



FACE MASKS: A GLOBAL CONTROVERSY

International Policies
for Mask Wearing
During the COVID-19 Pandemic

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Introduction

Mask-wearing policies are a major tool to limit the transmission of the COVID-19 virus, and have the side benefit of allowing the population to return to a semblance of their pre-pandemic lifestyle. However, there is no standard international approach to mask-wearing policies for the non-symptomatic public. The mask policies for each country, and even each region within a country, have differed in their timing and details. There is a significant international debate surrounding optimal mask-related public health policies. There is, in short, no consensus as to whether mask-wearing should become an immediate policy during a pandemic. There are many recommendations as to how best to use a mask, when to use one, how to clean one, which is the best type, but many of these recommendations contradict one another. The mask policies for each country, and even each region within a country, have differed in their timing and details. There is a significant international debate surrounding optimal mask-related public health policies.

There is also a gap in research on effectiveness of mask policy on mitigating the spread of a virus. Understanding the nature and impact of variation in mask policy is instrumental in creating effective public health policy in the age of COVID-19. Information on the usefulness of mask policies is essential in maintaining public health and financial sustainability during infectious disease outbreaks that occur in the future.

Mask-wearing is topical at this time for two primary reasons. (1) It is paramount that countries mitigate and eliminate the spread of COVID-19. (2) Effective viral spread mitigation mechanisms are essential for a return to normalcy for populaces. There is an international race to limit the spread of the virus to prevent hospitalization overloads, to lower mortality rates, and to contain the economic downturn as much as possible. Mask-wearing is essential in curtailing viral spread and necessary for a return to social normalcy. In these times of social change and global protest in the name of racial justice, social distancing and other mitigation best practices are rendered impossible. Mask-wearing effectively minimizes viral spread in these gatherings and provides societies with a tool to advance change while also making considerations for COVID-19.

This paper will use examples from ten different countries to explore the variety of policies and the general efficacy of certain policies on virus transmission rate. Although there are many factors involved in the transmission rate of a virus, mask-wearing is the primary technique advised by public health officials to minimize risk of infection in spaces where social distancing is not possible.

The Stumbling Block: WHO Policy

Across the world, there has been no standard agreement upon mask-wearing policies during the COVID-19 pandemic, perhaps in part because the agency in charge of the internationally coordinating pandemic defenses did not have a predetermined policy for mask-wearing. The World Health Organization (WHO) is the primary international coordinator for defense against communicable diseases for the 193 countries in the United Nations system, and their recommendations for general public mask-wearing have changed throughout the progression of the COVID-19 pandemic.

Up until approximately six months after the initial outbreaks in China, the WHO recommended that individuals should not wear masks unless they were sick or were caretakers for someone with symptoms.¹ The rationale behind their strong recommendation against masks in public was derived from the shortage of personal protective equipment for frontline healthcare workers and the desire to save the existing stockpile of masks for these workers. The WHO also cited the lack of research for or against the effectiveness of masks as a reason for discouraging mask-wearing, and noted that there was evidence that improper mask-wearing was more harmful than wearing no mask at all. The Director General of WHO, Tedros Adhanom Ghebreyesus, renounced the measures on June 5th, 2020 and instead urged countries to encourage public mask-wearing for all individuals.²

As of June 29th, 2020, the WHO website's Q&A on Coronavirus, originally published on April 17, had not been updated to reflect their new recommendations and still stated that there is not enough evidence for or against mask-wearing.³ The WHO is an internationally respected organization and is established as a world leader for public health solutions, but it is important to recognize that the WHO is a voluntary body and only has the capability to make recommendations, not mandates.

Categorization of Mask Policies

Background

Mask policies can be divided into four categories: 1) active discouragement of mask-wearing, 2) neutral policy for masks (i.e. no recommendations and no discouragement of wearing masks), 3) combination of recommendations for mask-wearing and requirement to do so, and 4) requirement for masks in all enclosed public spaces. Figure 1 below visualizes policy variation across countries frequently covered in the news during the early months of the pandemic.

