**AGENDA REPORT**

**DATE:** August 14, 2020

**TO:** MAYOR AND CITY COUNCIL

**FROM:** Jennifer Stapleton, City Administrator

**SUBJECT:** Request for Mask Mandate in City of Sandpoint

**DESCRIPTION/BACKGROUND:**

Councilwoman Ruehle has requested that the City of Sandpoint enact a mask mandate within Sandpoint city limits and has provided supporting materials for her request as attached.

I am preparing this memo to outline the process for implementation of a mask mandate should Council determine to pursue this action.

The Council will be voting on an Ordinance Creating Title 4, Chapter 9, entitled Emergency Powers which gives the Mayor of Sandpoint the authority to issue a public health emergency order mandating social distancing and a mask mandate as outlined in the proposed ordinance (attached) and pursuant to Idaho Code Sections 50-304 and 50-606. The ordinance is required to convey the authority to the Mayor to issue an order. The Council as a legislative body cannot issue the order.

IF the Council enacts the ordinance, the Mayor would then have the power to issue an amended local disaster/public health emergency declaration and order to his declaration issued March 18, 2020 (**https://www.sandpointidaho.gov/home/showdocument?id=13842**) which mandates social distancing and a mask mandate as outlined in the Council ordinance. The Mayor ultimately has the authority to determine whether or not to issue the amended declaration and order and can only do so if Council has enacted an Emergency Powers Ordinance. The order is only valid for seven days.

IF Council enacts the Emergency Powers Ordinance and IF the Mayor issues an amended local disaster/public health emergency declaration and order, the Council would need to consider passing a resolution extending the Mayor's amended emergency declaration and order beyond the seven days it is limited to. (See **https://www.sandpointidaho.gov/home/showdocument?id=13842** for reference.)

**STAFF RECOMMENDATION:** N/A

**ACTION:**

- **Council action on an Ordinance Creating Title 4, Chapter 9, entitled Emergency Powers**
- **Potential Mayor action to issue an amended local disaster/public health emergency declaration and order to his declaration issued March 18, 2020 mandating social distancing and a mask mandate as outlined in the Council Ordinance (if passed)**
- **Potential Council action on a resolution consenting to Mayor Rognstad's amended local disaster/public health emergency declaration and order (if issued)**

**WILL THERE BE ANY FINANCIAL IMPACT?** No **HAS THIS ITEM BEEN BUDGETED?** No

CITY COUNCIL AGENDA REQUEST FORM

Today's date: 8/10/20

Date of meeting 8/19/20

*(City Council meetings are held the 1st and 3rd Wednesday of each month.)*

Name of Elected Official, City Employee, Organization, or Citizen making request: Deb Ruehle, council member

Address: City Hall

Phone number and email address:

Authorized by: Deb Ruehle (name of City official) D. Ruehle (City official's signature)

Subject: City of Sandpoint Mask Mandate

Summary of what is being requested:

**The following information MUST be completed before submitting your request to the City Clerk:**

1. Would there be any financial impact to the city? ☐ **Yes or No** ☐ Budgeted? ☐ **Yes or No** ☐
   If yes, in what way?

2. Name(s) of any individual(s) or group(s) that will be directly affected by this action: — Have they been contacted? **Yes or No**

3. Is there a need for a general public information or public involvement plan? **Yes or No**
   If yes, please specify and suggest a method to accomplish the plan:

4. Is an enforcement plan needed? ☐ **Yes or No** ☐ Additional funds needed? ☐ **Yes or No** ☐

5. Have all the affected divisions been informed about this agenda item? ☒ **Yes or No** ☐

**This form must be submitted no later than 5:00pm Tuesday the week prior to the meeting. All pertinent documentation for the Council packet must be included.**

**ITEMS WILL NOT BE AGENDIZED WITHOUT THIS FORM**

# Kootenai Health Position on Masking in Public

July 16, 2020

Since April 22, Kootenai Health has required all employees, patients and visitors in the hospital and clinics to wear a facemask. Since July 2, because of increasing community rates of COVID-19 infection and the success seen in our clinical areas, Kootenai has required all 3,500 employees in every Kootenai Health facility to wear a mask. These measures have resulted in a significantly lower rate of transmission in Kootenai employees than in health care workers across the nation.

As health care leaders, Kootenai Health staff and physicians have dedicated thousands of hours to understanding, preparing for and caring for those affected by COVID-19. After observing the spread of COVID-19 in northern Idaho and other parts of the world, it is clear that wearing a mask helps prevent the transmission of COVID-19. **It is Kootenai Health's position that everyone should wear a protective facemask when out in public.**

While our primary focus is health care, we are also community members who want to see our local economy and school districts thrive. We understand the significant hardship lockdowns have on local businesses, and the impact school closures have on our children and families. Kootenai wants to avoid lockdowns and focus on practical solutions.

Masking has been proven to significantly slow the spread of COVID-19. It is as simple as that. The choice is ours; wear masks, slow the spread, keep businesses open and give our schools the best possible environment for re-opening, or do nothing while COVID-19 sweeps through our community. **At Kootenai Health, we will be wearing masks. We hope you will join us.**

KootenaiHealth

# North Idaho Health Care Organizations Support Masks

To Our Honorable Elected Officials,

As health care organizations, we have an important role in advocating for and protecting the health of our community and fellow health care workers. We cannot sit idly and watch COVID-19 sweep through our community and threaten to overrun health care facilities without trying to prevent further crisis. We view masking not as a matter of politics or rights, but as a matter of public health and civic duty.

We understand the significant hardship lockdowns have on local businesses, and the impact school closures have on our children and families. We want to avoid lockdowns. Wearing masks will slow the spread, keep businesses open and give our schools the best possible environment for re-opening.

After observing the alarming spread of COVID-19 in northern Idaho and other parts of the world, it is clear that wide-spread use of masks helps prevent the transmission of COVID-19.

**It is our position that every person should wear a face covering in public when a physical distance of 6 feet from others cannot be maintained.**

Furthermore, we fully support Panhandle Health District's decision to require masks in the public places of Kootenai County and we strongly encourage other municipalities in the other northern counties to prepare to enact the same.

Our collective doctors, nurses and employees have devoted their careers to caring for our community and as we navigate this unprecedented COVID-19 pandemic, our commitment to protecting human life has never been more important; which is the precise reason behind this letter.

**We are the health care providers of North Idaho and we are wearing masks to help prevent the spread of COVID-19. We ask everyone in our communities to join us.**

Sincerely,

**Benewah Community Hospital, Chuck Lloyd, CEO**
**CHAS Health, Aaron Wilson, CEO**
**Clearwater Valley Hospital and Clinics, Lenne Bonner, CEO**
**Gritman Medical Center, Kara Besst, CEO**
**Heritage Health, Mike Baker, CEO**
**Kaniksu Health, Kevin Knepper, CEO**
**Kootenai Health, Jon Ness, CEO**
**Marimn Health, Helo Hancock, CEO**
**North Idaho Advanced Care Hospital, Shane Sanborn, CEO**
**Northwest Specialty Hospital, Rick Rasmussen, CEO**
**Rehabilitation Hospital of the Northwest, Dave Cox, CEO**
**Shoshone Medical Center, Paul Lewis, CEO**
**St. Joseph Regional Medical Center, Tim Trottier, CEO**
**St. Mary's Hospital and Clinics, Lenne Bonner, CEO**
**Syringa Hospital and Clinics, Abner King, CEO**

AAMC

# Consensus Guidance on Face Coverings

This document is a consensus statement designed to provide national guidance for the public on wearing face coverings to decrease the spread of SARS-CoV-2, the virus that causes COVID-19. It was developed by the AAMC Research and Action Institute in conjunction with leading experts in public health as part of ***THE WAY FORWARD ON COVID-19: A ROAD MAP TO RESET THE NATION'S APPROACH TO THE PANDEMIC*** (//WWW.AAMC.ORG/COVIDROADMAP/ROADMAP) released by the AAMC on July 29, 2020.

While America's health care workforce has played a critical role since COVID-19 infected its first patient in the United States, physicians and scientists alone can't save American lives from being lost to COVID-19. We need a national, comprehensive, coordinated response to the pandemic, which the AAMC has previously described (//www.aamc.org/covidroadmap) .

**DOWNLOAD PDF OF THE GUIDANCE (//WWW.AAMC.ORG/MEDIA/47091/DOWNLOAD)**

**Wearing a mask is one step everyone can take to protect themselves, their family, and their community.** Clinicians and others working with patients wear masks and require all visitors to clinical sites to do the same regardless of their suspected COVID-19 status. A mask is not always comfortable and has not been a part of everyday life in the United States, but for the foreseeable future, the benefits outweigh the discomfort. In the absence of national policy, we are asking that state and local governments, and all Americans, join us in this effort.

**Face coverings are critical for slowing the spread of the coronavirus.** The medical community's understanding of this novel virus has grown and evolved since March, when efforts to slow the spread were first introduced. While we still have more to learn, our understanding of effective practices for prevention continues to grow. A study by the Centers for Disease Control and Prevention (CDC) followed up with 139 clients of coronavirus-positive hair stylists and found no symptomatic secondary cases; both parties had worn masks during the appointment.[1] A study in *Health Affairs* examined the natural experiment of states' mask mandates on community spread of COVID-19. The study estimates that, by late May, **between 230,000 and 450,000 potential COVID-19 cases were averted by the imposition of state mask mandates**.[2]

**Reinforcing the importance of prevention measures beyond monitoring symptoms, including wearing face coverings, is essential.** Evidence shows that people unknowingly spread the coronavirus because they are asymptomatic, are not yet manifesting their symptoms, or have mild symptoms. One such study by the CDC found that of the 1,000 infected service members on the Navy ship U.S.S. *Theodore Roosevelt*, one in five had no symptoms and many had only mild symptoms.[3] Wearing a face covering is one step most people can take to protect themselves, their loved ones, and the most vulnerable in our communities.

While research into the exact preventive efficacy of face coverings in combatting transmission of COVID-19 is not completely quantified, local and national guidance on face coverings will be helpful in the interim. State and local officials should consider the level of disease and community spread in their areas when considering how to implement this guidance. **As knowledge grows about the virus and its methods of spread and transmission, these guidelines should be regularly reevaluated and updated.**

## Do's

- DO take a face mask with you wherever you go. Before you leave your home, check that you have your wallet, keys, phone, and a mask.
- DO cover your mouth and nose with a face mask to stop the spread of COVID-19.
- DO wear a well-fitted face covering with no gaps around your nose and chin.
- DO wear a cloth mask with at least two layers (three layers when possible).
- DO wear a face mask indoors around people who are not members of your household. (Everyone 2 years of age and older.)

- DO wear a mask outdoors in public settings when you expect to be around others — the safest option is to wear a mask, even when briefly passing by others (e.g., running or walking by someone on the sidewalk). (Everyone 2 years of age and older).
- DO roll down the window of a car when sharing a ride or traveling with others who are not members of your household.
- DO wash your cloth face covering frequently.

### Don'ts

- DON'T forget to wear a face covering and stop the spread. Protect yourself and others.
- DON'T leave your home without a face mask.
- DON'T touch the front of your mask.
- DON'T wear the face covering under your nose.
- DON'T share your mask with others.

## Consensus Guidance on Face Coverings

**In regions where community spread is growing, wearing face coverings should be mandatory.** The following practices are recommended:

- **Well-fitted face coverings that minimize gaps around the nose and chin are important.** Loosely folded face masks and bandana-style coverings are better than no coverings; however, they still allow for the smallest aerosolized respiratory droplets to be dispersed.[4]
- **Wear face coverings with at least two layers (three layers when possible).** Studies have shown a double-layer cloth face covering was significantly better at reducing the droplet spread caused by coughing and sneezing, as compared to a single-layer one.[5]

### Indoors

- "CDC recommends **all people 2 years of age and older wear a cloth face covering in public settings and when around people who don't live in your household, especially when other social distancing measures are difficult to maintain**."[6] This guidance should be followed by the general public.
- **The use of face coverings is critically important indoors**, as compared to outdoors. Superspreader events, in which an infected individual causes many subsequent infections, are likely to occur indoors.[7]
- **All businesses open to the public, no matter how limited, should insist all customers be masked while indoors.**
- **Wear face coverings when indoors, even when six feet apart, if not with household members.** Some studies suggest that smaller droplets, known as aerosols, can remain in the air longer, though how long is not yet known.[8]

### Outdoors

- "CDC recommends all people 2 years of age and older wear a cloth face covering in public settings and when around people who don't live in your household, especially when other social distancing measures are difficult to maintain."[6] The safest option is to wear a face covering even for brief moments of close exposure, such as when walking by someone on the sidewalk.
- Face coverings are unnecessary outside if an individual does not reasonably expect to come within six feet of others.

**State and local officials should support distribution of masks for people experiencing homelessness, people who are incarcerated, and other vulnerable populations.**

As the level of COVID-19 community spread reaches sufficiently low levels, face coverings may become optional. "Low levels" can be defined as low regional spread, no national hot spots that could seed the local ecosystem, and adequate contact tracing so all contacts of infected individuals can be identified and quarantined.

**Face coverings do not fully prevent the spread of infection. As a result, widespread mask use does not diminish the importance of frequent hand-washing or replace social distancing practices**, such as avoiding large gatherings. Nonessential activities and gatherings that bring people in the same room closer

than within six feet of each other for more than a fleeting amount of time or that cause a more forceful exhalation, such as playing sports or singing, should continue to be avoided with or without face coverings when possible.

If all Americans work together, we can protect our communities and reopen our schools and economy. Please join health care leaders in encouraging your family, friends, and community to wear a face covering every time they come within six feet of someone outside their household. The quicker we make face coverings our "new normal," the faster we can overcome COVID-19.

**Acknowledgments**

The AAMC Research and Action Institute appreciates the expertise of the following individuals in developing this guidance:
**Atul Grover, MD, PhD,** Executive Director, AAMC Research and Action Institute
**Ross McKinney Jr., MD,** Chief Scientific Officer, AAMC
**Sheila P. Burke, MPA, RN, FAAN,** Adjunct Lecturer in Public Policy, Harvard Kennedy School
**Ashish K. Jha, MD, MPH,** K.T. Li Professor of Global Health, Director, Harvard Global Health Institute
**Megan L. Ranney, MD, MPH,** Associate Professor of Emergency Medicine, Assistant Dean of Brown Institute for Translational Sciences, Director of the Brown-Lifespan Center for Digital Health, Associate Professor of Health Services, Policy and Practice

The AAMC also thanks the following individuals for helping to develop this document:
**Laura M. Pincus, MHA,** Manager, Strategy and Planning, AAMC Research and Action Institute
**Amanda Field, PhD,** Senior Science Policy Specialist, AAMC

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AAMC Association of American Medical Colleges

655 K Street, NW, Suite 100 Washington, DC, 20001-2399

ORDER OF THE BOARD OF HEALTH,
PANHANDLE HEALTH DISTRICT, STATE OF IDAHO

Order regarding Face Coverings

RESTRICTION:
Individuals in Kootenai County, Idaho

THE DISTRICT BOARD OF HEALTH FOR PANHANDLE HEALTH DISTRICT HEREBY FINDS AND DECLARES AS FOLLOWS:

1. The virus that causes Coronavirus 2019 Disease ("COVID-19") has been shown to create a significant risk to the health and safety of the elderly population and other vulnerable members of the population.

2. COVID-19 is easily transmitted, especially in group settings, and it is essential that the spread of the virus be slowed to protect the ability of public and private health care providers to handle the influx of new patients and safeguard public health and safety.

3. Kootenai Health, the principal health system in Kootenai County is reporting an increase in hospital admissions for patients diagnosed with COVID-19, and has expressed concern for the hospital's ability to provide appropriate levels of care for all patients if the upward trend continues at the current rate.

4. Protection of the public health and the slowing of transmission of COVID-19 disease during the effective period of the Order would be facilitated by the use of face coverings in public places where others are present and physical distancing of 6 feet cannot be maintained.

5. An immediate danger to the public health, safety and welfare of the people of the Panhandle Health District and in particular, Kootenai County, requires the imposition of this emergency Order, which is authorized by Idaho Code§ 56-1003(7), IDAPA 16.02.10.065.09, Idaho Code§ 39-415, and Idaho Code§ 67-5247.

