

Do Masks Matter in Kansas?

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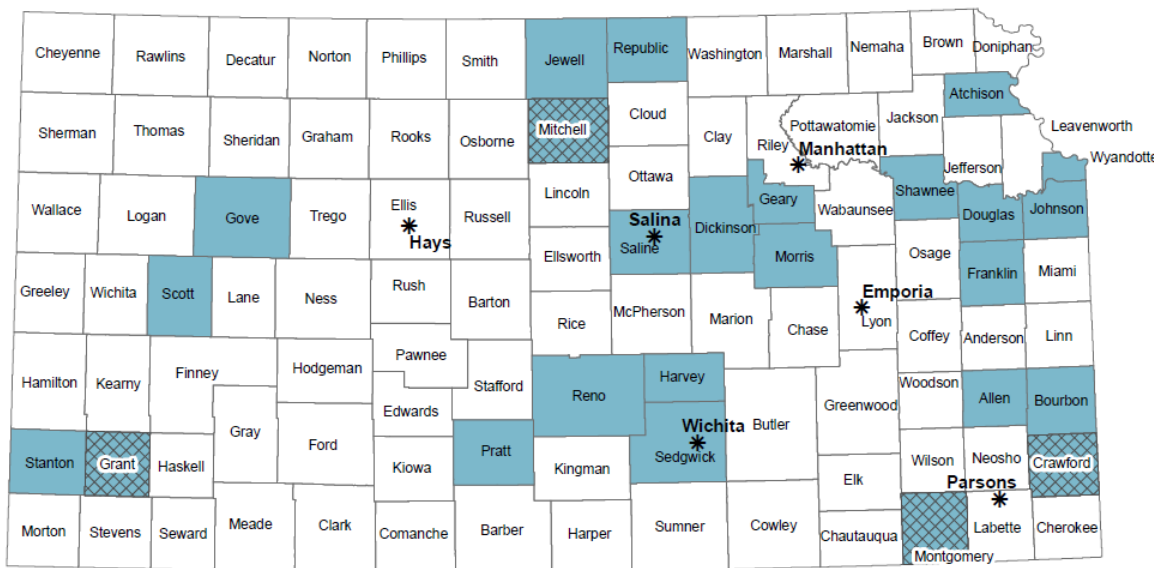
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KU INSTITUTE FOR
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Do Masks Work?

Mask Mandates in Kansas, by County
as of August 20, 2020



Source: Institute for Policy & Social Research, The University of Kansas; data from the Kansas Chamber and Kansas Health Institute.

- Adopted (or did not rescind Governor's) mask order
- Not enforcing mask order
- No county mask mandate
- * City mask mandate

- On July 3rd, the Governor implemented a mask mandate for the state of Kansas.
- Counties could opt-out of the mandate.
- Some cities imposed a mandate but the surrounding county did not
 - **Manhattan** has a mask mandate but Riley County does not.

Source: IPSR

Difference-in-Differences Model

	Before Change	After Change	Difference
Treatment (Masks)	Cases _{t1}	Cases _{t2}	ΔCases_t = Cases _{t2} - Cases _{t1}
Control (No Mask)	Cases _{c1}	Cases _{c2}	ΔCases_c = Cases _{c2} - Cases _{c1}
Difference			$\Delta\Delta\text{Cases}$ $\Delta\text{Cases}_t - \Delta\text{Cases}_c$

We can think of counties with a mask mandate as the treatment and counties without a mask mandate as the control. Taking the difference in the difference in cases for the treatment and control groups provides an estimate of the treatment effect of masks on cases.

