



# SARS-CoV2 and Influenza- Clinical Presentation, Testing Considerations, and Schools

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September 27, 2020



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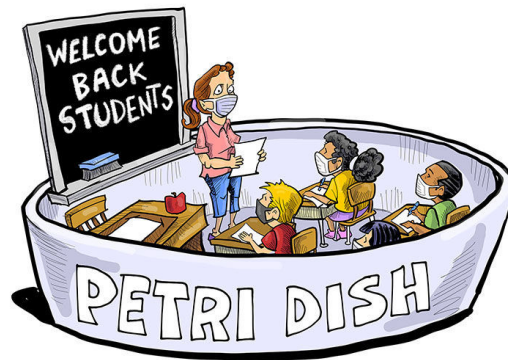
## Objectives

- To discuss prevalence of COVID-19 infection in pediatrics
- To review transmission risk from pediatric COVID-19 patients
- To review clinical presentation of COVID-19 in children and adolescents
- To look at metrics for school reopening thus far

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# Prevalence COVID in Children and Adolescents-Is School Really a Petri Dish?

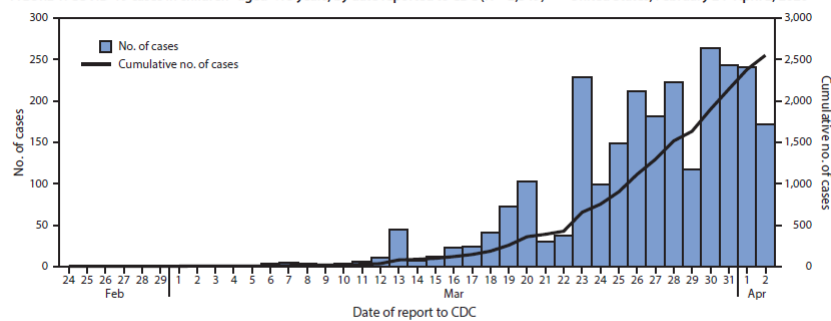
PAUL HANSEN



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## US Pediatric Experience

FIGURE 1. COVID-19 cases in children\* aged <18 years, by date reported to CDC (N = 2,549)<sup>†</sup> — United States, February 24–April 2, 2020<sup>§</sup>



\* Includes infants, children, and adolescents.

<sup>†</sup> Excludes 23 cases in children aged <18 years with missing report date.

<sup>§</sup> Date of report available starting February 24, 2020; reported cases include any with onset on or after February 12, 2020.

32%: age 15-17

27%: age 10-14

15%: age 5-9

11%: age 1-4

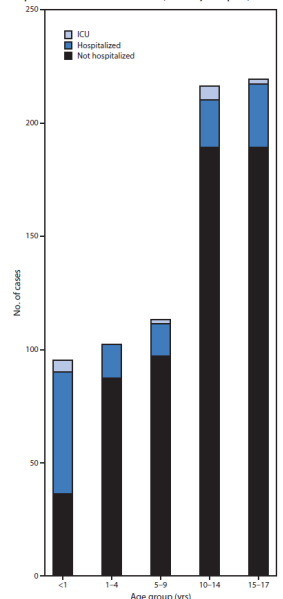
15% age < 1 yr

Pediatric Cases <  
2% of Total

Bialek S, Gierke R, Hughes M, et al. Coronavirus disease 2019 in children—United States, February 12–April 2, 2020. MMWR. 6 April, 2020

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FIGURE 2. COVID-19 cases among children\* aged <18 years, among those with known hospitalization status (N = 745),<sup>†</sup> by age group and hospitalization status — United States, February 12–April 2, 2020



## Hospitalization Rates

5.7-20% hospitalized

Most common among < 1 year and  
underlying conditions

0.5-2% admitted to ICU

Bialek S, Gierke R, Hughes M, et al. Coronavirus disease 2019 in children—United States, February 12–April 2, 2020. MMWR. 6 April, 2020

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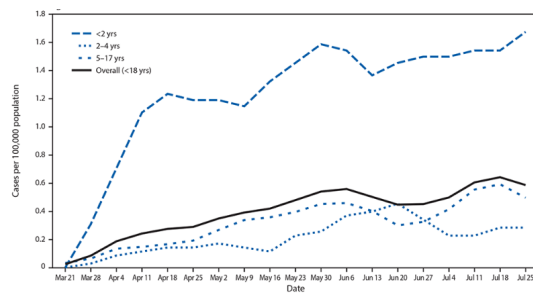
## Association with Underlying Conditions

Any underlying condition (N = 222)	94/222 (42.3)
Obesity <sup>§</sup>	42/111 (37.8)
Chronic lung disease	40/222 (18.0)
Asthma	30/222 (13.5)
Prematurity (gestational age <37 weeks) <sup>¶</sup>	10/65 (15.4)
Neurologic disorder	31/222 (14.0)
Immunocompromised condition	12/222 (5.4)
Feeding tube dependent	12/222 (5.4)
Chronic metabolic disease	10/222 (4.5)
Diabetes mellitus	6/222 (2.7)
Blood disorders	8/222 (3.6)
Sickle cell disease	5/222 (2.3)
Cardiovascular disease	7/222 (3.2)
Congenital heart disease	4/222 (1.8)

