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Mask Mandates Save Lives

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Abstract

We quantify the effect of mask mandates in the United States in 2020. Our regression discontinuity design exploits county-level variation in COVID-19 cases, hospital admissions, and deaths across the border between states with and without mandates. We find a significant and substantial effect—mask mandates reduced new weekly COVID-19 cases, hospital admissions, and deaths by 55, 11 and 0.7 per 100,000 inhabitants on average. Crucially, we find that the effect of mask mandates depends on the attitudes toward mask wearing at the county level, with larger effects in counties more positively inclined towards mask wearing. Our results imply that mandates saved 87,000 lives through December 19, 2020, while a nationwide mandate could have saved 58,000 additional lives. These large effects suggest that mask mandates are a crucial tool to counter pandemics, particularly if accepted widely by the population. Our results are thus also relevant for countries who will not be able to immunize large swaths of their population in the short term.

JEL Classification Numbers: I18, I12.

Keywords: COVID-19, public health measures, face masks, regression discontinuity.

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1 Introduction

Governments around the world implemented a range of policy measures to counter the rapid spread of COVID-19. Mandating the use of face masks was one such measure. Widespread mask wearing allows for continued human interaction and economic activity, unlike strict lockdown measures such as stay-at-home orders and is thus of macro-economic relevance. Evidence on the effect of mask mandates is important to inform decisions on their roll back and potential future deployment — both in the United States and abroad.

This paper asks the question, "Do mask mandates save lives?". Mask mandates can reduce the transmission of COVID-19 both directly, by inducing greater mask usage, which is proven to lower the transmission of airborne diseases such as COVID-19[1], and potentially also indirectly, by inducing behavioral changes prompted by greater awareness of the seriousness of the pandemic. Importantly, this paper does not estimate the effect of wearing masks, but rather the effect of mandating mask wearing. For mask mandates to succeed in saving lives, they would need to reduce the transmission of COVID-19. This would put a dent on the number of COVID-19 cases, hospital admissions, and ultimately deaths. We estimate the effect of mask mandates on these variables across counties in the United States.

To answer this question, we use a regression discontinuity design. In the United States, mask mandates were implemented at the state or sub-state level. We rely on the variation between counties across "mask borders", i.e. a state border that separates two counties, in which one county is in a state with a mask mandate at a given time and the other county is in a state without a mask mandate at the same time. Variation in COVID-19 outcomes across these "mask borders" is much more likely to be driven by the existence of mask mandates and less by different local stages of the pandemic. This identification strategy allows estimating the effect of state-wide mask mandates. We do not investigate the effect of sub-state mandates.

We find a significant and substantial effect of mask mandates. Specifically, mask mandates on average reduced new weekly COVID-19 cases, hospital admissions, and deaths by 55, 11 and 0.7 per 100,000 inhabitants. We find the effects of mask mandates vary significantly at the county level depending on the attitudes towards mask wearing. These conditional effects are important enough that they must be taken into account. Indeed, the estimated effect of mask mandates on weekly deaths per 100,000 varies from around -2.5 to 0 across our sample of counties, compared to the average effect of 0.7 mentioned above.

Our results imply that mask mandates saved 87,000 lives through December 19, 2020,

[1] Greenhalgh et al., 2020 provides a survey of the evidence.

while an additional 58,000 lives could have been saved in the same period if a nationwide mandate had been enacted in April 2020. The magnitude of these effects is large. For comparison, COVID-19 deaths in the same period amounted to around 309,000 in the United States. And yet, these are likely to be lower bound estimates. Indeed, states imposing mask mandates are in principle reacting to worse outbursts of the pandemic. This would lead us to find smaller differences between counties with and without mandates. Moreover, our findings are robust to controlling for other contemporaneous policy measures beyond mask mandates. Our results are also robust to controlling for mask mandates imposed at the county level.

Our results hold important lessons for all countries aiming to counter the spread of COVID-19 and other possible pandemics in the years to come. First, not all countries are rolling out vaccines at the same pace, and many will struggle to reach large swaths of their population in the medium-term. Second, existing vaccines may not be as effective against either known or future variants, and there may well be future outbreaks of other airborne pandemics. Thus, mask mandates are likely to remain highly relevant policy tools in the years to come.

Our contribution to the existing literature is both conceptual and methodological. Some studies found an effect of mask mandates in the United States, including Chernozhukov et al., 2021, Lyu and Wehby, 2020, and Renne et al., 2020. Others analyzed the same question for Germany (Mitze et al., 2020) and Canada (Karaivanov et al., 2020). In contrast, Leech et al., 2021 do not find evidence that mask mandates reduce transmission within 92 regions of 56 countries. We add to these existing studies conceptually by finding that mask mandates have markedly different effects depending crucially on the attitudes towards mask wearing. These conditional effects are critical to obtain unbiased estimates at the county-level. Our study is also related to Welsch, 2020, who investigates the effect of mask usage on deaths at the county level using as an instrument the vote share in the 2016 election. Conceptually, our paper is also related to the strand of literature showing how deeper views shaped the responses to COVID-19. Simonov et al., 2020 shows how media consumption shapes compliance with social distancing rules. Gollwitzer et al., 2020 studies social distancing across U.S. counties. Methodologically, we depart from previous studies by using a different empirical design and a new coding of state-level mask mandates, and by exploiting more data. First, our empirical strategy uses a regression discontinuity design based on granular county-level variation, while the aforementioned papers for the United States estimated state-level effects using an event study methodology (Lyu and Wehby, 2020) or a structural epidemiological model (Chernozhukov et al., 2021; Renne et al., 2020). Leech et al., 2021 estimate a Bayesian hierarchical model. We collected state mask orders to define statewide mask mandates consistently and more

broadly than Lyu and Wehby, 2020 and Chernozhukov et al., 2021, which analyze mask mandates for employees only. Finally, we make a data contribution by exploiting an additional COVID-19 outcome variable — COVID-19 hospital admissions — and by analyzing a longer period.

This paper is organized as follows: Section 2 details our approach, Section 3 shows key results and Section 4 concludes.

2 Methodology

To identify the effect of state-level mask mandates we rely on variation in the adoption of these mandates across time and on how COVID-19 outcomes vary across counties near "mask borders". A "mask border" is defined as a state border dividing two counties, in which one of the counties is in a state with a statewide mask mandate and the county is in another state without such a mandate.

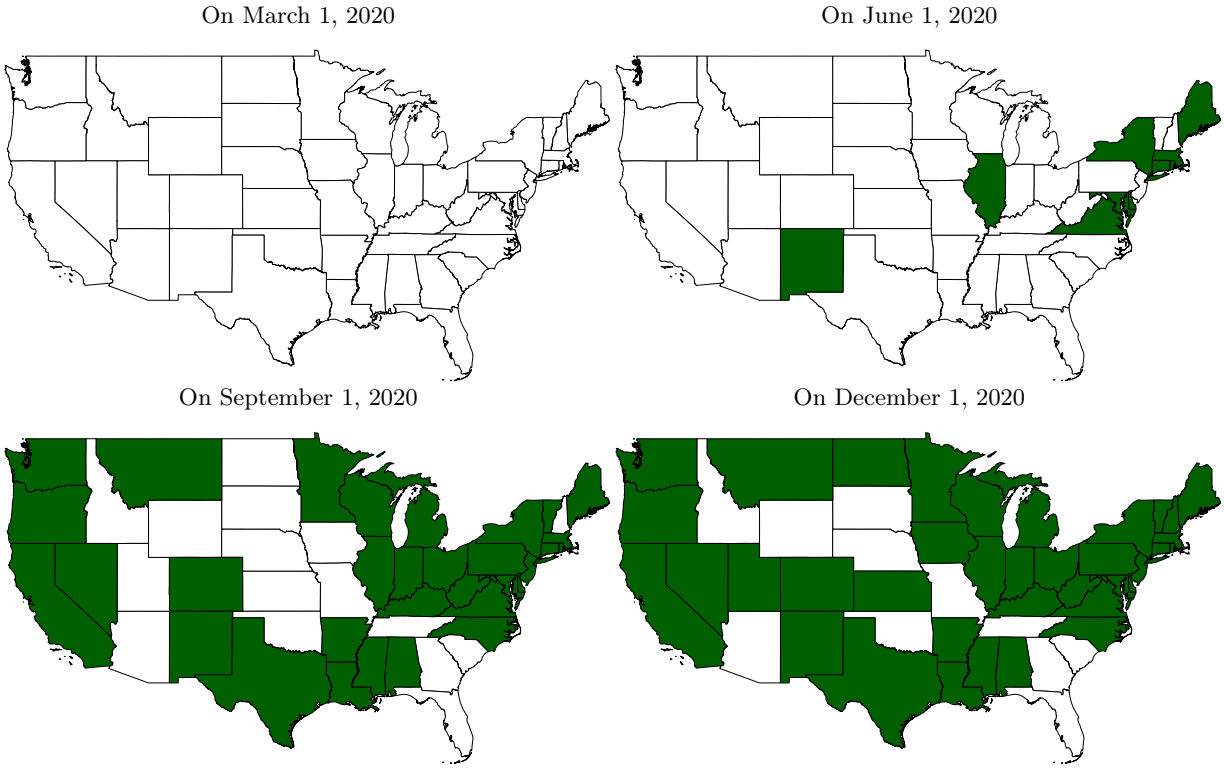
States implemented mask mandates at different points in time (Figure 1). In fact, face covering requirements loosely defined varied even more significantly across time and states. Some states merely recommended wearing masks, others mandated face coverings in select indoor spaces (e.g. state government buildings), yet others mandated much stricter face coverings. We code statewide mask mandates as a binary variable. In particular, we code a state to have a mask mandate in place if face coverings are *at least* required in most public indoor spaces if social distance cannot be maintained. We collected individual state orders and documented whether mandates adhere to this definition as well as the day in which they become effective.[2] For the detailed coding please refer to Appendix A.

Crucial to our research design is the variation at the county level across "mask borders" which we will exploit using a regression discontinuity design. Counties close to each other are more likely to be in similar stages of the pandemic. Thus, for nearby counties across state borders we can expect that mask mandates are less endogenous to the local state of the pandemic. To focus squarely on the distance to a "mask border", we compute the minimum distance between all pairs of counties, in which one county has a mask mandate and the other county does not at any point in time.[3] Thus, each county is assigned a minimum distance to a "mask border". Counties in states with mask mandates are assigned a positive distance while those without a mask mandate are assigned a negative. Finally, we exclude any absolute minimum distances greater than 150 miles from our regressions.

[2]If the time in which an order becomes effective is indicated to be in the afternoon, we code its effective date to be the following day.

[3]To compute minimum distances, we use as inputs the "great-circle distances calculated using the Haversine formula based on internal points in the geographic area" available from NBER's County Distance Database, see Appendix B.1.

Figure 1: Statewide Mask Mandates in the 48 Contiguous States and D.C.



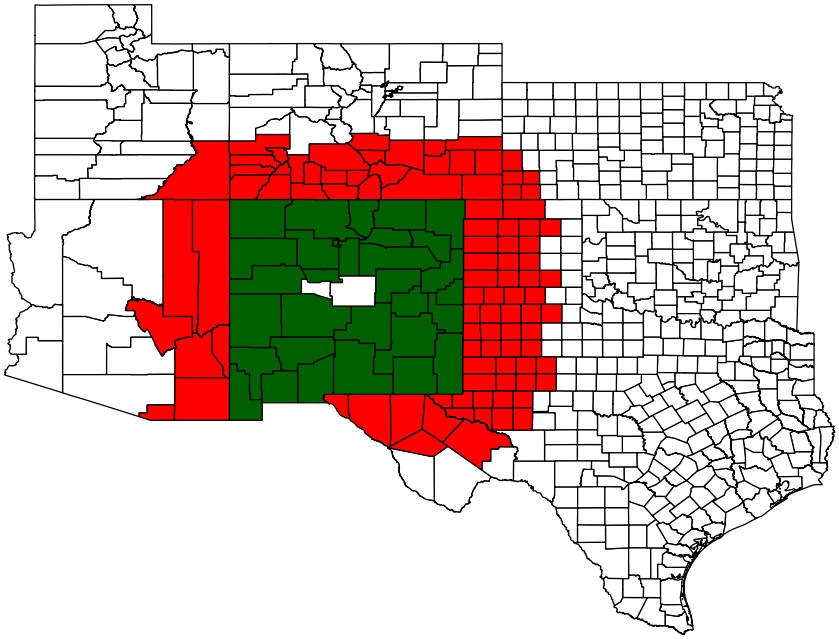
Note: State-level mask mandates are defined as the requirement that face coverings are worn *at least* in most public indoor spaces if social distance cannot be maintained, see Appendix A for details.