Data

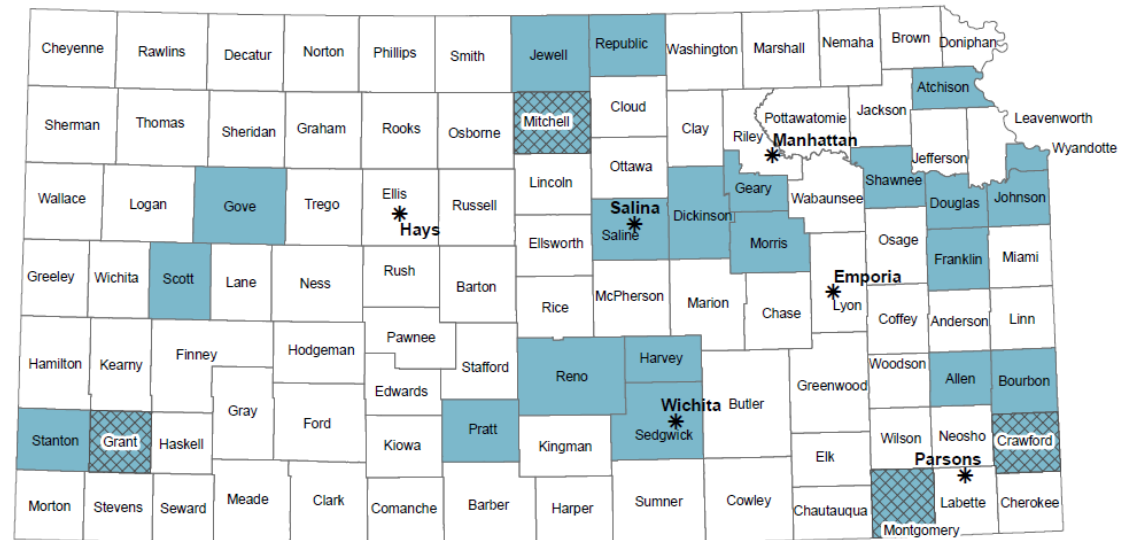
- Daily total number of cases per county March – October 11th
 - New York Times (<https://github.com/nytimes/covid-19-data>)
- 2019 Population per County
 - US Census Bureau
- City and County Face mask policies
 - Kansas Health Institute
(<https://www.khi.org/assets/uploads/news/15015/40830brieffinal102320sc.pdf>)
- Social Mobility Data
 - Maryland Transportation Institute
 - <https://data.covid.umd.edu>

Dates of County Mask Orders

New Counties

County	Date Adopted	Enforced
Geary	8/5/2020	Y
Gove	8/3/2020	Y
Grant	7/3/2020	N
Harvey	9/16/2020	Y
Morris	7/10/2020	Y
Pratt	7/16/2020	Y
Republic	8/4/2020	Y
Saline	7/9/2020	Y
Scott	8/10/2020	Y
Sedgwick	9/9/2020	Y
Stanton	7/23/2020	Y

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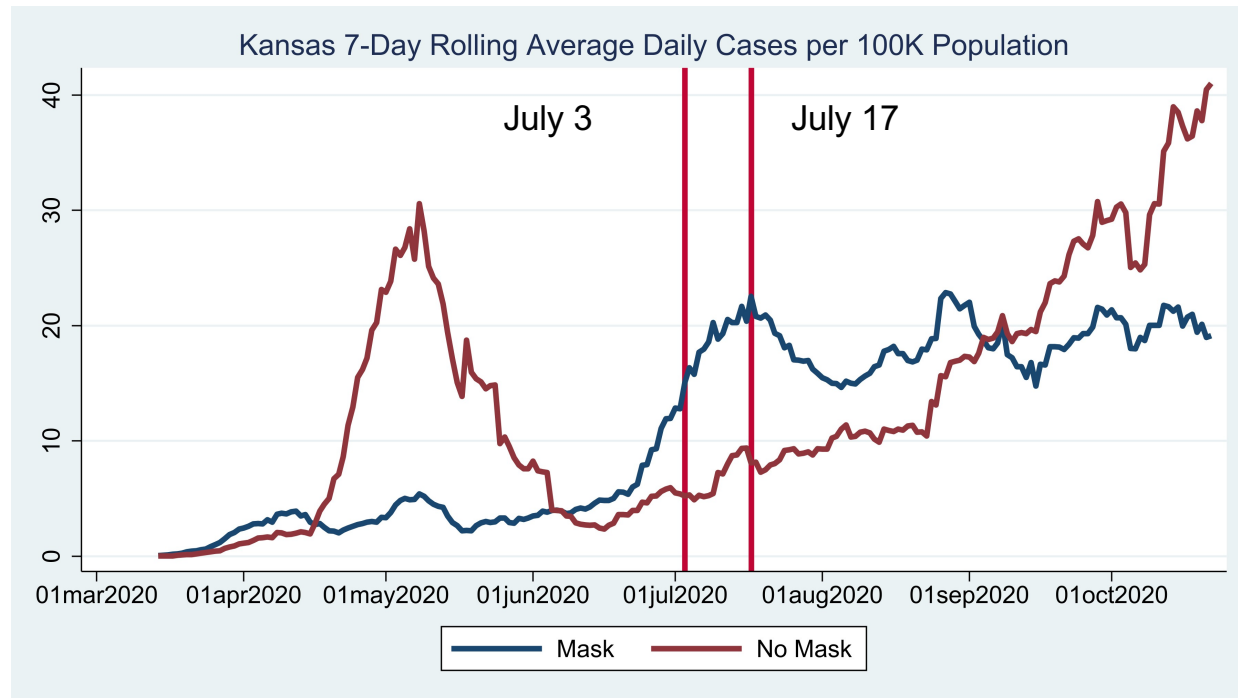