Bialek S, Gierke R, Hughes M, et al. Coronavirus disease 2019 in children—United States, February 12–April 2, 2020. MMWR. 6 April, 2020

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## Characteristics of Children aged < 18 Years Hospitalized with COVID-19, March 1-July 25, 2020



Cumulative hospitalization rate under 18: 8/100,000 (driven by younger age groups) [Adults 164.5/100,000]

1/3 admitted to ICU, 6% intubated

Higher hospitalization rates among Hispanic and black children (8x and 5x)

Median age (IQR) 8 years (9mo-15years)

Kim L, Whitaker M, O'Halloran A, et al. Hospitalization Rates and Characteristics of Children Aged <18 Years Hospitalized with Laboratory-Confirmed COVID-19 — COVID-NET, 14 States, March 1–July 25, 2020. MMWR Morb Mortal Wkly Rep. ePub: 7 August 2020. DOI: <http://dx.doi.org/10.15585/mmwr.mm6932e3>

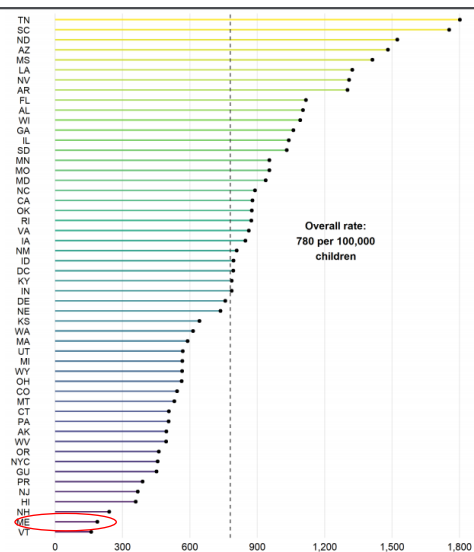
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### Fig 4. Cumulative COVID-19 Cases per 100,000 Children: 9/17/20

- Calculated using state-level population estimates from US Census Bureau (2019)\*
- Overall rate: 780 child COVID-19 cases per 100,000 children in the population
- Fourteen states reported more than 1,000 cases per 100,000 children

See detail in Appendix: Data from 48 states, NYC, DC, PR, and GU (TX excluded from figure)  
 All data reported by state/local health departments are preliminary and subject to change  
 Analysis by American Academy of Pediatrics and Children's Hospital Association  
 \* Source: US Census Bureau, State Population by Characteristics: 2010-2019  
<https://www.census.gov/data/tables/time-series/demographics/2010s/state-detail.html>

CHILDREN'S HOSPITAL ASSOCIATION  
 AMERICAN ACADEMY OF PEDIATRICS  
 DEDICATED TO THE HEALTH OF ALL CHILDREN



Maine: Children are 10.7% of total cases, 188.2/100,000 children

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## Mortality in Patients < 21 Years of Age

Characteristic	No (%) (n=121)
Age Group	
< 1	12(9.9%)
1-4	11(9.1%)
5-9	13(10.7%)
10-13	12(9.9%)
14-17	23(19%)
18-20	50(41.3%)
Race/Ethnicity	
Hispanic	54(44.6%)
American Indian/Alaska Native	5(4.1%)
Asian or Pacific Islander	5(4.1%)
Black, non-Hispanic	35(28.9%)
White, non-Hispanic	17(14%)
Underlying Medical Condition	
No underlying condition	30(24.8%)
> 1 underlying condition	91(75.2%)
>2 underlying condition	54(44.6%)

Bixler D, Miller AD, Mattison CP, et al. SARS-CoV-2–Associated Deaths Among Persons Aged <21 Years — United States, February 12–July 31, 2020. MMWR Morb Mortal Wkly Rep 2020;69:1324–1329.  
DOI: <https://dx.doi.org/10.15585/mmwr.mm6937e4external icon>

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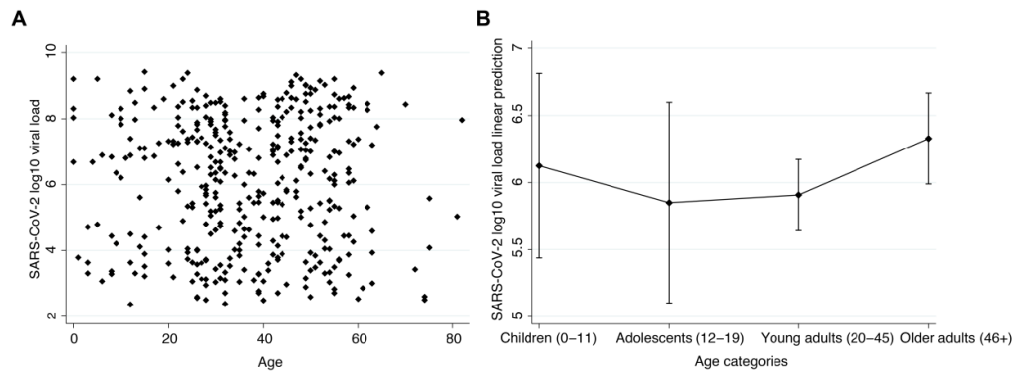
## Transmission of COVID From Children and Adolescents



