COUNTY OF SAN LUIS OBISPO HEALTH AGENCY
PUBLIC HEALTH DEPARTMENT
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Background Information on COVID-19 and the Use of **Cloth** Face Coverings in San Luis Obispo County

Summary:

San Luis Obispo County is in the important process of a phased re-opening while COVID-19 is still spreading in the community and across the nation. This circumstance presents a critical time for balancing prevention of disease spread, limiting hospitalizations, supporting economic activity, opening schools and places of worship, and regaining a partial sense of normalcy. We must maintain our community's safety and confidence.

With a new State requirement (June 18, 2020) for the use of face coverings in public settings, it is important to help residents understand the scientific basis for this mitigation approach. The development of this information is reflective of updated evidence of the potential benefits of face coverings in interrupting transmission of COVID-19. Simply put: If most people in SLO County wear a face covering in most community settings, and take other protective measures, we can limit the spread of COVID-19.

Primary Conclusions:

1. Transmission of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), the virus that causes COVID-19, occurs primarily through droplets, virus in respiratory secretions released when an infected person coughs, sneezes or talks, that can infect another person when directly contacting mucous membranes (eyes, nose, mouth). Droplets typically do not travel more than six feet.
2. Other modes of spread do occur, including: (a) indirect (secondary) transmission, when a susceptible person touches a contaminated surface and then touches his or her eyes, nose, or mouth; and (b) transmission through aerosolized secretions that travel further and remain suspended in air longer than droplets typically do. The relative importance of these other modes of transmission remains uncertain.
3. There is now a preponderance of evidence of both asymptomatic and especially presymptomatic transmission of SARS-CoV-2. Symptoms alone cannot be used to isolate people with the virus from infecting others.
4. Evidence continues to accumulate regarding use of cloth face coverings in community settings that have higher risk of transmission such as the three C's: closed spaces with poor ventilation; crowded places, particularly where physical distancing is difficult; and in close-contact settings such as close-range conversation, especially indoors.
5. Respirator masks and medical-grade surgical masks, which are used as personal protective equipment (PPE) in health care settings and by first responders, continue to

have insufficient supply to meet demand such that other types of face coverings should be used by the general public.

6. Due to evolving evidence, the County Public Health Department supports wearing cloth face coverings in community settings and supports businesses and local municipalities in their efforts to require wearing face coverings to protect workers and customers and to keep the spread of the virus in the community low.
7. Use of face coverings is one tool that will contribute to maintaining low transmission rates and help us return to work and restart the economy; yet, this protective measure does not replace other important mitigation efforts such as physical distancing and hand hygiene.

Part 1: Evidence of asymptomatic and presymptomatic transmission of coronavirus

Because infected asymptomatic (never develop symptoms) or presymptomatic (go on to develop symptoms later after start of infectious period) people might spread the COVID-19 disease before they are aware, widespread use of cloth face coverings to prevent transmission is one important tool for reducing community transmission. This section includes a few of the sentinel peer-reviewed journal articles that provide evidence for asymptomatic and/or presymptomatic transmission of SARS-CoV-2.

1. Clusters of Coronavirus Disease in Communities, Japan, January–April 2020. In this study of case clusters (>5 individuals), the authors determined that 41% of probable primary case-patients were presymptomatic or asymptomatic when they transmitted the virus to others. All age groups were represented in these presymptomatic or asymptomatic transmissions.

2. Presymptomatic Transmission of SARS-CoV-2 — Singapore, January 23–March 16, 2020. This study investigated 243 SARS-CoV-2 patients and identified seven cluster cases where presymptomatic transmission likely occurred.

3. Temporal Dynamics in Viral Shedding and Transmissibility of COVID-19. This study of 94 patient index cases estimated 44% of secondary infections (in transmission pairs) during the index cases' presymptomatic period (1-2 days prior to symptom onset).