This choice is not arbitrary and is based on the actual distribution of absolute minimum distances, and ensures that all counties across state borders are included while avoiding comparing counties too far from a mask border. See Appendix B.1 for more details.

Figure 2 illustrates our approach. New Mexico was the first state west of the Mississippi to adopt a mask mandate. The figure takes the situation in June 1st, 2020, as an example. Counties with a statewide mask mandate that are within 150 miles of a county without a mask mandate are shown in green. As mentioned, on that day these are all in New Mexico for this region. Two counties in New Mexico's interior are excluded because they are too far from the "mask border". Counties without a mask mandate within 150 miles of a county in New Mexico are shown in red. These are in the neighboring states of Arizona, Utah, Colorado, Kansas, Oklahoma and Texas. Most of the counties in those neighboring states, though, are colored white because they are too far from counties in New Mexico. Our regression discontinuity design exploits variation in COVID-19 outcomes across green and red counties.

This approach is, if anything, biased towards not finding an effect of statewide mask mandates, particularly after controlling for other policies enacted contemporaneously. State mandates are very likely to respond to recent changes in COVID-19 outcomes. Since

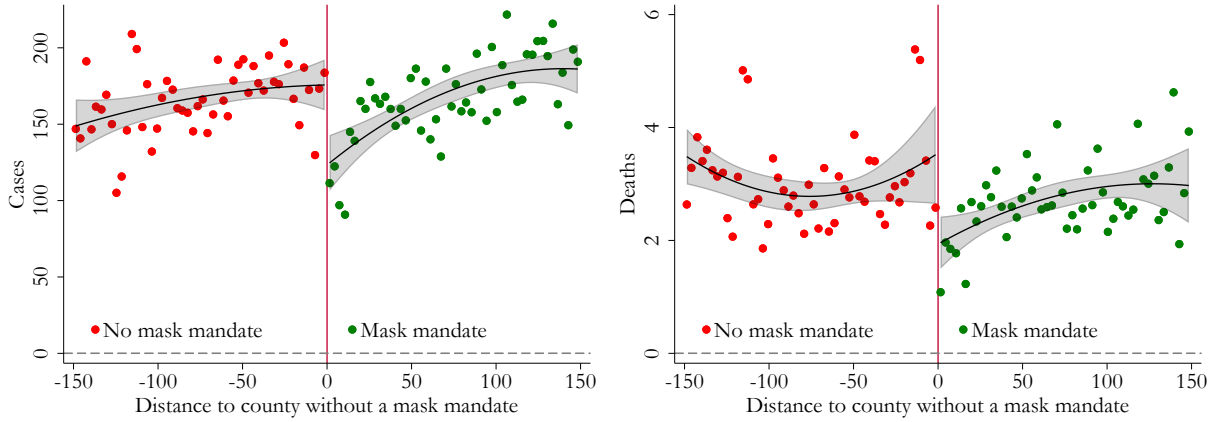
Figure 2: Mask Mandates in Counties in and around New Mexico on June 1, 2020



Note: The map shows counties in New Mexico and the neighboring states of Arizona, Utah, Colorado, Kansas, Oklahoma and Texas. Counties are colored: (i) white if they are beyond 150 miles from the "mask border"; (ii) red if they are within 150 miles from the "mask border" and do not have a mask mandate; and (iii) green if they are within 150 miles from the "mask border" and have a mask mandate.

outcomes are auto-correlated, our estimates could be subject to simultaneity bias against finding an effect of mask mandates. While mitigated by the use of county-level variation around the border, this bias could still be present in our design. The fact that states with populations that are less inclined to wear masks are less likely to impose mandates all else equal only diminish the strength of this bias, but do not change its sign. A second potential bias arises from omitting to control for county-level mask mandates, which would only exist in states without statewide mandates and thus would also bias our estimates towards not finding an effect of statewide mask mandates. An argument that runs counter our estimates being a lower bound for the effect of mandates is that the imposition of mask mandates could prompt individuals to travel more into neighboring counties without mask mandates, and thus increase the spread of COVID-19 in those counties—a negative spillover of mask mandates. But conceptually the opposite could also be true—individuals that prefer a safer environment may travel from counties without mandates to those with mandates, which would be a positive spillover of mask mandates. In reality, none of these possibilities seems to be borne by the data, as we find no significant relationship between mask mandates and mobility. This is consistent with the evidence from Chernozhukov et al., 2021. Finally, estimates could be biased by the simultaneous imposition of other state-level public health measures. To ensure that this is not driving our results we include controls for a large set of other such measures, like school closures or stay-at-home orders among many others. Our results are robust to including these controls. We

Figure 3: New weekly COVID-19 cases and deaths per 100,000 inhabitants



(a) Cases

(b) Deaths

Note: These charts show raw data of new weekly COVID-19 cases and deaths and thus do not account for county or time fixed effects as done in our econometric analysis. Data is binned in intervals of three miles.

also run placebo regressions to show that discontinuities in these other measures, along with mobility attitudes towards mask wearing do not drive our results.

A first look at the raw data on COVID-19 cases and deaths around "mask borders" suggests that cases and deaths are much lower in counties with mask mandates . Figure 3 plots the distance of each county to a "mask border" (x-axis) against new weekly COVID-19 cases (panel a) and deaths (panel b) per 100,000 inhabitants on the y-axis. The red dots to the left of the "mask border" are the counties *without* a mask mandate. The green dots to the right of the "mask border" are the counties *with* a mask mandate. The figures show a discontinuity at the "mask border". When moving from a county without a mask mandate (but close to a county with a mandate) the number of cases and deaths drops markedly. Our identification below exploits and formally estimates the size of this discontinuity.[4]

To explore the effects of mask mandates formally, we use the following regression discontinuity design:

$$y_{c,s,t+k} = \delta mask_{st} + \beta dist_{cst} + \gamma dist_{cst}^2 + \theta X_{c,s,t} + \tau_t + \tau_c + \epsilon_{cst} \quad (1)$$

where $y_{c,s,t+k}$ stands for COVID-19 new cases, new COVID-19 hospital admissions, and new COVID-19 deaths per 100,000 inhabitants in county c, state s, week $t+k$. We use $k = 1$ for cases, $k = 2$ for hospital admissions and $k = 4$ for deaths. $mask_{st}$ is a dummy for the existence of a statewide mask mandate in state s at week t and $dist_{cst}$ is the minimum

[4]A reader may wonder why cases appear to be increasing in distance on the right side of the cut-off. Notice however that the figure shows raw data without controls such as county and time effects. Once adding these controls, the effect of distance is small and insignificant in most specifications but the jump at the border remains significant, as we shall show in Section 3.

distance to a county with a different mask policy. τ_c is a county fixed effect capturing time-invariant specifics in a given county, such as geography, population density, or industrial structure, affecting the COVID-19 outcome. τ_t is a time fixed effect capturing nation-wide factors affecting the pandemic. $X_{c,s,t}$ includes other controls, including lagged mobility, that is added in the baseline but whose inclusion is not crucial for the overall effects, and other public health and containment measures added in robustness checks. These measures are collected by the Oxford COVID-19 Government Response Tracker, which includes restrictions on (i) school closures, (ii) workplace closures, (iii) public events, (iv) size of gatherings, (v) public transportation, (vi) stay at home requirements, (vii) restrictions on movement, (viii) public information campaigns, (ix) testing policies, and (x) contact tracing, and (xii) facial coverings.[5] We also include controls for county level mask mandates from (Wright et al., 2020). Standard errors are clustered at specific pairwise state borders yielding a total of 363 clusters.[6]

In the Appendix C we show that the specification in equation (1) for new weekly COVID-19 cases identifies the proportional effect of mask mandates on the contact rate of a SIR model. In the SIR model this is true when county-level active infections are continuous around mask borders, and we show this is the case. The tight relationship between our estimate and the contact rate of the SIR model allows for a structural interpretation of our results and underpin our subsequent counter-factual policy analysis.

Our dataset covers all counties in the 48 contiguous U.S. states and the District of Columbia (more than 3,000 matched units) at the weekly frequency spanning the period of January 22 to December 19, 2020. The dataset includes county-level COVID-19 outcomes, population, 2020 Presidential Election results, and mobility and state-level containment and health measures as well as the two key variables previously discussed, hand-collected "State-level mask mandates" and our computed county-level "Minimum Distance to Mask Border". See more details on the data in Appendix B.2.

Note that COVID-19 hospital admissions have conceptual drawbacks relative to new COVID-19 cases or deaths related to how they are assigned to counties. First, some (smaller) counties do not report data, which could reflect that there are no hospitals located within their boundaries, and thus residents with COVID-19 need to be admitted in nearby counties. Second, and related, hospitals admit patients from other counties more generally, even if their home county has hospitals. Third, hospitals that are to capacity may send patients to be admitted in other hospitals across county-lines. All of these makes

[5]Coding of facial coverings in the Oxford COVID-19 Government Response Tracker include sub-state level information and thereby differ from our mask mandate measures that are exclusively at the state-level .

[6]Residuals are likely correlated across counties within particular "mask borders". This clustering choice is standard in the literature that exploits similar cross border discontinuities, see for example Dieterle et al., 2020 and Pinkovskiy, 2017.

it harder to assign admissions to specific counties. Beyond these conceptual drawbacks, the time period covered by the data on admissions is also more limited, starting in July 31, 2020.

3 Results

This section reports and discusses our estimates of the effect of mask mandates on COVID-19 cases, hospital admissions, and deaths, including on how effects vary across attitudes towards mask wearing.

We find that state mask mandates significantly reduced new weekly COVID-19 cases, hospital admissions, and deaths, see Table 1(a). State-wide mask mandates reduced new weekly COVID-19 cases by 55.22 cases per 100,000 inhabitants (column 1), COVID-19 hospital admissions by 11.46 persons per 100,000 inhabitants (column 2) and new COVID-19 deaths by 0.74 by 100,000 inhabitants (column 3). To put these numbers in perspective, average new cases, hospital admissions and new deaths in our sample are 166.44, 23.57 and 2.64. These regressions control for prior mobility using county-level mobility lagged by one week and a second order polynomial on the distance to the "mask border". However, neither of these controls affect the significance or overall level of the estimate, see discussion below and Tables C5 and C6 . Other covariates do not exhibit a discontinuity at the mask border. Importantly for the validity of our design (see Lee and Lemieux, 2010), Table C1 shows that mobility, attitudes towards mask wearing, and other containment and health policies at the state-level do not jump at the mask border (except weakly for work place closures, and negatively for stay-at-home orders).

