25(21):No page numbers.

As many countries begin to lift some of the restrictions to contain COVID-19 spread, lack of evidence of transmission in the school setting remains. We examined Irish notifications of SARS-CoV2 in the school setting before school closures on 12 March 2020 and identified no paediatric transmission. This adds to current evidence that children do not appear to be drivers of transmission, and we argue that reopening schools should be considered safe accompanied by certain measures.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=73c450a96c62726f090cdf6ccdc953cf)

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=f1f9b592a0f9b075989217b37c4dfcb4)

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=f1f9b592a0f9b075989217b37c4dfcb4)

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=8123de4ca539cb7c482a64e9c230a7d4)

1. **Pathophysiology of COVID-19: Why Children Fare Better than Adults?**  
   Dhochak N. Indian journal of pediatrics 2020;:1-10.

The world is facing Coronavirus Disease-2019 (COVID-19) pandemic, which is causing a large number of deaths and burden on intensive care facilities. It is caused by Severe Acute Respiratory Syndrome coronavirus-2 (SARS-CoV-2) originating in Wuhan, China. It has been seen that fewer children contract COVID-19 and among infected, children have less severe disease. Insights in pathophysiological mechanisms of less severity in children could be important for devising therapeutics for high-risk adults and elderly. Early closing of schools and day-care centers led to less frequent exposure and hence, lower infection rate in children. The expression of primary target receptor for SARS-CoV-2, i.e. angiotensin converting enzyme-2 (ACE-2), decreases with age. ACE-2 has lung protective effects by limiting angiotensin-2 mediated pulmonary capillary leak and inflammation. Severe COVID-19 disease is associated with high and persistent viral loads in adults. Children have strong innate immune response due to trained immunity (secondary to live-vaccines and frequent viral infections), leading to probably early control of infection at the site of entry. Adult patients show suppressed adaptive immunity and dysfunctional over-active innate immune response in severe infections, which is not seen in children. These could be related to immune-senescence in elderly. Excellent regeneration capacity of pediatric alveolar epithelium may be contributing to early recovery from COVID-19. Children, less frequently, have risk factors such as co-morbidities, smoking, and obesity. But young infants and children with pre-existing illnesses could be high risk groups and need careful monitoring. Studies describing immune-pathogenesis in COVID-19 are lacking in children and need urgent attention.

1. **Projected geographic disparities in healthcare worker absenteeism from COVID-19 school closures and the economic feasibility of child care subsidies: a simulation study.**  
   Chin ET medRxiv : the preprint server for health sciences 2020;:No page numbers.

BACKGROUND: School closures have been enacted as a measure of mitigation during the ongoing COVID-19 pandemic. It has been shown that school closures could cause absenteeism amongst healthcare workers with dependent children, but there remains a need for spatially granular analyses of the relationship between school closures and healthcare worker absenteeism to inform local community preparedness. METHODS: We provide national- and county-level simulations of school closures and unmet child care needs across the United States. We develop individual simulations using county-level demographic and occupational data, and model school closure effectiveness with age-structured compartmental models. We perform multivariate quasi-Poisson ecological regressions to find associations between unmet child care needs and COVID-19 vulnerability factors. RESULTS: At the national level, we estimate the projected rate of unmet child care needs for healthcare worker households to range from 7.5% to 8.6%, and the effectiveness of school closures to range from 3.2% (R (0) = 4) to 7.2% (R (0) = 2) reduction in fewer ICU beds at peak demand. At the county-level, we find substantial variations of projected unmet child care needs and school closure effects, ranging from 1.9% to 18.3% of healthcare worker households and 5.7% to 8.8% reduction in fewer ICU beds at peak demand (R (0) = 2). We find significant positive associations between estimated levels of unmet child care needs and diabetes prevalence, county rurality, and race (p < 0.05). We estimate costs of absenteeism and child care and observe from our models that an estimated 71.1% to 98.8% of counties would find it less expensive to provide child care to all healthcare workers with children than to bear the costs of healthcare worker absenteeism during school closures. CONCLUSIONS: School closures are projected to reduce peak ICU bed demand, but could disrupt healthcare systems through absenteeism, especially in counties that are already particularly vulnerable to COVID-19. Child care subsidies could help circumvent the ostensible tradeoff between school closures and healthcare worker absenteeism.

1. **Prolonged fecal shedding of SARS-CoV-2 in pediatric patients. A quantitative evidence synthesis.**  
   Santos Victor Santana Journal of pediatric gastroenterology and nutrition 2020;:No page numbers.

OBJECTIVETo investigate differences in viral shedding in respiratory and fecal samples from children with COVID-19.METHODSWe searched PubMed, SCOPUS, Embase and Web of Science databases to identify pediatric studies comparing the pattern of fecal and respiratory shedding of SARS-CoV-2 RNA. Summary estimates were calculated using random-effects models.RESULTSFour studies reporting data from 36 children were included. A higher proportion of children had viral shedding in stools after 14 days of symptoms onset compared to respiratory samples (RR= 3.2, 95%CI 1.2 to 8.9, I2 = 51%). Viral RNA shedding was longer in fecal samples with a mean difference of approximately 9 days (Mean Difference = 8.6, 95%CI 1.7 to 15.4, I2 = 77%) compared with respiratory samples.CONCLUSIONSARS-CoV-2 shedding seems to be present in feces for a longer time than in the respiratory tract of children. Although fecal SARS-CoV-2 presence in feces do not confirm its transmissibility, the high and fast spread of the COVID-19 disease worldwide indicate other transmission routes are also plausible.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=ed08cbcd0001b6729e4a0b161fb547c2)

1. **Prolonged viral shedding in feces of pediatric patients with coronavirus disease 2019.**  
   Xing YH Journal of microbiology, immunology, and infection = Wei mian yu gan ran za zhi 2020;53(3):473-480.

OBJECTIVE: To determine the dynamic changes of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) RNA in respiratory and fecal specimens in children with coronavirus disease 2019 (COVID-19). METHODS: From January 17, 2020 to February 23, 2020, three paediatric cases of COVID-19 were reported in Qingdao, Shandong Province, China. Epidemiological, clinical, laboratory, and radiological characteristics and treatment data were collected. Patients were followed up to March 10, 2020, and dynamic profiles of nucleic acid testing results in throat swabs and fecal specimens were closely monitored. RESULTS: Clearance of SARS-CoV-2 in respiratory tract occurred within two weeks after abatement of fever, whereas viral RNA remained detectable in stools of pediatric patients for longer than 4 weeks. Two children had fecal SARS-CoV-2 undetectable 20 days after throat swabs showing negative, while that of another child lagged behind for 8 days. CONCLUSIONS: SARS-CoV-2 may exist in children's gastrointestinal tract for a longer time than respiratory system. Persistent shedding of SARS-CoV-2 in stools of infected children raises the possibility that the virus might be transmitted through contaminated fomites. Massive efforts should be made at all levels to prevent spreading of the infection among children after reopening of kindergartens and schools.

1. **Promoting healthy movement behaviours among children during the COVID-19 pandemic**  
   Guan Hongyan The Lancet Child & Adolescent Health 2020;4:416.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=e4bae0de6ef99af73cf3198b809a84c0)

1. **Reduction in COVID-19 Infection Using Surgical Facial Masks Outside the Healthcare System**  
   NCT04337541 https://clinicaltrials.gov/show/NCT04337541 2020;:No page numbers.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=59d1ae21af5d97da51c86047b3b3236b)

1. **Review article: gastrointestinal features in COVID-19 and the possibility of faecal transmission.**  
   Tian Y. Alimentary pharmacology & therapeutics 2020;51(9):843-851.

