

Researchers find confusion over masks for wildfire, COVID-19 crises

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To mask or not to mask—and which mask to use? With public health guidance about masks in the United States confused by political hedging, clarity around mask use is increasingly important, especially as the

western U.S. battles the twin crises of wildfire smoke and COVID-19.

"The CDC is the gold standard of where we find guidance to protect our health, but it's also really important for that information to be spread in ways that people can access and understand it," said Francisca Santana, a Ph.D. student at Stanford University and lead author of a perspective review on mask use published in *Environmental Research Letters* Oct. 28. "Unfortunately, just a website online may not be effective at communicating that information."

The researchers analyzed studies on large-scale responses to epidemics, drivers of human behavior and reactions to wildfire smoke exposure. Based on what scientists have gleaned in aggregate, they have outlined recommendations for communicating mask use guidelines. For U.S. government agencies, their suggestions include:

- Reconciling evidenced-based messaging from federal and local organizations,
- Clarifying which [masks](#) effectively protect against COVID-19 versus wildfire smoke,
- Providing information about mask quantities and where they can be acquired,
- Creating infographics or imagery about mask use differences, and
- Applying culturally appropriate formats and translating messaging so that it reaches vulnerable groups.

"Even people who understand what they should be doing are not doing it," said senior author Gabrielle Wong-Parodi, an assistant professor of Earth system science at Stanford's School of Earth, Energy & Environmental Sciences (Stanford Earth). "The message needs to be evidence-based, and we need to provide people with behaviorally realistic options that they can actually do and afford."

Social norms

The researchers noted the importance of incorporating the social and psychological influences of mask use behavior—a critical and poorly understood topic they urge scientists to further investigate. "We are social beings, we live in these [social contexts](#) and we're not making decisions in isolation, so that's really important to acknowledge in whatever messages are given to the public," Wong-Parodi said. "Just because we put out a great message doesn't mean that people are going to take it up and do it—we need to be sensitive to what people are going through right now."

One pathway to behavior change is through [social norms](#)—the shared beliefs within a social group. Common methods for establishing social norms include comparing people's actions to others, providing positive feedback and placing messaging where it is most relevant. That could mean, for example, posting signage about wildfire masks outdoors and COVID-19 masks indoors.

Further investigation is needed to understand if mask wearing can also affect other actions to prevent the spread of infectious disease, such as hand-washing and social distancing, according to the co-authors.

Mistaken behavior

To help fill gaps in research on mask use during wildfires, Santana, a Ph.D. student in the Emmett Interdisciplinary Program in Environment and Resources, interviewed residents affected by wildfire smoke from the 2018 Camp Fire that destroyed Paradise, California.

The discussions indicated that social norms are a powerful driver of mask use, but also revealed instances of maladaptive behavior, when the

action taken is ineffective or even harmful. In one interview, Santana learned that during persistent wildfire smoke, someone with asthma wore a mask while sleeping—a practice that can even further stress breathing for people with pre-existing asthmatic conditions. "That highlighted how some of the basic information about how to wear a mask—how to fit it, what conditions should you wear it in—was not permeating all the communities that we were working in," Santana said.

Unlike situations of infectious disease alone, the dual threats of wildfire smoke and COVID-19 have presented a plethora of mask-wearing options with varying effectiveness, depending on the hazard. While an N95 mask is form fitting and must be placed on top of your nose to protect from wildfire smoke, cloth face coverings are advised for indoor COVID-19 protection—and people sometimes wear less-structured cloth masks under their noses, going against the [CDC's recommendation](#) to wear them over your nose and mouth to reduce disease transmission.

Social influence

The interviews also revealed a form of social support that is now being repeated during COVID-19: gifting masks to others. While it may or may not actually encourage mask use, that support can influence how people perceive the behaviors of close friends and family.

"Your perception of the behavior of people you're in close contact with matters maybe even more than what they're actually doing, in terms of influencing your own behavior," Wong-Parodi said.

The review also included surveys from China and Japan, where mask-wearing was associated with the perceived threat of pandemics like SARS and H1N1 and strong perceived benefits of masks. More recent research in the U.S. reveals how mask use can indicate political affiliation or fear of racial profiling.

The researchers suggest several areas of study that would help public health communications leverage the social nature of mask use, such as how social norms influence individual health—like the inhalation of smoke—versus collective health such as the spread of COVID-19. Above all, they underscore the importance of communications based on scientific evidence.

"It's really important for public health officials at the local or state level to provide clearer guidance to the public about which masks are appropriate for which events, and to make recommendations for behavior change," Santana said.

More information: Francisca N Santana et al, Responding to simultaneous crises: communications and social norms of mask behavior during wildfires and COVID-19, *Environmental Research Letters* (2020). DOI: [10.1088/1748-9326/abba55](https://doi.org/10.1088/1748-9326/abba55)

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