¹ <https://www.cnn.com/2020/03/30/world/coronavirus-who-masks-recommendation-trnd/index.html>

² <https://www.cnn.com/2020/06/05/health/face-mask-coronavirus-who-recommendations-bn/index.html>

³ <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/question-and-answers-hub/q-a-detail/q-a-coronaviruses>

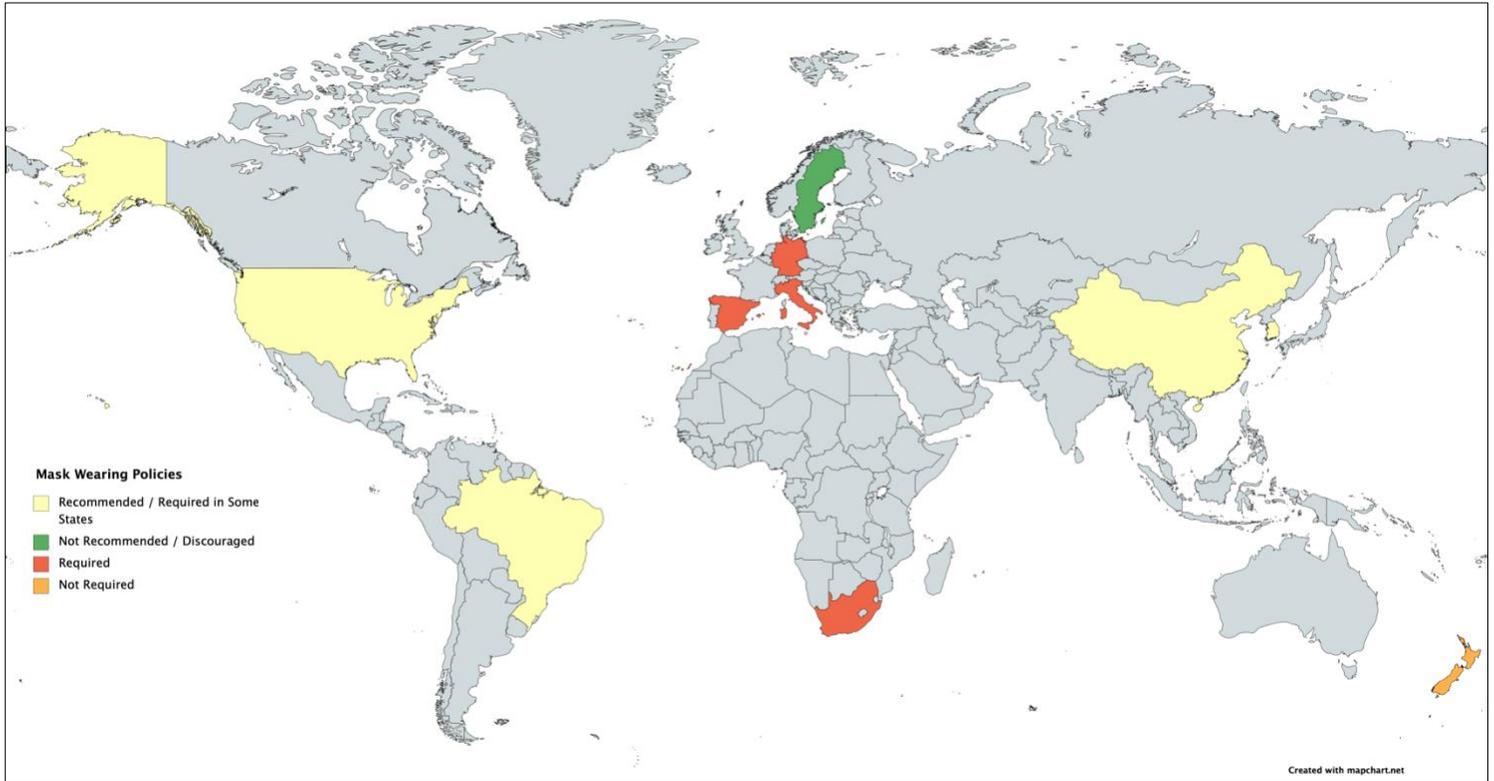


Figure 1. International Mask-wearing Policies of 10 Countries⁴

As discussed in prior sections, differences in mask policies are due to a lack of international coordination and suggest a lack of direction from WHO, resulting in no world-wide policy on how to minimize transmission in public spaces. However, it is worthwhile to notice that each country has its own public health team that could choose to follow WHO policies or to create their own.