BACKGROUND: There is little published evidence on the gastrointestinal features of COVID-19. AIMS: To report on the gastrointestinal manifestations and pathological findings of patients with COVID-19, and to discuss the possibility of faecal transmission. METHODS: We have reviewed gastrointestinal features of, and faecal test results in, COVID-19 from case reports and retrospective clinical studies relating to the digestive system published since the outbreak. RESULTS: With an incidence of 3% (1/41)-79% (159/201), gastrointestinal symptoms of COVID-19 included anorexia 39.9% (55/138)-50.2% (101/201), diarrhoea 2% (2/99)-49.5% (146/295), vomiting 3.6% (5/138)-66.7% (4/6), nausea 1% (1/99)-29.4% (59/201), abdominal pain 2.2% (3/138)-6.0% (12/201) and gastrointestinal bleeding 4% (2/52)-13.7% (10/73). Diarrhoea was the most common gastrointestinal symptom in children and adults, with a mean duration of 4.1 ± 2.5 days, and was observed before and after diagnosis. Vomiting was more prominent in children. About 3.6% (5/138)-15.9% (32/201) of adult and 6.5% (2/31)-66.7% (4/6) of children patients presented vomiting. Adult and children patients can present with digestive symptoms in the absence of respiratory symptoms. The incidence of digestive manifestations was higher in the later than in the early stage of the epidemic, but no differences in digestive symptoms among different regions were found. Among the group of patients with a higher proportion of severe cases, the proportion of gastrointestinal symptoms in severe patients was higher than that in nonsevere patients (anorexia 66.7% vs 30.4%; abdominal pain 8.3% vs 0%); while in the group of patients with a lower severe rate, the proportion with gastrointestinal symptoms was similar in severe and nonsevere cases (nausea and vomiting 6.9% vs 4.6%; diarrhoea 5.8% vs 3.5%). Angiotensin converting enzyme 2 and virus nucleocapsid protein were detected in gastrointestinal epithelial cells, and infectious virus particles were isolated from faeces. Faecal PCR testing was as accurate as respiratory specimen PCR detection. In 36% (5/14)-53% (39/73) faecal PCR became positive, 2-5 days later than sputum PCR positive. Faecal excretion persisted after sputum excretion in 23% (17/73)-82% (54/66) patients for 1-11 days. CONCLUSIONS: Gastrointestinal symptoms are common in patients with COVID-19, and had an increased prevalence in the later stage of the recent epidemic in China. SARS-CoV-2 enters gastrointestinal epithelial cells, and the faeces of COVID-19 patients are potentially infectious.

1. **SARS-CoV-2 (COVID-19): What do we know about children? A systematic review.**  
   Mehta Nisha S. Clinical infectious diseases : an official publication of the Infectious Diseases Society of America 2020;:No page numbers.

BACKGROUNDFew paediatric cases of COVID-19 have been reported and we know little about the epidemiology in children, though more is known about other coronaviruses. We aimed to understand the infection rate, clinical presentation, clinical outcomes and transmission dynamics for SARS-CoV-2, in order to inform clinical and public health measures.METHODSWe undertook a rapid systematic review and narrative synthesis of all literature relating to SARS-CoV-2 in paediatric populations. The search terms also included SARS-CoV and MERS-CoV. We searched three databases and the COVID-19 resource centres of eleven major journals and publishers. English abstracts of Chinese language papers were included. Data were extracted and narrative syntheses conducted.RESULTS24 studies relating to COVID-19 were included in the review. Children appear to be less affected by COVID-19 than adults by observed rate of cases in large epidemiological studies. Limited data on attack rate indicate that children are just as susceptible to infection. Data on clinical outcomes are scarce but include several reports of asymptomatic infection and a milder course of disease in young children, though radiological abnormalities are noted. Severe cases are not reported in detail and there are little data relating to transmission.CONCLUSIONSChildren appear to have a low observed case rate of COVID-19 but may have similar rates to adults of infection with SARS-CoV-2. This discrepancy may be because children are asymptomatic or too mildly infected to draw medical attention, be tested and counted in observed cases of COVID-19.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=fce977c9922a89750d479687219fe651)

1. **SARS-COV-2 children transmission: the evidence is that today we do not have enough evidence.**  
   García-Salido A. Acta paediatrica (Oslo, Norway : 1992) 2020;:No page numbers.

I have read with interest the review by Ludvigsson on the role of children as transmitters of the new coronavirus (SARS-COV-2). An in-depth review of the current literature focused on 40 published articles and 7 non-peer reviewed papers(1) . All the papers included have been done under lockdown conditions. As a consequence, we should not ignore a main bias of this review(1) . The main conclusion we can draw now is that under confined conditions, children are not the main drivers of the COVID-19 pandemic. And "Confined" is not a normal situation.

1. **SARS-CoV-2 infection in children - Understanding the immune responses and controlling the pandemic.**  
   Lu Xiaoxia Pediatric allergy and immunology : official publication of the European Society of Pediatric Allergy and Immunology 2020;:No page numbers.

In December 2019, a cluster of patients with severe pneumonia caused by a novel coronavirus (SARS-CoV-2) emerged in the city of Wuhan, China. The disease is now termed coronavirus disease 2019 (COVID-19). In the early reports, the patients were mainly middle-aged and elderly men, and children appeared to be less susceptible to this infection. With modern and efficient transportation, the disease quickly spread to almost all corners of the world and the mortality far exceeds that caused by severe acute respiratory syndrome (SARS) coronavirus or Middle East respiratory syndrome (MERS) coronavirus. As the number of children with COVID-19 gradually increases, the disease has been documented in premature babies, infants, children, and adolescents. Severe and fatal cases in children are relatively rare. The burden of disease in children has been relatively low, but the high proportions of asymptomatic or mildly symptomatic infections in children deserve careful attention. A clear understanding of the immune responses to the virus in children and the transmission potential of asymptomatic children is of paramount importance for the development of specific treatments and vaccine in order to effectively control the ongoing pandemic.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=570453670ad9bd238c7831eb56a4abc6)

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=cfd814cfc210b6d10e48e3cfa62da148)

1. **SARS-CoV-2 infection in children: Transmission dynamics and clinical characteristics.**  
   Cao Qing Journal of the Formosan Medical Association = Taiwan yi zhi 2020;119(3):670-673.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=35343f37cd66a756a55083db070cbbd8)

1. **SARS-CoV2 infection and primary school closure.**  
   Vanhems Philippe Euro surveillance : bulletin Europeen sur les maladies transmissibles = European communicable disease bulletin 2020;25(15):No page numbers.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=d66849535811a578c79912cf4bef4d69)

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=2ae9dff7be461ca12c33f064dbe6b4d5)

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=2ae9dff7be461ca12c33f064dbe6b4d5)

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=73287170f3abe023bcc37ed4ee3d6a4d)

1. **School closure and management practices during coronavirus outbreaks including COVID-19: a rapid systematic review.**  
   Viner Russell M. The Lancet. Child & adolescent health 2020;4(5):397-404.

