KRS 13A.190(1) Documentary Evidence for

702 KAR 1:195E Face Coverings in School Facilities

EXHIBIT 1

The documents in this exhibit highlight the alarming increase in COVID-19 cases and hospitalizations in children.

The Kentucky COVID-19 Report dated August 9, 2021 shows 269 new COVID-19 cases in individuals 18 and under in a single day. This represents 20.1% of the total new COVID-19 cases on this day.

The Kentucky Department for Public Health (DPH) Case Counts – June 1st to July 25th displays daily new COVID-19 cases for Kentuckians ages 17 and under from June 1, 2021 through July 25, 2021. The graph shows the increase in COVID-19 cases for that age group. Note that on weekends testing results are less available and may account for decreases that correspond to weekends.

The Centers for Disease Control and Prevention (CDC) New Admissions of Patients with Confirmed COVID-19 per 100,000 Population by Age Group, HHS Region 4, shows we are currently experiencing the highest level of hospitalization of individuals 0-17 years old throughout the entire course of the COVID-19 pandemic. In HHS region four (4), which includes Kentucky, there were 12,414 total COVID-19 hospital admissions of individuals aged 0-17 between August 1, 2021 and August 8, 2021.

KY COVID-19 Report
09AUG21

Daily Summary

Measure	Total	Confirmed	Probable
Cases	500,267	372,326	127,941
Deaths	7,387	6,621	766
New Cases	1,301	918	383
New Cases 18 and Under	269	188	81
Total New Deaths	7	5	2

Duplicates and records not meeting case criteria removed since last report: 0

Age Distribution

Cases	Case Percent	Age Group	Death Percent	Deaths
23,815	4.8%	0-9	0.0%	1
55,997	11.2%	10-19	0.0%	1
90,806	18.2%	20-29	0.2%	13
77,798	15.6%	30-39	0.6%	41
75,245	15.0%	40-49	2.2%	160
71,292	14.3%	50-59	6.3%	465
53,759	10.7%	60-69	17.4%	1,289
31,717	6.3%	70-79	27.5%	2,032
19,617	3.9%	80+	45.8%	3,385
221	0.0%	Unknown	0.0%	0

Race and Ethnicity Distribution

Cases	Case Percent	Race	Death Percent	Deaths
1,051	0.2%	American Indian	0.1%	8
4,415	1.0%	Asian	0.5%	37
34,779	8.3%	Black	8.0%	564
376	0.1%	Pacific Islander	0.1%	4
359,006	85.4%	White	88.9%	6,300
20,933	5.0%	Multiracial	2.4%	170

Cases	Case Percent	Ethnicity	Death Percent	Deaths
21,323	5.3%	Hispanic	1.6%	112
382,216	94.7%	Non-Hispanic	98.4%	6,727

Percentages are expressed as percentage of cases or deaths with race or ethnicity known
Race known for 84.1% of cases and 95.9% of deaths
Ethnicity known for 80.7% of cases and 92.6% of deaths

Current Positivity Rate

Positive PCRs	Total PCRs	Positivity Rate
8,411	77,990	10.78%

Positivity rate is calculated using electronically submitted PCRs from the past seven days.

Testing Type Summary

Total Tests	Total PCR Tests	Total Serology Tests	Total Antigen Tests	Total Positive Tests	Total PCR Positive	Total Serology Positive	Total Antigen Positive
7,377,430	5,782,418	353,702	1,092,092	613,087	438,245	38,966	135,876

Case Outcomes

Outcomes	Cases	Percent
Ever Hospitalized	24,671	4.93%
Ever ICU	4,997	1.00%

Current COVID-19 Hospital Census

Patient Type	Total
Hospitalized	1,139
ICU	331
On Ventilator	158

Current Overall Capacity

Resource	# Occupied	# Available	% Occupancy
Inpatient Beds	8,663	4,588	65.4%
ICU Beds	1,151	664	63.4%
Ventilators	546	1,486	26.9%

Current Regional Statistics

Region	COVID-19 Inpatient	COVID-19 ICU	COVID-19 on Ventilator	Inpatient Capacity Used for COVID-19	ICU Capacity Used for COVID-19	Ventilator Capacity Used for COVID-19	Inpatient Capacity in Use	ICU Capacity in Use	Ventilator Capacity in Use
Region 1	61	29	15	7.7%	28.4%	15.2%	61.87%	79.41%	23.23%
Region 2	77	22	13	9.3%	18.0%	14.8%	58.13%	52.46%	26.14%
Region 3	359	94	44	9.5%	17.6%	10.0%	69.53%	60.23%	34.24%
Region 4	72	24	9	8.5%	22.2%	8.0%	49.53%	66.67%	25.66%
Region 5	206	61	35	7.5%	14.7%	6.7%	74.21%	74.52%	36.92%
Region 6	64	14	6	5.0%	8.0%	1.8%	69.22%	41.71%	12.76%
Region 7	67	15	4	10.7%	23.4%	3.3%	64.91%	62.50%	8.26%
Region 8	129	33	18	10.8%	24.3%	12.2%	55.05%	67.65%	29.93%
Region 9	80	26	9	12.0%	22.8%	9.0%	60.81%	50.00%	16.00%
Region 10	24	13	5	5.1%	28.9%	7.6%	50.42%	91.11%	22.73%

Data is derived from the most recent report from facilities as of 12am. COVID-19 census numbers include both confirmed and suspected patients.
Red shading indicates regions with current inpatient, ICU, or ventilator capacity in use 80% or higher.

Region 1:
Ballard, Caldwell, Calloway, Carlisle, Crittenden, Fulton , Graves, Hickman, Livingston, Lyon, Marshall, McCracken, Trigg

Region 2:
Christian, Daviess, Hancock, Henderson, Hopkins, McLean, Muhlenberg, Ohio, Todd, Union, Webster

Region 3:
Breckinridge, Bullitt, Grayson, Hardin, Henry, Jefferson, LaRue, Marion, Meade, Nelson, Oldham, Shelby, Spencer, Trimble, Washington

Region 4:
Allen, Barren, Butler, Edmonson, Hart, Logan, Metcalfe, Monroe, Simpson, Warren

Region 5:
Anderson, Bourbon, Boyle, Clark, Estill, Fayette, Franklin, Garrard, Harrison, Jessamine, Lincoln, Madison, Mercer, Nicholas, Powell, Scott, Woodford

Region 6:
Boone, Bracken, Campbell, Carroll, Gallatin, Grant, Kenton, Owen, Pendleton

Region 7:
Bath, Boyd, Carter, Elliott, Fleming, Greenup, Lewis, Mason, Menifee, Montgomery, Morgan, Robertson, Rowan

Region 8:
Breathitt, Floyd, Johnson, Knott, Lawrence, Lee, Leslie, Letcher, Magoffin, Martin, Owsley, Perry, Pike, Wolfe

Region 9:
Bell, Clay, Harlan, Jackson, Knox, Laurel, Rockcastle, Whitley

Region 10:
Adair, Casey, Clinton, Cumberland, Green, McCreary, Pulaski, Russell, Taylor, Wayne

Total Cases by County

County	Cases	Percent
Jefferson	87,633	17.5%
Fayette	38,692	7.7%
Kenton	17,551	3.5%
Warren	17,528	3.5%
Boone	15,180	3.0%
Daviess	12,093	2.4%
Hardin	11,048	2.2%
Madison	10,243	2.0%
Campbell	9,151	1.8%
Laurel	8,599	1.7%
Oldham	8,066	1.6%
Bullitt	8,030	1.6%
Christian	7,484	1.5%
McCracken	7,422	1.5%
Pulaski	7,284	1.5%
Pike	6,510	1.3%
Scott	5,768	1.2%
Henderson	5,536	1.1%
Boyd	5,511	1.1%
Nelson	5,449	1.1%
Hopkins	5,369	1.1%
Shelby	5,157	1.0%
Jessamine	5,088	1.0%
Barren	5,013	1.0%
Graves	4,741	0.9%
Whitley	4,576	0.9%
Franklin	4,571	0.9%
Knox	4,228	0.8%
Greenup	4,051	0.8%
Floyd	4,044	0.8%

County	Cases	Percent
Calloway	3,957	0.8%
Boyle	3,750	0.7%
Muhlenberg	3,577	0.7%
Bell	3,402	0.7%
Taylor	3,398	0.7%
Clark	3,390	0.7%
Logan	3,315	0.7%
Marshall	3,251	0.6%
Clay	3,222	0.6%
Harlan	3,160	0.6%
Montgomery	3,111	0.6%
Perry	3,078	0.6%
Mercer	2,831	0.6%
Carter	2,764	0.6%
Ohio	2,754	0.6%
Grant	2,730	0.5%
Lincoln	2,627	0.5%
Marion	2,538	0.5%
Grayson	2,466	0.5%
Rowan	2,425	0.5%
Woodford	2,424	0.5%
Morgan	2,368	0.5%
Hart	2,345	0.5%
Simpson	2,317	0.5%
Johnson	2,315	0.5%
Wayne	2,296	0.5%
Allen	2,288	0.5%
Letcher	2,276	0.5%
Meade	2,265	0.5%
Adair	2,121	0.4%

County	Cases	Percent
McCreary	2,077	0.4%
Anderson	1,972	0.4%
Russell	1,961	0.4%
Bourbon	1,924	0.4%
Harrison	1,921	0.4%
Mason	1,845	0.4%
Spencer	1,816	0.4%
Rockcastle	1,755	0.4%
Garrard	1,650	0.3%
Casey	1,647	0.3%
Webster	1,645	0.3%
Washington	1,642	0.3%
Union	1,625	0.3%
Lyon	1,604	0.3%
Caldwell	1,587	0.3%
Lawrence	1,578	0.3%
Butler	1,561	0.3%
Henry	1,553	0.3%
Jackson	1,550	0.3%
Lewis	1,512	0.3%
Breckinridge	1,498	0.3%
Clinton	1,495	0.3%
Larue	1,479	0.3%
Powell	1,420	0.3%
Monroe	1,417	0.3%
Trigg	1,376	0.3%
Fleming	1,359	0.3%
Lee	1,326	0.3%
Green	1,325	0.3%
Knott	1,312	0.3%

County	Cases	Percent
Todd	1,265	0.3%
Estill	1,253	0.3%
Metcalfe	1,199	0.2%
Martin	1,157	0.2%
Pendleton	1,148	0.2%
Breathitt	1,125	0.2%
Magoffin	1,119	0.2%
Carroll	1,103	0.2%
Bath	1,102	0.2%
Leslie	1,063	0.2%
Elliott	1,019	0.2%
Edmonson	982	0.2%
Livingston	977	0.2%
McLean	971	0.2%
Hancock	967	0.2%
Owen	811	0.2%
Gallatin	793	0.2%
Trimble	767	0.2%
Crittenden	739	0.1%
Cumberland	725	0.1%
Bracken	723	0.1%
Nicholas	628	0.1%
Wolfe	579	0.1%
Fulton	560	0.1%
Owsley	534	0.1%
Carlisle	518	0.1%
Menifee	516	0.1%
Ballard	450	0.1%
Hickman	410	0.1%
Robertson	246	0.0%

Total Cases
500,267

New Cases by County

County	Cases	Percent
Jefferson	197	15.1%
Laurel	59	4.5%
Warren	54	4.2%
Hardin	40	3.1%
Daviess	34	2.6%
Hopkins	33	2.5%
Kenton	33	2.5%
Fayette	31	2.4%
Graves	29	2.2%
Grayson	28	2.2%
Logan	26	2.0%
Bullitt	23	1.8%
Floyd	23	1.8%
McCracken	23	1.8%
Barren	22	1.7%
Calloway	22	1.7%
Clay	22	1.7%
Boone	20	1.5%
Madison	20	1.5%
Shelby	19	1.5%
Campbell	18	1.4%
Henry	17	1.3%
Hart	16	1.2%
Mercer	16	1.2%
Nelson	16	1.2%
Jessamine	15	1.2%
Muhlenberg	15	1.2%
Pike	15	1.2%
Ohio	14	1.1%
Perry	14	1.1%

County	Cases	Percent
Greenup	13	1.0%
Harrison	13	1.0%
Casey	12	0.9%
Christian	12	0.9%
Franklin	12	0.9%
Whitley	12	0.9%
Montgomery	11	0.8%
Carter	10	0.8%
Lincoln	10	0.8%
Bell	9	0.7%
Marion	9	0.7%
Oldham	9	0.7%
Rowan	9	0.7%
Union	9	0.7%
Washington	9	0.7%
Woodford	9	0.7%
Boyd	8	0.6%
Marshall	8	0.6%
Meade	8	0.6%
Pulaski	8	0.6%
Boyle	7	0.5%
Knox	7	0.5%
Taylor	7	0.5%
Butler	6	0.5%
Cumberland	6	0.5%
Henderson	6	0.5%
Scott	6	0.5%
Spencer	6	0.5%
Clark	5	0.4%
Fleming	5	0.4%

County	Cases	Percent
Green	5	0.4%
Jackson	5	0.4%
Johnson	5	0.4%
Letcher	5	0.4%
Adair	4	0.3%
Ballard	4	0.3%
Bourbon	4	0.3%
Breathitt	4	0.3%
Caldwell	4	0.3%
Carlisle	4	0.3%
Edmonson	4	0.3%
Estill	4	0.3%
Martin	4	0.3%
Metcalfe	4	0.3%
Wolfe	4	0.3%
Breckinridge	3	0.2%
Carroll	3	0.2%
Clinton	3	0.2%
McLean	3	0.2%
Mason	3	0.2%
Powell	3	0.2%
Todd	3	0.2%
Trimble	3	0.2%
Wayne	3	0.2%
Allen	2	0.2%
Anderson	2	0.2%
Bath	2	0.2%
Grant	2	0.2%
Hancock	2	0.2%
Knott	2	0.2%

County	Cases	Percent
Larue	2	0.2%
Lawrence	2	0.2%
Leslie	2	0.2%
McCreary	2	0.2%
Menifee	2	0.2%
Monroe	2	0.2%
Webster	2	0.2%
Bracken	1	0.1%
Elliott	1	0.1%
Gallatin	1	0.1%
Garrard	1	0.1%
Livingston	1	0.1%
Lyon	1	0.1%
Nicholas	1	0.1%
Pendleton	1	0.1%
Simpson	1	0.1%
Crittenden	0	0.0%
Fulton	0	0.0%
Harlan	0	0.0%
Hickman	0	0.0%
Lee	0	0.0%
Lewis	0	0.0%
Magoffin	0	0.0%
Morgan	0	0.0%
Owen	0	0.0%
Owsley	0	0.0%
Robertson	0	0.0%
Rockcastle	0	0.0%
Russell	0	0.0%
Trigg	0	0.0%

Total New Cases
1,301

Total Deaths by County

County	Deaths	Percent
Jefferson	1,353	18.3%
Fayette	319	4.3%
Kenton	210	2.8%
Daviess	202	2.7%
Warren	194	2.6%
Hardin	174	2.4%
Hopkins	154	2.1%
Boone	151	2.0%
McCracken	136	1.8%
Pulaski	118	1.6%
Madison	113	1.5%
Pike	113	1.5%
Christian	108	1.5%
Barren	106	1.4%
Graves	99	1.3%
Harlan	93	1.3%
Oldham	85	1.2%
Bullitt	84	1.1%
Laurel	82	1.1%
Boyle	80	1.1%
Campbell	80	1.1%
Henderson	80	1.1%
Shelby	79	1.1%
Boyd	77	1.0%
Floyd	75	1.0%
Jessamine	75	1.0%
Logan	74	1.0%
Muhlenberg	70	0.9%
Perry	66	0.9%
Marshall	64	0.9%

County	Deaths	Percent
Greenup	63	0.9%
Nelson	63	0.9%
Whitley	63	0.9%
Lincoln	61	0.8%
Franklin	60	0.8%
Bell	58	0.8%
Grayson	58	0.8%
Ohio	56	0.8%
Hart	55	0.7%
Adair	54	0.7%
Taylor	53	0.7%
Mercer	52	0.7%
Calloway	51	0.7%
Wayne	48	0.6%
Allen	47	0.6%
Knox	47	0.6%
Letcher	47	0.6%
Clay	46	0.6%
Russell	46	0.6%
Monroe	44	0.6%
Simpson	44	0.6%
Lewis	42	0.6%
Washington	41	0.6%
Mason	40	0.5%
Casey	39	0.5%
Marion	39	0.5%
Carter	37	0.5%
Garrard	37	0.5%
Johnson	37	0.5%
Scott	36	0.5%

County	Deaths	Percent
Gallatin	34	0.5%
McCreary	34	0.5%
Caldwell	32	0.4%
Clark	32	0.4%
Jackson	32	0.4%
Clinton	31	0.4%
Metcalfe	31	0.4%
Montgomery	30	0.4%
Larue	29	0.4%
Lawrence	29	0.4%
McLean	29	0.4%
Butler	28	0.4%
Todd	28	0.4%
Harrison	27	0.4%
Meade	27	0.4%
Lee	26	0.4%
Spencer	26	0.4%
Crittenden	25	0.3%
Edmonson	25	0.3%
Fleming	25	0.3%
Knott	25	0.3%
Livingston	25	0.3%
Webster	25	0.3%
Anderson	24	0.3%
Bath	24	0.3%
Rockcastle	24	0.3%
Grant	22	0.3%
Lyon	22	0.3%
Rowan	22	0.3%
Woodford	22	0.3%

County	Deaths	Percent
Carroll	21	0.3%
Bourbon	20	0.3%
Henry	20	0.3%
Martin	20	0.3%
Breckinridge	18	0.2%
Magoffin	18	0.2%
Union	18	0.2%
Green	17	0.2%
Menifee	17	0.2%
Fulton	16	0.2%
Hickman	16	0.2%
Owsley	16	0.2%
Hancock	15	0.2%
Trigg	15	0.2%
Robertson	14	0.2%
Owen	13	0.2%
Powell	13	0.2%
Cumberland	12	0.2%
Estill	12	0.2%
Breathitt	11	0.1%
Ballard	10	0.1%
Carlisle	10	0.1%
Leslie	9	0.1%
Nicholas	9	0.1%
Bracken	8	0.1%
Trimble	8	0.1%
Wolfe	7	0.1%
Morgan	5	0.1%
Pendleton	4	0.1%
Elliott	2	0.0%

Total Deaths
7,387

Incidence Rates by County

Average daily new cases per 100,000 population based on previous seven days

County	Rate
Clay	134.2
Webster	99.3
Logan	95.4
Hart	90.8
Laurel	90.2
Union	86.4
Washington	85.0
Metcalfe	80.9
Montgomery	80.7
Floyd	79.1
Carter	76.2
Jackson	72.9
Henry	70.0
Marshall	68.4
Henderson	66.7
Whitley	65.8
Barren	65.2
Leslie	62.2
Spencer	62.0
Johnson	61.8
Mercer	61.2
Letcher	61.0
Daviess	60.8
Pike	60.2
Perry	59.3
Nelson	58.4
Muhlenberg	58.3
Caldwell	57.2
Hardin	55.2
Bell	54.9

County	Rate
Calloway	54.2
Carlisle	54.0
Monroe	53.7
Knox	53.2
Hopkins	53.1
Graves	52.9
Clark	52.4
Harlan	52.2
Marion	51.9
Larue	51.6
Shelby	50.7
Fleming	50.0
Grayson	49.7
Boyle	49.4
Magoffin	49.3
Butler	48.8
Breckinridge	48.1
Todd	47.6
Powell	47.4
Franklin	47.3
Warren	46.8
Boyd	46.5
Greenup	46.4
Bourbon	46.2
Allen	45.6
Casey	45.1
McLean	45.0
Martin	44.7
Hancock	44.2
Pendleton	44.1

County	Rate
Wolfe	43.9
Trimble	43.8
Bracken	43.0
Ohio	42.9
Taylor	42.7
McCracken	42.6
Lewis	42.0
Menifee	41.8
Pulaski	41.3
Cumberland	41.0
Lincoln	40.7
Anderson	39.6
Green	37.9
Carroll	37.6
Jessamine	37.0
Bullitt	36.9
Owen	36.7
Madison	36.6
Edmonson	36.4
Woodford	36.3
Fayette	36.0
Jefferson	35.9
Livingston	35.7
Knott	35.7
Breathitt	35.1
Ballard	34.4
Lawrence	33.6
Adair	33.5
Rockcastle	33.4
Scott	32.6

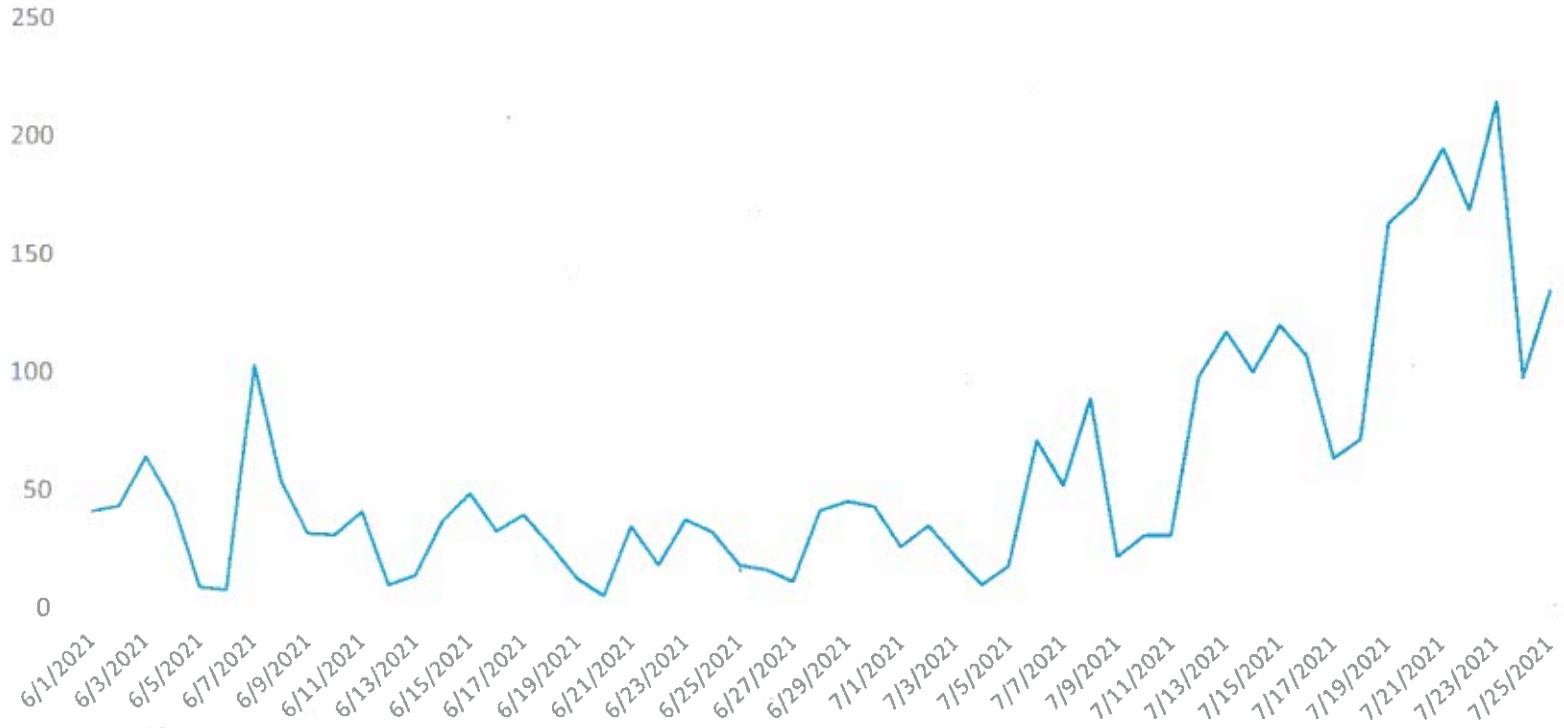
County	Rate
Estill	32.4
Owsley	32.4
Harrison	31.8
Grant	31.3
Rowan	31.0
Christian	30.8
Meade	30.5
Boone	29.9
Elliott	28.5
Mason	28.5
Oldham	27.6
Clinton	26.6
Simpson	26.2
Gallatin	25.8
Kenton	23.7
Garrard	23.5
Lyon	22.6
Morgan	22.5
McCreary	22.4
Campbell	22.3
Bath	21.7
Wayne	20.4
Robertson	20.3
Russell	19.1
Nicholas	17.7
Crittenden	13.0
Lee	11.6
Hickman	9.8
Fulton	7.2
Trigg	6.8

Current Overall Incidence Rate
43.83 per 100k population

The average daily incidence rates are calculated using the number of cases with an investigation start date in the previous seven days and a specimen collection date or onset date less than 14 days prior to the investigation start date. Populations used for the rate calculation are the 2019 estimates from the US Census Bureau.