ORDER AND RESTRICTIONS

NOW, THEREFORE, IT IS HEREBY ORDERED BY THE BOARD OF HEALTH FOR THE PANHANDLE HEALTH DISTRICT:

1. That every person in Kootenai County is required to wear a face covering that completely covers the person's nose and mouth when the person is in a public place and physical distancing of 6 feet from others cannot be maintained.

A. "Public place" shall mean any place open to all members of the public without specific invitation, including but not necessarily limited to, retail business establishments, government offices, medical, educational, arts and recreational institutions, public transportation, including taxi cabs and ridesharing vehicles, outdoor public areas, including but not limited to public parks, trails, streets, sidewalks, lines for entry, exit, or service, when a distance of at least six feet cannot be maintained from any non-household member.

B. Facial coverings are not required to be worn under the following circumstances:

a. Where the individuals are immediate family members or household occupants.

b. Children under the age of two (2).

c. Persons with medical conditions, mental health condition, or disability that prevent them from wearing a face covering. A person is not required to provide documentation demonstrating that the person cannot tolerate wearing a face covering.

d. Persons who are communicating with a person who is deaf and hard of hearing, where the ability to see the mouth is essential for communication.

e. Persons, including on-duty law-enforcement officers, for whom wearing a face covering would create a risk to the person related to their work, as determined by local, state, or federal regulators or workplace safety guidelines.

f. Persons who are obtaining a service involving the nose, face, or head for which temporary removal of the face covering is necessary to perform the service.

g. Persons who are eating or drinking at a restaurant or other establishment that offers food or beverage service, so long as they are seated at a table and able to maintain a distance of 6 feet from persons who are not members of the same household or party. This exemption does NOT apply to entry, exit, or other movement through the facility.

h. Persons incarcerated in a jail or related facility.

i. When necessary to confirm a person's identity.

j. When local, state or federal law prohibits wearing a face covering or requires removal of a face covering.

2. This Order shall become effective immediately, and will continue to be in effect until rescinded, superseded, or amended in writing by the Board of Health.

3. Please read this Order carefully. Violation of or failure to comply with this Order could constitute a misdemeanor punishable by fine, imprisonment, or both. Idaho Code § 56-1003(7)( c).

4. If any provision of this Order or its application to any person or circumstance is held to be invalid, then the remainder of the Order, including the application of such part or provision to other persons or

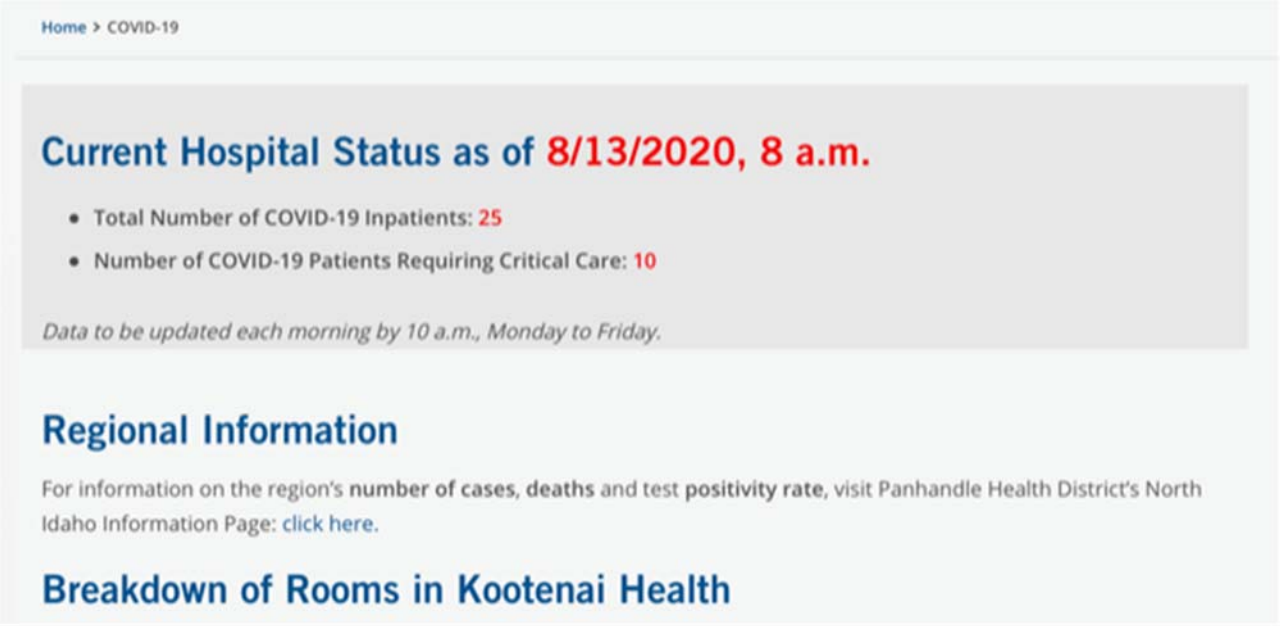
circumstances, shall not be affected and shall continue in full force and effect. To this end, the provisions of this Order are severable.

5. Kootenai County and each city within must promptly provide copies of the Order as follows: (1) by posting the Order on its website, (2) by posting the Order at the Kootenai County courthouse and each city hall in Kootenai County, and (3) by providing a copy to any member of the public requesting it. The Order will also be posted on the website of Panhandle District Health.

DATED this 23rd day of July 2020

PANHANDLE HEALTH DISTRICT
BOARD OF HEALTH

Marlow Thompson
Chairman of the Panhandle Health
District Board of Health




Link to Kootenai Health Hospital Bed Status Website: https://www.kh.org/covid-19 (example shown above)

July 20, 2020

Dear Mayor Rognstad,

I represent our Nurse Practitioner community for the 5 northern counties of Idaho. Our state organization is the Nurse Practitioners of Idaho. I want you to know that the NP's are concerned for the health of our community and want to be proactive in trying to keep people safe -- impacting the covid-19 numbers in our district.

There are over 30 NP's practicing in the greater Sandpoint area. A smaller group of us decided we wanted to thank businesses trying to follow CDC guidelines and encourage people to shop locally. We are providing a flyer to post in their window that also has the 3 W's recommended by the CDC:

Wear a mask.
Watch your distance.
Wash your hands.

We are also giving them a bottle of hand sanitizer, a few masks to distribute, and gloves for touchless shopping. Do you need any for the city offices?

In addition, my guest editorial for The Reader's appeared in the July 9 edition, and there will be another letter submitted to The Bee. Nichole Grimm NP and I have done an interview with KRFY; it was aired on the morning show "community radio" July 16, and we have another interview scheduled with KSPT Tuesday, July 21.

In the midst of this pandemic, Samantha Hickey, a NP from Caldwell Idaho died from complications of Covid-19. She was 45 years old, had four children, and was working with St. Luke's Children's Pediatrics. We can't wait until our medical providers are sick to take action. What would we do without them? I talked to a nurse practitioner from our board this week who had seen 15 patients that day for covid-19 symptoms.

We want to let the community of Sandpoint know that NP's are taking a leadership role in addressing Covid-19. Are there additional ways you see as Mayor that we can be influential on this matter? With numbers rising, NP's are on the front lines, evaluating patients with symptoms concerning for Covid-19. Our Health Department is also on overtime with their efforts to address this as is Bonner General Health. They are working hard for our local community.

Mr. Mayor, you could help the people of Bonner County. The Mayor of Boise and the Ada County Central District Board of Public Health have made masks mandatory. Masks are mandatory in Washington State. We are now a hotspot. The sooner action is taken, the fewer of us will get the virus and more businesses can stay open.

We are afraid that if effective action is not taken soon, businesses will be forced to shut down again. We want to see our businesses open and our schools safely reopen. If 95% of the people wore a mask it is as protective as a strict lockdown. I would be happy to meet or talk with you, my phone number is 208-290-7870. Or you probably know a nurse practitioner you could talk with. Whatever you decide to do the nurse practitioners are there for you.

Thank you
Cynthia Dalsing, MSN/ARNP
NPI District 1 Representative

Statement from the Nurse Practitioners of North Idaho August 2020

All the 30 Nurse Practitioners in North Idaho support the wearing of masks to prevent the spread of COVID. After reviewing reliable scientific evidence, local spread ,and health care resources, the NPs have concluded that a city council ordinance requiring masks would go a long way toward limiting the spread of the virus in our community, saving the life and health of our citizens and businesses, and especially of our first responders.

The NPs contacted approximately 60 local businesses in the last two week to offer them support in the form of masks, hand sanitizer, gloves, and a poster. All but a couple of store owners accepted the gifts and were relieved to have the good judgement and dedication of the NPs to stand behind them. They understand that if COVID spreads, they will be forced to close their businesses.

Requiring masks would  protecting the safety and health of our children if schools are to open, while cases are still increasing here, and may save the life of our hospital.

After the library kerfuffle last week, the East Bonner County Library Board received 8 emails opposed to their mask policy and 138 in support. An informed and quick-acting Sandpoint city police force was able to disperse a group of  people opposed to mask wearing without mishap or even discussion of the policy.

Finally, local resources are faltering. Another local nurse relayed information from her personal professional nurse contacts: Chelan, Colville, Deaconness (very close to closing) and Kootenai are short staffed, despite increases in hourly rates for medical personnel. Who knows about Bonner General?

We include four scientific studies in the appendices. The first two contain the full text of the study, the second two links to the full studies.

We need not argue any longer about the facts. With your critical support the community will beat this virus, setting an example and inspiring the rest of the country.

Please second and pass an ordinance requiring the wearing of masks in public.

# Appendices: Scientific Studies: quick overview

## Appendix 1:

HealthAffairs

"As a result of the implementation of these mandates, more than 200,000 COVID-19 cases were averted by May 22, 2020. The findings suggest that requiring face mask use in public could help in mitigating the spread of COVID-19."

## Appendix 2:


## Appendix 3: "Combined analysis of face mask use could result in a large reduction in risk of infection."

# Appendix 4: Meta-analysis of 172 observational studies across 16 countires and six continents

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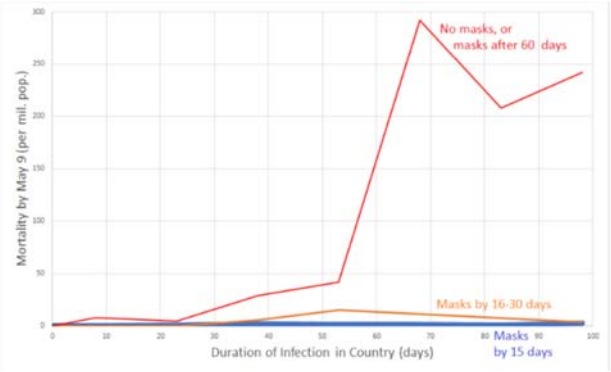

# Appendix 1:


## Research Article

COVID-19
Health AffairsVol. 39, No. 8: COVID-19, Home Health & More


## Community Use Of Face Masks And COVID-19: Evidence From A Natural Experiment Of State Mandates In The US


- Wei Lyu and
- George L. Wehby



PUBLISHED:June 16, 2020 Free Accesshttps://doi.org/10.1377/hlthaff.2020.00818



## Abstract

State policies mandating public or community use of face masks or covers in mitigating the spread of coronavirus disease 2019 (COVID-19) are hotly contested. This study provides evidence from a natural experiment on the effects of state government mandates for face mask use in public issued by fifteen states plus Washington, D.C., between April 8 and May 15, 2020. The research design is an event study examining changes in the daily county-level COVID-19 growth rates between March 31 and May 22, 2020. Mandating face mask use in public is associated with a decline in the daily COVID-19 growth rate by 0.9, 1.1, 1.4, 1.7, and 2.0 percentage points in 1–5, 6–10, 11–15, 16–20, and 21 or more days after state face mask orders were signed, respectively. Estimates suggest that as a result of the implementation of these mandates, more than 200,000 COVID-19 cases were averted by May 22, 2020. The findings suggest that requiring face mask use in public could help in mitigating the spread of COVID-19.


One of the most contentious issues being debated worldwide in the response to the coronavirus disease 2019 (COVID-19) pandemic is the value of wearing masks or face coverings in public settings.[1] A key factor fueling the debate is the limited direct evidence thus far on how much widespread community use would affect COVID-19 spread. However, there is now substantial evidence of asymptomatic

transmission of COVID-19.[2,3] For example, a recent study of antibodies in a sample of customers in grocery stores in New York State reported an infection rate of 14.0 percent by March 29 (projected to represent more than 2.1 million cases), which substantially exceeds the number of confirmed COVID-19 cases.[4] Moreover, all public health authorities call on symptomatic people to wear masks to reduce transmission risk. Even organizations that at the time of our study had not yet recommended widespread community use of face masks for COVID-19 mitigation (that is, everyone without symptoms should use a face mask outside of their home), such as the World Health Organization, strongly recommend that symptomatic individuals wear them.[5] Because mask wearing by infected people can reduce transmission risk, and because of the high proportion of asymptomatic infected individuals and transmissions, there appears to be a strong case for the effectiveness of widespread use of face masks in reducing the spread of COVID-19. However, there is no direct evidence thus far on the magnitude of such effects, especially at a population level.

Researchers have been reviewing evidence from previous randomized controlled trials for other respiratory illnesses, examining mask use and types among people at higher risk of contracting infections (such as health care workers or people in infected households). Systematic reviews and meta-analyses of such studies have provided suggestive, although generally weak, evidence.[6] The estimates from the meta-analyses based on randomized controlled trials suggest declines in transmission risk for influenza or influenza-like illnesses to mask wearers, although estimates are mostly statistically insignificant possibly because of small sample sizes or design limitations, especially those related to assessing compliance.[7–9] There is also a relationship between increased adherence to mask use, specifically, and effectiveness of reducing transmission to mask wearers: In one randomized study of influenza transmission in infected households in Australia, transmission risk for mask wearers was lower with greater adherence.[10] Further, the evidence is mixed from randomized studies on types of masks and risk for influenza-like illness transmission to mask wearers; for example, a recent systematic review and meta-analysis comparing N-95 respirators versus surgical masks found a statistically insignificant decline in influenza risk with N-95 respirators.[11]

Positions on widespread face mask use have differed worldwide but are changing over time. In the US, public health authorities did not recommend widespread face mask use in public at the start of the pandemic. The initially limited evidence on asymptomatic transmission and concern about mask shortages for the health care workforce and people caring for patients contributed to that initial decision. On April 3, 2020, the Centers for Disease Control and Prevention (CDC) issued new guidance advising everyone to wear cloth face covers in public areas where close contact with others is unavoidable, citing new evidence on virus transmission from asymptomatic or presymptomatic people.[12] Guidelines differ between countries, and some, including Germany, France, Italy, Spain, China, and South Korea, have mandated the use of face masks in public.[13–16]

This study adds complementary evidence to the literature on the impacts of widespread community use of face masks on COVID-19 spread from a natural experiment based on whether or not US states had

mandated the use of face masks in public for COVID-19 mitigation as of May 2020. Fifteen states plus Washington, D.C., issued mandates for face mask use in public between April 8 and May 15.

We identified the effects of state mandates for the use of face masks in public on the daily COVID-19 growth rate, using an event study that examined the effects over different periods. We considered the impact of mandates for mask use targeted only to employees in some work settings, as opposed to communitywide mandates. This evidence is critical, as states and countries worldwide begin to shift to "reopening" their economies and as foot traffic increases. Mandating the public use of masks has become a socially and politically contentious issue, with multiple protests and even acts of violence directed against masked employees and those asking customers to wear face masks.[17] Face cover recommendations and mandates are part of the current set of measures, following earlier social distancing measures such as school and nonessential business closures, bans on large gatherings, and shelter-in-place orders being considered by states and local governments, especially as regions of the country reopen. For example, during Virginia's phase one reopening, begun May 22, 2020, everyone in the state was required to wear a face mask in public where people congregate.[18] Even though more states have issued such orders since the study was completed, it is critical to provide direct evidence on this question not only for public health authorities and governments but also for educating the public.

## Study Data And Methods

### Data

We collected information on statewide face cover mandate orders from public data sets on such policies and from searching and reviewing all state orders issued between April 1 and May 21, 2020. Our study focused on state executive orders or directives signed by governors that mandate use. Recommendations or guidelines from state departments of public health were not included, as these largely follow the CDC guidelines and might not necessarily add further information or impact. See online appendix A for a more detailed description of the data sources and measuring of the mandates.[19]

States differ in whether or not they require their citizens to wear face masks (covers) to limit COVID-19 spread. Between April 8 and May 15, governors of fifteen states and the mayor of Washington, D.C., signed orders mandating all individuals who can medically tolerate the wearing of a face mask do so in public settings (for example, public transportation, grocery stores, pharmacies, or other retail stores) where maintaining six feet of "social distance" might not always be practicable. These sixteen jurisdictions also have specific mandates requiring employees in certain professions to wear masks at all times while working.