In response to the coronavirus disease 2019 (COVID-19) pandemic, 107 countries had implemented national school closures by March 18, 2020. It is unknown whether school measures are effective in coronavirus outbreaks (eg, due to severe acute respiratory syndrome [SARS], Middle East respiratory syndrome, or COVID-19). We undertook a systematic review by searching three electronic databases to identify what is known about the effectiveness of school closures and other school social distancing practices during coronavirus outbreaks. We included 16 of 616 identified articles. School closures were deployed rapidly across mainland China and Hong Kong for COVID-19. However, there are no data on the relative contribution of school closures to transmission control. Data from the SARS outbreak in mainland China, Hong Kong, and Singapore suggest that school closures did not contribute to the control of the epidemic. Modelling studies of SARS produced conflicting results. Recent modelling studies of COVID-19 predict that school closures alone would prevent only 2-4% of deaths, much less than other social distancing interventions. Policy makers need to be aware of the equivocal evidence when considering school closures for COVID-19, and that combinations of social distancing measures should be considered. Other less disruptive social distancing interventions in schools require further consideration if restrictive social distancing policies are implemented for long periods.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=1b4b4efcc109dc997f29fa03dfc65d85)

1. **School Opening Delay Effect on Transmission Dynamics of Coronavirus Disease 2019 in Korea: Based on Mathematical Modeling and Simulation Study.**  
   Kim Soyoung Journal of Korean medical science 2020;35(13):e143.

BACKGROUNDNonpharmaceutical intervention strategy is significantly important to mitigate the coronavirus disease 2019 (COVID-19) spread. One of the interventions implemented by the government is a school closure. The Ministry of Education decided to postpone the school opening from March 2 to April 6 to minimize epidemic size. We aimed to quantify the school closure effect on the COVID-19 epidemic.METHODSThe potential effects of school opening were measured using a mathematical model considering two age groups: children (aged 19 years and younger) and adults (aged over 19). Based on susceptible-exposed-infectious-recovered model, isolation and behavior-changed susceptible individuals are additionally considered. The transmission parameters were estimated from the laboratory confirmed data reported by the Korea Centers for Disease Control and Prevention from February 16 to March 22. The model was extended with estimated parameters and estimated the expected number of confirmed cases as the transmission rate increased after school opening.RESULTSAssuming the transmission rate between children group would be increasing 10 fold after the schools open, approximately additional 60 cases are expected to occur from March 2 to March 9, and approximately additional 100 children cases are expected from March 9 to March 23. After March 23, the number of expected cases for children is 28.4 for 7 days and 33.6 for 14 days.CONCLUSIONThe simulation results show that the government could reduce at least 200 cases, with two announcements by the Ministry of education. After March 23, although the possibility of massive transmission in the children's age group is lower, group transmission is possible to occur.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=986f7445a7a80a0c481d0f6b2868bc76)

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=2ddab28982ac88fe35ce2f560bdf8ccc)

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=65c83f590cd71617672f503a0f8ecfb1)

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=65c83f590cd71617672f503a0f8ecfb1)

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=ccf44eaf1c8162463021500b0189ee36)

1. **Systematic review of COVID-19 in children shows milder cases and a better prognosis than adults.**  
   Ludvigsson Jonas F. Acta paediatrica (Oslo, Norway : 1992) 2020;109(6):1088-1095.

AIMThe coronavirus disease 2019 (COVID-19) pandemic has affected hundreds of thousands of people. Data on symptoms and prognosis in children are rare.METHODSA systematic literature review was carried out to identify papers on COVID-19, which is caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), using the MEDLINE and Embase databases between January 1 and March 18, 2020.RESULTSThe search identified 45 relevant scientific papers and letters. The review showed that children have so far accounted for 1%-5% of diagnosed COVID-19 cases, they often have milder disease than adults and deaths have been extremely rare. Diagnostic findings have been similar to adults, with fever and respiratory symptoms being prevalent, but fewer children seem to have developed severe pneumonia. Elevated inflammatory markers were less common in children, and lymphocytopenia seemed rare. Newborn infants have developed symptomatic COVID-19, but evidence of vertical intrauterine transmission was scarce. Suggested treatment included providing oxygen, inhalations, nutritional support and maintaining fluids and electrolyte balances.CONCLUSIONSThe coronavirus disease 2019 has occurred in children, but they seemed to have a milder disease course and better prognosis than adults. Deaths were extremely rare.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=10a7c4eb3529065ec4f0cae96330e8cc)

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=f4102bdbe9b1f36279e6571658bbeb43)

1. **The Demographics and Economics of Direct Care Staff Highlight Their Vulnerabilities Amidst the COVID-19 Pandemic.**  
   Almeida B. Journal of aging & social policy 2020;:1-7.

An estimated 3.5 million direct care staff working in facilities and people's homes play a critical role during the COVID-19 pandemic. They allow vulnerable care recipients to stay at home and they provide necessary help in facilities. Direct care staff, on average, have decades of experience, often have certifications and licenses, and many have at least some college education to help them perform the myriad of responsibilities to properly care for care recipients. Yet, they are at heightened health and financial risks. They often receive low wages, limited benefits, and have few financial resources to fall back on when they get sick themselves and can no longer work. Furthermore, most direct care staff are parents with children in the house and almost one-fourth are single parents. If they fall ill, both they and their families are put into physical and financial risk.

1. **The different clinical characteristics of corona virus disease cases between children and their families in China - the character of children with COVID-19.**  
   Su Liang Emerging microbes & infections 2020;9(1):707-713.

This study aims to analyze the different clinical characteristics between children and their families infected with severe acute respiratory syndrome coronavirus 2. Clinical data from nine children and their 14 families were collected, including general status, clinical, laboratory test, and imaging characteristics. All the children were detected positive result after their families onset. Three children had fever (22.2%) or cough (11.2%) symptoms and six (66.7%) children had no symptom. Among the 14 adult patients, the major symptoms included fever (57.1%), cough (35.7%), chest tightness/pain (21.4%), fatigue (21.4%) and sore throat (7.1%). Nearly 70% of the patients had normal (71.4%) or decreased (28.6%) white blood cell counts, and 50% (7/14) had lymphocytopenia. There were 10 adults (71.4%) showed abnormal imaging. The main manifestations were pulmonary consolidation (70%), nodular shadow (50%), and ground glass opacity (50%). Five discharged children were admitted again because their stool showed positive result in SARS-CoV-2 PCR. COVID-19 in children is mainly caused by family transmission, and their symptoms are mild and prognosis is better than adult. However, their PCR result in stool showed longer time than their families. Because of the mild or asymptomatic clinical process, it is difficult to recognize early for pediatrician and public health staff.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=353c7c6b660e3762099c9ba08474d7e2)

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=cc3749c222818a1a2014fb9b30fb5655)

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=04e238f3226be12864e34801fae5f402)

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=27605cf42ce3607ec70da624eab4ed5f)

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=d24c09fcf6fdc89ead70275d10f1ba70)

1. **The effect of control strategies to reduce social mixing on outcomes of the COVID-19 epidemic in Wuhan, China: a modelling study**  
   Prem K. The Lancet Public Health 2020;5(5):No page numbers.

