Public Health Ontario | Santé publique Ontario

SYNTHESIS

2020/11/04

Coronavirus Disease 2019 and the Pediatric Population: An Umbrella Review

Accompanying Appendices and Tables

List of Appendices and Tables

Executive Summary

These accompanying appendices and tables provide details of the included studies supporting the synthesis: Coronavirus Disease 2019 and the Pediatric Population: An Umbrella Review. An overview of the programs and interventions is detailed, and information is provided on the search strategy, included reviews, and findings across all relevant outcome categories.

Appendix A. Search strategy

Databases Searched

Database	Date searched	Records	Duplicates removed by database	Remaining
MEDLINE	09/11/2020	792	0	792

Results Totals

Records source	Records
Records identified through database searching	792
Duplicates removed by database	0
Duplicates removed by bibliographic management software	5
Total records after duplicates removed	787
Review type literature in total records	192
Primary studies	595

MEDLINE

Search Strategy: Ovid MEDLINE(R) ALL <1946 to September 09, 2020>

#	Searches	Results
1	("COVID-19" or "severe acute respiratory syndrome coronavirus 2" or "SARS–CoV–2").nm,ps,px,rs,rx.	22533
2	(*Pandemics/ and Coronavirus Infections/) or (Pandemics/ and *Coronavirus Infections/) or (*Pneumonia, Viral/ and Coronavirus Infections/) or (Pneumonia, Viral/ and *Coronavirus Infections/)	21341
3	("2019 corona virus" or "2019 coronavirus" or "2019 ncov" or "corona virus 19" or "corona virus 2019" or "corona virus 2019" or "corona virus disease 19" or "corona virus disease 2019" or "corona virus epidemic*" or "corona virus outbreak*" or "corona virus pandemic*" or "coronavirus 19" or "coronavirus 2019" or "coronavirus 2019" or "coronavirus disease 19" or "coronavirus disease 2019" or "coronavirus epidemic*" or "coronavirus outbreak*" or "coronavirus pandemic*" or "covid 19" or "covid 2019" or "new corona virus" or "new coronavirus" or "novel corona virus" or "novel coronavirus" or "novel human coronavirus" or "sars coronavirus 2" or "sars cov 2" or "sars cov2" or "sars like coronavirus" or "severe acute respiratory syndrome corona virus 2" or "severe acute respiratory syndrome coronavirus 2" or	49321

#	Searches	Results
	"severe specific contagious pneumonia" or "wuhan corona virus" or "wuhan coronavirus" or 2019ncov or covid19 or covid2019 or ncov or sarscov2 or "coronavirus response" or "corona virus response").kf,kw,ti.	
4	((pandemic* or novel or wuhan) adj3 (coronavirus* or "corona virus*" or betacoronavirus* or "beta coronavirus*" or "beta corona virus*" or pneumonia* or SARS or "severe acute respiratory syndrome")).kf,kw,ti.	4164
5	(pneumonia adj3 (coronavirus* or "corona virus*" or betacoronavirus* or "beta coronavirus*" or "beta corona virus*" or SARS or "severe acute respiratory syndrome")).kf,kw,ti.	692
6	(*Coronavirus Infections/ or coronavirus.ti.) and ("2019 corona virus" or "2019 coronavirus" or "2019 ncov" or "corona virus 19" or "corona virus 2019" or "corona virus 2019" or "corona virus disease 19" or "corona virus disease 2019" or "corona virus epidemic*" or "corona virus outbreak*" or "corona virus pandemic*" or "coronavirus 19" or "coronavirus 2019" or "coronavirus 2019" or "coronavirus disease 19" or "coronavirus disease 2019" or "coronavirus epidemic*" or "coronavirus outbreak*" or "coronavirus pandemic*" or "covid 19" or "covid 2019" or "new corona virus" or "new coronavirus" or "novel corona virus" or "novel coronavirus" or "novel human coronavirus" or "sars coronavirus 2" or "sars cov 2" or "sars cov2" or "sars like coronavirus" or "severe acute respiratory syndrome corona virus 2" or "severe acute respiratory syndrome coronavirus 2" or "severe specific contagious pneumonia" or "wuhan corona virus" or "wuhan coronavirus" or 2019ncov or covid19 or covid2019 or ncov or sarscov2 or "coronavirus response" or "corona virus response").ab.	13606
7	(*Coronavirus Infections/ or coronavirus.ti.) and ((pandemic* or novel or wuhan) adj3 (coronavirus* or "corona virus*" or betacoronavirus* or "beta coronavirus*" or "beta corona virus*" or pneumonia* or SARS or "severe acute respiratory syndrome")).ab.	3494
8	(*Coronavirus Infections/ or coronavirus.ti.) and (pneumonia* adj3 (coronavirus* or "corona virus*" or betacoronavirus* or "beta coronavirus*" or "beta corona virus*" or SARS or "severe acute respiratory syndrome")).ab.	388
9	or/1–8	51474
10	*Infant/ or exp *Infant, Newborn/ or *Infant Health/ or exp *Infant, Low Birth Weight/ or exp *Infant, Very Low Birth Weight/ or exp *Infant, Premature/ or *Child Health/ or *Child/ or *Adolescent Health/ or *Adolescent/ or *Psychology, Child/ or *Psychology, Adolescent/ or *Pediatrics/ or *Pediatric Obesity/ or *Pediatricians/ or *Pediatric Emergency Medicine/ or *Neonatology/ or *Child, Preschool/ or *Adolescent Medicine/ or *Siblings/ or ((Infant/ or exp Infant, Newborn/ or Infant Health/ or exp Infant, Low Birth Weight/ or exp Infant, Very Low Birth Weight/ or exp Infant, Premature/ or Child Health/ or Child/ or Adolescent Health/ or Adolescent/ or Psychology, Child/ or Psychology, Adolescent/ or Pediatrics/ or Pediatric Obesity/ or Pediatricians/ or Pediatric Emergency Medicine/ or Neonatology/ or Child, Preschool/ or Adolescent Medicine/ or Siblings/) and (paediatric* or pediatric* or "school age*" or (age? adj3 ("4" or "5" or "6" or "7" or "8" or "9" or "10" or "11" or "12" or four or five or six or seven or eight or nine or ten or eleven or twelve)) or (year* adj3 ("4" or "5" or "6" or "7" or "8" or "9" or "10" or "11" or "12" or four or five or six or seven or eight or nine or ten or eleven or twelve) adj3 old) or boy or boys or child or schoolchild* or children or childhood or girl or girls or kid or kids or preteen* or toddler* or infant* or newborn* or new–born* or baby or babies or neonat* or (age? adj3 ("1" or "2" or "3" or one or two or three)) or (year* adj3 ("1" or "2" or "3" or one or two or three) adj3 old) or (month* adj3 ("1" or "2" or "3" or "4" or "5" or	1894465

#	Searches	Results
	"6" or "7" or "8" or "9" or "10" or "11" or "12" or "18" or "24" or "30" or "36") adj3 old) or adolescent* or (age? adj3 ("13" or "14" or "15" or "16" or "17" or "18" or "19" or thirteen or fourteen or fifteen or sixteen or seventeen or eighteen or nineteen)) or (year* adj3 ("13" or "14" or "15" or "16" or "17" or thirteen or fourteen or fifteen or sixteen or seventeen or eighteen or nineteen) adj3 old) or adolescence or adolescent or juvenile* or teen* or youth*).ab,kf,kw,ti.)	
11	("school age*" or (age? adj3 ("4" or "5" or "6" or "7" or "8" or "9" or "10" or "11" or "12" or four or five or six or seven or eight or nine or ten or eleven or twelve)) or (year* adj3 ("4" or "5" or "6" or "7" or "8" or "9" or "10" or "11" or "12" or four or five or six or seven or eight or nine or ten or eleven or twelve) adj3 old) or boy or boys or child or schoolchild* or children or childhood or girl or girls or kid or kids or preteen*).kf,kw,ti. not medline.st.	88330
12	(toddler* or infant* or newborn* or new–born* or baby or babies or neonat* or (age? adj3 ("1" or "2" or "3" or one or two or three)) or (year* adj3 ("1" or "2" or "3" or one or two or three) adj3 old) or (month* adj3 ("1" or "2" or "3" or "4" or "5" or "6" or "7" or "8" or "9" or "10" or "11" or "12" or "18" or "24" or "30" or "36") adj3 old)).kf,kw,ti. not medline.st.	36992
13	(adolescent* or (age? adj3 ("13" or "14" or "15" or "16" or "17" or "18" or "19" or thirteen or fourteen or fifteen or sixteen or seventeen or eighteen or nineteen)) or (year* adj3 ("13" or "14" or "15" or "16" or "17" or thirteen or fourteen or fifteen or sixteen or seventeen or eighteen or nineteen) adj3 old) or adolescence or adolescent or juvenile* or teen* or youth*).kf,kw,ti. not medline.st.	40935
14	or/10–13	2044732
15	Schools/ or Students/ or School Teachers/ or Child Day Care Centers/ or Child Care/ or Infant Care/ or Nurseries, Infant/ or Schools, Nursery/ or ((school* or class or classes or classroom* or preschool* or "primary school*" or daycare or "day care" or childcare or "early learning" or (education* adj3 (setting* or institution*)) or kindergarten* or teacher* or instructor* or student* or pupil or pupils).kf,kw,ti. not medline.st.)	157627
16	("grade* 1" or "grade* one" or "first grade*" or "1st grade*" or "grade* 2" or "grade* two" or "second grade*" or "2nd grade*" or "grade* 3" or "grade* three" or "third grade*" or "3rd grade*" or "grade* 4" or "grade* four*" or "fourth grade*" or "4th grade*" or "grade* 5" or "grade* five*" or "fifth grade*" or "5th grade*" or "grade* 6" or "grade* six*" or "sixth grade*" or "6th grade*" or "grade* 7" or "grade* seven" or "seventh grade*" or "7th grade*" or "grade* 8" or "grade* eight" or "eighth grade*" or "8th grade*" or "grade* 9" or "grade* nine" or "ninth grade*" or "9th grade*" or "grade* 10" or "grade* ten" or "tenth grade*" or "10th grade*" or "grade* 11" or "grade* eleven" or "eleventh grade*" or "11th grade*" or "grade* 12" or "grade* twelve" or "twelfth grade*" or "12th grade*" or "high school*" or "secondary school*" or "middle school*" or "grade school*" or "primary school*" or pre–school* or preschool* or "nursery school*" or "elementary school*" or "public school*" or "private school*" or montessori or kindergarten* or "school age*").kf,kw,ti. not medline.st.	8150
17	((school or schools) adj2 (open* or reopen* or "re–open*" or restart* or "re–start*" or resume* or resuming or "re–establish*" or reestablish* or "re–instat*" or reinstat* or return* or restor* or "go* back" or closur* or close* or closing or suspend* or suspension* or "stay* home" or shutdown* or "shut down*" or "back to?" or recover*)).kf,kw,ti. not medline.st.	165