In addition to these sixteen jurisdictions, twenty additional states have employee-only mandates (but no community mandate) requiring that some employees (for example, close-contact service providers such as in barber shops and nail salons) wear a face mask at all times while providing services. The face

mask defined in these orders primarily refers to cloth face coverings or nonmedical masks. The state orders strongly discourage the use of any medical or surgical masks and N-95 respirators, which should be reserved for health care workers and first responders. The orders also clearly specify that the face masks are not a replacement for any other social distancing protocols. More information on dates and links to these state orders are in appendix exhibit A1 and appendices D and E.[19] Fifteen states had not yet issued community or employee mandates when we performed the study.

The main model used publicly available daily county-level data of confirmed COVID-19 cases from March 25 through May 21.[20] The data covered all states plus Washington, D.C., and the analytical sample included 2,930 unique counties plus New York City (five boroughs combined). See appendix A for a more detailed description of COVID-19 data.[19]

## Statistical Analysis

We employed an event study, which is generally similar to a difference-in-differences design, to examine whether statewide mandates to wear face masks in public affect the spread of COVID-19 based on the state variations noted earlier. This design allowed us to estimate the effects in the context of a natural experiment, comparing the pre-post mandate changes in COVID-19 spread in the states with mandates versus changes in COVID-19 spread in the states that did not pass these mandates, over time. The model also tested whether states issuing these mandates had differential pre-event trends in COVID-19 rates before they were issued. This is a critical assumption of the validity of an event study that must be upheld under testing. In addition, the model allowed us to control for a wide range of time-invariant differences between states and counties, such as population density and socioeconomic and demographic factors, plus time-variant differences between states and counties, such as other mitigation and social distancing policies, in addition to state-level COVID-19 testing rates.

We estimated the effects of face cover mandates on the daily county-level COVID-19 growth rate, which is the difference in the natural log of cumulative COVID-19 cases on a given day minus the natural log of cumulative cases in the prior day, multiplied by 100.[21] This measure gives the daily growth rate in percentage points.

The reference period for estimating the face cover mandate effects was 1–5 days before signing the order. We examined how effects change over five post-event periods: 1–5, 6–10, 11–15, 16–20, and 21 or more days. The model also tested for pre-event trends over the course of 6–10, 11–15, and 16 or more days before signing the mandate. For all counties in the analytical sample, the main model included daily data from March 31 (seven days before the first state signed a face cover mandate) through May 22. The models were estimated by least squares weighted by the county's 2019 population with heteroscedasticity-robust and state-clustered standard errors.

As noted earlier, all of the fifteen states plus Washington, D.C., that mandated face cover use in public also mandated employee mask use. To assess the effects of employee face cover mandates, we

employed another event study model that focused solely on the employee face cover mandate as the policy intervention. In this analysis, we excluded the sixteen jurisdictions that enacted both public and employee face cover mandates and focused on the twenty states that enacted an employee-only mandate and the fifteen states with neither a public nor an employee mandate.

## Limitations

We were unable to measure face cover use in the community (that is, compliance with the mandate). As such, the estimates represent the intent-to-treat effects of these mandates—that is, their effects as passed and not the individual-level effect of wearing a face mask in public on one's own COVID-19 risk. Related, we did not measure enforcement of the mandates, which might affect compliance. We also did not have data on county-level mandates for wearing face masks in public. In some states without state-level mandates at the time of our study, such as California,[22] Texas,[23] and Colorado,[24] multiple counties had enacted such mandates. These county-level mandates did not bias the intent-to-treat estimates of effects of state-level mandates as actually passed, but they added local-level heterogeneity not directly accounted for in the model. We did examine the robustness of estimates to the exclusion of some of these states. Finally, we were able to examine only confirmed COVID-19 cases. However, there is evidence of a higher infection rate in the community than is reflected in the number of confirmed cases.[25]

## Study Results

## Effects Of Mandates For Face Covering In Public

Exhibit 1 plots the event study estimates of effects of state mandates for community face covering in public on the county-level daily growth rate of COVID-19 cases, with 95 percent confidence intervals, obtained from the main regression model (in appendix B),[19] using county-level daily data from March 31 through May22; appendix exhibit C1 (column 1) reports the exact estimates. The effects are shown over the course of five periods after signing the orders, relative to the five days before signing (which is the reference period). Also shown are estimated differences in daily COVID-19 growth rates between states with and without the mandates over the course of three periods before the reference period.

Exhibit 1 Event study estimates of the effects of states mandating community face mask use in public on the daily county-level growth rate of COVID-19 cases, 2020

# Appendix 2:

## Absence of Apparent Transmission of SARS-CoV-2 from Two Stylists After Exposure at a Hair Salon with a Universal Face Covering Policy — Springfield, Missouri, May 2020

*Weekly* / July 17, 2020 / 69(28);930-932

*On July 14, 2020, this report was posted online as an* MMWR *Early Release.*

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View suggested citation

## Summary

**What is already known about this topic?**

Consistent and correct use of cloth face coverings is recommended to reduce the spread of SARS-CoV-2.

**What is added by this report?**

Among 139 clients exposed to two symptomatic hair stylists with confirmed COVID-19 while both the stylists and the clients wore face masks, no symptomatic secondary cases were reported; among 67 clients tested for SARS-CoV-2, all test results were negative. Adherence to the community's and company's face-covering policy likely mitigated spread of SARS-CoV-2.

**What are the implications for public health practice?**

As stay-at-home orders are lifted, professional and social interactions in the community will present more opportunities for spread of SARS-CoV-2. Broader implementation of face covering policies could mitigate the spread of infection in the general population.

**References**

Related Materials

- Time for universal masking and prevention of transmission of SARS-CoV-2external icon
- MMWR Article PDF pdf icon[202 KB]


On May 12, 2020 (day 0), a hair stylist at salon A in Springfield, Missouri (stylist A), developed respiratory symptoms and continued working with clients until day 8, when the stylist received a positive test result for SARS-CoV-2, the virus that causes coronavirus disease 2019 (COVID-19). A second hair stylist (stylist B), who had been exposed to stylist A, developed respiratory symptoms on May 15, 2020 (day 3), and worked with clients at salon A until day 8 before seeking testing for SARS-CoV-2, which returned a positive result on day 10. A total of 139 clients were directly serviced by stylists A and B from the time they developed symptoms until they took leave from work. Stylists A and B and the 139 clients followed the City of Springfield ordinance* and salon A policy recommending the use of face coverings (i.e., surgical masks, N95 respirators,† or cloth face coverings) for both stylists and clients during their interactions. Other stylists at salon A who worked closely with stylists A and B were identified, quarantined, and monitored daily for 14 days after their last exposure to stylists A or B. None of these stylists reported COVID-19 symptoms. After stylist B received a positive test result on day 10, salon A closed for 3 days to disinfect frequently touched and contaminated areas. After public health contact tracings and 2 weeks of follow-up, no COVID-19 symptoms were identified among the 139 exposed clients or their secondary contacts. The citywide ordinance and company policy might have played a role in preventing spread of SARS-CoV-2 during these exposures. These findings support the role of source control in preventing transmission and can inform the development of public health policy during the COVID-19 pandemic. As stay-at-home orders are lifted, professional and social interactions in the community will present more opportunities for spread of SARS-CoV-2. Broader implementation of masking policies could mitigate the spread of infection in the general population.

Stylist A worked from day 0 to day 8 with COVID-19 symptoms before receiving a diagnosis of COVID-19 by polymerase chain reaction (PCR) testing. Although self-isolation was recommended after testing on day 6, stylist A continued to work until the test returned a positive result, at which time stylist A was excluded from work by salon A. On day 3, after working with stylist A, stylist B developed respiratory symptoms. During Stylist A's symptomatic period, the two stylists interacted while neither was masked during intervals between clients. Stylist B worked from day 3 to day 8 while symptomatic before self-isolating and seeking PCR testing, which returned a positive result for SARS-CoV-2 on day 10. Stylist A worked with clients for 8 days while symptomatic, as did stylist B for 5 days. During all interactions with clients at salon A, stylist A wore a double-layered cotton face covering, and stylist B wore a double-layered cotton face covering or a surgical mask.

The Greene County Health Department (Missouri) conducted contact tracing for all 139 exposed clients back to the dates that stylists A and B first developed symptoms. The 139 clients were monitored after their last exposure at salon A. Clients were asked to self-quarantine for 14 days and were called or sent daily text messages to inquire about any symptoms; none reported signs or symptoms of COVID-19. Testing was offered to all clients 5 days after exposure, or as soon as possible for those exposed >5 days before contact tracing began. Overall, 67 (48.2%) clients volunteered to be tested, and 72 (51.8%) refused; all 67 nasopharyngeal swab specimens tested negative for SARS-CoV-2 by PCR. Telephone interviews were attempted 1 month after initial contact tracings to collect supplementary information. Among the 139 exposed clients, the Greene County Health Department interviewed 104 (74.8%) persons.

Among the 139 clients, the mean age was 52 years (range = 21–93 years); 79 clients (56.8%) were male (Table 1). Salon appointments ranged from 15 to 45 minutes in length (median = 15 minutes; mean = 19.5 minutes). Among the 104 interviewed clients, 102 (98.1%) reported wearing face coverings for their entire appointment, and two (1.9%) reported wearing face coverings part of the time (Table 2). Types of face covering used by clients varied; 49 (47.1%) wore cloth face coverings, 48 (46.1%) wore surgical masks, five (4.8%) wore N95 respirators, and two (1.9%) did not know what kind of face covering they wore. Overall, 101 (97.1%) interviewed clients reported that their stylist wore a face covering for the entire appointment; three did not know. When asked about the type of face coverings worn by the stylists, 64 (61.5%) reported that their stylist wore a cloth face covering (39; 37.5%) or surgical mask (25; 24.0%); 40 (38.5%) clients did not know or remember the type of face covering worn by stylists. When asked whether they had experienced respiratory symptoms in the 90 days preceding their appointment, 87 (83.7%) clients reported that they had not. Of those who did report previous symptoms, none reported testing for or diagnosis of COVID-19.

Six close contacts of stylists A and B outside of salon A were identified: four of stylist A and two of stylist B. All four of stylist A's contacts later developed symptoms and had positive PCR test results for SARS-CoV-2. These contacts were stylist A's cohabitating husband and her daughter, son-in-law, and their roommate, all of whom lived together in another household. None of stylist B's contacts became symptomatic.

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## Discussion

SARS-CoV-2 is spread mainly between persons in close proximity to one another (i.e., within 6 feet), and the more closely a person interacts with an infected person and the longer the interaction, the higher the risk for transmission (*1*). At salon A in Springfield, Missouri, two stylists with COVID-19 symptoms worked closely with 139 clients before receiving diagnoses of COVID-19, and none of their clients developed COVID-19 symptoms. Both stylists A and B, and 98% of the interviewed clients followed posted company policy and the Springfield city ordinance requiring face coverings by employees and clients in businesses providing personal care services. The citywide ordinance reduced maximum building waiting area seating to 25% of normal capacity and recommended the use of face coverings at indoor and outdoor public places where physical distancing was not possible. Both company and city policies were likely important factors in preventing the spread of SARS-CoV-2 during these interactions between clients and stylists. These results support the use of face coverings in places open to the public, especially when social distancing is not possible, to reduce spread of SARS-CoV-2.

Although SARS-CoV-2 is spread largely through respiratory droplets when an ill person coughs or sneezes (*1*), data suggest that viral shedding starts during the 2-to-3-day period before symptom onset, when viral loads are at their highest (*2*). Although the rate of transmission of SARS-CoV-2 from presymptomatic patients (those who have not yet developed symptoms) and asymptomatic persons (those who do not develop symptoms) is unclear, these persons likely contribute to the spread of SARS-CoV-2 (*3*). With the potential for presymptomatic and asymptomatic transmission, widespread adoption of policies requiring face coverings in public settings should be considered to reduce the impact and magnitude of additional waves of COVID-19.

Previous studies show that both surgical masks and homemade cloth face coverings can reduce the aerosolization of virus into the air and onto surfaces (*4*,*5*). Although no studies have examined SARS-CoV-2 transmission directly, data from previous epidemics (*6*,*7*) support the use of universal face coverings as a policy to reduce the spread of SARS-CoV-2, as does observational data for COVID-19 in an analysis of 194 countries that found a negative association between duration of a face mask or respirator policy and per-capita coronavirus-related mortality; in countries that did not recommend face masks and respirators, the per-capita coronavirus-related mortality increased each week by 54.3% after the index case, compared with 8.0% in those countries with masking policies (CT Leffler, Virginia Commonwealth University, unpublished data, 2020).[§] Similar outcomes have been observed for other respiratory virus outbreaks, including the 2002–04 outbreak of Severe Acute Respiratory Syndrome (SARS) (*6*) and the 2007–08 influenza season (*7*). A systematic review on the efficacy of face coverings against respiratory viruses analyzed 19 randomized trials and concluded that use of face masks and respirators appeared to be protective in both health care and community settings (*8*).

The findings in this report are subject to at least four limitations. First, whereas the health department monitored all exposed clients for signs and symptoms of COVID-19, and no clients developed symptoms, only a subset was tested; thus, asymptomatic clients could have been missed. Similarly, with a viral incubation period of 2–14 days, any COVID-19 PCR tests obtained from clients too early

in their course of infection could return false-negative results. To help mitigate this possibility, all exposed clients were offered testing on day 5 and were contacted daily to monitor for symptoms until day 14. Second, although the health department obtained supplementary data, no information was collected regarding underlying medical conditions or use of other personal protective measures, such as gloves and hand hygiene, which could have influenced risk for infection. Third, viral shedding is at its highest during the 2 to 3 days before symptom onset; any clients who interacted with the stylists before they became symptomatic were not recruited for contact tracing. Finally, the mode of interaction between stylist and client might have limited the potential for exposure to the virus. Services at salon A were limited to haircuts, facial hair trimmings, and perms. Most stylists cut hair while clients are facing away from them, which might have also limited transmission.

The results of this study can be used to inform public health policy during the COVID-19 pandemic. A policy mandating the use of face coverings was likely a contributing factor in preventing transmission of SARS-CoV-2 during the close-contact interactions between stylists and clients in salon A. Consistent and correct use of face coverings, when appropriate, is an important tool for minimizing spread of SARS-CoV-2 from presymptomatic, asymptomatic, and symptomatic persons. CDC recommends workplace policies regarding use of face coverings for employees and clients in addition to daily monitoring of signs and symptoms of employees, procedures for screening employees who arrive with or develop symptoms at work, and posted messages to inform and educate employees and clients (https://www.cdc.gov/coronavirus/2019-ncov/community/organizations/businesses-employers.html).

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## Acknowledgments

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* Springfield, Missouri, city ordinance went into effect May 6, 2020, restricted seating in waiting areas to 25% of normal capacity and recommended social distancing and use of face coverings for employees and clients when social distancing was not or could not be followed. https://www.springfieldmo.gov/5140/Masks-and-Face-Coveringsexternal icon.

† Particulate-filtering facepiece respirators that filter ≥95% of airborne particles (https://www.cdc.gov/niosh/npptl/topics/respirators/disp_part/n95list1.html).

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TABLE 1. Characteristics* of clients (N = 139) who visited hair salon A and were exposed to stylists A and B with COVID-19 —Springfield, Missouri, May 2020

Return

| Characteristic | Value |
|---|---|
| **Demographic characteristic** | |

| Characteristic | Value |
|---|---|
| Male, no. (%) | 79 (56.8) |
| Age, yrs. mean (range) | 52 (21–93) |
| **Encounter information** | |
| Appointment date range | May 12–20 (days 0–8†) |
| Exposure to stylist A, no. (%) | 84 (60.4) |
| Exposure to stylist B, no. (%) | 55 (39.6) |
| Appointment duration, mins, median (range) | 15 (15–45) |
| **Client testing** | |
| Clients tested, no. (%) | 67 (48.2) |
| Negative tests, no. (%)§ | 67 (100) |

**Abbreviation:** COVID-19 = coronavirus disease 2019.

* All interviews were conducted via telephone by the Greene County Health Department.

