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Opinion

A Data-driven, Dynamic and Flexible Approach to Safely Lifting Mask Mandate: A Proposal

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Abstract

The governors of New Jersey, New York, California, Connecticut, Delaware and Oregon announced early in the week of February 7 that select mask mandates in their states would end in two to six weeks. These states together account for 77.9 million Americans, or ~23.5% of the U.S. population, and therefore these changes in policy could have a significant impact on the U.S. economy, as well as education and healthcare systems in each state. As counts of COVID-19 cases, hospitalizations and deaths decrease, mask mandates should be reassessed. We propose that a data-driven, dynamic and flexible approach may help lift mask mandates safely and facilitate a smooth transition to post-pandemic normalcy.

The governors of New Jersey, New York, California, Connecticut, Delaware and Oregon announced early in the week of February 7 that select mask mandates in their states would end in 2–6 weeks, with the extent of policy changes varying by state.[1] According to 2020 census data, these six states together account for 77.9 million Americans or ~23.5% of the U.S. population, such that these policies could have a significant impact on the U.S. economy, as well as education and healthcare systems in these states.[2] Public health officials, however, stated that it was too early to remove mask mandates.[3] Strikingly, scientists had also cautioned not to lift mask mandates too early or quickly last May, when the U.S. and other countries began lifting mask mandates.[4] Then, due to the omicron variant, came the largest surge of COVID-19 cases, despite increasing numbers of people being vaccinated.[5,6] In this context, we recommend here a data-driven, dynamic and flexible approach to safely lifting mask mandates (Fig. 1). Briefly, mask mandates policies should be based on assessments of the COVID-19 burden, including COVID-19 metrics such as transmission rate, the impact of COVID-19 to the healthcare system and to the society, and risks of a resurgence.

According to the Centers for Disease Control and Prevention, there were 108,159 new cases of COVID-19 reported on Feb 18, 2022, with a seven-day death-rate of 4.1 per 100,000. Nowadays nearly all public health policies are based on data, but the challenges lie in assessing the quality of that data and deciding how best to use it. COVID-19 data have the following characteristics that policy makers must be aware of. Firstly, recent case counts of COVID-19 may be underestimated. Indeed, the need for more rigorous collection of COVID-19 case counts by U.S. government has previously been highlighted.[7] COVID-19 case counts were unreliable early in the pandemic. The Biden administration started to distribute free at-home test kits to Americans. Even though this policy has benefits, self-diagnosis at home is likely to make case counts less reliable.[8] Although counts of hospitalizations and deaths are more reliable than case counts, many new cases diagnosed or misdiagnosed at home will be unlikely to be reported or collected by public health agencies. Thus, the case count is lower than the true count and should be interpreted with great caution. Secondly, in order for trends in COVID-19 case counts and reproduction number to be assessed robustly, other monitoring tools must be considered. For example, studies have shown that internet search interests and Farr's law for COVID-19 cases hold predictive value, and these could be considered as additional methods for determining case counts.[9,10] Thirdly, high-quality data and expertise in economic and health sciences are required for a sound analysis of the risks and benefits of mask mandates. The effectiveness of mask mandates for preventing and controlling the spread of COVID-19 has been well demonstrated.[11–13] However, there are also well-documented risks and potential harms associated with long-term mask mandates, such as depression, anxiety, and mental health problems.[14,15] Other perceived harms such as physiologic decompensation, seem questionable.[16] Finally, we need more and better data to increase rates of vaccination. Notably, while vacci-