#	Searches	Results
18	or/15–17	158106
19	Disease Transmission, Infectious/ or infectious disease incubation period/ or Virus Shedding/ or Carrier State/ or Disease Susceptibility/ or asymptomatic infections/ or Infections/tm or tm.fs. or (transmi* or spread* or infectivity or (infect* adj3 route*) or excret* or shed* or carrier* or asymptomatic or resist or resistance or resilienc* or resilient or susceptible or susceptibility).kf,kw,ti. or (transmi* or spread* or infectivity or (infect* adj3 route*) or excret* or shed* or carrier* or asymptomatic or resist or resistance or resilienc* or resilient or susceptible or susceptibility).ab. /freq=2	1197690
20	Bodily Secretions/ or Body Fluids/ or Sneezing/ or Cough/ or Fever/ or ((droplet* or ((body or bodies or lung* or mouth* or nose*) adj3 (fluid* or secretion* or secrete or discharge*)) or cough* or sneez* or fever*).kf,kw,ti. not medline.st.)	107196
21	Feces/ or Diarrhea/ or exp Gastrointestinal Diseases/ or ((fecal or faecal or feces or stool or stools or diarrhea or diarrhoea or enterocolitis or gastrointestin* or gastroenter*).kf,kw,ti. not medline.st.)	1076713
22	Patient Acuity/ or "severity of illness index"/ or convalescence/ or critical illness/ or disease progression/ or sepsis/ or mortality/ or morbidity/ or fatal outcome/ or hospital mortality/ or infant mortality/ or Infant Death/ or Infant, Newborn, Diseases/ or child mortality/ or mortality, premature/ or Neutropenia/ or Febrile Neutropenia/ or survival rate/ or Hospitalization/ or Hospitals, Pediatric/ or Intensive Care Units, Pediatric/ or Child, Hospitalized/ or Adolescent, Hospitalized/ or incidence/ or prevalence/ or Risk Assessment/ or risk factors/ or Protective Factors/ or Age Factors/ or Age Distribution/ or Sex Factors/ or Socioeconomic Factors/ or Coinfection/ or Immunosuppression/ or Diabetes Mellitus, Type 1/ or Pediatric Obesity/ or Overweight/ or Body Mass Index/ or Systemic Inflammatory Response Syndrome/ or Mucocutaneous Lymph Node Syndrome/ or Lung Diseases/ or Respiratory Tract Diseases/ or Respiration Disorders/ or ((risk factor* or incidence* or prevalence* or morbidity or mortality or death* or hospitaliz* or hospitalis* or (hospital* adj2 (admit* or admission* or stay*)) or co–infect* or coinfect* or (risk* adj2 (increas* or decreas* or high* or low* or more or less or rais* or lower*))).ti,kf,kw. not medline.st.)	3085440
23	Communicable Disease Control/ or Communicable Diseases/pc, tm or Community–Acquired Infections/pc, tm or Cross Infection/pc, tm or Disease Outbreaks/pc, tm or Decontamination/ or Disinfection/ or Hand Hygiene/ or Hand Disinfection/ or Fomites/ or Disease Reservoirs/ or Infection Control/ or Inhalation Exposure/ or Infections/pc, tm or Masks/ or Sterilization/ or Social Distance/ or Crowding/ or Universal Precautions/ or Aerosols/ or Air Microbiology/ or Exhalation/tm or Ventilation/ or Filtration/ or ((transmi* or "bio foul*" or "cross infect*" or (infect* adj3 route*) or biofoul* or cluster* or communicability or epidemic* or excret* or infectivity or outbreak* or reinfect* or "re infect*" or shed* or spread* or droplet* or ((body or bodies or lung* or mouth* or nose*) adj3 (fluid* or secretion* or secrete or discharge*)) or cough* or sneez* or ((room* or classroom* or school* or HVAC or vent or vents or "ventilation system*" or duct*) adj3 circulat*) or ((new* or increas* or decreas* or up or down or rise* or rising or fall* or higher* or lower*) adj5 cases) or ((infect* or disease*) adj3 (prevent* or control*)) or fomite* or cleaning or contaminat* or decontaminat* or disinfect* or ((hand or hands) adj3 (hygiene or wash* or clean* or disinfect* or rub* or scrub*)) or handwash* or hygiene or IPAC or reservoir* or sanitis* or sanitiz* or sterilis* or steriliz* or "universal precautions").kf,kw,ti. not medline.st.)	302024

#	Searches	Results
24	or/19–23	5260799
25	(14 or 18) and 24	717691
26	9 and 25	1165
27	26 not (exp Animals/ not Humans/)	1165
28	27 not (comment or editorial or letter or news or case reports).pt.	854
29	28 not (case report or case study).ti.	850
30	limit 29 to yr="2020 –Current"	829
31	limit 30 to English	791
32	(meta analysis or "review" or systematic review).pt. or review.ti. or ("meta–analy*" or metaanaly* or "meta analy*" or metanaly* or "systematic review*").ti,ab,kw,kf.	2989735
33	29 and 32	204
34	limit 33 to English	195
35	31 or 34	792
36	31 not 34	597

Appendix B. Characteristics of 48 studies included in umbrella review*

First author[reference] 2020 end date for search	Number of studies included Total patients	Patient age Gender (male [%])	Types of studies included	Synthesis methodology Analyses	Number of databases searched	Assessment of methodological quality (Y/N)	Overall quality score (AMSTAR)
Akobeng[1] Apr 1	9 280	Range: 0–19 y Not reported	Case series	Meta-analysis Pooled prevalence % (95% CI)	4	No	Moderate
Azadbakht[2] Mar 27	3 29	Range: 0–15 y Not reported	Not reported	Raw prevalence % with some pooled non-weighted prevalence % without 95% CI	5	No	Critically low
Chang[3] Mar 15	7 93	Range: 10 m–17 y Male: 52%	Case series	Meta-analysis Pooled prevalence % (95% CIs), random effects	2 (+2 additional non-database sources)	No	Critically low
Chen[4] Aug 28	7 Not reported	Range: 0–7 y Male: not reported	Cross-sectional studies	Meta-analysis Pooled prevalence % (95% CIs), odds ratios	1 (+6 non-database sources)	Yes	Moderate
Cui[5] Submitted Apr 23	24 2,597	Range: 0–18 y Male: 56.6%	Case reports, case series	Raw prevalence %	Not reported	No	Critically low
Cui[6] Apr 30	48 5,829	Range: 0–18 y Male: 55%	Case reports, case series	Meta-analysis Pooled prevalence % (95% CI)	4	No	Low

First author[reference] 2020 end date for search	Number of studies included Total patients	Patient age Gender (male [%])	Types of studies included	Synthesis methodology Analyses	Number of databases searched	Assessment of methodological quality (Y/N)	Overall quality score (AMSTAR)
De Bernardo[7] Apr 27	18 25	Mean (SE): 8.2 ± 8.5 d Male: 74%	Case series	Raw prevalence %	1	No	Critically low
De Souza[8] Apr 7	38 1,124	Range: 0–17 y Male: 57.4%	Case report, case series, retrospective	Raw prevalence %	1	No	Critically low
Dhir[9] Jun 9	32 58	Range: 0–29 d Not reported	Case report, case series	Raw prevalence %	3	No	Critically low
Ding[10] Apr 1	33 371	Mean: 5.5 y (95% CI: 4.2–6.8) Male: 54.8% (95% CI: 47.2–62.2)	Cross-sectional, case series	Meta-analysis Pooled prevalence % (95% CIs), random effects	4	Yes	Critically low
Escosa-Garcia[11] Apr 20	Not reported Not reported	Age for inclusion: ≤19 y Not reported	Not reported	Meta-analysis Pooled prevalence % (95% CIs)	1	No	Critically low
Gholami[12] Mar 22	14 2,579	were in their childhood and adolescence Male: 56.9%	Not reported	Meta-analysis Pooled prevalence % (95% CIs)	6	No	Critically low
Gordon[13] May 12	8 11	Age for inclusion: ≤28 d Not reported	Case series, case report	Qualitative review	3	Yes	Critically low

First author[reference] 2020 end date for search	Number of studies included Total patients	Patient age Gender (male [%])	Types of studies included	Synthesis methodology Analyses	Number of databases searched	Assessment of methodological quality (Y/N)	Overall quality score (AMSTAR)
He[14] May 20	11 1,152	Not reported Not reported	Case reports, case series	Meta-analysis Pooled prevalence % (95% CIs)	2	No	Critically low
Henry[15] May 1	24 624	Range: 0–17.5 y Male: 57%	Case series, case reports, observational studies	Meta-analysis Pooled prevalence % (95% CIs) for mild cases Raw prevalence % for severe cases	4	No	Critically low
Hoang[16] May 24	131 7,780	Mean (SD): 8.9 ± 0.5 y Male: 55.6%	Cross-sectional, case series, case report	Raw prevalence %	2 (+3 additional non-database sources)	Yes	Moderate
Jutzeler[17] Mar 28	22 1,056	Mean: 10.0 y (IQR: 2.0–13.0) Male: 57%	Case reports, case series	Meta-analysis Pooled prevalence % (95% CIs)	4	Yes	Critically low
Katal[18] Jun 20	39 850	6 articles not reported on age, in others it ranges 0–16 y Not Reported	Case report, case series	Meta-analysis Raw prevalence %	4	Yes	Moderate
Kumar[19] May 20	46 908	Range: 0–18 y Not reported	Case series, case report	Meta-analysis	3	No	Critically low

First author[reference] 2020 end date for search	Number of studies included Total patients	Patient age Gender (male [%])	Types of studies included	Synthesis methodology Analyses	Number of databases searched	Assessment of methodological quality (Y/N)	Overall quality score (AMSTAR)
				Pooled prevalence % (95% CIs), random effects			
Liguoro[20] May 1	49 1,780	Not reported Not reported	Case reports, case series, cohort	Pooled prevalence % (95% CIs)	1	No	Critically low
Liu[21] May 10	29 4,300	Mean: 7.0 y (95% CI: 5.1–9.1) Male: 53.6% (95% CI: 49.4–57.7)	Case series, cross-sectional, cohort	Meta-analysis Pooled prevalence % (95% CIs)	5	Yes	Low
Ho[22] Mar 16	8 820	Mean: 7 y (range: 1 d–17 y) Male: 56.8%	Case series	Raw prevalence %	2 (+1 non-database source)	No	Critically low
Ma[23] Apr 21	15 486	Not reported Male: 45%	Case reports, case series	Meta-analysis Pooled prevalence % (95% CIs)	3	Yes	Critically low
Mantovani[24] Apr 11	19 2,855	Mean (SE): 6.9 ± 7.0 y Male: 50.3%	Not reported	Meta-analysis Pooled prevalence % (95% CIs)	3	No	Critically low
Mark [25] Jun 15	38 63	Range: 5 d–3 m Male: 69%	Cohort, case series, case report	Raw prevalence %	2	Yes	Low

