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**COVID-19 Trends in Jasper County, MO, Newton County, MO, Tulsa  
County, OK and Neighboring Counties**

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The mission of the Lerner Center for Public Health Promotion at Syracuse University is to improve population health through applied research and evaluation, education, engaged service, and advocating for evidence-based policy and practice change.

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## 1. Introduction

This report describes trends in COVID-19 confirmed positive cases and deaths from March 1 to July 7, 2020 for three focal counties (Jasper County, MO, Newton County, MO, and Tulsa County, OK) and their neighboring counties. Neighboring counties are included to help readers understand the potential for spillover effects that may occur as a result of commuting across county borders for work, shopping, etc. Neighboring counties in Missouri include Barton, Dade, Lawrence, McDonald, and Barry. Neighboring counties in Oklahoma include Creek, Okmulgee, Wagoner, Rogers, Washington, Osage, and Pawnee. In addition to presenting trends in COVID-19 cases and deaths, we also present maps showing how COVID-19 health risk (described in the Data and Methods section below) varies across MO and OK counties. Counties with higher health risk scores are at risk of experiencing high rates of hospitalization and death should there be a COVID-19 outbreak in that county.

## 2. Data and Methods

### *COVID-19 Cases and Deaths*

Data on COVID-19 confirmed positive cases and deaths were retrieved from USA Facts (<https://usafacts.org/visualizations/coronavirus-covid-19-spread-map/>). Data are represented from March 1 to July 7, 2020. For each of the focal and neighboring counties, we present trends in *new daily cases* (new confirmed positive cases each day); *the infection rate* (cumulative number of confirmed positive cases per 100,000 population); *daily COVID-19 deaths* (new deaths attributable to COVID-19); and the *COVID-19 mortality rate* (cumulative deaths per 100,000 population).

We also constructed COVID-19 interactive dashboards for both states. In these dashboards, we present data on all counties within Missouri and Oklahoma. In this report, we describe trends for the 15 focal counties only.

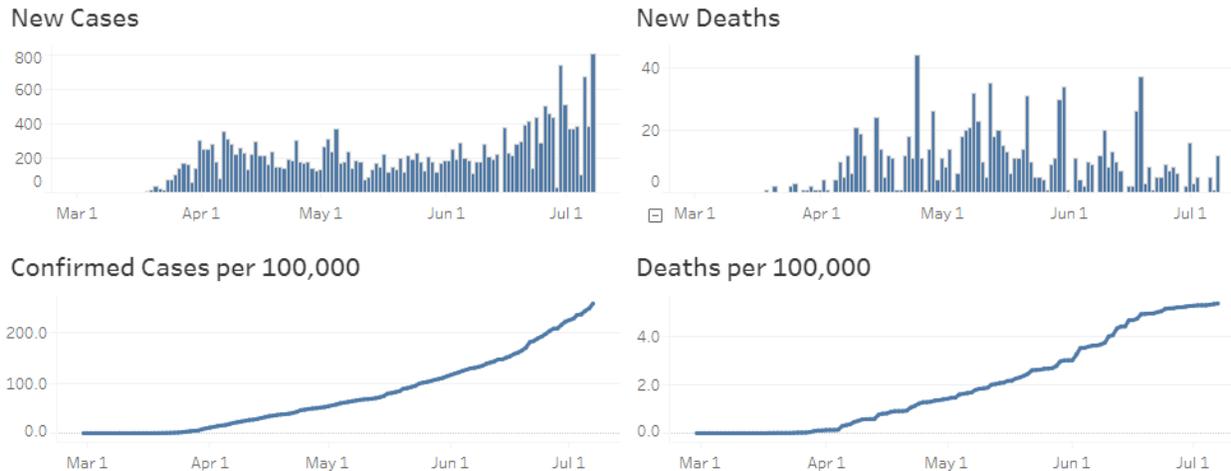
Missouri: <https://public.tableau.com/profile/lernercenter#!/vizhome/MissouriStateCOVID-19/MO>.

Oklahoma: [https://public.tableau.com/profile/lernercenter#!/vizhome/OklahomaStateCOVID-19\\_15934560456160/OK](https://public.tableau.com/profile/lernercenter#!/vizhome/OklahomaStateCOVID-19_15934560456160/OK)

The bar charts and time series charts on the interactive dashboard home screen and shown below (when no individual county is selected) represent the total new cases and deaths for Missouri and Oklahoma, respectively, and the average case and death rates among all counties in each state. Clicking on any individual county within the COVID-19 Cases and Deaths map will bring up the case and death data for that county in the bar and line charts in the bottom half of the dashboard.