Active recommendation against masks

Some countries do not recommend mask-wearing. We chose Sweden to represent this group since is the most prominent country in this category, since they have the highest number of COVID-19 cases among the nations that do not recommend wearing masks. Their Public Health Agency has maintained that masks do more harm than good, since masks can increase the number of times an individual touches their face through itchiness or a mask slippage adjustment.⁵

Neutral stance

We selected New Zealand to represent countries that do not offer recommendations on mask-wearing for the general public, except for those who feel sick or exhibit symptoms. New Zealand is a unique case study, however, because as of June 8th, 2020, the country declared

⁴ Original and unmodified graphic created with mapchart.net and licensed under [CC BY-SA 4.0](https://creativecommons.org/licenses/by-sa/4.0/).

⁵ <https://www.thelocal.se/20200608/why-isnt-sweden-asking-people-to-wear-face-masks>

the eradication of COVID-19. Prior to their victory, the New Zealand government did not require face masks in public spaces. They used vigorous contact tracing, as well as hand washing and social distancing advice, as their primary sources of defense against the virus.

Masks recommended

Other countries merely recommend the wearing of masks, and do not take action against individuals who decide not to wear masks in public. South Korea is the example country for this category. The United States and Brazil have federal recommendations, but some states make masks mandatory, so mask-wearing varies across the country. As of August 9th, 2020, 34 states⁶ in the U.S. mandate masks, while 16 states do not. Divisions in this category arise when looking at the previous culture of wearing masks. For example, populations in South Korea and other Asian countries were introduced to mask-wearing during the SARS outbreaks in the early 2000s and the H1N1 outbreaks in the late 2000s, whereas the United States population is new to wearing masks.

Masks required

There are a large number of countries that require individuals to wear masks in enclosed public spaces, such as buildings and public transportation. Spain, Italy, Germany, and South Africa fall into this category. Spain released an announcement that detailed the guidelines for the masks: *"Using masks will be compulsory on the street, in open spaces and any closed place of public use, when it is not possible to maintain a safe distance of at least two meters (6.5ft)."*⁷ The Spanish government specified that children under the age of 5 and people with respiratory conditions are exempt from the rules. Spain has instituted a 100 euro fine, and certain German states have a similar penalty. In Bavaria, Germany, there is a \$5,000 fine for businesses who allow customers into their premises without a mask.⁸

Comparison of efficacy

The United States, a country with varying mask policies by state, has experienced the highest total caseload and one of the most persistent upward trends in new COVID-19 cases. Sweden, a country that actively recommends against mask use, has also experienced a high number of new cases that recently began to decline. Conversely, New Zealand, a country with a neutral stance regarding mask-wearing, was able to dramatically reduce new cases early on. New Zealand chose instead to pursue aggressive contact tracing policies, eliminating the need for the general public to wear masks. Germany and Italy are examples of countries that require masks, and these two countries have experienced similar steady downward trends in new cases.

⁶ <https://www.aarp.org/health/healthy-living/info-2020/states-mask-mandates-coronavirus.html#:~:text=California-,Statewide%20order%3A%20Yes,guidance%20for%20using%20face%20coverings.>

⁷ <https://www.bbc.com/news/world-europe-52735166>

⁸ <https://www.npr.org/sections/coronavirus-live-updates/2020/04/27/845535990/masks-become-compulsory-in-germany-as-lockdown-restrictions-slowly-ease>