Case Counts - June 1st to July 25th*

Includes cases ages 17 & Under**



New Admissions of Patients with Confirmed COVID-19 per 100,000 Population by Age Group, HHS Region 4

Aug 01, 2020 - Aug 08, 2021

HHS Region 4 | 0 - 17 Years

12,414
Total Admissions
Aug 01, 2020 - Aug 08, 2021

96
Current 7-Day Average
Aug 02, 2021 - Aug 08, 2021

72
Prior 7-Day Average
Jul 26, 2021 - Aug 01, 2021

96
Peak 7-Day Average
Aug 01, 2021 - Aug 07, 2021

+33.7%
Percent change from prior 7-day avg. of Jul 26, 2021 - Aug 01, 2021

-0.4%
Percent change from peak 7-day avg. of Aug 01, 2021 - Aug 07, 2021

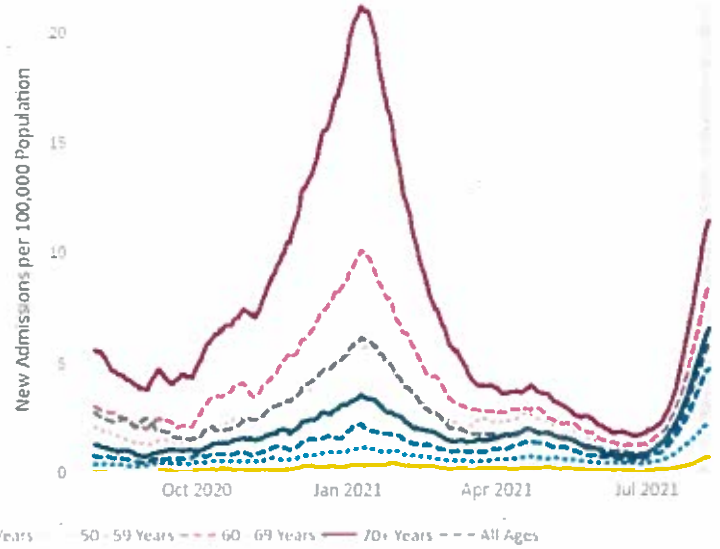
By Jurisdiction | By Jurisdiction and Age Group

Select a Jurisdiction: HHS Region 4

Select an Age Group: 0 - 17 Years

HHS Region 4 | 0 - 17 Years

HHS Region 4 | All Age Groups



Age Group — 0 - 17 Years · 18 - 29 Years · 30 - 39 Years — 40 - 49 Years · 50 - 59 Years · 60 - 69 Years — 70+ Years · All Ages

Based on reporting from all hospitals (N=3,251). Due to potential reporting delays, data reported in the most recent 7 days (as represented by the shaded bar) should be interpreted with caution.

Small shifts in historic data may occur due to changes in the CMS Provider of Services file, which is used to identify the cohort of included hospitals. Data since December 1, 2020 have had error correction methodology applied. Data prior to this date may have anomalies that are still being resolved. Note that the above graphs are often shown on different scales. Data prior to August 1, 2020 are unavailable.

Last Updated: Aug 10, 2021

Unified Hospital Dataset, White House COVID-19 Team: Data Strategy and Execution Workgroup

EXHIBIT 2

The document in this exhibit, dated August 6, 2021 and published by the Centers for Disease Control and Prevention (CDC) explains the science related to the COVID-19 Delta variant. In this exhibit the CDC indicates the Delta variant is highly contagious, nearly twice as contagious as previous variants, and that patients are more likely to experience severe illness. The CDC document concludes: "Given what we know about the Delta variant, vaccine effectiveness, and current vaccine coverage, layered prevention strategies, such as wearing masks, are needed to reduce the transmission of this variant."

CDC Centers for Disease Control and Prevention

COVID-19

To maximize protection from the Delta variant and prevent possibly spreading it to others, wear a mask indoors in public if you are in an area of substantial or high transmission.

Delta Variant: What We Know About the Science

Updated Aug. 6, 2021 Print

On July 27, 2021, CDC released updated guidance on the need for urgently increasing COVID-19 vaccination coverage and a recommendation for everyone in areas of substantial or high transmission to wear a mask in public indoor places, even if they are fully vaccinated. CDC issued this new guidance due to several concerning developments and newly emerging data signals. First is a reversal in the downward trajectory of cases. In the days leading up to our guidance update, CDC saw a rapid and alarming rise in the COVID case and hospitalization rates around the country.

- In late June, our 7-day moving average of reported cases was around 12,000. On July 27, the 7-day moving average of cases reached over 60,000. This case rate looked more like the rate of cases we had seen before the vaccine was widely available.

Second, new data began to emerge that the Delta variant was more infectious and was leading to increased transmissibility when compared to other variants, even in vaccinated individuals. This includes recently published data from CDC and our public health partners, unpublished surveillance data that will be publicly available in the coming weeks, information included in CDC's updated Science Brief on COVID-19 Vaccines and Vaccination, and ongoing outbreak investigations linked to the Delta variant.

Delta is currently the predominant strain of the virus in the United States. Below is a high-level summary of what CDC scientists have recently learned about the Delta variant. More information will be made available when more data are published or released in other formats.

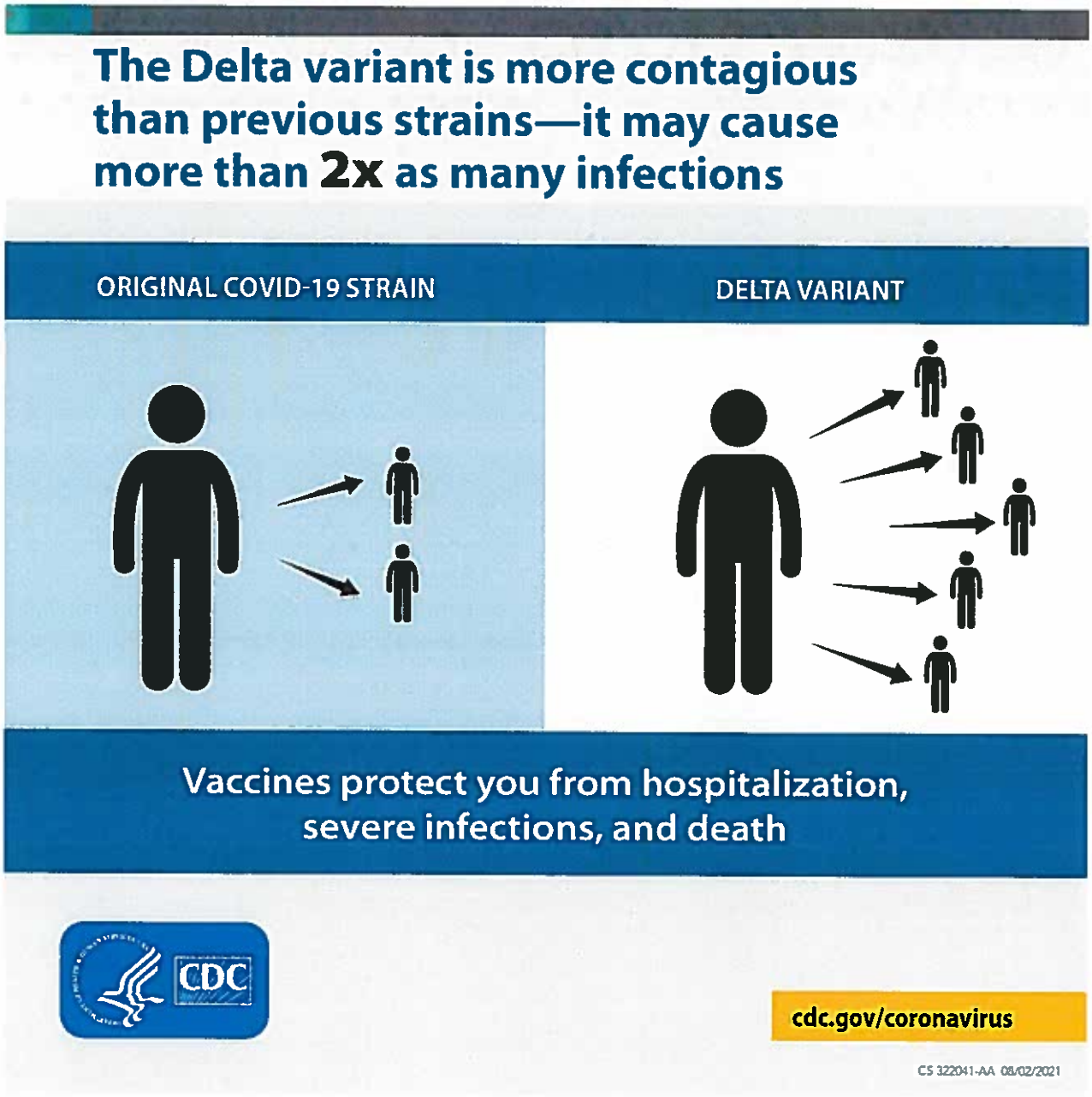
Infections and Spread

The Delta variant causes more infections and spreads faster than early forms of SARS-CoV-2

- **The Delta variant is more contagious:** The Delta variant is highly contagious, nearly twice as contagious as previous variants.
- **Some data suggest the Delta variant might cause more severe illness than previous strains in unvaccinated persons.** In two different studies from Canada and Scotland, patients infected with the Delta variant were more likely to be hospitalized than patients infected with Alpha or the original virus strains.
- **Unvaccinated people remain the greatest concern:** Although breakthrough infections happen much less often than infections in unvaccinated people, individuals infected with the Delta variant, including fully vaccinated people with symptomatic breakthrough infections, can transmit it to others. CDC is continuing to assess data on whether fully vaccinated people with asymptomatic breakthrough infections can transmit. However, the greatest risk of transmission is among unvaccinated people who are much more likely to contract, and therefore transmit the virus.
- **Fully vaccinated people with Delta variant breakthrough infections can spread the virus to others. However, vaccinated people appear to be infectious for a shorter period:** Previous variants typically produced less virus in the body of infected fully vaccinated people (breakthrough infections) than in unvaccinated people. In contrast, the Delta variant seems to produce the same high amount of virus in both unvaccinated and fully vaccinated people. However, like other variants, the amount of virus produced by Delta breakthrough infections in fully vaccinated people also goes down faster than infections in unvaccinated people. This means fully vaccinated people are likely infectious for less time than unvaccinated people.

Vaccines

Vaccines in the US are highly effective, including against the Delta variant



View Larger

The COVID-19 vaccines authorized in the United States are highly effective at preventing severe disease and death, including against the Delta variant. But they are not 100% effective and some fully vaccinated people will become infected (called a breakthrough infection) and experience illness. For such people, the vaccine still provides them strong protection against serious illness and death.

Masks

Given what we know about the Delta variant, vaccine effectiveness, and current vaccine coverage, layered prevention strategies, such as wearing masks, are needed to reduce the transmission of this variant

- At this time, as we build the level of vaccination nationwide, we must also use all the prevention strategies available, including masking indoors in public places, to stop transmission and stop the epidemic.
- Vaccines are playing a crucial role in limiting spread of the virus and minimizing severe disease. Although vaccines are highly effective, they are not perfect and there will be vaccine breakthrough infections. Millions of Americans are vaccinated, and that number is growing. This means that even though the risk of breakthrough infections is low, there will be thousands of fully vaccinated people who become infected and able to infect others, especially with the surging spread of the Delta variant. Low vaccination coverage in many communities is driving the current rapid and large surge in cases associated with the Delta variant, which also increases the chances that even more concerning variants could emerge.

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Last Updated Aug 6, 2021

EXHIBIT 3

The documents contained in this exhibit are made of up news articles highlighting the transmission of COVID-19 in K-12 school settings, as well as mass quarantine and school closures, when universal face coverings are not required.

A WBKO Bowling Green article dated August 10, 2021 indicates 95 active student COVID-19 cases in the school district, and over 700 students and staff members quarantined. The district superintendent is quoted, saying "What we do know – that if we had started school with the face coverings, we could have reduced the number of quarantines obviously [...]"

A WTHR Indianapolis article dated August 2, 2021 highlights a surge of COVID-19 cases in Anderson, Indiana less than one week into the school year. The article highlights over 100 elementary students quarantined in the first four days of school. The school district did not require universal masking.

A FOX5 Atlanta article dated August 2, 2021 details two Cobb County, Georgia schools that did not require face coverings notifying parents of possible COVID-19 exposure before classes started as a result of families attending a school preview day.

A WCNC Charlotte article dated August 2, 2021 indicates more than 150 students and staff at a North Carolina charter school must quarantine after 14 positive COVID-19 cases among elementary aged students. The school opened July 26, 2021 and did not require universal masking prior to the COVID-19 outbreak.

An August 10, 2021 New York Times essay by Dr. Kanecia Zimmerman, Associate Professor of Pediatrics at Duke University School of Medicine, and Dr. Danny Benjamin, Pediatric Infectious Disease Specialist at Duke Health, highlights research in North Carolina involving more than one million students and staff members in schools from March to June, 2021. "During that time, more than 7,000 children and adults acquired the coronavirus and attended school while infectious. Because of close contact with those cases, more than 40,000 people required quarantine. Through contact tracing and testing, however, [Drs. Zimmerman and Benjamin] found only 363 additional children and adults acquired the coronavirus." Drs. Zimmerman and Benjamin conclude that the low rate of transmission occurred because both the infected person and close contact wore masks. "Schools provided this protection without expensive screening tests for the coronavirus or massive overhauls of ventilation systems." During the period of study, North Carolina had a mask mandate for all K-12 schools.

Over 700 students, staff in quarantine at WCPS prompts mask requirement

By Kelly Dean

Published: Aug. 10, 2021 at 3:05 PM EDT | Updated: 20 hours ago

BOWLING GREEN, Ky. (WBKO) - According to Warren County Public Schools, over 700 students and staff members among 24 schools are in quarantine following COVID exposures. Monday's data indicates there are 95 active student cases within the district.

Superintendent Rob Clayton says the high number of cases and quarantines in a short amount of time prompted the district to implement a mask requirement which begins Wednesday.

"What we do know-- that if we had started school with the face coverings, we could have reduced the number of quarantines obviously, there's no way for us to verify specifically what that number would be," said Clayton.

The mask requirement will be in effect until Labor Day.

CORONAVIRUS

Anderson schools quarantine more than 100 students because of COVID cases

Anderson is "mask optional" this year, meaning masks are encouraged but not required.

Dozens of Anderson students quarantined because of COV...

Author: Jennie Runevitch
Published: 4:45 PM EDT August 2, 2021
Updated: 8:31 PM EDT August 2, 2021

ANDERSON, Ind. — There's already a surge in COVID cases less than a week into the school year in Anderson.

The district started back to class last Wednesday, and by Monday, had to quarantine six classrooms in four different schools because students may have been exposed to COVID-19.

Less than a week into third grade, and Wyatt Garrett is already back home.

His whole class at Eastside Elementary is quarantined because of exposure to a COVID-19 positive student. His mom got the call Monday morning to pick him up from school, go home and get him tested.

"They said Wyatt had been potentially exposed in his classroom as of the first day of school last week and that he needs to quarantine for ten days," Taylor Garrett said.

He's not alone. Lots of parents in Anderson got the same message.

Anderson Community Schools learned about the first positive case on Friday. Then five more classrooms got quarantined on Monday.

This affects well over 100 kids at Anderson Intermediate, Eastside Elementary, Valley Grove Elementary and 10th Street Elementary: six classrooms in four different buildings, just four days into the school year.

Affected students will go to virtual learning during quarantine.

"I feel like on the fourth day of school, and you're quarantining six separate classrooms, that should be a red flag," Garrett said.

RELATED: IPS begins new school year with masks required in school

Brad Meadows, Anderson Community Schools' director for district and community engagement, said some high school students are under quarantine, too, after positive cases and contact tracing at Anderson High School.

"This is the same plan we put in place in February when we came back to school, to ensure that if there is a positive case, that we're doing all we can to ensure that it's not being spread," Meadows said. "At the elementary, we quarantine the entire class, because they're in that class all day and we're able to keep the teacher and transition to virtual learning and so there's some good continuity there. We do have had some other positive cases at the high school. Since they're not in the same class every day, we're doing contact tracing and making sure the folks who are in close contact are also being quarantined in addition to the students that tested positive."

Anderson is "mask optional" this year, meaning masks are encouraged but not required. School leaders say even with the spike in cases, there's no plan yet to change that.

But some parents say a surge in cases so early is cause for concern.

"This is the fourth day of school and he's being sent home. It just makes me feel a little more nervous about the no mask situation. I think that we kind of removed that a little too soon. I

think that students and staff should still be wearing masks in the classroom, I don't think it should be an optional decision there," Garrett said.

"I think it's something that we're looking at," Meadows said. "At this time we're not going in that direction but it doesn't mean that, you know, down the line we couldn't consider something like that."

RELATED: 70% of American adults have at least started COVID vaccination process

Meanwhile, more than 100 kids, including Garrett's son, will spend the next ten days at home.

"I'd rather send my kid in a mask than have this happen," Garrett said.

Anderson Schools would not share the total number of positive cases right now, saying that will come out on their dashboard on Friday. Last Friday, they had 11 positive cases, just a few days into the school year.

"I'd say the numbers are pretty consistent with what we saw last year when we returned and again you know the number of cases is still relatively low," Meadows said.

School leaders also have a message for families, to keep everyone safe and healthy.

"If you've got a child that's been that's not feeling well, make sure to keep them home," Meadows said. "If it's COVID-like symptoms, get tested."

What other people are reading:

- Murder inside Marion County Jail: How an inmate was targeted and killed in 3 hours
- Federal appeals court rules to not block IU's COVID-19 vaccine requirement while case plays out in court
- Colts quarterback Carson Wentz to get foot surgery
- Pike Township coach remembered for positive impact on students after possible drowning at Geist Reservoir
- Target to require masks for employees in areas at higher COVID-19 risk

Parents concerned after possible COVID-19 exposure at Cobb County back-to-school event

By Laura Neal | Published August 2 | Cobb County | FOX 5 Atlanta

Schools reporting positive cases as students head back to class

Some Cobb County parents say they're now concerned after several positive coronavirus tests were reported at back-to-school events the week before classes began again.

COBB COUNTY, Ga. - Notifications went out to families at two Cobb County elementary schools to let them know they may have come in contact with someone with COVID-19 at the Thursday "Sneak a Peek". Two schools were notified: Teasley and King Springs Elementary schools. The memo reads "several" families in attendance that day tested positive for the virus.

Those who attended similar events hosted by Cobb County Schools told FOX 5 they saw few families wearing masks and it was discouraging.

"None of the students at his school are age-eligible," says Cobb County parent Mindy Seger. "So none of our youngest learners have that strongest layer of protection so we have to do other things that we can do for them."

Seger has a son who will start first grade Monday. He spent his entire Kindergarten year doing virtual learning, but now mom says he needs to be face to face.

"He needs that full emergence school environment but he also needs to do that safely," says Seger.

Seger tells FOX 5's Laura Neal that she was shocked to see hardly any of the teachers and staff wearing masks, let alone the families. Masks are not mandatory in Cobb County Schools. In the memo that went out to families, they ask that everyone be "diligent in monitoring your children every day for symptoms."