### **Missouri**

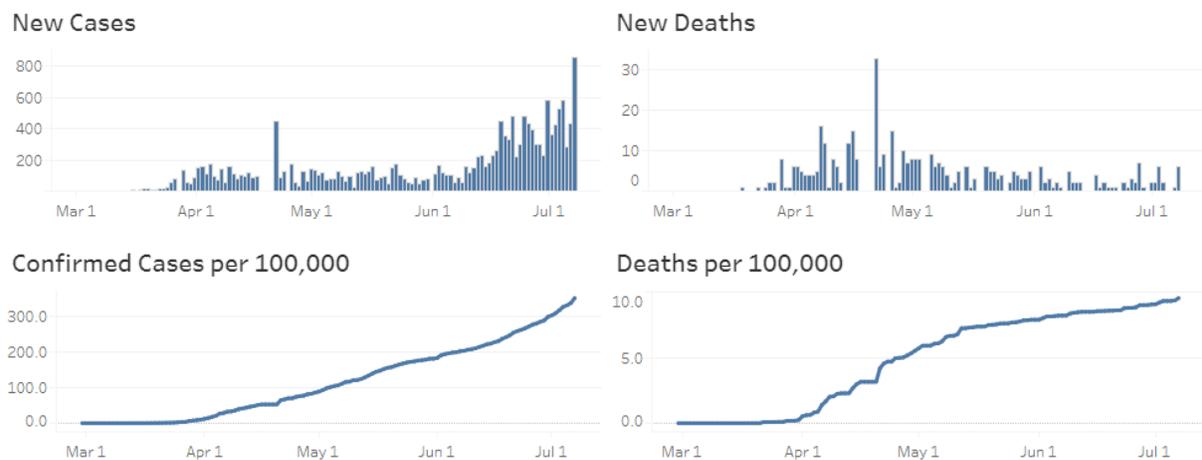
As of July 7, 2020, there were 24,620 confirmed COVID-19 cases (total state rate of 401.1 per 100,000 persons; average county rate of 257.3 per 100,000 persons) and 1,040 total deaths (total state rate of 16.9 per 100,000 persons; average county rate of 5.3 per 100,000 persons) in Missouri.



**Figure 1. COVID-19 Case Count and Death Trends for Missouri, Mar. 1-July 7, 2020**

### **Oklahoma**

As of July 7, 2020, there were 17,219 confirmed COVID-19 cases (total state rate of 435.2 per 100,000 persons; average county rate of 348.6 per 100,000 persons) and 404 total deaths (total state rate of 10.2 per 100,000 persons; average county rate of 9.5 per 100,000 persons) in Oklahoma.

