

## SYNOPSIS

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# Review of “Association of State-Issued Mask Mandates and Allowing On-Premises Restaurant Dining with County-Level COVID-19 Case and Death Growth Rates — United States, March 1–December 31, 2020”

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## One-minute summary

- This study, by authors at the United States (US) Centers for Disease Control and Prevention, supports recommendations of universal masking and avoiding non-essential shared spaces to mitigate the spread of Coronavirus Disease 2019 (COVID-19). In this study, the non-essential indoor spaces considered were on-premises restaurant dining.
- A statistically significant decrease in daily COVID-19 case and death growth rates was associated with mandating mask use in the time periods '1-20', '21-40', '41-60', '61-80' and '81-100' days after implementation.
- Allowing on-premises restaurant dining was associated with a statistically significant increase in daily COVID-19 case growth rates '41-60', '61-80', and '81-100' days after implementation and a statistically significant increase in daily death growth rates '61-80' and '81-100' days after implementation.

## Additional information

- Data on state-issued mask mandates and restaurant closures at the county-level were obtained from state government websites. Mask mandates were defined as requirements for persons to wear a mask: 1) anywhere outside their home; or 2) in retail businesses and in restaurants/food establishments. Restaurant closures were defined as prohibitions on restaurants operating or limiting service to takeout, curbside pickup, or delivery. Allowing restaurants to provide indoor or outdoor on-premises dining was defined as the state lifting a state-issued restaurant closure order.

Review of “Association of State-Issued Mask Mandates and Allowing On-Premises Restaurant Dining with County-Level COVID-19 Case and Death Growth Rates — United States, March 1–December 31, 2020”.

- In April 2020, 39 states and the District of Columbia (DC) issued mask mandates. In March/April 2020, 49 states and DC prohibited any on-premises dining at restaurants. These restrictions were lifted by mid-June by all states and DC.
- During the period March 1 to December 31, 2020, county-level data on mask mandates and restaurant re-openings were compared with county-level changes in COVID-19 case and death growth rates relative to the mandate implementation and re-opening dates.
- The two outcomes that were examined were the daily percentage point growth rate of county-level COVID-19 cases and county-level COVID-19 deaths. The daily growth rate was defined as the difference between the natural log of cumulative cases or deaths on a given day and the natural log of cumulative cases or deaths on the previous day, multiplied by 100. Cumulative county-level COVID-19 case and death data were collected from state and local health department websites.
- State-issued mask mandates applied in 2,313 (73.6%) of the 3,142 US counties for the study period March 1 to December 31, 2020. Table 1 provides the time relative to the day the state mask mandate was implemented, the percentage point change in case growth rates and the associated p-value for statistical significance, the percentage point change in death growth rates and the associated p-value. For example, mask mandates were associated with a 0.5 percentage point decrease ( $p = 0.02$ ) in daily COVID-19 case growth rates and a 0.7 percentage point decrease ( $p=0.03$ ) in death growth rates 1–20 days after implementation.

**Table 1. Association between State-issued Mask Mandates and Changes in COVID-19 Case and Death Growth Rates**

Time Relative to the Day the State Mask Mandate was Implemented	Percentage Point Change in Case Growth Rates	P-value*	Percentage Point Change in Death Growth Rates
1-20 days before	Referent	Not applicable	Referent
1-20 days after	-0.5	0.02*	-0.7
21-40 days after	-1.1	<0.01*	-1.0
41-60 days after	-1.5	<0.01*	-1.4
61-80 days after	-1.7	<0.01*	-1.6
81-100 days after	-1.8	<0.01*	-1.9

\* <0.05 was considered statistically significant.

- During the study period, states allowed restaurants to reopen for on-premises dining in 3,076 (97.9%) US counties. Table 2 provides the time relative to the day the state allowed on-premises dining, the percentage point change in case growth rates and the associated p-value for statistical significance, the percentage point change in death growth rates and the associated p-value. For example, allowing on-premises dining at restaurants was associated with 0.9 ( $p = 0.02$ ) percentage point increase in the case growth rate 41–60 days after restrictions were lifted.

Allowing on-premises dining at restaurants was associated with 2.2 ( $p < 0.01$ ) percentage point increase in the death growth rate 61–80 days after restrictions were lifted.

**Table 2. Association between States Allowing Any On-Premises Restaurant Dining and Changes in COVID-19 Case and Death Growth Rates**

Time Relative to the Day the State Allowed On-Premises Dining	Percentage Point Change in Case Growth Rates	P-value*	Percentage Point Change in Death Growth Rates
1-20 days before	Referent	Not applicable	Referent
1-20 days after	-0.4	0.22	0.1
21-40 days after	-0.1	0.83	0.5
41-60 days after	0.9	0.02*	1.1
61-80 days after	1.2	<0.01*	2.2
81-100 days after	1.1	0.04*	3.0

\* <0.05 was considered statistically significant.

- The regression models controlled for restaurant closures in the mask mandate models and mask mandates in the restaurant reopening models, as well as bar closures, stay-at-home orders, bans on gatherings of  $\geq 10$  persons, daily COVID-19 tests per 100,000 persons, county and time (day).
- The authors’ note that COVID-19 case and death growth rates might have also increased because of persons engaging in close contact activities other than, or in addition to, on-premises restaurant dining.
- The authors’ noted the following limitations with the study:
  - The models did not control for other policies that might affect case and death rates, including other types of business closures, physical distancing recommendations, policies issued by localities, and variances granted by states to certain counties if variances were not made publicly available.
  - Compliance with and enforcement of policies were not measured.
  - The analysis did not differentiate between indoor and outdoor dining, adequacy of ventilation and adherence to physical distancing and occupancy requirements.

## PHO reviewer’s comments

- The methodology for this study is described well and controls for relevant variables such as concomitant measures where possible appears to be sound.
- The study findings provide additional evidence that public health measures such as universal masking mitigate the spread of and death rates from COVID-19, with this study demonstrating effect less than one month after implementation of state mask mandates.

- In addition, the study provides evidence to describe the increased risk of infection and death associated with opening non-essential, shared indoor spaces, noting particularly that dining makes mask use impossible due to eating and drinking on-premises. Increased community mask use and closure of shared, indoor settings where masks are not worn is expected to be important to control spread, particularly in the setting of community transmission.
- This study provides data from a time period when the US population was largely unvaccinated. Further, it represents a time period before the identified emergence of Variants of Concern (VOC) such as B.1.1.7. With increased transmissibility and potentially increased disease severity associated with VOC, risks for disease spread from exposure in indoor, unmasked settings may be higher.

## Citation

Ontario Agency for Health Protection and Promotion (Public Health Ontario). Association of state-issued mask mandates and allowing on-premises restaurant dining with county-level COVID-19 case and death growth rates — United States, March 1–December 31, 2020. Toronto, ON: Queen’s Printer for Ontario; 2021.

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