The effects remain unchanged when controlling for other public policies and mobility. We control for the vast array of state-level containment and health policies collected by the Oxford COVID-19 Government Response Tracker in Tables C2-C4.[7] Our results are robust to controlling for all policies, an index of containment and health measures and to each individual measure in the index. Most measures are insignificant except for international travel restrictions for cases and deaths, but even in that case our coefficient of interest remains virtually unchanged. Note that "facial coverings" are insignificant too. That variable is coded differently than ours, crucially containing information on whether a state has significant sub-state mask mandates. In that sense, by controlling for it we show that such sub-level mandates are not obviously affecting our results. County-level mandates are only problematic in so far as they are present in counties whose state did not impose a mask mandate, since it would be hard to imagine that the effect is somehow

[7]These measures include restrictions on (i) school closures, (ii) workplace closures, (iii) public events, (iv) size of gatherings, (v) public transportation, (vi) stay at home requirements, (vii) restrictions on movement, (viii) public information campaigns, (ix) testing policies, and (x) contact tracing.

Table 1: Results per 100,000 inhabitants

(a) Unconditional results

	(1) Cases	(2) Admissions	(3) Deaths
State mask mandate	-55.22***	-11.46***	-0.74**
	[17.68]	[4.24]	[0.34]
Observations	45577	22042	41034
R2	0.487	0.417	0.215
Mean of dep. variable	166.44	23.57	2.64
Linear term	Yes	Yes	Yes
Quadratic term	Yes	Yes	Yes
Lagged mobility	Yes	Yes	Yes

(b) Results conditional on attitudes towards mask wearing

	(1) Cases	(2) Admissions	(3) Deaths
State mask mandate	-122.12***	-16.55	-2.89***
	[38.67]	[10.92]	[0.83]
Proxy for attitudes towards mask wearing × State mask mandate	108.64**	8.31	3.55***
	[49.51]	[16.24]	[1.18]
Observations	45577	22042	41034
R2	0.488	0.417	0.216
Mean of dep. variable	166.44	23.57	2.64
Linear term	Yes	Yes	Yes
Quadratic term	Yes	Yes	Yes
Lagged mobility	Yes	Yes	Yes

Source: Authors' calculations.

Notes: The estimates are based on data for 3107 counties over 48 weeks. Counties within 150 miles of a state border over which mask mandates vary are included. We lead cases(hospital admissions)[deaths] by 1(2)[4] weeks with respect to the state mask mandate dummy. All specifications include time and county fixed effects. Standard errors are clustered at specific pairwise state borders. ***, **, and * indicate statistical significance at 1, 5, and 10 percent, respectively.

reversed if both mandates co-exist. Hence, we formally investigate the issue and find that our results are unaffected when controlling for the existence of county-level mask mandates in counties without state-level mandates (Table C9). Similarly, the estimate of the effect of mask mandates is not much changed when controlling for lagged mobility, even if the coefficient on mobility itself is significant (Table C5). The coefficient on lagged mobility is negative for all outcomes, likely reflecting reverse causality and slow moving outcomes and mobility — i.e. concerns about worsening COVID-19 outcomes likely lead to lower mobility, all else equal. As we are not interested in the causal effects of mobility, we don't explore this correlation further but retain lagged mobility as a control in all main regressions to avoid biased estimates. However, as we show below, its inclusion is not crucial for the estimated effects.

Our estimated coefficients, and their significance, are also robust to a range of other checks. Table C6 explores a more flexible polynomial over the distance to a county with a different mask mandate, in particular by allowing different coefficients in either side of the "mask border", as is standard in regression discontinuity designs . The results remain significant, except in the most flexible specification for deaths and hospital admissions. However, none of the polynomial coefficients are significant in those specifications, pointing to over-fitting. In general, we find the coefficients on these polynomials on distance to be weak, with the only robustly significant coefficient being the effect at the border. Table C7 shows that estimates remain significant and broadly of the same magnitude across different bandwidths , i.e. the maximum distance that defines "mask borders". An exception is deaths where wider bandwidths render the coefficient on mask mandates insignificant. In any case, the regression discontinuity design is well motivated for reasonably close counties, and we think 165+ miles is too wide of a bandwidth (for reference, that is close to the "crow" distance between New York City and Baltimore, which crosses several state lines). The choice of a bandwidth of 150 miles is well motivated as it makes sure all counties in state borders are included. Beneath that value, regressions exclude border counties, above that value regressions start including a lot of counties far from the border and even potentially not even in a neighboring state. Table C8 exploits a different lead structure for the outcome variables. In it, we vary the leads for cases, deaths, and hospital admissions from 1-3, 2-4, and 3-5 weeks, respectively. Cases remains significant across all choices of leads. Hospital admissions and deaths are significant for leads of 2-3 and 4-5 weeks, respectively, consistent with hospital admissions preceding deaths, with the latter calling for the widest leads.[8]

Crucially, we find that the effects of mask mandates vary with attitudes towards mask

[8]We did not find evidence that effects vary significantly across length of time since mask mandates were imposed for at least up to 16 weeks since mandate enactment.

wearing (see Table 1(b)).[9] Cases and deaths indeed seem to be affected by mask mandates differently depending on the attitudes towards mask wearing at the county level (columns 1 and 3), while we don't find an effect for hospital admissions (column 2), potentially reflecting the much smaller sample size for that variable.[10] Specifically, mask mandates reduce COVID-19 cases and deaths by -78.03 and -1.45, respectively, in the median county more positively inclined to wearing masks in our sample. While the same numbers for the median county more negatively inclined towards to wearing masks are -44.54 and -0.37, also respectively.[11] That is, mask mandates are still effective in reducing COVID-19 cases and deaths in both the median county that is more negatively inclined towards wearing masks and the median county that is more positive towards wearing masks, although much more so in the latter. Separate regressions exploring an additional interaction with mobility are not consequential — the mobility interaction itself is never significant, while the interaction with the proxy of attitudes towards mask wearing remains significant for cases and deaths. Thus, differences in mobility do not explain our finding that the effect of mandates depends on the attitudes towards mask wearing.

4 Conclusion

This paper estimates the effect of statewide mask mandates on COVID-19 cases, hospital admissions, and deaths in the United States. To identify such an effect, we rely on variation in the adoption of state-level mandates across time and on how COVID-19 outcomes vary across counties near "mask borders".

Our estimates imply that mask mandates saved 87,000 lives and could have potentially saved 58,000 additional lives up to December 19, 2020.[12] Lives saved are calculated comparing the actual mask mandates in place after April 18, 2020—when the first states, Maryland and New York, instituted their mandates—with a scenario without any statewide mandates. Lives potentially saved are calculated under a scenario in which a nationwide mask mandate would have been imposed starting April 18, 2020.

We find that the effects of mask mandates crucially depend on the local attitudes towards mask wearing, and these conditional effects are important enough that they must be taken into account when conducting counterfactual policy experiments. This paper is

[9] We proxy attitudes towards mask wearing with county level results in the 2020 Presidential Election following the evidence in Milosh et al., 2020.

[10] Effects for cases and deaths are also significant if we use instead a dummy variable for only the more negative attitudes towards mask wearing.

[11] In these illustrative calculations, median counties across the attitudes towards mask wearing are defined as the median value of the proxy among counties whose share is smaller than 50 % or larger than 50%.

[12] These calculations use our estimates from column 3 of Table 1(b)) applied to all counties in the United States.

the first to look at such conditional effects to our knowledge. If we ignored conditional effects (using instead column 3 of Table 1(a)), estimates for lives saved and potentially saved would be 45 and 33 percent lower, respectively. These conditional results highlight that mask mandates are particularly powerful if accepted widely among the population.

Lives saved and potentially saved vary across political leaning and geography. Most lives saved are located in California, Texas, Michigan, and New York (Appendix Figure D1a). Potentially saved lives are notably concentrated in California and Florida (Appendix Figure D1b). These distributions across states also clearly reflect population sizes.

Our findings have important broader implications beyond the year 2020 in the United States. First, not all countries are rolling out vaccines with equal speed and global widespread vaccination is not likely to be achieved in the near term. Second, COVID-19 may become an endemic disease much like the influenza[13], and thus the effectiveness of current vaccines against current and future variants of the virus could be lower. Hence, mask mandates are likely to remain an important policy in the toolkit against COVID-19. Moreover, masks are likely to be a pivotal tool in fighting any future pandemics as well.

[13] As discussed in this Nature article.

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A State-Level Mask Mandates

Definition. A state is classified as having a mask mandate if it *at least* is a requirement to wear a mask indoor if physical distance can not be maintained.

Alabama

Start date: July 16, 2020. End date: Current, as of December 19, 2020.

> Facial coverings for individuals. Effective July 16, 2020 at 5:00 P.M., each person shall wear a mask or other facial covering that covers his or her nostrils and mouth at all times when within six feet of a person from another household in any of the following places: an indoor space open to the general public, a vehicle operated by a transportation service, or an outdoor public space where ten or more people are gathered.

State order

Alaska

No Mask Mandate as of December 19, 2020

> The State of Alaska strongly encourages the wearing of masks in public but has not ordered it. The CDC and the World Health Organization also recommend that people wear a facial covering over their nose and mouth in community settings.

Recommendation

Arizona

No Mask Mandate as of December 19, 2020

Arkansas

Start date: June 19, 2020. End date: Current, as of December 19, 2020.

> Whereas: On June 19, 2020, the Secretary of Health released guidance regarding the use of face covering by the general public, which asserts that ample evidence exists to support the efficacy of wearing face covering to prevent the transmission of COVID-19.

State order

California

Start date: June 18, 2020. End date: Current, as of December 19, 2020.

> "It mandates that face coverings be worn state-wide in the circumstances and with the exceptions outlined below. It does not substitute for existing guidance about social distancing and handwashing." [Issued June 18]

Source: State order

Colorado

Start date: July 16, 2020. End date: Current, as of December 19, 2020.

> The mandatory statewide mask Executive Order went into effect on July 16, 2020, and Governor Polis has extended it repeatedly since then. The Governor's Office released the most recent amendment to the Executive Order on January 6. An extension of the Executive Order takes effect for a maximum of 30 days. The Governor and his team review each Executive Order as it approaches expiration.

State order

Connecticut

Start date: April 20, 2020. End date: Current, as of December 19, 2020.

> Cloth Face Coverings or Higher Level of Protection Required in Public Wherever Close Contact is Unavoidable. Effective at 8:00 p.m. on Monday, April 20, 2020, any person in a public place in Connecticut who is unable to or does not maintain a safe social distance of approximately six feet from every other person shall cover their mouth and nose with a mask or cloth face-covering

State order

Delaware

Start date: April 25, 2020. End date: Current, as of December 19, 2020.

> WHEREAS, on April 25, 2020 at 4:00 p.m. E.D.T., I issued the Thirteenth Modification to the COVID-19 State of Emergency declaration to require the use of cloth face coverings in public settings where other social distancing

measures are difficult to maintain, including in grocery stores and pharmacies, especially in areas of significant community-based transmission;" "Obligations for Individuals to Wear Face Coverings. i. While visiting a business, indoor or outdoor space open to the public, individuals are required to wear a face covering, except as follows: [September 3, 2020]

State order

District of Columbia

Start date: July 22, 2020. End date: Current, as of December 19, 2020.

II. INDOOR WEARING OF MASKS

Except as specified in Section IV of this Order:

1. Persons must wear a mask in the common areas of apartments, condominiums and cooperatives.

2. Businesses, office buildings, and other establishments open to members of the public shall post signage on their exterior doors stating that a person may not enter unless the person is wearing a mask. In addition, the business, office building, or other establishment shall exclude or attempt to eject persons who are not wearing masks or who remove their required masks.

3. Employers shall provide masks to their employees.

III. OUTDOOR AND TRANSIT-RELATED WEARING OF MASKS

Except as specified in Section IV of this Order:

1. Persons leaving their residences shall wear a mask when they are likely to come into contact with another person, such as being within six feet of another person for more than a fleeting time; and

2. Persons who are operating or a passenger in a taxi or a vehicle that is part of a Transportation Network Company, or who are a passenger on or operator of any form of public transit in the District, including a bus, subway, streetcar, shuttle bus or van, or school bus, must wear a mask at all such times. [Mayor's Order 2020-080 July 22, 2020]

State order

Florida

No Mask Mandate as of December 19, 2020

Georgia

No Mask Mandate as of December 19, 2020

Idaho

No Mask Mandate as of December 19, 2020

Illinois

Start date: May 1, 2020. End date: Current, as of December 19, 2020.