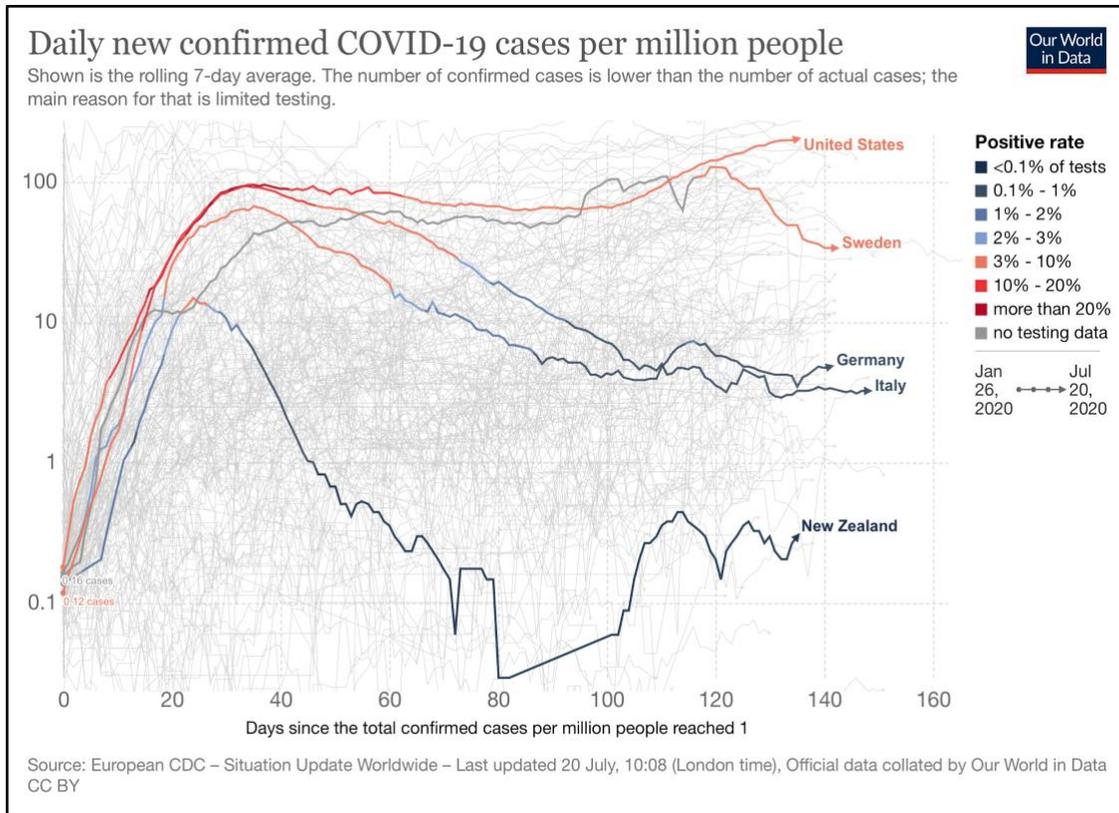


Figure 2. Daily New Confirmed COVID-19 cases per million people (log scale)⁹

Mask mandates and disincentives for non-compliance

Even if policies are in place, it is difficult to measure the number of people who adhere to the policy. Furthermore, regional differences exist within countries, including the U.S, which allows local governments to make individual policies. The Centers for Disease Control and Prevention (CDC) of the United States completed a survey that found that 74.1% of Americans always or often wear face coverings in public areas.¹⁰ However, Figure 3 demonstrates the inconsistency of mask-wearing policies both across and within states.

⁹ <https://ourworldindata.org/coronavirus-data-explorer?yScale=log&zoomToSelection=true&country=®ion=World&casesMetric=true&interval=total&aligned=true&hideControls=true&smoothing=0&pickerMetric=location&pickerSort=asc>

