

COVID-19 Transmission and the Ongoing Need for Universal Masking

A member of the World Health Organization (WHO) stated this month that asymptomatic spread of COVID-19 is 'very rare.' The WHO rushed to clarify the statement within 24 hours, noting that asymptomatic spread occurs but is incompletely understood. These mixed messages have resulted in widespread confusion about the utility of universal masking in preventing the spread of COVID-19. This month's newsletter focuses on the data which lead us to recommend continued universal masking policies, especially in healthcare settings.

People infected with COVID-19 demonstrate a spectrum of clinical presentations. The Centers for Disease Prevention and Control (CDC) estimate that approximately 35% of COVID cases are asymptomatic.¹ In patients that develop symptoms, a pre-symptomatic phase occurs with viral shedding 24-48 hours prior to the onset of symptoms. Approximately 1-7% of symptomatic individuals go on to develop more severe illness and require hospitalization. Virus transmission from each of these populations has been detailed in the literature. Moreover, transmission can be mitigated by preventative policies such as universal masking..

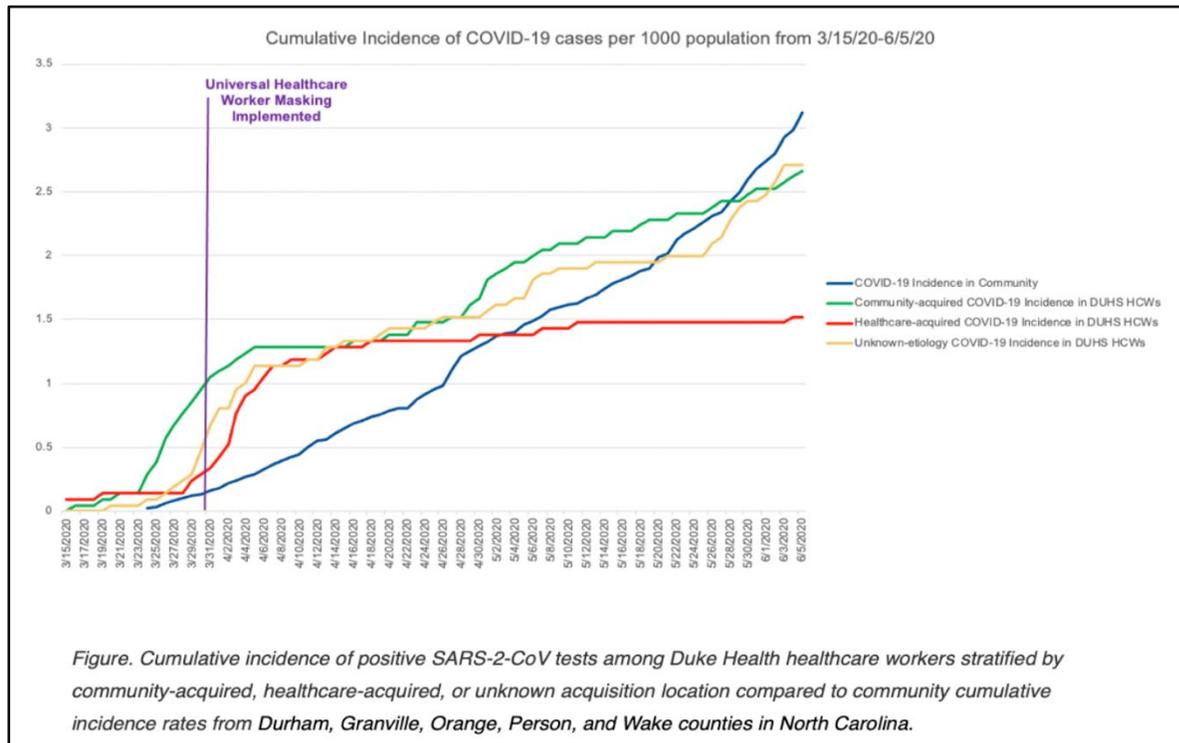
Transmission from Asymptomatic Individuals
Transmission from asymptomatic individuals was described early in the pandemic.^{2,3} The degree of transmissibility may be lower due to the lack of symptoms that expel body fluids such as sneezing, coughing, or a runny nose. However, SARS-CoV-2

has a high level of viral shedding in the upper respiratory tract, and virus has been isolated from individuals who never go on to develop COVID-19 infection.^{4,5} Talking, laughing, breathing, or any other action that exposes individuals to respiratory droplets are all potential modes of transmission.