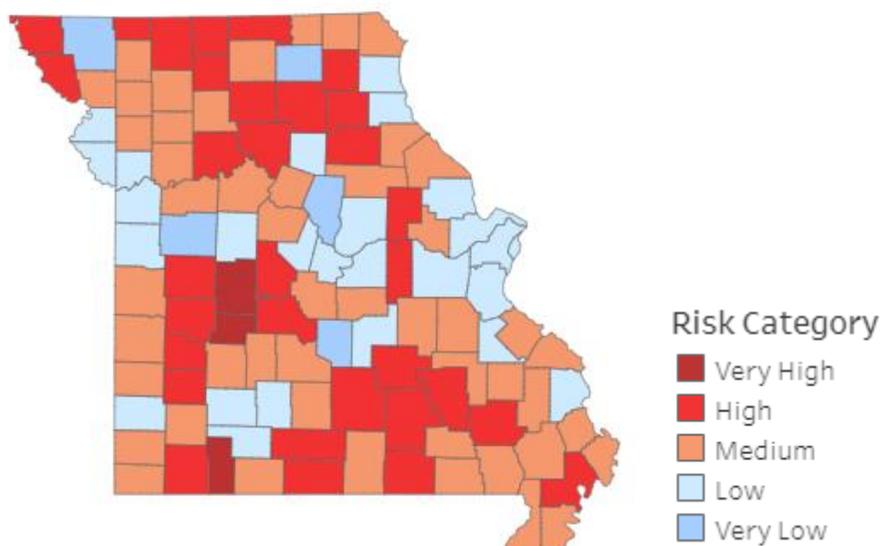


**Figure 2. COVID-19 Case Count and Death Trends for Oklahoma, Mar. 1-July 7, 2020**

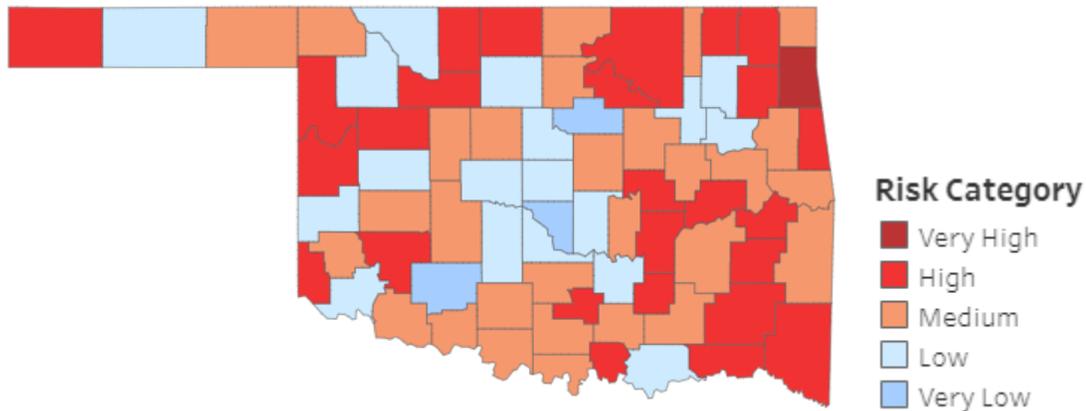
### ***COVID-19 Health Risk***

The COVID-19 Health Risk Indices for Missouri and Oklahoma Counties represent weighted sums of county-level prevalence of several chronic health conditions that increase risk of severe complications, hospitalization, and death should someone become infected with COVID-19. Counties with higher prevalence scores are at greater risk. The index includes the following variables: estimated percentage of adults ever diagnosed with chronic obstructive pulmonary disease, emphysema, or chronic bronchitis; estimated percentage of adults ever diagnosed with diabetes; estimated percentage of adults ever diagnosed with heart disease; estimated percentage of adults ever diagnosed with high blood pressure; estimated percentage of adults reporting to be obese (a body mass index of 30 or greater); and estimated percentage of residents who are age 65 and older (2014-18). The chronic health indicator data are from Policy Map (<https://www.policymap.com/>). Percentage age 65 and older is from the U.S. Census American Community Survey (<https://www.census.gov/programs-surveys/acs>).

Values for each risk indicator were standardized for each county (separately within MO and OK) to have a mean of 0 and standard deviation of 1. Each standardized indicator was then weighted by its correlation with the total group of indicators and then summed (Cronbach's alpha for OK=0.97 and for MO=0.96, indicating very high internal consistency on both indices). The summed total was then standardized to have a mean of 0 and standard deviation of 1, such that a value of 0 represents a county with an average health risk score among all counties within the state. Values greater than 0 represent above average health risk, and values below 0 represent below average health risk. In the map, counties are categorized as follows: Very High (2+ standard deviations above the average), High (between 0.5 and 2 standard deviations above the average), Medium (between 0.5 standard deviation above and 0.5 standard deviation below the average), Low (between 0.5 and 2 standard deviations below the average), Very Low (2+ standard deviations below the average). In Missouri, county scores range from a low of -3.2 (lowest risk) to a high of 2.9 (highest risk). In Oklahoma, county scores range from a low of -3.3 to to a high of 2.0.