† After onset of symptoms in stylist A.

§ Among those tested.

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TABLE 2. Hair salon clients' (N = 104) responses to interview questions* about their interactions with two stylists with COVID-19 during salon appointments — Springfield, Missouri, May 12–20, 2020

Return

| Interview question | Response | No. (%) |
|---|---|---|
| **Did you wear a face covering?** | Yes, for the entire appointment | 102 (98.1) |
| | Yes, for part of the appointment | 2 (1.9) |
| | No, not at all | 0 (—) |
| | Did not know | 0 (—) |
| **What type of face covering did you wear?** | Cloth face covering | 49 (47.1) |
| | Surgical mask | 48 (46.1) |
| | N95 respirator† | 5 (4.8) |
| | Did not know | 2 (1.9) |
| | Did not answer question | 0 (—) |
| **Did the stylist wear a face covering?** | Yes, for the entire appointment | 101 (97.1) |
| | Yes, for part of the appointment | 0 (—) |
| | No, not at all | 0 (—) |
| | Did not know | 3 (2.9) |
| **What type of face covering did the stylist wear?** | Cloth face covering | 39 (37.5) |
| | Surgical mask | 25 (24.0) |
| | N95 respirator | 0 (—) |
| | Did not know | 35 (33.7) |
| | Did not answer question | 5 (4.8) |
| **Did you have a respiratory illness in the past 90 days?** | Yes | 7 (6.7) |

| Interview question | Response | No. (%) |
|---|---|---|
| | No | 87 (83.7) |
| | Did not know | 1 (1.0) |
| | Did not answer the question | 9 (8.7) |

**Abbreviation:** COVID-19 = coronavirus disease 2019.

* All interviews were conducted via telephone by the Greene County Health Department.

† Particulate-filtering facepiece respirators that filter ≥95% of airborne particles (https://www.cdc.gov/niosh/npptl/topics/respirators/disp_part/n95list1.html).

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# Appendix 3:

Meta-analysis of 172 observational studies across 16 countires and six continents

Our search identified 172 observational studies across 16 countries and six continents, with no randomised controlled trials and 44 relevant comparative studies in health-care and non-health-care settings (n=25 697 patients). Transmission of viruses was lower with physical distancing of 1 m or more, compared with a distance of less than 1 m (n=10 736, pooled adjusted odds ratio [aOR] 0·18, 95% CI 0·09 to 0·38; risk difference [RD] −10·2%, 95% CI −11·5 to −7·5; moderate certainty); protection was increased as distance was lengthened (change in relative risk [RR] 2·02 per m; $p_{\text{interaction}}$=0·041; moderate certainty). Face mask use could result in a large reduction in risk of infection (n=2647; aOR 0·15, 95% CI 0·07 to 0·34, RD −14·3%, −15·9 to −10·7; low certainty), with stronger associations with N95 or similar respirators compared with disposable surgical masks or similar (eg, reusable 12–16-layer cotton masks; $p_{\text{interaction}}$=0·090; posterior probability >95%, low certainty). Eye protection also was associated with less infection (n=3713; aOR 0·22, 95% CI 0·12 to 0·39, RD −10·6%, 95% CI −12·5 to −7·7; low certainty). Unadjusted studies and subgroup and sensitivity analyses showed similar findings.

## Interpretation

The findings of this systematic review and meta-analysis support physical distancing of 1 m or more and provide quantitative estimates for models and contact tracing to inform policy. Optimum use of face masks, respirators, and eye protection in public and health-care settings should be informed by these findings and contextual factors. Robust randomised trials are needed to better inform the evidence for these interventions, but this systematic appraisal of currently best available evidence might inform interim guidance.

Full study available at: https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(20)31142-9/fulltext

Appendix 4: Global Data

Full
study

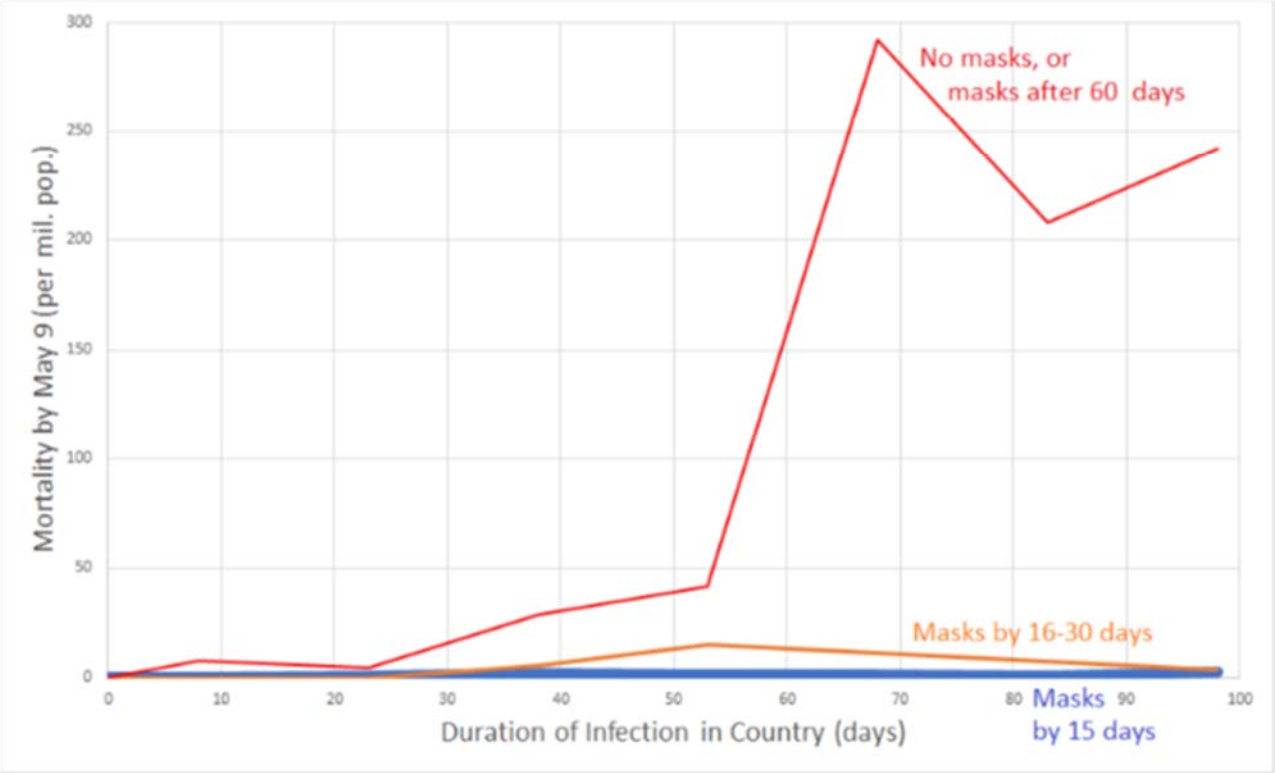


**Figure 1**. Per-capita mortality by May 9 versus duration of infection according to whether early masking was adopted. Data grouped by whether country did not recommend masks by April 16, 2020 or recommended them more than 60 days after outbreak onset (red line); recommended masks 16 to 30 days after onset of the country's outbreak (orange line); or recommended masks (or traditionally used masks) within 15 days of the outbreak onset (blue line close to the x-axis). Country mortality was averaged for the following country groups of infection duration: 0-15 days, 16-30 days, 31-45 days, 46-60 days, 61-75 days, 76-90 days, 91-105 days. For instance, per-capita mortality for all non-mask or late-masking countries with infection duration between 61 and 75 days was averaged, and graphed at the x-value 68 days. Data for graph derived from 200 countries.

For instance, for the early mask-wearing countries in which the infection had arrived by January (Thailand, Japan, South Korea, Taiwan, Macau, Hong Kong, Vietnam, Cambodia, Malaysia, the Philippines), the virus was present in the country by 80 or more days by April 16 (Table 2). If masks had no effect, we might have expected these countries to have a mortality well over 200 deaths per million (Figure 1). Instead, the mortality for these 10 regions was 2.1 per million (SD 2.5, Table 2)—approximately a 100-fold reduction.

available at: https://bit.ly/33Pypdj

Arizona State University Research Study on Masks

Full study can be accessed at:
https://www.sciencedirect.com/science/article/pii/S2468042720300117

Discussion & Conclusions

There is considerable ongoing debate on whether to recommend general public face mask use (likely mostly homemade cloth masks or other improvised face coverings) 4, and while the situation is in flux, more authorities are recommending public mask use, though they continue to (rightly) cite appreciable uncertainty. With this study, we hope to help inform this debate by providing insight into the potential community-wide impact of widespread face mask use by members of the general population. We have designed a mathematical model, parameterized using data relevant to COVID-19 transmission dynamics in two US states (New York and Washington), and our model suggests nontrivial and possibly quite strong benefits to general face mask use. The population-level benefit is greater the earlier masks are adopted, and at least some benefit is realized across a range of epidemic intensities. Moreover, even if they have, as a sole intervention, little influence on epidemic outcomes, face masks decrease the equivalent effective transmission rate (in our model), and thus can stack with other interventions, including social distancing and hygienic measures especially, to ultimately drive nonlinear decreases in epidemic mortality and healthcare system burden. It bears repeating that our model results are consistent with the idea that face masks, while no panacea, may synergize with other non-pharmaceutical control measures and should be used in combination with and not in lieu of these.

Under simulated epidemics, the effectiveness of face masks in altering the epidemiologic outcomes of peak hospitalization and total deaths is a highly nonlinear function of both mask efficacy and coverage in the population (see Fig. 1), with the product of mask efficacy and coverage a good one-dimensional surrogate for the effect. We have determined how mask use in the full model alters the equivalent, denoted, in the baseline model (without masks), finding this equivalent to vary nearly linearly with efficacy coverage (Fig. 2).

Masks alone, unless they are highly effective and nearly universal, may have only a small effect (but still nontrivial, in terms of absolute lives saved) in more severe epidemics, such as the ongoing epidemic in New York state. However, the relative benefit to general mask use may increase with other decreases in, such that masks can synergize with other public health measures. Thus, it is important that masks not be viewed as an alternative, but as a complement, to other public health control measures (including non-pharmaceutical interventions, such as social distancing, self-isolation etc.). Delaying mask adoption is also detrimental. These factors together indicate that even in areas or states where the COVID-19 burden is low (e.g. the Dakotas), early aggressive action that includes face masks may pay dividends.

These general conclusions are illustrated by our simulated case studies, in which we have tuned the infectious contact rate, (either as fixed or time-varying, to cumulative mortality data for Washington and New York state through April 2, 2020, and imposed hypothetical mask adoption scenarios. The estimated range for is much smaller in Washington state, consistent with this state's much slower epidemic growth rate and doubling time. Model fitting also suggests that total symptomatic cases may be dramatically undercounted in both areas, consistent with prior conclusions on the pandemic (Li et al., 2020). Simulated futures for both states suggest that broad adoption of even weak masks could help avoid many deaths, but the greatest relative death reductions are generally seen when the underlying transmission rate also falls or is low at baseline.

Considering a fixed transmission rate, 80% adoption of 20%, 50%, and 80% effective masks reduces cumulative relative (absolute) mortality by 1.8% (4,419), 17% (41,317), and 55% (134,920), respectively, in New York state. In Washington state, relative (absolute) mortality reductions are dramatic, amounting to 65% (22,262), 91% (31,157), and 95% (32,529). When varies with time, New York deaths reductions are 9% (21,315), 45% (103,860), and 74% (172,460), while figures for Washington are 24% (410), 41% (684), and 48% (799). In the latter case, the epidemic peaks soon even without masks. Thus, a range of outcomes are possible, but both the absolute and relative benefit to weak masks can be quite large; when the relative benefit is small, the absolute benefit in terms of lives is still highly nontrivial.

Most of our model projected mortality numbers for New York and Washington state are quite high (except for variable in Washington), and likely represent worst-case scenarios, as they primarily reflect values early in time. Thus, they may be dramatic overestimates, depending upon these states' populations ongoing responses to the COVID-19 epidemics. Nevertheless, the estimated transmission values for the two states, under fixed and variable, represent a broad range of possible transmission dynamics and are within the range estimated in prior studies (Li et al., 2020; Read et al., 2020; Shen et al., 2020), and so we may have some confidence in our general conclusions on the possible range of benefits to masks. Note also that we have restricted our parameter estimation only to initial conditions and transmission parameters, owing to identifiability problems with more complex models and larger parameter groups (see e.g. Roda, Varughese, Han, & Li, 2020). For example, the same death data may be consistent with either a large and low $\delta$ (death rate), or visa versa.

Considering the subproblem of general public mask use in addition to mask use for source control by any (known) symptomatic person, we find that general face mask use is still highly beneficial (see Fig. 4). Unsurprisingly, this benefit is greater if a larger proportion of infected people are asymptomatic (i.e., $\alpha$ in the model is smaller). Moreover, it is not the case that masks are helpful exclusively when worn by asymptomatic infectious persons for source control, but provide benefit when worn by (genuinely) healthy people for prevention as well. Indeed, if there is any asymmetry in outward vs. inward mask effectiveness, inward

effectiveness is actually slightly preferred, although the direction of this asymmetry matters little with respect to overall epidemiologic outcomes. At least one experimental study (Patel et al., 2016) does suggest that masks may be superior at source control, especially under coughing conditions vs. normal tidal breathing and so any realized benefit of masks in the population may still be more attributable to source control.

This is somewhat surprising, given that appears more times than in the model terms giving the forces of infection, which would suggest outward effectiveness to be of greater import at first glance. Our conclusion runs counter to the notion that general public masks are primarily useful in preventing asymptomatically wearers from transmitting disease: Masks are valuable as both source control and primary prevention. This may be important to emphasize, as some people who have self-isolated for prolonged periods may reasonably believe that the chance they are asymptomatically infected is very low and therefore do not need a mask if they venture into public, whereas our results indicate they (and the public at large) still stand to benefit.
Our theoretical results still must be interpreted with caution, owing to a combination of potentially high rates of noncompliance with mask use in the community, uncertainty with respect to the intrinsic effectiveness of (especially homemade) masks at blocking respiratory droplets and/or aerosols, and even surprising amounts of uncertainty regarding the basic mechanisms for respiratory infection transmission (Bourouiba, 2020; MacIntyre et al., 2017). Several lines of evidence support the notion that masks can interfere with respiratory virus transmission, including clinical trials in healthcare workers (MacIntyre et al., 2017; Offeddu et al., 2017), experimental studies as reviewed in (Davies et al., 2013; Dharmadhikari et al., 2012; Lai et al., 2012; Patel et al., 2016; van der Sande et al., 2008), and case control data from the 2003 SARS epidemic (Lau et al., 2004; Wu et al., 2004). Given the demonstrated efficacy of medical masks in healthcare workers (Offeddu et al., 2017), and their likely superiority over cloth masks in MacIntyre et al. (2015), it is clearly essential that healthcare works be prioritized when it comes to the most effective medical mask supply. Fortunately, our theoretical results suggest significant (but potentially highly variable) value even to low quality masks when used widely in the community.

With social distancing orders in place, essential service providers (such as retail workers, emergency services, law enforcement, etc.) represent a special category of concern, as they represent a largely unavoidable high contact node in transmission networks: Individual public-facing workers may come into contact with hundreds or thousands of people in the course of a day, in relatively close contact (e.g. cashiers). Such contact likely exposes the workers to many asymptomatic carriers, and they may in turn, if asymptomatic, expose many susceptible members of the general public to potential transmission. Air exposed to multiple infectious persons (e.g. in grocery stores) could also carry a psuedo-steady load of infectious particles, for which masks would be the only plausible prophylactic (Lai et al., 2012). Thus, targeted, highly effective mask use by service workers may be reasonable. We are currently extending the basic model framework presented here to examine this hypothesis.

In conclusion, our findings suggest that face mask use should be as nearly universal (i.e., nation-wide) as possible and implemented without delay, even if most masks are homemade and of relatively low quality. This measure could contribute greatly to controlling the COVID-19 pandemic, with the benefit greatest in conjunction with other non-pharmaceutical interventions that reduce community transmission. Despite uncertainty, the potential for benefit, the lack of obvious harm, and the precautionary principle lead us to strongly recommend as close to universal (homemade, unless medical masks can be used without diverting healthcare supply) mask use by the general public as possible.