¹⁰ https://www.cdc.gov/mmwr/volumes/69/wr/mm6924e1.htm?s_cid=mm6924e1_w

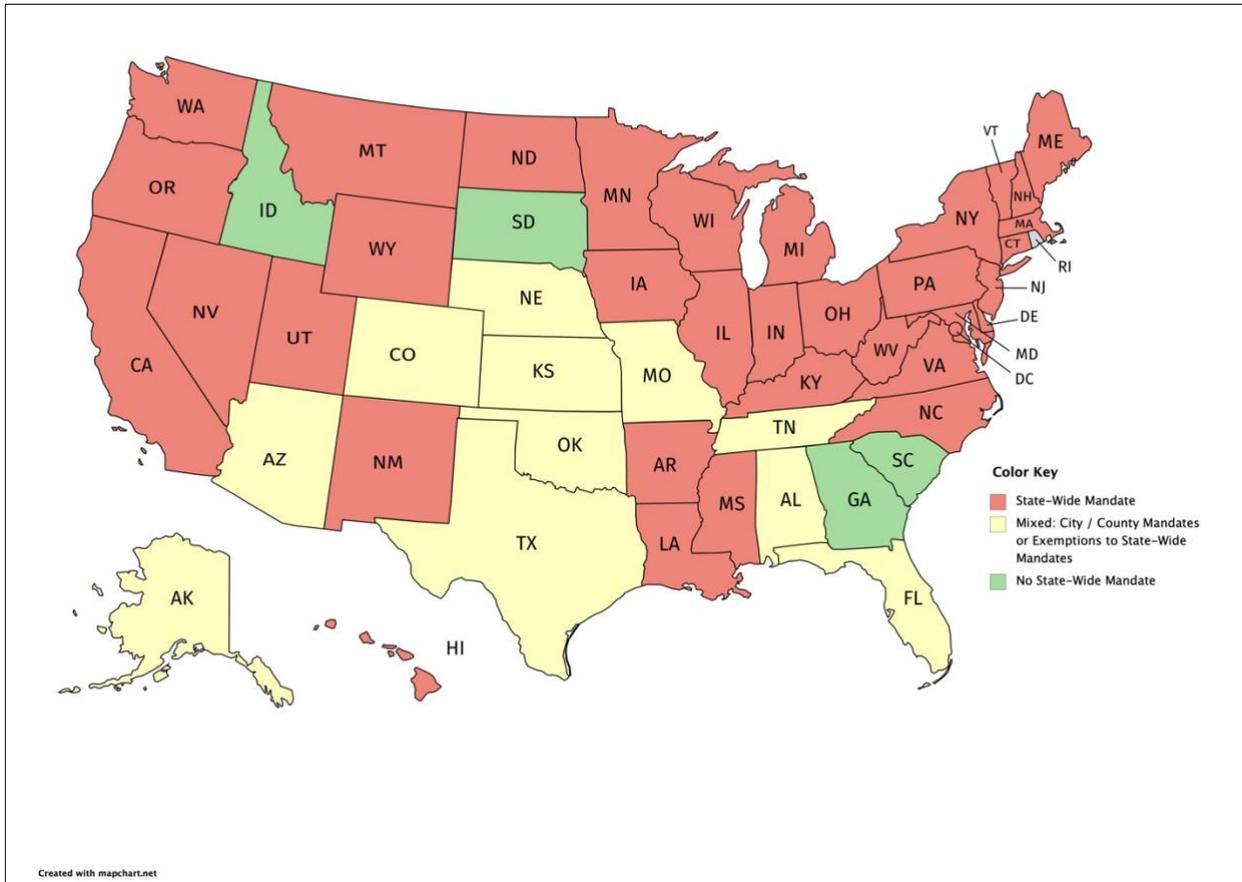


Figure 3. Varying Mask Policies in The United States¹¹

Some countries impose strict penalties for failure to comply with mask-wearing policies in an effort to enforce compliance. Taiwan has a maximum \$510 fine¹² for failing to wear a mask on public transport, by far the strictest international penalty for not wearing a mask. Interestingly, Taiwan's rate of coronavirus transmission is among the lowest in the world. However, the Taiwanese government has implemented a rigorous contact-tracing and surveillance program in addition to strict mask laws.

Research on Efficacy of Masks

A June 2020 study by two physicists from Florida Atlantic University (FAU) responded to the COVID-19 pandemic by studying the degree to which masks obstruct respiratory jets. Their findings are described in Table 1.¹³ While theirs is not an epidemiological study, and investigates droplet dispersal rather than measures how likely a person wearing a mask is to be infected by the COVID-19 virus, it nonetheless shows that masks do decrease the spread of potentially virus-carrying spit.

¹¹ Data compiled by AARP as of 12/24/2020. <https://www.aarp.org/health/healthy-living/info-2020/states-mask-mandates-coronavirus.html>. Original and unmodified graphic created with mapchart.net and licensed under [CC BY-SA 4.0](https://creativecommons.org/licenses/by-sa/4.0/).