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## Transmission and Viral Load in Children

Figure 1



Baggio S, L'Huikku AG, Yerly S, et al. SARS-CoV-2 viral load in the upper respiratory tract of children and adults with early acute COVID-19. CID, 2020

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## Rate of Covid among Contacts, South Korea, January 20-March 27, 2020

	Household		Nonhousehold	
Index pt age (n)	+ cts/traced	Percent (95%CI)	+ cts/traced	Percent (95% CI)
0-9 years (29)	3/57	5.3%(1.3-13.7%)	2/180	1.1%(0.2-3.6%)
10-19 years (124)	43/231	18.6%(14.0-24.0)	2/226	0.9% (0.1-2.9%)
20-29 years (1695)	240/3417	7%(6.2-7.9%)	138/12,393	1.1(0.9-1.3)
30-39 years (668)	143/1229	11.6(9.9-13.5)	70/7407	0.9(0.7-1.2)
40-49 years (807)	206/1749	11.8(10.3-13.4)	161/7960	2(1.7-2.3)
50-59 years (1107)	300/2045	14.7(13.2-16.3)	166/9308	1.8(1.5-2.1)
60-69 years (736)	177/1039	17(14.8-19.4)	215/7451	2.9(2.5-3.3)
70-79 years (338)	86/477	18(14.8-21.7)	92/1912	4.8(3.9-5.8)
≥80 years (202)	50/348	14.4(11-18.4)	75/1644	4.6(3.6-5.7)

Park YJ, Choe YJ, Park O, Park SY, Kim YM, Kim J, et al. Contact tracing during coronavirus disease outbreak, South Korea, 2020. Emerg Infect Dis. 2020 Oct [July 27, 2020]. <https://doi.org/10.3201/eid2610.201315>

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## Contact Tracing in Trento, Italy

- 2812 cases (mean 2.3 contacts per case, range 1-42) → 6690 contacts

Age of Case	Cases	#contacts	# contacts becoming cases	Attack Rate
0-14 years	14	49	11	22.4%
20-29	118	475	62	13.1%
30-49	446	2361	250	10.6%
50-64	477	2222	303	13.6%
67-74	181	559	85	15.2%
75+	253	909	155	17.1%

8/11 secondary cases infected others

3 < 5 years of age

4-age 5-10 years

1 age 11

Fateh-Moghadam P, Battisti L, Molinaro S, et al. Contact tracing during phase I of the COVID-19 pandemic in the province of Trento, Italy: key findings and recommendations  
<https://doi.org/10.1101/2020.07.16.20127357>

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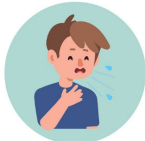
## Current Maine CDC Recommendations

**Table 1: Recommended Public Health Actions for COVID-19 in Schools**

Number of Cases	Location	Testing Recommendation	Quarantine Recommendation	Cleaning/Closure Recommendation	Notes
1 or 2	Single classroom	All students/staff within the classroom	All students in the classroom	Clean or leave classroom dormant for 7 days	Additional potential locations for close contacts include busses, after-school activities, etc.
1 or 2	Two or more classrooms	All students/staff within both classrooms	All students in the classrooms	Clean or leave classroom dormant for 7 days	Additional potential locations for close contacts include busses, after-school activities, etc.
3+ (outbreak)	Single classroom	All students/staff within the classroom	All students in the classroom	Clean or leave classroom dormant for 7 days	Additional potential locations for close contacts include busses, after-school activities, etc.
3+ (outbreak)	Multiple classrooms	Entire school	Close contacts: 14 days Non-close contacts: may return following a negative test result.	Clean or leave classroom dormant for 7 days	Additional potential locations for close contacts include busses, after-school activities, etc.  If and only if students are cohorted in one classroom, it is possible that only affected classrooms will be closed.