> I hereby order the following, effective May 1, 2020 (...) Section 1. Public Health Requirements for Individuals Leaving Home and for Businesses
>
> Wearing a face covering in public places or when working. Any individual who is over age two and able to medically tolerate a face-covering (a mask or cloth face-covering) shall be required to cover their nose and mouth with a face-covering when in a public place and unable to maintain a six-foot social distance. Face-coverings are required in public indoor spaces such as stores.

State order

Indiana

Start date: July 27, 2020. End date: Current, as of December 19, 2020.

> This directive becomes effective at 12:01 a.m. on Monday, July 27, 2020, and continues for a period of thirty (30) days until 11:59 p.m. on Wednesday, August 26, 2020 unless rescinded, modified or extended by me. Any recission, modification or extension of this directive will be contingent on the status of our state's COVID-19 data which may be directly impacted and influenced by Hoosiers' compliance with this directive. During this time period, every individual within the state of Indiana shall wear a face covering over the nose and mouth when:
>
> a. inside a business, public building, or other indoor place open to the public. This does not extend, however, to private offices, private workspaces or meeting in which six feet of social distancing can be achieved and maintained between people not in the same household;
>
> b. in an outdoor public space whereever it is not feasible to maintain six feet of social distancing from another person not in the same household; or

c. using public transportation or while in a taxi, private car sharing, or ride-sharing vehicle.

State order

Iowa

Start date: November 17, 2020. End date: Current, as of December 19, 2020.

Persuant to Iowa Code paragraph 135.144 (3), and in conjuction with the Iowa Department of Public Health, unless otherwise modified by subsequent proclamation or order of the Iowa Department of public health, I continue to order that until 11:59 pm on February 6, 2021, all people two or older must wear a mask or other face covering when inside an indoor space that is open to the public and within six feet of individuals who are not members of their household for 15 minutes or longer [...]

[November 17, 2020]

State order

Kansas

Start date: November 25, 2020. End date: Current, as of December 19, 2020.

Effective at 12:01 a.m. on Wednesday, November 25, 2020, any person in Kansas shall wear a face covering when they are in the following situations: a. Inside, or in line to enter, any indoor public space; b. Obtaining services from the healthcare sector in settings including, but not limited to, a hospital, pharmacy, medical clinic, laboratory, physician or dental office, veterinary clinic, or blood bank; 1 c. Waiting for or riding on public transportation or while in a taxi, private car service, or ride-sharing vehicle; d. While outdoors in public spaces and unable to maintain a 6-foot distance between individuals (not including individuals who reside together) with only infrequent or incidental moments of closer proximity. 3. Also effective at 12:01 a.m. on Wednesday, November 25, 2020, all businesses or organizations in Kansas must require all employees, customers, visitors, members, or members of the public to wear a face covering when: a. Employees are working in any space visited by customers or members of the public, regardless of whether anyone from the public is present at the time; b. Employees are working in any space where food is prepared or packaged for sale or distribution to others; c. Employees

are working in or walking through common areas, such as hallways, stairways, elevators, and parking facilities; d. Customers, members, visitors, or members of the public are in a facility managed by the business or organization; or e. Employees are in any room or enclosed area where other people (except for individuals who reside together) are present and are unable to maintain a 6-foot distance except for infrequent or incidental moments of closer proximity.

State order

Kentucky

Start date: July 9, 2020. End date: Current, as of December 19, 2020.

WHEREAS, I declared on July 9, 2020, through Executive Order 2020-586 that Kentuckians were required to wear face covering in many public places to fight the continued spread of COVID-19.

Louisiana

Start date: July 11, 2020. End date: Current, as of December 19, 2020.

Every individual in Louisiana shall wear a face covering over the nose and mouth when inside a commercial establishment or any other building or space open to the public, whether indoor or outdoor. This shall include public or commercial modes of transportation. This order shall apply statewide. [July 11, 2021]

State order

Maine

Start date: April 29, 2020. End date: Current, as of December 19, 2020.

Consistent with guidance from the United States Centers for Disease Control and Prevention individuals must wear cloth face coverings in public settings where other physical distancing measures are difficult to maintain. [April 29, 2021]

State order

Maryland

Start date: April 18, 2020. End date: Current, as of December 19, 2020.

> Effective as of 7:00 a.m. on April 18, 2020: i. all riders and operators on any Public Transportation are required to wear Face Coverings (excluding any operator in a separate compartment that is off-limits to riders); ii. all customers over the age of nine are required to wear Face Coverings while inside the enclosed area of any Retail Establishment or Foodservice Establishment; iii. adult customers accompanying children age two through nine shall use reasonable efforts to cause those children to wear Face Coverings while inside the enclosed area of any Retail Establishment or Foodservice Establishment; iv. all Retail Establishments shall require staff to wear, and those staff shall wear, Face Coverings while working in areas open to the general public and areas in which interactions with other staff are likely; and v. all Foodservice Establishments shall require staff who interact with customers (including, without limitation, delivery personnel) to wear, and those staff shall wear, Face Coverings while working. b. Single-use Face Coverings shall be properly discarded in trash receptacles. It is recommended that all reusable Face Coverings be cleaned frequently (at least once per day). c. Wearing a Medical-Grade Mask satisfies any requirement in paragraph II.a to wear a Face Covering, but all Marylanders are urged to reserve Medical-Grade Masks for use by health care workers and first responders.

State order

Massachusetts

Start date: May 6, 2020. End date: Current, as of December 19, 2020.

> Effective Wednesday, May 6, 2020, any person over age two who is in a place open to the public in the Commonwealth, whether indoor or outdoor, and is unable to or does not maintain a distance of approximately six feet from every other person shall cover their mouth and nose with a mask or cloth face covering, except where a person is unable to wear a mask or face covering due to a medical condition or the person is otherwise exempted by Department of Public Health guidance. A person who declines to wear a mask or cloth face covering because of a medical condition shall not be required to produce documentation verifying the condition. This requirement applies to all workers and customers of businesses and other organizations open to the public

that are permitted to operate as COVID-19 Essential Businesses as defined in Appendix A ofCOVID-19Order13, as extended by COVID-19 Orders 21and30.

All persons are required to wear masks or cloth face coverings at all times when inside grocery stores, pharmacies, and other retail stores. All persons are also required to wear masks or cloth face coverings when providing or using the services of any taxi, car, livery, ride-sharing, or similar service or any means of mass public transit, or while within an enclosed or semienclosed transit stop or waiting area.

State order

Michigan

Start date: July 17, 2020. End date: Current, as of December 19, 2020.

Acting under the Michigan Constitution of 1963 and Michigan law, I order the following: 1. Any individual who leaves their home or place of residence must wear a face covering over their nose and mouth: (a) When in any indoor public space; (b) When outdoors and unable to consistently maintain a distance of six feet or more from individuals who are not members of their household; and (c) When waiting for or riding on public transportation, while in a taxi or ridesharing vehicle, or when using a private car service as a means of hired transportation.

State order

Minnesota

Start date: July 25, 2020. End date: Current, as of December 19, 2020.

Beginning on Friday, July 24, 2020 at 11:59 p.m., Minnesotans must wear a face covering in indoor businesses and indoor public settings, as described in this order and the related industry guidance, available at the Stay Safe Minnesota website (https://staysafe.mn.gov), as well as any other guidance referenced in this order. Workers must also wear face coverings outdoors when it is not possible to maintain social distancing. When leaving home, Minnesotans are strongly encouraged to have a face covering with them at all times to be prepared to comply with the requirements of this Executive Order

State order

Mississippi

Start date: August 5, 2020. End date: September 30, 2020.

> Every person in Mississippi shall wear a face covering, covering the nose and mouth, while inside a business, school, or other building or space open to the public, or when in an outdoor public space whenever it is not possible to maintain a minimum of six feet social distancing from another person not in the same household [....].
>
> The Executive Order shall we be effective at 8:00 a.m. on Wednesday, August 5, 2020.

Source: State order

Missouri

No Mask Mandate as of December 19, 2020

Montana

Start date: July 15, 2020. End date: Current, as of December 19, 2020.

> I hereby direct the following measures be in place in the State of Montana, effective immediately: [...]
>
> Except as provided in section 4 of this Directive, all businesses, government offices, or other persons responsible for indoor spaces open to the public shall require and take reasonable measures to ensure that all employees, contractors, volunteers, customers, or other members of the public wear a face covering that covers their mouth and nose at all times while entering or remaining in any indoor spaces open to the public.

Source: State order

Nebraska

No Mask Mandate as of December 19, 2020

Nevada

Start date: June 26, 2020 End date: Current, as of December 19, 2020.

> When and where am I required to wear a face covering? Whenever you leave the house. To keep businesses open and help slow the spread, face coverings

are required. Face coverings should be worn at all times in the following circumstances: o Public spaces: o Inside of, or standing in line waiting to enter, any indoor public space. o While outside in a public space when 6 feet of social distancing from those not in your same household isn't possible. o Public or Private Transportation or paratransit that others HAVE used or WILL use o While at work o While working out indoors at a gym, fitness center, dance studio, or boutique fitness facility This Directive is effective at 11:59pm on Thursday, June 25, 2020...

State Order

New Hampshire

Start date: November 20, 2020 End date: Current, as of December 19, 2020.

1. Beginning on November 20, 2020, all persons over the age of 5 within the State of New Hampshire shall wear a mask or cloth face covering over their noses and mouths any time they are in public spaces, indoors or outdoors, where they are unable to or do not consistently maintain a physical distance of at least six feet from persons outside their own households. 2. For purposes of this Order, the term "public spaces" includes any part of private or public property that is generally open or accessible to members of the general public. Public spaces include, but are not limited to, lobbies, waiting areas, outside plazas or patios, restaurants, retail businesses, streets, sidewalks, parks, beaches, elevators, restrooms, stairways, parking garages, etc.

State Order

New Jersey

Start date: July 8, 2020 End date: Current, as of December 19, 2020.

hereby ORDER and DIRECT: 1. When it is not practicable for individuals in outdoor public spaces to socially distance and keep a six-foot distance from others, excluding immediate family members, caretakers, household members, or romantic partners, consistent with Paragraph 3 of Executive Order No. 107 (2020), all individuals shall wear face coverings. This requirement shall not apply (...) where the individual is under two years of age. 2. (...) 3. As provided for in Executive Order Nos. 122, 125, 135, 142, 152, 154, 155, and 157 (2020), all individuals shall continue to wear face coverings in indoor spaces that are accessible to members of the public, such as retail, recreational, and

entertainment businesses, areas of government buildings open to the public, and mass transit buses, trains, and stations, except when doing so would inhibit the individual's health, including when engaging in high intensity aerobic or anaerobic activities, when in the water, and in other situations where the presence of a mask would pose a risk to the individual's safety, or where the individual is under two years of age. For indoor commercial spaces that are not open to members of the public, such as office buildings, those spaces must have policies that at a minimum, require individuals to wear face coverings when in prolonged proximity to others. (...) This Order shall take effect immediately (...) under my hand and seal this 8th day of July

State Order

New Mexico

Start date: May 15, 2020 End date: Current, as of December 19, 2020.

(7) Unless a healthcare provider instructs otherwise, all individuals shall wear a mask or multilayer cloth face covering in public settings except when eating, drinking, or exercising. (...)

(...) This order shall take effect immediately (...) Done at the Executive Office this 15th day of May 2020

State Order

New York

Start date: April 18, 2020 End date: Current, as of December 19, 2020.