"When I walked in on Thursday I was shocked," said Cherish Burnham, another Cobb County mom. " I said something to an administrator, several teachers."

Burnham says she also wrote emails to the superintendent and some school board members. Last year, Burnham first put her triplet sons in virtual learning. When they weren't thriving there, she pulled them and did homeschooling.

"That's one of the silver linings. I love our teachers! I can not homeschool them. I love their classrooms and I love their teachers ... I can't give that up," said Burnham.

School begins Monday for Cobb County. All families were given the option to do in-person or virtual learning.

WATCH: FOX 5 Atlanta live news coverage

SHOW TRANSCRIPT

North Carolina charter school requiring masks after at least 14 COVID-19 cases during first week of school

WXII 12

Updated: 11:26 PM EDT Aug 2, 2021

WXII12.com Web Staff

MONROE, N.C. — More than 150 students and staff at a North Carolina charter school are quarantining after a COVID-19 outbreak, NBC affiliate WCNC reports.

Union Academy Charter School in Monroe saw at least 14 positive COVID-19 cases during its first week of school. The school's headmaster told WCNC most of the cases are among elementary-aged students, but there are cases across the board.

Administrators said in a press release that the school has 14 active COVID-19 cases and more than 150 students and staff quarantined due to exposure. The school reopened July 26, following its long-established modified year-round calendar.

Masks were originally optional for Union Academy students before the outbreak, according to WCNC.

Union Academy sent a letter to parents on Sunday the universal mask mandate will remain in place until the next board meeting on Sept. 2.

Parent Mike Stack told WCNC his daughter was going to wear a mask regardless. But he didn't expect numerous cases within the first week of school.

"I would have just hoped that with delta and the things we've been hearing the last few weeks, they would have went with masks instead of having to back track," Stack said.

Stack also said he thought more safeguards would be put in place at Union Academy after the school lost a teacher to COVID-19 last year.

"When the school was in the position we were in, having lost a staff member, now there are cases rising, I think you know that the focus should be on keeping everyone safe and healthy," Stack said.

North Carolina: Hundreds quarantined after COVID-19 outbreak at school

The New York Times https://www.nytimes.com/2021/08/10/opinion/covid-schools-masks.html

GUEST ESSAY

We Studied One Million Students. This Is What We Learned About Masking.

Aug. 10, 2021

By Kanecia Zimmerman and Danny Benjamin Jr.
Dr. Zimmerman is an associate professor of pediatrics at the Duke University School of Medicine. Dr. Benjamin is a pediatric-infectious-disease specialist at Duke Health.

Big questions loom over the upcoming back-to-school season: Should children be required to wear masks? Should children go to in-person classes at all?

If we send children to school without masks, we increase their risk of acquiring Covid-19. Some could suffer illness or die. If we close schools, millions of children will suffer learning loss, and many of them may suffer lifelong effects on their physical and mental health.

For more than a year, we've worked with North Carolina school districts and charter schools, studying the rate of new Covid cases, the efficacy of mitigation measures such as masking and the increased risks of participating in school-sponsored sports. We have learned a few things for certain: Although vaccination is the best way to prevent Covid-19, universal masking is a close second, and with masking in place, in-school learning is safe and more effective than remote instruction, regardless of community rates of infection.

Vaccination is the strongest method for preventing the ill effects of Covid, but students under 12 years of age are ineligible for the vaccines. Masking, then, is one of the best, most readily available methods to protect them from the disease, with universal masking being one of the most effective and efficient strategies for preventing SARS-CoV-2 transmission in schools.

Universal masking in schools can save lives. Voluntary masking in schools will likely be much less effective and could lead to school closures and community transmission. This summer, we've seen that voluntary masking has failed in some schools in Missouri and North Carolina, which saw increases in Covid-19 cases and days missed because of quarantines, prompting several districts to reinstate mask mandates.

OPINION CONVERSATION

Questions surrounding the Covid-19 vaccine and its rollout.

- **Is the pandemic getting worse again?**
  Aaron E. Carroll, the chief health officer for Indiana University, writes that the answer depends on whether you are vaccinated.
- **Are new mask mandates a good idea?**
  Jennifer B. Nuzzo and Beth Blauer, health experts at Johns Hopkins, examine three important questions about masking rules.
- **What do you say to a friend who doesn't want the vaccine?**
  Our chatbot, developed with experts, tackles this thorny conversation.
- **Should we get vaccine booster shots, and when?**
  While it's not yet clear boosters are truly needed, Elizabeth Rosenthal explores why the F.D.A. is likely to approve them for use.

How do we know that masking helps prevent spread among unvaccinated people in schools? In July 2020, we and our colleagues developed the ABC Science Collaborative to pair scientists with school and community leaders to make sure that school leaders had the most up-to-date, scientific information pertaining to Covid-19 and K-12 schools. In conjunction with North Carolina, the ABC Science Collaborative collected data from more than one million students and staff members in the state's schools from March to June 2021. Certain school districts in North Carolina were required, by bipartisan legislation, to submit infection data to the ABC Science Collaborative as a trusted third party.

During that time, more than 7,000 children and adults acquired the coronavirus and attended school while infectious. Because of close contact with those cases, more than 40,000 people required quarantine. Through contact tracing and testing, however, we found only 363 additional children and adults acquired the coronavirus. We believe this low rate of transmission occurred because of the mask-on-mask school environment: Both the infected person and the close contact wore masks. Schools provided this protection without expensive screening tests for the coronavirus or massive overhauls in ventilation systems.

Because North Carolina had a mask mandate for all K-12 schools, we could not compare masked schools to unmasked schools. To understand the preventive impact masks can have, we looked outside North Carolina for comparisons. Data from our research and from studies conducted in Utah, Missouri and Wisconsin shows that school transmission rates of coronavirus were low when schools enforced mask mandates. By contrast, one school in Israel without a mask mandate or proper social distancing protocols reported an outbreak of Covid-19 involving 153 students and 25 staff members.

Recent outbreaks at youth camps in Texas, Illinois and Florida show how quickly Covid-19 can spread among adolescents and adults who are largely unmasked and mostly unvaccinated, with the possibility of spreading into surrounding communities. The potential for this kind of community spread was the reason schools closed their doors in March 2020.

With the evidence now clear that universal masking is linked to lower spread, why not require universal masking? Why seek to gather hundreds of unvaccinated, unmasked individuals in an enclosed space for several hours a day, five days a week?

Schools that do not require masks will have more coronavirus transmission. And while mortality from Covid was only two per 100,000 school-age children as of April, with more than 50 million public school children in the United States, that could still mean many avoidable deaths of children in a year.

Once vaccination is available for all children, districts can serve their students best by creating incentives to encourage masking and vaccination. For example, if universal masking is enforced or a student is vaccinated, it's reasonable for schools to decide not to require quarantining or testing after exposure for asymptomatic children and adults. Similarly, schools may consider allowing vaccinated students who participate in extracurricular activities to continue even if they've been exposed to someone who tested positive. School districts that do not have universal masking should keep using strategies like ventilation and social distancing and continue to perform routine testing for unvaccinated students.

In schools that choose to open without mask mandates and with limited vaccine uptakes, increased Covid is likely. Until all children can get vaccinated, masks remain a well-researched solution for lowering the risk of getting Covid. Children should be in school, and we should embrace the measures that can keep them safe.

Kanecia Zimmerman is an associate professor of pediatrics at the Duke University School of Medicine. Danny Benjamin Jr. is a pediatric-infectious-disease specialist at Duke Health and the Kiser-Arena distinguished professor of pediatrics at the Duke University School of Medicine.

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EXHIBIT 4

This exhibit consists of the Centers for Disease Control and Prevention (CDC) August 5, 2021 Guidance for COVID-19 Prevention in K-12 Schools. Therein, the CDC "recommends universal indoor masking by all students (age 2 and older), staff, teachers, and visitors to K-12 schools, regardless of vaccination status."

COVID-19

Given new evidence on the B.1.617.2 (Delta) variant, CDC has updated the guidance for fully vaccinated people: CDC recommends universal indoor masking for all teachers, staff, students, and visitors to K-12 schools, regardless of vaccination status. Children should return to full-time in-person learning in the fall with layered prevention strategies in place.

Guidance for COVID-19 Prevention in K-12 Schools

Updated Aug. 5, 2021 Print

Key Takeaways

- Students benefit from in-person learning, and safely returning to in-person instruction in the fall 2021 is a priority.
- Vaccination is the leading public health prevention strategy to end the COVID-19 pandemic. Promoting vaccination can help schools safely return to in-person learning as well as extracurricular activities and sports.
- Due to the circulating and highly contagious Delta variant, CDC recommends universal indoor masking by all students (age 2 and older), staff, teachers, and visitors to K-12 schools, regardless of vaccination status.
- In addition to universal indoor masking, CDC recommends schools maintain at least 3 feet of physical distance between students within classrooms to reduce transmission risk. When it is not possible to maintain a physical distance of at least 3 feet, such as when schools cannot fully re-open while maintaining these distances, it is especially important to layer multiple other prevention strategies, such as screening testing.
- Screening testing, ventilation, handwashing and respiratory etiquette, staying home when sick and getting tested, contact tracing in combination with quarantine and isolation, and cleaning and disinfection are also important layers of prevention to keep schools safe.
- Students, teachers, and staff should stay home when they have signs of any infectious illness and be referred to their healthcare provider for testing and care.
- Many schools serve children under the age of 12 who are not eligible for vaccination at this time. Therefore, this guidance emphasizes implementing layered prevention strategies (e.g., using multiple prevention strategies together consistently) to protect students, teachers, staff, visitors, and other members of their households and support in-person learning.
- Localities should monitor community transmission, vaccination coverage, screening testing, and occurrence of outbreaks to guide decisions on the level of layered prevention strategies (e.g., physical distancing, screening testing).

Summary of Recent Changes

Updates as of August 4, 2021

- Updated to recommend universal indoor masking for all students, staff, teachers, and visitors to K-12 schools, regardless of vaccination status.

- Added recommendation for fully vaccinated people who have a known exposure to someone with suspected or confirmed COVID-19 to be tested 3-5 days after exposure, regardless of whether they have symptoms.

Updates as of July 9, 2021

- Added information on offering and promoting COVID-19 vaccination.
- Updated to emphasize the need for localities to monitor community transmission, vaccination coverage, screening testing, and occurrence of outbreaks to guide decisions on the level of layered prevention strategies.
- Revised to emphasize the COVID-19 prevention strategies most important for in-person learning for K-12 schools.
  - Added language on the importance of offering in-person learning, regardless of whether all of the prevention strategies can be implemented at the school.
  - For example, because of the importance of in-person learning, schools where not everyone is fully vaccinated should implement physical distancing to the extent possible within their structures (in addition to masking and other prevention strategies), but should not exclude students from in-person learning to keep a minimum distance requirement.
- Updated to align with guidance for fully vaccinated people.
- Updated to align with current mask guidance.
  - In general, people do not need to wear masks when outdoors.
- Added language on safety and health protections for workers in K-12 schools.

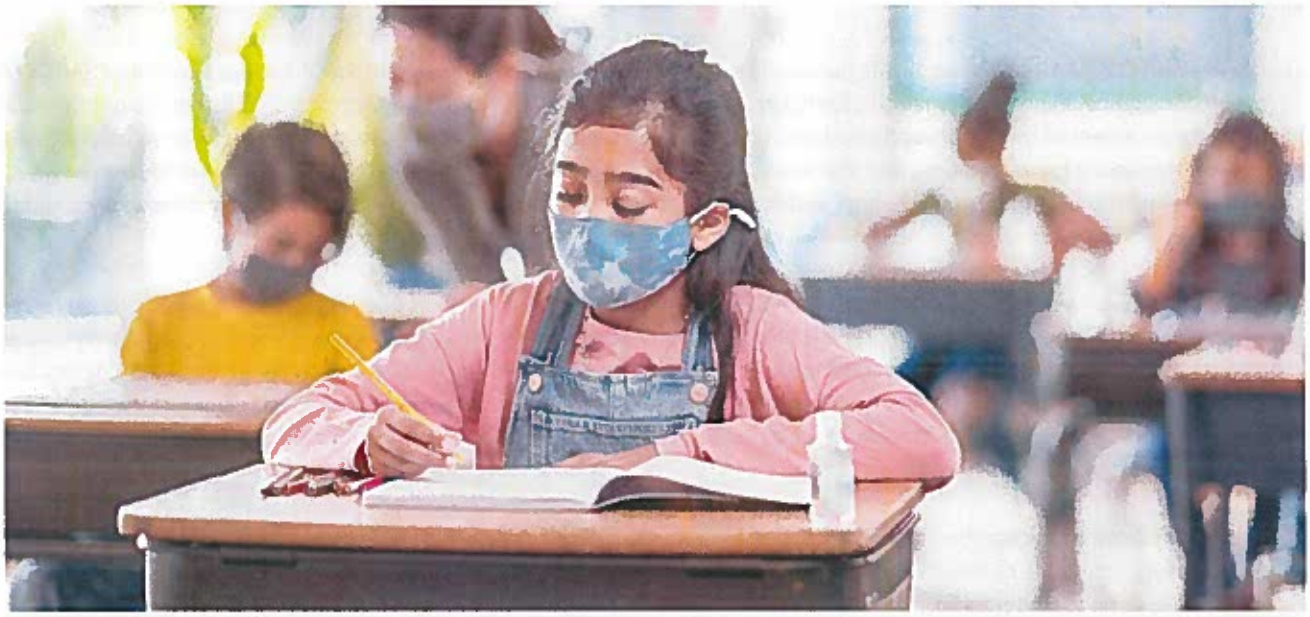
This updated version of COVID-19 guidance for school administrators outlines strategies for K-12 schools to reduce the spread of COVID-19 and maintain safe operations.

Many schools serve children under the age of 12 who are not eligible for vaccination at this time. Therefore, this guidance emphasizes implementing layered prevention strategies (e.g., using multiple prevention strategies together) to protect students, teachers, staff, and other members of their households, and to support in-person learning. This guidance is based on current scientific evidence and lessons learned from schools implementing COVID-19 prevention strategies.

This CDC guidance is meant to supplement—not replace—any federal, state, local, territorial, or tribal health and safety laws, rules, and regulations with which schools must comply. The adoption and implementation of this guidance should be done in collaboration with regulatory agencies and state, local, territorial, and tribal public health departments, and in compliance with state and local policies and practices.

COVID-19 Prevention Strategies Most Important for Safe In-Person Learning in K-12 Schools

To get kids back in-person safely, schools should monitor



Community Transmission

Vaccination Coverage

Testing

Outbreaks

to help prevent the spread of COVID-19

CDC

cdc.gov/coronavirus

CS325431A 07/06/2021

Schools are an important part of the infrastructure of communities. They provide safe and supportive learning environments for students that support social and emotional development, provide access to critical services, and improve life outcomes. They also employ people, and enable parents, guardians, and caregivers to work. Though COVID-19 outbreaks have occurred in school settings, multiple studies have shown that transmission rates within school settings, when multiple prevention strategies are in place, are typically lower than – or similar to – community transmission levels. CDC's science brief on Transmission of SARS-CoV-2 in K-12 Schools and Early Care and Education Programs summarizes evidence on COVID-19 among children and adolescents and what is known about preventing transmission in schools and Early Care and Education programs.

However, with COVID-19 cases increasing nationally since mid-June 2021, driven by the B.1.617.2 (Delta) variant of SARS-CoV-2, protection against exposure remains essential in school settings. Because of the highly transmissible nature of this variant, along with the extent of mixing of vaccinated and unvaccinated people in schools, the fact that children <12 years of age are not currently eligible for vaccination, and low levels of vaccination among youth ages 12-17, CDC recommends universal indoor masking for all students (age 2 years and older), teachers, staff, and visitors to K-12 schools regardless of vaccination status.

Schools should work with local public health officials, consistent with applicable laws and regulations, including those related to privacy, to determine the additional prevention strategies needed in their area by monitoring levels of community transmission (i.e., low, moderate, substantial, or high) and local vaccine coverage, and use of screening testing to detect cases in K-12 schools. For example, with a low teacher, staff, or student vaccination rate, and without a screening testing program, schools might decide that they need to continue to maximize physical distancing or implement screening testing in addition to mask wearing.

Schools should communicate their strategies and any changes in plans to teachers, staff, and families, and directly to older students, using accessible materials and communication channels, in a language and at a literacy level that teachers, staff, students, and families understand.

Health Equity

Schools play critical roles in promoting equity in learning and health, particularly for groups disproportionately affected by COVID-19. People living in rural areas, people with disabilities, immigrants, and people who identify as American Indian/Alaska Native, Black or African American, and Hispanic or Latino have been disproportionately affected by COVID-19; these disparities have also emerged among children. For these reasons, health equity considerations related to the K-12 setting are a critical part of decision-making and have been considered in CDC's updated guidance for schools. School administrators and public health officials can ensure safe and supportive environments and reassure families, teachers, and staff by planning and using comprehensive prevention strategies for in-person learning and communicating those efforts. Schools can work with parents to understand their preferences and concerns for in-person learning.

School administrators can promote health equity by ensuring all students, teachers, and staff have resources to support physical and mental health. School administrators can offer modified job responsibilities for staff at higher risk for severe illness who have not been fully vaccinated while protecting individual privacy. Federal and state disability laws may require an individualized approach for working with children and youth with disabilities consistent with the child's Individualized Family Service Plan (IFSP), Individualized Education Program (IEP), or Section 504 plan. Administrators should consider adaptations and alternatives to prevention strategies when serving people with disabilities, while maintaining efforts to protect all children and staff from COVID-19.

Section 1: Prevention Strategies to Reduce Transmission of SARS-CoV-2 in Schools

CDC recommends that all teachers, staff and eligible students be vaccinated as soon as possible. However, schools have a mixed population of both people who are fully vaccinated and people who are not fully vaccinated. Elementary schools primarily serve children under 12 years of age who are not eligible for the COVID-19 vaccine at this time. Other schools (e.g., middle schools, K-8 schools) may also have students who are not yet eligible for COVID-19 vaccination. Some schools (e.g., high schools) may have a low percentage of students and staff fully vaccinated despite vaccine eligibility. These variations

require K-12 administrators to make decisions about the use of COVID-19 prevention strategies in their schools and are reasons why CDC recommends universal indoor masking regardless of vaccination status at all levels of community transmission.

Together with local public health officials, school administrators should consider multiple factors when they make decisions about implementing layered prevention strategies against COVID-19. Since schools typically serve their surrounding communities, decisions should be based on the school population, families and students served, as well as their communities. The primary factors to consider include:

- Level of community transmission of COVID-19.
- COVID-19 vaccination coverage in the community and among students, teachers, and staff.
- Strain on health system capacity for the community.
- Use of a frequent SARS-CoV-2 screening testing program for students, teachers, and staff who are not fully vaccinated. Testing provides an important layer of prevention, particularly in areas with substantial to high community transmission levels.
- COVID-19 outbreaks or increasing trends in the school or surrounding community.
- Ages of children served by K-12 schools and the associated social and behavioral factors that may affect risk of transmission and the feasibility of different prevention strategies.

Prevention Strategies

- Promoting vaccination
- Consistent and correct mask use
- Physical distancing
- Screening testing to promptly identify cases, clusters, and outbreaks
- Ventilation
- Handwashing and respiratory etiquette
- Staying home when sick and getting tested
- Contact tracing, in combination with isolation and quarantine
- Cleaning and disinfection

CDC recommends universal indoor masking, physical distancing to the extent possible, and additional prevention strategies to protect students, teachers, and staff. Schools should not exclude students from in-person learning to keep a minimum distance requirement; layering multiple prevention strategies is essential when physical distancing of at least 3 feet is not possible at all times.

1. Promoting Vaccination

COVID-19 vaccination among all eligible students as well as teachers, staff, and household members is the most critical strategy to help schools safely resume full operations.

Vaccination is the leading public health prevention strategy to end the COVID-19 pandemic. People who are fully vaccinated against COVID-19 are at low risk of symptomatic or severe infection. A growing body of evidence suggests that people who are fully vaccinated against COVID-19 are less likely to become infected and develop symptoms and are at substantially reduced risk from severe illness and death from COVID-19 compared with unvaccinated people.

Only a small proportion of fully vaccinated people get infected (breakthrough infections), even with the Delta variant. Moreover, when these infections occur among vaccinated people, they tend to be milder than among those who are unvaccinated. However, preliminary evidence suggests that fully vaccinated people who are infected with the Delta variant can be infectious and can spread the virus to others. To reduce the risk of becoming infected with the Delta variant and spreading it to others, students, teachers, and school staff should continue to use layered prevention strategies including universal masking in schools.

People 12 years and older are now eligible for COVID-19 vaccination. Schools can promote vaccinations among teachers, staff, families, and eligible students by providing information about COVID-19 vaccination, encouraging vaccine trust and confidence, and establishing supportive policies and practices that make getting vaccinated as easy and convenient as possible.

When promoting COVID-19 vaccination, consider that certain communities and groups have been disproportionately affected by COVID-19 illness and severe outcomes, and some communities might have experiences that affect their trust and confidence in the healthcare system. Teachers, staff, students, and their families may differ in their level of vaccine confidence. School administrators can adjust their messages to the needs of their families and community and involve trusted community messengers as appropriate, including those on social media, to promote COVID-19 vaccination among people who may be hesitant to receive it.