First author[reference] 2020 end date for search	Number of studies included Total patients	Patient age Gender (male [%])	Types of studies included	Synthesis methodology Analyses	Number of databases searched	Assessment of methodological quality (Y/N)	Overall quality score (AMSTAR)
Meena[26] May 10	27 4,857	Mean (SD): 6.4 ± 3.4 y (range: 0–19) Male: 57%	Cohort, cross-sectional, case-control, case series	Meta-analysis Pooled prevalence % (95% CIs)	4	Yes	Low
Mustafa[27] Apr 2	11 250	Median: 6.5 y (range: 0–12) Male: 59% (95% CI: 53–65)	Not reported	Meta-analysis Pooled prevalence % (95% CIs)	2	No	Critically low
Nino[28] Jul 11	29 1,026	Mean/median: 6.6 y (range: 1.5–14.5) Male: 54.2%	Case series	Meta-analysis Pooled prevalence % (95% CIs)	1	Yes	Critically low
Panda[29] Jul 12	31 3,712	Range: 0–18 y Not reported	Case reports, case series, case control	Meta-analysis Pooled prevalence (95% CIs)	6	Yes	Critically low
Patel[30] Apr 16	10 2,914	Mean: 7.9 y (range: 0–17) Male: 56.4%	Case series, retrospective chart reviews	Raw prevalence %	2	No	Critically low
Raba[31] Apr 7	18 160	Mean: 5.9 m (range 1 d–12 m) Male: 41%	Cohort, cross-sectional, case series, case report	Raw prevalence %	5	No	Critically low

First author[reference] 2020 end date for search	Number of studies included Total patients	Patient age Gender (male [%])	Types of studies included	Synthesis methodology Analyses	Number of databases searched	Assessment of methodological quality (Y/N)	Overall quality score (AMSTAR)
Rokkas[32] Apr 20	3 222	Not reported Not reported	Case series	Meta-analysis Pooled prevalence % (95% CIs)	3	Yes	Critically low
Santos[33] Apr 19	4 36	Range: 56–91 m Male: 41.7%	Case series	Meta-analysis Risk ratio mean difference with 95% CI for persistence of viral shedding and duration of viral shedding respectively Raw prevalence % for symptoms	7	Yes	Critically low
Shelmerdine[34] Mar 17	22 431	Range: 36 h–17 y Male: 55.9%	Case series, case report	Raw prevalence %	2 (+1 non-database source)	Yes	Low
Trevisanuto[35] May 12	26 44	Range: 0–3 m Male: 58%	Case reports, case series	Raw prevalence %	6	No	Low
Trippella[36] Apr 18	37 248	Range: 0–3 m Not reported	Case reports, case series	Raw prevalence %	4	Yes	Moderate
Viner[37] Jul 2	14 Not reported for children	Range: 0–19 y Not reported	Contact tracing studies	Meta-analysis Pooled odds ratio (95% CI)	2	Yes	Moderate

First author[reference] 2020 end date for search	Number of studies included Total patients	Patient age Gender (male [%])	Types of studies included	Synthesis methodology Analyses	Number of databases searched	Assessment of methodological quality (Y/N)	Overall quality score (AMSTAR)
Wang, Zhou[38] Mar 31	49 1,667	Age for inclusion: <18 y Male: 57.3%	Cohort, case series, case report	Meta-analysis Pooled prevalence % (95% CIs), random effects	6 (+10 non-database sources)	Yes	Critically low
Wang, Mo[39] Aug 10	37 1,747	Not reported Not reported	Not reported	Meta-analysis Pooled prevalence % (95% CIs), random effects	1 (+6 non-database sources)	Yes	Critically low
Weiss[40] Apr 23	5 26	Not reported Not reported	Case series	Meta-analysis Pooled mean (95% CIs)	2	Yes	Moderate
Williams[41] May 31	28 5,686 Focused on 108 cases requiring mechanical ventilation and/or died, 48 had medical history to assess comorbidity	Range: 0–18 y Not reported	Not reported	Quantitative data synthesis without meta-analysis Pooled prevalence %	1	No	Critically low

First author[reference] 2020 end date for search	Number of studies included Total patients	Patient age Gender (male [%])	Types of studies included	Synthesis methodology Analyses	Number of databases searched	Assessment of methodological quality (Y/N)	Overall quality score (AMSTAR)
Xu[42] May 8	17 69	Range: 0–15 y Male: 44.8%	Case series, case report	Raw prevalence %	2 (+1 non-database sources)	Yes	Critically low
Yasuhara[43] Jun 20	46 114	Range: 0–17 y Male: 46.7%	Case reports, case series	Raw prevalence %	2	No	Critically low
Yoon[44] Submitted Aug 8	43 158	Range: 0–18 y Male: 54%	Case reports, case series	Raw prevalence %	4	No	Critically low
Zhang[45] May 4	46 551	Range: 0–17.5 y Male: 57% (95% CI: 53-62)	Case series, case report	Meta-analysis Pooled prevalence % (95% CIs), random effects	3 (+1 non-database source)	Yes	Low
Yang[46] Apr 3	37 406	Median: 7 y (range: 0–16) Male: 53.9%	Not reported	Raw prevalence %	4+	No	Critically low
Zheng[47] Apr 5–11	14 410	Mean (SE): 5.3 ± 2.4 y Male: 56.6%	Case reports, case series, research	Meta-analysis Pooled prevalence % (95% CIs)	4	No	Critically low
Zimmerman[48] Mar 27	11 333	Range: 0–16 y Male: 55%	Case series	Raw prevalence %	Not reported	No	Critically low

*Infants only

**y, year; d, day; m, month; h, hour; SE, standard error; SD, standard deviation

Table 2. Summary of systematic reviews reporting COVID-19 prevalence by pediatric age group

First author[reference] 2020 end date for search	Number of studies included Total patients	Patient age group (years)	Pooled prevalence by age group, % (95% CI, if applicable)
Wang, Zhou[38] Mar 31	49 1,667	<1 1–17	18 82
Ding[10] Apr 1	Varied by age group (10–11) Varied by age group (295–326)	<1 1–5 6–17	9.0 (2.4–[1.8]) 35.3 (20.0–54.3) 60.1 (53.7–66.4)
Yang[46] Apr 3	37 406	<1 1–5 6–10 11–16 Unknown	16.5 18.7 23.2 16.3 25.4
Cui[5] Submitted Apr 23	24 2,492	<1 1–5 6–10 11–15 16–upper limit not defined	17.9 23.8 25.1 19.7 13.4
Cui[6] Apr 30	Varied by age group (20–28) Varied by age group (5,194–5,343)	<1 1–5 6–10 11–15 16–17	17 (15–18) 24 (19–29) 25 (19–31) 20 (16–24) 18 (8–28)
Liu[21] May 10	Varied by age group (21–24) Varied by age group (3,791–4,176)	<1 1–4 5–9 10–14 15–19	12.0 (6.3–18.8) 14.9 (10.5–19.6) 23.2 (17.7–29.0) 23.1 (21.6–24.6) 5.8 (0.9–13.3)
Yasuhara[43]	46	<1	25.4

First author[reference] 2020 end date for search	Number of studies included Total patients	Patient age group (years)	Pooled prevalence by age group, % (95% CI, if applicable)
Jun 20	114	1–10	53.5
		10–17	21.0
Yoon[44]	43	<10	74.4
Submitted Aug 8	156	10–17	25.6

Table 3. Summary of systematic reviews reporting on clinical manifestations of COVID-19 in children (0–19 years old)*

First author[reference] 2020 end date for search	Number of studies included Total patients	Patient age (years) Gender (male [%])	Pooled prevalence by clinical manifestation (as reported by authors), % (95% CI, if applicable)
Chang[3] Mar 15	7 93	Range: 0–17 Male: 52	Fever: 59 (41–72) Cough: 46 (27–66) Gastrointestinal symptoms: 12 (6–32)
Ho[22] Mar 18	7 89	Mean: 7.3 Male: 56.8	Fever: 53.9 Cough: 39.3 Rhinorrhea/nasal congestion: 13.5 Sore throat: 9.0 Diarrhea: 7.9 Fatigue: 4.5 Headache or dizziness: 3.4
Gholami[12] Mar 22	14 2,579	Not reported Male: 56.9	Fever: 55 (40–70) Cough: 41 (27–56) Tachypnea: 34 (1–67) Vomiting: 10 (0–20) Nasal discharge: 9 (5–12) Fatigue: 6 (4–9) Diarrhea: 5 (2–8) Sore throat: 5 (1–10)
Zimmermann[48] Mar 27	Varied by manifestation (2–11) Varied by manifestation (44–333)	Range: 0–16 Male: 55	Cough: 48 (range: 19–100) Fever: 42 (range: 11–100) Pharyngitis: 30 (range: 0–100) Tachypnea: range 0–100 Nasal congestion: range 0–30 Rhinorrhea range 0–20 Wheezing: range 0–33 Diarrhea: range 0–38 Vomiting: range 0–67 Headache: range 8–13

First author[reference] 2020 end date for search	Number of studies included Total patients	Patient age (years) Gender (male [%])	Pooled prevalence by clinical manifestation (as reported by authors), % (95% CI, if applicable)
			Fatigue: range 5–13
Jutzeler[17] Mar 28	Varied by manifestation (2–22) Varied by manifestation (21–320)	Mean: 10.0 (95% CI: 2.0–13.0) Male: 57	Fever: 67.5 (51.6–80.2) Cough: 51.3 (35.1–67.3) Sputum: 36.5 (11.2–72.2) Nausea: 29.1 (6.6–70.6) Vomiting: 23.7 (2.7–77.7) Diarrhea: 18.7 (8.9–35.2) Dyspnea: 14.3 (4.7–36.1) Rhinorrhea: 10.7 (3.4–29.1) Headache: 10.3 (3.9–24.3) Fatigue: 8.5 (5.6–12.8) Nasal congestion: 6.6 (3.9–11.0)
Wang, Zhou[38] Mar 31	Varied by manifestation (4–22) Varied by manifestation (203–890)	Range: 0–18 Male: 57.3	Fever: 48 (39–56) Cough: 39 (30–48) Fever and cough: 30 (18–42) Sputum: 19 (0–44) Rhinorrhea: 9 (6–12) Dyspnea/shortness of breath: 9 (0–19) Myalgia or fatigue: 8 (5–12) Diarrhea: 7 (5–9) Nausea or vomiting: 6 (4–9) Nasal obstruction: 6 (3–9) Sore throat: 6 (2–10) Headache: 4 (1–6)
Akobeng[1] Apr 1	9 280	Range: 0–16 Male: 62	Any gastrointestinal symptoms: 22.8 (12.7–37.6) Diarrhea: 12.4 (7.8–19.2) Vomiting: 10.3 (4.9–20.3) Abdominal pain: 5.4 (2.2–12.7)
Ding[10]	14	Mean: 5.5 (95% CI: 4.2–6.8)	Fever: 51.2 (40.2–62.2)