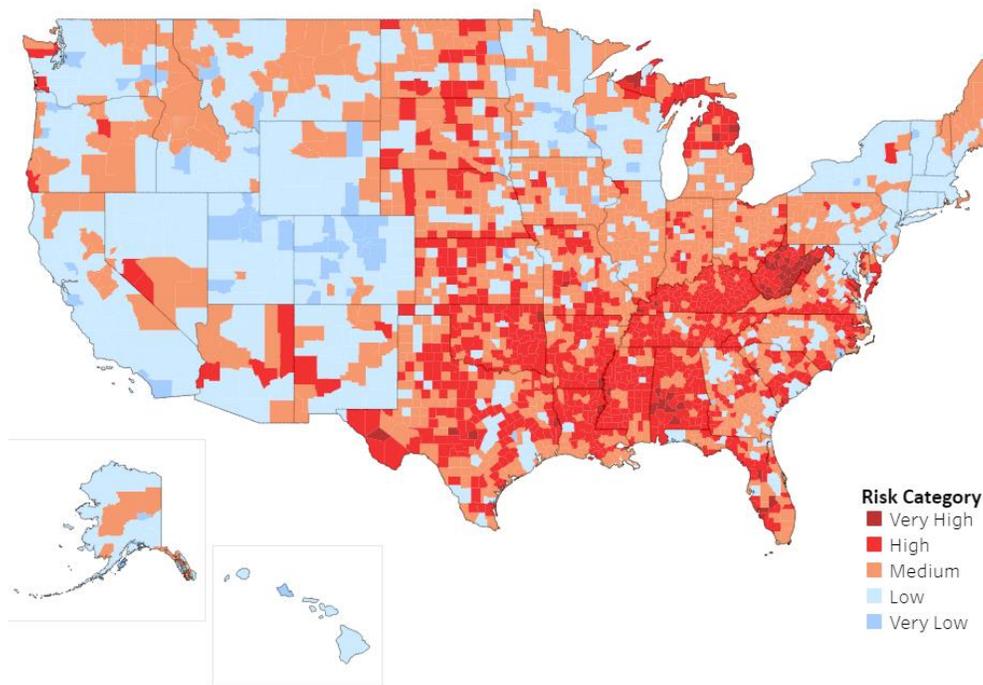


**Figure 3. COVID-19 Health Risk Index for Missouri Counties**



**Figure 4. COVID-19 Health Risk Index for Oklahoma Counties**

Note that these maps show each county's value on the Health Risk Index standardized within Missouri state and Oklahoma state. This means that the counties' scores are relative only to other counties in the same state. They are not comparable across states. To see the national map and how MO and OK counties compare nationally (and to each other), click [here](#) (and see below) In the national map, counties are categorized based on their standardized index value compared to *all* U.S. counties. Nationally, Oklahoma performs quite poorly, with most counties having high health risk (including most of the counties neighboring Tulsa), and only three displaying low health risk. Tulsa is in the 'Medium' category nationally. In Missouri, Hickory is the only county in the 'Very High' category, but several Missouri counties fall into the 'high' category, including Barry (which neighbors Newton) and Dade (which neighbors Jasper). Nationally, Newton falls into the 'Medium' category, and Jasper is categorized as having 'Low' health risk.



**Figure 5. COVID-19 Health Risk Index for U.S. Counties**

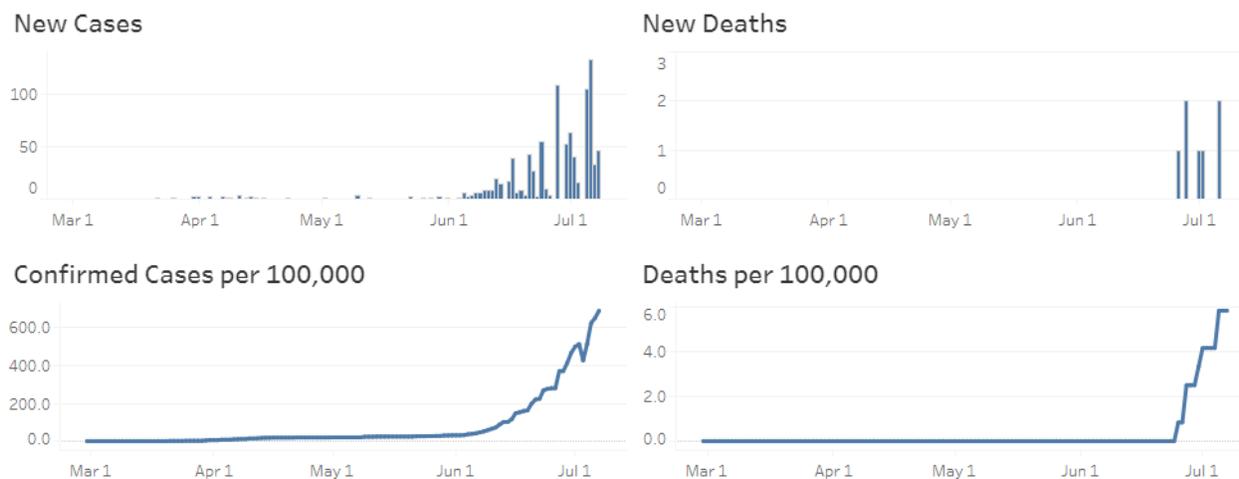
Important to note is that this index does not predict which counties are at risk of high rates of COVID-19 spread, but rather predicts risk of high rates of hospitalization, serious complications, and death should the county experience a surge in cases. Counties that have experienced case surges so far are not always the same counties have the highest health risk. In general, [rural counties have higher health risk](#) given their older age composition and greater prevalence of chronic health conditions.

### 3. COVID-19 Trends and Health Risk for Missouri Counties

Below we describe COVID-19 case count and death trends and COVID-19 health risk for Jasper and Newton counties and their neighboring counties. The interactive dashboard can be accessed [here](#).