To promote vaccination, schools can:

- Visit vaccines.gov to find out where teachers, staff, students, and their families can get vaccinated against COVID-19 in the community and promote COVID-19 vaccination locations near schools.
- Encourage teachers, staff, and families, including extended family members that have frequent contact with students, to get vaccinated as soon as they can.
- Consider partnering with state or local public health authorities to serve as COVID-19 vaccination sites, and work with local healthcare providers and organizations, including school-based health centers. Offering vaccines on-site before, during, and after the school day and during summer months can potentially decrease barriers to getting vaccinated against COVID-19. Identify other potential barriers that may be unique to the workforce and implement policies and practices to address them. The Workplace Vaccination Program has information for employers on recommended policies and practices for encouraging COVID-19 vaccination uptake among workers.
- Find ways to adapt key messages to help families, teachers, and staff become more confident about the vaccine by using the language, tone, and format that fits the needs of the community and is responsive to concerns.
- Use CDC COVID-19 Vaccination Toolkits to educate members of the school community and promote COVID-19 vaccination. CDC's Workers COVID-19 Vaccine Toolkit is also available to help employers educate their workers about COVID-19 vaccines, raise awareness about vaccination benefits, and address common questions and concerns. HHS also has an On-site Vaccination Clinic Toolkit to help community groups, employers, and other host organizations work directly with vaccine providers to set up vaccination clinics in locations that people know and trust.
- Host information sessions to connect parents and guardians with information about the COVID-19 vaccine. Teachers, staff, and health professionals can be trusted sources to explain the safety, efficacy, and benefits of COVID-19 vaccines and answer frequently asked questions.
- Offer flexible, supportive sick leave options (e.g., paid sick leave) for employees to get vaccinated or who have side effects after vaccination. See CDC's Post-vaccination Considerations for Workplaces.
- Promote vaccination information for parents and guardians, siblings who are eligible for vaccines, and other household members as part of kindergarten transition and enrollment in summer activities for families entering the school system.
- Provide students and families flexible options for excused absence to receive a COVID-19 vaccination and for possible side effects after vaccination.
- Work with local partners to offer COVID-19 vaccination for eligible students and eligible family members during pre-sport/extracurricular activity summer physicals.

2. Consistent and Correct Mask Use

When teachers, staff, and students consistently and correctly wear a mask, they protect others as well as themselves. Consistent and correct mask use is especially important indoors and in crowded settings, when physical distancing cannot be maintained.

- **Indoors:** CDC recommends indoor masking for all individuals age 2 years and older, including students, teachers, staff, and visitors, regardless of vaccination status.
- **Outdoors:** In general, people do not need to wear masks when outdoors. CDC recommends that people who are not fully vaccinated wear a mask in crowded outdoor settings or during activities that involve sustained close contact with other people. Fully vaccinated people might choose to wear a mask in crowded outdoor settings if they or someone in their household is immunocompromised.

Exceptions can be made for the following categories of people:

- A person who cannot wear a mask, or cannot safely wear a mask, because of a disability as defined by the Americans with Disabilities Act (ADA) (42 U.S.C. 12101 et seq.). Discuss the possibility of reasonable accommodation with workers who are unable to wear or have difficulty wearing certain types of masks because of a disability.
- A person for whom wearing a mask would create a risk to workplace health, safety, or job duty as determined by the relevant workplace safety guidelines or federal regulations.

Masks should meet one of the following criteria:

- CDC mask recommendations
- NIOSH Workplace Performance and Workplace Performance Plus masks

During school transportation: CDC's Order applies to all public transportation conveyances including school buses. Passengers and drivers must wear a mask on school buses, including on buses operated by public and private school systems, regardless of vaccination status, subject to the exclusions and exemptions in CDC's Order. Learn more here.

Schools should provide masks to those students who need them (including on buses), such as students who forgot to bring their mask or whose families are unable to afford them. No disciplinary action should be taken against a student who does not have a mask as described in the U.S. Department of Education COVID-19 Handbook, Volume 1.

3. Physical Distancing

Because of the importance of in-person learning, schools should implement physical distancing to the extent possible within their structures but should not exclude students from in-person learning to keep a minimum distance requirement. In general, CDC recommends people who are not fully vaccinated maintain physical distance of at least 6 feet from other people who are not in their household. However, several studies from the 2020-2021 school year show low COVID-19 transmission levels among students in schools that had less than 6 feet of physical distance when the school implemented and layered other prevention strategies, such as the use of masks.

Based on studies from 2020-2021 school year, CDC recommends schools maintain at least 3 feet of physical distance between students within classrooms, combined with indoor mask wearing to reduce transmission risk. When it is not possible to maintain a physical distance of at least 3 feet, such as when schools cannot fully re-open while maintaining these distances, it is especially important to layer multiple other prevention strategies, such as screening testing, cohorting, improved ventilation, handwashing and covering coughs and sneezes, staying home when sick with symptoms of infectious illness including COVID-19, and regular cleaning to help reduce transmission risk. A distance of at least 6 feet is recommended between students and teachers/staff, and between teachers/staff who are not fully vaccinated. Mask use by all students, teachers, staff, and visitors is particularly important when physical distance cannot be maintained.

Cohorting: Cohorting means keeping people together in a small group and having each group stay together throughout an entire day. Cohorting can be used to limit the number of students, teachers, and staff who come in contact with each other, especially when it is challenging to maintain physical distancing, such as among young children, and particularly in areas of moderate-to-high transmission levels. The use of cohorting can limit the spread of COVID-19 between cohorts but should not replace other prevention measures within each group. Cohorting people who are fully vaccinated and people who are not fully vaccinated into separate cohorts is not recommended. It is a school's responsibility to ensure that cohorting is done in an equitable manner that does not perpetuate academic, racial, or other tracking, as described in the U.S. Department of Education COVID-19 Handbook, Volume 1.

4. Screening Testing

Screening testing identifies infected people, including those with or without symptoms (or before development of symptoms) who may be contagious, so that measures can be taken to prevent further transmission. In K-12 schools, screening testing can help promptly identify and isolate cases, quarantine those who may have been exposed to COVID-19 and are not fully vaccinated, and identify clusters to reduce the risk to in-person education. CDC guidance provides that people who are fully vaccinated do not need to participate in screening testing and do not need to quarantine if they do not have any symptoms. Decisions regarding screening testing may be made at the state or local level. Screening testing may be most valuable in areas with substantial or high community transmission levels, in areas with low vaccination coverage, and in schools where other prevention strategies are not implemented. More frequent testing can increase effectiveness, but feasibility of increased

testing in schools needs to be considered. Screening testing should be done in a way that ensures the ability to maintain confidentiality of results and protect student, teacher, and staff privacy. Consistent with state legal requirements and Family Educational Rights and Privacy Act (FERPA), K-12 schools should obtain parental consent for minor students and assent/consent for students themselves.

Screening testing can be used to help evaluate and adjust prevention strategies and provide added protection for schools that are not able to provide optimal physical distance between students. Screening testing should be offered to students who have not been fully vaccinated when community transmission is at moderate, substantial, or high levels (Table 1); at any level of community transmission, screening testing should be offered to all teachers and staff who have not been fully vaccinated. To be effective, the screening program should test at least once per week, and rapidly (within 24 hours) report results. Screening testing more than once a week might be more effective at interrupting transmission. Schools may consider multiple screening testing strategies, for example, testing a random sample of at least 10% of students who are not fully vaccinated, or conducting pooled testing of cohorts. Testing in low-prevalence settings might produce false positive results, but testing can provide an important prevention strategy and safety net to support in-person education.

To facilitate safe participation in sports, extracurricular activities, and other activities with elevated risk (such as activities that involve singing, shouting, band, and exercise that could lead to increased exhalation), schools should consider implementing screening testing for participants who are not fully vaccinated. Schools can routinely test student athletes, participants, coaches, and trainers, and other people (such as adult volunteers) who are not fully vaccinated and could come into close contact with others during these activities. Schools should consider implementing screening testing of participants who are not fully vaccinated up to 24 hours before sporting, competition, or extracurricular events. Schools can use different screening testing strategies for lower-risk sports. High-risk sports and extracurricular activities should be virtual or canceled in areas of high community transmission unless all participants are fully vaccinated.

Funding provided through the ELC Reopening Schools award is primarily focused on providing needed resources to implement screening testing programs in schools aligned with the CDC recommendations. Learn more ELC Reopening Schools: Support for Screening Testing to Reopen & Keep Schools Operating Safely Guidance. Resources are available to support school testing – see Appendix 2: Testing Strategies for COVID-19 Prevention in K-12 Schools.

Table 1. Screening Testing Recommendations for K-12 Schools by Level of Community Transmission

	Low Transmission[1] Blue	Moderate Transmission Yellow	Substantial Transmission Orange	High Transmission Red
Students	Do not need to screen students.	**Offer screening testing for students** who are not fully vaccinated at least once per week.		
Teachers and staff	**Offer screening testing for teachers and staff** who are not fully vaccinated at least once per week.			
High risk sports and activities	**Recommend screening testing for high-risk sports[2] and extracurricular activities[3]** at least once per week for participants who are not fully vaccinated.		**Recommend screening testing for high-risk sports and extracurricular activities** twice per week for participants who are not fully vaccinated.	**Cancel or hold high-risk sports and extracurricular activities virtually** to protect in-person learning, unless all participants are fully vaccinated.
Low- and intermediate-risk sports	Do not need to screen students participating in low- and intermediate-risk sports.[2]	**Recommend screening testing for low- and intermediate-risk sports** at least once per week for participants who are not fully vaccinated.		

[1] Levels of community transmission defined as total new cases per 100,000 persons in the past 7 days (low, 0-9; moderate 10-49; substantial, 50-99, high, ≥100) and percentage of positive tests in the past 7 days (low, <5%; moderate, 5-7.9%; substantial, 8-9.9%; high, ≥10%.)

[2] Examples of low-risk sports are diving and golf; intermediate-risk sport examples are baseball and cross country; high-risk sport examples are football and wrestling.

[3]High-risk extracurricular activities are those in which increased exhalation occurs, such as activities that involve singing, shouting, band, or exercise, especially when conducted indoors.

5. Ventilation

Improving ventilation is an important COVID-19 prevention strategy that can reduce the number of virus particles in the air. Along with other preventive strategies, including wearing a well-fitting, multi-layered mask, bringing fresh outdoor air into a building helps keep virus particles from concentrating inside. This can be done by opening multiple doors and windows, using child-safe fans to increase the effectiveness of open windows, and making changes to the HVAC or air filtration systems.

During transportation, open or crack windows in buses and other forms of transportation, if doing so does not pose a safety risk. Keeping windows open a few inches improves air circulation.

For more specific information about maintenance, use of ventilation equipment, actions to improve ventilation, and other ventilation considerations, refer to:

- CDC's Ventilation in Schools and Child care Programs
- CDC's Ventilation in Buildings webpage
- CDC's Ventilation FAQs and
- CDC's Improving Ventilation in Your Home

Additional ventilation recommendations for different types of school buildings can be found in the American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) schools and universities guidance document.

Funds provided through the Elementary and Secondary Schools Emergency Relief Programs and the Governor's Emergency Education Relief Programs can support improvements to ventilation. Please see question B-7 of the U.S. Department of Education Uses of Funds guidance for these programs.

6. Handwashing and Respiratory Etiquette

People should practice handwashing and respiratory etiquette (covering coughs and sneezes) to keep from getting and spreading infectious illnesses including COVID-19. Schools can monitor and reinforce these behaviors and provide adequate handwashing supplies.

- Teach and reinforce handwashing with soap and water for at least 20 seconds.
- Remind everyone in the facility to wash hands frequently and assist young children with handwashing.
- If handwashing is not possible, use hand sanitizer containing at least 60% alcohol (for teachers, staff, and older students who can safely use hand sanitizer). Hand sanitizers should be stored up, away, and out of sight of young children and should be used only with adult supervision for children under 6 years of age.

7. Staying Home When Sick and Getting Tested

Students, teachers, and staff who have symptoms of infectious illness, such as influenza (flu) or COVID-19, should stay home and be referred to their healthcare provider for testing and care, regardless of vaccination status. Staying home when sick with COVID-19 is essential to keep COVID-19 infections out of schools and prevent spread to others. Schools should also allow flexible, non-punitive, and supportive paid sick leave policies and practices that encourage sick workers to stay home without fear of retaliation, loss of pay, or loss of employment level and provide excused absences for students who are sick. Employers should ensure that workers are aware of and understand these policies. If a student becomes sick at school, see

What to do if a Student Becomes Sick or Reports a New COVID-19 Diagnosis at School. If a school does not have a routine screening testing program, the ability to do rapid testing on site could facilitate COVID-19 diagnosis and inform the need for quarantine of close contacts and isolation.

Schools should educate teachers, staff, and families about when they and their children should stay home and when they can return to school. During the COVID-19 pandemic, it is essential that parents keep children home if they are showing signs and symptoms of COVID-19 and get them tested.

Getting tested for COVID-19 when symptoms are compatible with COVID-19 will help with rapid contact tracing and prevent possible spread at schools, especially if key prevention strategies (masking and distancing) are not in use. Some localities might choose to use testing to shorten quarantine periods.

8. Contact Tracing in Combination with Isolation and Quarantine

Schools should continue to collaborate with state and local health departments, to the extent allowable by privacy laws and other applicable laws, to confidentially provide information about people diagnosed with or exposed to COVID-19. This allows identifying which students, teachers, and staff with positive COVID-19 test results should isolate, and which close contacts should quarantine.

- Fully vaccinated close contacts should be referred for COVID-19 testing. If asymptomatic, fully vaccinated close contacts do not need to quarantine at home following an exposure (they can continue to attend school in-person and participate in other activities). In addition to correctly wearing masks in school, they should wear a mask in other indoor public settings for 14 days or until they receive a negative test result.
- Close contacts who are not fully vaccinated should be referred for COVID-19 testing. Regardless of test result, they should quarantine at home for 14 days after exposure. Options to shorten quarantine provide acceptable alternatives of a 10-day quarantine or a 7-day quarantine combined with testing and a negative test result.

See the added exception in the close contact definition for the exclusion of students in the K-12 indoor classroom who are within 3 to 6 feet of an infected student with masking. See the Department of Education's Protecting Student Privacy FERPA and the Coronavirus Disease 2019 for more information.

Schools should report, to the extent allowable by applicable privacy laws, new diagnoses of COVID-19 to their state or local health department as soon as they are informed. School officials should notify, to the extent allowable by applicable privacy laws, teachers, staff, and families of students who were close contacts as soon as possible (within the same day if possible) after they are notified that someone in the school has tested positive.

9. Cleaning and Disinfection

In general, cleaning once a day is usually enough to sufficiently remove potential virus that may be on surfaces. Disinfecting (using disinfectants on the U.S. Environmental Protection Agency COVID-19 list) removes any remaining germs on surfaces, which further reduces any risk of spreading infection.

For more information on cleaning a facility regularly, when to clean more frequently or disinfect, cleaning a facility when someone is sick, safe storage of cleaning and disinfecting products, and considerations for protecting workers who clean facilities, see Cleaning and Disinfecting Your Facility.

If a facility has had a sick person or someone who tested positive for COVID-19 within the last 24 hours, clean AND disinfect the space.

Section 2: Additional Considerations for K-12 Schools

Disabilities or Other Health Care Needs

Provide accommodations, modifications, and assistance for students, teachers, and staff with disabilities and other health care needs when implementing COVID-19 safety protocols:

- Work with families to better understand the individual needs of students with disabilities.

- Remain accessible for students with disabilities:
  - Help provide access for direct service providers (DSP) (e.g., paraprofessionals, therapists, early intervention specialists, mental health and healthcare consultants, and others). If DSPs who are not fully vaccinated provide services at more than one location, ask whether any of their other service locations have had COVID-19 cases.
  - Ensure access to services for students with disabilities when developing cohorts.
- Adjust strategies as needed
  - Be aware that physical distancing and wearing masks can be difficult for young children and people with certain disabilities (for example, visual or hearing impairments) or for those with sensory or cognitive issues.
  - For people who are only able to wear masks some of the time for the reasons above, prioritize having them wear masks during times when it is difficult to separate students and/or teachers and staff (e.g., while standing in line or during drop off and pick up).
  - Consider having teachers and staff wear a clear or cloth mask with a clear panel when interacting with young students, students learning to read, or when interacting with people who rely on reading lips.
  - Use behavioral techniques (such as modeling and reinforcing desired behaviors and using picture schedules, timers, visual cues, and positive reinforcement) to help all students adjust to transitions or changes in routines.

Please see Guidance for Direct Service Providers for resources for DSPs serving children with disabilities or other health care needs during COVID-19.

Visitors

Schools should review their rules for visitors and family engagement activities.

- Schools should limit nonessential visitors, volunteers, and activities involving external groups or organizations, particularly in areas where there is moderate-to-high COVID-19 community transmission.
- Schools should not limit access for direct service providers, but can ensure compliance with school visitor polices.
- Schools should continue to emphasize the importance of staying home when sick. Anyone, including visitors, who have symptoms of infectious illness, such as flu or COVID-19, should stay home and seek testing and care, regardless of vaccination status.

Food Service and School Meals

- Staff should wear masks at all times during meal preparation and service, and during breaks except when eating or drinking.
- Students should wear masks when moving through the food service line.
- Maximize physical distance as much as possible when moving through the food service line and while eating (especially indoors). Using additional spaces outside of the cafeteria for mealtime seating such as the gymnasium or outdoor seating can help facilitate distancing. Students should not be excluded from in-person learning to keep a minimum distance requirement, including during mealtimes.
- Given very low risk of transmission from surfaces and shared objects, there is no need to limit food service approaches to single use items and packaged meals.
- Clean frequently touched surfaces. Surfaces that come in contact with food should be washed, rinsed, and sanitized before and after meals.
- Promote hand washing before, after, and during shifts, before and after eating, after using the toilet, and after handling garbage, dirty dishes, or removing gloves.
- Improve ventilation in food preparation, service, and seating areas.
- U.S. Department of Agriculture has issued several Child Nutrition COVID-19 Waivers. Learn more here .

Recess and Physical Education

In general, people do not need to wear masks when outdoors (e.g., participating in outdoor play, recess, and physical education activities). CDC recommends people who are not fully vaccinated wear a mask in crowded outdoor settings or during activities that involve sustained close contact with other people. Fully vaccinated people might choose to wear a mask

in crowded outdoor settings if they or someone in their household is immunocompromised. Universal masking is recommended during indoor physical education or recess.

Sports and Other Extracurricular Activities

School-sponsored sports and extracurricular activities provide students with enrichment opportunities that can help them learn and achieve, and support their social, emotional, and mental health. Due to increased exhalation that occurs during physical activity, some sports can put players, coaches, trainers, and others at increased risk for getting and spreading COVID-19. Close contact sports and indoor sports are particularly risky. Similar risks might exist for other extracurricular activities, such as band, choir, theater, and school clubs that meet indoors.

Prevention strategies in these activities remain important and should comply with school day policies and procedures. People who are fully vaccinated can refrain from quarantine following a known exposure if asymptomatic, facilitating continued participation in in-person learning, sports, and extracurricular activities. Students should refrain from these activities when they have symptoms consistent with COVID-19 and should be tested. Schools are strongly encouraged to use screening testing (Table 1) for student athletes and adults (e.g., coaches, teachers, advisors) who are not fully vaccinated who participate in and support these activities to facilitate safe participation and reduce risk of transmission – and avoid jeopardizing in-person education due to outbreaks.

Coaches and school sports administrators should also consider specific sport-related risks:

- **Setting of the sporting event or activity.** In general, the risk of COVID-19 transmission is lower when playing outdoors than in indoor settings. Consider the ability to keep physical distancing in various settings at the sporting event (i.e., fields, benches/team areas, locker rooms, spectator viewing areas, spectator facilities/restrooms, etc.).
- **Physical closeness.** Spread of COVID-19 is more likely to occur in sports that require sustained close contact (such as wrestling, hockey, football).
- **Number of people.** Risk of spread of COVID-19 increases with increasing numbers of athletes, spectators, teachers, and staff.
- **Level of intensity of activity.** The risk of COVID-19 spread increases with the intensity of the sport.
- **Duration of time.** The risk of COVID-19 spread increases the more time athletes, coaches, teachers, staff and spectators spend in close proximity or in indoor group settings. This includes time spent traveling to/from sporting events, meetings, meals, and other settings related to the event.
- **Presence of people more likely to develop severe illness.** People at increased risk of severe illness might need to take extra precautions.

Section 3: School Workers

Workers at increased risk for severe illness from COVID-19 include older adults and people of any age with certain underlying medical conditions if they are not fully vaccinated. Workers who have an underlying medical condition or are taking medication that weakens their immune system may NOT be fully protected even if fully vaccinated and may need to continue using additional prevention measures. Policies and procedures addressing issues related to workers at higher risk of serious illness should be made in consultation with occupational medicine and human resource professionals, keeping in mind Equal Employment Opportunity concerns and guidance. Employers should also understand the potential mental health strains for workers during the COVID-19 pandemic. CDC recommends that school administrators should educate workers on mental health awareness and share available mental health and counseling services. Employers should provide a supportive work environment for workers coping with job stress and building resilience, and managing workplace fatigue.

As part of each school's response plan, administrators should conduct workplace hazard assessments periodically to identify COVID-19 transmission risks and prevention strategies, when worksite conditions change, or when there are instances of COVID-19 transmission within the workplace. Strategies to prevent and reduce transmission are based on an approach that prioritizes the most effective practices, known as the hierarchy of controls. School employers should engage and train all workers on potential workplace hazards, what precautions should be taken to protect workers, and workplace policies for reporting concerns. Schools should ensure communication and training for all workers are frequent and easy to understand. Additionally, schools should ensure communication and training are in a language, format, and at a literacy level that workers understand.

Workers in K-12 have the right to a safe and healthful workplace. The Occupational Safety and Health Administration (OSHA) has issued Guidance on Mitigating and Preventing the Spread of COVID-19 in the Workplace. This guidance contains recommendations to help employers provide a safe and healthy workplace free from recognized hazards that are causing, or are likely to cause, death or serious physical harm. It also contains descriptions of mandatory safety and health standards. If a worker believes working conditions are unsafe or unhealthful, they or a representative may file a confidential safety and health complaint with OSHA at any time. In states where public sector employers and workers are not covered by OSHA-approved State Plans, there may be agencies that provide public worker occupational safety and health protections and enforce such workers' rights to safe workplaces. Workers should contact state, county, and/or municipal government entities to learn more.