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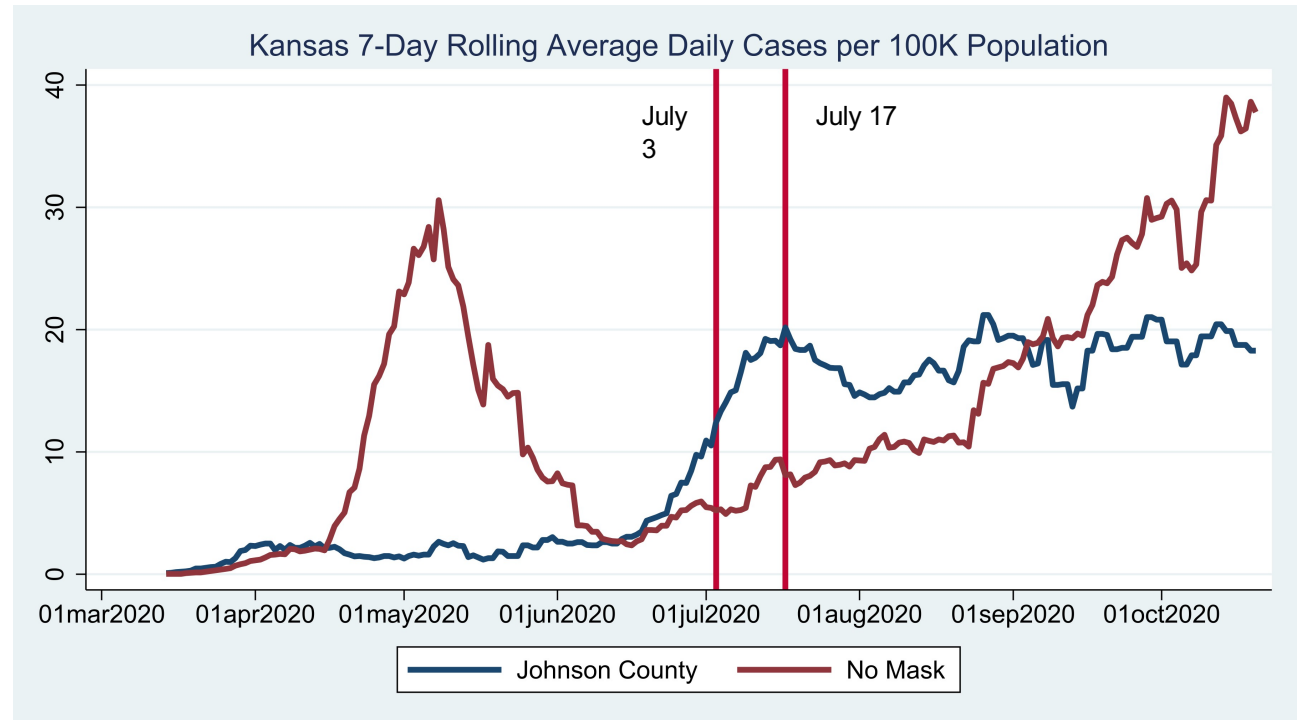
Kansas 7-Day Rolling Average Daily Cases per 100K Population

- Counties with a mask mandate saw a decrease starting 14 days after the mandate
- New spikes afterwards despite mandate
- Mask counties held cases flat
- No-Mask counties steadily increasing