4. Prevalence of Asymptomatic of SARS-CoV-2 Infection: A Narrative Review. This article summarizes all published studies of 16 cohorts around the world of asymptomatic infections where infection was determined by the same method (viral RNA detection in nasopharyngeal swabs). The authors conclude from this review that up to 40% of infections may be asymptomatic, though this number may be as low as 30% when accounting for those that go on to develop symptoms.

Part 2: Guidance and research studies documenting the benefits of wearing cloth face coverings

Evidence continues to emerge and expand demonstrating that early and universal adoption of wearing face coverings is likely to turn the trajectory on the rate of population transmission and the rise in new cases of COVID-19.

1. World Health Organization Guidance (June 5, 2020). New WHO guidance recommends that the general public wear cloth masks "in public settings, such as grocery stores, at work, social gatherings, mass gatherings, closed settings, including schools, churches, mosques, etc." as source control to prevent onward transmission and that seniors or persons with preexisting conditions should wear medical (surgical) masks in areas where there is community transmission of coronavirus. WHO emphasizes that masks alone are not enough to interrupt the transmission chain of coronavirus, and that they must be used in conjunction with hand hygiene, physical distancing and other infection control measures. This guidance also has information about the types of materials and shape of the cloth masks for consideration. The WHO based this new guidance on a report from Strategic and Technical Advisory Group for Infectious Hazards (STAG-IH).

2. Centers for Disease Control recommendation regarding cloth face coverings. "CDC recommends wearing cloth face coverings in public settings where other social distancing measures are difficult to maintain (e.g., grocery stores and pharmacies) especially in areas of significant community-based transmission." CDC also emphasizes maintaining social distancing in addition to wearing a mask, and that medical masks should still be saved for healthcare workers. CDC also has information about how to make, care for and properly wear and remove a cloth face mask at this site.

3. Community Use Of Face Masks And COVID-19: Evidence From A Natural Experiment Of State Mandates In The US. "The research design is an event study examining changes in the daily county-level COVID-19 growth rates between March 31, 2020 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+ days after signing, respectively. Estimates suggest as many as 230,000–450,000 COVID-19 cases possibly averted by May 22, 2020 by these mandates. The findings suggest that requiring face mask use in public might help in mitigating COVID-19 spread."

4. Cloth Masks May Prevent Transmission of COVID-19: An Evidence-Based, Risk-Based Approach**.** Authors analyzed different cloth mask filtration efficiency for outward protection of droplet and aerosol transmission and concluded based on accumulated evidence that potential for modest protection to support cloth masks as a public health intervention with impact at the population level.

5. Aerosol Filtration Efficiency of Common Fabrics Used in Respiratory Cloth Masks. These authors compared filtration efficiencies of aerosol particles (10 nm to 10 microns) of common fabric in cloth face masks and found that combinations of different fabrics and multiple layers enhanced filtration efficiency. Gaps in masks decreased filtration efficiencies by 60%, highlighting the need for proper fitting. Overall, cloth masks made from common fabrics have the potential to offer significant protection against transmission of aerosol particles.

6. Face Masks Considerably Reduce COVID-19 Cases in Germany: A Synthetic Control Method Approach. The authors of this study compared regions of Germany with different points in time for mandatory face mask ordinances. Based on these comparative analyses, 10 days after mandatory face mask rules went into effect, they found a reduction of COVID-19 cases between 2.3-13% after becoming mandatory, and estimated that face masks reduced the daily growth rate of reported infections by approximately 40%.

7. Universal Masking is Urgent in the COVID-19 Pandemic: SEIR and Agent Based Models, Empirical Validation, Policy Recommendations. The authors use theoretical models to predict the outcome of universal mask wearing on the transmission of SARS-CoV-2 and conclude that universal face masking as one of several key non-pharmaceutical interventions has the potential to contribute to reduction of transmission.