Appendix 1: Planning and Preparing

Emergency Operations Plans

Each school district and school should have an Emergency Operations Plan (EOP) in place to protect students, teachers, staff, and families from the spread of COVID-19 and other emergencies. The EOP should:

- Describe COVID-19 prevention strategies to be implemented.
- Describe steps to take when a student, teacher, or staff member has been exposed to someone with COVID-19, has symptoms of COVID-19, or tests positive for COVID-19.
- Document policy or protocol differences for people who are fully vaccinated for COVID-19 versus those who are not fully vaccinated.
- Be developed in collaboration with regulatory agencies and state, local, territorial, and tribal public health departments, and comply with state and local licensing regulations.
- Be developed with involvement of teachers, staff, parents and guardians, and other community partners (for example, health centers).

Utilize the Whole School, Whole Community, Whole Child (WSCC) model to outline EOP policies and protocols across each component. Tools and resources from the U.S. Department of Education can be used by K-12 administrators to develop and update their EOP.

Vaccination Verification

Existing laws and regulations require certain vaccinations for children attending school. K-12 administrators regularly maintain documentation of people's immunization records. Administrators who maintain documentation of students' and workers' COVID-19 vaccination status can use this information, consistent with applicable laws and regulations, including those related to privacy, to inform prevention strategies, school-based testing, contact tracing efforts, and quarantine and isolation practices. Schools that plan to request voluntary submission of documentation of COVID-19 vaccination status should use the same standard protocols that are used to collect and secure other immunization or health status information from students. The protocol to collect, secure, use, and further disclose this information should comply with relevant statutory and regulatory requirements, including Family Educational Rights and Privacy Act (FERPA) statutory and regulatory requirements. Policies or practices related to providing or receiving proof of COVID-19 vaccination should comply with all relevant state, tribal, local, or territorial laws and regulations.

As part of their workplace COVID-19 vaccination policy, schools should recognize that a worker who cannot get vaccinated due to a disability (covered by the ADA), has a disability that affects their ability to have a full immune response to vaccination, or has a sincerely held religious belief or practice (covered by Title VII of the Civil Rights Act of 1964) may be entitled to a reasonable accommodation that does not pose an undue hardship on the operation of the employer's business. Additionally, school employers should advise workers with weakened immune systems about the importance of talking to their healthcare professional about the need for continued personal protective measures after vaccination. For more information on what you should know about COVID-19 and the ADA, the Rehabilitation Act and other Equal Employment Opportunity Laws visit the Equal Employment Opportunity Commission website.

Appendix 2: Testing Strategies for COVID-19 Prevention in K-12 Schools

Testing Benefits

School testing gives communities, schools, and families added assurance that schools can open and remain open safely for all students. By identifying infections early, testing helps keep COVID-19 transmission low and students in school for in-person learning, sports, and extracurricular activities. Screening testing is likely to be most feasible in larger settings and for older children and adolescents.

Collaboration between Education and Public Health

Before implementing COVID-19 testing in their schools, K–12 school leaders should coordinate with public health officials to develop a testing plan and build support from students, parents, teachers, and staff and must ensure that such screening testing is administered consistent with applicable law, including the Protection of Pupil Rights Amendment (PPRA). COVID-19 testing introduces challenges that schools may not have considered in the past (for example, requirements to perform on-site tests and to refer people for confirmatory testing), and public health officials can provide guidance on federal, state, and local requirements for implementing testing. Both school leaders and public health officials should assure the testing plan has key elements in place, including:

- Protocols for screening testing frequency based on community transmission rates, vaccination levels, and prevention strategies implemented at the school.
- Protocols for providing or referring to diagnostic testing for students, teachers, and staff who come to school with symptoms and for students, teachers, and staff following exposure to someone with COVID-19.
- Physical space to conduct testing safely and privately.
- Ability to maintain confidentiality of results and protect student, teacher, and staff privacy.
- Ways to obtain parental consent for minor students and assent/consent for students themselves.
- A mechanism to report all testing results, to the extent allowable by or consistent with applicable federal, state, or local laws and regulations, including privacy laws such as FERA, as required by the state or local health department.
- Roles and responsibilities for contact tracing for each party, including identification of close contacts.

If these elements are not in place, schools may consider referring students, teachers, and staff to community-based testing sites.

Collaboration among local counsel, education, and public health is recommended to ensure appropriate consent is obtained and maintained and results are maintained, used, and further disclosed with appropriate privacy and confidentiality in accordance with the Americans with Disabilities Act (ADA), Family Educational Rights and Privacy Act (FERPA), the Protection of Pupil Rights Amendment (PPRA), and other applicable laws and regulations. School administrators who have questions about FERPA (or PPRA) may contact the Department of Education's Student Privacy Policy Office (SPPO) at https://studentprivacy.ed.gov.

Testing Strategies

Schools may consider testing a random sample of at least 10% of students who are not fully vaccinated or may conduct pooled testing for COVID-19. Random sampling can reduce costs and eliminate bias in the testing design but may require more logistics and planning. Pooled testing increases the number of people who can be tested at once and reduces testing resources used. Pooled testing works best when the number of positives is expected to be very low. Ideally, specimens should be pooled at the laboratory rather than in the classroom. If the pooled test result is positive, each of the samples in the pool will need to be tested individually to determine which samples are positive. This allows for faster isolation of cases and quarantine of close contacts.

More frequent testing may be needed for students, teachers, staff, and adult volunteers who are not fully vaccinated and engaged in school athletics and other extracurricular activities. Testing at least once per week is recommended for high-risk sports and extracurricular activities (those that cannot be done outdoors or with masks) at all community transmission levels. In areas of substantial-to-high community transmission levels, testing twice per week is recommended for participation in these activities. Additionally, if the school is not tracking COVID-19 vaccination status of participants and support teacher and staff screening testing should be encouraged.

Fully vaccinated students, teachers, and staff with no COVID-19 symptoms do not need to quarantine at home following an exposure to someone with COVID-19 but should get tested 3-5 days after exposure. In addition to wearing masks in school, they should wear a mask in other indoor public settings for 14 days or until they receive a negative test. People who have tested positive for COVID-19 within the past 3 months and recovered do not need to get tested following an exposure as long as they do not develop new symptoms. Any fully vaccinated person who experiences symptoms consistent with COVID-19 should isolate themselves from others, be clinically evaluated for COVID-19, and tested for SARS-CoV-2 if indicated.

People with COVID-19 have reported a wide range of symptoms from no or mild symptoms to severe illness. Symptoms may appear 2-14 days after exposure to the SARS-CoV-2 virus. Because some of the symptoms of flu, common cold, and COVID-19 are similar, it is hard to tell the difference between them based on symptoms alone. Testing can help confirm a diagnosis, and inform medical treatment and care. Also, testing will confirm the need to isolate from others for at least 10 days and quarantine close contacts.

Choosing a Test

When considering which tests to use for screening testing, schools or their testing partners should choose tests that can be reliably supplied and provide results within 24 hours. If available, saliva tests and nasal tests that use a short swab may be more easily implemented and accepted in schools. A viral test tells a person if they have a current infection. Two types of viral tests can be used: nucleic acid amplification tests (NAATs) and antigen tests. Frequency of testing should be determined by the performance characteristics of the test being used. The intended use of each test, available in the Instructions for Use and in the Letter of Authorization for each test, defines the population in which the test is intended to be used, the acceptable specimen types, and how the results should be used.

Reporting Results

Schools performing on-site tests (i.e., that are not sent to a laboratory) must apply for a Clinical Laboratory Improvement Amendments (CLIA) certificate of waiver, and report test results to the extent allowable by or consistent with applicable privacy laws to state or local public health departments and as may be mandated by the Coronavirus Aid, Relief, and Economic Security (CARES) Act (P.L. 116-136). Schools should work closely with their local health department when establishing on-site testing so that their performance of CLIA-waived or FDA-authorized point-of-care tests for SARS-CoV-2 is done in accordance with regulations and should work closely with local counsel to ensure the reporting of test results is done in accordance with applicable privacy laws and regulations.

Parents, guardians, and caregivers should be asked to report new diagnoses of COVID-19 to schools and public health authorities to facilitate contact tracing and communication planning for cases and outbreaks. In addition, school administrators should notify teachers, staff, families, and emergency contacts or legal guardians immediately of any case of COVID-19 while maintaining confidentiality in accordance with the Health Insurance Portability and Accountability Act of 1996 (HIPAA), the Americans with Disabilities Act (ADA), the Family Educational Rights and Privacy Act (FERPA) and other applicable laws and regulations. Notifications must be accessible for all students, teachers, and staff, including those with disabilities or limited English proficiency (for example, through use of interpreters or translated materials).

Ethical Considerations for School-Based Testing

- Testing should be conducted with informed consent from the person being tested (if an adult) or the person's parent or guardian (if a minor), consistent with applicable state laws related to consent. Informed consent requires disclosure, understanding, and free choice, and is necessary for teachers, staff (who are employees of a school) and students' families, to act independently and make choices according to their values, goals, and preferences.
- Consider distributing consent forms with the other paperwork for returning to school and making them easily accessible.
- Differences in position and authority (i.e., workplace hierarchies), as well as employment and educational status, can affect a person's ability to make free decisions. CDC provides guidance and information related to consent for COVID-19 testing among employees.
- The benefits of school-based testing need to be weighed against the costs, inconvenience, and feasibility of such programs to both schools and families. These challenges must be considered carefully and addressed as part of plans for school-based testing developed in collaboration with public health officials. The burden of testing is likely to be higher for younger children and therefore screening testing may be more feasible and acceptable for older children and adolescents.

Resources to Support School Screening Testing Programs

- CDC ELC Cooperative Agreement Reopening Schools Award provides $10 billion to support COVID-19 screening testing in schools for safe, in-person learning.
- COVID-19 Testing and Diagnostics Working Group | HHS.gov develops testing-related guidance and provides tailored or focused investments to expand the available testing supply and maximize testing capacity.
- Increasing Community Access to Testing provides COVID-19 testing resources and support to underserved school districts.
- Operation Expanded Testing expands national COVID-19 testing capacity and support for K-8 schools and groups at higher risk of COVID-19 through three regional hubs:
  - Northeast and South
  - Midwest
  - West
- National Institutes of Health RADx Initiative rapidly scales up testing across the country to enhance access to those most in need and provides a When to Test impact calculator which illustrates how different mitigation strategies can minimize the spread of COVID-19.
- Shah Family Foundation Open and Safe Schools toolkit provides school leaders resources and tools to implement COVID-19 screening testing.
- Rockefeller Foundation has created a playbook with detailed, step-by-step guidance to help design and implement effective testing programs in schools. It addresses the operational challenges and everyday realities of implementing a complex, logistical program in an easy-to-understand, practical guide.
- The U.S. Department of Education's COVID-19 Resources for Schools, Students, and Families provides up-to-date guidance and policies to support life-long learning while addressing challenges presented by COVID-19.

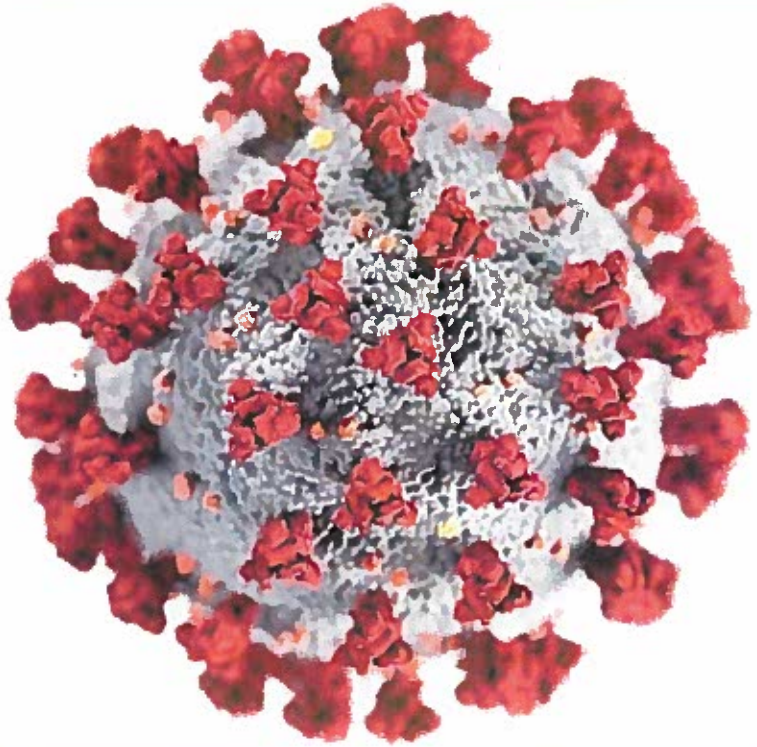
Last Updated Aug. 5, 2021

EXHIBIT 5

The November 16, 2020 Centers for Disease Control and Prevention (CDC) document titled The Science of Masking to Control COVID-19 contains detailed scientific justification for the effectiveness of face coverings to mitigate the spread of COVID-19.

The February 10, 2021 Boston University School of Public Health research report titled Mask Adherence and Rate of COVID-19 Across the United States concludes: "[W]e show that mask wearing adherence, regardless of mask wearing policy, may curb the spread of COVID-19 infections. We recommend renewed efforts be employed to improve adherence to mask wearing."

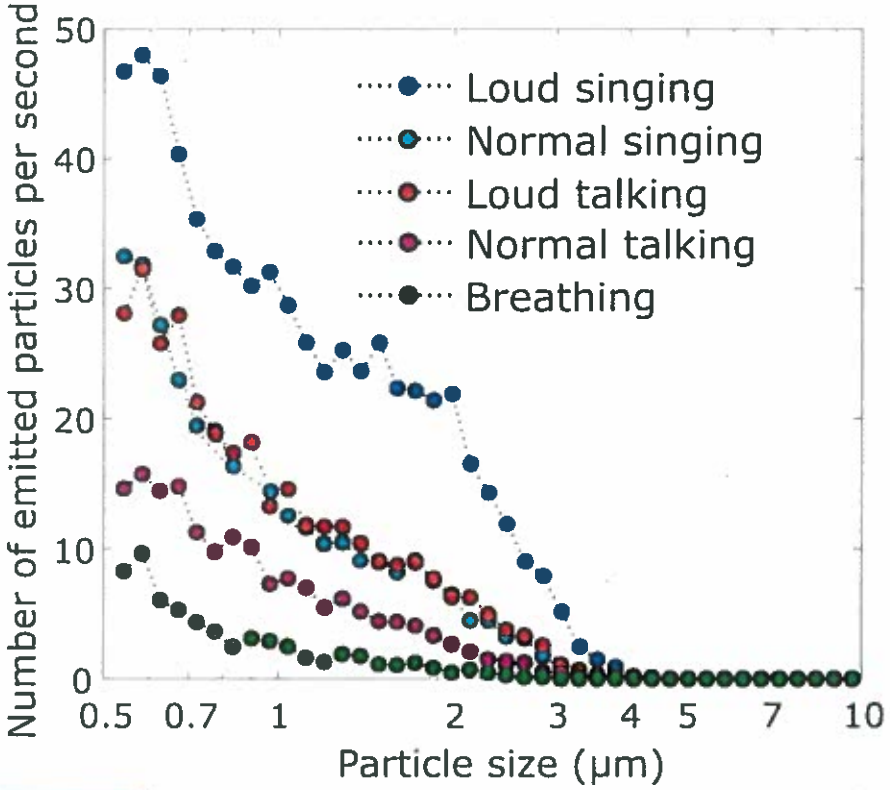
The Science of Masking to Control COVID-19



cdc.gov/coronavirus

Valid as of November 16, 2020

Most SARS-CoV-2 Infections Are Spread by People without Symptoms



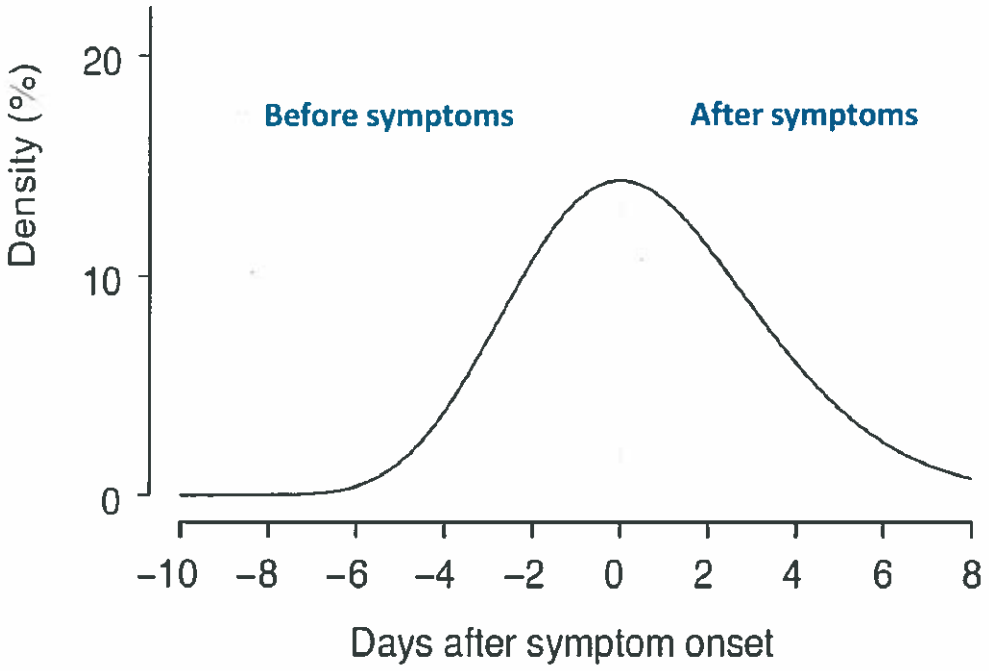
Infection is spread primarily through exposure to respiratory droplets exhaled by infected people when they breathe, talk, cough, sneeze, or sing

- Most of these droplets are <10 µm, often referred to as aerosols
- The amount of these fine droplets and particles increases with volume of speech (e.g., loud talking, shouting) and respiratory exertion (e.g., exercise)

Adapted from Aslved et al. 2020, Aerosol Sci Technol; https://doi.org/10.1080/02786826.2020.1812502.

Valid as of November 16, 2020

Most SARS-CoV-2 Infections Are Spread by People without Symptoms

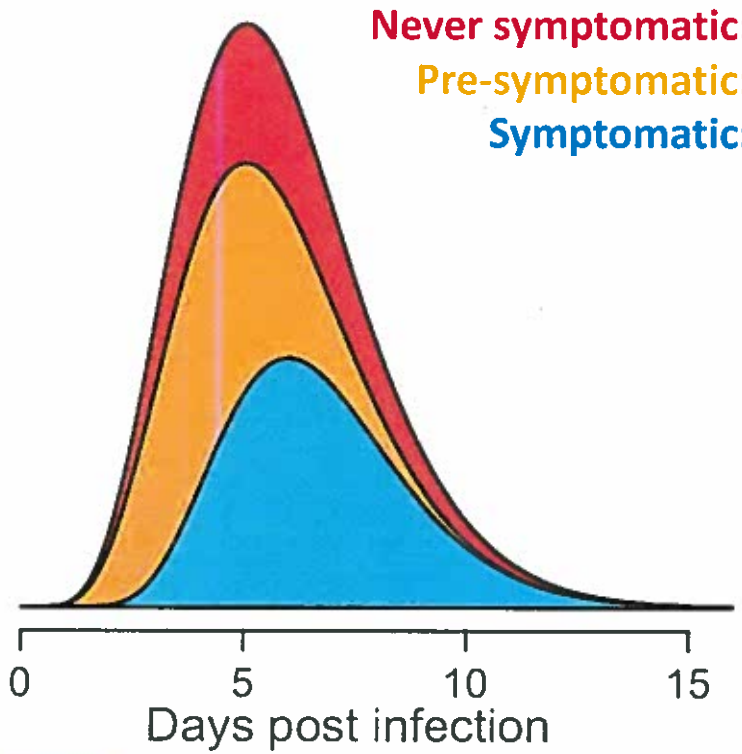


- 40-45% of infected people are estimated to never develop symptoms
- Among people who do develop symptomatic illness
  - Transmission risk peaks in the days just before symptom onset (presymptomatic infection) and for a few days thereafter
  - Accordingly, the number of infections transmitted peaks when virus levels peak

He et al. 2002, Nat Med; 26(5):672-675 and 26(9):1491-1494.

Valid as of November 16, 2020

Most SARS-CoV-2 Infections Are Spread by People without Symptoms



- CDC and others estimate that more than 50% of all infections are transmitted from people who are not exhibiting symptoms
- This means, at least half of new infections come from people likely unaware they are infectious to others (red and orange in the figure, left)*

* Figure assumes peak infectiousness occurs 5 days after infection and that 24% of infections are asymptomatic. With these assumptions, 59% of infections would be transmitted when no symptoms are present but could range 51%-70% if the fraction of asymptomatic infections were 24%-30% and peak infectiousness ranged 4-6 days.

Moghadas et al. 2020, Proc Natl Acad Sci USA;117(30):17513-17515. Johansson et al. 2020, CDC unpublished data; submitted.