Effective at 8 p.m. on Friday, April 17, 2020 any individual who is over age two and able to medically tolerate a face-covering shall be required to cover their nose and mouth with a mask or cloth face-covering when in a public place and unable to maintain, or when not maintaining, social distance.

State Order

North Carolina

Start date: June 27, 2020 End date: Current, as of December 19, 2020.

Where Face Coverings Are Required. People are required to wear Face Coverings in the following settings, whether they are inside or outside, unless an

exception applies. 1. In Retail Businesses. Retail Businesses must have all workers wear Face Coverings when they are or may be within six (6) feet of another person. In addition, Retail Businesses must have all customers wear Face Coverings when they are inside the establishment and may be within (6) feet of another person, unless the customer states that an exception applies. 2. In Restaurants. Restaurants must have all workers wear Face Coverings when they are or may be within six (6) feet of another person. In addition, restaurants must have all customers wear Face Coverings when not at their table, unless the customer states that an exception applies. 3. In Personal Care, Grooming, and Tattoo Businesses. Personal Care, Grooming, and Tattoo Businesses must have workers wear Face Coverings when they are or may be within six (6) feet of another person. In addition, the business must have all customers wear Face Coverings when they are inside the establishment and may be within six (6) feet of another person, unless the customer states that an exception applies. Customers may take off their Face Coverings if they are receiving a facial treatment, shave, or other services on a part of the head which the Face Covering covers or by which the Face Covering is secured. 4. In Child Care Facilities, Day Camps, and Overnight Camps. Child care facilities, day camps, and overnight camps must have workers, all other adults, and children eleven (11) years or older on site wear Face Coverings when they are or may be within six (6) feet of another person. 5. In State Government. State government agencies headed by members of the Governor's Cabinet must have their on-site workers wear Face Coverings when they are or may be within six (6) feet of another person. Public-facing operations of state government agencies under the jurisdiction of the undersigned must also follow the requirements for Retail Businesses established in this Executive Order. All other state and local government agencies are strongly encouraged to adopt similar policies that require Face Coverings. 6. In Transportation. All workers and riders on public or private transportation regulated by the State ofNorth Carolina, as well as all people in North Carolina airports, bus and train stations or stops, must wear Face Coverings when they are or may be within six (6) feet of another person. This provision does not apply to people traveling alone with household members or friends in their personal vehicles, but does apply to ride-shares, cabs, vans, and shuttles, even ifthe vehicles are privately owned. Notwithstanding the foregoing, no customer will be removed from or denied entry to public transportation for failure to wear a Face Covering. 7. In Certain High-Density Occupational Settings Where

Social Distancing is Difficult. Social distancing is inherently difficult where multiple workers are together in manufacturing settings, at construction sites, and in migrant farm, other farm, and agricultural settings. Therefore, in businesses or operations within North American Industry Classification System (NAICS) sectors 311 to 339 (manufacturing), 236 to 238 (construction), and 111, 112, 1151, and 1152 (agriculture), all workers must wear Face Coverings when they are or may be within six (6) feet of another person. 8. In Meat or Poultry Processing Plants. All workers in any meat or poultry processing plant, packing plant, or slaughterhouse must wear Face Coverings when they are or may be within six (6) feet of another person, and those Face Coverings must be Surgical Masks, as long as Surgical Mask supplies are available. 9. Long Term Care Facilities. All workers in Long Term Care ("LTC") Facilities, including skilled nursing facilities ("SNF"), adult care homes ("ACH"), family care homes ("FCH"), mental health group homes, and intermediate care facilities for individuals with intellectual disabilities ("ICF-IID"), must wear Face Coverings while in the facility, and those Face Coverings must be Surgical Masks, as long as Surgical Mask supplies are available. 10. Other Health Care Settings. Health care facilities other than L TC facilities must follow the Face Covering requirements in the CDC Infection Control Guidance for Healthcare Professionals about Coronavirus (COVID-19). (...) This Executive Order is effective at 5:00 pm on June 26, 2020

State Order

North Dakota

Start date: November 14, 2020 End date: January 18, 2021

Effective November 14, 2020, at 12:01 a.m. through December 14, 2020, at 12:01 a.m., face coverings are required in indoor businesses and indoor public settings, as described in this Order. Face coverings must also be worn in outdoor business and public settings when it is not possible to maintain physical distancing. This order applies to all workers, patrons, customers, visitors or guests unless exempt under Paragraph 4 of this Order.

State Order

Ohio

Start date: July 24, 2020 End date: Current, as of December 19, 2020.

2. Facial Coverings (Masks). Except as provided herein, all individuals, in the State of Ohio shall wear face coverings at all times when: a. In any indoor location that is not a residence; b. Outdoors and unable to consistently maintain a distance of six feet or more from individuals who are not members of their family/household; or c. Waiting for, riding, driving, or operating public transportation, a taxi, a car service, or a ride sharing vehicle. (...) This Order shall be effective at 6:00pm on July 23, 2020 (...)

State Order

Oklahoma

Start date: No Mask Mandate as of December 19, 2020

Oregon

Start date: July 1, 2020 End date: Current, as of December 19, 2020.

Governor Brown did not issue a new executive order for the mask policy, but Executive Order 20-25 — which lays out the rules and processes for Oregon's reopening — includes multiple sections that say the Governor can modify aspects "as necessary" to then be expressed through Oregon Health Authority guidelines.

Applicability: This guidance applies statewide to: • All businesses, as defined below, and to the general public when visiting these businesses. • The general public when visiting indoor spaces open to the public. (...) Effective date: July 1, 2020

State Order Details

Pennsylvania

Start date: July 1, 2020 End date: Current, as of December 19, 2020.

Except as provided in Section 3, individuals are required to wear face coverings if they are: A. outdoors and unable to consistently maintain a distance of six feet from individuals who are not members of their household; B. in any indoor location where members of the public are generally permitted; ... E. engaged in work, whether at the workplace or performing work off-site, when interacting in-person with any member of the public, working in any space visited by members of the public, working in any space where food is prepared

or packaged for sale or distribution to others,... Accordingly, on this date, July 1, 2020, (...) This Order is effective immediately (...)

State Order

Rhode Island

Start date: May 8, 2020 End date: Current, as of December 19, 2020.

1. Effective on Friday, May 8, 2020, any person who is in a place open to the public, whether indoors or outdoors, shall cover their mouth and nose with a mask or cloth face covering unless doing so would damage the person's health. No person under two years of age or any person whose health would be damaged thereby shall be required to wear a face covering. Face coverings are not required for people who can easily, continuously, and measurably maintain at least six (6) feet of distance from other people. Face coverings shall also not be required of those who are developmentally unable to comply, including young children who may not be able to effectively wear a mask. 2. Effective on Friday, May 8, 2020, all persons are required to wear masks or cloth face coverings at all times when inside grocery stores, pharmacies or other retail stores. All persons are also required to wear masks or cloth face coverings when providing or using the services of any taxi, car, livery, ride-sharing, or similar service or any means of mass public transit, or while within an enclosed or semi-enclosed transit stop or waiting area. Face coverings shall not be required of those whose health would be damaged thereby or who are developmentally unable to comply, including young children who may not be able to effectively wear a mask. Nothing in this Executive Order shall require a store or other place of business to refuse entry to a customer not wearing a face covering.

State Order

South Carolina

Start date: No Mask Mandate as of December 19, 2020

South Dakota

Start date: No Mask Mandate as of December 19, 2020

Tennessee

Start date: No Mask Mandate as of December 19, 2020

Texas

Start date: July 3, 2020 End date: Current, as of December 19, 2020.

> Every person in Texas shall wear a face covering over the nose and mouth when inside a commercial entity or other building or space open to the public, or when in an outdoor public space, wherever it is not feasible to maintain six feet of social distancing from another person not in the same household; (...) do hereby order the following on a statewide basis effective at 12:01 p.m. on July 3, 2020:

State Order

Utah

Start date: November 9, 2020 End date: Current, as of December 19, 2020.

> Restrictions. The following restrictions apply statewide: a. Individuals. An individual: i. shall wear a face mask while within six feet of any individual from a separate household; (...) This Order is effective on November 9, 2020, at 1:00 p.m. (...)

State Order

Vermont

Start date: August 1, 2020 End date: Current, as of December 19, 2020.

> (f) Masks or Cloth Facial Coverings Required in Public Wherever Close Contact is Unavoidable. As of Saturday, August 1, 2020, Vermonters shall wear masks or cloth facial coverings over their nose and mouth any time they are in public spaces, indoors or outdoors, where they come in contact with others from outside their households, especially in congregate settings, and where it is not possible to maintain a physical distance of at least six feet.

State Order

Virginia

Start date: May 29, 2020 End date: Current, as of December 19, 2020.

> All patrons in the Commonwealth aged ten and over shall when entering, exiting, traveling through, and spending time inside the settings listed below cover their mouth and nose with a face covering, as described and recommended by

the CDC: 1. Personal care and personal grooming businesses, including but not limited to, beauty salons, barbershops, spas, massage centers, tanning salons, tattoo shops, and any other location where personal care or personal grooming services are provided. 2. All brick and mortar retail businesses, including both essential and non-essential brick and mortar retail businesses, as delineated in Amended Executive Order 61 and Amended Order of Public Health Emergency Three (2020). 3. Food and beverage establishments, including but not limited to, restaurants, dining establishments, food courts, breweries, microbreweries, distilleries, wineries, tasting rooms, and farmers markets, when permitted to reopen for indoor dining. 4. Entertainment or recreation businesses, including but not limited to, racetracks, historic horse racing facilities, theaters, performing arts centers, concert venues, museums, and other indoor entertainment centers, bowling alleys, skating rinks, arcades, amusement parks, trampoline parks, fairs, arts and craft facilities, aquariums, zoos, escape rooms, public and private social clubs, and all other places of indoor public amusement, once permitted to reopen to the public. Face coverings shall also be required when patrons are outdoors at these businesses if a distance of six feet from every other person cannot be maintained. 5. Train stations, bus stations, and intrastate public transportation, including buses, rideshares, trains, taxis, and cars for hire, as well as any waiting or congregating areas associated with boarding public transportation. This requirement shall not apply in any area under federal jurisdiction or control. 6. Any other indoor place shared by groups of people who are in close proximity to each other. This restriction does not apply to persons while inside their residence or the personal residence of another. Face coverings may be removed to participate in a religious ritual. 7. State or local government buildings when accessed for the purpose of securing public services, with the exception of students in daycare centers or participating in-person classes in K-12 education or institutions of higher education. (...) this Order shall be effective 12:00 a.m., Friday, May 29, 2020 (...)

State Order

Washington

Start date: June 26, 2020 End date: Current, as of December 19, 2020.

Whereas, on June 24, 2020, I issued Order of the Secretary of Health 20-03 directing every person in Washington State to wear a face covering when in any

indoor or outdoor public setting, subject to certain exceptions; and Whereas, for the the same reasons stated above, requiring people to wear face coverings when they are outside their house, mobile home, apartment, condominium, hotel or motel room, bedroom in a congregate living setting, or other dwelling using will also help control and prevent the spread of COVID-19 in Washington State. (...) The order goes into effect on Friday, June 26 (...)

State Order Press Release

West Virginia

Start date: July 7, 2020 End date: Current, as of December 19, 2020.

hereby DECLARE and ORDER effective as of 12:01 AM, Eastern Standard Time, on the Seventh day of July, Two Thousand Twenty, as follows: 1. All individuals age 9 and over within the State of West Virginia shall wear an adequate face covering when in confined, indoor spaces, other than then in one's residence or when actively engaged in the consumption of food and/or beverage, and when not able to adequately social distance from other individuals who do not reside in the same household.

State Order

Wisconsin

Start date: August 1, 2020 End date: Current, as of December 19, 2020.