¹² <https://focustaiwan.tw/society/202004030012>

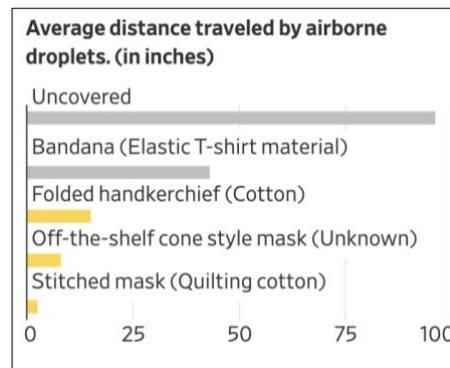
¹³ <https://aip.scitation.org/doi/10.1063/5.0016018>

Table 1. Impact of masks on aerosol dispersion¹⁴

| Mask Type | Material | Threads/In. | Average Jet Distance |
|------------------------------|--------------------------|---------------------------------------|----------------------|
| Uncovered | n/a | n/a | ~8 ft. |
| Bandana | Elastic T-shirt Material | 85 | ~3 ft. 7 in. |
| Folded handkerchief | Cotton | 55 | 1 ft. 3 in. |
| Stitched mask | Quilting Cotton | 70 | 2.5 in. |
| Commercial Mask ^a | Unknown | Randomly assorted fibres <i>[sic]</i> | 8 in. |

^aCVS Cone Face Mask

The study found that an uncovered cough propels virus-carrying spit over an average of 8 feet, and the upper range of the test trials showed droplet dispersal up to 12 feet.¹⁵ Meanwhile, the least effective mask, which is equivalent to holding a t-shirt over one's face, curbed the spray of spit to more than half the baseline distance. Figures 4 and 5, based on the FAU study, offer another visual showing the capabilities of different types of masks to stop the spread of cough droplets.

Figure 4. Droplet Dispersal¹⁶

While there are few studies on the subject, the preliminary data suggest that masks are effective at curbing the spread of spit throughout a room, indicating that mask policies are a helpful tool for keeping the public safe in spaces where social distancing is difficult.

¹⁴ Ibid.

¹⁵ Ibid.

¹⁶ Data from *ibid.*; visualization courtesy of Alberto Cervantes.

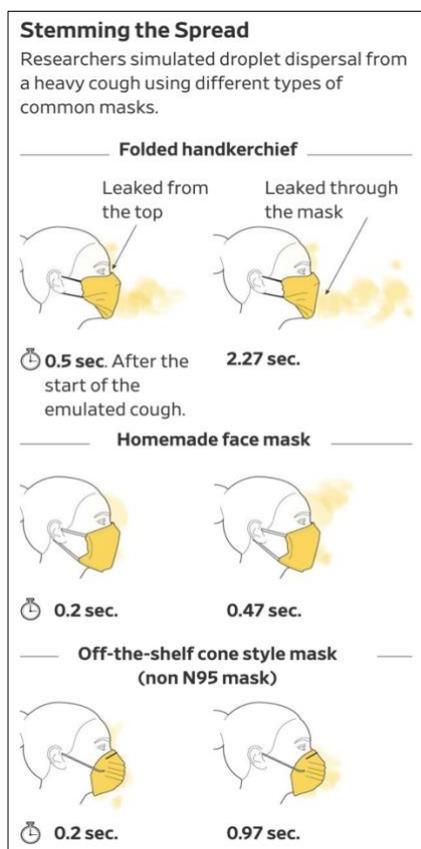


Figure 5. Comparing Aerosol Dispersals: Handkerchief, Homemade Mask, N95 Masks¹⁷

Increased face touching as caused by mask-wearing is one of the concerns about masks cited by Sweden in their anti-mask recommendation. It is common sense that the more someone touches their face, the more likely they are to introduce the virus into their system. Swedish public health officials reasoned that masks can cause facial discomfort, leading to constant adjustments, increased hand-to-face contact, and therefore an increased risk of infection. However, a recent study found that healthcare professionals who do not wear masks are four times more likely to touch their faces as compared to their mask-wearing peers.¹⁸ While the total number of observed people was small, $n = 40$, the results are highly significant. Non-mask wearers were recorded touching their face 20.1 times per hour, compared to 6.4 times per hour by the mask-wearers. Past studies showed a comparable number of face-touchings by maskless medical students, clinicians, and staff. Follow up studies are needed, but this preliminary study from the University of California, San Francisco shows that the concerns about increased face touching due to masks may be unfounded.