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## SARS-CoV-2 Symptoms in Children and Adolescents



COUGH



FEVER



SHORTNESS OF BREATH

### CDC Symptoms:

Fever  
 Fatigue  
 Headache  
 Myalgia  
 Cough  
 Nasal congestion  
 New loss of taste or smell  
 Sore throat  
 Shortness of breath  
 Abdominal pain  
 Diarrhea  
 Nausea/vomiting  
 Poor appetite

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## COVID Effects on Children

Publication	NEJM April 23, 2020	Pediatrics-prepublication	MMWR April 20, 2020	NEJM May 1, 2020	MMWR August 14, 2020
Location	China-children < 16 yo contacts of known cases	Switzerland-Children < 16 yo with + SARS CoV2 test	US-Kids < 18 with + test	Italy-exposed children	US Covid net
Number	171	40	291	100	224
Asymptomatic	15.8%			21%	
Cough	38.5%	82%	54%	44%	29.5%
Sore throat		36%	24%	4%	
Fever	41.5%	67%	56%	54%	54%
Diarrhea	8.8%	18%	13%	9%	12.1%
Fatigue	7.6%	13%		9%	
Nasal congestion	7.6%	64%	7.2%	22%	23.7%
Shortness of breath	28.7%	33%	13%	11%	22.3%

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## Signs and Symptoms of Covid in Children

Sign/Symptom	No. (%) with sign/symptom	
	Pediatric	Adult
Fever, cough, or shortness of breath <sup>†</sup>	213 (73)	10,167 (93)
Fever <sup>§</sup>	163 (56)	7,794 (71)
Cough	158 (54)	8,775 (80)
Shortness of breath	39 (13)	4,674 (43)
Myalgia	66 (23)	6,713 (61)
Runny nose <sup>¶</sup>	21 (7.2)	757 (6.9)
Sore throat	71 (24)	3,795 (35)
Headache	81 (28)	6,335 (58)
Nausea/Vomiting	31 (11)	1,746 (16)
Abdominal pain <sup>¶</sup>	17 (5.8)	1,329 (12)
Diarrhea	37 (13)	3,353 (31)

Bialek S, Gierke R, Hughes M, et al. Coronavirus disease 2019 in children—United States, February 12–April 2, 2020. MMWR. 6 April, 2020

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## Signs and Symptoms of Children Hospitalized with Covid 19

Characteristic	All Ages	0-2 years	2-4 years	5-17 years
Fever/chills	121/224 (54%)	50/67 (74.6%)	13/24 (54.2%)	58/133(43.6%)
Poor PO intake	22/67 (32.8%)	22/67(32.8%)	n/a	n/a
Nausea/vomiting	69/224 (29.4%)	17/67(25.5%)	3/24(12.5%)	46/133(36.8%)
Cough	53/224(23.7%)	22/67(32.8%)	5/24(20.8%)	26/133(19.5%)
Nasal congestion	53/224(22.3%)	9/67(13.4%)	2/24(8.3%)	39/133(29.3%)
Shortness of breath	50/224 (22.3%)	9/67(13.4%)	2/24(8.3%)	39/133(29.3%)
Abdominal pain	42/224(18.8%)	2/67(3%)	3/24(12.5%)	57/133(27.8%)
Diarrhea	27/224(12.1%)	5/67(7.5%)	3/24(12.5%)	19/133(14.3%)

Kim L, Whitaker M, O'Halloran A, et al. Hospitalization Rates and Characteristics of Children Aged <18 Years Hospitalized with Laboratory-Confirmed COVID-19 — COVID-NET, 14 States, March 1–July 25, 2020. MMWR Morb Mortal Wkly Rep. ePub: 7 August 2020. DOI: <http://dx.doi.org/10.15585/mmwr.mm6932e3>

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## Signs and Symptoms of Covid in Children at a Georgia Camp

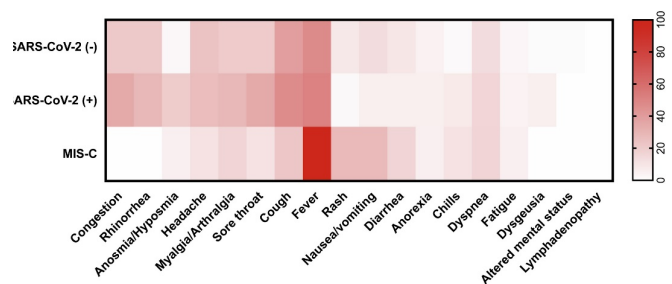
- Total of 597 Georgia residents
- Median age- 12 years(range 6-19 years) for campers, 15 years (14-59 years) for staff
- 260 positive results (overall attack rate 44%)
- 136 cases with available symptom data
  - 36(26%)-no symptoms
  - 100(74%)-symptoms
    - 65% fever
    - 61% headache
    - 46% sore throat

Szablewski CM, Chang KT, Brown MM, et al. SARS-CoV-2 Transmission and Infection Among Attendees of an Overnight Camp — Georgia, June 2020. MMWR Morb Mortal Wkly Rep 2020;69:1023–1025. DOI: <http://dx.doi.org/10.15585/mmwr.mm6931e1>

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## COVID Symptoms in Children-Distinguishing from Other Common Childhood Illnesses