Full study can be accessed at:
https://www.sciencedirect.com/science/article/pii/S2468042720300117

Research on false positives:https://www.acpjournals.org/doi/full/10.7326/M20-1495

Annals of Internal Medicine ORIGINAL RESEARCH

# Variation in False-Negative Rate of Reverse Transcriptase Polymerase Chain Reaction–Based SARS-CoV-2 Tests by Time Since Exposure

**Lauren M. Kucirka, MD, PhD*; Stephen A. Lauer, PhD*; Oliver Laeyendecker, PhD, MBA; Denali Boon, PhD; and Justin Lessler, PhD**

**Background:** Tests for severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) based on reverse transcriptase polymerase chain reaction (RT-PCR) are being used to "rule out" infection among high-risk persons, such as exposed inpatients and health care workers. It is critical to understand how the predictive value of the test varies with time from exposure and symptom onset to avoid being falsely reassured by negative test results.

**Objective:** To estimate the false-negative rate by day since infection.

**Design:** Literature review and pooled analysis.

**Setting:** 7 previously published studies providing data on RT-PCR performance by time since symptom onset or SARS-CoV-2 exposure using samples from the upper respiratory tract ($n$ = 1330).

**Patients:** A mix of inpatients and outpatients with SARS-CoV-2 infection.

**Measurements:** A Bayesian hierarchical model was fitted to estimate the false-negative rate by day since exposure and symptom onset.

**Results:** Over the 4 days of infection before the typical time of symptom onset (day 5), the probability of a false-negative result in an infected person decreases from 100% (95% CI, 100% to 100%) on day 1 to 67% (CI, 27% to 94%) on day 4. On the day of symptom onset, the median false-negative rate was 38% (CI, 18% to 65%). This decreased to 20% (CI, 12% to 30%) on day 8 (3 days after symptom onset) then began to increase again, from 21% (CI, 13% to 31%) on day 9 to 66% (CI, 54% to 77%) on day 21.

**Limitation:** Imprecise estimates due to heterogeneity in the design of studies on which results were based.

**Conclusion:** Care must be taken in interpreting RT-PCR tests for SARS-CoV-2 infection—particularly early in the course of infection—when using these results as a basis for removing precautions intended to prevent onward transmission. If clinical suspicion is high, infection should not be ruled out on the basis of RT-PCR alone, and the clinical and epidemiologic situation should be carefully considered.

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* Drs. Kucirka and Lauer contributed equally to this work.

Tests for severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) based on reverse transcriptase polymerase chain reaction (RT-PCR) are often used to "rule out" infection among high-risk persons, such as exposed inpatients and health care workers. Hence, it is critical to understand how the predictive value changes in relation to time since exposure or symptoms, especially when using the results of these tests to make decisions about whether to stop using personal protective equipment or allow exposed health care workers to return to work. The sensitivity and specificity of PCR-based tests for SARS-CoV-2 are poorly characterized, and the "window period" after acquisition in which testing is most likely to produce false-negative results is not well known.

Accurate testing for SARS-CoV-2, followed by appropriate preventive measures, is paramount in the health care setting to prevent both nosocomial and community transmission. However, most hospitals are facing critical shortages of SARS-CoV-2 testing capacity, personal protective equipment, and health care personnel (1). As the epidemic progresses, hospitals increasingly have to decide how to respond when a patient or health care worker has a known exposure to SARS-CoV-2. Although 14 days of airborne precautions or quarantine would be a conservative approach to minimizing transmission per guidelines from the Centers for Disease Control and Prevention (2), this is not feasible for many hospitals given starkly limited resources.

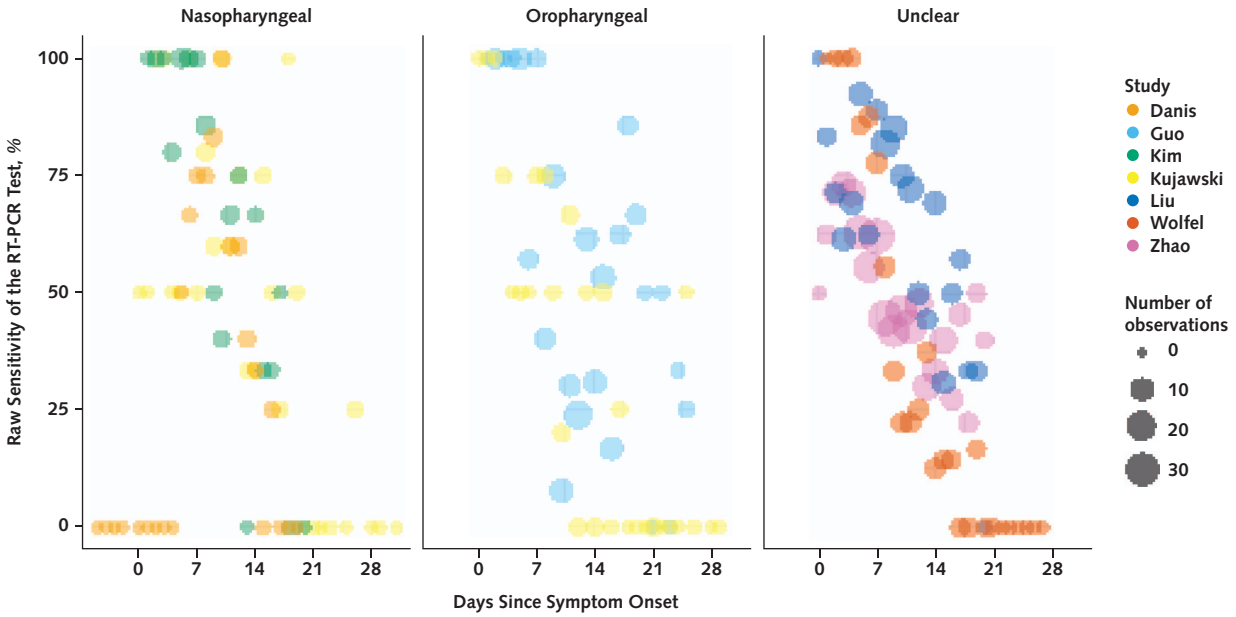
As RT-PCR–based tests for SARS-CoV-2 are becoming more available, they are increasingly being used to "rule out" infection to conserve scarce personal protective equipment and preserve the workforce. When exposed health care workers test negative, they may be cleared to return to work; similarly, when exposed patients test negative, airborne or droplet precautions may be removed. If negative results from tests done during the window period are treated as strong evidence that an exposed person is SARS-CoV-2–negative, preventable transmission could occur.

It is critical to understand how the predictive value of the test varies with time from exposure and symptom onset to avoid being falsely reassured by negative results from tests done early in the course of infection. The goal of our study was to estimate the false-negative rate by day since infection.

**See also:**

*Web-Only*
Supplement

***Figure 1.*** Sensitivity of RT-PCR tests, by study and days since symptom onset, for nasopharyngeal samples (*left*), oropharyngeal samples (*middle*), and unspecified upper respiratory tract (*right*).




RT-PCR = reverse transcriptase polymerase chain reaction.

## METHODS

### Source Data

As part of a broader effort to provide critical evaluation of emerging evidence, the Novel Coronavirus Research Compendium at the Johns Hopkins School of Public Health did a literature review to identify preprint and peer-reviewed articles on SARS-CoV-2 diagnostics (3). Investigators searched PubMed, bioRxiv, and medRxiv using a strategy detailed in Supplement Table 1 (available at Annals.org). The search was last updated on 15 April 2020. From the broader search, we identified articles that provided data on RT-PCR performance by time since symptom onset or exposure using samples derived from nasal or throat swabs among patients tested for SARS-CoV-2. Inclusion criteria were use of an RT-PCR–based test, sample collection from the upper respiratory tract, and reporting of time since symptom onset or exposure. We excluded articles that did not clearly define time between testing and symptom onset or exposure. We identified 7 studies (2 preprints and 5 peer-reviewed articles) (4–10) with a total of 1330 respiratory samples analyzed by RT-PCR. Figure 1 summarizes the source data. One study by Kujawski and colleagues (10) provided both nasal and throat samples for each patient; we used only the nasal samples in our analysis.

### How Cases Were Defined

Most studies (Danis and colleagues [6], Wölfel and colleagues [4], Kim and colleagues [7], Kujawski and colleagues [10], and Zhao and colleagues [8]) did serial testing and required at least 1 positive RT-PCR result to consider a case confirmed. Our pooled analysis included only confirmed cases from those studies. The studies by Liu and colleagues (9) and Guo and colleagues (5) included both confirmed cases (≥1 positive RT-PCR result, similar to other studies; $n$ = 153 for Liu and $n$ = 82 for Guo) and probable cases as determined by a set of clinical criteria ($n$ = 85 for Liu and $n$ = 58 for Guo). In both studies, most probable case patients were positive for IgM or IgG SARS-CoV-2 antibodies (67 of 85 probable cases for Liu were IgM- or IgG-positive, and 54 of 58 for Guo were IgM-positive). Thus, 22 participants were considered case patients on the basis of clinical criteria alone because we could not separate them out using the information provided. Supplement Table 2 (available at Annals.org) provides additional details on the source data used in our calculations. As a sensitivity analysis to assess the effect of individual studies on our inferences, we excluded each study in turn from calculations of the posttest probability of infection after a negative RT-PCR result (Supplement Figure 3, available at Annals.org).

### Statistical Analysis

#### *Model for Estimating False-Negative Rate and False Omission Rate by Time Since Exposure*

Using an approach similar to that of Leisenring and colleagues (11) and Azman and colleagues (12), we fitted a Bayesian hierarchical logistic regression model for test sensitivity pj,t with a random effect for study $j$ and a cubic polynomial spline for log-time $t$ since exposure:

$$x_{j,t} \sim \text{Binomial}(n_{j,t}, p_{j,t})$$
$$logit(p_{j,t}) = \beta_j + \beta_1 log(t) + \beta_2 log(t)^2 + \beta_3 (t)^3$$
$$\beta_j \sim \text{Normal}(\beta_0, \sigma^2)$$

where $x_{j,t}$ is the number of patients who tested positive on RT-PCR out of $n_{j,t}$ total tests $t$ days after exposure in study $j$. The exposure was assumed to have occurred 5 days before symptom onset based on the median incubation period previously estimated in a large study of transmission in household contacts (13) and among publicly confirmed cases (14). From the sensitivity, we calculated the expected false-negative rate on each day. We also calculated the posttest probability of infection, assuming a pretest probability based on the attack rate in close household contacts of SARS-CoV-2 case patients in Shenzhen, China (77 of 686 [11.2%]) (14). We assumed a specificity of 100% for RT-PCR, as reported in the U.S. Food and Drug Administration package insert for the Quest RT-PCR assay for SARS-CoV-2, which based its estimate on testing in 72 presumed negative samples from the upper respiratory tract and 30 from the lower respiratory tract (15). This specificity is further supported by a European study that showed no cross-reactivity with other coronaviruses in 297 clinical samples (16).

#### *Sensitivity Analyses*

Although the Food and Drug Administration reported that specificity for SARS-CoV-2 RT-PCR is 100%, many of the supporting studies were done outside the United States, and we cannot exclude variability in test performance. Thus, we repeated our analysis assuming 90% specificity to assess the sensitivity of our results to this assumption. A second assumption of our model, the 5-day incubation period, was based on a large study of household contacts in Shenzhen (13) and on publicly confirmed cases (14). We did additional analyses varying the incubation period to 3 and 7 days to assess the sensitivity of our results to this assumption. We also repeated analyses excluding 1 study each time to assess the effect on our inferences.

#### *Code and Data Availability*

The data and code used to run this analysis are publicly available at https://github.com/HopkinsIDD/covidRTPCR (17).

### Role of the Funding Source

The funders had no influence on the study's design, conduct, or reporting.

## RESULTS

### Probability of a False-Negative Result Among SARS-CoV-2–Positive Patients, by Day Since Exposure

Over the 4 days of infection before the typical time of symptom onset (day 5), the probability of a false-negative result in an infected person decreases from 100% (95% CI, 100% to 100%) on day 1 to 67% (CI, 27% to 94%) on day 4, although there is considerable uncertainty in these numbers. On the day of symptom onset, the median false-negative rate was 38% (CI, 18% to 65%) (Figure 2, *top*). This decreased to 20% (CI, 12% to 30%) on day 8 (3 days after symptom onset) then began to increase again, from 21% (CI, 13% to 31%) on day 9 to 66% (CI, 54% to 77%) on day 21.

### Posttest Probability of Infection if RT-PCR Result is Negative (1 Minus Negative Predictive Value)

Translating these results into a posttest probability of infection, a negative result on day 3 would reduce our estimate of the relative probability that a case patient was infected by only 3% (CI, 0% to 47%) (for example, from 11.2%, the rate seen in a large study of household contacts, to 10.9%) (Figure 2, *bottom*). Tests done on the first day of symptom onset are more informative, reducing the inferred probability that a case patient was infected by 60% (CI, 33% to 80%).

### Variation in Posttest Probability of Infection if RT-PCR Result is Negative, by Pretest Probability

The posttest probability of infection in a patient with a negative RT-PCR result varies with the pretest probability of infection—that is, how likely infection is on the basis of the magnitude of exposure or clinical presentation. When we assumed a high pretest probability of infection (4 times the attack rate observed in a large cohort study), the posttest probability of infection was at minimum 14% (CI, 9% to 20%) 8 days after exposure (Figure 3). When we assumed a lower pretest probability of 5.5% (half the observed attack rate), the negative posttest probability of infection was still minimized 8 days after exposure (1.2% [CI, 0.7% to 2.0%]).

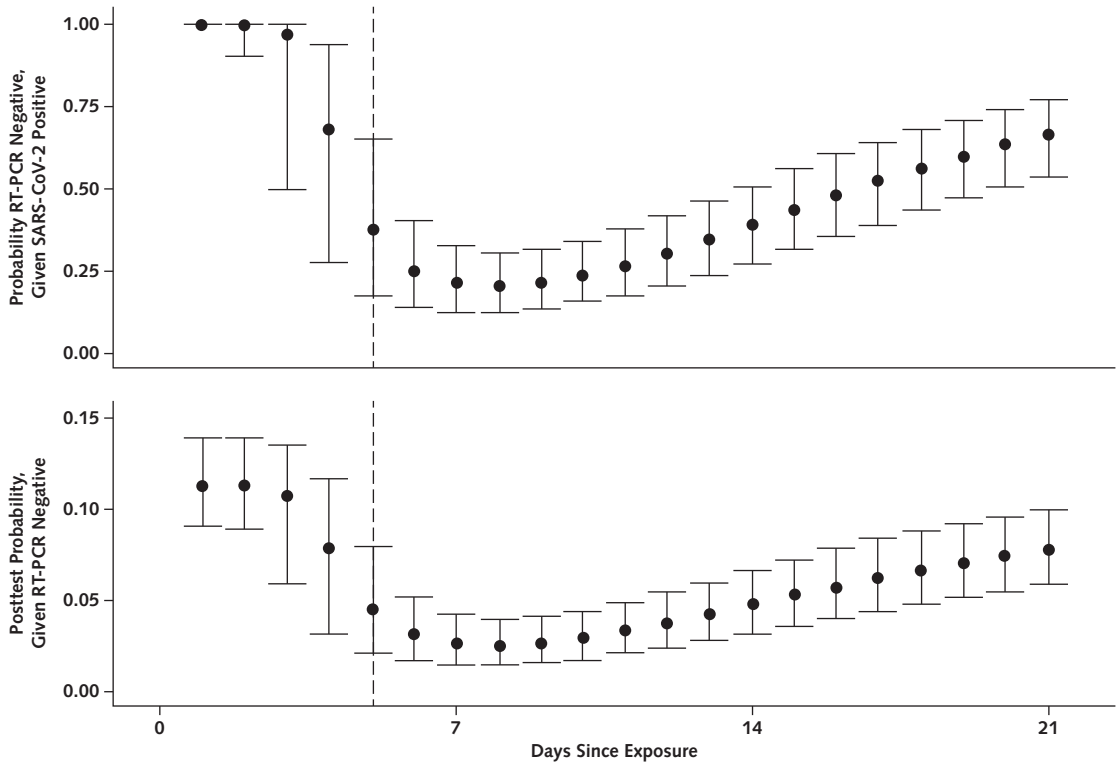
### Sensitivity Analyses

When we repeated our analysis assuming a specificity of RT-PCR of 90% rather than 100%, results were very similar (Supplement Figure 1, available at Annals.org). We found a higher probability of infection in the setting of a negative RT-PCR result, with the greatest difference occurring on day 2 (12.4% vs. 11.3% [1.1 percentage point higher]). When we repeated our analyses varying the incubation period, we found that an earlier onset time of symptoms led to a quicker decrease in false omission rate and a later onset time led to a slower decrease; however, curves were similar overall, and our primary inferences remained the same relative to the date of onset (Supplement Figure 2, available at Annals.org). When we repeated our analysis of the posttest probability of infection excluding a different study each time, our inferences were unchanged (Supplement Figure 3).