Valid as of November 16, 2020

Three Levels of Scientific Evidence Demonstrate the Benefit of Community Masking to Control SARS-CoV-2

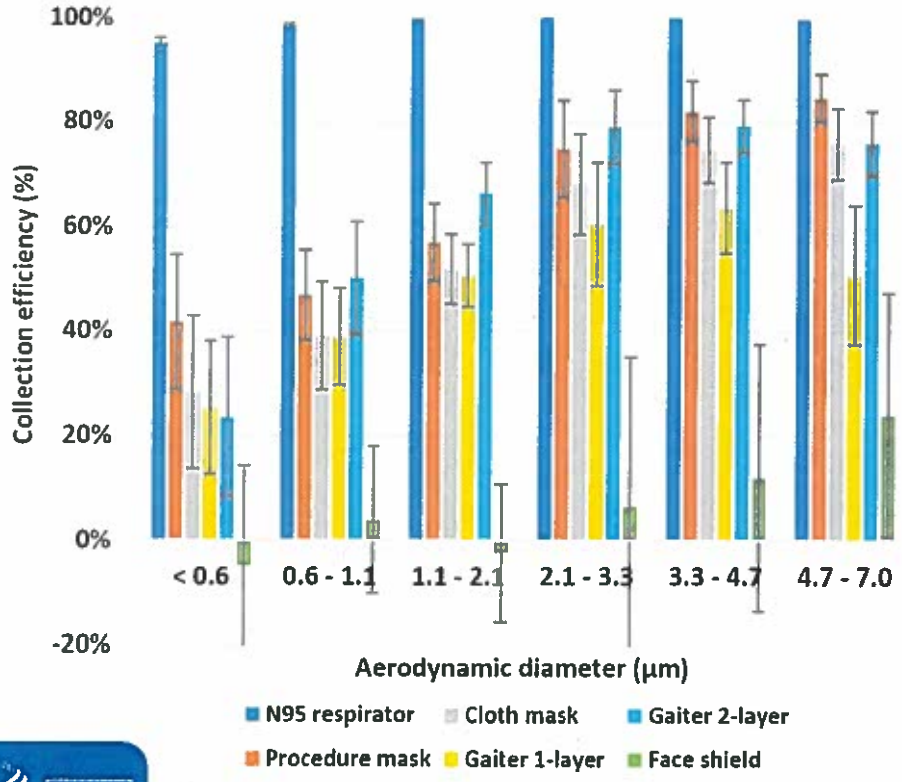
1. Controlled laboratory-based experimental studies of cloth masks' capacity to
   - Block exhaled emission of virus-laden respiratory particles (source control)
   - Reduce inhalation of these droplets by the wearer (personal protection)
2. Epidemiological investigations
   - Outbreaks
   - Cohort and case-control studies
3. Population-level community studies
   - Across multiple levels (e.g., hospital system, city, state, country, multi-country)

Community Masking to Control SARS-CoV-2

Experimental Studies

Valid as of November 16, 2020

Laboratory Assessment of Cloth Masks Effectiveness: Source Control (exhalational)

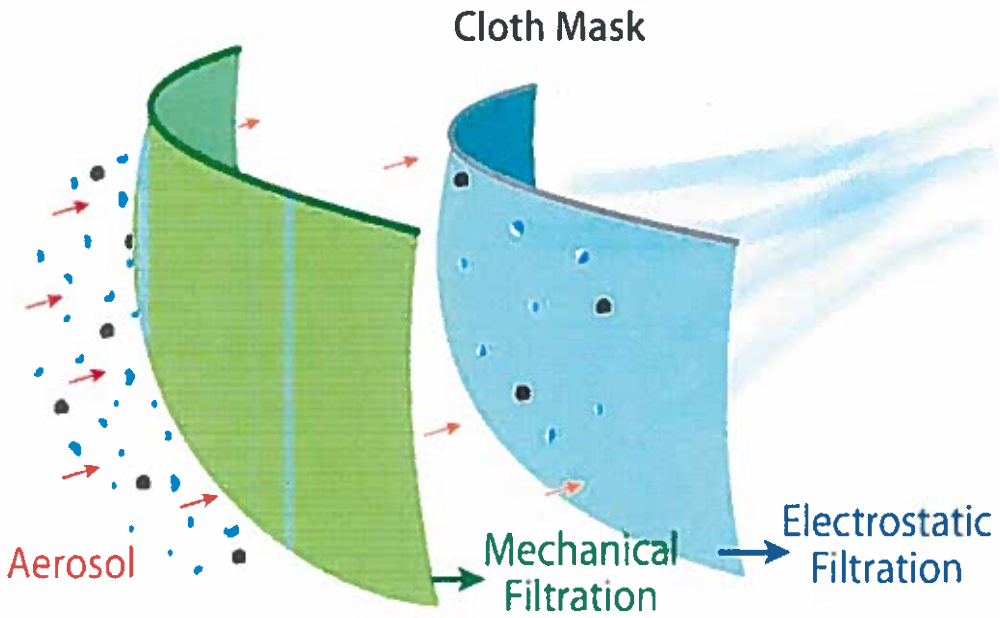


Cloth masks provide source control

- Cloth masks block most large (>20-30 µm) exhaled respiratory droplets
- Multi-layer cloth masks substantially block respiratory droplets <1-10 µm
  - Comprise the greatest fraction of exhaled respiratory droplets
  - Reductions as high as 50-70%
- Some on par with surgical masks

Figure from Lindsley et al. 2020; medRxiv: doi 10.1101/2020.10.05.20207241.. See "Appendix" at end of slide set for full set of references.

Laboratory Assessment of Cloth Masks Effectiveness: Filtering Protection (inhalational)

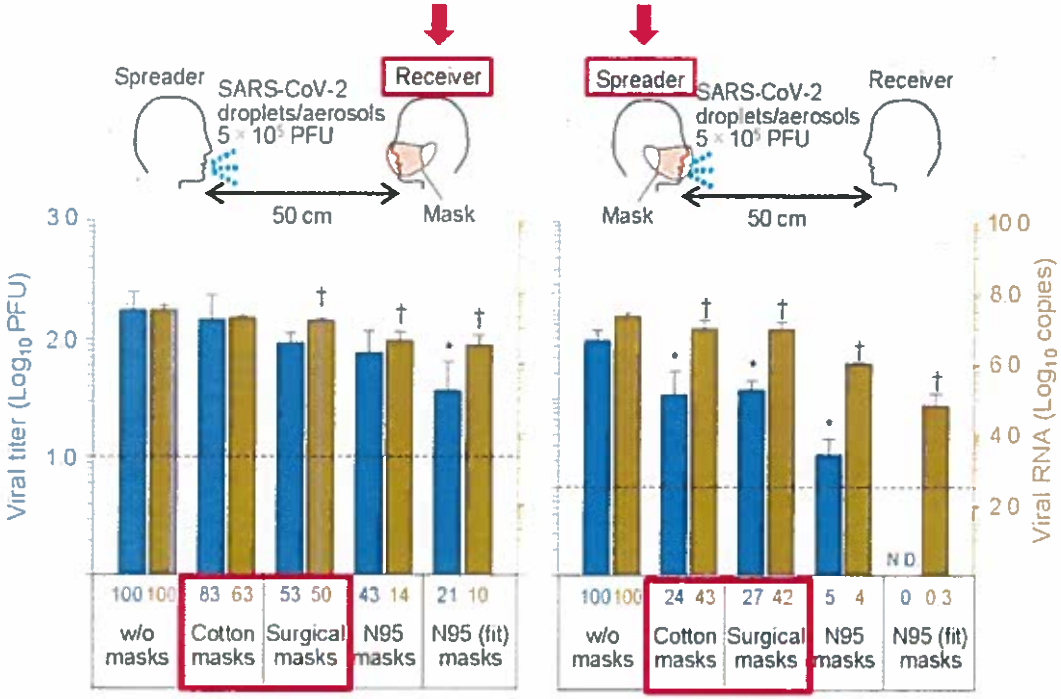


Cloth masks also filter inhaled droplets

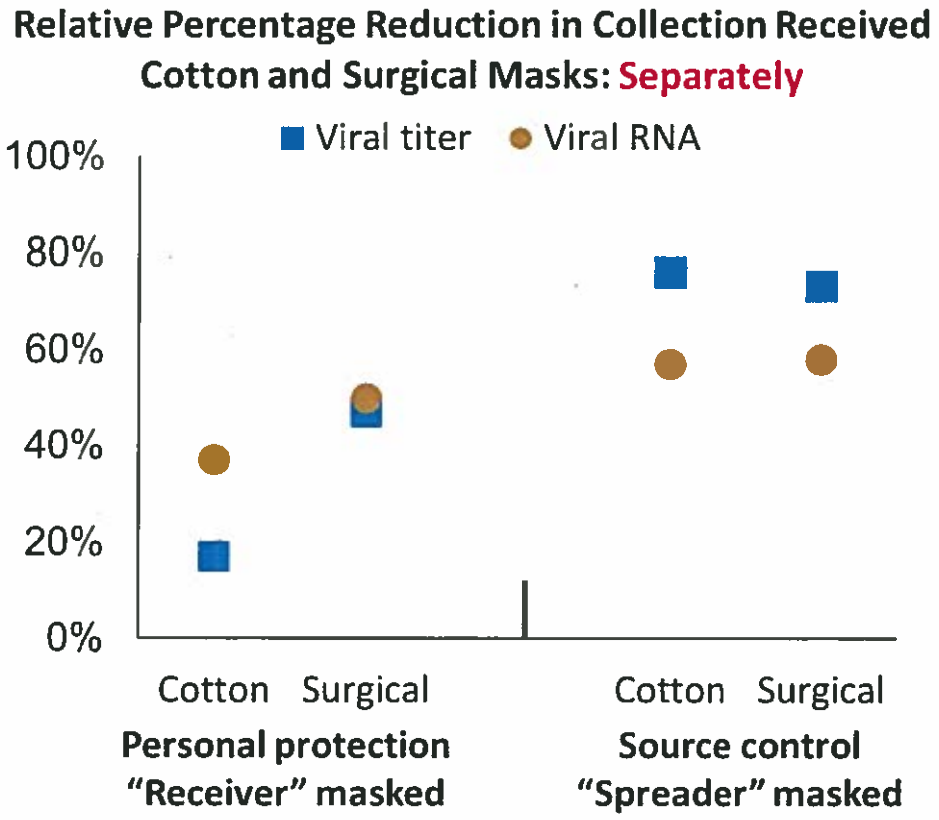
- Their performance *filtering inhaled* small droplets is not as good as their performance *blocking exhaled* small droplets
- Improvements possible with more layers, multiple materials
  - Static charge, hydrophobic
- Opportunities for innovation

Image from Konda et al. 2020, ACS Nano; 14(5):6339-6347. See "Appendix" at end of slide set for full set of references.

Laboratory Assessment of Cloth Masks Effectiveness: Two-Headed Experimental Masking Evaluation using SARS-CoV-2



The numbers below the bars show the percentages detected relative to the left-most control bar values. * and † indicate p-value <0.05 compared with left-most columns.

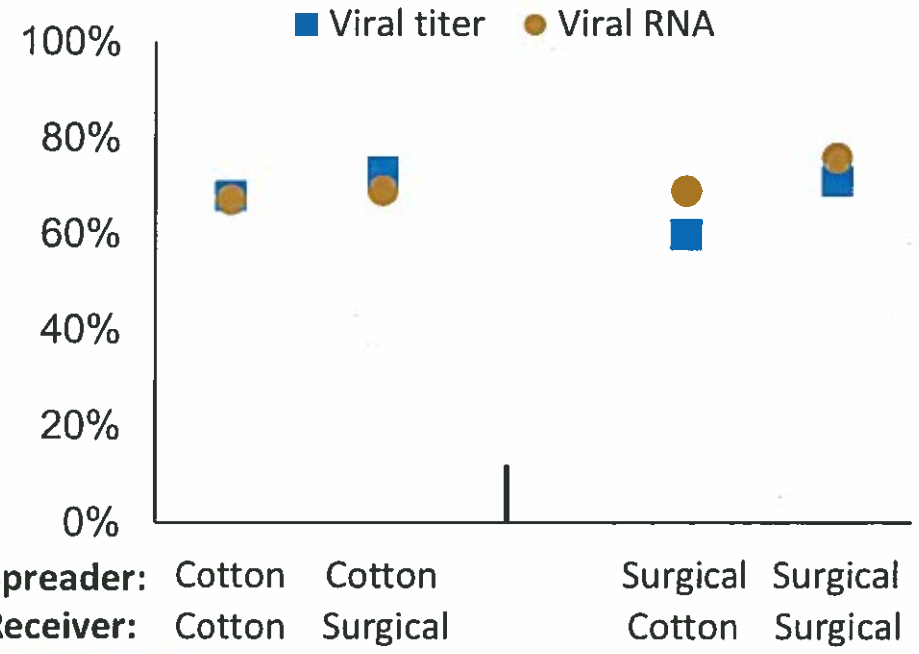


Ueki et al. 2020, mSphere; doi.org/10.1128/mSphere.00637-20.

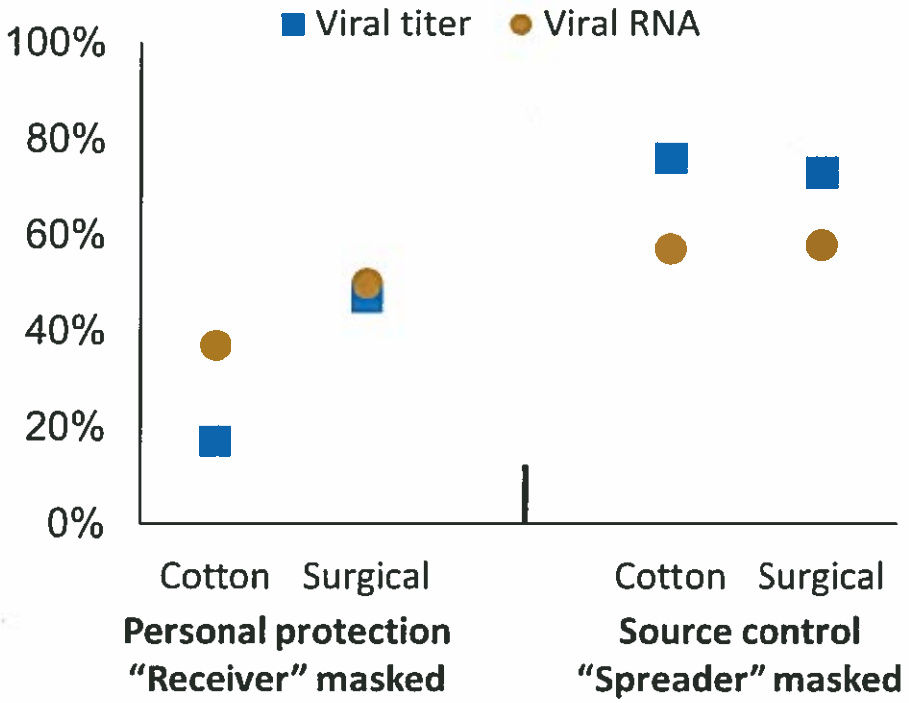
Valid as of November 16, 2020

Laboratory Assessment of Cloth Masks Effectiveness: Two-Headed Experimental Masking Evaluation using SARS-CoV-2

Relative Percentage Reduction in Collection Received Cotton and Surgical Masks: Combined



Relative Percentage Reduction in Collection Received Cotton and Surgical Masks: Separately



Ueki et al. 2020, mSphere; doi.org/10.1128/mSphere.00637-20.

Valid as of November 16, 2020

Laboratory Assessment of Cloth Masks Effectiveness: Summary

- Focus on the *relative* effects, not the absolute values from these laboratory studies
  - All experiments are proxies for human experience and biological processes
- Source control is substantial, but there is also measurable and meaningful personal protection with the use of cloth masks
  - Masking reduces the wearers' viral exposure
- Cloth masks are comparable to surgical masks when used together for community control (i.e., when combined for both source control *and* personal protection)

Community Masking to Control SARS-CoV-2

Epidemiological Investigations

Valid as of November 16, 2020

Multiple Epidemiologic Investigations of Cloth Mask Effectiveness

- **High-risk exposure events**
  - May 2020: 2 symptomatically ill hair stylists
    - Interacted closely, for 15 minutes on average, with 139 clients over an 8-day period
    - The stylists and all clients wore masks per local ordinance and company policy
    - *0 of 67 clients subsequently reached for interview and tested developed infection*
  - March and April 2020: Outbreak aboard the USS Theodore Roosevelt
    - Environment notable for congregate living quarters and close working environments
    - *Use of face coverings on-board was associated with a 70% reduced risk*
- **Retrospective case-control study of exposed contacts (Thailand)**
  - March 2020: People who reported having always worn a mask during high-risk exposures
    - Experienced a *greater than 70% reduced risk of acquiring infection* compared with people who did not wear masks under these circumstances

Hendrix et al 2020, MMWR; doi.org/10.1101/2020.05.22.20109231. Payne et al. 2020, MMWR; 69(23):714-721.
Doung-Ngern et al. 2020, Emerg Infect Dis;26(11).

Multiple Epidemiologic Investigations of Cloth Mask Effectiveness

- **Household surveys**
  - February and March 2020: Within 124 Beijing households with ≥ 1 laboratory-confirmed case of SARS-CoV-2 infection
    - Mask use by the index case and family contacts before the index case developed symptoms *reduced secondary transmission within the households by 79%*
- **Air travel**
  - January 2020: symptomatically ill person was the sole air passenger wearing a surgical mask
    - 15-hour flight (Wuhan to Toronto)
    - *0 of 25 close contacts were infected in subsequent 14 days*
  - June and July 2020: At least 6 known infected passengers on 5 flights
    - 11-hour flights (Dubai to Hong Kong)
    - 100% enforced mask mandate on-board
    - *0 new infections among other passengers in the subsequent 14 days*

Schwartz et al. 2020, CMAJ; 192(15):E410. Freedman et al. 2020, J Travel Med; doi: 10.1093/jtm/taaa178.
Wang et al. 2020, BMJ Glob Health; 5:e002794. doi:10.1136/bmjgh-2020-002794.

Frequently Cited Study that Cloth Masks Are Not Protective

- **MacIntyre et al. 2015: 1,607 healthcare workers in 15 Vietnamese hospitals**
  - Compared: Regular use of surgical masks (3-ply), regular use of cloth masks (2-ply), control (standard masking practice)
  - Endpoint: Respiratory illness identified through self-monitoring or lab-confirmed infection with flu, rhinovirus, or human metapneumovirus
  - Outcome: Despite equal compliance wearing surgical and cloth masks, cloth masks were statistically no better than the control situation and inferior to surgical masks against
    - Clinical upper respiratory illness
    - Lab-confirmed viral infection

MacIntyre et al. 2015, BMJ Open; 5:e006577, doi:10.1136/bmjopen-2014-006577.

Frequently Cited Study that Cloth Masks Are Not Protective

- **Generalization of these findings to community masking is limited**
  - Study did not include SARS-CoV-2 infection
  - Study did not include a true "no mask" group
  - Study took place in a healthcare setting and not a general community setting
  - Hospitalized patients and other staff were not masked (limited source control)
  - Assignment to study arms was unblinded
    - Possible mask-type preferences could influence self-reporting of illness
  - Cloth masks were washed by users and re-used (risk of self-inoculation handling mask)
    - Re-analysis of the data in 2020 found increased risk of infection from self-washing masks
      - HR of infection for self-washing was 2.04 (95% CI 1.03-4.00); p=0.04
    - *"Healthcare workers whose cloth masks were laundered in the hospital laundry were protected as well as those who wore disposable medical masks."* *MacIntyre et al., 2020*

MacIntyre et al. 2020, BMJ Open ;10:e042045, doi:10.1136/bmjopen-2020-042045.
MacIntyre et al. 2015, BMJ Open; 5:e006577, doi:10.1136/bmjopen-2014-006577.

Community Masking to Control SARS-CoV-2

Community Studies

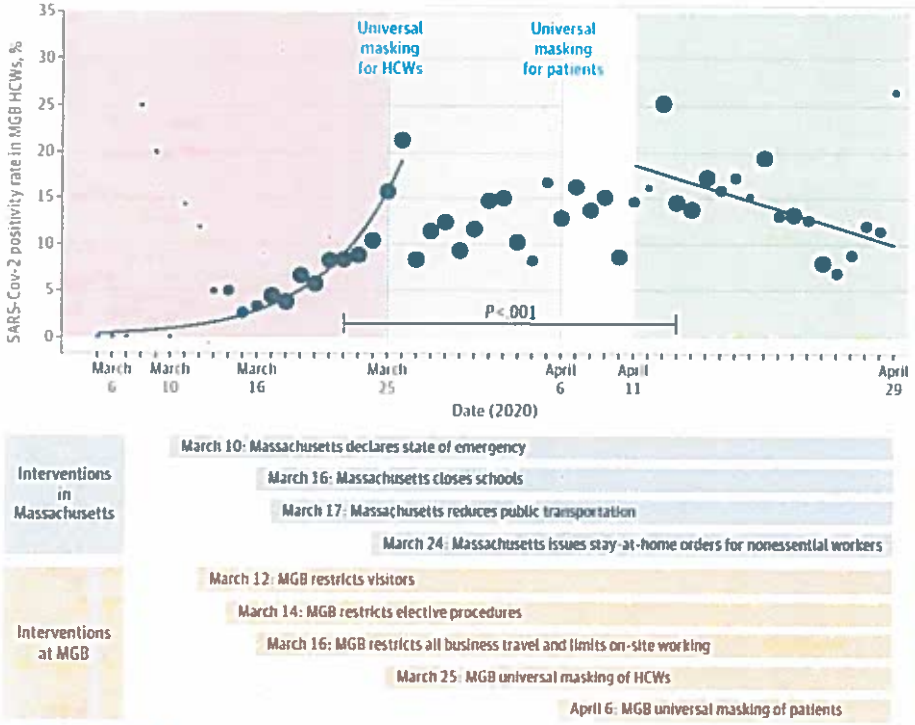
Valid as of November 16, 2020

Jurisdictional Declines in New Diagnoses Associated With Organizational/Political Leadership Directives for Universal Masking

- Seven published reports examined changes in new diagnoses or deaths with mask mandates
  - Massachusetts General Brigham (MGB) Integrated Health Care System
  - Jena city, Germany
  - Arizona state, United States
  - 15 states and District of Columbia, United States (two analyses)
  - Canada, national
  - United States, national
- All observed reductions in new COVID-19 diagnoses (n=6) or deaths (n=3) following recommendations for universal masking

Wang et al. 2020, JAMA; 323(14):1341-1342. Gallaway et al 2020, MMWR; 69(40):1460-1463. Lyu and Wehby 2020, Health Affairs (Millwood); 39(8):1419-1425.
Mitze et al. 2020, Institute of Labor Economics Report; DP No. 13319, http://ftp.iza.org/dp13319.pdf.
Karaivanov et al. 2020, National Bureau Of Economic Research; Working Paper 27891, http://www.nber.org/papers/w27891.
Hatzius et al. 2020, Goldman Sachs Research report https://www.goldmansachs.com/insights/pages/face-masks-and-gdp.html.
Chernozhukov et al. 2020, medRxiv: https://doi.org/10.1101/2020.05.27.20115139.