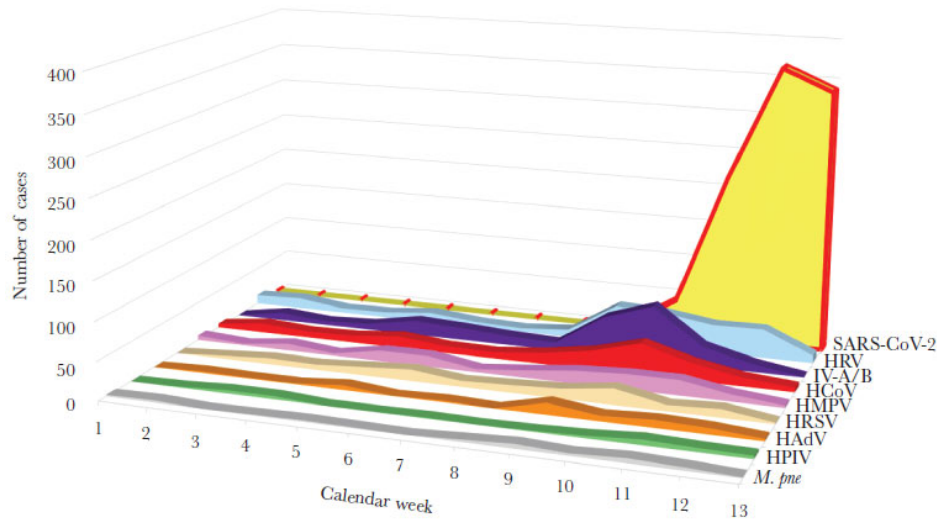
Symptom report- no. (%)	Comparison of acute SARS-CoV-2 (+) and MIS-C				
	SARS-CoV-2 (-)	SARS-CoV-2 (+)	p-value	MIS-C	p-value
Congestion	27 (21.6)	17 (34.7)	0.08	0 (0)	0.002
Rhinorrhea	27 (21.6)	14 (28.6)	0.33	0 (0)	<0.001
Anosmia/Hyposmia	3 (2.4)	10 (20.4)	<0.001	1 (5.6)	0.005
Headache	30 (24.0)	13 (26.5)	0.75	2 (11.1)	0.006
Myalgia/Arthralgia	26 (20.8)	14 (28.6)	0.25	3 (16.7)	0.06
Sore throat	26 (20.8)	17 (34.7)	0.04	2 (11.1)	<0.001
Cough	49 (39.2)	23 (46.9)	0.32	4 (22.2)	0.003
Fever	59 (47.2)	25 (51.0)	0.67	18 (100.0)	<0.001
Rash	11 (8.8)	1 (2.0)	0.06	5 (27.8)	<0.001
Nausea/vomiting	17 (13.6)	3 (6.1)	0.10	5 (27.8)	<0.001
Diarrhea	12 (9.6)	3 (6.1)	0.44	3 (16.7)	0.02
Anorexia	6 (4.8)	3 (6.1)	>0.99	1 (5.6)	>0.99
Chills	2 (1.6)	4 (8.2)	0.10	2 (11.1)	0.63
Dyspnea	17 (13.6)	8 (16.3)	0.84	3 (16.7)	>0.99
Fatigue	4 (3.2)	2 (4.1)	>0.99	1 (5.6)	0.75
Dysgeusia	1 (0.8)	3 (6.1)	0.12	0 (0)	0.03
Altered mental status	1 (0.8)	0 (0)	>0.99	0 (0)	>0.99
Lymphadenopathy	0 (0)	0 (0)	N/a	0 (0)	N/a



Yonker LM, Neilan AM, Bartsch Y et al., Pediatric SARS-CoV-2: Clinical presentation, infectivity, and immune response. The Journal of Pediatrics. 19 August 2020; DOI: <https://doi.org/10.1016/j.jpeds.2020.08.037>

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## COVID and other Respiratory Viruses



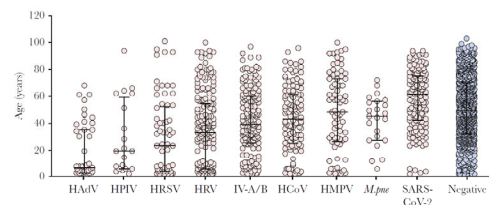
Leuzinger K, Roloff T, Gosert R, et al. Epidemiology of severe acute respiratory syndrome coronavirus 2 emergence amidst community acquired respiratory viruses. *Journal of Infectious Diseases* 2020; 222:1270-1279. DOI: 10.1093/infdis/jiaa464

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## Covid and Other Respiratory Viruses

**Table 2. Comparison of Severe Acute Respiratory Syndrome Coronavirus 2 and Any Community-Acquired Respiratory Virus Infection in Adults and Children (n = 1816)**

Pathogen and Test Result	Age		P Value <sup>a</sup>
	≤16 y	>16 y	
SARS-CoV-2			
Positive	5 (2)	143 (9)	<.001
Negative	257 (98)	1411 (91)	
Any CARV <sup>b</sup>			
Positive	166 (63)	479 (31)	<.001
Negative	96 (37)	1075 (69)	
SARS-CoV-2 or any CARV			
Positive	169 (65)	606 (39)	<.001
Negative	93 (35)	948 (61)	
SARS-CoV-2 or CARV <sup>c</sup> (excluding rhinovirus)			
Positive	127 (65)	503 (39)	<.001
Negative	93 (35)	948 (61)	