#### *Jasper County, MO*

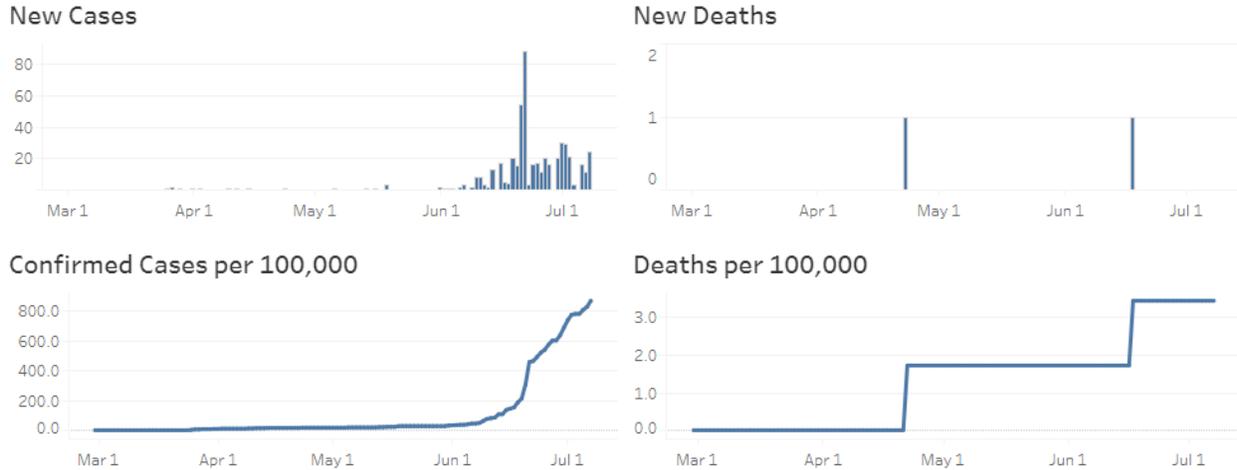
As of July 7, 2020, there were 833 confirmed COVID-19 cases (rate=686.6 per 100,000 persons) and 7 total deaths (rate=5.8 per 100,000 persons) in Jasper County, Missouri. Case counts remained relatively flat until early June, after which, they surged. Jasper County ranks low on the COVID-19 Health Risk Index, with an index score of -1.0 (average=0) and a rank 101 out of 115 counties.



**Figure 6. COVID-19 Case Count and Death Trends for Jasper County, MO, Mar. 1-July 7, 2020**

#### *Newton County, MO*

As of July 7, 2020, there were 502 confirmed COVID-19 cases (rate=862.0 per 100,000 persons) and 2 total deaths (rate=3.4 per 100,000) in Newton County, Missouri. Case counts remained relatively flat until early June, after which, they increased rapidly, but then appears to level off throughout late June and early July. The largest single day increase was on June 21, when there were 88 new positive cases reported. Newton County has medium health risk with a score of -0.3 (average=0) and ranks 74<sup>th</sup> out of 115 counties.

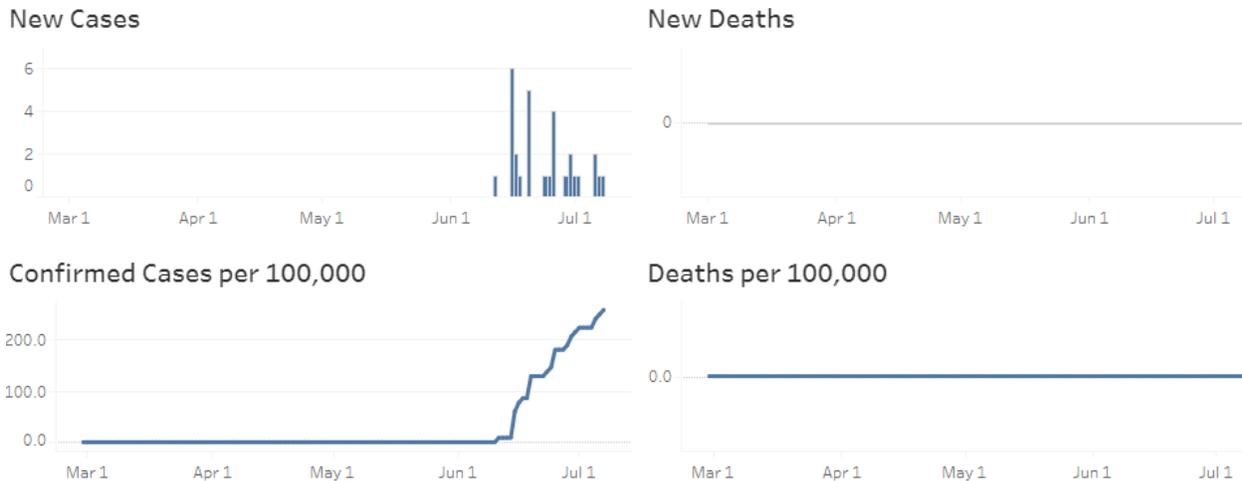


**Figure 7. COVID-19 Case Count and Death Trends for Newton County, MO, Mar. 1-July 7, 2020**

## Neighboring Counties

### *Barton County, MO*

As of July 7, 2020, there were 30 confirmed COVID-19 cases (rate=255.2 per 100,000 persons) and no deaths in Barton County, Missouri. The largest single day report of cases has been six. Barton County has medium health risk with a score of 0.4 (average=0) and ranks 44<sup>th</sup> out of 115 counties.