Background: In December, 2019, severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), a novel coronavirus, emerged in Wuhan, China. Since then, the city of Wuhan has taken unprecedented measures in response to the outbreak, including extended school and workplace closures. We aimed to estimate the effects of physical distancing measures on the progression of the COVID-19 epidemic, hoping to provide some insights for the rest of the world. <br/>Method(s): To examine how changes in population mixing have affected outbreak progression in Wuhan, we used synthetic location-specific contact patterns in Wuhan and adapted these in the presence of school closures, extended workplace closures, and a reduction in mixing in the general community. Using these matrices and the latest estimates of the epidemiological parameters of the Wuhan outbreak, we simulated the ongoing trajectory of an outbreak in Wuhan using an age-structured susceptible-exposed-infected-removed (SEIR) model for several physical distancing measures. We fitted the latest estimates of epidemic parameters from a transmission model to data on local and internationally exported cases from Wuhan in an age-structured epidemic framework and investigated the age distribution of cases. We also simulated lifting of the control measures by allowing people to return to work in a phased-in way and looked at the effects of returning to work at different stages of the underlying outbreak (at the beginning of March or April). <br/>Finding(s): Our projections show that physical distancing measures were most effective if the staggered return to work was at the beginning of April; this reduced the median number of infections by more than 92% (IQR 66-97) and 24% (13-90) in mid-2020 and end-2020, respectively. There are benefits to sustaining these measures until April in terms of delaying and reducing the height of the peak, median epidemic size at end-2020, and affording health-care systems more time to expand and respond. However, the modelled effects of physical distancing measures vary by the duration of infectiousness and the role school children have in the epidemic. <br/>Interpretation(s): Restrictions on activities in Wuhan, if maintained until April, would probably help to delay the epidemic peak. Our projections suggest that premature and sudden lifting of interventions could lead to an earlier secondary peak, which could be flattened by relaxing the interventions gradually. However, there are limitations to our analysis, including large uncertainties around estimates of R<sub>0</sub> and the duration of infectiousness. <br/>Funding(s): Bill & Melinda Gates Foundation, National Institute for Health Research, Wellcome Trust, and Health Data Research UK.<br/>Copyright &#xa9; 2020 The Author(s). Published by Elsevier Ltd. This is an Open Access article under the CC BY 4.0 license

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=cdcffec1c675a1071e2ba60af02bc117)

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=9e88b1fde5485b952695ecef397eeb2d)

1. **The epidemiology and pathogenesis of coronavirus disease (COVID-19) outbreak.**  
   Rothan HA Journal of autoimmunity 2020;109:102433.

Coronavirus disease (COVID-19) is caused by SARS-COV2 and represents the causative agent of a potentially fatal disease that is of great global public health concern. Based on the large number of infected people that were exposed to the wet animal market in Wuhan City, China, it is suggested that this is likely the zoonotic origin of COVID-19. Person-to-person transmission of COVID-19 infection led to the isolation of patients that were subsequently administered a variety of treatments. Extensive measures to reduce person-to-person transmission of COVID-19 have been implemented to control the current outbreak. Special attention and efforts to protect or reduce transmission should be applied in susceptible populations including children, health care providers, and elderly people. In this review, we highlights the symptoms, epidemiology, transmission, pathogenesis, phylogenetic analysis and future directions to control the spread of this fatal disease.

1. **The immune system of children: the key to understanding SARS-CoV-2 susceptibility?**  
   Carsetti Rita The Lancet Child & Adolescent Health 2020;4:414.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=c02c4e74852ff9ed8b576a4548617297)

1. **The Importance of Advancing SARS-CoV-2 Vaccines in Children.**  
   Kao Carol M. Clinical infectious diseases : an official publication of the Infectious Diseases Society of America 2020;:No page numbers.

While the role of children in the chain of transmission of SARS-CoV-2 remains to be fully defined, they likely play an important role based on our knowledge of other respiratory viruses. Children are more likely to be asymptomatic or have milder symptoms and less likely to present for healthcare and be tested for SARS-CoV-2; thus, our current estimates are likely under-representative of the true burden of SARS-CoV-2 in children. Given the potential direct benefit of a SARS-CoV-2 vaccine in children and the substantial indirect benefit through community protection or 'herd immunity', we argue that planning and implementation of SARS-CoV-2 vaccines should include children. Furthermore, community protection occurred after widespread implementation of prior childhood vaccines against Streptococcus pneumoniae, rubella and rotavirus. We detail considerations for vaccine clinical trials, potential barriers to the implementation of widespread vaccination and argue why children would be an ideal target population for vaccination.

1. **The isolation period should be longer: Lesson from a child infected with SARS-CoV-2 in Chongqing, China.**  
   Lin Jilei Pediatric pulmonology 2020;55(6):E6.

In December 2019, COVID-19 caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) outbroke in Wuhan, the capital city of Hubei province, China. The disease rapidly spread to other areas in China due to a huge population movement during the New Year Festival. Here, a 7-year-old child with SARS-CoV-2 infection in Chongqing, outside of Wuhan, Hubei province, was reported. This case suggested that children infected with SARS-CoV-2 are more likely to present milder manifestations than adults. The continuous positive real-time reverse transcription-polymerase chain reaction assay for SARS-CoV-2 in the child's throat swab sample indicated the isolation period for suspected child cases should be longer than 14 days.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=e8e113e58ce673e960af77ba79b42e11)

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=e9516f8d4dc083472212c698d6e9a117)

1. **The Role of Children in the Dynamics of Intra Family Coronavirus 2019 Spread in Densely Populated Area.**  
   Somekh Eli The Pediatric infectious disease journal 2020;:No page numbers.

We examined the dynamics of coronavirus 2019 (Covid-19) transmission within families. Our investigation demonstrated significantly lower rates of Covid-19 positivity in children compared with adults residing in the same household. Children of 5-17 years of age were 61% and children of 0-4 years of age were 47% less likely to have positive polymerase chain reaction results compared with adults residing in the same household.

1. **The role of children in the transmission of mild SARS-CoV-2 infection.**  
   de Niet Annikki Acta paediatrica (Oslo, Norway : 1992) 2020;:No page numbers.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=ebafd85689772eb8d9125c113593fb8e)

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=49c7bb9021ab506f9c95028177cc2343)

1. **The transmission and diagnosis of 2019 novel coronavirus infection disease (COVID-19): A Chinese perspective.**  
   Han Y. Journal of medical virology 2020;:No page numbers.

2019 novel coronavirus (SARS-CoV-2), which originated in Wuhan, China, has attracted the world's attention over the last month. The Chinese government has taken emergency measures to control the outbreak and has undertaken initial steps in the diagnosis and treatment of 2019 novel coronavirus infection disease (COVID-19). However, SARS-CoV-2 possesses powerful pathogenicity as well as transmissibility and still holds many mysteries that are yet to be solved, such as whether the virus can be transmitted by asymptomatic patients or by mothers to their infants. Our research presents selected available cases of COVID-19 in China to better understand the transmission and diagnosis regarding this infectious disease.

1. **The Unexpected Risks of COVID-19 on Asthma Control in Children.**  
   Oreskovic NM The journal of allergy and clinical immunology. In practice 2020;:No page numbers.

Much is being learned about clinical outcomes for adult COVID-19 patients with underlying chronic conditions, however, there is less coverage on how the COVID-19 pandemic impacts the management of chronic medical conditions in children and youth, such as asthma. Asthma is a common chronic medical condition in children that is uniquely susceptible to changes brought upon by COVID-19. Sudden dramatic changes in the environment, medical practice, and medication use have altered the asthma management landscape with potential impacts on asthma outcomes. In this paper, we review how changes in transportation and travel patterns, school attendance, physical activity, and time spent indoors, along with changes in healthcare delivery since the start of the pandemic all play a contributing role in asthma control in children. We review potentially important influences of asthma control in children during the COVID-19 pandemic worthy of further study.

1. **To mask or not to mask children to overcome COVID-19.**  
   Esposito Susanna European journal of pediatrics 2020;:No page numbers.