8. Face masks against COVID-19: An evidence review. This comprehensive review article synthesizes published evidence around what we know currently about COVID-19 transmission, cloth mask filtration capacity, mask efficacy studies and the effectiveness of face masks at preventing COVID-19 transmission. Further, it offers practical policy guidance on adopting face mask recommendations or mandates.

Part 3: Addressing concerns with wearing face coverings

Some of the earlier concerns about the potential negative consequences of the use of face coverings are further addressed here.

1. The effectiveness of cloth face coverings - Two studies are often cited as showing cloth masks are not effective. One publication that expressed concerns that cloth and surgical masks fail to protect both the wearer and bystander has been retracted by the authors after numerous objections to the quality of the study and the authors' conclusions. The other publication is a large randomized control trial comparing cloth vs medical masks for workers in high-risk influenza wards that demonstrated that those wearing the cloth masks were more likely to contract influenza than those wearing medical masks. The authors did not include a "no mask" control and they state that cloth masks are preferable to no mask with regard to protecting the wearer.

2. Proper use and care - Face coverings need to be worn and removed properly to be effective. With the implementation of a State mandate for face coverings, additional educational campaigns are available and forthcoming. Here is CDC guidance on how to make a cloth mask, as well as directions on how to wear and remove masks.

3. Supply chain management of medical masks (N95 respirators and surgical masks) - N95 respirators and surgical masks are still in short supply and must be reserved to protect our health care workers. People should not contribute to this shortage by wearing these types of masks and if they have extra should consider donating to local hospitals.

4. Access to cloth face coverings – Production of cloth masks has increased considerably. We are mindful that because medical masks are in short supply, we are placing a burden on individuals/businesses to provide their own cloth face coverings. While more available, there is still a need to be sure that there is equitable access to face coverings, especially for low-income and unhoused community members. A variety of community organizations are donating time and materials to this effort (e.g., Face Masks for SLO County, HelpSLO) and we continue to work to assure that homeless shelters, food banks and other places that serve people with less resources have an adequate supply.

5. Risk compensation behavior, or false sense of security when wearing face coverings. This has long been a concern with risk reduction interventions (e.g. people will drive faster with seatbelts) but has generally proven to be untrue (for example, see paper on seatbelts or wearing helmets during skiing). To help prevent risk compensation behavior, the Public Health Department will promote wearing face coverings while continuing to emphasize the other proven interventions like physical distancing and hand hygiene.

6. Stigma of mask wearing/mask shaming - People have reported feeling stigmatized for wearing face coverings (as being fearful or ill), or shamed for not wearing face coverings (as not caring for the community). Neither of these are appropriate or compassionate responses, nor is shaming or stigmatizing a person likely to change their behavior (see research). It is important to note that many individuals cannot wear face coverings due to age, medical condition, mental health, disability or anxiety. To address problematic behaviors, the County will engage with the State Department of Public Health, the County Health Commission and community partners in educational campaigns to promote wearing face coverings as universally as possible. As we work on the time-intensive effort of changing social norms around mask wearing, we ask the community to engage in less stigma and shaming.

7. Health risks associated with wearing a mask:
    a. The outer surface of the mask (outer side) can become contaminated with viruses and bacteria. Proper education on how to remove a mask, as well as methods and frequency of washing and storing them will help with this issue.
    b. Masks can become moist, and trap/breed bacteria on the inner surface. There is a lack of scientific evidence that this commonly results in transmitted infection or illness. Further, it is unlikely that these bacteria will cause illness, as they are already present in the wearer's mouth. Frequent washing and changing masks should prevent this issue.
    c. Masks will concentrate CO_2 and cause issues with rebreathing or reduce oxygen levels. Any face covering will balance filtration (how well it traps microbes or droplets) and breathability, and different combinations of fabric will affect both of these. It is unlikely that CO_2 will concentrate enough to cause a medical issue with rebreathing. Masks are generally porous enough to allow small gas molecules through. However, people may have different tolerance for these conditions and should try different fabrics for those that are most comfortable for breathing but still offer some protection with respect to disease spread. With ramped up production in recent weeks, this should be less of a problem for most people.
    d. Some people may experience allergic reactions to fabrics or coatings on masks. To avoid this, use/obtain masks made of known materials, and try a variety of different masks. Discontinue wearing any face coverings that cause symptoms of allergies.