First author[reference] 2020 end date for search	Number of studies included Total patients	Patient age (years) Gender (male [%])	Pooled prevalence by clinical manifestation (as reported by authors), % (95% CI, if applicable)
Apr 1	Varied by manifestation (367–369)	Male: 54.8 (95% CI: 47.2–62.2)	Cough: 37.0 (25.9–48.8) Nasal congestion/rhinorrhea: 9.9 (3.6–18.1) Pharyngeal congestion/pharyngeal erythema/sore throat: 8.3 (0.4–21.5) Vomiting/diarrhea/abdominal pain: 7.4 (3.4–12.3) Headache/fatigue: 3.3 (1.0–6.4) Dyspnea/tachypnea: 1.0 (0.0–7.9)
Mustafa[27] Apr 2	11 251	Median: 6.5 (range: 0–12) Male: 59 (95% CI: 53–65)	Cough: 49 (42–55) Fever: 47 (41–53) Sore throat: 36 (30–42) Vomiting or diarrhea: 17 (12–21) Rhinorrhea: 9 (5–12) Note: sneezing and fatigue were reported but prevalence not presented
Yang[46] Apr 3	37 406	Median: 7 (range: 0–16) Male: 53.9	Fever: 50.7 Cough: 42.4 Pharyngeal erythema: 31.5 Shortness of breath: 14.0 Rhinorrhea: 5.7 Diarrhea: 5.4 Vomiting: 5.4 Sputum: 3.0 Note: poor mental health, poor appetite, fatigue and myalgia were reported but prevalence not presented
De Souza[8] Apr 7	33 393	Range: 0–17 Male: 57.4	Fever: 47.5 Cough: 41.5 Pharyngeal erythema: 20.6 Tachycardia on admission: 18.6 Nasal symptoms: 11.2 Diarrhea: 8.1

First author[reference] 2020 end date for search	Number of studies included Total patients	Patient age (years) Gender (male [%])	Pooled prevalence by clinical manifestation (as reported by authors), % (95% CI, if applicable)
			Nausea/vomiting: 7.1 Fatigue: 5.0 Sore throat: 2.5 Sputum: 1.5 Hypoxemia: 1.3 Abdominal pain: 0.5 Cyanosis: 0.5 Sneezing: 0.5 Lymphadenopathy: 0.2
Zheng[47] Apr 5–11	14 410 (all patients)	Mean (SE): 5.3 ± 2.4 Male: 56.7	Fever: 48.7 (36.8–60.6) Cough: 35.1 (23.6–46.6) Sore throat: 12.2 (4.0–20.5) Diarrhea/vomiting: 11.3 (4.8–17.8)
Patel[30] Apr 16	Varied by manifestation (1–10) Varied by manifestation (202–633)	Mean: 7.9 (range: 0–17) Male: 56.4	Cough: 48.1 (range: 11.1–100) Fever: 46.8 (range: 26.8–100) Sore throat/pharyngitis: 28.6 (range: 8.3–46.2) Headache: 24.3 (range: 8.3–27.8) Myalgia: 22.7 (range: 10.4–22.7) Shortness of breath/tachypnea/respiratory distress: 15.7 (range: 0–50) Rhinorrhea/sneezing/nasal congestion: 13.7 (range: 6.5–40.0) Diarrhea: 10.1 (range: 0–22.2) Fatigue: 7.9 (range: 2.5–9.7) Vomiting/nausea: 7.8 (range: 0–10) Abdominal pain: 6.0 (range: 3–8)
Mantovani[24] Apr 11	Varied by manifestation (13–18) Varied by manifestation (576–709)	Mean (SE): 6.9 ± 7.0 Male: 50.3	Fever: 47 (22–72) Cough: 37 (15–63) Diarrhea: 4 (0–12) Nasal congestion: 2 (0–7) Dyspnea: 1 (0–7)

First author[reference] 2020 end date for search	Number of studies included Total patients	Patient age (years) Gender (male [%])	Pooled prevalence by clinical manifestation (as reported by authors), % (95% CI, if applicable)
			Abdominal pain: 0 (0–1)
Santos[33] Apr 19	Varied by manifestation (2–4) Varied by manifestation (20–36)	Range: 56–91 months Male: 41.7	Fever: 58.3 Cough: 46.7
Escosa-Garcia[11] Apr 20	Varied by manifestation (16–22) Varied by manifestation (996–1,102)	Range: 0–18 Not reported	Fever: 58.3 (55.4–61.2) Cough: 47.3 (44.3–50.2) Sore throat: 18.3 (16.0–20.7) Rhinorrhea: 15.9 (13.7–18.2) Gastrointestinal: 12.7 (10.8–14.8)
Rokkas[32] Apr 20	3 222	Not reported Not reported	Any gastrointestinal symptoms: 9.6 (6.3–14.3) Diarrhea: 9.6 (6.3–14.3) Diarrhea/vomiting: 6.8 (4.2–11.0)
Ma[23] Apr 21	Varied by manifestation (4–12) Varied by manifestation (230–468)	Range: 0–18 Not reported	Fever: 46 (36–56) Cough: 42 (29–57) Nasal congestion: 12 (6–23) Diarrhea: 10 (7–14) Vomiting: 8 (5–11) Fatigue: 8 (5–12)
Cui[5] Submitted Apr 23	23 452	Range: 0–18 Not reported	Cough: 43.4 Fever: 43.1 Sore throat: 20.4 Tachycardia: 16.8 Rhinorrhea: 16.4 Nasal congestion: 15.3 Tachypnea/shortness of breath: 12.6 Diarrhea: 6.6 Vomiting: 5.8 Myalgia or fatigue: 5.1

First author[reference] 2020 end date for search	Number of studies included Total patients	Patient age (years) Gender (male [%])	Pooled prevalence by clinical manifestation (as reported by authors), % (95% CI, if applicable)
			Hypoxemia: 1.8 Chest pain: 0.4%
Cui[6] Apr 30	Varied by manifestation (29–48) Varied by manifestation (623–1,494)	Range: 0–18 Male: 55 (95% CI: 53–58)	Fever: 51 (45–57) Cough: 41 (35–47) Nasal congestion: 17 (6–27) Sore throat: 16 (7–25) Rhinorrhea: 14 (8–19) Myalgia or fatigue: 12 (7–17) Tachycardia: 12 (3–21) Tachypnea: 9 (4–14) Diarrhea: 8 (6–11) Vomiting: 7 (5–10) Hypoxemia: 3 (1–4) Chest pain: 3 (0–5)
Liguoro[20] May 1	49 1,016	Range: 0–18 Not reported	Fever: 51.6 Cough: 47.3 Sore throat: 17.9 Fatigue: 10.6 Diarrhea: 9.7 Runny nose: 7.7 Dyspnea: 7.7 Vomiting: 7.2
Zhang[45] May 4	Varied by manifestation (10–45) Varied by manifestation (390–551)	Range: 0–17.5 Male: 57 (95% CI: 53–62)	Fever: 53 (45–61) Cough: 39 (30–47) Sore throat/pharyngeal erythema: 14 (4–28) Diarrhea: 8 (3–14) Tachypnea/dyspnea: 8 (2–15) Rhinorrhea/stuffy nose/sneezing: 7 (3–14) Fatigue/weakness: 5 (0–13) Headache: 3 (0–12)

First author[reference] 2020 end date for search	Number of studies included Total patients	Patient age (years) Gender (male [%])	Pooled prevalence by clinical manifestation (as reported by authors), % (95% CI, if applicable)
			Vomiting: 2 (0–5)
Xu[42] May 8	17 69	Mean: 6 (range: 0–15) Male: 44.8	Fever: 56.5 Cough: 31.9 Diarrhea/nausea/vomiting/constipation/loss of appetite: 17.4 Nasal congestion/rhinorrhea/sneezing: 15.9 Sore throat: 14.5 Headache/malaise/myalgia/fatigue/crying/wakefulness: 5.8
Meena[26] May 10	Varied by manifestation (6–23) Varied by manifestation (405–1,330)	Mean (SD): 6.4 ± 3.4 Male: 57	Fever: 49 (41–58) Cough: 45 (39–51) Coryza: 20 (13–26) Sore throat: 14 (7–21) Tachypnea: 11 (6–17) Myalgia: 10 (1–18) Headache: 10 (1–19) Diarrhea: 9 (6–13) Vomiting: 6 (4–9) Abdominal pain: 4 (1–6) Hypoxia: 2 (1–3)
Liu[21] May 10	Varied by manifestation (17–29) Varied by manifestation (270–2,017)	Mean: 7.0 (95% CI: 5.1–9.1) Male: 53.6 (95% CI: 49.4–57.7)	Fever: 52.7 (44.3–62.0) Cough: 41.9 (35.7–48.1) Pharyngeal erythema: 6.0 (0.0–19.1) Sore throat: 5.0 (0.6–11.8) Diarrhea: 4.2 (1.8–7.3) Vomiting: 3.5 (2.1–5.1) Rhinorrhea: 3.5 (0.1–9.8) Fatigue/myalgia: 2.7 (0.3–6.4) Tachypnea/dyspnea: 2.5 (1.6–4.8) Sputum: 1.4 (0.0–4.1) Stuffy nose: 1.0 (0.1–2.5)

First author[reference] 2020 end date for search	Number of studies included Total patients	Patient age (years) Gender (male [%])	Pooled prevalence by clinical manifestation (as reported by authors), % (95% CI, if applicable)
Hoang[16] May 24	119 2,445	Mean (SD): 8.9 ± 0.5 Male: 55.6	Fever: 59.1 Cough: 55.9 Rhinorrhea/nasal congestion: 20.0 Myalgia/fatigue: 18.7 Sore throat: 18.2 Dyspnea/shortness of breath: 11.7 Abdominal pain/diarrhea: 6.5 Vomiting/nausea: 5.4 Headache/dizziness: 4.3 Pharyngeal erythema: 3.3 Decreased oral intake: 1.7 Rash: 0.25
Yasuhara[43] Jun 20	46 112	Mean: 6.0 (95% CI: 1.0–10.0) Male: 46.7	Fever: 64.2 Cough: 34.8 Rhinorrhea: 16.1 Diarrhea: 13.4 Dyspnea: 10.7 Rash: 10.7 Sore throat: 8.9 Shock: 8.9 Conjunctivitis: 8.0 Swelling of extremities: 8.0 Vomiting: 6.3 Oral mucosal changes: 6.3 Headache: 4.5 Sputum: 2.7 Cervical lymphadenopathy: 2.7
Panda[29] Jul 12	Varied by manifestation (5–11) Not reported	Not reported Not reported	<u>Mild infection:</u> Fatigue/myalgia: 14.3 (13.1–15.6) Headache: 3.7 (3.1–4.4)