¹⁷ Data from *ibid.*; visualization courtesy of Alberto Cervantes.

¹⁸ <https://www.authorea.com/users/321745/articles/450942-frequency-of-face-touching-with-and-without-a-mask-in-healthcare-professionals?commit=7507e404230004811963671d461d6478872b9cec>

Further Considerations

Mask policies for previous pandemics

Mask-related recommendations have been established during pandemics and epidemics in the past. For example, during the H1N1 pandemic of 2009, the CDC recommended face masks or respirators for high-risk persons and respirators for health care workers who care for people with known, probable, or suspected H1N1 infection.¹⁹ WHO similarly recommended masks/respirators for healthcare workers.²⁰ During the SARS epidemic of 2003, the CDC did not recommend mask-wearing but did recommend that respirators be worn in the presence of a SARS patient.²¹

Culture of wearing masks

An understanding of the cultural, political, and historical factors at play in countries with high and low degrees of mask adherence is crucial in understanding how and why mask mandates may or may not be implemented at the local and federal level.

Hong Kong has a confluence of factors that have resulted in an island with some of the world's highest mask adherence rates. (1) Hong Kong has faced the impacts of deadly pandemics in the past: The 1968 Flu originated in Hong Kong and killed approximately 1 million people worldwide and infected 15% of the Hong Kong population. In 2003, SARS arrived in Hong Kong from the Chinese mainland and was primarily curtailed due to mask-adopting and mask-wearing normalization due to prior experience with the 1968 Flu. (2) Hong Kong's geographical structure makes this island nation more susceptible to rapid viral spread, as seen in 1968. As a result, the populace has a longstanding culture of shaming and stigmatizing those who do not appear to take viral spread mitigation with the utmost seriousness. This reality has created a culture of mask adherence without need for a mandate. The social construct of the island enforces it.

Similar to Hong Kong, China has had a storied history of dealing with respiratory viruses: the 1957 Asian flu, which killed 1.1 million people; the 1968 Hong Kong Flu; the 1997 H5N1; and the 2003 SARS. China's history of airborne viruses has resulted in outcomes similar to those seen in Hong Kong. China also has a cultural normalization of mask-wearing. Collective cultural trauma and recognition of past experiences necessitate mask-wearing as a norm in China. As with Hong Kong, social pressures are a lynchpin of mask adherence in Chinese culture. A unique aspect of Chinese mask-wearing is also based on the environmental factors at play. Air pollution in China continues to be a leading public health crisis. According to the Air Quality Index, Beijing, Chengdu, Guangzhou, Shanghai, and Shenyang all have air quality ratings routinely ranging from unhealthy to hazardous. Due to this public health hazard, mask-wearing is a prominent means of protecting against particulate matter, ozone, nitrogen oxide, and sulfur dioxide inhalation. Like Hong Kong, a history of respiratory illness in tandem with a unique challenge have led to establishing cultural norms regarding mask-wearing.

The United States has had different levels of mask adherence than found in East Asian countries. In particular, the American south does not have an established culture of mask-

¹⁹ <https://www.cdc.gov/h1n1flu/masks.htm#table1>

²⁰ <https://www.who.int/influenza/preparedness/measures/Adviceusemaskscommunityrevised.pdf?ua=1>

²¹ <https://www.cdc.gov/sars/clinical/respirators.html>

wearing, and low adherence to mask-wearing guidelines. Research has shown that there are elevated levels of anti-scientific authority and anti-government sentiment in the Sun Belt (Alabama, Arizona, Florida, Georgia, Louisiana, Mississippi, New Mexico, South Carolina, Texas). The antagonistic relationship with bodies of authority is a core reason why the south and, as a result, the United States generally has low mask adherence rates. In addition to anti-government sentiments, there is a limited history of airborne illness in the Sun Belt resulting in less cultural trauma. This lack of cultural trauma in regards to past respiratory illness, in tandem with elevated levels of anti-science and anti-government sentiments, has resulted in a non-mask-wearing culture.