**Figure 3.** Age distribution of patients positive for community-acquired respiratory virus (CARV) and severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). Nasopharyngeal/oropharyngeal swabs were analyzed in parallel for different CARVs with multiplex nucleic acid test and SARS-CoV-2 with reverse-transcription quantitative nucleic acid test. Patient age of CARV- or SARS-CoV-2-positive patients is displayed (median, 25<sup>th</sup> and 75<sup>th</sup> percentile; n = 1816), and compared using Mann-Whitney U test (Table 3; Supplementary Tables 4-6). Abbreviations: HAdV, human adenovirus; HCoV, human coronavirus (229E, OC43, NL63, and HKU1); HMPV, human metapneumovirus; HPIV, human parainfluenza virus (types 1-4); HRSV, human respiratory syncytial virus; HRV, human rhinovirus; IV-A/B, influenza virus A and B; *M. pne*, *Mycoplasma pneumoniae*; SARS-CoV-2, severe acute respiratory syndrome coronavirus 2.

Leuzinger K, Roloff T, Gosert R, et al. Epidemiology of severe acute respiratory syndrome coronavirus 2 emergence amidst community acquired respiratory viruses. *Journal of Infectious Diseases* 2020; 222:1270-1279. DOI: 10.1093/infdis/jiaa464

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## COVID and Other Common Childhood Illness

Pathogen Detected	Xia et al (n = 20)	Zhang et al (n=34)	Sun et al (n=8)
Any Pathogen	9(45%)	27(79%)	1(13%)
Mycoplasma	4(20%)	9(26%)	NR
Influenza A/B	3(15%)	12(35%)	1(13%)
RSV	1(5%)	2(6%)	0
Parainfluenza	NR	1(3%)	0
Adenovirus	NR	1(3%)	0

Zimmermann P and Curtis N. Covid-19 in children, pregnancy, and neonates: a review of epidemiologic and clinical features. The Pediatric Infectious Disease Journal 2020; 39: 469-477.

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## COVID or Flu?

**Table 1**  
Characteristics of patients with COVID-19 or Influenza A.

Variable	No. (%) or median $\pm$ SD			P value
	Total (n = 116)	COVID-19 (n = 57)	Influenza A (n = 59)	
Male	74 (63.8)	35 (61.4)	39 (66.1)	0.599
Age (months)	20.2 $\pm$ 16.7	18.7 $\pm$ 16.7	21.8 $\pm$ 16.7	0.121
Severe pneumonia	13 (11.2)	2 (3.5)	11 (18.6)	0.016
Symptoms and signs				
Fever	81 (69.8)	31 (54.4)	50 (84.7)	<0.001
Highest temperature ( $^{\circ}$ C)	38.9 $\pm$ 0.7	38.5 $\pm$ 0.7	39.3 $\pm$ 0.6	<0.001
Cough	98 (84.5)	40 (70.2)	58 (98.3)	<0.001
Dyspnea	7 (6.0)	2 (3.5)	5 (8.5)	0.439
Gastrointestinal symptoms	29 (25)	8 (14.1)	21 (35.6)	0.007
Convulsions	4 (3.4)	1 (1.7)	3 (5.1)	0.619
Hospitalized treatment				
Oxygen inhalation	8 (6.9)	1 (1.7)	7 (11.8)	0.061
ICU	6 (5.2)	2 (3.5)	4 (6.7)	0.679

COVID-19, coronavirus disease 2019; No., number; SD, standard deviation; ICU, Intensive Care Unit.

Li Y, Wang H, Wang F et al. Comparison of hospitalized patients with pneumonia caused by COVID-19 and influenza A in children under 5 years. International Journal of Infectious Diseases 2020; 98: 80-83. DOI: <https://doi.org/10.1016/j.ijid.2020.06.026>

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## COVID-19

### Pre-Screening Tool for School Attendance

**Within the past 24 hours have you had a fever (100.4 and above\*) or used any fever reducing medicine?** YES =

**Do you feel sick with any of the most common symptoms of Covid, had vomiting/diarrhea, or felt unwell? (see symptom list to the right)** YES =

**Have you been a close contact of a person with Covid in the past 14 days?** YES =

**Have you traveled outside of the state in the past 14 days?** YES =

Contact Your School

*Stay home with any YES response to the questions above OR with two or more of the "less common" symptoms listed to the right.*

*Attend school when all answers are NO and your child is feeling well with no other symptoms of illness. Call or see your school nurse or other designated person at school if you have questions.*