It has been reported that asymptomatic people can transmit the new coronavirus disease 2019 (COVID-19) and become important sources of COVID-19. To reduce the role of asymptomatic or poorly symptomatic people in COVID-19, universal use of face masks in addition to hand hygiene and safety distance seems extremely useful. Consequently, preparing the healthy child to use face masks is strongly needed. To obtain maximal compliance, reasons for mask wearing without attempts of removing must be clearly explained. Moreover, child's will must not be forced.Conclusion: On the basis of clinical findings, we think that the universal use of facial masks seems necessary when people have to go out in their everyday lives. In addition to the availability of masks of different sizes capable of adapting perfectly to the face, it is necessary that the use of masks in children is preceded by a strong parental work and school lessons on this issue and other hygiene topics with the main aim to obtain child cooperation.What is Known:• Asymptomatic people can transmit and become important sources of COVID-19.• Asymptomatic cases are common also in pediatrics.What is New:• Universal use of face masks for success against COVID-19 seems necessary also in pediatric age when people have to go out in their everyday lives.• In addition to the availability of masks of different sizes capable of adapting perfectly to the face, it is necessary that the use of masks in children is preceded by a strong parental work and school lessons with the main aim to obtain child cooperation.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=63290685e44a5e68b51a001c6abf7c53)

1. **Viral RNA Load in Mildly Symptomatic and Asymptomatic Children with COVID-19, Seoul.**  
   Han Mi Seon Emerging infectious diseases 2020;26(10):No page numbers.

Along with positive SARS-CoV-2 RNA in nasopharyngeal swabs, viral RNA was detectable at high concentration for >3 weeks in fecal samples from 12 mildly symptomatic and asymptomatic children with COVID-19. Saliva also tested positive during the early phase of infection. If proven infectious, feces and saliva could serve as transmission sources.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=570042fa44a24bb6703e70a82e3bc08e)

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=ea26898a00f1c5c261a50d844657ded4)

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=800e68ed101686bce33c82acae70620d)

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=ea26898a00f1c5c261a50d844657ded4)

1. **What are the Underlying Transmission Patterns of COVID-19 Outbreak? - An Age-specific Social Contact Characterization.**  
   Liu Y. EClinicalMedicine 2020;:100354.

BackgroundCOVID-19 has spread to 6 continents. Now is opportune to gain a deeper understanding of what may have happened. The findings can help inform mitigation strategies in the disease-affected countries.MethodsIn this work, we examine an essential factor that characterizes the disease transmission patterns: the interactions among people. We develop a computational model to reveal the interactions in terms of the social contact patterns among the population of different age-groups. We divide a city's population into seven age-groups: 0-6 years old (children); 7-14 (primary and junior high school students); 15-17 (high school students); 18-22 (university students); 23-44 (young/middle-aged people); 45-64 years old (middle-aged/elderly people); and 65 or above (elderly people). We consider four representative settings of social contacts that may cause the disease spread: (1) individual households; (2) schools, including primary/high schools as well as colleges and universities; (3) various physical workplaces; and (4) public places and communities where people can gather, such as stadiums, markets, squares, and organized tours. A contact matrix is computed to describe the contact intensity between different age-groups for each of the four settings. By integrating the four contact matrices with the next-generation matrix, we quantitatively characterize the underlying transmission patterns of COVID-19 among different populations.FindingsWe focus our study on 6 representative cities in China: Wuhan, the epicenter of COVID-19, together with Beijing, Tianjin, Hangzhou, Suzhou, and Shenzhen, which are five major cities from three key economic zones. The results show that the social contact-based analysis can readily explain the underlying disease transmission patterns as well as the associated risks (including both confirmed and unconfirmed cases). In Wuhan, the age-groups involving relatively intensive contacts in households and public/communities are dispersedly distributed. This can explain why the transmission of COVID-19 in the early stage mainly took place in public places and families in Wuhan. We estimate that Feb. 11, 2020 was the date with the highest transmission risk in Wuhan, which is consistent with the actual peak period of the reported case number (Feb. 4-14). Moreover, the surge in the number of new cases reported on Feb. 12-13 in Wuhan can readily be captured using our model, showing its ability in forecasting the potential/unconfirmed cases. We further estimate the disease transmission risks associated with different work resumption plans in these cities after the outbreak. The estimation results are consistent with the actual situations in the cities with relatively lenient control policies, such as Beijing, and those with strict control policies, such as Shenzhen.InterpretationWith an in-depth characterization of age-specific social contact-based transmission, the retrospective and prospective situations of the disease outbreak, including the past and future transmission risks, the effectiveness of different interventions, and the disease transmission risks of restoring normal social activities, are computationally analyzed and reasonably explained. The conclusions drawn from the study not only provide a comprehensive explanation of the underlying COVID-19 transmission patterns in China, but more importantly, offer the social contact-based risk analysis methods that can readily be applied to guide intervention planning and operational responses in other countries, so that the impact of COVID-19 pandemic can be strategically mitigated.FundingGeneral Research Fund of the Hong Kong Research Grants Council; Key Project Grants of the National Science Foundation of China.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=4cfc380269125da2aa795e661c8d6c86)

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=42a2921991289648bfe4d8291d268b95)

1. **[Back to school and COVID-19: It is urgent to control our fears and move forward for the good of children].**  
   Delacourt C. Journal de pediatrie et de puericulture 2020;33(3):99-100.

1. **High-density Bacterial Nasal Carriage in Children Is Transient and Associated with Respiratory Viral Infections - Implications for Transmission Dynamics**  
   Thors V. Pediatric Infectious Disease Journal 2019;38(5):533-538.

Background: This longitudinal study describes the associations between respiratory viral infections, rhinitis and the prevalence and density of the common nasopharyngeal bacterial colonizers, Streptococcus pneumoniae (Sp), Moraxella catarrhalis (Mc), Haemophilus influenzae (Hi) and Staphylococcus aureus. <br/>Method(s): In an observational cohort study, 161 children attending day care centers in Bristol, United Kingdom, were recruited. Monthly nasopharyngeal swabs were taken and stored frozen in Skim-milk, tryptone, glucose and glycerin broth (STGG) broth. Quantitative polymerase chain reaction was used for detection of respiratory viruses and 4 bacterial species. t tests and logistic regression models were used for analysis. <br/>Result(s): The frequent colonisers, Sp, Mc and Hi were more frequently found at high density in contrast to Staphylococcus aureus although temporally, high-density carriage was short lived. Respiratory viral infections and symptoms of rhinitis were both independently and consistently associated with higher bacterial density with an observed 2-fold increase in density for Sp, Mc and Hi (P = 0.004-0.017). <br/>Conclusion(s): For Sp and Hi, the association between young age and higher bacterial DNA density was explained by more frequent viral infection and increased nasal discharge, while the associations between some viral specie's and some bacterial species' density appear to be stronger than others. Increased colonization density and rhinitis may promote transmission of these commonly carried organisms.<br/>Copyright &#xa9; 2018 Wolters Kluwer Health, Inc. All rights reserved.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=e6bda976af3c13360d364a7e6319f8a2)

1. **A wake-up call: COVID-19 and its impact on children's health and wellbeing**  
   Fore Henrietta H. The Lancet Global Health 0;:No page numbers.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=372a99118a6970f18de8ff13eb7190ad)

### Opening Internet Links

The links to internet sites in this document are 'live' and can be opened by holding down the CTRL key on your keyboard while clicking on the web address with your mouse

### Full text papers

Links are given to full text resources where available. For some of the papers, you will need an **NHS OpenAthens Account**. If you do not have an account you can [register online](https://openathens.nice.org.uk/).

You can then access the papers by simply entering your username and password. If you do not have easy access to the internet to gain access, please let us know and we can download the papers for you.