Figure 6. Mask Use across States²²

²² "The States Most & Least Likely to Wear Face Masks" by statista is licensed under CC BY-ND. <https://www.statista.com/chart/21687/share-of-the-public-who-have-worn-a-face-mask-in-public/>.

Public resistance against masks

The anti-government attitude in the U.S. specifically refers to a desire to transfer concentrated decision-making power from the government to each of its citizens, in this case materializing in an outcry against mask mandates. Within this framework, individuals must be allowed to make their own decisions about whether or not to wear a mask and any external enforcement infringes on their personal freedom.²³ A widespread narrative of voluntary masking has clashed with the heterogeneous masking policy across the country that aims for increased mask adherence. Mandates aside, masking recommendations alone have stirred up conflicting social pressures. As individual businesses make choices or attempt to avoid major fines imposed by local government, viral videos document masked customers and store management expelling unmasked customers. Ironically, respect for individual choice seems absent from anti-maskers who harass people for ordering masks.²⁴ In addition to signals from COVID data, competing social pressures have challenged the supposed ideal of masking as an individual choice, forcing local policymakers to choose which direction to take their policy. While some governors have recanted orders that prevent local officials from mask mandates, others have walked back their own masking requirements. One such official, Ohio Governor Mike DeWine, bluntly stated that “people were not going to accept the government telling them what to do.”²⁵

Anti-maskers also tend to associate masking with more heavy-handed mandates, such as lock-downs and associated business closures that do not restrict liberties based on individual decisions but do so across an entire population. Below is an example of a Twitter user (R.R. Reno) sharing his hatred for mask enforcement on May 12th, 2020. As he followed up on his point later in the day (image on the right), he used strong language that disavowed the choice to wear a mask while subtly invoking the mask association with lockdowns or “[cowering] in place.” This association contradicts the goal of enforced mask policy: providing the opportunity for people to participate in a reopened economy.



Figure 7. Public Protest

²³ <https://www.bbc.com/news/world-us-canada-52540015>

²⁴ <https://www.npr.org/sections/health-shots/2020/06/21/880832213/yes-wearing-masks-helps-heres-why>

²⁵ <https://www.bbc.com/news/world-us-canada-52540015>

Perceived uncertainty about mask effectiveness has also bolstered anti-masking sentiment. This uncertainty stems from unclear messaging. First, masking policy was directed specifically to only protect health care workers. Then some policymakers cited a lack of consensus for mask effectiveness to support the voluntary choice narrative. However, the growing evidence for masks, specifically in defining their primary role of protecting others, has reframed the policy discussion. Rob Klain, the Ebola Response Coordinator under the Obama administration, circulated a counterargument to masking as a personal choice in the media. He defines mask-wearing as a public health matter, making an analogy to drunk driving. Since an individual carrying the virus, perhaps asymptotically, and not wearing a mask increases the likelihood of transmitting COVID-19, the individual decision of masking has the potential to endanger others as with drunk driving. He argues that this externality forces the government to move the decision away from individuals in order to protect public health.²⁶

Conclusion

There seems to be a correlation between countries who either discourage mask-wearing or only recommend it and higher rates of transmission of COVID-19. Brazil, Sweden, and the United States are facing higher numbers of infection per million people than the majority of their peers who have mandatory face covering policies and countries who have established mask-wearing as a social norm. New Zealand is a unique case, since there were never mandatory face covering policies; yet the country has successfully eliminated community transmitted COVID-19 for 100 days, as of August 9, 2020. With the use of contact tracing, mask-wearing for the general public is shown to be unnecessary, which is important to keep in mind for policymakers who are preparing for the next pandemic. Mask-wearing is a prevention method, and like many other prevention methods, it only works if the entire community follows the same policies. Standardization has been a hallmark of any policy decision made in regards to mask-wearing policy. Regardless of the existence or lack thereof of any mask mandate, there must be consistency of policy from the governmental authority and uniformity of action by the population at large.

To have a successful adoption of a disease prevention program, it is imperative to pay attention to the history, culture, and politics of the region. Consistent communication with the community is important when establishing a mask-wearing policy, so every country should think about the messaging they will use for the next pandemic and establish a plan to have their population wear masks, or not wear masks.

²⁶ <http://www.msnbc.com/transcripts/the-last-word/2020-05-21>