## DISCUSSION

Over the 4 days of infection before the typical time of symptom onset (day 5), the probability of a false-negative result in an infected person decreased from 100% on day 1 to 68% on day 4. On the day of symptom onset, the median false-negative rate was 38%. This decreased to 20% on day 8 (3 days after symptom onset) then began to increase again, from 21% on day 9 to 66% on day 21. The false-negative rate was minimized 8 days after exposure—that is, 3 days after the onset of symptoms on average. As such, this may be

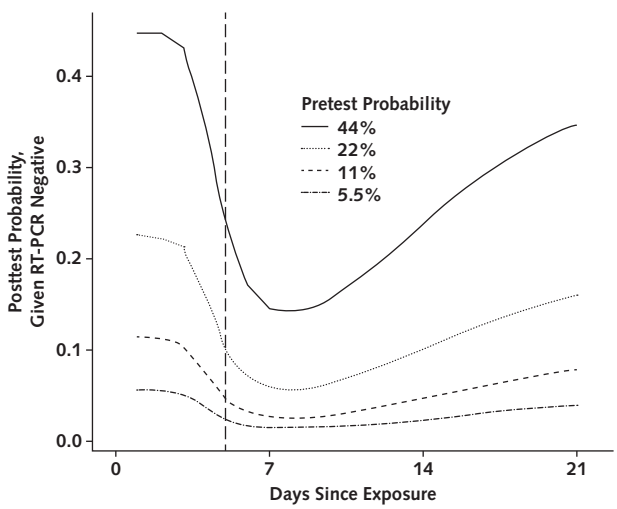
***Figure 2.*** Probability of having a negative RT-PCR test result given SARS-CoV-2 infection (*top*) and of being infected with SARS-CoV-2 after a negative RT-PCR test result (*bottom*), by days since exposure.




RT-PCR = reverse transcriptase polymerase chain reaction; SARS-CoV-2 = severe acute respiratory syndrome coronavirus 2.

the optimal time for testing if the goal is to minimize false-negative results. When the pretest probability of infection is high, the posttest probability remains high even with a negative result. Furthermore, if testing is done immediately after exposure, the pretest probability is equal to the negative posttest probability, meaning that the test provides no additional information about the likelihood of infection.

***Figure 3.*** Posttest probability of SARS-CoV-2 infection after a negative RT-PCR result, by pretest probability of infection.




RT-PCR = reverse transcriptase polymerase chain reaction; SARS-CoV-2 = severe acute respiratory syndrome coronavirus 2.

Since the outbreak began, concerns have been raised about the poor sensitivity of RT-PCR–based tests (18); 1 study has suggested that this might be as low as 59% (19). We have designed a publicly available model that provides a framework for estimating the performance of these tests by time since exposure and can be updated as additional data become available.

Tests for SARS-CoV-2 based on RT-PCR added little diagnostic value in the days immediately after exposure. This is consistent with a window period between acquisition of infection and detectability by RT-PCR seen in other viral infections, such as HIV and hepatitis C (20, 21). Our study suggests a window period of 3 to 5 days, and we would not recommend making decisions regarding removing contact precautions or ending quarantine on the basis of results obtained in this period in the absence of symptoms. Although the false-negative rate is minimized 1 week after exposure, it remains high at 21%. Possible mechanisms for the high false-negative rate include variability in individual amount of viral shedding and sample collection techniques.

One consideration is whether serial testing would offer any benefit in test performance compared with a single test. If we assume independence of the test re-

sults, serial testing would almost certainly reduce the false-negative rate; however, without more data on the underlying mechanism for the high false-negative rate, this assumption may not be warranted. For example, if the rate were due to individual variability in viral shedding, performance would likely not be improved by serial tests. Although we are aware of no large-scale studies, some preliminary reports suggest lack of independence; for example, in 1 case report of a person with infection confirmed on the basis of both radiologic findings and RT-PCR positivity from endotracheal aspirates, RT-PCR results from nasopharyngeal swabs were negative throughout the clinical course (6). Further studies to better characterize the underlying mechanism for poor diagnostic performance of SARS-CoV-2 RT-PCR are needed to inform testing strategies.

The relationship between a false-negative result and infectiousness is unclear, and patients who test negative on samples from nasopharyngeal swabs may be less likely to transmit the virus regardless of true case status. We found an increase in the false-negative rate starting 9 days after exposure; however, it is possible that some of the later results were not true false negatives but rather represented clearance of the infection. Thus, interpretation later in the clinical course depends on the purpose of testing: If the goal is to clear a patient from isolation, these negative results may be correct, although more data are needed given studies showing viral replication in other sites. However, if the goal of the test is to evaluate whether additional follow-up is needed or whether the patient should be treated as SARS-CoV-2–positive for the purpose of contact tracing, the test may not be providing the desired information and caution should be used in decision making. Because antibodies appear later in the course of infection, a combination of antibody testing and RT-PCR might be most useful for patients more remote from symptoms or exposure.

Our study has several limitations. There was significant heterogeneity in the design and conduct of the underlying studies from which the data used in our analyses were drawn. However, when we did a sensitivity analysis excluding each study in turn, we found that no 1 study was especially influential and inferences were largely unchanged. Sample collection techniques varied across studies (oropharyngeal vs. nasopharyngeal swabs), and several studies stated that samples were from the upper respiratory tract without providing further details. Thus, we could not fully account for differences in sample collection techniques. Most studies tested samples at time of symptom onset rather than time of exposure, leading to high variance in estimates in the first few days after exposure. Our model is applicable only in the setting of a known, one-time exposure, not in the setting of continuous exposure, such as in health care workers who may be exposed daily to SARS-CoV-2–positive patients. Finally, most studies defined true-positive cases as those with at least 1 positive RT-PCR result, meaning that patients who never tested positive would not be included; this could lead to underestimation of the true false-negative rate. Two studies included probable cases based on clinical and epidemiologic characteristics even if the patients had never had a positive RT-PCR result or serology. Because such criteria as fever, respiratory symptoms, and imaging findings are nonspecific, misclassification is likely, wherein some proportion of probable cases are actually true negatives rather than false negatives. We believe that this effect was small because excluding these studies from our analysis did not change our primary inferences.

In summary, care must be taken when interpreting RT-PCR tests for SARS-CoV-2 infection, particularly early in the course of infection and especially when using these results as a basis for removing precautions intended to prevent onward transmission. If clinical suspicion is high, infection should not be ruled out on the basis of RT-PCR alone, and the clinical and epidemiologic situation should be carefully considered. In many cases, time of exposure is unknown and testing is done on the basis of time of symptom onset. The false-negative rate is lowest 3 days after onset of symptoms, or approximately 8 days after exposure. Clinicians should consider waiting 1 to 3 days after symptom onset to minimize the probability of a false-negative result. Further studies to characterize test performance and research into higher-sensitivity approaches are critical.

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**Reproducible Research Statement:** *Study protocol:* Further details are available from Dr. Kucirka (e-mail, lauren@jhmi.edu). *Statistical code and data set:* Available at https://github.com/HopkinsIDD/covidRTPCR.

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Current author addresses and author contributions are available at Annals.org.

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Obtaining of funding: J. Lessler.
Administrative, technical, or logistic support: O. Laeyendecker, J. Lessler.
Collection and assembly of data: L.M. Kucirka, S.A. Lauer, D. Boon.

For more data concerning all aspects of COVID- 19, search COVID on this website:
https://ourworldindata.org/

As of right now, Kellogg and Wallace city councils have passed mask resolutions in their cities. Outside of our district, the city of Moscow, city of Boise, city of Driggs, city of Hailey, city of Ketchum, city of McCall, and the city of Victor along with Bonneville county, Ada county, Fremont county, Jefferson county, and possibly Valley county (believe they are voting today). Those are just the ones I'm aware of, so there could be more.

Please let me know if you have any other questions.

Thank you,

Katherine Hoyer
Public Information Officer
Panhandle Health District
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Hayden, ID  83835

Public Health
Prevent. Promote. Protect.
Panhandle Health District

# Panhandle Health District

*Healthy People in Healthy Communities*

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## Panhandle Health District Position Statement on COVID-19

Due to the on-going community transmission we are experiencing in the 5 northern counties and the rapid increase in cases in our district recently, the Panhandle health District Board of Health issued a COVID-19 position statement on July 8th 2020. The statement informs community leaders and the public that the Board of Health is involved and engaged. The positions statement can be located on Panhandle Health District's website.

In order to keep our businesses open and our economy thriving, we need healthy employees. To keep your employees and patrons safe, we urge everyone to take the precautions seriously.

Idaho did not meet the epidemiologic and healthcare criteria to advance past Stage 4. The number of reported cases from June 10-25 trended upward instead of downward, the percent of positive tests from June 8-21 trended upward instead of downward, and the average percent positive for the prior 14-day period was greater than 5-percent at 5.12-percent. In addition, the number of healthcare workers reported with COVID-19 from June 10-23 trended upward, and the average number of healthcare workers reported having COVID-19 per day was greater than the standard of 2.

Idahoans are urged to continue to:

- Wear cloth face coverings in public.
- Keep physical distance of at least 6-feet from others outside your household.
- Wash hands and surfaces regularly. Hands should be washed for at least 20 seconds.
- Cancel or postpone events over 50 people through the end of the year.
- And stay home if you are sick.

The seven public health districts across the state are continually evaluating the criteria at the local level and will announce any changes in moving forward, if that becomes necessary.

https://www.postregister.com/coronavirus/mask-mandates-come-to-east-idaho-in-droves/article_3d82864a-c3b5-5def-a8ac-c6506f02c3a5.html

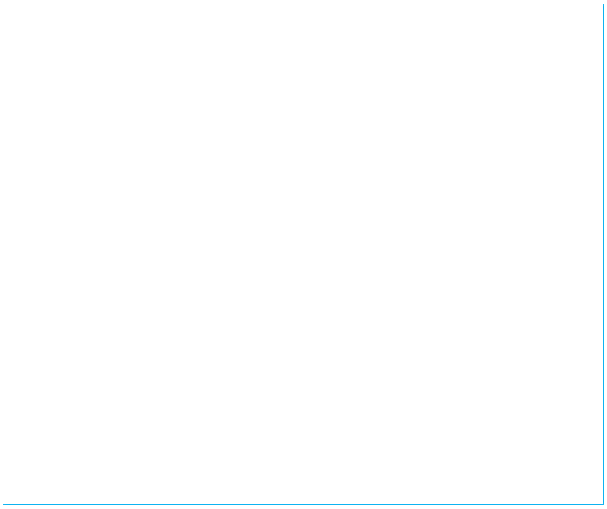
# Mask mandates come to east Idaho in droves

By KYLE PFANNENSTIEL kpfannenstiel@postregister.com
Aug 11, 2020


In most public places you enter in eastern Idaho, you're now legally required to wear a mask, with some exceptions.

The wave of heightened restrictions here come as Eastern Idaho Public Health's board of county representatives tries to tamp down the rapidly rising coronavirus caseloads that even smaller counties have seen lately.

On Monday night, the board unanimously approved new mandates for Fremont, Jefferson and Teton counties. With Bonneville's three-week-old mandate, the board has mandated masks in half of eight east Idaho's eight counties — mainly the most populated ones



Anyone who violates the mandates could be charged with a misdemeanor, which carries up to $300 in fines, six months in jail, or both. The mandates allow some people to be exempt, such as those with certain medical conditions.

Idaho law requires all health district orders to carry those sharp penalties. But law enforcement officers have, since the state's stay-home order in March, generally said they'd educate violators rather than enforce the legal public health measures.

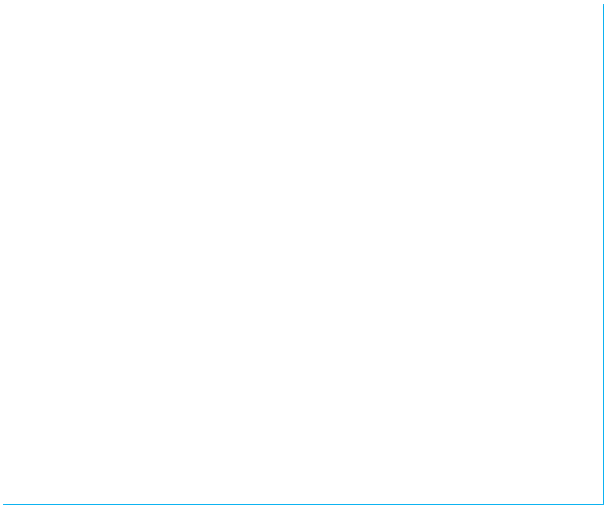
The mask mandates come with large event restrictions that cap the number of occupants based on how much space is available. To encourage physical distancing, each mandate by the health board says public events must have at least 28 square feet per person at a given venue, which is aimed at allowing each attendee to maintain a 3-foot radius from others.

The board's regional plan says mandates will remain in place for at least 14 days. Before the board may remove the mandates, the plan says an area's COVID-19 metrics for caseload and hospitalization must drop below the threshold for the past week.

The board's mandates follow the tiered regional response plan that calls on the board to adopt certain public health measures in response to established daily active case rates, sustained for three days.

Four of the more populous counties are at the moderate risk level, which calls for the heightened social restrictions, while the other four remain at the minimal risk level. The region as a whole breached limits for the moderate risk level; the board didn't address that.

The board issued Bonneville's mandates on July 21. Anecdotally, mask use is increasing in large retailers, which enforce the mandates, but mask use varies elsewhere as small businesses aren't all enforcing the mandates.



Board chairman Bryon Reed, who represents Bonneville, asked how long it takes to see cases decline after more restrictions. Health district administrator James Corbett said that isn't clear.

"Short of actual stay-at-home orders, we're looking at slowing (the rate of coronavirus's spread.) So it will not be as quickly ...," Corbett said. "It's difficult to know how quickly that will drop because of the compliance rates of different strategies."

For months, eastern Idaho saw relatively few coronavirus cases, few hospitalizations and no deaths. Then last month, following a statewide surge, eastern Idaho began seeing a steady rise in cases that led to a rise in hospitalizations a few weeks later. A spate of more deaths could be approaching here, as increased deaths tend to come weeks after a rise in hospitalizations. Just recently, the state reported outbreaks in a handful of nearby long-term care facilities, which are linked with about half of all COVID-19 deaths in the state.

At the end of June, eastern Idaho had just 208 total cases. By the end of July, the region's staggering new total came in: 1,011 cases. Less than two weeks into August, that total has almost doubled: 1,711 cases, as of Monday night.

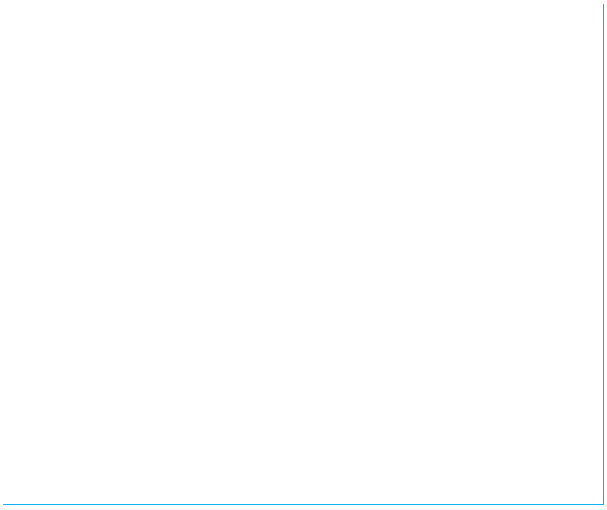
The board first mandated masks in Teton County on July 16. For two weeks, Teton's cases dropped below the threshold of 10 active cases per 10,000 people, where the board's plan calls for mask mandates. Then the board voted last Thursday to repeal Teton's mandate, effective 5 p.m. Monday.

The health board's mandate for Teton lapsed for less than three hours before it reinstated it.

The weekend surge also brought Fremont above the threshold for three days, a threshold it recently breached for a two-day period, leading the board to issue the mandate.