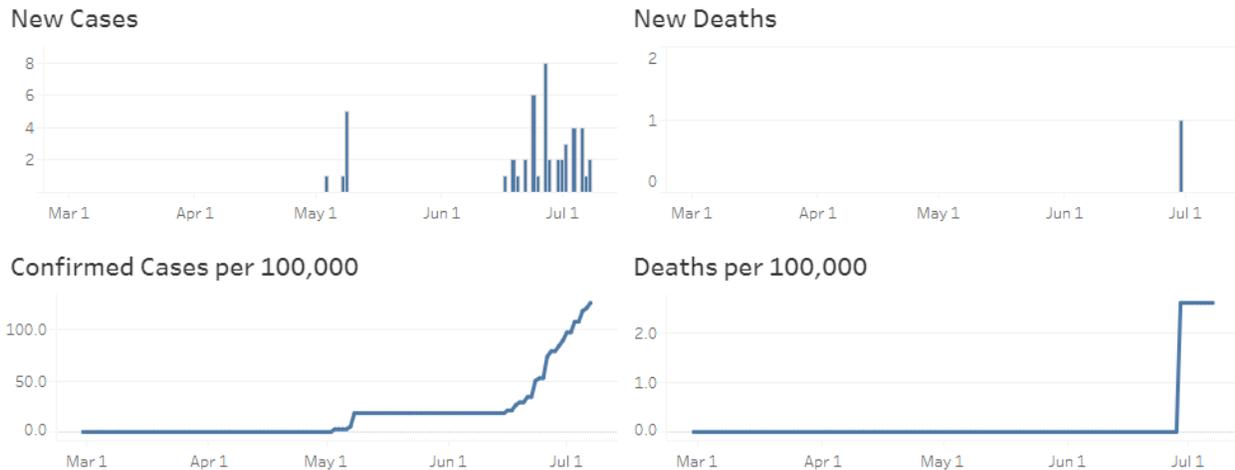
**Figure 8. COVID-19 Case Count and Death Trends for Barton County, MO, Mar. 1-July 7, 2020**

### *Dade County, MO*

Dade County has only one confirmed case and zero deaths as of July 7, 2020, so we do not show figures for Dade County below. However, Dade County has high health risk, meaning that should cases surge (which is possible given its adjacency to Jasper County), Dade County is at risk of high rates of hospitalization and death. Dade ranks 11<sup>th</sup> out of 115 counties on health risk vulnerability, with an index score of 1.2 (avg=0).

**Lawrence County, MO**

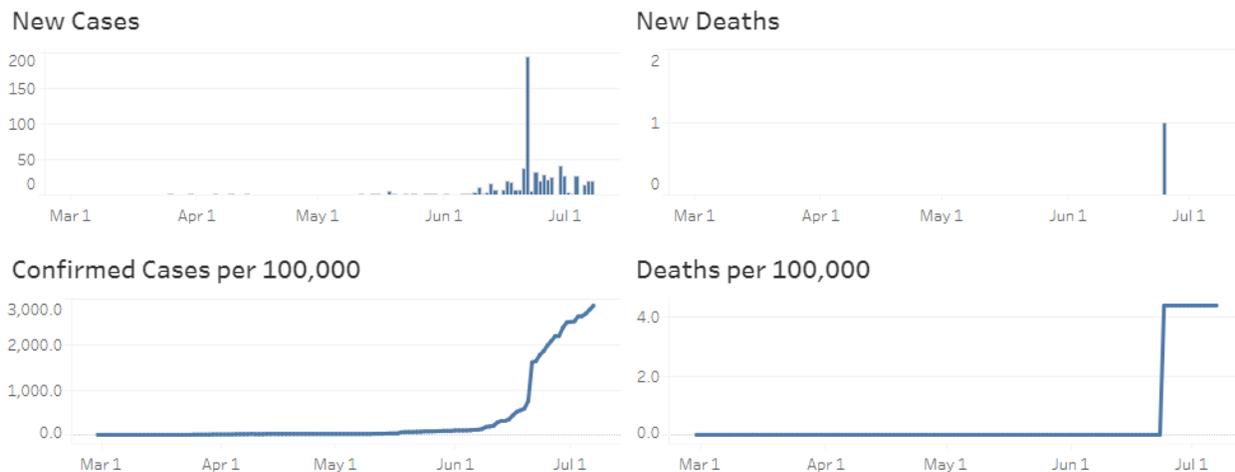
As of July 7, 2020, there were 48 confirmed COVID-19 cases (rate=125.1 per 100,000 persons) and one death in Lawrence County, Missouri. There were a few isolated cases in May, but then no new cases until mid-June. Cases increased throughout late June (but never reached more than eight new cases in a day) and then began to level off in July and are currently holding steady at between one and four new cases daily. Lawrence County has medium health risk with a score of 0.1 (avg=0) and ranks 57<sup>th</sup> out of 115 counties.