Jurisdictional Declines in New Diagnoses Associated With Organizational/Political Leadership Directives for Universal Masking

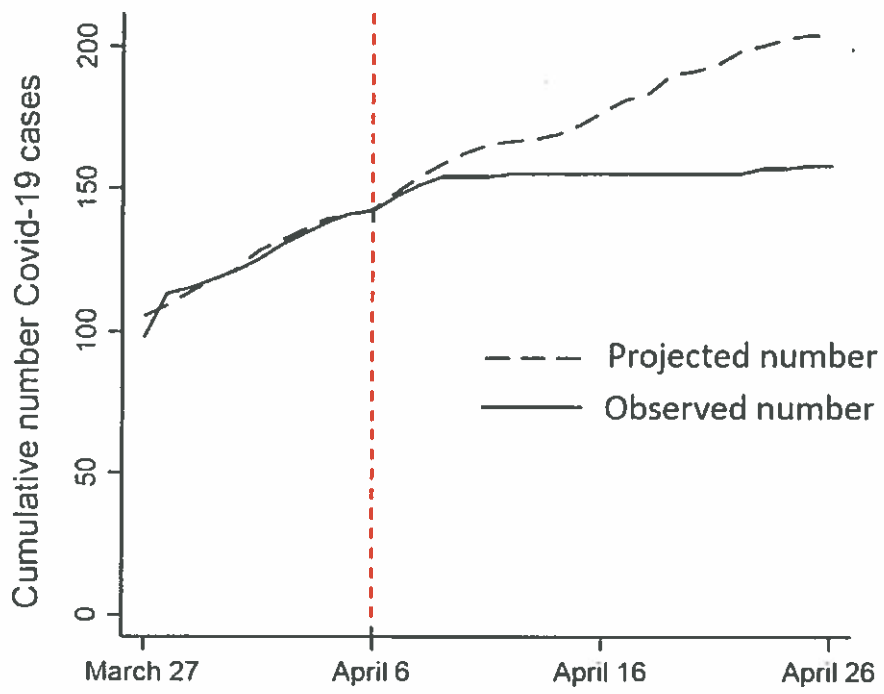


- MGB required masking for all health care workers (HCW) followed two weeks later by required masking for all patients and visitors
- Despite interventions locally and within the MGB system (see bars below figure)
  - New diagnoses among HCWs first started to decline within ~1 week* after implementation of full masking mandate

* Median incubation period is 4-6 days

Wang et al. 2020, JAMA; 324(7):703-704. doi:10.1001/jama.2020.12897

Jurisdictional Declines in New Diagnoses Associated With Organizational/Political Leadership Directives for Universal Masking



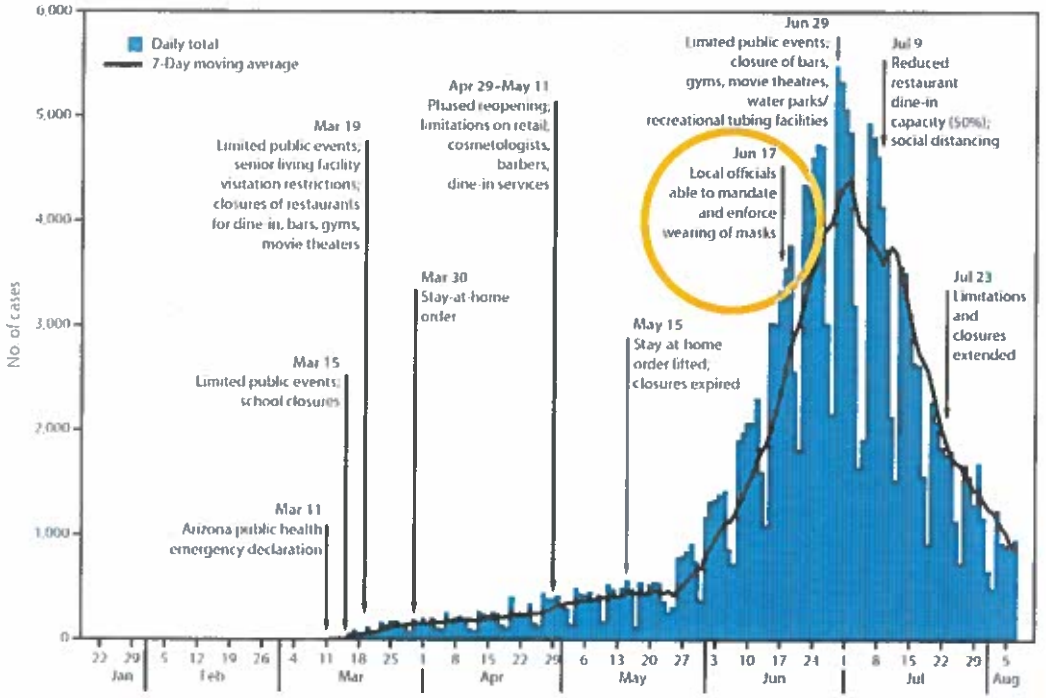
- Political leaders mandated universal community masking in the city of Jena (Germany) on April 6, 2020
- New diagnoses leveled off starting about 10 days later*
- Cumulative decline in number of new diagnoses of about 25% within 20 days
  - >50% for persons aged ≥ 60 years
- Other interventions had already been introduced (e.g., social distancing, hand hygiene)

* Median incubation period is 4-6 days

Adapted from Mitze et al. 2020, Institute of Labor Economics Report; DP No. 13319, http://ftp.iza.org/dp13319.pdf.

Valid as of November 16, 2020

Jurisdictional Declines in New Diagnoses Associated With Organizational/Political Leadership Directives for Universal Masking



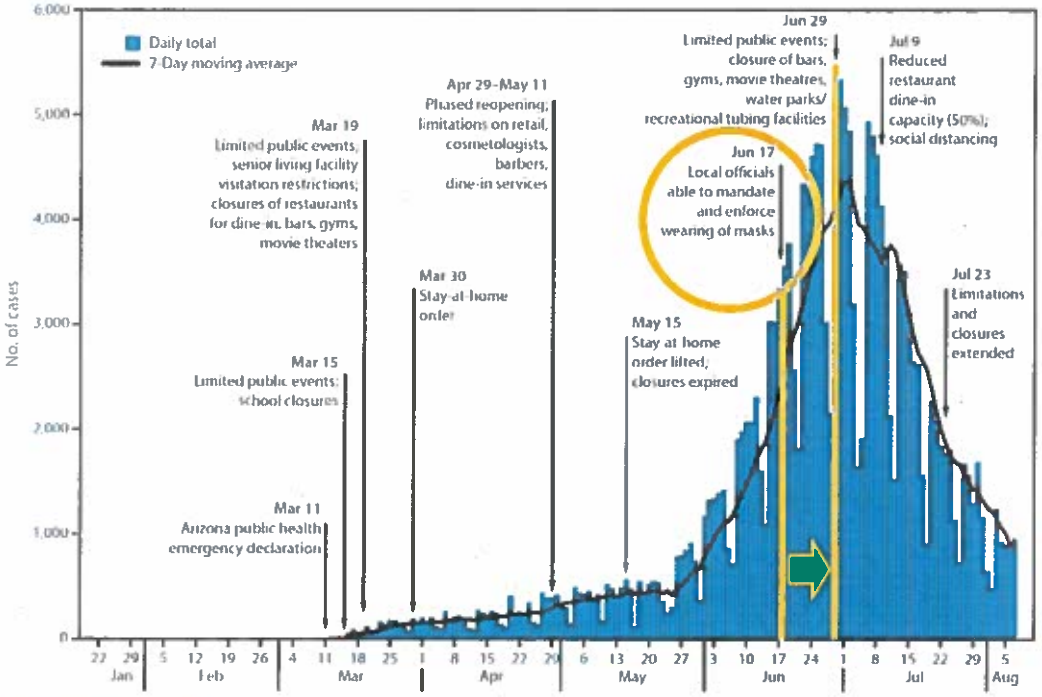
- Arizona mandated masking on June 17
- Decline in number of new cases began about 12 days later*
- Further interventions applied June 29
  - These interventions were coincident with the start of the decline
  - Their effect could not have been instantaneous
  - This observation suggests start of decline was due to earlier masking mandate

Gallaway et al. 2020, MMWR; 69(40):1460-1463.10.15585/mmwr.mm6940e3.

* Median incubation period is 4-6 days

Valid as of November 16, 2020

Jurisdictional Declines in New Diagnoses Associated With Organizational/Political Leadership Directives for Universal Masking



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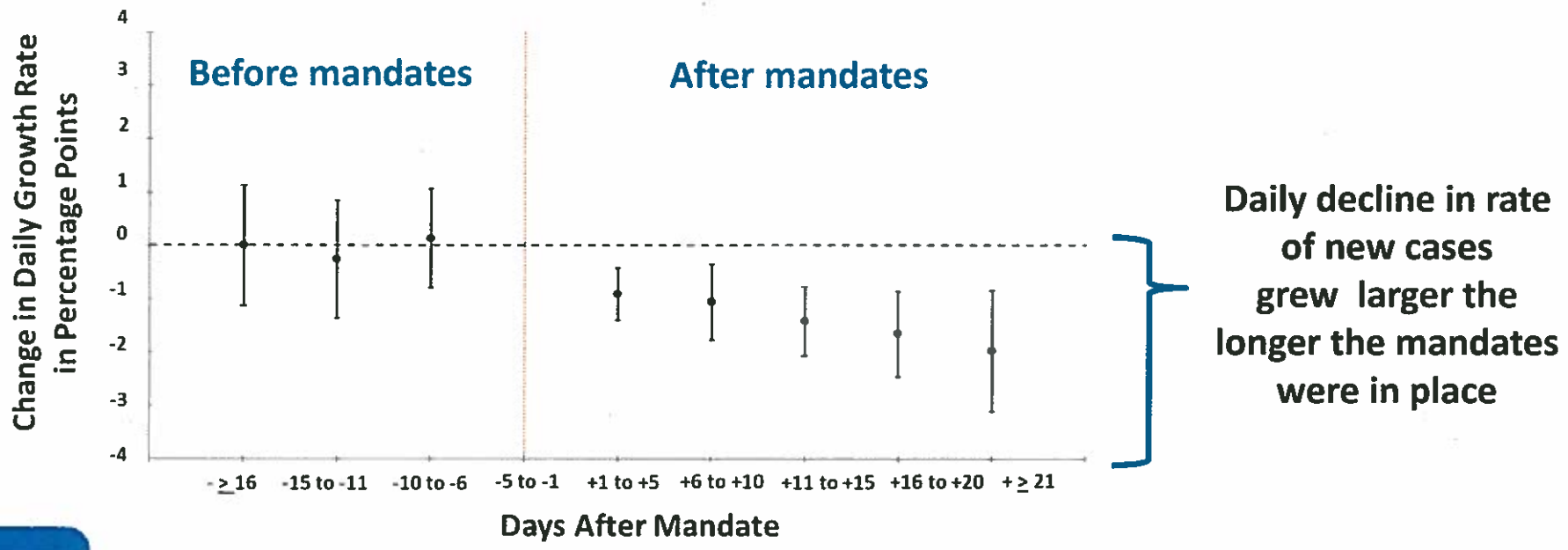
* Median incubation period is 4-6 days

Valid as of November 16, 2020

Jurisdictional Declines in New Diagnoses Associated With Organizational/Political Leadership Directives for Universal Masking

- Masking mandates in 15 states led to 2% decline in rate of new diagnoses by 21 days*
- Rate of decline steadily increased with time after mandate, doubling by 21 days



Lyu and Wehby 2020, Health Affairs (Millwood); 39(8):1419-1425.

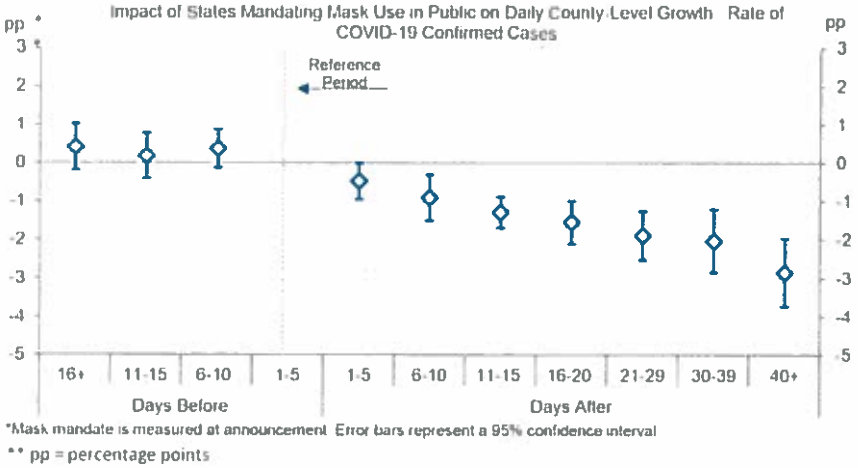
*included D.C. and controlled for other major COVID-19 mitigation policies as time-varying.

Valid as of November 16, 2020

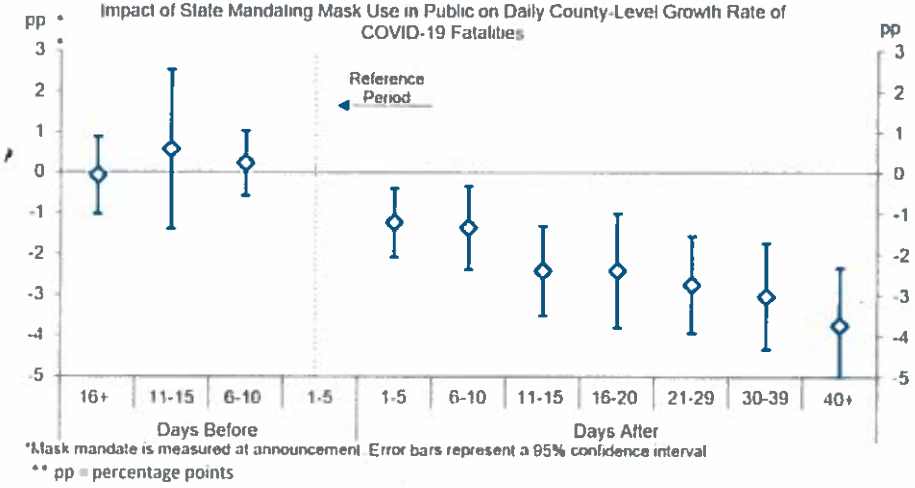
Jurisdictional Declines in New Diagnoses Associated With Organizational/Political Leadership Directives for Universal Masking

- Mandatory masking prevented both infections and deaths; could avert more lockdowns
- With 15% increase in masking, estimated potential GDP savings of $1 trillion (5% GDP)

Daily Average *Case Rate*



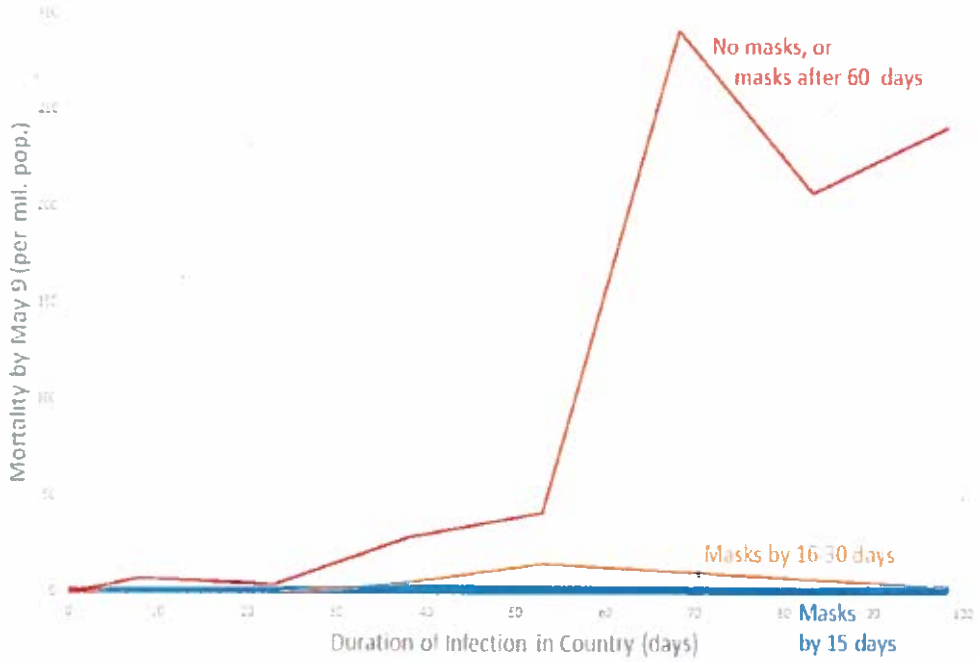
Daily Average *Fatality Rate*



Hatzius et al. 2020, Goldman Sachs Research report, https://www.goldmansachs.com/insights/pages/face-masks-and-gdp.html.

Valid as of November 16, 2020

Country-Level Declines in Deaths Associated With Timing of Universal Masking Adoption or Mandates



- Evaluated mortality rates stratified by time
  - From date of first diagnosis to date masking was mandated or otherwise universally adopted in 200 countries (including U.S.) through May 9, 2020
  - Used 3 strata based on time since infection first identified in country
- During each week without masks, mortality increased 59%

Leffler et al 2020, medRxiv; doi.org/10.1101/2020.05.22.20109231.

Valid as of November 16, 2020

The Science of Masking to Control COVID-19: Summary

- **Cloth masks reduce community exposure to SARS-CoV-2**
- **Cloth masks offer both source control and personal protection**
  - The relationship is likely complementary and possibly synergistic
  - Community benefit derives from the combination of these effects
  - Individual benefit increases with increasing community mask use
- **Wearing masks by both the infected and uninfected person gives the uninfected person the most protection**
  - "Masking can protect you and works *best* for *you* when *everyone* does it"
  - "When you wear a mask, you protect others as well as yourself"
- **Universal masking policies can help avert the need for shutdowns**
  - Especially if combined with other non-pharmaceutical interventions such as social distancing, hand hygiene, and adequate ventilation

Appendix: Additional References

Slide 7: Laboratory Assessment of Cloth Masks Effectiveness: Source Control

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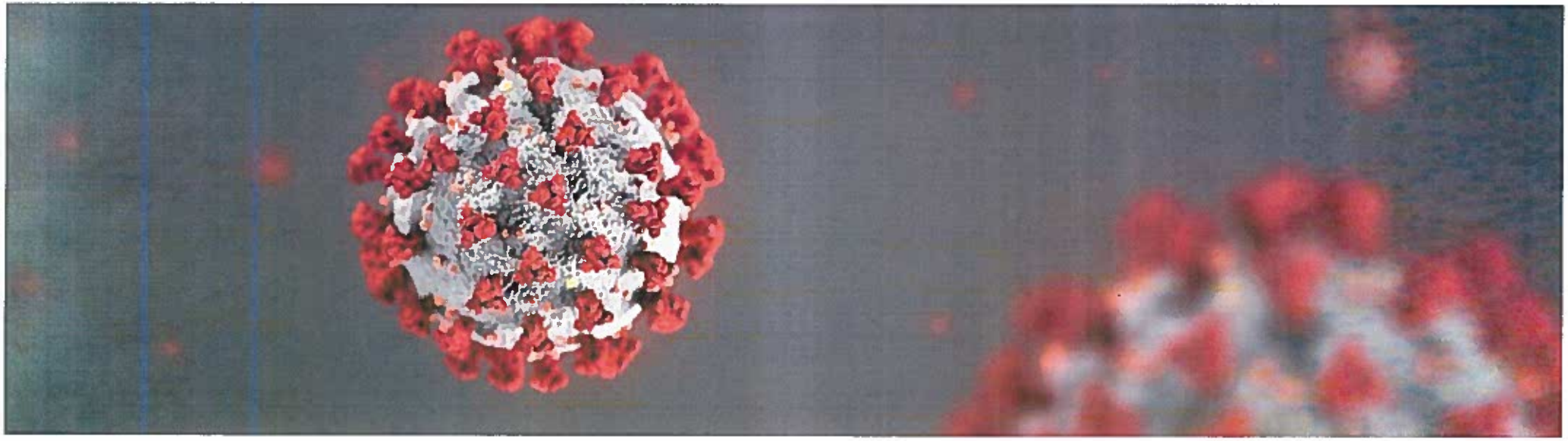
Slide 8: Laboratory Assessment of Cloth Masks Effectiveness: Filtering Protection

Rengasamy et al. 2010, Ann Occup Hyg; 54(7):789-798. Konda et al. 2020, ACS Nano; 14(5):6339-6347. Long et al. 2020, PLoS One; 15(10):e0240499. O'Kelly et al. 2020, BMJ Open; 10(9):e039424. Aydin et al. 2020, Extreme Mech Lett; 40:100924. Bhattacharjee et al. 2020, BMJ Open Respir Res; doi 10.1136/bmjresp-2020-000698. Maurer et al. 2020, J Aerosol Med Pulm Drug Deliv; doi 10.1089/jamp.2020.1635. Hill et al. 2020, Nano Lett; 20(10):7642-7647. Whiley et al. 2020, Pathogens; doi:10.3390/pathogens9090762. Hao et al. 2020, Int J Hyg Environ Health; 229:113582. van der Sande et al. 2008, PLoS One; 3(7):e2618. Chu et al. 2020, Lancet; doi 10.1016/S0140-6736(20)31183-1. Zhao et al. 2020, Nano Lett; 20:5544–5552. Parlin et al. 2020, PLoS One; 15(9):e0239531. Kahler et al. 2020, J Aerosol Sci; 148:105617. Ueki et al. 2020, mSphere; doi.org/10.1128/mSphere.00637-20.