Updated 9.3.20

**Most Common Symptoms of Covid 19:**

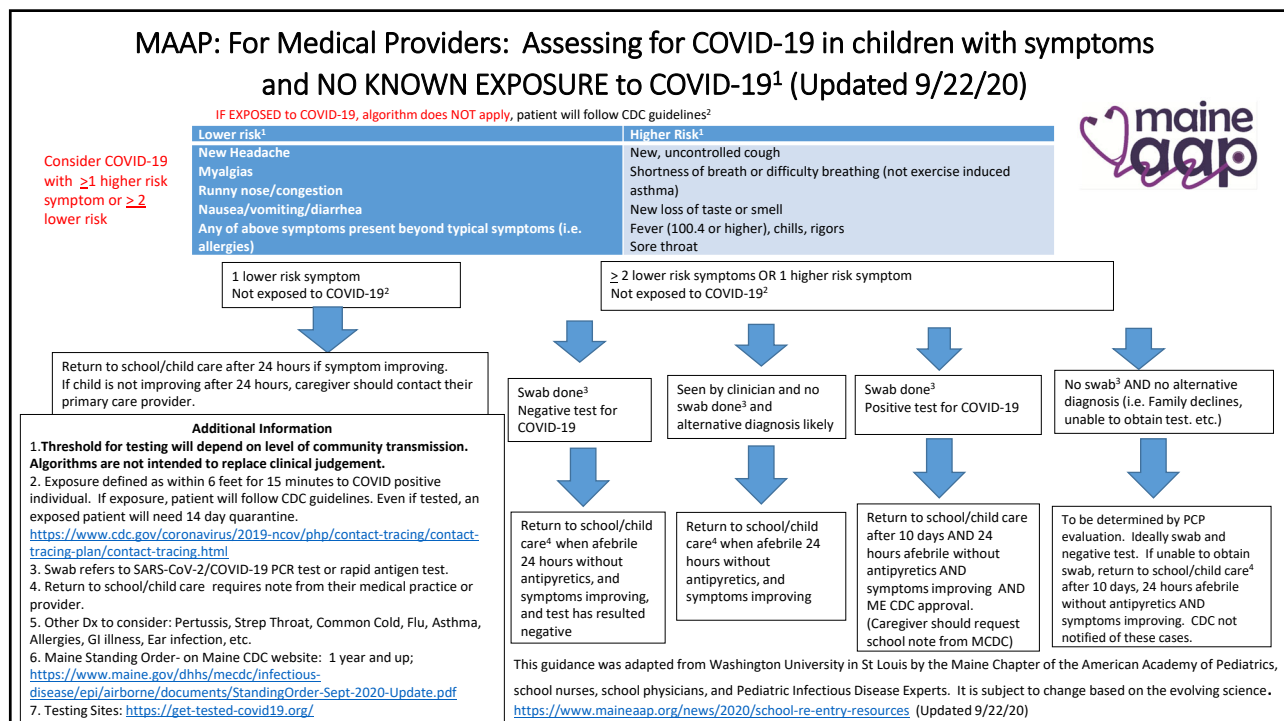
Cough  
Shortness of breath or difficulty breathing  
Fever (100.4°F/ 38 °C or greater)\*  
Chills  
Sore throat  
New loss of taste or smell

**Less Common Symptoms:**

Muscle pain  
Nausea or Vomiting  
Stomach pain  
Diarrhea  
Fatigue  
Headache  
Rash  
Swelling or redness of hands/feet  
Red eyes/eye drainage  
Congestion/runny nose

\*Fever is 100.4°F/ 38°C regardless of measurement location (oral, temporal).

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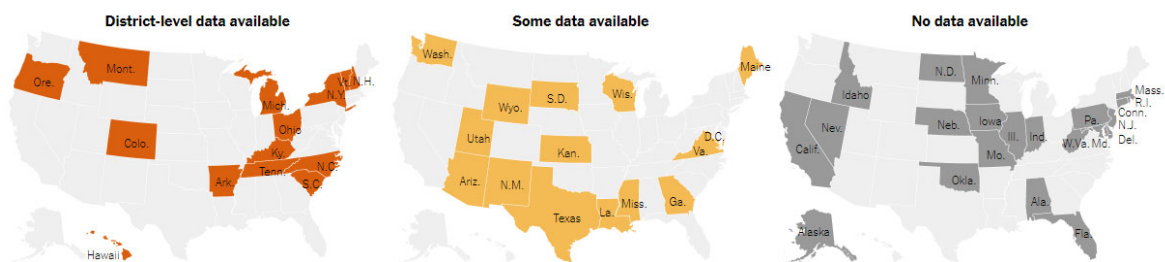
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## How are We Doing???