### Guidance on searching within online documents

Links are provided to the full text of each document. Relevant extracts have been copied and pasted into these results. Rather than browse through lengthy documents, you can search for specific words as follows:

**Portable Document Format / pdf / Adobe**  
Click on the Search button (illustrated with binoculars). This will open up a search window. Type in the term you need to find and links to all of the references to that term within the document will be displayed in the window. You can jump to each reference by clicking it.

**Word documents**  
Select Edit from the menu, the Find and type in your term in the search box which is presented. The search function will locate the first use of the term in the document. By pressing 'next' you will jump to further references.

## C. Search History

## Reviewer’s Note 23/6/20:

## Consider using the MeSH term exp “CORONAVIRUS INFECTIONS”/ in Medline and CINAHL.

## The ERIC database is freely accessible so consider a search of this too: <https://eric.ed.gov/>

|  | **Source** | **Criteria** | **Results** |
| --- | --- | --- | --- |
| 1. | Medline | (Coronavirus OR "Covid-19" OR "C-19" OR Betacoronavirus OR "nCoV\*" OR "2019nCoV" OR "19nCoV" OR "COVID19\*" OR "COVID-19" OR COVID OR "SARS-COV-2" OR "SARSCOV-2" OR "SARSCOV2" OR "Severe Acute Respiratory Syndrome Coronavirus 2" OR "Severe Acute Respiratory Syndrome Corona Virus 2" OR "Severe Acute Respiratory Syndrome Coronavirus 2" OR "SARS-CoV-2" OR Corona OR "2019-nCoV Acute Respiratory Disease" OR "Novel Coronavirus Pneumonia").ti,ab | 40692 |
| 2. | Medline | ((Wuhan OR Hubei OR China OR Chinese) ADJ4 (Pneumonia OR Pandemic\* OR Epidemic\* OR Outbreak\*)).ti,ab | 3236 |
| 3. | Medline | CORONAVIRUS/ | 2498 |
| 4. | Medline | BETACORONAVIRUS/ | 4630 |
| 5. | Medline | (1 OR 2 OR 3 OR 4) | 43540 |
| 6. | Medline | (Child\* OR Infan\* OR Toddler\* OR Schoolchild\* OR Preschool\* OR "Pre-school\*" OR P?ediatric\* OR Girl\* OR Boy\*).ti,ab | 1911772 |
| 7. | Medline | "CHILD, PRESCHOOL"/ | 910490 |
| 8. | Medline | CHILD/ | 1674054 |
| 9. | Medline | "INFANT, NEWBORN"/ | 600070 |
| 10. | Medline | INFANT/ | 785733 |
| 11. | Medline | (Transmissibility OR Transmission\* OR "Disease Transmission" OR "Basic Reproduction Number" OR "Basic Reproduction Ratio" OR "Basic Reproductive Rate" OR "R Number" OR "Communicable Disease Transmission" OR "Horizontal Transmission of Infection" OR "Virus Transmission" OR "Viral Transmission").ti,ab | 360400 |
| 12. | Medline | "BASIC REPRODUCTION NUMBER"/ | 874 |
| 13. | Medline | "DISEASE TRANSMISSION, INFECTIOUS"/ | 9237 |
| 14. | Medline | (11 OR 12 OR 13) | 365147 |
| 15. | Medline | (6 OR 7 OR 8 OR 9 OR 10) | 3024178 |
| 16. | Medline | (5 AND 14 AND 15) | 347 |
| 17. | Medline | 16 [DT 2019-2020] | 217 |
| 18. | EMBASE | (Coronavirus OR "Covid-19" OR "C-19" OR Betacoronavirus OR "nCoV\*" OR "2019nCoV" OR "19nCoV" OR "COVID19\*" OR "COVID-19" OR COVID OR "SARS-COV-2" OR "SARSCOV-2" OR "SARSCOV2" OR "Severe Acute Respiratory Syndrome Coronavirus 2" OR "Severe Acute Respiratory Syndrome Corona Virus 2" OR "Severe Acute Respiratory Syndrome Coronavirus 2" OR "SARS-CoV-2" OR Corona OR "2019-nCoV Acute Respiratory Disease" OR "Novel Coronavirus Pneumonia").ti,ab | 44605 |
| 19. | EMBASE | ((Wuhan OR Hubei OR China OR Chinese) ADJ4 (Pneumonia OR Pandemic\* OR Epidemic\* OR Outbreak\*)).ti,ab | 2758 |
| 20. | EMBASE | CORONAVIRUS/ | 10374 |
| 21. | EMBASE | BETACORONAVIRUS/ | 1452 |
| 22. | EMBASE | CORONAVIRINAE/ | 2259 |
| 23. | EMBASE | CORONAVIRIDAE/ | 1048 |
| 24. | EMBASE | (18 OR 19 OR 20 OR 21 OR 22 OR 23) | 51357 |
| 25. | EMBASE | (Child\* OR Infan\* OR Toddler\* OR Schoolchild\* OR Preschool\* OR "Pre-school\*" OR P?ediatric\* OR Girl\* OR Boy\*).ti,ab | 2401981 |
| 26. | EMBASE | TODDLER/ | 4706 |
| 27. | EMBASE | "SCHOOL CHILD"/ | 361183 |
| 28. | EMBASE | "PRESCHOOL CHILD"/ | 541122 |
| 29. | EMBASE | INFANT/ | 587949 |
| 30. | EMBASE | GIRL/ | 40408 |
| 31. | EMBASE | BOY/ | 27208 |
| 32. | EMBASE | CHILD/ | 1700154 |
| 33. | EMBASE | (25 OR 26 OR 27 OR 28 OR 29 OR 30 OR 31 OR 32) | 3084434 |
| 34. | EMBASE | (Transmissibility OR Transmission\* OR "Disease Transmission" OR "Basic Reproduction Number" OR "Basic Reproduction Ratio" OR "Basic Reproductive Rate" OR "R Number" OR "Communicable Disease Transmission" OR "Horizontal Transmission of Infection" OR "Virus Transmission" OR "Viral Transmission").ti,ab | 404627 |
| 35. | EMBASE | "DISEASE TRANSMISSION"/ | 98130 |
| 36. | EMBASE | "BASIC REPRODUCTION RATIO"/ | 1442 |
| 37. | EMBASE | "BASIC REPRODUCTION RATE"/ | 1442 |
| 38. | EMBASE | "BASIC REPRODUCTION NUMBER"/ | 1442 |
| 39. | EMBASE | (34 OR 35 OR 36 OR 37 OR 38) | 465704 |
| 40. | EMBASE | (24 AND 33 AND 39) | 433 |
| 41. | EMBASE | 40 [DT 2019-2020] | 215 |
| 1. | Medline | (Coronavirus OR "Covid-19" OR "C-19" OR Betacoronavirus OR "nCoV\*" OR "2019nCoV" OR "19nCoV" OR "COVID19\*" OR "COVID-19" OR COVID OR "SARS-COV-2" OR "SARSCOV-2" OR "SARSCOV2" OR "Severe Acute Respiratory Syndrome Coronavirus 2" OR "Severe Acute Respiratory Syndrome Corona Virus 2" OR "Severe Acute Respiratory Syndrome Coronavirus 2" OR "SARS-CoV-2" OR Corona OR "2019-nCoV Acute Respiratory Disease" OR "Novel Coronavirus Pneumonia").ti,ab | 38422 |