FACE COVERING REQUIRED. Every individual, age five and older, in Wisconsin shall wear a face covering if both of the following apply: a. The individual is indoors or in an enclosed space, other than at a private residence; and; b. Another person or persons who are not members of individual's household or living unit are present in the same room or enclosed space. Face coverings are strongly recommended in all other settings, including outdoors when it is not possible to maintain physical distancing. (...) This Order shall enter into effect at 12:01am on Saturday, August 1, 2020. (...)

State Order

Wyoming

Start date: December 9, 2020 End date: Current, as of December 19, 2020.

Except as specifically exempted below, all members of the public must wear a Face Covering outside their home or other place of residence in the following situations: a. When any person is inside, or in line to enter, any business, or any government facility open to the general public, including state, county, and municipal buildings but excluding federal buildings; or b. When any person is obtaining services at, or visiting healthcare operations including, but not limited to, hospitals, clinics, and walk-in health facilities, dentists, pharmacies, blood banks, other healthcare facilities, behavioral health providers, and facilities providing veterinary and similar healthcare services for animals; or c. When any person is waiting for or riding on public transportation or paratransit, or while they are riding in a taxi, private care service, shuttle, tour, or ride-sharing vehicle. The driver shall also wear a Face Covering when passengers are in the vehicle. (...) This Order is effective on December 9, 2020 (...)

State Order

B Data Appendix

B.1 Construction of distance variable

Our regression discontinuity design requires computing the "minimum distance to a mask border" for any county , i.e. the shortest distance to a county with a different mask mandate.

This minimum distance is computed in steps:

1. First, we obtain the distance of each county to any other in the U.S. from https://www.nber.org/research/data/county-distance-database. "The distance between counties are great-circle distances calculated using the Haversine formula based on internal points in the geographic area" (see reference for details).

2. Second, we merge the information on distances with the state-level mask mandates (see Appendix A) for a given day, t.

3. Thirdly, for a given county i we compute the minimum distance to another county, j, that has a different mask mandate. If county i has a state-level mask mandate the distance is kept as a positive number, if, on the other hand, county i does not have a state-level mask mandate, then the distance is kept as a negative number.

4. Fourth, the process is repeated for all dates in our dataset.

In the end, this "minimum distance to a mask border" is positive for all counties that have a mask mandate and is negative for all counties that do not have a mask mandate, meaning it measures miles away from county without a mask mandate.

We restrict our dataset to absolute minimum distances of at most 150 miles. That threshold guarantees that all counties that are in the border are included in the regressions[14], but also allows for counties that are sufficiently close to the border but not exactly at the border to be included. Appendix D shows how results vary depending on this threshold.

B.2 Other Data & Sources

- *COVID-19 outcomes.* We collect three types of COVID-19 outcomes at the county-level: cases and deaths from https://usafacts.org/, and hospital admissions at facility-level aggregated to county-level from http://www.healthdata.org.

[14] After calculating the minimum distance to a different mask mandate, the maximum across such distances for counties at any state border is 148 miles.

- *Population.* Data for all counties are also retrieved from https://usafacts.org/.
- *2020 General Election data.* The share of votes for President at the county-level is taken from https://github.com/tonmcg.
- *Containment and health policy measures.* An index of state-level containment and health measures as well as individual measures, including a categorical variable on the degree of mandated face coverings, are taken from https://github.com/OxCGRT. The index is defined as "A containment and health index, showing how many and how forceful the measures to contain the virus and protect citizen health are (this combines 'lockdown' restrictions and closures with health measures such as testing policy and contact tracing)", see Hallas et al., 2020.
- *Mobility.* An overall index is constructed at the county-level as the simple average of individual indices for retail and recreation, grocery and pharmacy, transit stations and workplaces, provided in https://www.google.com/covid19/mobility/.
- *County-level mask mandates.* Data on county-level mask mandates for counties in states without a statewide mask mandate are taken from Wright et al., 2020.

C SIR model

Consider a standard SIR model where lower case variables represent *per capita*[15] susceptibles (s), actively infected (i), recovered (r), and deaths (d) in period t:

$$\begin{aligned} s_{t+1} - s_t &= -\beta s_t i_t \\ i_{t+1} - i_t &= \beta s_t i_t - \delta i_t - \alpha i_t \\ r_{t+1} - r_t &= \alpha i_t \\ d_{t+1} - d_t &= \delta i_t \end{aligned}$$

and β is the contact rate, δ is the case fatality rate, and α is the recovery rate.

Adding up the equations on actively infected, deaths and recoveries, we can define the change in ever infected (i^{ever}) as:

$$i^{ever}_{t+1} - i^{ever}_t \equiv i_{t+1} + d_{t+1} + r_{t+1} - (i_t + d_t + r_t) = \beta s_t i_t \tag{B2}$$

where i^{ever}_t denotes cumulated cases of COVID-19 at time t.

Simplifying further by assuming $s_t = 1$, which is approximately true in the early stage of the pandemic or if the recovered can become susceptible again, and that data on

[15] We ignore deaths and births in the relevant time period.

new weekly COVID infections (*newcases*) reflect actual infections, equation (B2) can be written at the county-level (indexed by c) as:

$$newcases_{c,t} = \beta i_{c,t} \tag{B3}$$

The advantage of our regression discontinuity design in equation (1) is that it attempts to control for the local state of the pandemic across mask borders, i.e. that $i_{c,t}$ is roughly the same across counties on either side of the mask border. If that is the case, equation (1) identifies the effect of mask mandates on the contact rate β up to a proportionality constant:

$$newcases_{t+k} = \tilde{\beta}_{t+k}(maskmandate_t)$$

where the subscript allows for a flexible function of the lead of the left-hand-side variable.

Table B1 (Panel A) shows that the level of actively infected are indeed continuous across mask borders. In regressions of actively infected on mask mandates and the distance polynomial, the coefficient on state mask mandates is insignificant, including across several specifications for the distance polynomial and with and without controlling for mobility (columns 1-3). [16]

Note that if infections are not systematically different across mask borders on average and we find effects on new cases, it then must follow that counties with mask mandates have a higher number of actively infected initially, and then over time they turn to having a lower number. In Table B1 (Panel B) we find that this is indeed the case: restricting to counties with newly imposed mask mandates the (column 1) mask mandates are positively associated with infections, wile this relationship turns negative (although borderline insignificant) when restricting to counties where mask mandates have been in place for more than 5 weeks (columns 2 - 5).

In Table B2 we instead run our baseline specification for cases (in logarithms), while also controlling for infections — as suggested by equation (B3). We do so for a range of specifications allowing for different functional forms for the distance polynomial as well as with and without controlling for mobility (column 1-4). Across all specifications the coefficient on mask mandates remains negative and significant.[17]

In sum, this discussion establishes our estimate of the effect of mask mandates for cases is proportional to the effect of mask mandates on the contact rate in a SIR model.

[16] Actively infected at the county level are calculated using $i_{c,t+1} = i_{c,t} + newcases_{c,t+1} - newdeaths_{c,t+1} - \alpha i_{c,t}$, where $\alpha = 0.387$ following Eichenbaum et al., 2021 and $i_{c,0}$ equals the weekly cases that are first reported.

[17] We do not use a specification that corrects for using a lagged dependent variable because we don't use one strictly speaking. However, infections are implicitly a function of previous new cases. Nevertheless, with $T > 30$ the Nickell bias is unlikely to be a serious problem (Judson and Owen, 1999).

Table B1: Actively infected per 100,000 inhabitants

Panel A: Varying the specification

	(1)	(2)	(3)
State mask mandate	-0.21	-0.26	-0.14
	[0.21]	[0.22]	[0.19]
Distance	0.01*	0.01*	0.00**
	[0.00]	[0.00]	[0.00]
Distance*Pos	-0.01	-0.00	-0.00*
	[0.00]	[0.01]	[0.00]
Distance^2	0.00	0.00	
	[0.00]	[0.00]	
Distance^2*Pos	-0.00	-0.00	
	[0.00]	[0.00]	
Lagged Mobility	-0.02***		
	[0.00]		
Constant	5.24***	5.46***	5.38***
	[0.14]	[0.13]	[0.09]
Observations	46930	55858	55858
R2	0.728	0.692	0.692

Panel B: Varying time since state mandates were imposed

	(1)	(2)	(3)	(4)
State mask mandate	0.30**	-0.29	-0.45	-0.39
	[0.14]	[0.22]	[0.30]	[0.31]
Distance	-0.00	0.00	-0.00	-0.00
	[0.00]	[0.00]	[0.00]	[0.00]
Distance*Pos	-0.00*	-0.00	0.00	0.00
	[0.00]	[0.00]	[0.00]	[0.00]
Constant	4.96***	5.03***	5.02***	5.10***
	[0.16]	[0.15]	[0.16]	[0.16]
Observations	30423	31086	30700	30526
R2	0.736	0.728	0.717	0.715
Time since mandate	1-4	4-8	8-12	12-16

Source: Authors' calculations.
Notes: The estimates are based on data for 3107 counties over 48 weeks. Counties within 150 miles of a state border over which mask mandates vary are included. All specifications include time and county fixed effects. Standard errors are clustered at specific pairwise state borders. ***, **, and * indicate statistical significance at 1, 5, and 10 percent, respectively. In Panel B, the sample of counties is restricted to those with mask mandates in place for at least 16 weeks and the paired control counties without mask mandates.

The tight relationship between our estimate and the contact rate of the SIR model allows for a structural interpretation of our results and underpins our subsequent counter-factual analysis.

Table B2: Cases per 100,000 inhabitants, controlling for prior actively infected

	(1)	(2)	(3)	(4)
Ln(Infections per 100'000)	0.59***	0.59***	0.59***	0.51***
	[0.03]	[0.03]	[0.03]	[0.02]
State mask mandate	-0.20**	-0.16**	-0.16**	-0.19**
	[0.10]	[0.07]	[0.07]	[0.07]
Distance	0.00***	-0.00	0.00***	0.00***
	[0.00]	[0.00]	[0.00]	[0.00]
Distance*Pos	-0.01***		-0.01***	-0.01***
	[0.00]		[0.00]	[0.00]
Distance^2	0.00***	0.00	0.00***	0.00***
	[0.00]	[0.00]	[0.00]	[0.00]
Distance^2*Pos	-0.00			
	[0.00]			
Lagged Mobility	-0.00	-0.00	-0.00	
	[0.00]	[0.00]	[0.00]	
Constant	1.60***	1.46***	1.58***	2.05***
	[0.16]	[0.14]	[0.15]	[0.15]
Observations	43266	43266	43266	50365
R2	0.790	0.790	0.790	0.760

Source: Authors' calculations.
Notes: The estimates are based on data for 3107 counties over 48 weeks. Counties within 150 miles of a state border over which mask mandates vary are included. We lead cases by 1 week with respect to the state mask mandate dummy. Actively infected at the county level are calculated using $i_{c,t+1} = i_{c,t} + newcases_{c,t+1} - newdeaths_{c,t+1} - \alpha i_{c,t}$, where $\alpha = 0.387$ following Eichenbaum et al., 2021 and $i_{c,0}$ equals the weekly cases that are first reported. All specifications include time and county fixed effects. Standard errors are clustered at specific pairwise state borders. ***, **, and * indicate statistical significance at 1, 5, and 10 percent, respectively.