Transmission from Presymptomatic Individuals
COVID-19 transmission occurs during the pre-symptomatic period as well.⁵ Peak levels of SARS-CoV-2 occur early in the course of illness after symptoms develop and the amount of virus present in upper respiratory tract is increasing quickly even before symptoms occur. In combination with a median incubation period of 5 days, this creates a window of opportunity for virus to spread unknowingly from the host. To characterize pre-symptomatic spread further, two studies modeled the average time between symptom onset in a primary patient and symptom onset in a secondary patient (the serial interval). The interval was found to average around 4 days, less than the 5 day median incubation. The difference can be explained by asymptomatic or pre-symptomatic transmission.^{6,7}

Superspreading events (SSEs)

Symptomatic individuals are clear vectors for transmission. In contrast to asymptomatic or pre-symptomatic individuals who transmit disease to close contacts, symptomatic people have been associated with superspreading events (SSEs) in the literature.⁸ SSEs occur when one individual infects a large number of people, much greater than what the R-nought value predicts. Thus far, SSEs have been tied only to symptomatic individuals for COVID-19. Myriad factors are involved in SSEs which typically involve higher population densities and



enclosed spaces. Critical among these factors are adherence to standard infection control policies (i.e. masking).

Spread of respiratory droplets, and thus viral particles, is greatly reduced in all individuals (asymptomatic, pre-symptomatic, and symptomatic) by face masks.⁹ Knowledge of asymptomatic and pre-symptomatic spread influenced the CDC's recommendation for universal healthcare masking policies.⁵

Impact of Universal Masking Policies

Local institutions that adopt universal masking policies see dramatic reduction in the spread of disease. For example, at Duke University Health System, incidence of COVID-19 infections acquired by healthcare workers in the workplace reduced drastically shortly after introduction of the universal masking policy (Figure 1).¹⁰ COVID-19 acquisition from unknown or community sources continued to increase, which suggests the efficacy of universal masking in a hospital setting. Please see our [commentary published in April 2020](#) that details the

rationale behind universal masking in a healthcare environment.

Universal masking remains most effective in combination with staff and visitor screening and restriction policies.¹¹ The CDC outlines multiple [strategies](#) that may be used for employee screening. Surgical masks should be provided as part of the screening process to all visitors and employees. Limiting visitors (for example, one visitor per hospitalized patient per day) eases the resource burden of surgical mask allocation for individuals without a face covering.

Important strategies related to universal masking:

Universal masking policies require that all hospital employees wear face masks in common areas at all times, including patient care areas, shared workrooms, breakrooms, shared offices, hallways etc. Employees should continue to maintain physical distance from each other when possible, and not share food or eat meals together. As employees need to unmask while eating or drinking, it is especially important to keep at least 6ft distance

from one another in breakrooms, workrooms, workstations, the cafeteria, courtyards or any other settings where people can gather.

Key Points:

1. **Asymptomatic and pre-symptomatic transmission of COVID-19 are important causes of disease spread, and can be mitigated by universal masking policies.**
2. **Masks can help prevent symptomatic individuals from causing SSEs.**
3. **All hospital employees and visitors should be required to wear masks on entry screening to the hospital, and wear a mask at all times, especially in common areas**
4. **Hospital employees should continue to mask in the presence of other staff, even in office spaces and work rooms**
5. **Hospital employees should absolutely avoid eating meals close together or sharing food, and should maintain >6ft distance when eating.**

References

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