| 2. | Medline | BETACORONAVIRUS/ | 4062 |
| 3. | Medline | CORONAVIRUS/ | 2449 |
| 4. | Medline | ((Wuhan OR Hubei OR China OR Chinese) ADJ4 (Pneumonia OR Pandemic\* OR Epidemic\* OR Outbreak\*)).ti,ab | 3166 |
| 5. | Medline | (1 OR 2 OR 3 OR 4) | 41262 |
| 6. | Medline | (Child\* OR Infan\* OR Toddler\* OR Schoolchild\* OR Preschool\* OR "Pre-school\*" OR P?ediatric\* OR Girl\* OR Boy\*).ti,ab | 1910216 |
| 7. | Medline | CHILD/ | 1673243 |
| 8. | Medline | "CHILD, PRESCHOOL"/ | 910087 |
| 9. | Medline | INFANT/ | 785359 |
| 10. | Medline | (6 OR 7 OR 8 OR 9) | 2831971 |
| 11. | Medline | (School\* OR Reception\* OR "Primary School\*" OR Education OR Kindergarten\* OR Nursery OR Nurseries OR Teacher\* OR "Educational Personnel" OR Educator\* OR "Teaching Assistant\*" OR "Classroom Assistant\*").ti,ab | 693647 |
| 12. | Medline | "SCHOOLS, NURSERY"/ | 1467 |
| 13. | Medline | SCHOOLS/ | 37575 |
| 14. | Medline | "SCHOOL TEACHERS"/ | 1328 |
| 15. | Medline | "EDUCATIONAL PERSONNEL"/ | 113 |
| 16. | Medline | (11 OR 12 OR 13 OR 14 OR 15) | 699184 |
| 17. | Medline | (5 AND 10 AND 16) | 176 |
| 18. | EMBASE | (Coronavirus OR "Covid-19" OR "C-19" OR Betacoronavirus OR "nCoV\*" OR "2019nCoV" OR "19nCoV" OR "COVID19\*" OR "COVID-19" OR COVID OR "SARS-COV-2" OR "SARSCOV-2" OR "SARSCOV2" OR "Severe Acute Respiratory Syndrome Coronavirus 2" OR "Severe Acute Respiratory Syndrome Corona Virus 2" OR "Severe Acute Respiratory Syndrome Coronavirus 2" OR "SARS-CoV-2" OR Corona OR "2019-nCoV Acute Respiratory Disease" OR "Novel Coronavirus Pneumonia").ti,ab | 43741 |
| 19. | EMBASE | CORONAVIRUS/ | 10352 |
| 20. | EMBASE | BETACORONAVIRUS/ | 1447 |
| 21. | EMBASE | CORONAVIRINAE/ | 2237 |
| 22. | EMBASE | ((Wuhan OR Hubei OR China OR Chinese) ADJ4 (Pneumonia OR Pandemic\* OR Epidemic\* OR Outbreak\*)).ti,ab | 2738 |
| 23. | EMBASE | (18 OR 19 OR 20 OR 21 OR 22) | 50036 |
| 24. | EMBASE | (Child\* OR Infan\* OR Toddler\* OR Schoolchild\* OR Preschool\* OR "Pre-school\*" OR P?ediatric\* OR Girl\* OR Boy\*).ti,ab | 2401004 |
| 25. | EMBASE | TODDLER/ | 4699 |
| 26. | EMBASE | "SCHOOL CHILD"/ | 361096 |
| 27. | EMBASE | "PRESCHOOL CHILD"/ | 541037 |
| 28. | EMBASE | GIRL/ | 40408 |
| 29. | EMBASE | BOY/ | 27201 |
| 30. | EMBASE | CHILD/ | 1699389 |
| 31. | EMBASE | INFANCY/ | 17991 |
| 32. | EMBASE | (24 OR 25 OR 26 OR 27 OR 28 OR 29 OR 30 OR 31) | 3021611 |
| 33. | EMBASE | (School\* OR Reception\* OR "Primary School\*" OR Education OR Kindergarten\* OR Nursery OR Nurseries OR Teacher\* OR "Educational Personnel" OR Educator\* OR "Teaching Assistant\*" OR "Classroom Assistant\*").ti,ab | 900852 |
| 34. | EMBASE | "PRIMARY SCHOOL"/ | 12385 |
| 35. | EMBASE | "NURSERY SCHOOL"/ | 970 |
| 36. | EMBASE | KINDERGARTEN/ | 2770 |
| 37. | EMBASE | SCHOOL/ | 61314 |
| 38. | EMBASE | "TEACHING ASSISTANT"/ | 37 |
| 39. | EMBASE | "SCHOOL TEACHER"/ | 1361 |
| 40. | EMBASE | TEACHER/ | 33040 |
| 41. | EMBASE | (33 OR 34 OR 35 OR 36 OR 37 OR 38 OR 39 OR 40) | 920184 |
| 42. | EMBASE | (23 AND 32 AND 41) | 206 |
| 43. | EMBASE | 42 [DT 2019-2020] | 85 |
| 44. | CINAHL | (Coronavirus OR "Covid-19" OR "C-19" OR Betacoronavirus OR "nCoV\*" OR "2019nCoV" OR "19nCoV" OR "COVID19\*" OR "COVID-19" OR COVID OR "SARS-COV-2" OR "SARSCOV-2" OR "SARSCOV2" OR "Severe Acute Respiratory Syndrome Coronavirus 2" OR "Severe Acute Respiratory Syndrome Corona Virus 2" OR "Severe Acute Respiratory Syndrome Coronavirus 2" OR "SARS-CoV-2" OR Corona OR "2019-nCoV Acute Respiratory Disease" OR "Novel Coronavirus Pneumonia").ti,ab | 6027 |
| 45. | CINAHL | CORONAVIRUS/ | 419 |
| 46. | CINAHL | ((Wuhan OR Hubei OR China OR Chinese) ADJ4 (Pneumonia OR Pandemic\* OR Epidemic\* OR Outbreak\*)).ti,ab | 637 |
| 47. | CINAHL | (44 OR 45 OR 46) | 6601 |
| 48. | CINAHL | (Child\* OR Infan\* OR Toddler\* OR Schoolchild\* OR Preschool\* OR "Pre-school\*" OR P?ediatric\* OR Girl\* OR Boy\*).ti,ab | 697882 |
| 49. | CINAHL | INFANT/ | 176888 |
| 50. | CINAHL | "CHILD, PRESCHOOL"/ | 218839 |
| 51. | CINAHL | CHILD/ | 484729 |
| 52. | CINAHL | (48 OR 49 OR 50 OR 51) | 902328 |
| 53. | CINAHL | (School\* OR Reception\* OR "Primary School\*" OR Education OR Kindergarten\* OR Nursery OR Nurseries OR Teacher\* OR "Educational Personnel" OR Educator\* OR "Teaching Assistant\*" OR "Classroom Assistant\*").ti,ab | 440538 |
| 54. | CINAHL | "SCHOOLS, NURSERY"/ | 1282 |
| 55. | CINAHL | SCHOOLS/ | 14333 |
| 56. | CINAHL | TEACHING/ | 8348 |
| 57. | CINAHL | TEACHERS/ | 12158 |
| 58. | CINAHL | "SCHOOLS, ELEMENTARY"/ | 5501 |
| 59. | CINAHL | (53 OR 54 OR 55 OR 56 OR 57 OR 58) | 451633 |
| 60. | CINAHL | (47 AND 52 AND 59) | 40 |
| 61. | CINAHL | 60 [DT 2019-2020] | 19 |