First author[reference] 2020 end date for search	Number of studies included Total patients	Patient age (years) Gender (male [%])	Pooled prevalence by clinical manifestation (as reported by authors), % (95% CI, if applicable)
	Varied by manifestation (198–3,129)		Severe infection: Encephalopathy: 12.6 (8.7–17.9) Seizure: 3.1 (1.8–5.4)
Yoon[44] Submitted Aug 8	43 150	Mean (SE): 5.5 ± 5.08 Male: 54	Fever: 49.7 Respiratory symptoms (cough, tachypnea, pharyngeal congestion): 47.1 Gastrointestinal symptoms (vomiting, diarrhea): 17.2 Note (symptoms included but prevalence not reported): malaise, convulsions, arthralgia, headache, chest pain, fatigue, skin rash, feeding difficulty, decreased oral intake, drowsiness and myalgia

*CI, confidence interval; SE, standard error; SD, standard deviation

Table 4. Summary of systematic reviews reporting on clinical manifestations of COVID-19 in infants (less than 1 year)*

First author[reference] 2020 end date for search	Number of studies included Total patients	Patient age Gender (male [%])	Pooled prevalence by clinical manifestation (as reported by authors), % (95% CI, if applicable)
De Bernardo7 Apr 27	18 25	Mean (SE): 8.2 ± 8.5 days Male: 74	Fever: 28 Vomiting: 16 Cough or shortness of breath: 12 Diarrhea/lethargy/respiratory difficulty: 8 Cyanosis/difficulty feeding/hyperpnea/mild intercostal retractions/mottling/sneezing/stuffy nose/paroxysmal episodes: 4
Raba31 Apr 7	18 160	Mean: 5.9 months (range: 0–12) Male: 41	Fever: 54 Cough: 33 Rhinorrhea: 23 Gastrointestinal symptoms: 16 Dyspnea: 3
Trippella36 Apr 18	37 16	Range: 0–27 days Not reported	Fever: 56.3 Distress: 31.3 Feeding intolerance: 6.3 Mild respiratory symptoms: 6.3 Vomiting/diarrhea: 31.3 Cough: 12.5
Cui6 Apr 30	Varied by manifestation (6–11) Varied by manifestation (9–24)	Not reported Not reported	Fever: 53 (30–76) Nasal congestion: 50 (20–99) Tachypnea: 33 (20–57) Vomiting: 33 (18–67) Cough: 30 (2–58) Rhinorrhea: 21 (5–43)
Liguoro20 May 1	11 [12] 25	Range: 0–3 months Male: 74	Fever: 32.0 Cough: 8.0 Feeding intolerance: 24.0 Vomiting: 12.0

First author[reference] 2020 end date for search	Number of studies included Total patients	Patient age Gender (male [%])	Pooled prevalence by clinical manifestation (as reported by authors), % (95% CI, if applicable)
			Dyspnea: 40.0
Trevisanuto35 May 12	26 Varied by manifestation (34–35)	Range: 0–3 months Not reported	Fever: 50 Diarrhea and vomiting: 26 Cough: 20 Hypoxia: 20 Tachycardia: 9 Shortness of breath: 9 Rhinorrhea: 6 Seizures: 3
Dhir9 Jun 9	32 58	Range: 0–29 days Not reported	Respiratory symptoms (e.g., respiratory distress, desaturation, cough, hypoxia): 41.4 Fever: 15.5 Vomiting/diarrhea: 8.6 Lethargy: 5.2 Poor feeding: 5.2 Unknown: 22.4
Mark25 Jun 15	38 63	Range: 5 days to <3 months Male: 69	Fever: 73 Cough: 38 Rhinitis: 36 Respiratory distress: 26 Poor feeding: 24 Hypoxia: 14 Emesis: 14 Diarrhea: 14 Hypothermia: 5 Rash: 5 Hypotension: 3 Apnea: 3 Seizure: 3

First author[reference] 2020 end date for search	Number of studies included Total patients	Patient age Gender (male [%])	Pooled prevalence by clinical manifestation (as reported by authors), % (95% CI, if applicable)
Yasuhara43 Jun 20	16 29	Median: 2.0 months (IQR: 0.8–3.8) Male: 42.9	Fever: 59.3 Cough: 29.6 Rhinorrhea: 25.9 Diarrhea: 3.7 Dyspnea: 22.2 Rash: 3.7 Sore throat: 3.7 Shock: 3.7 Conjunctivitis: 3.7 Swelling of extremities: 3.7 Vomiting: 3.7 Oral mucosal changes: 3.7 Headache: 0.0 Sputum: 3.7 Cervical lymphadenopathy: 0.0

*SE, standard error; IQR, interquartile range; CI, confidence interval

Table 5. Summary of systematic reviews reporting on COVID-19 severity in children

First author[reference] 2020 end date for search	Number of studies included Total patients	Pooled prevalence by disease severity (as reported by authors), % (95% CI if applicable)**
Chang[3] Mar 15	7 93	Mild/moderate: 98 (asymptomatic: 26% of these cases) Critical: 2 Deaths: 0 reported
Ho[22] Mar 18	8 820	Asymptomatic: 14.3
Shelmerdine[34] Mar 17	22 431	Asymptomatic: 22.7
Gholami[12] Mar 22	14 2,579	Asymptomatic: 13 (5–20)
Jutzeler[17] Mar 28	27 1,055	Asymptomatic: 16.7 (8.5–28.6) Critical: 14.9 (6.1–32.2) Deaths: 0.32 (0.05–2.25)
Wang, Zhou[38] Mar 31	Varied by severity (17–19) Varied by severity (1,396–1,525)	Asymptomatic: 19 (14–23) Mild: 94 (90–98) Severe: 3 (2–4) Deaths: 2 reported
Akobeng[1] Apr 1	13 284	Asymptomatic: 9.9 Mild: 24.6 Moderate: 60.9 Severe: 4.6
Ding[10] Apr 1	Varied by severity (10–14) Varied by severity (296–371)	Asymptomatic (abnormal CT): 19.0 (7.4–33.5) Asymptomatic (normal CT): 17.4 (9.1–27.3) Mild/moderate: 66.7 (51.1–80.9) Severe/critical: 0.0 (0.0–1.0) Deaths: 2 reported
De Bernardo[7] Apr 27	18 25*	Asymptomatic: 16 Severe: 32

First author[reference] 2020 end date for search	Number of studies included Total patients	Pooled prevalence by disease severity (as reported by authors), % (95% CI if applicable)**
		Deaths: 0 reported
Mustafa[27] Apr 2	11 251	Critical: 4 (1–6) Deaths: case fatality rate = 0%
Yang[46] Apr 3	37 406	Asymptomatic: 19.0 Mild/moderate: 67.8 Severe: 11.6 Critical: 1.7 Deaths: 1 reported
De Souza[8] Apr 7	38 1,117	Asymptomatic: 14.2 Mild/moderate: 82.3 Severe: 2.1 Critical: 1.2 Deaths: 1 reported
Raba[31] Apr 7	18 160*	Asymptomatic: 16 Critical: 7 Deaths: 1 reported
Zheng[47] Apr 5–11	14 410	Asymptomatic: 40.5 (24.0–56.9)
Patel[30] Apr 16	Varied by manifestation (7–9) Varied by manifestation (342–2,843)	Asymptomatic: 14.9 (range: 0–53.3) Critical: 6.8 (range: 0–50) Deaths: 5 reported (0.18%)
Mantovani[24] Apr 11	Varied by manifestation (17–18) Varied by manifestation (2,544–2,564)	Mild: 79 (65–91) Critical: 4 (1–9)
Trippella[36] Apr 18	37 16*	Asymptomatic: 12.5
Escosa-Garcia[11] Apr 20	Varied by manifestation (20–22)	Mild/moderate: 33.3 (30.9–35.6) Severe/critical: 9.1 (7.2–11.3)

First author[reference] 2020 end date for search	Number of studies included Total patients	Pooled prevalence by disease severity (as reported by authors), % (95% CI if applicable)**
	Varied by manifestation (749–1,535)	
Ma[23] Apr 21	Varied by manifestation (3–7) Varied by manifestation (198–207)	Asymptomatic: 42 (27–59) Severe: 3 (1–6)
Cui[5] Submitted Apr 23	24 2,597	Asymptomatic: 7.6 Mild/moderate: 87 Severe: 4.4 Critical: 0.9 Deaths: 0.1
Cui[6] Apr 30	Varied by severity (40–42) Varied by severity (3,046–5,684)	Asymptomatic: 20 (14–26) Mild: 33 (23–43) Moderate: 51 (42–61) Severe: 7 (4–11) Critical: 5 (2–9) Deaths: 0 (0–0)
Cui[6] Apr 30	Not reported*	Asymptomatic: 6 (5–13) Mild: 54 (49–59) Moderate: 36 (27–45) Severe: 7 (4–11) Critical: 14 (13–34)
Liguoro[20] May 1	11 25*	Asymptomatic: 20.0 Mild: 48.0 Moderate: 20.0 Severe: 12.0 Deaths: 1 reported
Liguoro[20] May 1	46 1,475	Asymptomatic: 15.1 Mild: 41.9 Moderate: 38.5 Severe: 2.0

First author[reference] 2020 end date for search	Number of studies included Total patients	Pooled prevalence by disease severity (as reported by authors), % (95% CI if applicable)**
		Critical: 0.7 Deaths: 5 reported (0.08% mortality rate)
Zhang[45] May 4	46 551	Asymptomatic: 18 (11–27) Severe/critical: 1.6 Deaths: 3 reported
Xu[42] May 8	17 69	Asymptomatic: 18.8 Mild/moderate: 81.2
Meena[26] May 10	Varied by severity (10–19) Varied by severity (1,224–1,677)	Asymptomatic: 23 (17–30) Mild: 40 (26–52) Moderate: 56 (40–72) Severe: 3 (1–5) Critical: 1 (0.1–2) Deaths: 5 reported
Liu[21] May 10	Varied by severity (14–28) Varied by severity (347–1,726)	Asymptomatic: 18.9 (12.1–26.6) Mild/moderate: 100 (99.1–100) Severe: 0 (0–0.6) Critical: 0 (0–0.5) Deaths: 4 reported, 0 (0–0)
Gordon[13] May 12	8 10*	Asymptomatic: 10
Trevisanuto[35] May 12	26 38*	Asymptomatic: 31.6
He[14] May 20	11 1,152	Asymptomatic: 27.7 (16.4–42.7)
Hoang[16] May 24	Varied by severity (88–131) Varied by severity (2,367–7,780)	Asymptomatic: 19.3 Critical: 3.3 Deaths: 0.09
Williams[41] May 31	28 5,686	Critical: 1.9 Deaths: 0.3

First author[reference] 2020 end date for search	Number of studies included Total patients	Pooled prevalence by disease severity (as reported by authors), % (95% CI if applicable)**
Dhir[9] June 9	Varied by severity (23–32) Varied by severity (31–58)*	Asymptomatic: 22.4 Deaths: 0 reported
Mark[25] Jun 15	38 Varied by severity (61–63)*	Asymptomatic: 5 Severe: 21 Deaths: 0 reported
Yasuhara[43] June 20	46 114	Asymptomatic: 15.2 Critical: 12.3 Deaths: 0 reported
Yoon[44] Submitted Aug 8	43 157*	Asymptomatic: 32.5