Jefferson's active case rate has, for weeks, barely stayed below the threshold for mandates. Toward the end of July, the county breached the threshold for two days. But this past weekend, Jefferson breached the threshold for a full three days.

Last week, the Post Register found that delays in test turnaround times throughout July led the health district's reporting to under-represent how many cases were active in a given county. The 10-day turnaround time last month has since improved to around four days now, the health district says, but the data issues indicate officials used incomplete information to levy public health measures during the early weeks of the spike.



Reporter Kyle Pfannenstiel can be reached at 208-542-6754. Follow him on Twitter: @pfannyyy. He is a corps member with *Report for America*, a national service program that places journalists into local newsrooms.

Kyle Pfannenstiel

Copied out of my (Deb's) personal email on August 12th from a regional MD, when I inquired about critical care beds.

These statements were supported by an ICU nurse that lives in our region who added they a begging people to work extra shifts because they were near capacity before COVID:

As of today, Deaconess as 18 ICU beds with 2 available, Valley 10 with none available, Sacred Heart 50 with 1 available, holy family 14 with 1 available. Kootenai has 26 ICU beds with 7 available beds today. Kootenai can also manage an additional 6 ICU level patients in the COVID unit. Just counting the usual ICU beds, there are 118 in the area with 11 available.
Lots of caveats. Beds does not equal staff for beds. There are other spaces in the hospital that can be transitioned to ICU-like beds in a dire situation. ICU patients might get flown to Seattle, Boise, SLC if they have capacity and we do not. And so on, and so on. KH has 31 ICU beds. SH has 54. Can't find numbers for Deaconess, Valley and HF. I can say that KH has been near capacity (for all beds) for the last few days.

The bigger point is that how many ICU beds the region has is a moot point. You just don't want to get to a disaster situation. We've been in an emergency situation for months, but you don't want the collateral damage that will go along with a disaster situation. Decisions will get made about who lives and dies based on resources. Businesses will continue to shut down. Schools will shut down. People will lose jobs permanently. People will get sick and have life long morbidity. People will die.

August 13, 2020

To: Sandpoint City Council
From: East Bonner County Library Board

The East Bonner County Library Board supports a mask requirement within Sandpoint city limits. Currently, while most health-related clinics and some businesses request or require mask usage, it is not consistent, which minimizes its effectiveness in slowing the spread of COVID-19, reducing health concerns, and encouraging citizens to visit local businesses. It's particularly concerning that many out-of-town visitors and some local residents seem to perceive Sandpoint as a "safe haven" or "mask free" zone – which is certainly not appropriate given our current and escalating number of confirmed cases.

The Library Board did not make the decision to require masks inside the building without considering substantial facts and scientific research. Protecting community health and safety (like requiring seatbelt use or banning texting while driving) is a common sense measure and is therefore apolitical. Since the small protest last week, we have received over 150 messages from patrons in support of our policy, but only 12 who disagree with our mask requirement. The wider community seems to support mask usage.

In addition to recommendations from the World Health Organization, the Centers for Disease Control and Prevention, and Panhandle Health District (among countless others), our decision was also based on the following facts and research findings:

"Visualizing the effectiveness of face masks in obstructing respiratory jets," Verma et al., June 30 2020, Phys Fluids: https://aip.scitation.org/doi/pdf/10.1063/5.0016018

"Association of country-wide coronavirus mortality with demographics, testing, lockdowns, and public wearing of masks" Leffler et al., June 15 2020, medRxiv: https://www.medrxiv.org/content/10.1101/2020.05.22.20109231v3

"Visualizing Speech-Generated Oral Fluid Droplets with Laser Light Scattering," Anfinrud et al., Apr 15 2020, N Engl J Med: https://www.nejm.org/doi/full/10.1056/NEJMc2007800

"Universal Masking is Urgent in the COVID-19 Pandemic: SEIR and Agent Based Models, Empirical Validation, Policy Recommendations," Kai et al., Apr 21 2020, arXiv: https://arxiv.org/pdf/2004.13553.pdf

Many unknowns about COVID-19 - how it spreads and why it kills some while others show no symptoms – make this new virus particularly concerning. We urge you to protect the citizens of Sandpoint by issuing a citywide mask mandate.

Published in Bonner County Daily Bee April 2020

# BONNER COUNTY HEALTHCARE PROVIDERS STATEMENT

**We are your healthcare providers for Bonner County.** We are your doctors and nurses, your practice administrators, receptionists and support staff. We are your nurse practitioners, physician assistants and nursing assistants. We are your EMS providers, including paramedics, EMTs, firefighters and police department first responders. We are your physical, occupational and respiratory therapists, dentists, pharmacists, dietitians, nurse anesthetists, mental healthcare providers, imaging and lab technologists. We are your hospital employees, emergency room staff and physicians who will be your lifeline when you need us. We are your medical providers of North Idaho.

We are aware that some would like you to relax and let life return to normal. We wish that were possible. We acknowledge how one might think this is a reasonable recommendation given the fact that as of April 5, only two members of our community are known to be infected with COVID-19. However, it is really the unknown cases in the community that will spread the most disease. According to the Department of Health and Welfare, Idaho has gone from less than 10 confirmed COVID-19 cases to over 1,000 cases in the last 20 days, including 80 infected health care providers up from 47 on April 4. (DPH Idaho COVID-19) Do not doubt the power and contagion of this virus. This is our modern plague.

The reason we need to make changes to our daily life is simple. According to the CDC, for every 1,000 of our citizens who become ill with COVID-19, approximately 190 need to be hospitalized and many (about 70) will need Intensive Care Unit (ICU) care. We have 4 ICU beds at Bonner General Health. We have great physicians and staff, but Bonner General has limited ability to manage this pandemic. It is not unthinkable that more than 50 persons will need hospitalization at one time, and it could be 3-4 times that if we ignore the request to modify behaviors. Yes, we are expanding our hospital's capabilities as is happening across the nation, but our resources are limited. Yes, we have Kootenai Health nearby. On the third of April, Kootenai Health's ICUs were completely full and they were using the recovery room as an overflow ICU. Many of these patients have Influenza A and others have medical needs unrelated to COVID-19 infection that require ICU care. Our regional ICU capacity is already stretched and the pandemic has yet to fully penetrate our area. This is a health emergency! We are rising to this challenge. Will you join us now?

Friday, CDC announced support of community use of face coverings in addition to the continuation of the difficult but necessary social distancing. We are in unanimous support of this action. We, your hospital and EMS providers, are already wearing masks to protect you from us. Can you please wear masks to protect us from you? If we all work together, we can decrease the spread of this virus and save many lives.

***What can you do to help?***

All essential businesses should require employees that have contact with the public wear masks while working. Thank you postal workers for taking the lead! We advocate homemade face coverings as the commercially made masks which are in short supply, must be reserved for healthcare providers who are in contact with infected patients.

All citizens and visitors to our community should wear masks when getting groceries, going to the pharmacy, picking up a take-out meal, etc. Trips out of the house will be necessary. These trips may be when we are most vulnerable to infection. Surgeon General, Dr Jerome Adams, describes here how to make a simple mask for personal use youtu.be/tPx1yqvJgf4

We strongly recommend that all businesses provide masks at the entrance of their business for those not wearing one. For businesses in need of homemade masks to pass out, we hope to have enough masks to distribute by the end of the week. Please send a message to the Bonner County Coalition for Health (BCCH) Facebook page to request your masks.

Wash your hands after putting on your mask. Wash your hands whenever you touch your mask. Wash your hands after taking off your mask. Wash your mask daily with laundry soap in a washing machine when possible.

We ask that those citizens with sewing machines quickly ramp up and produce home-made masks. There are numerous on-line tools to help. Here are links to two examples https://youtu.be/_4KW-br7lovk or www.joann.com. Two layers of cotton seems to be an acceptable starting point. As elastic becomes unavailable, we can use string, cord, rubber bands or cloth to make ties.

Finished masks may be dropped off in the foyer of Bonner General Health PATIENT REGISTRATION entrance on 3rd Avenue. There are three bins for you to donate masks and other requested items and a clipboard to leave your name and contact information so they can properly thank you for the support. Written mask making instructions are available at this drop off site. If 100 citizens each make 100 masks, we will have enough to launch this effort. Once Bonner General Health has enough masks for the hospital, our volunteers will deliver them to businesses in need.

We love living in North Idaho. We love doing what we do. We want our friends, our families and our fellow citizens to survive this. We are Idahoans, known for our free thinking and independence. Let's use this to our advantage and unite in this effort. We have support of the CDC, Panhandle Health District, Bonner General Health, Sandpoint Women's Health, Family Health Center, Internal Medicine Associates, Sandpoint Pediatrics, Lake Pend Oreille Emergency Medicine, Woodlands Family Medicine, Sandpoint Family Medicine, Pend Oreille Health Care, Sandpoint Surgical Associates, North Idaho Orthopedics and Sports Medicine (NIOSM), Sandpoint Direct Primary Care, Applegate Health Care, Sandpoint Health Care, Alpine Family Medicine, Mt Baldy Dental Center, Glidden Counseling, Kaniksu Health Services, Sandpoint Optometry, Journey Pediatric Therapy, Total Physical Therapy, All About Kids Pediatric Therapy, Kauai Physical Therapy, Lynch Anesthesia, PLLC, Apollo Med Anesthesia, PLLC, Lewis and Hawn Excellence in Dentistry, Pend Oreille Veterinary Service, Curves of Sandpoint, White Cross Pharmacy, Caribou Physical Therapy, Homestead Health Direct Primary Care, Produce Ministry Team, Inc. Life Choices Pregnancy Center, Community Cancer Services, Selkirk Firefighters Union, Clark Fork Valley Ambulance, Sandpoint City Government including the Mayor's office, Sandpoint Police and Selkirk Fire, plus the following health care providers:

Frazier King, MD
Vince Huntsberger, MD
Amelia Huntsberger, MD
Tabitha Barron, NP
Nichole Grimm, APRN NP-C
Katie Sweeney-Amorebieta, FNP
Hailey Rose, MD
Kristin Algoe, MD
Chase Williams, MD
Laci Burk, FNP
Whitney Lilly, NP
Jeffrey Lindsey, Paramedic
Drew Rinella, Paramedic
Michelle Anderson, DNP, FNP-BC
Paige Russell, DNP-NP-C
Cari House, RN
Todd M House, DMD
Amanda Thome, PT, DPT
Clinton Thome, MD
Julie Walkington, RN
Dale Hopkins, Fire Chief
Kelly Fuhrman, ARNP-BC
Darwin Hurst, FNP
Jade Dardine, MD
Mark Hernandez, MD
Charlie Crane, MD
Joni MacNeil, DDS
Stacey Good, DO, RDMS
Benjamin Good, MD
Joan Bloom, MD
Nanci Jenkins, RDN, LD
Ronald D Jenkins, MD
Hans Hurt, MD
Erin Bass, NP
Alexandra Schulz, RN, BSN
Craig Burns, MD
Dan Meulenberg, MD
Doug Cipriano, MD
Scott Dunn, MD
George Deland, MD
Zachary Halversen, MD
Jeremy Waters, MD
Hannah Raynor, MD
Ken Gramyk, MD, FACEP
Marian Martin, BSN, RN, CEN
Mary Logsdon, MD
Morgan Morton, MD
Robert Rust, MD
Teresa Kuhta, DO
Jamie Karambay, MD
Nathan Kanning, MD
William Wheeler, MD
Karen McClelland, PT
Mark Croft, Paramedic
Robin Rowland, OT
Maresa Black, OT
Colleen Lock, RN

Scott Porter, Pharm.D.
Bill Lock
Lori Garza, RN
Jacci Humble, RN
Lolita Broadsworth, RN
Liz Smith, RN
Rachael Stet, RN
Monica Shoemaker, RDCS, RVT
Christina Uzeta, BCEMS
Suzanne Elassis, RN
Emily Strizich, MS, OTR/L
Jacelyn Lawson
Sharon Bistodeau, RN, MSN
Jake Rich, EMT B(NSFD)
Jonathan Klaucke, MD
Jillian Klaucke, MD
Perky Smith-Hagadone, Principal of Northside Elementary
Trina Kennedy, RN, BSN
Peggy O'Sullivan, RN
Lisa Hollett, RN
Bruce Hollett, Paramedic
Holly Weber, RN
Lizz Garza, FF
Emily Roser, RN
Tracy Autler, RN
Judy Mahon, RN
John Wilson, RN
Marian Wilson, PhD, MPH, RN
Jason Campbell, Phlebotomist
Cheyenne Baker, Phlebotomist
Janet Lukehart, FNP
Doug Lambrecht, RN
Hal Schmidt, PT
Traci Schmidt, PT, MSPT
Adam Kerr, CRNA
Sam Morton, PT, DPT
Joe Wassif, PhD
Anna Blackford, LPN
Michael Schicker, DO
Hannah Badger, RN
John Fontana, CRNA
Pam Schillar, CRNA
Brent Leedle, MD
Jonathan Fisher, DPM
Deb Ruehle, MPT, Sandpoint City Councilwoman
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William Blackmore, Adv. EMT
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Mark W Hawn, DDS
Cheri Proctor, MLS
Jamie Karambay, MD
Carrie Taylor, RN
Travis Taylor, RN
Becki Dotson, RN
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Kara Waters, DO
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Brian Hutcherson, EMT-I
Brianna Williams, RN
Daniel Holland, Radiology Dept Chief
Kyrik White, MLS
Connie Malone, MT
Janet Edwards, RT
Ron Dahl, RT
Shawn Clum, RT
Nickey Bye, RT
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Makel Freer, Care Coordinator
Teresa Kemink, PE
Debbie Hackworthy, RN, BSN
Dave Brown, RN, BSN

Carol Ballard
Barney Ballard
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Vicki Woodward, EMT
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Bonner Partners Free Healthcare Clinic - Executive Board
Bill Litsinger
Sandpoint Medical Massage & Bodyworks, LLC
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Christina Ponsness, DVM
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Laurel Sundberg, DVM
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Suzanne Huguenin, RN
Brooke Kane, RN
April Libby, RN, BSN
Tara Olds, RN
Seila Mederios, RN
Kiersten Ogebeide, RN
Eva Bradburn, RN, BSN, RNC
Mike Victorino, PPD
Colby Deibel, CNA
Kathy Hubbard
Bobbie Franklin, DC
Amy Sutliff, LMSW
Brom Glidden, LCPC
Doree Kovis-Tonks, LCSW
Hilary Hanson
Lissa DeFreitas, BGH Community Hospice
Debra G Nance, RN
Angie Brass
Matt Brass
Kristin Arvidson, PT, DPT
Brad Owens, Pharm D
Emily Williamson, RN, BSN
Marie Lund, BSN, CGRN-R
Jordyn Phillips, MOT, OTR/L
Sharmane Krohmer, CNA
Ginny Reid, RN
Sherry Baker, LPN
John Faggard, MD
Stephen Christensen, MD
Russell Blakeley, MD
Lori Howard, PharmD
Solan Wolf, AEMT
Jay Jolley, RRT (Lincare)
Tom Lawrence MD
Ann Cox ARNP-BC
Kim Bledsoe, Clinic Manager

Gwen Pogue, R.N.
Amanda L. Thomas, MPhEd, LAMFT
Terri Driscoll, RN
William Bruce, LCPC
Brianna Thoreson, LCSW
Jennifer Bullard, FNP-C
Peter Kelterborn, DO
Tammy Karoblis, RN
Shannon Barnes, CHRO
Kevin Amorebieta, Fire Department, EMTI
Anna Phillips, RN
Hannah Cook, CDA
Rebecca Resso, RDH
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Michele Murphree
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The Rev. Deacon Barbara Carver
The Rev. JP Carver
Briana Addison, CNA
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Mike Keough
Jacalyn Siemer, RNFA
JoAnn Filce, RN
Angela May, CNA
Jill Kahn, LMFT
Chuck Ashton, DVM
Lucas Bloxon EMT-B, FF
Steve Zukus, EMT-B, FF
Erica Best, RN
Stephanie Dillion, RN
Jessi Fyfe, CNA
Jessica Geanetta, RN
Jill Wolfe, BSN
Jayde Cordes, BSN
Angie Harris-Owens, BSN
Russ Cash, RN
Cheryl Simonson, RN
Staci Franklin, RN
Dawn LaCoursiere, RN
Nicole Picozzi, RN
Peg Tuddenham, MD
Kelli Hansen, RN
Ivy Brown, RN
Desire Blodgett, CPT
Jennifer Hepinstall
Whitney Henker, OD
Don Henker, OD

Paula Lund, PT
Nelson Antoniuk, MD
Melanie Almeida
Jessica Janssen, RN
Kevin Knepper, CEO Kaniksu Health Services
Melinda Rossman M.A. Principal THSA
Tim Larson, PT
Hanna Rench, RN, BSN
Heather Margaret, MD
Noelle Argue, Elementary Educator
Amy Seastone, DPT
Natasha Splaine-Talbott APRN, FPMHNP-BC
Robert Talbott OECT, WFRI
Shannon Perkins Baker, LMSW
Chris Vanderford, DPT
Kendra Posselt, PTA
Jennifer Dreier, Office Manager
Julie Price, MPT
Danielle Meehan, MOT, OTR/L
Jane Hoover, NP
Andrea Stoffels, RN
Daniel Barry, PA-C
Mike McIsaac, PA-C
Cami Howell - Referral Coordinator
Angie Reynolds - Referral Coordinator
Brenda Hammond, LCSW
Beverly Werth, RN, MSN, CCM
Marc Grenier, MD, FACS
Stacie Riffe, CMA, CHPNA
Tyler Armitstead, EMTP
Sean Pitt, EMTP, CCRN
Christine Denova - Life Choices Pregnancy Center
Bob Abbott, AEMT
Jack Parker
Randy Brook, RN, BSN
Daniel Jefferies, DMD
Mary Jo Ambrosiana
Bobbie Coleman, CN, CFSM
Joanne Barlow-Bonner Homeless Transitions
Mary Fiedler, NP
Michael Gow- President Selkirk Firefighters Union
Bart Casey
Ann Marie Casey
Ann Nichols East Bonner County Library District
Fosha Mimbs, RN
Tim Cochran, Vice Chairman Bonner General Hospital Board
Bob Howard - Emergency Management Director

# Protect others and yourself by wearing a mask

KATHY HUBBARD

We all know that the Centers for Disease Control and Prevention recommends wearing a mask when we can't distance ourselves from others to the tune of more than six feet. The simple science says that if my face is covered and your face is covered, the droplets that contain the coronavirus are unlikely to be exchanged.