| 62. | EMCARE | (Coronavirus OR "Covid-19" OR "C-19" OR Betacoronavirus OR "nCoV\*" OR "2019nCoV" OR "19nCoV" OR "COVID19\*" OR "COVID-19" OR COVID OR "SARS-COV-2" OR "SARSCOV-2" OR "SARSCOV2" OR "Severe Acute Respiratory Syndrome Coronavirus 2" OR "Severe Acute Respiratory Syndrome Corona Virus 2" OR "Severe Acute Respiratory Syndrome Coronavirus 2" OR "SARS-CoV-2" OR Corona OR "2019-nCoV Acute Respiratory Disease" OR "Novel Coronavirus Pneumonia").ti,ab | 5391 |
| 63. | EMCARE | CORONAVIRUS/ | 749 |
| 64. | EMCARE | BETACORONAVIRUS/ | 36 |
| 65. | EMCARE | ((Wuhan OR Hubei OR China OR Chinese) ADJ4 (Pneumonia OR Pandemic\* OR Epidemic\* OR Outbreak\*)).ti,ab | 601 |
| 66. | EMCARE | (62 OR 63 OR 64 OR 65) | 6261 |
| 67. | EMCARE | (Child\* OR Infan\* OR Toddler\* OR Schoolchild\* OR Preschool\* OR "Pre-school\*" OR P?ediatric\* OR Girl\* OR Boy\*).ti,ab | 684575 |
| 68. | EMCARE | TODDLER/ | 3164 |
| 69. | EMCARE | "SCHOOL CHILD"/ | 103027 |
| 70. | EMCARE | "PRESCHOOL CHILD"/ | 89362 |
| 71. | EMCARE | INFANT/ | 136480 |
| 72. | EMCARE | GIRL/ | 32704 |
| 73. | EMCARE | BOY/ | 27168 |
| 74. | EMCARE | CHILD/ | 485376 |
| 75. | EMCARE | (67 OR 68 OR 69 OR 70 OR 71 OR 72 OR 73 OR 74) | 790638 |
| 76. | EMCARE | (School\* OR Reception\* OR "Primary School\*" OR Education OR Kindergarten\* OR Nursery OR Nurseries OR Teacher\* OR "Educational Personnel" OR Educator\* OR "Teaching Assistant\*" OR "Classroom Assistant\*").ti,ab | 399159 |
| 77. | EMCARE | "PRIMARY SCHOOL"/ | 11897 |
| 78. | EMCARE | "NURSERY SCHOOL"/ | 366 |
| 79. | EMCARE | "MIDDLE SCHOOL"/ | 2948 |
| 80. | EMCARE | KINDERGARTEN/ | 3759 |
| 81. | EMCARE | SCHOOL/ | 55745 |
| 82. | EMCARE | "SCHOOL TEACHERS"/ | 412 |
| 83. | EMCARE | "SCHOOL TEACHER"/ | 412 |
| 84. | EMCARE | "TEACHING ASSISTANT"/ | 36 |
| 85. | EMCARE | TEACHER/ | 34069 |
| 86. | EMCARE | (76 OR 77 OR 78 OR 79 OR 80 OR 81 OR 82 OR 83 OR 84 OR 85) | 406868 |
| 87. | EMCARE | (66 AND 75 AND 86) | 39 |
| 88. | EMCARE | 87 [DT 2019-2020] | 14 |
| 89. | PsycINFO | (Coronavirus OR "Covid-19" OR "C-19" OR Betacoronavirus OR "nCoV\*" OR "2019nCoV" OR "19nCoV" OR "COVID19\*" OR "COVID-19" OR COVID OR "SARS-COV-2" OR "SARSCOV-2" OR "SARSCOV2" OR "Severe Acute Respiratory Syndrome Coronavirus 2" OR "Severe Acute Respiratory Syndrome Corona Virus 2" OR "Severe Acute Respiratory Syndrome Coronavirus 2" OR "SARS-CoV-2" OR Corona OR "2019-nCoV Acute Respiratory Disease" OR "Novel Coronavirus Pneumonia").ti,ab | 934 |
| 92. | PsycINFO | ((Wuhan OR Hubei OR China OR Chinese) ADJ4 (Pneumonia OR Pandemic\* OR Epidemic\* OR Outbreak\*)).ti,ab | 177 |
| 93. | PsycINFO | (89 OR 92) | 1094 |
| 94. | PsycINFO | (Child\* OR Infan\* OR Toddler\* OR Schoolchild\* OR Preschool\* OR "Pre-school\*" OR P?ediatric\* OR Girl\* OR Boy\*).ti,ab | 799974 |
| 95. | PsycINFO | (child).mm,mh,me,su,mj | 359918 |
| 96. | PsycINFO | (toddler).mm,mh,me,su,mj | 901 |
| 97. | PsycINFO | (infant).mm,mh,me,su,mj | 67321 |
| 98. | PsycINFO | (girl).mm,mh,me,su,mj | 1375 |
| 99. | PsycINFO | (boy).mm,mh,me,su,mj | 1386 |
| 100. | PsycINFO | (preschooler).mm,mh,me,su,mj | 237 |
| 101. | PsycINFO | (schoolchild).mm,mh,me,su,mj | 10 |
| 102. | PsycINFO | (94 OR 95 OR 96 OR 97 OR 98 OR 99 OR 100 OR 101) | 866876 |
| 103. | PsycINFO | (School\* OR Reception\* OR "Primary School\*" OR Education OR Kindergarten\* OR Nursery OR Nurseries OR Teacher\* OR "Educational Personnel" OR Educator\* OR "Teaching Assistant\*" OR "Classroom Assistant\*").ti,ab | 711165 |
| 104. | PsycINFO | "NURSERY SCHOOLS"/ | 452 |
| 105. | PsycINFO | "MIDDLE SCHOOLS"/ | 4113 |
| 106. | PsycINFO | KINDERGARTENS/ | 2974 |
| 107. | PsycINFO | "JUNIOR HIGH SCHOOLS"/ | 610 |
| 108. | PsycINFO | "ELEMENTARY SCHOOLS"/ | 7925 |
| 109. | PsycINFO | SCHOOLS/ | 36256 |
| 110. | PsycINFO | "PRESCHOOL TEACHERS"/ | 1715 |
| 111. | PsycINFO | "MIDDLE SCHOOL TEACHERS"/ | 993 |
| 112. | PsycINFO | "JUNIOR HIGH SCHOOL TEACHERS"/ | 1624 |
| 113. | PsycINFO | "ELEMENTARY SCHOOL TEACHERS"/ | 8509 |
| 114. | PsycINFO | "EDUCATIONAL PERSONNEL"/ | 11530 |
| 115. | PsycINFO | TEACHERS/ | 41209 |
| 116. | PsycINFO | (103 OR 104 OR 105 OR 106 OR 107 OR 108 OR 109 OR 110 OR 111 OR 112 OR 113 OR 114 OR 115) | 718443 |
| 117. | PsycINFO | (93 AND 102 AND 116) | 27 |
| 118. | PsycINFO | 117 [DT 2019-2020] | 9 |

**Disclaimer**  
We hope that you find the evidence search service useful. Whilst care has been taken in the selection of the materials included in this evidence search, the Library and Knowledge Service is not responsible for the content or the accuracy of the enclosed research information. Accordingly, whilst every endeavour has been undertaken to execute a comprehensive search of the literature, the Library and Knowledge Service is not and will not be held responsible or liable for any omissions to pertinent research information not included as part of the results of the enclosed evidence search. Users are welcome to discuss the evidence search findings with the librarian responsible for executing the search. We welcome suggestions on additional search strategies / use of other information resources for further exploration. You must not use the results of this search for commercial purposes. Any usage or reproduction of the search output should acknowledge the Library and Knowledge Service that produced it.