Part 4: Additional considerations and recommendations

1. Material: When deciding what materials to use for a cloth mask, keep in mind that some textile fabrics can contain dyes and chemicals from the factory. Try to avoid any fabrics that are labeled "wrinkle-free," "durable press" or "easy care finish" since these fabrics may be treated with a product that includes formaldehyde. Do not use

fabrics that have been in contact with harmful household chemicals such as paint removers, stain removers and cleaning products.

2. Care: Launder the fabric at least two times before first use in order to ensure any harmful contaminants are removed. Be cautious of using scented detergent because residual odor may cause a respiratory reaction. Face coverings should be washed after every use, or at least once a day when using daily.

3. Do **not** use cloth face coverings for:
    - Children under age 2
    - Anyone who may have difficulty breathing
    - Anyone who is unconscious
    - Anyone who is incapacitated or otherwise unable to remove the mask without assistance

4. Remember to:
    - Wash your hands after putting the face covering on and after taking it off
    - Not touch your face or the outside of the face covering while wearing it
    - Disinfect areas where the face covering is stored while not in use
    - Continue to adhere to physical distancing standards

5. Some of the places where a face covering should be worn:
    - waiting in line to pick up an order or to be seated at a restaurant
    - shopping inside any store or receiving personal care services (e.g., hair care, nail salons, tattoo shops)
    - waiting to board and riding on public transportation
    - while seeking health care
    - inside any building doing business, like banks or government building
    - inside for religious worship services
    - working inside at a job where you interact with people, or outside where physical distancing of at least 6 feet is difficult

6. Places where a face covering is not needed:
    - at home (unless you live with someone at high risk of COVID-19)
    - in your car alone, or just with the people you live with
    - outside if you are able to maintain at least 6 feet (and preferably more) of distance between people you do not live with
    - exercising outdoors alone (hiking, biking, running), or with people that you live with so long as not in crowded or potentially crowded conditions

Final Statement:

The health and safety of our community, our jobs, the SLO County economy, and our ability to engage in daily activities all depend on keeping COVID-19 transmission relatively low and reducing hospitalized cases, particularly those that require intensive care. SLO County residents do not have to choose between the economy and safety. Using evidence-based practices, we can increase safety, protect the vulnerable, and reopen our economy responsibly. We can accomplish this by individually doing these things: (1) stay home when you are sick, (2) maintain physical distancing, (3) perform proper hand hygiene, (4) cough or sneeze into a tissue, sleeve or cloth, (5) sanitize frequently-used surfaces, and (6) wear a face covering as required. Wearing face coverings in the community is most important in settings that are at higher risk for transmission, i.e., the three C's: closed spaces with poor ventilation; crowded places, particularly where physical distancing is difficult; and in close-contact settings such as during close-range conversation, especially indoors.

It is important that we all make our best efforts to do all of these things. It is also imperative to not presume knowledge of others' circumstances, which may result in some people not being able to wear a mask, even if they do not look to be of a certain age or medical condition.

Collectively these actions can make a significant difference for our entire population. The main near-term goal is to reduce the reproductive transmission rate to below one (R_0<1), the number of people to whom each infected person spreads the disease. This R_0 ("R-naught") is the rate that is necessary for the incidence of COVID-19 to diminish or disappear. By not adhering to protective measures, the entire community is put at risk of further shutdowns and increases the likelihood of a spike of cases of disease, along with hospitalizations, critical illness and fatalities. Therefore, it is in our communal best interest for everyone to do as much as we can, including wearing face coverings. If most people in SLO County wear a face covering in most community settings, and take other protective measures, we can manage the spread of COVID-19 here in SLO County.

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