*Infants only
**CT, computed tomography; CI, confidence interval

Table 6. Summary of systematic reviews reporting on laboratory findings in children with COVID-19

First author[reference] 2020 end date for search	Number of studies included Total patients	Pooled prevalence by laboratory finding (as reported by authors), % (95% CI, if applicable)**
Chang[3] Mar 15	7 93	Lymphopenia: 32 (5–83)
Ho[22] Mar 18	Varied by finding (6–8) Varied by finding (67–83)	Elevated C-reactive protein: 29.9 Lymphopenia: 18.1 Lymphocytosis: 13.3
Wang, Zhou[38] Mar 31	Varied by finding (3–11) Varied by finding (59–465)	Elevated procalcitonin: 44 (20–69) Lymphocytosis: 41 (2–80) Elevated lactate dehydrogenase: 38 (25–51) Leucopenia: 28 (17–39) Neutropenia: 24 (4–44) Neutrophilia (neutrocytosis): 23 (0–48) Elevated C-reactive protein: 22 (15–29) Elevated D-dimer: 15 (7–22) Leucocytosis: 15 (4–26) Lymphopenia: 15 (8–22) Elevated aspartate aminotransferase: 15 (9–21) Elevated creatine kinase: 13 (0–38) Elevated hemoglobin: 13 (4–22) Elevated alanine aminotransferase: 11 (8–14) Thrombocytosis: 10 (3–17) Thrombocytopenia: 7 (0–19) Low hemoglobin: 7 (0–14)
Ding[10] Apr 1	Varied by finding (5–12) Varied by finding (243–351)	Leucopenia/lymphopenia: 28.9 (19.5–39.2) Elevated creatine kinase: 20.1 (1.3–49.9) Elevated alanine/aspartate aminotransferase: 15.2 (4.9–29.1) Elevated procalcitonin: 12.2 (0–46.1) Leucocytosis/lymphocytosis: 9.1 (0.7–22.6) Elevated lactate dehydrogenase: 8.3 (0–26.1)

First author[reference] 2020 end date for search	Number of studies included Total patients	Pooled prevalence by laboratory finding (as reported by authors), % (95% CI, if applicable)**
		Elevated C-reactive protein: 7.4 (0.8–17.9)
Mustafa[27] Apr 2	Varied by finding (3–8) Varied by finding (28–70)	Elevated C-reactive protein: 28 (18–37) Elevated procalcitonin: 28 (18–37) Lymphopenia: 21 (12–30) Leucopenia: 19 (10–27) Elevated transaminase: 13 (5–20) Leucocytosis: 11 (4–18) Lymphocytosis: 5 (0–10) Elevated lactate dehydrogenase: 5 (0–10) Thrombocytopenia: 4 (0–8)
De Souza[8] Apr 7	Varied by finding (15–31) Varied by finding (32–350)	Elevated procalcitonin: 49.8 Elevated C-reactive protein: 19.3 Increased liver enzymes: 19.2 Leucopenia: 16.6 Lymphopenia: 12.9 Lymphocytosis: 11.7 Thrombocytosis: 9.5 Leucocytosis: 7.5 Thrombocytopenia: 3.2
Raba[31] Apr 7	18 160*	Lymphocytosis: 61 Abnormal liver function tests: 54 Elevated C-reactive protein: 47 Lymphopenia: 16 Abnormal renal function tests: 11
Ma[23] Apr 21	Varied by finding (2–7) Varied by finding (43–398)	Lymphocytosis: 22 (11–38) Leucopenia: 21 (12–34) Elevated aspartate aminotransferase: 19 (10–33) Elevated C-reactive protein: 17 (7–37) Lymphopenia: 16 (7–32) Elevated alanine aminotransferase: 15 (5–38) Leucocytosis: 13 (5–29)

First author[reference] 2020 end date for search	Number of studies included Total patients	Pooled prevalence by laboratory finding (as reported by authors), % (95% CI, if applicable)**
		Elevated D-dimer: 12 (5–25) Elevated creatine kinase-myocardial band: 5 (1–32)
Escosa-Garcia[11] Apr 20	Varied by finding (12–17) Varied by finding (207–525)	Lymphocytosis: 44.0 (37.3–50.7) Elevated procalcitonin: 37.1 (32.3–42.0) Elevated C-reactive protein: 25.2 Lymphopenia: 17.5 (13.8–21.9)
Cui[5] Submitted Apr 23	22 445	Elevated procalcitonin: 40.8 Elevated creatine kinase-myocardial band: 27.0 Leukopenia: 21.0 Elevated lactate dehydrogenase: 20.4 Elevated C-reactive protein: 18.8 Elevated aspartate aminotransferase: 17.3 Elevated D-dimer: 12.1 Elevated alanine aminotransferase: 11.2 Elevated creatine kinase: 10.6 Lymphopenia: 9.8 Leucocytosis: 8.8 Elevated blood creatinine: 2.2 Elevated urea nitrogen: 1.5
Cui[5] Apr 30	Varied by finding (4–9) Varied by finding (7–25)*	Elevated creatine kinase-myocardial band: 88 (71–94) Elevated lactate dehydrogenase: 50 (15–69) Elevated alanine aminotransferase: 47 (25–69) Elevated C-reactive protein: 42 (6–78) Lymphopenia: 33 (24–47) Elevated aspartate aminotransferase: 33 (20–67)
Cui[6] Apr 30	Varied by finding (17–42) Varied by finding (109–978)	Elevated creatine kinase-myocardial band: 37 (25–48) Elevated procalcitonin: 36 (21–51) Elevated lactate dehydrogenase: 29 (20–39) Leucopenia: 19 (14–25) Elevated C-reactive protein: 19 (13–26) Elevated aspartate aminotransferase: 18 (13–23)

First author[reference] 2020 end date for search	Number of studies included Total patients	Pooled prevalence by laboratory finding (as reported by authors), % (95% CI, if applicable)**
		Lymphopenia: 16 (11–21) Elevated alanine aminotransferase: 11 (7–15) Elevated D-dimer: 11 (8–14) Leucocytosis: 10 (7–14) Elevated creatinine kinase 9 (1–17)
Liguoro[20] May 1	11 25*	Lymphopenia: 20 High transaminase: 20 Thrombocytopenia: 16 High creatine phosphokinase: 12 Thrombocytosis: 8 High C-reactive protein-procalcitonin: 4 Leucocytosis: 0
Liguoro[20] May 1	38 655	High C-reactive protein-procalcitonin: 31.1 Leucopenia: 17.1 High creatine phosphokinase: 14.5 Leucocytosis: 13.7 High transaminase: 12.4 Thrombocytosis: 10.3 Thrombocytopenia: 5.1
Henry[15] May 1	Varied by finding (3–16) Varied by finding (23–421) Note: Authors includes 3 patients with severe cases from 2 studies into the mild cohort analysis as they could not remove them individually. Note: Meta-analysis performed for only mild cases	Low creatinine: 39 (0–100) Neutropenia: 38 (19–60) Elevated creatine kinase-myocardial band: 33 (25–42) Elevated lactate dehydrogenase: 28 (17–41) Elevated procalcitonin: 26 (9–46) Elevated aspartate aminotransferase: 25 (17–35) Elevated D-dimer: 20 (12–29) Elevated erythrocyte sedimentation rate: 20 (4–42) Leucopenia: 19 (12–26) Elevated C-reactive protein: 18 (10–28) Lymphocytosis: 18 (9–30) Lymphopenia: 17 (8–28)

First author[reference] 2020 end date for search	Number of studies included Total patients	Pooled prevalence by laboratory finding (as reported by authors), % (95% CI, if applicable)**
	on 610 patients from 20 studies	Elevated creatine kinase: 15 (3–32) Elevated alanine aminotransferase: 15 (10–20) Leucocytosis: 13 (8–19) Neutrophilia: 10 (2–23) Thrombocytosis: 10 (4–18) Elevated hemoglobin: 10 (0–27) Low hemoglobin: 5 (0–16)
Zhang[45] May 4	Varied by finding (5–27) Varied by finding (139–323)	Lymphocytosis: 35 (14–59) Elevated lactate dehydrogenase: 29 (16–43) Elevated creatinine kinase: 21 (8–37) Elevated aspartate aminotransferase: 18 (9–28) Elevated C-reactive protein: 17 (7–29) Leucocytosis: 15 (9–21) Leucopenia: 14 (6–26) Lymphocytopenia: 13 (7–20) Elevated D-dimer: 12 (4–22) Elevated procalcitonin: 10 (1–22) Elevated alanine aminotransferase: 9 (3–15) Elevated urea: 5 (0–19) Elevated creatinine: 4 (0–25)
Meena[26] May 10	Varied by finding (4–19) Varied by finding (125–808)	Elevated procalcitonin: 25 (9–42) Elevated C-reactive protein: 16 (10–22) Leucopenia: 16 (11–22) Elevated aspartate aminotransferase: 15 (9–21) Leucocytosis: 12 (7–17) Lymphopenia: 12 (8–17) Elevated alanine aminotransferase: 10 (7–12) Elevated erythrocyte sedimentation rate: 9 (4–14)
Liu[21] May 10	Varied by finding (13–20) Varied by finding (182–537)	Elevated lactate dehydrogenase: 23.0 (8.8–38.3) Lymphocytosis: 15.4 (9.8–21.7) Elevated C-reactive protein: 12.3 (5.4–21.0)

First author[reference] 2020 end date for search	Number of studies included Total patients	Pooled prevalence by laboratory finding (as reported by authors), % (95% CI, if applicable)**
		Elevated aspartate aminotransferase: 10.9 (5.0–18.2) Lymphopenia: 10.8 (3.9–19.7) Leucopenia: 10.6 (5.4–16.8) Leucocytosis: 10.3 (6.6–14.6) Elevated alanine aminotransferase: 6.5 (3.8–9.6)
Trevisanuto[35] May 12	26 42*	Abnormal aspartate aminotransferase: 12 Lymphopenia: 10 Abnormal white blood cells: 7 Abnormal platelets: 7 Abnormal alanine aminotransferase: 2 Abnormal hemoglobin: 0
Hoang[16] May 24	Varied by finding (9–52) Varied by finding (92–672), elevated means ± standard deviation only reported	Neutropenia: mean 44.4 (± SD 2.7) Lymphocytosis: mean 39.9 (± SD 2.0) Elevated C-reactive protein (males only): mean 9.4 (± SD 0.5) Elevated D-dimer: mean 0.7 (± SD 0.1) Elevated procalcitonin: mean 0.25 (± SD 0.0) Elevated creatine kinase: mean 197.9 (± SD 23.1) Elevated interleukin-6: mean 26.1 ± SD (3.7)
Mark [25] Jun 15	Varied by finding (indeterminable study number) Varied by finding (27–45)*	Neutropenia: 56 Lymphopenia: 16 Thrombocytopenia: 7
Yasuhara[43] June 20	37 Varied by finding (29-81)	Elevated D-dimer: 51.7 Elevated C-reactive protein: 39.5 Lymphopenia: 32.5 Neutrophilia: 22.5 Elevated creatinine: 22.6 Elevated aspartate aminotransferase: 22.2 Thrombocytopenia: 20.0 Elevated alanine aminotransferase: 16.4