**Figure 9. COVID-19 Case Count and Death Trends for Lawrence County, MO, Mar. 1-July 7, 2020**

**McDonald County, MO**

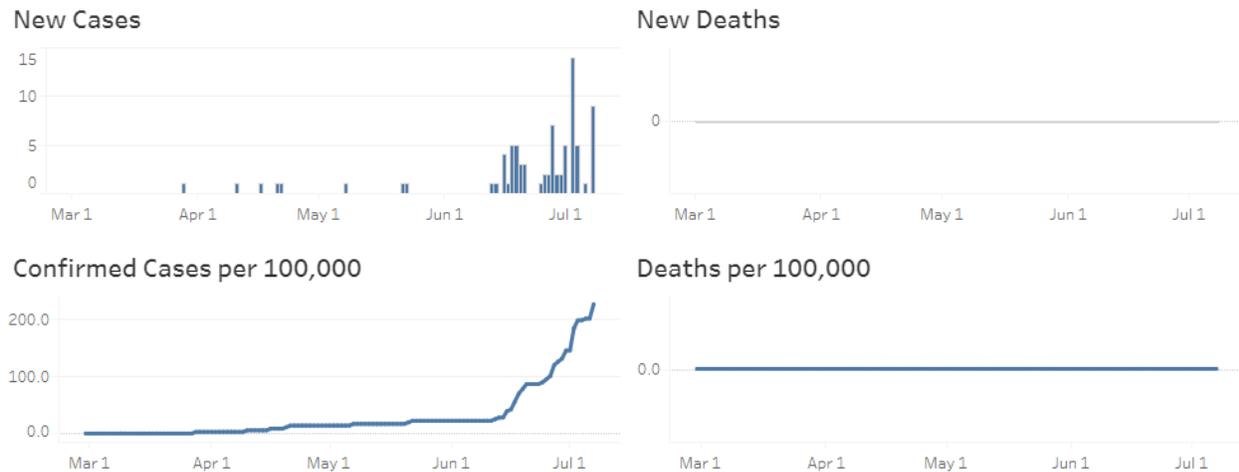
McDonald County has the highest COVID-19 infection rate in Missouri. As of July 7, 2020, there were 652 confirmed COVID-19 cases (rate=2,855.0 per 100,000 persons) and one death. New cases peaked on June 21 (with 196 new cases), thanks at least in part to an outbreak at the Tyson chicken plant in Noel. New cases have fluctuated between the teens and 40s since then. McDonald County has medium health risk with a score of -0.4 (avg=0) and ranks 76<sup>th</sup> out of 115 counties.



**Figure 10. COVID-19 Case Count and Death Trends for McDonald County, MO, Mar. 1-July 7, 2020**

### ***Barry County, MO***

As of July 7, 2020, there were 81 confirmed COVID-19 cases (rate=226.3 per 100,000 persons) and no deaths in Barry County, Missouri. There were instances of single daily cases scattered throughout April and May, but new cases began increasing in mid-June and continued to rise in early July. The largest single day report of new cases was 14 on July 2. Barry County has medium health risk with a score of 0.8 (avg=0) and ranks 20<sup>th</sup> out of 115 counties.



