

Capstone Memo

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Community Use Of Face Masks And COVID-19: Evidence From A Natural Experiment Of State Mandates In The US

Lyu, W., & Wehby, G. L. (2020). *Community Use Of Face Masks And COVID-19: Evidence From A Natural Experiment Of State Mandates In The US*. *Health Affairs*, 10.1377/hlthaff.2020.00818. <https://doi.org/10.1377/hlthaff.2020.00818>

Summary: National policies that require the public or the community to use masks or masks to alleviate the spread of the new coronavirus disease (COVID-19) have caused heated debate. This study provides evidence of a natural experiment, which is the impact of public use masks issued by 15 states and DCs authorized by the US state government between April 8 and May 15. The research design is an event study that aims to investigate the changes in daily activities below the county level—the COVID-19 growth rate level between March 31, 2020 and May 22, 2020.

Mandatory use of masks in public places will result in a decrease of 0.9, 1.1, 1.4, 1.7 and 2.0 percentage points in the daily growth rate of COVID-19 within 1-5, 6-10, 11-15, 16-20 and 21 days after signing the order. Estimates indicate that by May 22, 2020, these authorizations may have avoided as many as 230,000 to 450,000 COVID-19 cases. Research results indicate that requiring the use of masks in public places may help reduce the spread of COVID-19.

Demographic science aids in understanding the spread and fatality rates of COVID-19

Dowd, J. B., Andriano, L., Brazel, D. M., Rotondi, V., Block, P., Ding, X., ... Mills, M. C. (2020). *Demographic science aids in understanding the spread and fatality rates of COVID-19*. *Proceedings of the National Academy of Sciences*, 117(18), 9696 LP – 9698. <https://doi.org/10.1073/pnas.2004911117>

Summary: Governments around the world must quickly mobilize and make difficult policy decisions to alleviate the 2019 coronavirus disease (COVID-19) pandemic. Because deaths are concentrated at a higher age, authors emphasize the important role of demographics, especially how the age structure of the population helps explain the differences in mortality rates between countries and how the transmission routes develop. The results show that the burden of death in aging and younger countries has greatly increased. This powerful interaction between demographics and the current age-specific mortality rate of COVID-19 suggests that social distancing and other policies that slow down transmission should take into account the age composition of local and national environments and intergenerational interactions.

Mask-Wearing Increased After a Government Recommendation: A Natural Experiment in the U.S. During the COVID-19 Pandemic

Goldberg, M. H., Gustafson, A., Maibach, E. W., Ballew, M. T., Bergquist, P., Kotcher, J. E., ... Leiserowitz, A. (2020). Mask-Wearing Increased After a Government Recommendation: A Natural Experiment in the U.S. During the COVID-19 Pandemic . Frontiers in Communication . Retrieved from <https://www.frontiersin.org/article/10.3389/fcomm.2020.00044>

Summary: On April 3 2020, the U.S. Centers for Disease Control and Prevention (CDC) recommended that all Americans wear face masks to prevent the spread of COVID-19. The announcement came during the fielding of a large, nationally-representative survey ($N = 3,933$) of Americans' COVID-19-related knowledge, attitudes, and behaviors, providing an opportunity to measure the impact of the CDC's recommendation on public reported mask wearing and buying behavior. The study found significant increases in reported mask wearing (+12 percentage points) and mask buying (+7 points). **These findings indicate the speed with which government recommendations can affect the adoption of protective behaviors by the public. The results demonstrate the importance of national leadership and communication during a public health crisis.**

Knowledge and Behaviors Toward COVID-19 Among US Residents During the Early Days of the Pandemic: Cross-Sectional Online Questionnaire

Clements, J. M. (2020). Knowledge and behaviors toward COVID-19 among us residents during the early days of the pandemic: Cross-sectional online questionnaire. Journal of Medical Internet Research, 22(5), 1-11. <https://doi.org/10.2196/19161>

Summary: The aim of this study is to test the hypothesis that knowledge about COVID-19 influences participation in different behaviors including self-reports of purchasing more goods than usual, attending large gatherings, and using medical masks.

For every point increase in knowledge, the odds of participation in purchasing more goods (odds ratio [OR] 0.88, 95% CI 0.81-0.95), attending large gatherings (OR 0.87, 95% CI 0.81-0.93), and using medical masks (OR 0.56, 95% CI 0.50-0.62) decreased by 12%, 13%, and 44%, respectively. Gen X and millennial participants had 56% and 76% higher odds, respectively, of increased purchasing behavior compared to baby boomers. The results suggest that there is a politicization of response recommendations. Democrats had 30% lower odds of attending large gatherings (OR 0.70, 95% CI 0.50-0.97) and 48% lower odds of using medical masks (OR 0.52, 95% CI 0.34-0.78) compared to Republicans.

Causal Impact of Masks, Policies, Behavior on Early Covid-19 Pandemic in the U.S

Chernozhukov, V., Kasaha, H., & Schrimpf, P. (2020). Causal Impact of Masks, Policies, Behavior on Early Covid-19 Pandemic in the U.S. Retrieved from <http://arxiv.org/abs/2005.14168>

Summary: This paper evaluates the dynamic impact of policies adopted by US states on the growth rates of confirmed Covid-19 cases and deaths as well as social distancing behavior. Analysis finds that both policies and information on transmission risks are important determinants of Covid-19 cases and deaths and shows that a change in policies explains a large fraction of observed changes in social distancing behavior. The counterfactual experiments

suggest that nationally mandating face masks for employees on April 1st could have reduced the growth rate of cases and deaths by more than 10 percentage points in late April, and could have led to as much as 17 to 55 percent less deaths nationally by the end of May, which roughly translates into 17 to 55 thousand saved lives. These estimates imply that removing non-essential business closures (while maintaining school closures, restrictions on movie theaters and restaurants) could have led to -20 to 60 percent more cases and deaths by the end of May. What's more, without stay-at-home orders, cases would have been larger by 25 to 170 percent, which implies that 0.5 to 3.4 million more Americans could have been infected if stay-at-home orders had not been implemented. Finally, not having implemented any policies could have led to at least a 7 fold increase with an uninformative upper bound in cases (and deaths) by the end of May in the US, with considerable uncertainty over the effects of school closures, which had little cross-sectional variation.

Mask Policy Start Date for Different States in the US