D Robustness

Table C1: Regression discontinuity analysis on covariates

	(1) Proxy for attitudes	(2) Mobility	(3) Schools	(4) Workplace	(5) Event
State mask mandate	0.00	0.22	-0.06	0.15*	0.13
	[0.03]	[0.52]	[0.04]	[0.09]	[0.11]
Distance	-0.00***	-0.01***	0.00	-0.00	-0.00
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
Distance^2	-0.00	0.00	0.00***	0.00	-0.00***
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
Observations	56412	47042	54848	54848	54848
R2	0.075	0.806	0.809	0.774	0.773
Time FE	Yes	Yes	Yes	Yes	Yes
County FE	No	Yes	Yes	Yes	Yes
Distance	150	150	150	150	150

	(1) Gatherings	(2) Transport	(3) Stay-at-home	(4) Domestic travel	(5) International travel controls
State mask mandate	0.21	0.01	-0.27***	0.07	-0.06
	[0.14]	[0.05]	[0.08]	[0.10]	[0.06]
Distance	0.00***	0.00	0.00*	-0.00	-0.00
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
Distance^2	-0.00***	0.00*	-0.00***	0.00**	0.00***
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
Observations	54848	54848	54813	54761	54761
R2	0.769	0.897	0.792	0.901	0.851
Time FE	Yes	Yes	Yes	Yes	Yes
County FE	Yes	Yes	Yes	Yes	Yes
Distance	150	150	150	150	150

	(1) Public information campaigns	(2) Testing policy	(3) Contract tracing	(4) Facial coverings
State mask mandate	-0.00	-0.09	-0.05	0.24
	[0.01]	[0.11]	[0.06]	[0.17]
Distance	-0.00	-0.00	0.00	-0.00
	[0.00]	[0.00]	[0.00]	[0.00]
Distance^2	-0.00	0.00**	0.00	-0.00***
	[0.00]	[0.00]	[0.00]	[0.00]
Observations	54813	54813	54813	54265
R2	0.578	0.782	0.738	0.773
Time FE	Yes	Yes	Yes	Yes
County FE	Yes	Yes	Yes	Yes
Distance	150	150	150	150

Source: Authors' calculations.

Table C2: Cases per 100,000 population, controlling for statewide health and containment measures

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
State mask mandate	-57.38***	-72.41***	-54.55***	-54.66***	-55.67***	-57.68***	-56.31***
	[17.90]	[17.64]	[17.27]	[18.04]	[17.52]	[17.91]	[16.77]
Broad policy index	1.14						
	[2.21]						
Schools			20.33				
			[18.42]				
Workplace				-6.73			
				[20.06]			
Event					0.21		
					[20.76]		
Gatherings						11.64	
						[12.53]	
Transport							62.55
							[38.11]
Observations	45381	44747	45400	45416	45416	45416	45416
R2	0.489	0.498	0.489	0.489	0.489	0.490	0.492
Linear term	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Quadratic term	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lagged mobility	Yes	Yes	Yes	Yes	Yes	Yes	Yes
All policies	No	Yes	No	No	No	No	No

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
State mask mandate	-59.94***	-55.41***	-57.12***	-55.99***	-55.44***	-53.72***	-61.56***
	[18.56]	[17.81]	[17.71]	[17.71]	[17.45]	[17.96]	[17.91]
Stay-at-home	-16.99						
	[13.62]						
Domestic travel		-0.21					
		[18.15]					
International travel controls			-47.39**				
			[18.49]				
Public information campaigns				-65.05			
				[78.62]			
Testing policy					2.62		
					[13.31]		
Contract tracing						27.60	
						[29.48]	
Facial coverings							13.73
							[15.63]
Observations	45416	45358	45358	45416	45416	45416	44833
R2	0.489	0.489	0.491	0.489	0.489	0.490	0.487
Linear term	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Quadratic term	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lagged mobility	Yes	Yes	Yes	Yes	Yes	Yes	Yes
All polices	No	No	No	No	No	No	No

Source: Authors' calculations.
Notes: The estimates are based on data for 3107 counties over 48 weeks. "All policies" means that variables for all measures are included in the regression. Counties within 150 miles of a state border over which mask mandates vary are included. We lead cases(hospital admissions)[deaths] by 1(2)[4] weeks with respect to the state mask mandate dummy. All specifications include time and county fixed effects. Standard errors are clustered at specific pairwise state borders. ***, **, and * indicate statistical significance at 1, 5, and 10 percent, respectively.

Table C3: Hospital admissions per 100,000 population, controlling for statewide health and containment measures

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
State mask mandate	-10.56***	-10.90**	-10.54***	-10.06***	-11.38***	-11.97***	-10.01**
	[3.96]	[5.07]	[3.90]	[3.82]	[4.27]	[4.25]	[4.30]
Broad policy index	0.29						
	[0.32]						
Schools			0.04				
			[1.96]				
Workplace				1.89			
				[2.68]			
Event					2.09		
					[3.43]		
Gatherings						2.96*	
						[1.74]	
Transport							4.79
							[3.98]
Observations	17588	17486	17580	17588	17588	17588	17588
R2	0.523	0.526	0.522	0.523	0.523	0.525	0.523
Linear term	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Quadratic term	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lagged mobility	Yes	Yes	Yes	Yes	Yes	Yes	Yes
All policies	No	Yes	No	No	No	No	No

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
State mask mandate	-10.17**	-11.00***	-10.44***	-10.56***	-10.70***	-10.18**	-10.40**
	[4.49]	[3.99]	[3.98]	[4.03]	[3.95]	[4.84]	[4.26]
Stay-at-home	0.90						
	[2.27]						
Domestic travel		3.17					
		[3.10]					
International travel controls			-2.82*				
			[1.60]				
Public information campaigns				1.44			
				[9.05]			
Testing policy					-0.61		
					[3.01]		
Contract tracing						1.12	
						[5.48]	
Facial coverings							-2.84
							[2.92]
Observations	17588	17574	17574	17588	17588	17588	17512
R2	0.523	0.522	0.522	0.523	0.523	0.523	0.523
Linear term	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Quadratic term	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lagged mobility	Yes	Yes	Yes	Yes	Yes	Yes	Yes
All polices	No	No	No	No	No	No	No

Source: Authors' calculations.
Notes: The estimates are based on data for 3107 counties over 48 weeks. Counties within 150 miles of a state border over which mask mandates vary are included. We lead cases(hospital admissions)[deaths] by 1(2)[4] weeks with respect to the state mask mandate dummy. All specifications include time and county fixed effects. Standard errors are clustered at specific pairwise state borders. ***, **, and * indicate statistical significance at 1, 5, and 10 percent, respectively.

Table C4: Deaths per 100,000 population, controlling for statewide health and containment measures

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
State mask mandate	-0.81**	-1.18***	-0.75**	-0.73**	-0.79**	-0.78**	-0.80**
	[0.35]	[0.34]	[0.33]	[0.34]	[0.37]	[0.33]	[0.33]
Broad policy index	0.04						
	[0.04]						
Schools			-0.04				
			[0.43]				
Workplace				-0.09			
				[0.44]			
Event					0.90		
					[0.55]		
Gatherings						0.52	
						[0.35]	
Transport							1.00
							[0.90]
Observations	41034	40435	41018	41034	41034	41034	41034
R2	0.216	0.222	0.215	0.215	0.217	0.218	0.216
Linear term	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Quadratic term	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lagged mobility	Yes	Yes	Yes	Yes	Yes	Yes	Yes
All policies	No	Yes	No	No	No	No	No

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
State mask mandate	-0.82**	-0.73**	-0.73**	-0.77**	-0.74**	-0.73**	-0.87**
	[0.33]	[0.33]	[0.33]	[0.33]	[0.34]	[0.34]	[0.34]
Stay-at-home	-0.46						
	[0.40]						
Domestic travel		-0.30					
		[0.25]					
International travel controls			-0.75*				
			[0.42]				
Public information campaigns				-2.99			
				[2.79]			
Testing policy					-0.05		
					[0.28]		
Contract tracing						0.35	
						[0.63]	
Facial coverings							0.15
							[0.28]
Observations	41034	41034	41034	41034	41034	41034	40451
R2	0.216	0.215	0.216	0.217	0.215	0.215	0.215
Linear term	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Quadratic term	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lagged mobility	Yes	Yes	Yes	Yes	Yes	Yes	Yes
All polices	No	No	No	No	No	No	No

Source: Authors' calculations.
Notes: The estimates are based on data for 3107 counties over 48 weeks. Counties within 150 miles of a state border over which mask mandates vary are included. We lead cases(hospital admissions)[deaths] by 1(2)[4] weeks with respect to the state mask mandate dummy. All specifications include time and county fixed effects. Standard errors are clustered at specific pairwise state borders. ***, **, and * indicate statistical significance at 1, 5, and 10 percent, respectively.

Table C5: Cases, hospital admissions, and deaths per 100,000 population, with and without controlling for mobility

	(1)	(2)	(3)	(4)	(5)	(6)
State mask mandate	-63.11***	-55.22***	-8.01*	-11.46***	-0.82**	-0.74**
	[17.49]	[17.68]	[4.71]	[4.24]	[0.34]	[0.34]
Distance	0.21**	0.17*	0.00	0.03	0.00*	0.00
	[0.10]	[0.10]	[0.03]	[0.02]	[0.00]	[0.00]
Distance^2	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00*
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
Lagged Mobility		-1.20***		0.00		-0.01
		[0.41]		[0.07]		[0.01]
Observations	54540	45577	26004	22042	49248	41034
R2	0.446	0.487	0.402	0.417	0.168	0.215

Source: Authors' calculations.

Notes: The estimates are based on data for 3107 counties over 48 weeks. Counties within 150 miles of a state border over which mask mandates vary are included. We lead cases(hospital admissions)[deaths] by 1(2)[4] weeks with respect to the state mask mandate dummy. All specifications include time and county fixed effects. Standard errors are clustered at specific pairwise state borders. ***, **, and * indicate statistical significance at 1, 5, and 10 percent, respectively.

Table C6: Results varying the polynomial on distance

Panel A: Cases per 100,000 population

	(1)	(2)	(3)	(4)
State mask mandate	-56.01***	-54.95***	-55.22***	-53.45**
	[17.39]	[17.71]	[17.68]	[25.08]
Distance	0.18*	0.26**	0.17*	0.70**
	[0.10]	[0.11]	[0.10]	[0.34]
Lagged Mobility	-1.20***	-1.19***	-1.20***	-1.19***
	[0.40]	[0.41]	[0.41]	[0.41]
Distance*Pos		-0.18		-1.13**
		[0.21]		[0.45]
Distance^2			-0.00	0.00
			[0.00]	[0.00]
Distance^2*Pos				0.00
				[0.00]
Observations	45577	45577	45577	45577
R2	0.487	0.487	0.487	0.487

Panel B: Admissions per 100,000 population

	(1)	(2)	(3)	(4)
State mask mandate	-11.42***	-11.44***	-11.46***	-13.25**
	[4.25]	[4.24]	[4.24]	[5.21]
Distance	0.02	0.03	0.03	0.01
	[0.02]	[0.03]	[0.02]	[0.10]
Lagged Mobility	0.00	0.00	0.00	0.00
	[0.07]	[0.07]	[0.07]	[0.07]
Distance*Pos		-0.01		0.09
		[0.04]		[0.12]
Distance^2			-0.00	-0.00
			[0.00]	[0.00]
Distance^2*Pos				-0.00
				[0.00]
Observations	22042	22042	22042	22042
R2	0.417	0.417	0.417	0.417

Panel C: Deaths per 100,000 population

	(1)	(2)	(3)	(4)
State mask mandate	-0.80**	-0.73**	-0.74**	-0.60
	[0.32]	[0.34]	[0.34]	[0.56]
Distance	0.00*	0.01***	0.00	0.02
	[0.00]	[0.00]	[0.00]	[0.01]
Lagged Mobility	-0.01	-0.01	-0.01	-0.01
	[0.01]	[0.01]	[0.01]	[0.01]
Distance*Pos		-0.01*		-0.03
		[0.01]		[0.02]
Distance^2			-0.00*	0.00
			[0.00]	[0.00]
Distance^2*Pos				0.00
				[0.00]
Observations	41034	41034	41034	41034
R2	0.215	0.215	0.215	0.215

Source: Authors' calculations.
Notes: The estimates are based on data for 3107 counties over 48 weeks. Counties within 150 miles of a state border over which mask mandates vary are included. We lead cases(hospital admissions)[deaths] by 1(2)[4] weeks with respect to the state mask mandate dummy. All specifications include time and county fixed effects. Standard errors are clustered at specific pairwise state borders. ***, **, and * indicate statistical significance at 1, 5, and 10 percent, respectively.