Johnson County vs. No Mask Counties 7-Day Rolling Average

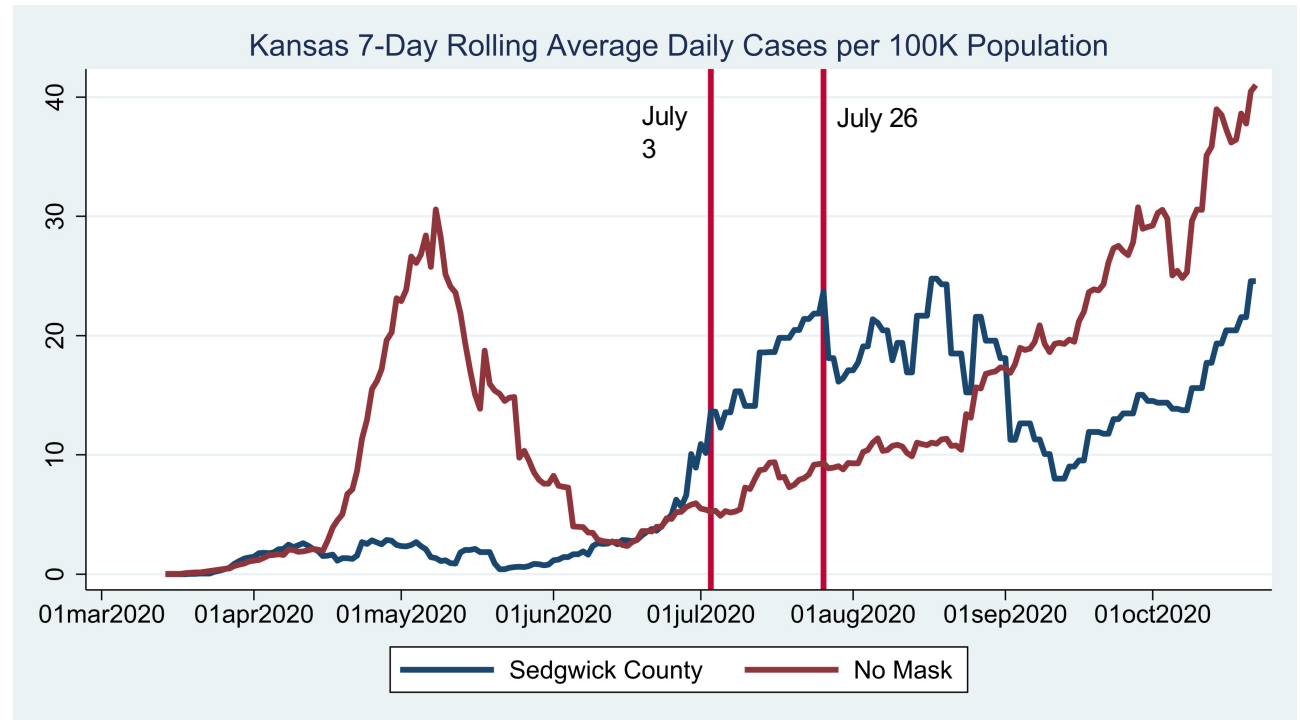
- Johnson County had a decrease starting 14 days after the mandate
- Results are not increasing over time for Johnson County
- No-Mask counties now have much higher case rates than Johnson County



Carlos Zambrana, PhD & Donna K. Ginther PhD

Sedgwick County vs. No Mask Counties 7-Day Rolling Average

- Sedgwick County had a decrease starting 23 days after the mandate
- No-Mask counties now have much higher case rates than Sedgwick County



Difference-in-Differences Model

What is the average effect starting 21 days after the mandate?

$$Y_{it} = \alpha + \beta \text{MandateN}_{it} + \eta X_t + \gamma_t + \delta_t + \epsilon_{it}$$

Where:

- Y_{it} : Daily cases in county i at day t
- MandateN_{it} : Dummy equal to one **starting N = 21 days since mask mandate** in county i , and zero otherwise
- X_t : A vector with variables controlling for social distancing behavior
- γ_t : A vector with day fixed effects
- δ_t : A vector with county fixed effects
- ϵ_{it} : Error term

Difference-in-Difference Estimates

- Mask mandate associated with an average 7 fewer cases per day in Kansas and 6.5 fewer cases in Johnson County (50% reduction)
- Sedgwick County: between 9 fewer cases (61% reduction)
- Analysis drops counties that had late mandate, no enforcement or city-only mandates.

VARIABLES	Full Sample		Johnson	Sedgwick
Mask Mandate + 21 days	-7.30*** (1.13)	-7.12*** (1.15)	-6.49* (3.88)	-9.12** (4.29)
Constant	-3.92 (5.69)	-13.46 (9.09)	-15.27 (9.62)	-12.12 (10.64)
Observations	11,424	11,424	9,928	10,074
R-squared	0.24	0.24	0.25	0.23
Number of Counties	84	84	73	73
Average New Daily Cases	14.27		14.99	
County FE	Y	Y	Y	Y
Day FE	Y	Y	Y	Y

Note: Non-Enforcers, Late Adopters and Mixed Counties dropped. Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Do Masks Work in Kansas?

- Yes!
- We found a 50% reduction in the spread of COVID-19 in counties that had a mask mandate compared to those without.
- Masks do not eliminate COVID, but they significantly slow the spread of the disease.

Thank You!

Thank You *Mahalo*
Kiitos
Tack
Grazie **Thanks**
Toda
Obrigado
Takk **Gracias** *Merci*
Danke

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