I don't know about you, but I don't want to get sick. Therefore I always wear a mask when I'm out in public. And, I do it for two simple reasons: you and me. I have no way to know if the person standing next to me has the virus and, forty percent of them don't either. Yes, that's the estimated percentage of asymptomatic people.

In a letter to the editor of this newspaper on Sunday, August 2, a man said that he had a concern about "being around individuals wearing bacteria-infested possibly infectious face masks."

If he's reading, I'd like to start by explaining the difference between bacteria and viruses.

"Bacterial and viral infections have many things in common. They are both types of infections caused by microbes – bacteria and viruses, respectively – and spread by things such as coughing and sneezing, kissing, sex, contact with contaminated surfaces, food and water, and contact with infected creatures such as pets, livestock, and insects." WebMD explains.

"Although bacteria and viruses are both too small to be seen without a microscope, they're as different as giraffes and goldfish.

"Most bacteria are harmless, and some help by digesting food, destroying disease-causing microbes, fighting cancer cells, and providing essential nutrients. Fewer than one percent of bacteria cause diseases in people.

"Viruses can only reproduce by attaching themselves to cells. Also, unlike bacteria, most viruses do cause disease, and they're quite specific about the cells they attack."

The discovery of antibiotics for bacterial infections is often considered the most important medical breakthrough. While there are antiviral medicines on the market for some viruses, to date, that's not the case for COVID-19.

A simple answer to this individual's question is that, of course, there are bacteria on the mask. Will they make you sick? Most likely, they will not. However, wash or replace your face covering regularly.

When taking it on and off, you should do so by touching the bands that attach to your ears, avoid touching the front of the mask where your nose and mouth are, and immediately wash your hands thoroughly after removal.

He also said he thought it was "common sense that a mask is oxygen depriving …" I thought that was an interesting observation.

So interesting I decided to do a little research on my own. I took my fingertip pulse oximeter (you can buy one for yourself at Walmart for $12.99) and checked my oxygen level. It was at 97. Normal is 95 to 100.

I then put on my mask for five minutes, and my level went up to 98. I figured that it was because I was aware that I was wearing the face-covering, so I left it on and went about doing household chores. About a half-hour later, while still wearing the mask, I retook my oxygen level and it was still 98.

I figured that I couldn't write a paper on my findings until I tried this experiment on someone else, and my life partner happened to come in, so I took his oxygen saturation. He was at 98 to start, and fifteen minutes later, while wearing the mask, he was at 99.

My conclusion is that although it's warm breathing through a mask, it does not deplete your oxygen. The experts told us so, and now I believe them. It's a good thing since surgeons wear masks for many hours while performing surgery, and one wouldn't want their oxygen-depleted.

I find the more I wear a mask, the more used to it I've become. Please be patient. You probably didn't like wearing shoes when you first had to.

Wearing a face mask doesn't mean you have to give up your rights; it just means you have to be respectful of mine.

*Kathy Hubbard is a member of Bonner General Health Foundation Advisory Council. She can be reached at kathyleehubbard@yahoo.com.*

ORDINANCE NO. ____

AN ORDINANCE AMENDING THE MUNICIPAL CODE OF THE CITY OF SANDPOINT, BONNER COUNTY, IDAHO, ADDING A NEW TITLE 4, CHAPTER 9, TITLED MAYOR'S TEMPORARY EMERGENCY POWERS TO PRESERVE THE PUBLIC HEALTH IN RESPONSE TO THE COVID-19 VIRUS; SETTING FORTH THE AUTHORITY, PURPOSE AND INTENT; DESCRIBING THE TEMPORARY PUBLIC HEALTH EMERGENCY ORDERS; DESCRIBING THE PROCESS FOR ENACTING THE TEMPORARY PUBLIC HEALTH EMERGENCY ORDERS; PROVIDING FOR EXCLUSIONS; LIMITING LIABILITY; PROVIDING FOR AN END DATE; PROVIDING FOR A WAIVER OF THE READING RULES; AND PROVIDING AN EFFECTIVE DATE UPON PROCLAMATION BY THE MAYOR POSTED IN FIVE PUBLIC PLACES OF THE CITY.

WHEREAS, on March 11, 2020, the World Health Organization declared the worldwide outbreak of COVID-19 (aka coronavirus) a pandemic; and

WHEREAS, on March 13, 2020, the President of the United States issued an emergency declaration for the country in response to the increasing number of COVID-19 cases within the U.S.; and

WHEREAS, on March 13, 2020, Idaho Governor Brad Little signed a declaration of emergency for the State of Idaho in response to concerns that cases of COVID-19 are imminent in Idaho; and

WHEREAS, on July 23, 2020, the Panhandle Health District Board of Health issued an Order requiring, with certain exceptions, that every person in Kootenai County wear a face covering that completely covers the person's nose and mouth when the person is in a public place and physical distancing of 6 feet from others cannot be maintained; and

WHEREAS, under Idaho Code Section 50-304, the City is authorized to pass all ordinances and make all regulations necessary to preserve the public health, prevent the introduction of contagious diseases into the City, and to make quarantine laws for that purpose, and to enforce the same within the City limits, any health or quarantine ordinance and regulation thereof; and

WHEREAS, under Idaho Code Section 50-606, the Mayor shall have such jurisdiction as may be vested in him by ordinance over all places within the corporate limits of the City, for the enforcement of any health or quarantine ordinance and regulation thereof; and

WHEREAS, in order to effectively preserve the health and safety of the public, the Mayor is granted the temporary emergency powers contained within this Ordinance.

NOW, THEREFORE, BE IT ORDAINED, by the Mayor and City Council of the City of Sandpoint, Idaho.

**SECTION 1.** That a new Title 4, Chapter 9, entitled Mayor's Temporary Emergency Powers, is added to the Sandpoint City Code as follows:

**MAYOR'S TEMPORARY EMERGENCY POWERS TO PRESERVE THE PUBLIC HEALTH IN RESPONSE TO THE COVID-19 VIRUS**

4-9-1 LEGAL AUTHORITY:

Idaho Code Sections 50-304 and 50-606 authorize the City of Sandpoint to enact ordinances granting certain powers to the Mayor related to public health emergencies.

4-9-2 PURPOSE AND INTENT:

The City finds that the preservation of public health, safety, and welfare may require immediate action by the City in response to emergency situations. Therefore, the City hereby authorizes the Mayor certain temporary powers for immediate response to foreseeable, imminent, or present public health emergencies arising out of the spread of the COVID-19 virus.

4-9-3 SCOPE:

This chapter sets forth the scope and procedures for activating the temporary emergency powers of the Mayor and the specific powers of the Mayor during this public health emergency.

4-9-4 PUBLIC HEALTH EMERGENCY ORDERS:

The Mayor, as authorized by this Ordinance and Idaho Code Sections 50-304 and 50-606, may issue the following orders, as deemed appropriate by the Mayor, following consultation with or review of information issued by local, regional, statewide, or nationwide public health authorities, within the City of Sandpoint.

A. The Mayor may order that every person in the City of Sandpoint, when in places that are open to the public, maintain six-foot (6-foot) physical distancing from a non-household member, whenever possible.

B. The Mayor may order that every person in the City of Sandpoint is required to wear a face covering that completely covers the person's nose and mouth when the person is in a public place and physical distancing of six (6) feet from others cannot be maintained.

1. "Public place" shall mean any place open to all members of the public without specific invitation, including but not necessarily limited to, retail business establishments, government offices, medical, educational, arts and recreational institutions, public transportation, including taxi cabs and ridesharing vehicles, outdoor public areas, including but not limited to public parks, trails, streets, sidewalks, lines for entry, exit, or service, when a distance of at least six feet cannot be maintained from any non-household member.

2. Facial coverings are not required to be worn under the following circumstances:

a) Where the individuals are immediate family members or household occupants.

b) Children under the age of two (2).

c) Persons with medical conditions, mental health conditions, or disabilities that prevent them from wearing a face covering. A person is not required to provide documentation demonstrating that the person cannot tolerate wearing a face covering.

d) Persons who are communicating with a person who is deaf and hard of hearing, where the ability to see the mouth is essential for communication.

e) Persons, including on-duty law-enforcement officers, for whom wearing a face covering would create a risk to the person related to their work, as determined by local, state, or federal regulators or workplace safety guidelines.

f) Persons who are obtaining a service involving the nose, face, or head for which temporary removal of the face covering is necessary to perform the service.

g) Persons who are eating or drinking at a restaurant or other establishment that offers food or beverage service, so long as they are seated at a table and able to maintain a distance of six (6) feet from persons who are not members of the same household or party. This exemption does NOT apply to entry, exit, or other movement through the facility.

h) Persons incarcerated in a jail or related facility.

i) When necessary to confirm a person's identity.

j) When local, state or federal law prohibits wearing a face covering or requires removal of a face covering.

4-9-5 PROCESS FOR ENACTING PUBLIC HEALTH EMERGENCY ORDERS:

A. Issuance of an Order. The Mayor shall issue any Order or Orders pursuant to his authority authorized under this Ordinance, in written form, and publish them pursuant to this Section.

B. Notice to the City Council. Following the issuance of any such Order, the Mayor will simultaneously advise the City Council of the issuance of the Order, and the basis thereof.

C. Council Veto. The City Council may reverse or alter the Order issued by the Mayor by a majority vote of the full City Council.

D. Publication of the Order. As soon as possible and prudent under the circumstances, the Mayor will cause a Public Health Emergency Order to be published as follows:

1. Posting the order in a prominent place at the Sandpoint City Hall;

2. Posting the Order on the City's website;

3. E-mailing the Order to all persons subscribed to City e-mail notification services;

4. Posting the Order to all City social media accounts;

5. Providing the Order to local media outlets; and

6. Notifying other government agencies, including Bonner County, Lake Pend Oreille School District, Local Highway Districts, and Panhandle Health District.

Except as may be specifically stated in the Public Health Emergency Order, such Order will be effective upon posting at the Sandpoint City Hall.

4-9-6 EXCLUSIONS:

Unless otherwise specifically prohibited by a Public Health Emergency Order duly enacted by the Mayor, the following activities are exempt from the scope of such order:

A. Any and all expressive and associative activity that is protected by the United States and Idaho Constitutions, including speech, press, assembly, and/or religious activity, not in violation of any state or federal law.

B. Activities necessary to operate critical infrastructure sectors as defined in Presidential Policy Directive 21 (PPD 21), or any successive policy directives related thereto.

C. Orders requiring homeless individuals to self-isolate, but encouraging such individuals to seek governmental shelter and services.

4-9-7 LIMITATION OF LIABILITY:

Pursuant to Idaho Code Section 46-1017, except in cases of willful misconduct, no agent, employee or representative of the City engaged in implementation of the Public Health Emergency Orders provided for herein, shall be liable for the death of or injury to any person, or damage to property, as a result of such activity.

4-9-8 END DATE:

The authority of the Mayor to issue the Public Health Emergency Orders provided for in this Chapter shall terminate no later than seven (7) days from date of passage, unless extended by Resolution of the City Council.

4-9-9 COORDINATION WITH CITY COUNCIL:

In accordance with the developing City response plan to the COVID-19 pandemic, defining phases as follows:

Phase 1: Persons Under Monitoring;

Phase 2: Persons Under Investigation (Testing in Progress);

Phase 3: Confirmed Case(s) (No Person-to-Person spread or spread only in household); and

Phase 4: Person-to-Person Spread in the Community;

the City Council shall meet weekly during Phases 2 to 4 to receive updates on the City's administrative response to the COVID-19 virus, to receive general updates, and to discuss the impact of any Orders issued by the Mayor, including whether to veto any such Order, or to extend this Ordinance to a later date.

**SECTION 2.** All provisions of the current Sandpoint City Code or Ordinances of the City of Sandpoint and parts of Ordinances in conflict with this Ordinance are hereby repealed to the extent of such conflict.

**SECTION 3.** The provisions of this Ordinance are severable, and if any provision, clause, or sentence is held illegal, invalid, or unconstitutional, such illegality, invalidity or unconstitutionality will not affect or impair any of the remaining provisions, clauses or sentences contained herein. It is further declared to be the legislative intent that this Ordinance would have been adopted if such illegal, invalid or unconstitutional provision, clause or sentence had not been included therein.

**SECTION 4.** That this Ordinance, consistent with Idaho Code Section 50-901, will be effective immediately upon its passage and proclamation of the Mayor with publication via posted notice in at least five (5) public places of the City.

Passed under suspension of rules upon which a roll call vote was duly taken and duly enacted an Ordinance of the City of Sandpoint, Idaho, at a regular session of the City Council on _____, 2020.

APPROVED, ADOPTED and SIGNED this _____ day of _____, 2020.

_____
SHELBY ROGNSTAD, Mayor

Attest:

_____
Melissa Ward, City Clerk

SUMMARY OF SANDPOINT ORDINANCE NO. ____
Creating Title 4, Chapter 9, entitled Emergency Powers

AN ORDINANCE AMENDING THE MUNICIPAL CODE OF THE CITY OF SANDPOINT, BONNER COUNTY, IDAHO, ADDING A NEW TITLE 4, CHAPTER 9, TITLED MAYOR'S TEMPORARY EMERGENCY POWERS TO PRESERVE THE PUBLIC HEALTH IN RESPONSE TO THE COVID-19 VIRUS; SETTING FORTH THE AUTHORITY, PURPOSE AND INTENT; DESCRIBING THE TEMPORARY PUBLIC HEALTH EMERGENCY ORDERS; DESCRIBING THE PROCESS FOR ENACTING THE TEMPORARY PUBLIC HEALTH EMERGENCY ORDERS; PROVIDING FOR EXCLUSIONS; LIMITING LIABILITY; PROVIDING FOR AN END DATE; PROVIDING FOR A WAIVER OF THE READING RULES; AND PROVIDING AN EFFECTIVE DATE UPON PROCLAMATION BY THE MAYOR POSTED IN FIVE PUBLIC PLACES OF THE CITY. THE FULL TEXT OF THE SUMMARIZED ORDINANCE NO. ____ IS AVAILABLE AT SANDPOINT CITY HALL, 1123 LAKE STREET, SANDPOINT, IDAHO 83864, IN THE OFFICE OF THE CITY CLERK.

_____
MELISSA WARD, City Clerk