Table C7: Results across different bandwidths

Panel A: Cases per 100,000 population

	(1)	(2)	(3)	(4)	(5)
State mask mandate	-43.18**	-47.59***	-55.22***	-57.36***	-56.80***
	[17.36]	[17.62]	[17.68]	[19.58]	[20.42]
Distance	0.13	0.12	0.17*	0.18	0.13
	[0.08]	[0.08]	[0.10]	[0.11]	[0.13]
Distance^2	-0.00	-0.00	-0.00	-0.00	-0.00
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
Lagged Mobility	-1.43***	-1.36***	-1.20***	-0.92**	-0.86**
	[0.42]	[0.41]	[0.41]	[0.38]	[0.38]
Observations	52282	48906	45577	41939	38303
R2	0.483	0.484	0.487	0.509	0.515
Bandwidth	180	165	150	135	120

Panel B: Hospital admissions per 100,000 population

	(1)	(2)	(3)	(4)	(5)
State mask mandate	-6.98*	-9.69**	-11.46***	-12.34***	-15.06***
	[4.17]	[4.24]	[4.24]	[4.26]	[4.81]
Distance	0.01	0.02	0.03	0.04	0.05**
	[0.02]	[0.02]	[0.02]	[0.02]	[0.02]
Distance^2	-0.00	-0.00	-0.00	-0.00	-0.00
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
Lagged Mobility	-0.03	-0.01	0.00	-0.00	-0.03
	[0.07]	[0.07]	[0.07]	[0.07]	[0.08]
Observations	25490	23675	22042	20351	18627
R2	0.417	0.417	0.417	0.413	0.407
Bandwidth	180	165	150	135	120

Panel C: Deaths per 100,000 population

	(1)	(2)	(3)	(4)	(5)
State mask mandate	-0.48	-0.53	-0.74**	-0.92**	-0.93**
	[0.33]	[0.33]	[0.34]	[0.37]	[0.38]
Distance	0.00	0.00	0.00	0.00**	0.01**
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
Distance^2	-0.00***	-0.00**	-0.00*	-0.00**	-0.00*
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
Lagged Mobility	-0.01	-0.01	-0.01	-0.01	-0.01
	[0.01]	[0.01]	[0.01]	[0.01]	[0.01]
Observations	47168	44056	41034	37684	34377
R2	0.211	0.213	0.215	0.221	0.224
Bandwidth	180	165	150	135	120

Source: Authors' calculations.

Notes: The estimates are based on data for 3107 counties over 48 weeks. Counties within 150 miles of a state border over which mask mandates vary are included. We lead cases(hospital admissions)[deaths] by 1(2)[4] weeks with respect to the state mask mandate dummy. All specifications include time and county fixed effects. Standard errors are clustered at specific pairwise state borders. ***, **, and * indicate statistical significance at 1, 5, and 10 percent, respectively.

Table C8: Results varying the number of leads on the dependent variable

Panel A: Cases per 100,000 population

	(1)	(2)	(3)
State mask mandate	-55.22***	-49.11***	-47.69**
	[17.68]	[18.49]	[19.18]
Distance	0.17*	0.12	0.11
	[0.10]	[0.10]	[0.10]
Distance^2	-0.00	-0.00	0.00
	[0.00]	[0.00]	[0.00]
Lagged Mobility	-1.20***	-0.57	-0.30
	[0.41]	[0.40]	[0.36]
Observations	45577	44102	42557
R2	0.487	0.493	0.497
Leads	1	2	3

Panel B: Hospital admissions per 100,000 population

	(1)	(2)	(3)
State mask mandate	-11.46***	-11.41**	-2.30
	[4.24]	[4.56]	[6.09]
Distance	0.03	0.03	0.00
	[0.02]	[0.02]	[0.02]
Distance^2	-0.00	0.00	0.00
	[0.00]	[0.00]	[0.00]
Lagged Mobility	0.00	0.01	0.06
	[0.07]	[0.08]	[0.08]
Observations	22042	22213	22327
R2	0.417	0.410	0.409
Leads	2	3	4

Panel C: Deaths per 100,000 population

	(1)	(2)	(3)
State mask mandate	0.07	-0.74**	-0.90***
	[0.68]	[0.34]	[0.33]
Distance	0.00**	0.00	0.00**
	[0.00]	[0.00]	[0.00]
Distance^2	-0.00*	-0.00*	-0.00
	[0.00]	[0.00]	[0.00]
Lagged Mobility	-0.02**	-0.01	-0.00
	[0.01]	[0.01]	[0.01]
Observations	42557	41034	39609
R2	0.224	0.215	0.217
Leads	3	4	5

Source: Authors' calculations.
Notes: The estimates are based on data for 3107 counties over 48 weeks. Counties within 150 miles of a state border over which mask mandates vary are included. We lead cases(hospital admissions)[deaths] by 1(2)[4] weeks with respect to the state mask mandate dummy. All specifications include time and county fixed effects. Standard errors are clustered at specific pairwise state borders. ***, **, and * indicate statistical significance at 1, 5, and 10 percent, respectively.

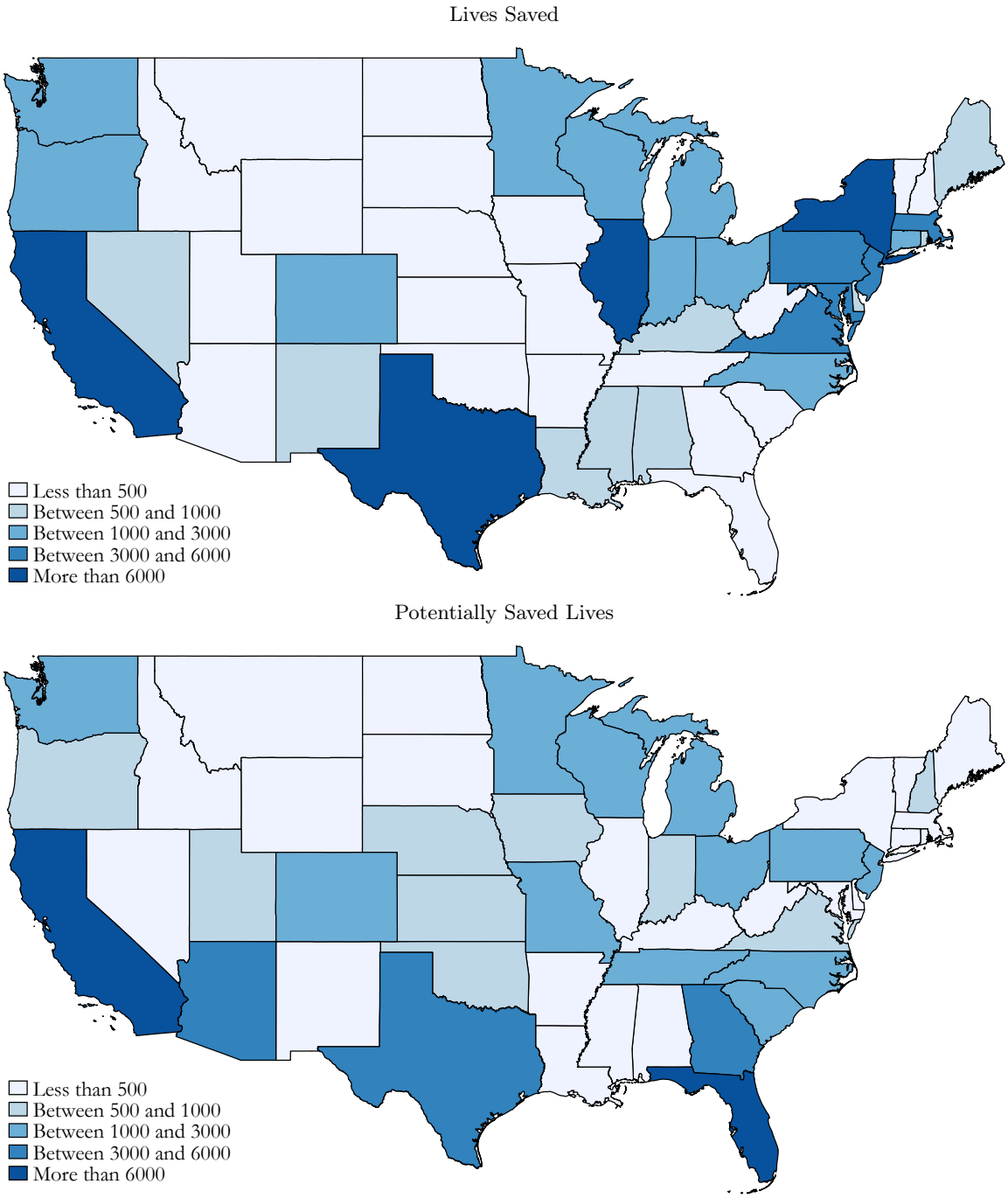
Table C9: Cases, hospital admissions, and deaths per 100,000 population, with and without controls for county level mask mandates

	(1)	(2)	(3)	(4)	(5)	(6)
State mask mandate	-55.22***	-57.08***	-0.74**	-0.75**	-11.46***	-11.20***
	[17.68]	[18.08]	[0.34]	[0.34]	[4.24]	[4.28]
Distance	0.17*	0.17*	0.00	0.00	0.03	0.03
	[0.10]	[0.10]	[0.00]	[0.00]	[0.02]	[0.02]
Distance^2	-0.00	-0.00	-0.00*	-0.00*	-0.00	-0.00
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
Lagged Mobility	-1.20***	-1.21***	-0.01	-0.01	0.00	0.00
	[0.41]	[0.40]	[0.01]	[0.01]	[0.07]	[0.07]
County mandates		-14.35		-0.10		1.23
		[19.40]		[0.60]		[3.66]
Constant	179.89***	181.85***	3.15***	3.16***	30.08***	29.81***
	[12.21]	[12.71]	[0.25]	[0.26]	[2.82]	[2.86]
Observations	45577	45577	41034	41034	22042	22042
R2	0.487	0.487	0.215	0.215	0.417	0.417

Source: Authors' calculations.
Notes: The estimates are based on data for 3107 counties over 48 weeks. Counties within 150 miles of a state border over which mask mandates vary are included. We lead cases(hospital admissions)[deaths] by 1(2)[4] weeks with respect to the state mask mandate dummy. All specifications include time and county fixed effects. Standard errors are clustered at specific pairwise state borders. ***, **, and * indicate statistical significance at 1, 5, and 10 percent, respectively. Mask mandates at the county level are coding from the database by Wright et al., 2020. Column 1(2) reports our results for cases not including (including) controls for county level mandates (without state level mandates). Column 3(4) and 5(6) report the same for hospitalizations and deaths, respectively.

E Extra Figures

Figure D1: State-by-State Effect of Mask Mandates



Note: Lives saved calculated using $\sum_c \left(\hat{\delta} + \hat{\omega} Proxy_c\right) * avg(mask_{c,t}) * weeks * population_c/100,000$ where $\hat{\delta}, \hat{\omega}$ are estimated in column 3 of Table 1(b), $Proxy_c$ is the proxy for attitudes towards mask wearing in county c, $avg(mask_{c,t})$ is the average of county c's mask mandate for the period of April 18 and December 19, 2020, $weeks$ is the number of weeks in that period, and $population_c$ is county c's population. Potentially saved lives use $1 - avg(mask_{c,t})$ instead of $avg(mask_{c,t})$ in the above formula.