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## Current School Data



New Hampshire: 18 cases (6/193 districts)  
 Vermont: 3 cases (2/2 districts)

New York Times, September 21, 2020

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## Current School Data

### US DATA-n= 333

- Confirmed plus suspected infection rate, students: 0.23%
- Confirmed infection rate, students: 0.076%
- Confirmed plus suspected infection rate, staff: 0.51%
- Confirmed infection rate, staff: 0.15%

- 23% of schools in person, full capacity
- 49% in person reduced capacity/hybrid
- 27% remote learning only

- NPI's
  - 73% staff masks
  - 70% student masks
  - 71% at home screens
  - 46% 6 feet distance
  - 45% 3 feet distance
  - 83% fixed cohorts

Average of 239 cases/100,000 students  
Average of 490 cases/100,000 staff

### MAINE DATA-n=30

- Confirmed plus suspected infection rate, students: 0.18%
- Confirmed infection rate, students: 0.014%
- Confirmed plus suspected infection rate, staff: 0.23%
- Confirmed infection rate, staff: 0%

- 8% of schools in person, full capacity
- 92% of schools in person, reduced capacity/hybrid

- NPI's
  - 100% staff masks
  - 100% student masks
  - 100% at home screens
  - 70% 6 feet distance
  - 83% 3 feet distance
  - 83% fixed cohorts

[https://statsiq.co1.qualtrics.com/public-dashboard/v0/dashboard/5f62eae4451ae001535c839#/dashboard/5f62eae4451ae001535c839?pagelId=Page\\_1ac6a6bc-92b6-423e-9f7a-259a18648318](https://statsiq.co1.qualtrics.com/public-dashboard/v0/dashboard/5f62eae4451ae001535c839#/dashboard/5f62eae4451ae001535c839?pagelId=Page_1ac6a6bc-92b6-423e-9f7a-259a18648318)

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## Summary

- Severe disease in children appears less common
- Hospitalizations and pediatric mortality rates remain low
- Unclear degree to which children and adolescents transmit SARS-CoV-2
- Differentiation between COVID and other common pathogens will be difficult
- Necessity for national and local tracking and metrics
- Most important for children to continue to utilize NPI's-hand hygiene, distancing, masks, small cohorts, and ***influenza vaccine***

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## References

- Baggio S, L'Huickuer AG, Yerly S, et al. SARS-CoV-2 viral load in the upper respiratory tract of children and adults with early acute COVID-19. *CID*, 2020
- Bialek S, Gierke R, Hughes M, et al. Coronavirus disease 2019 in children-United States, February 12-April 2, 2020. *MMWR*. 6 April, 2020
- Bixler D, Miller AD, Mattison CP, et al. SARS-CoV-2–Associated Deaths Among Persons Aged <21 Years — United States, February 12–July 31, 2020. *MMWR Morb Mortal Wkly Rep* 2020;69:1324–1329. DOI: [http://dx.doi.org/10.15585/mmwr.mm6937e4external icon](http://dx.doi.org/10.15585/mmwr.mm6937e4external%20icon)
- Fateh-Moghadam P, Battisti L, Molinaro S, et al. Contact tracing during phase I of the COVID-19 pandemic in the province of Trento, Italy: key findings and recommendations <https://doi.org/10.1101/2020.07.16.20127357>
- Kim L, Whitaker M, O'Halloran A, et al. Hospitalization Rates and Characteristics of Children Aged <18 Years Hospitalized with Laboratory-Confirmed COVID-19 — COVID-NET, 14 States, March 1–July 25, 2020. *MMWR Morb Mortal Wkly Rep*. ePub: 7 August 2020. DOI: <http://dx.doi.org/10.15585/mmwr.mm6932e3>
- Leuzinger K, Roloff T, Gosert R, et al. Epidemiology of severe acute respiratory syndrome coronavirus 2 emergence amidst community acquired respiratory viruses. *Journal of Infectious Diseases* 2020; 222:1270-1279. DOI: 10.1093/infdis/jiaa464
- Li Y, Wang H, Wang F et al. Comparison of hospitalized patients with pneumonia caused by COVID-19 and influenza A in children under 5 years. *International Journal of Infectious Diseases* 2020; 98: 80-83. DOI: <https://doi.org/10.1016/j.ijid.2020.06.026>
- Park YJ, Choe YJ, Park O, Park SY, Kim YM, Kim J, et al. Contact tracing during coronavirus disease outbreak, South Korea, 2020. *Emerg Infect Dis*. 2020 Oct [July 27, 2020]. <https://doi.org/10.3201/eid2610.201315>
- Szablewski CM, Chang KT, Brown MM, et al. SARS-CoV-2 Transmission and Infection Among Attendees of an Overnight Camp — Georgia, June 2020. *MMWR Morb Mortal Wkly Rep* 2020;69:1023–1025. DOI: <http://dx.doi.org/10.15585/mmwr.mm6931e1>
- Yonker LM, Neilan AM, Bartsch Y et al., Pediatric SARS-CoV-2: Clinical presentation, infectivity, and immune response. *The Journal of Pediatrics*. 19 August 2020; DOI: <https://doi.org/10.1016/j.jpeds.2020.08.037>
- Zimmermann P and Curtis N. Covid-19 in children, pregnancy, and neonates: a review of epidemiologic and clinical features. *The Pediatric Infectious Disease Journal* 2020; 39: 469-477.