For more information, contact CDC
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TTY: 1-888-232-6348 www.cdc.gov

Mask adherence and rate of COVID-19 across the United States

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Abstract

Mask wearing has been advocated by public health officials as a way to reduce the spread of COVID-19. In the United States, policies on mask wearing have varied from state to state over the course of the pandemic. Even as more and more government leaders encourage or even mandate mask wearing, many citizens still resist the notion. Our research examines mask wearing policy and adherence in association with COVID-19 case rates. We used state-level data on mask wearing policy for the general public and on proportion of residents who stated they always wear masks in public. For all 50 states and the District of Columbia (DC), these data were abstracted by month for April – September 2020 to measure their impact on COVID-19 rates in the subsequent month (May – October 2020). Monthly COVID-19 case rates (number of cases per capita over two weeks) >200 per 100,000 residents were considered high. Fourteen of the 15 states with no mask wearing policy for the general public through September reported a high COVID-19 rate. Of the 8 states with at least 75% mask adherence, none reported a high COVID-19 rate. States with the lowest levels of mask adherence were most likely to have high COVID-19 rates in the subsequent month, independent of mask policy or demographic factors. Mean COVID-19 rates for states with at least 75% mask adherence in the preceding month was 109.26 per 100,000 compared to 249.99 per 100,000 for those with less adherence. Our analysis suggests high adherence to mask wearing could be a key factor in reducing the spread of COVID-19. This association between high mask adherence and reduced COVID-19 rates should influence policy makers and public health officials to focus on ways to improve mask adherence across the population in order to mitigate the spread of COVID-19.

Introduction

Mask wearing has been advocated by public health officials as a way to reduce the spread of COVID-19 (1, 2, 3). In the United States, policies on mask wearing have varied from state to state over the course of the pandemic (4). For the period of April 1 through October 31, 2020, less than half of states had issued a mandate for mask wearing in public and nearly a third had not made any recommendation. Even as more and more government leaders encourage mask wearing (5), many citizens still resist the notion. Individuals' mask wearing behaviors are not only influenced by recommendations and mandates issued by state leaders, but also by print, televised, and social media (6). Thus, adherence to mask wearing in public remains a challenge for mitigating the spread of COVID-19.

Public health policy-making requires navigating the balance of public good and individual rights (7). The adoption of universal masking policies is increasingly polarized and politicized, demanding that public health authorities balance the values of health and individual liberty. Adherence to public policy is influenced by a complex interplay of factors such as public opinion, cultural practices, individual perceptions and behaviors (8), which are difficult to quantify. The politicization of COVID-19 epidemiology (6, 9) has further complicated policy-making, messaging, and uptake. Nevertheless, adherence is essential for policy effectiveness. Research on lax public health policies and lack of adherence is warranted because they can carry real risks to health, with myriad downstream effects including increased death, stressed health care systems, and economic instability (10). We examined the impact of state-based mask wearing policy and adherence on COVID-19 case rates during the summer and early fall of 2020 in order to quantify this effect.

Methods

For all 50 states and D.C., data on mask wearing and physical distance policies, mask adherence, COVID-19 cases, and demographics were abstracted from publicly available sources. We utilized the COVID-19 US State Policy Database, created by Dr. Julia Raifman at Boston University School of Public Health (11), for policy and demographic information. We abstracted data on whether the state issued a mandate of mask use by all individuals in public spaces, and if so, the dates of implementation and whether the mandate was enforced by fines or criminal charge/citation(s). For policies on physical distancing, we recorded whether a stay-at-home order was issued and, if so, when. For mask adherence levels, we utilized the Institute of Health Metrics and Evaluation (IHME) COVID-19 Projections online database (12), which holds data collected by Facebook Global in partnership with the University of Maryland Social Data Science Center (13). We abstracted daily percentages of the population who say they always wear a mask in public. To calculate monthly COVID-19 case rates, we abstracted the number of new cases reported by the U.S. Centers for Disease Control and Prevention (CDC) (14) and state population sizes in 2019 (15).

Mask wearing policy: We categorized the existence of a mask policy as "None" if there was no requirement for face coverings in public spaces, "Recommended" if required in all public spaces without

consequences, and "Strict" if required in all public spaces with consequences in the form of fine(s) or citation(s). States and D.C. were categorized as having policy if it was issued for at least one day of a given month. Although Hawaii's governor did not issue a mask wearing policy until after October 2020, we considered that state to have a policy because mayors of the four populous counties had mandated mask wearing earlier in the pandemic.

Mask wearing adherence: We calculated the average mask use percentage by month for April – September, 2020. For each month, the distributions of mask adherence across all 50 states and D.C. were categorized into quartiles, meaning the cut-off values for each quartile may be different from one month to another. Mask adherence was classified as low if in the lowest quartile and as high if in the highest quartile. We also identified states with average mask adherence $\geq$75% in a given month.

COVID-19 rates: We calculated the number of new cases in each month, for each state and D.C. Rates were the number of new cases divided by the population in 2019. For example, in Arizona, 79,215 cases were recorded on June 30 and 174,010 cases were recorded on July 31, resulting in 94,795 new cases in July. We divided the monthly number by 2.2 to obtain the number in a two-week period (43,088). The 2-week rate in July in Arizona = 43,088 cases / 7,278,717 population in 2019 = 0.00592 or 592 per 100,000. We classified a state and D.C. as having a high case rate in a given month if a 2-week rate was >200 cases per 100,000 people, per CDC classifications of highest risk of transmission (16).

Covariates: Based on CDC at-risk guidelines for COVID-19 (17), we considered non-Hispanic Black, Hispanic, age, and population density as potential confounders. Data on population distributions from the COVID-19 US State Policy Database (11) came from the US Census. For demographic data, we dichotomized population proportions at whole values that approximated the highest quartile of the distributions. Specifically, we created the following categories: >15% non-Hispanic Black, >15% Hispanic, median age >40 years, and population density >200 people per square mile, which corresponded to 74.5%, 78.4%, 82.4%, and 78.4% of the distributions, respectively. Policy data on physical distancing were dichotomized as any versus no stay-at-home order during the April 1 to October 31, 2020 interval.

Statistical analysis: Our analyses took into consideration the delayed effect of mask wearing and policies on COVID-19 health outcomes. Thus, policy and adherence levels in a given month were contrasted with lagged COVID-19 case rates in the subsequent month. Both mask policy and mask adherence for states and D.C. were cross-tabulated with high case rates in the subsequent month. Logistic regression models were used to estimate the odds ratio and 95% confidence intervals for high case rates in the subsequent month associated with average mask adherence (as a continuous variable). Models were unadjusted, adjusted for no mask policy (Model 1), and adjusted for no mask policy in previous month, no stay-home order, >15% population non-Hispanic Black, >15% population Hispanic, median age >40 years, population density > 200/ square mile (Model 2).

Results and discussion

States in COVID-19 high-risk categories are listed in Table 1. Because stay-at-home order, mask wearing policy, mask adherence, and COVID-19 rates can vary from month to month, we listed those states with consistent classifications across the period April through September (or May through October for COVID-19 rates). Eleven states had no stay-at-home order, 15 had no mask policy, and four states had low adherence throughout this six-month period.

Table 1. States with high COVID-19 population characteristics.

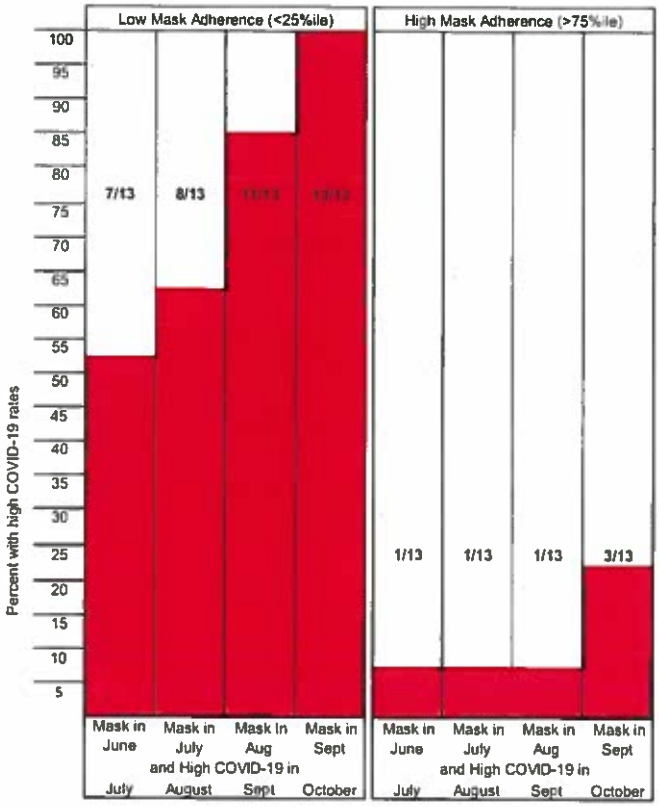
High risk category	States
>15% non-Hispanic Black	AL, AR, DC, DE, FL, GA, HI, LA, MD, MS, NC, SC, TN, VA
>15% Hispanic	AZ, CA, CO, CT, FL, IL, NJ, NM, NV, NY, RI, TX
Median age >40 years	CT, DE, FL, ME, MT, NH, NJ, PA, RI, VT, WV
Pop. density > 200/m^2	CA, CT, DC, DE, FL, HI, MA, MD, NH, NY, OH, PA, RI
No stay at home order	AR, CT, IA, KY, ND, NE, OK, SD, TX, UT, WY
No mask policy Apr-Sep	AZ, FL, GA, IA, ID, MO, MT, ND, NE, NH, OK, SC, SD, TN, WY
<25%ile mask adherence Apr-Sep	IA, KS, ND, SD
High COVID-19 rate[a]	
May	DC, DE, IL, MA, MD, NE, NJ, RI
June	AR, AZ, FL, SC
July	AL, AR, AZ, CA, FL, GA, ID, IA, KS, LA, MO, MS, NC, NV, OK, SC, TN, TX, UT
August	AL, AR, CA, FL, GA, ID, IA, IL, KS, LA, MO, MS, ND, NV, OK, SC, SD, TN, TX
September	AL, AR, GA, ID, IA, IL, KS, KY, MO, MS, MT, NE, ND, OK, SC, SD, TN, TX, UT, WI
October	AL, AK, AR, CO, DE, ID, IA, IL, IN, KS, KY, MI, MN, MO, MS, MT, NC, NE, ND, NM, NV, OH, OK, RI, SC, SD, TN, TX, UT, WI, WV, WY
Jul, Aug, Sep or Oct and no mask policy Jun - Sep	AZ, FL, GA, IA, ID, MO, MT, ND, NH, OK, SC, SD, TN, WY
Not high COVID-19 rate[b] in sub-sequent month	
Mask adherence ≥75% Jun, Jul, Aug, or Sep	AZ, CT, HI, MA, NY, RI, VT, VA

[a] 2-week COVID-19 rate >200 cases/100,000

[b] 2-week COVID-19 rate <200 cases/100,000

Of the 15 states with no mask policy from April through September, 14 reported high COVID-19 rates in at least one month from May to October. Because high COVID rates were reported by only eight states in May and four states in June, we did not examine mask adherence or policy in the preceding April or May. Thus, our comparison of states with high COVID-19 rates by month focused on July, August, September and October. Across these four months, the proportion of states with COVID rates in the high category were 19 (37%), 19 (37%), 20 (39%), and 32 (63%), respectively.

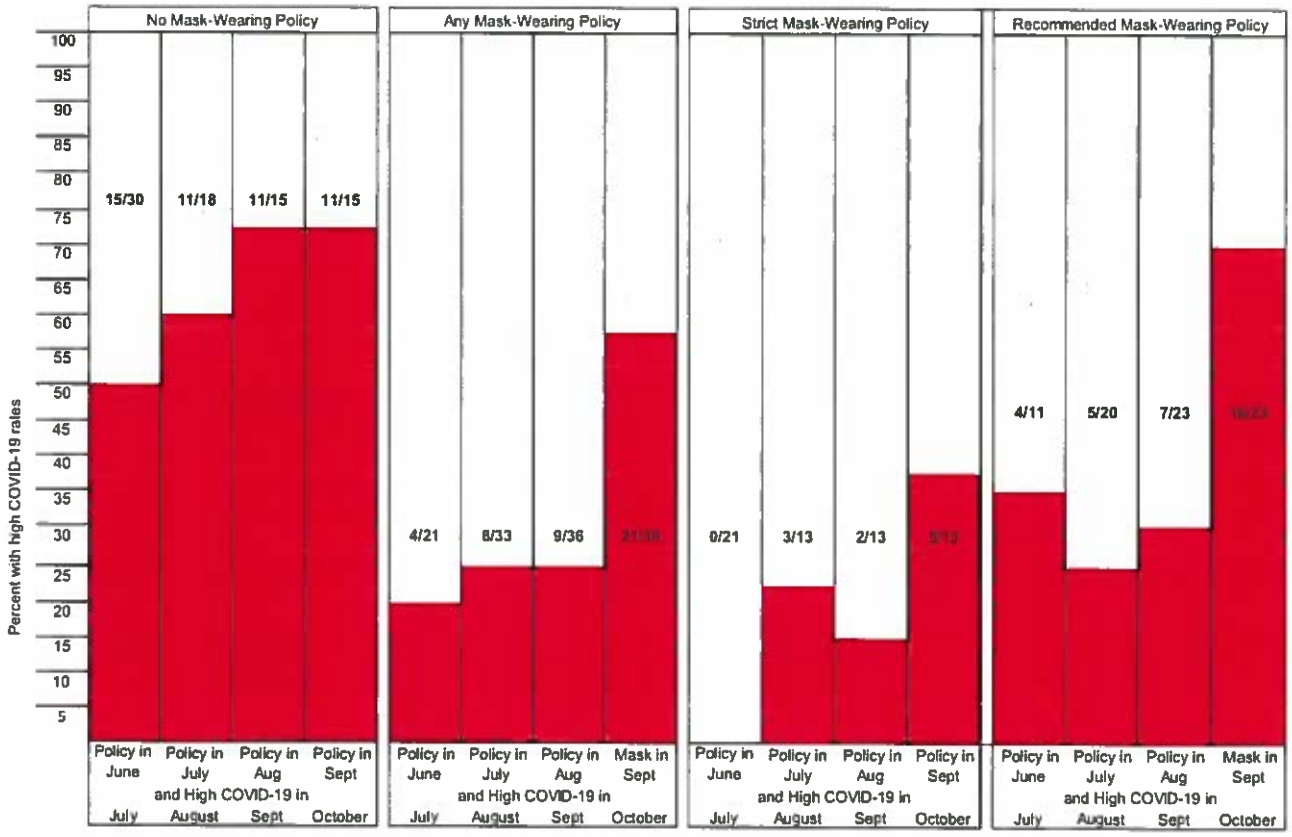
Fig. 1. Proportion of states with high COVID-19 rates among those in the low and high mask adherence quartiles in the preceding month.



For mask adherence, the cut-off values for the low and high quartiles were 31% and 46% in June, 53% and 72% in July, 55% and 71% in August, and 55% and 68% in September. The proportions of states with high COVID-19 rates are shown for those in the low and high quartiles of mask adherence in the preceding month (Fig 1). Most states in the low quartile had high COVID-19 rates in the subsequent month. Indeed all 13 states in the low mask adherence group in September had high COVID-19 rates in October. In contrast, just one state in July, August, and September and three in October in the high quartile had high COVID-19 rates in the subsequent month. When we looked at states with ≥75% mask adherence (Arizona, Connecticut, Hawaii, Massachusetts, Michigan, New York, Rhode Island, Vermont), we found none had experienced a high COVID-19 rate in the

subsequent month. Mean COVID-19 rates for states with ≥75% mask adherence in the preceding month was 109.26 per 100,000 compared to 249.99 per 100,000 for those with less adherence.

Fig. 2. Proportion of states with high COVID-19 rates among those no, any, strict, and recommended mask wearing policy in the preceding month.



The proportions of states and D.C. with high COVID-19 rates were greatest for those with no mask wearing policy for the general public in the preceding month (Fig 2). Among states and D.C. with no mask wearing policy, 50 to 73% had high COVID-19 rates in the subsequent month. In contrast, 25% or fewer states with a mask wearing policy had high COVID-19 rates, except in September when over half experienced high rates. Fourteen of the 15 states with no mask wearing policy for the general public for the entire four month period (June through September) reported a high COVID-19 rate. High COVID-rates were less frequent in states and D.C. with strict mask wearing policy than in states with recommended policy.

Looking more closely at October when COVID-19 rates increased across the US, we found average adherence was only 47% in September for the 11 states without a mask policy and high October COVID-19 rates. In contrast, average adherence was 68% in the 15 states with lower COVID-19 rates in October and any mask policy in September. Of note, there were no states with ≥75% in September.

Odds ratios and 95% confidence intervals for average mask adherence and mask policy for the general public are associated with high COVID-19 rates in the subsequent month (Table 2). Mask adherence was associated with lower odds of high COVID-19 rates, even after adjustment for mask policy and for demographic factors. For every 1% increase in average adherence in June, the fully adjusted odds ratios for high COVID-19 in July was 0.95, indicating a protective effect against high COVID-19 rates. Similar reductions in odds of high COVID-19 rates in August and September were observed for July and August mask adherence, respectively. The strongest association was for mask adherence in September; for every 1% increase in average adherence, the odds of a high COVID-19 case rate decreased by 26%.

Table 2: State-level odds ratios and 95% confidence intervals (CI) for mask adherence and mask policy in relation to high COVID-19 rates in the subsequent month

		Unadjusted			Model 1[a]			Model 2 [b]		
		OR	95% CI		OR	95% CI		OR	95% CI	
June	Mask adherence, avg	0.91	0.85,	0.98	0.93	0.86,	1.00	0.95	0.83,	1.08
	Any mask policy	0.24	0.06,	0.87	0.42	0.10,	1.78	0.19	0.03,	1.41
July	Mask adherence, avg	0.91	0.86,	0.97	0.93	0.87,	0.99	0.87	0.77,	0.99
	Any mask policy	0.20	0.06,	0.70	0.41	0.10,	1.70	0.22	0.03,	1.63
August	Mask adherence, avg	0.88	0.81,	0.95	0.90	0.83,	0.98	0.94	0.85,	1.03
	Any mask policy	0.12	0.03,	0.48	0.23	0.05,	1.18	0.21	0.03,	1.57
September	Mask adherence, avg	0.81	0.72,	0.92	0.78	0.68,	0.90	0.74	0.59,	0.93
	Any mask policy	0.41	0.11,	1.52	3.52	0.49,	25.41	6.28	0.61,	64.85

[a] Model 1, includes average mask adherence and any mask policy

[a] Model 2, includes Model 1 and adjusted for no stay-home order, >15% population non-Hispanic Black, >15% population Hispanic, median age >40 years, population density >200/m2

Crude and adjusted odds ratios for any mask policy in relation to high COVID-19 rates in the subsequent month were below 1.0; but confidence intervals were wide. For mask policy and adherence in September in relation to high COVID-19 rates in October, collinearity caused the odds ratio to flip.

We were not able to measure statistical interactions between mask policy and adherence due to instability arising from small numbers. We did estimate odds ratios for mask adherence within subgroups of states with and without mask policy. Odds ratios indicating protection of high COVID-19 rates remained for all months and policy subgroups, ranging from 0.82 to 0.93 for states with any policy and from 0.60 to 0.95 for states with no policy.

Interpretation

We show supporting evidence for reducing the spread of COVID-19 through mask wearing. This protective effect of mask wearing was evident across four months of the pandemic, even after adjusting the associations for mask policy, distance policy, and demographic factors. We observed some benefit of mask policy on COVID-19 rates, but the findings were unstable. The weaker

associations for mask policy may reflect the lack of a unified policy across all states and D.C. and the inconsistent messaging by the media and government leaders. Our observed associations should influence policy-makers and contribute to public health messaging by government officials and the media that mask wearing is a key component of COVID-19 mitigation.

Our observation that states with mask adherence by ≥75% of the population was associated with lower COVID-19 rates in the subsequent month suggests that states should strive to meet this threshold. The difference in mean COVID-19 rates between states with ≥75% and <75% mask adherence was 140 cases per 100,000. It is worth noting that no states achieved this level of mask adherence in September, which might account in part for the spike in COVID-19 rates in October. Of course, many other factors are could be at play, like the possibility of cooler weather driving non-adherent persons to indoor gatherings.

Our study accounted for temporality by staggering COVID-19 outcome data after adherence measures. Nevertheless, it is possible that average mask adherence in a given month does not capture the most effective time period that influences COVID-19 rates. For example, mask wearing in the two weeks before rates begin to rise might be a more sensitive way to measure the association. If this is true, we would expect associations between mask adherence and high COVID-19 rates to be even stronger. It is also possible that survey respondents misreported their mask wearing adherence; whether they would be more or less likely to over or under-report is open to speculation, but residents in states with mask wearing policy might over-report adherence to appear compliant. The lag between mask adherence measures and COVID-19 rates should reduce reverse causation, but high COVID-19 rates early in a month could affect mask adherence levels later in that month.

It is important to note that state level distributions of demographic factors do not account for concentrations or sparsity of populations within a given state. Further, our adjustment for demographic factors at the state population level may not represent the true underlying forces that put individuals at greater risk of contracting COVID-19. Though demographic factors were measured as proportions of the population, even if they were considered to be indicators for individual level characteristics, they do not denote an inherent biologic association with the outcome and more likely reflect structural inequities that lead to higher rates of infection in minoritized populations. Another consideration is that access to COVID-19 testing appears to vary from state to state (18). If states with less accessible COVID-19 testing also have less mask adherence, the associations we report here may be under-estimates.

Our analysis of state and D.C.-level data does not account for variations in policy, adherence, and demographic factors at smaller geographic levels, such as county-levels. Further analyses of more granular geographic regions would be a logical next step. Indeed, associations between mask policy, adherence and other factors may be obscured in states with many high density and low density areas.

Conclusions

In conclusion, we show that mask wearing adherence, regardless of mask wearing policy, may curb the spread of COVID-19 infections. We recommend renewed efforts be employed to improve adherence to mask wearing.

Acknowledgements

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