First author[reference] 2020 end date for search	Number of studies included Total patients	Pooled prevalence by laboratory finding (as reported by authors), % (95% CI, if applicable)**
		Leucocytosis: 14.3 Leucopenia: 11.7 Elevated procalcitonin: 3.2
Yoon[44] Submitted Aug 8	43 Varied by finding (30–128)*	High creatine kinase-myocardial band: 45.5 High procalcitonin: 43.3 High D-dimer: 30.6 High C-reactive protein: 18.1 Neutropenia: 14.3 Leucopenia: 10.9 Leucocytosis: 10.2 Lymphocytosis: 10.2 Low creatinine: 8.8 Lymphopenia: 8.6 High alanine aminotransferase: 8.1 High lactate dehydrogenase: 6.6 Thrombocytosis: 4.2 Neutrophilia: 4.2 Thrombocytopenia: 3.4 Low alanine aminotransferase: 2.4 High creatinine: 1.8

*Infants only
*CI, confidence interval; SD, standard deviation

Table 7. Summary of systematic reviews reporting on imaging findings in children with COVID-19

First author[reference] 2020 end date for search	Number of studies included Total patients	Pooled prevalence by imaging finding (as reported by authors), % (95% CI, if applicable), CT findings unless specified otherwise
Chang[3] Mar 15	Not determined Not determined	Normal: 27 (18–43) *Where there is at least 1 abnormal finding:* Ground-glass opacities: 48 (36–64) Patchy consolidations: 31 (13–55)
Shelmerdine[34] Mar 17	Varied by finding (18–21) Varied by finding (255–421)	Ground-glass opacities: 62.4 Infiltrates/shadows: 43.5 Normal: 34.0 Halo sign: 9.4 Consolidation: 5.5 Interstitial lesions: 1.9 Nodules: 1.6 [1.2%] Pleural effusion: 1.2
Jutzeler[17] Mar 28	Varied by finding (3–13) Varied by finding (15–108)	Bilateral pneumonia: 54.8 (42.4–66.7) Ground-glass opacities: 48.4 (34.9–62.1) Bilateral patchy shadowing: 38.7 (11.1–76.1) Local patchy shadowing: 34.1 (16.0–58.4) Unilateral pneumonia: 27.3 (17.2–40.4)
Wang, Zhou[38] Mar 31	Varied by finding (10–18) Varied by finding (347–727)	Ground-glass opacities 35 (26–44) Normal: 34 (23–45) Unilateral pneumonia: 31 (20–43) Bilateral pneumonia: 28 (20–36)
Azadbakht Mar 27	Varied by finding (1–3) Varied by finding (4–29)	Peripheral distribution: 100 Halo sign: 50 Ground-glass opacities: 55.2 Bilateral involvement: 50 Unilateral involvement: 30 Consolidation: 22.2 Normal: 20.8

First author[reference] 2020 end date for search	Number of studies included Total patients	Pooled prevalence by imaging finding (as reported by authors), % (95% CI, if applicable), CT findings unless specified otherwise
		Crazy paving: 20 Nodular opacities: 15 Pleural effusion: 4.2 Lymphadenopathy: 0 Ground-glass opacities and consolidation combination: 0 Central distribution: 0
Ding[10] Apr 1	11 326	Ground glass opacities: 53.9 (38.4–68.7)
Yang[46] Apr 3	37 406	Normal: 42.4 Ground-glass opacities: 26.4 Local patchy shadow: 14.5 Bilateral bronchopneumonia-like changes: 14.3 Interstitial lesions: 1.0 Unknown: 1.5
De Bernardo[7] Apr 27	12 15*	Thickening of lung structure: 53 Normal (based on reporting of 'no lesions'): 13 Ground-glass opacities: 13 Mild lung infection: 7 Bilateral linear opacities: 7 Bilateral nonspecific striated lung infiltrates: 7
Mantovani[24] Apr 11	Varied by finding (14–15) Varied by finding - (353–368)	Normal: 26 (8–48) Unilateral pneumonia: 26 (13–41) Bilateral pneumonia: 16 (5–29) Interstitial pneumonia: 9 (0–24)
Ma[23] Apr 21	Varied by finding (5–7) Varied by finding (72–254)	Ground-glass opacities: 39 (25–53) Unilateral involvement: 22 (12–33) Bilateral involvement: 22 (6–44)
Patel[30] Apr 16	Varied by modality (2–7)	CT normal: 45.1 X-ray normal: 42.9 X-ray unilateral patchy infiltration: n=4

First author[reference] 2020 end date for search	Number of studies included Total patients	Pooled prevalence by imaging finding (as reported by authors), % (95% CI, if applicable), CT findings unless specified otherwise
	Varied by modality (14–82)	X-ray unilateral lung opacification: n=1 X-ray bilateral subpleural ground-glass opacities: n=3 CT bilateral subpleural ground-glass opacities: n=3 CT opacification: n=1 CT ground-glass opacities: n=9 CT unilateral ground-glass opacities: n=2 CT patchy ground-glass shadows and nodules: n=9 CT unilateral "patchy shadows or lung consolidation": n=5 CT bilateral patchy shadows or lung consolidations: n=11
Escosa-Garcia[11] Apr 20	Varied by finding (4–16) Varied by finding (42–447)	X-ray normal: 48.1 (37.6–58.8) X-ray unilateral opacities: 50.0 (35.5–64.4) X-ray bilateral opacities: 50.0 (35.5–64.4) CT normal: 39.1 (34.7–43.7) CT unilateral opacities: 37.8 (31.7–44.3) CT bilateral opacities: 62.2 (55.6–68.2)
Cui[5] Submitted Apr 23	21 409	Normal: 43.5 Ground-glass opacities: 29.6 Local patchy shadow: 20.4 Bilateral patchy shadow: 14.6 Interstitial lesions: 0.7 Pleural effusion: 0.7 White lung change: 0.5
Cui Apr 30	Varied by finding (7–8) Varied by finding (11–14)*	Ground-glass opacities: 50 (20–80) Normal: 42 (6–78) Local patchy shadow: 42 (6–78) Bilateral patchy shadow: 40 (13–55)
Cui[6] Apr 30	Varied by finding (32–39) Varied by finding (653–928)	Normal: 41 (30–52) Ground-glass opacities: 36 (25–47) Bilateral patchy shadow: 28 (21–35) Local patchy shadow: 26 (21–32) White lung change: 2 (0–4)

First author[reference] 2020 end date for search	Number of studies included Total patients	Pooled prevalence by imaging finding (as reported by authors), % (95% CI, if applicable), CT findings unless specified otherwise
		Pleural effusion: 2 (0–3)
Liguoro[20] May 1	11 25*	Normal: 28 Local patchy: 20 Bilateral patchy: 12 Ground-glass opacities: 4
Liguoro[20] May 1	37 Varied by finding (574–670)*	Normal: 32.7 Ground-glass opacities: 29.4 Local patchy: 26.6 Bilateral patchy: 23.2
Zhang[45] May 4	Varied by finding (44–45) Varied by finding (390–503)	Normal: 36 (28–45) Patchy consolidation: 33 (23–43) Ground-glass opacities: 28 (18–39)
Meena[26] May 10	13 Unknown	Ground-glass opacities: 41 Consolidation: 16
Liu[21] May 10	Varied by finding (14–23) Varied by finding (224–501)	Normal: 37.4 (28.0–47.4) Ground-glass opacities: 35.7 (31.0–40.5) Unilateral compromised: 28.2 (19.4–37.8) Bilateral compromised: 21.9 (10.4–35.5) Consolidation: 10.5 (1.6–23.6)
Hoang[16] May 24	Varied by finding (49–67) Varied by finding (501–1,115)	X-ray normal: 23.6 X-ray patchy lesions: 21.0 X-ray ground glass opacities: 6.0 X-ray consolidation: 2.4 CT ground-glass opacities: 32.9 CT normal: 18.9 CT patchy lesions: 10.5 CT consolidation: 6.5
Kumar[19] May 20	Varied by finding (4–32 [possibly 34])	Clinically symptomatic normal: 17.6 Clinically asymptomatic normal: 81.1

First author[reference] 2020 end date for search	Number of studies included Total patients	Pooled prevalence by imaging finding (as reported by authors), % (95% CI, if applicable), CT findings unless specified otherwise
	Varied by finding (36–722)	Patchy shadow: 44 (32-55) Ground-glass opacities: 39 (31–48) Normal: 38 (28–42) Halo sign: 26 (11–41) Nodules: 25 (9–41) Consolidation: 23 (12–34) Prominent bronchiovascular markings: 17 (9–24) Interstitial pattern: 12 (1–23) Bronchial wall thickening: 11 (1–21) Pleural effusion: 2 (0.1–4)
Mark[25] Jun 15	Varied by finding (indeterminable study number) Varied by finding (9–28)*	Normal X-ray: 54 Normal CT: 0
Katal[18] Jun 20	Varied by finding (12–39) Varied by finding (111–850)	Normal: 26.6 (225) Ground-glass opacities: 205 out of 685 Consolidations: 156 out of 685 Ground-glass opacities/consolidation: 23 out of 111
Yasuhara[43] Jun 20	10 Varied by finding (46–50)	Ground-glass opacity (X-ray): 34.8 Mottling and ground-glass opacities (CT): 54.0
Nino[28] Jul 11	Varied by finding (22–28) Varied by finding (811–975)	Ground-glass opacities: 37.2 (29.3–45.0) Normal: 35.7 (27.5–44.0) Bilateral compromise/lesions: 27.7 (19.9–35.6) Consolidations or pneumonic infiltrates: 22.3 (17.8–26.9) Halo sign: 0.9 (0.1–1.8) Interstitial abnormalities and interlobular septal thickening: 0.7 (0.2–1.2) Bronchovascular bundle thickening: 0.6 (0.1–1.1) Crazy paving pattern: 0.5 (0.1–0.9) Lymphadenopathy: 0.5 (0.1–0.9)

First author[reference] 2020 end date for search	Number of studies included Total patients	Pooled prevalence by imaging finding (as reported by authors), % (95% CI, if applicable), CT findings unless specified otherwise
		Pleural effusion or adjacent pleural thickening: 0.5 (0.1–0.9)
Yoon[44] Submitted Aug 8	43 100*	Normal: 41.0 Ground-glass opacities w/patchy shadows: 19.0 Ground-glass opacities w/consolidation: 2.0 Ground-glass opacities: 14.1/37.0 Consolidation: 3.0 Pneumonia: 57.0 Bronchitis: 2.0
Wang, Mo[39] Aug 10	Varied by finding (7–30) Varied by finding (121–780)	Ground-glass opacities: 39.5 (30.7–48.3) Consolidation: 24.1 (15.9–32.4) Air bronchogram sign: 11.2 (5.5–16.9) Crazy paving pattern: 6.2 (1.5–10.8)