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Abbreviations: COVID-19, coronavirus disease 2019.
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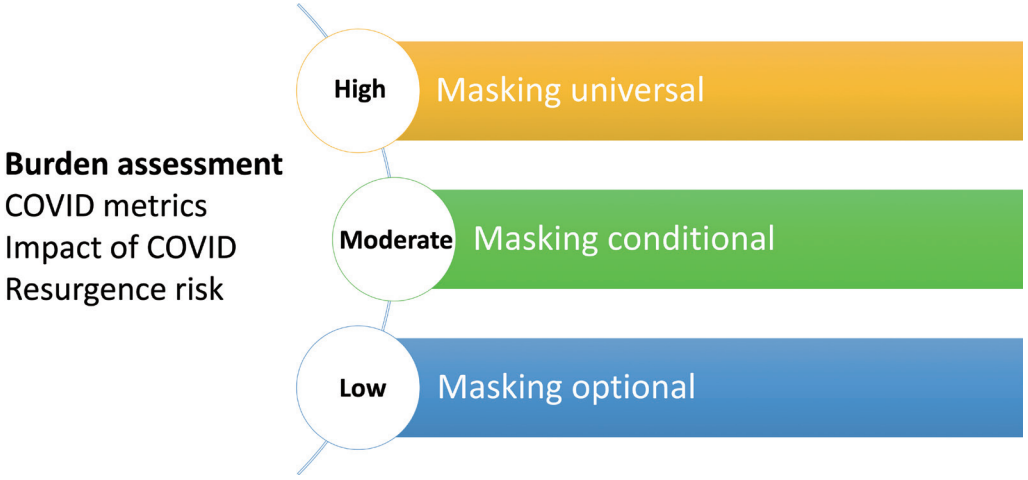

Fig. 1. A data-driven, dynamic and flexible approach to lifting mask mandates. The mask mandate policy in a given community is based on burden assessment and supported by the majority of stakeholders. Burden assessment consists of three main categories: 1) COVID metrics, including transmission rate, hospitalization rate, Intensive care unit admission rate, COVID-related death rate, and vaccination rate; 2) impact of COVID, including workforce shortage, school opening, *etc.*; and 3) risk of COVID resurgence based on transmission rates of new variants and the effectiveness of vaccination. When COVID-related burdens are considered high, a universal masking mandate is appropriate. When COVID-related burdens are considered moderate, masking is required for at-risk populations, including people who are immunocompromised, unvaccinated or have an unknown vaccination status. When COVID-related burdens are considered low, masking is optional.

nation does not completely prevent COVID-19, it can reduce rates of COVID-19-related hospitalization, death, and to a lesser extent, incidence.[17,18] Research suggests mask mandates for healthcare workers increases vaccination rates and decreases hospital visits for influenza, and it is possible that such mandates may have similar effects for COVID-19.[19] Since vaccination mandates have been the subject of litigation, a reasonable alternative could be to dynamically and gradually lift mask mandates while reinforcing vaccination recommendations.

Cultural preferences, vaccination rates and COVID-19 case counts vary greatly by state and at the local community level in the U.S. Therefore, it will be practical and effective to adopt a dynamic approach to gradually lifting mask mandates. Recently, Rowland *et al*. proposed a burden-metric based dynamic approach to mask mandates that holistically assesses the impact of masking policies on transmission within schools, student absenteeism and staff capacity.[20] Their proposed policy includes masking requirements spanning four levels, namely making masking universal, making it optional when more than 80% of the eligible population is vaccinated, having masking required for people who are not vaccinated and leaving masking as an optional individual decision.[20] Such an approach is practical and metric-based and will be widely acceptable to the public. It is noteworthy that having masking as optional, the lowest level of masking requirement, could greatly reduce discrimination against, and the psychological burden of, people who are willing to wear a mask. An optional mask policy may also encourage some people to wear a mask. A similar approach can be considered by policy makers at state, county and municipal levels. Notably, state and county officials may consider providing municipal officials with greater flexibility to determine local masking policies or mask mandates. Presumably, a masking policy primarily made by local officials should better satisfy the local community's needs, be more likely to be supported by its constituents, and be effectively adopted.

Since COVID-19 cases, hospitalizations and deaths have decreased significantly after the U.S. winter holiday surge, mask mandates should be reassessed.[21,22] Social distancing policies could also be reassessed if long-term data support safely lifting mask mandates in a given community. Our proposed data-driven, dynamic and flexible approach may help lift mask mandates safely and facilitate a smooth transition to post-pandemic normalcy.

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Conflict of interest

Dr. Shiqian Shen has been an associate editor of *Exploratory Research and Hypothesis* since March 2021. The authors have no other conflicts of interest to note.

Author contributions

Proposal concept and design (CC, SS), manuscript preparation and revision (CC, SS). All authors have made a significant contribution to this study and have approved the final manuscript.

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