*Infants only
*CI, confidence interval; CT, computed tomography; n, number of patients

Table 8. Summary of systematic reviews reporting on co-infections in children with COVID-19

First author[reference] 2020 end date for search	Number of studies included Total patients	Pooled prevalence by co-infection, % and n (95% CI, if applicable) Pathogens detected (n)
Wang, Zhou[38] Mar 31	Indeterminable study number 49	8.2 (4) Note: Patients had co-infection reported only if there was clearly reported severe symptoms No data reported for pathogens detected
De Souza[8] Apr 7	9 70	27.1 (9) *Mycoplasma pneumoniae* (7) Influenza B (5) Respiratory syncytial virus (3) Influenza A (2) Cytomegalovirus (1) *Enterobacter aerogenes* (1)
Ding[10] Apr 1	7 180	10.0 (0.9–24.2) No complete list of pathogens detected provided
Patel[30] Apr 16	3 76	10.5 (8) Influenza B (4) *Mycoplasma pneumoniae* (3) *Enterobacter aerogenes* (1)
Zheng[47] Apr 5–11	4 Not reported	10.1 (4.0–16.3) *Mycoplasma pneumoniae* (50.0, 28.2–71.8) Influenza virus/parainfluenza virus (22.8, 4.8–40.8) Adenovirus, respiratory syncytial virus and Epstein-Barr virus also reported without details
Zhang[45] May 4	6 141	10 (1–24) *Mycoplasma pneumoniae* (20) Respiratory syncytial virus (4) Influenza “virus” (3) “bacteria” (2) Adenovirus (1)
Gordon[13]	8	Not reported

First author[reference] 2020 end date for search	Number of studies included Total patients	Pooled prevalence by co-infection, % and n (95% CI, if applicable) Pathogens detected (n)
May 12	10*	*Enterobacter* sp. (3)
Hoang[16] May 24	35 1,183	5.6 (72) *Mycoplasma pneumoniae* (42) Influenza virus A/B (8) Respiratory syncytial virus (7) Cytomegalovirus (3) Epstein-Barr virus (3) *Enterobacter sepsis* (2) Adenovirus (2) Human metapneumovirus (2) Human parainfluenza virus (2) *Streptococcus pneumoniae* (1)
Mark[25] Jun 15	Varies by bacteria vs virus testing (indeterminable study number) Varies by bacteria vs virus testing (30–33)*	Virus: 17 (5) (+1 infection detected after hospital admission) Bacteria: 14 (6) *Escherichia coli* (2) Respiratory syncytial virus (2) *Staphylococcus epidermidis* (2) (Note: One positive culture may have been due to contamination) *Staphylococcus salivarius* (1) (Note: May have been due to contamination) *Klebsiella oxytoca* (1) Rhinovirus/enterovirus (2) Seasonal CoV (1) Human metapneumovirus (1) (Note: Developed after initial SARS-CoV-2 hospital admission)

* Infants only

*CI, confidence interval; n, number of patients

Table 9. Summary of systematic reviews reporting on comorbidities in children with COVID-19

First author[reference] 2020 end date for search	Number of studies included Total patients	Pooled prevalence of comorbidity, % (95% CI, if applicable) Comorbidities (n)
Jutzeler[17]	1	8.0 (crude prevalence)
Mar 28	25	Not reported
Wang, Zhou[38]	Indeterminable study number	18.4 Note: Patients had comorbidity reported only if there was clearly reported severe symptoms
Mar 31	49	Specific comorbidities not reported, however, in at least two cases intussusception was a comorbidity
Ding[10]	5	6.1 (2.4–10.9)
Apr 1	166	Specific comorbidities not reported
Mustafa[27]	1	Not reported
Apr 2	8	Immunosuppression (acute lymphoblastic leukemia) (1)
Yang[46]	37	Not reported Congenital heart diseases (2) Hydronephrosis (1)
Apr 3	406	Leukemia receiving maintenance chemotherapy (1) Intussusception (1) Asthma (1) Polycystic kidney disease (1) Pleural effusion (1)
Raba[31]	1	Only one study explicitly reported a specific comorbidity related to the death of an infant with multiorgan failure
Apr 7	1*	Intussusception (1)
Patel[30]	Varied by finding (4–5)	Overall comorbidity (95) 21.4 (range: 8.7–50; specific comorbidity, n=84) Asthma (40)
Apr 16	Varied by finding (433–444)	Cardiovascular disease (28) Immunosuppression (11) Other comorbidities (not identified) (5)
Cui[5]	24	Not reported

First author[reference] 2020 end date for search	Number of studies included Total patients	Pooled prevalence of comorbidity, % (95% CI, if applicable) Comorbidities (n)
Submitted Apr 23	2,597	Renal calculi/hydronephrosis (1) Acute lymphoblastic leukemia and myelosuppression (1) Intussusception (1) Congenital heart disease/malnutrition (1) Congenital heart disease (1) Acute respiratory distress syndrome (1)
Liguoro[20] May 1	7 587	22.0 (129) Asthma/chronic lung disease: 45% (58) Congenital heart disease: 23% (30) Hemato-oncological diseases: 6% (8) Neurological and endocrine: reported with no details
Zhang[45] May 4	5 9	78 (7) Note: Comorbidities were specifically reported and listed only for patients with severe/critical COVID-19 Congenital heart disease (3) Hydronephrosis (1) Leukemia (1) Intussusception (1) Encephalopathy (1)
Liu[21] May 10	19 927	9.9 (2–21) Specific comorbidities not reported
Hoang[16] May 24	20 655	35.6 (233) Immunosuppression (71) Respiratory (49) Cardiovascular (32) Medically complex/congenital (25) Not reported (17) Hematologic (8) Neurologic (8) Obesity (8) Prematurity (5) Endocrine/metabolic (5)

First author[reference] 2020 end date for search	Number of studies included Total patients	Pooled prevalence of comorbidity, % (95% CI, if applicable) Comorbidities (n)
		Renal (4) Gastrointestinal (1)
Williams[41] May 31	21 48	75 (36) Congenital heart disease and cardiomyopathy: 21 (10) Hypertension: 2 (1) Mucopolysaccharidosis with cardiac failure: 2 (1) Epilepsy, neurodegenerative disorders, cerebral palsy: 10 (4) Asthma or reactive airway disease: 10 (4) Recurrent chest infections: 2 (1) Obstructive sleep apnea: 2 (1) Allogeneic hematopoietic stem cell transplantation: 2 (1) Leukaemia on maintenance chemotherapy: 2 (1) Immunodeficiency: 6 (3) Sickle cell disease: 2 (1) Metastatic cancer: 2 (1) Nephroblastoma: 2 (1) Unspecified genetic syndrome: 4 (2) T21: 4 (2) 18q deletion: 2 (1) Diabetes: 4 (2) Obesity: 15 (7) Prematurity: 4 (2) Intussusception: 2 (1) Hydronephrosis: 2 (1)
Mark[25] Jun 15	Indeterminable study number 42*	19 (8) Prematurity (1) Congenital heart disease (3) Cystic fibrosis (1) Renal anomalies (3)

*Infants only
*CI, confidence interval; n, number of patients

Table 10. Summary of systematic reviews reporting on duration of COVID-19 shedding from respiratory and/or gastrointestinal samples from children

First authorreference 2020 end date for search	Number of studies included Total patients	Respiratory viral shedding (days)**	Gastrointestinal viral shedding (days)**
De Bernardo[7] Apr 27	8 8*	Mean (SE) duration: 10.3 ± 4.5 (range: 6–17)	Not reported
Santos[33] Apr 19	3 Varied by source (26–30)	Duration range: 3.9–14.3	Duration range: 16.3–22 Virus is more likely continues to shed into fecal samples compared to respiratory samples after 14 days of symptoms onset: RR=3.2 (95% CI: 1.2–8.9) The viral shedding from gastrointestinal system was 8.6 (95% CI: 1.7–15.4) days longer than respiratory tract
Weiss[40] Apr 23	Varied by source (3–5) Varied by source (14–26)	Mean duration in mild disease: 11.1 (95% CI: 7.1–15.1)	Mean duration in mild disease: 16.0 (95% CI: 11.5–20.1)
Cui[5] Submitted Apr 23	13 2,597	Duration range: 3–23	Duration range: 5–43
Xu[42] May 8	Varied based on location sampled (3–13) Varied based on location sampled (4–53)	Duration range: 0–24 Mean (SE) duration in symptomatic patients: 11.0 ± 5.8 Mean (SE) duration in asymptomatic patients: 9.4 ± 5.1	From symptom onset duration range: 10–33; mean (SE): 23.6 ± 8.8 Mean (SE) duration in asymptomatic patients: 16.8 ± 9.8

*Infants only
**CI, confidence interval; SE, standard error; RR, risk ratio

Table 11. Summary of systematic reviews reporting on exposure history of children with COVID-19

First author[reference] 2020 end date for search	Number of studies included Total patients	Pooled prevalence by exposure history, % (95% CI, if applicable)**
Chang[3] Mar 15	7 93	Household: 75
Ho[22] Mar 18	7 89	Contact with symptomatic or COVID-positive individual: 65.2 Epidemic area: 11.2
Zimmerman[48] Mar 27	11 333	Contact with symptomatic or COVID-19-positive individual: 84 (range within individual studies: 52–100) Family contact: 70 (range: 60–100) Endemic area: 6.4 (range: 20–70)
Wang, Zhou[38] Mar 31	Indeterminable study number Indeterminable patient number	Family: 83 (78–88)
Ding[10] Apr 1	10 336	Family: 86.4 (75.5–94.9)
Yang[46] Apr 3	37 406	Family: 88.4 Unknown: 7.4 Non-family: 4.2
Patel[30] Apr 16	Not reported 338	Contact with symptomatic or COVID-positive individual: 85.5 (range: 39–100) Likely from community: 14.5 (range: 0–61)
Zheng[47] Apr 5–11	42 410	Family: 83.6 (77.5–89.7)
Cui[5] Submitted Apr 23	24 2,597	Adult patients or epidemic areas: 98.5
Liguoro[20] May 1	38 941	Family: 73.3 Unknown: 13.5
Zhang[45]	46	Family: 87 (77–95)

First author[reference] 2020 end date for search	Number of studies included Total patients	Pooled prevalence by exposure history, % (95% CI, if applicable)**
May 4	516	Other: 9 (2–20) Unknown: 1 (0–4)
Liu[21] May 10	20 704	Family: 81.5 (71.0–90.3)
Hoang[16] May 24	94 1,360	Family: 75.6 Travel to/lived-in high-risk area: 71.6
Mark [25] Jun 15	Not reported 59*	Contact with symptomatic or COVID-positive individual: 69

*Infants only
**CI, confidence interval

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