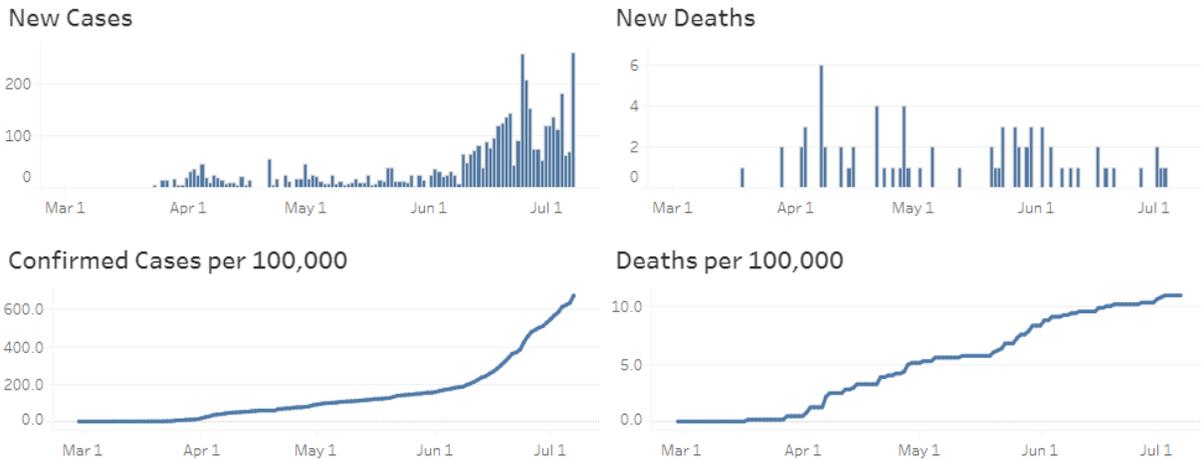
**Figure 11. COVID-19 Case Count and Death Trends for Barry County, MO, Mar. 1-July 7, 2020**

## **4. COVID-19 Trends and Health Risk for Oklahoma Counties**

Below we describe COVID-19 case count and death trends and COVID-19 health risk for Tulsa County, OK and its neighboring counties. The interactive dashboard can be accessed [here](#).

### ***Tulsa County, OK***

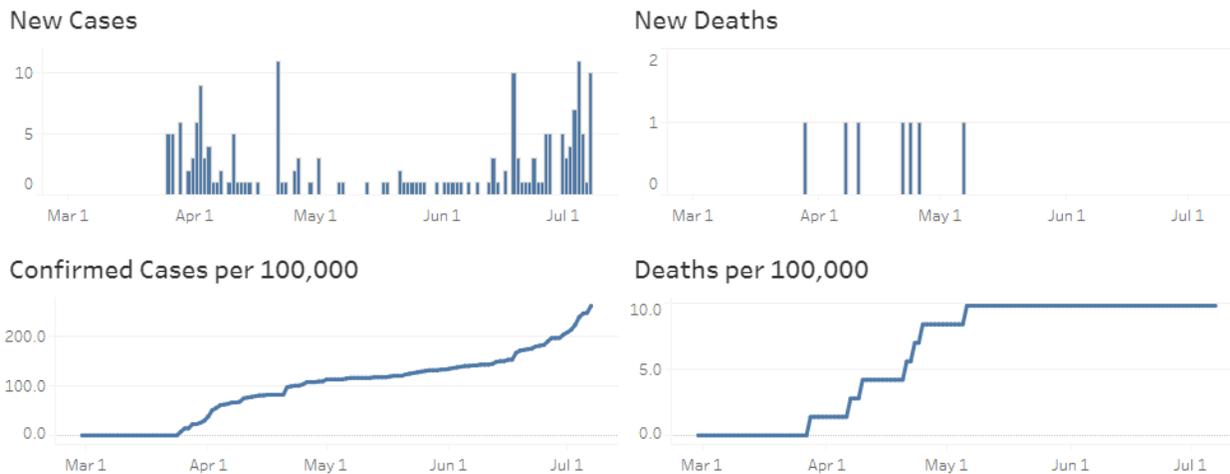
As of July 7, 2020, there were 4,365 confirmed COVID-19 cases (rate=669.9 per 100,000 persons) and 71 deaths (rate=10.9 per 100,000 population) in Tulsa County, Oklahoma. Tulsa is currently a U.S. hotspot for COVID-19, with large increases in the past two weeks. There were steady new positive cases (in the low hundreds) throughout April, May, and early-June. Cases began to increase at a faster rate in mid- and late-June but surged in July to over an average of 500 new cases per day. The rapid rate of increase in Tulsa County over the past two weeks is concerning, and we are likely to see increases in deaths follow in the next 2-4 weeks. Tulsa County has a low health risk index score of -1.4 (avg=0) and ranks 71<sup>st</sup> out of 77 counties. The somewhat healthier population of Tulsa is a potential buffer against extremely high hospitalization and death rates in that county, but the neighboring counties of Pawnee and Osage have high health risk, and viruses do not stop at county borders. High infection rates in Tulsa could spill over into these high risk adjacent counties.



**Figure 12. COVID-19 Case Count and Death Trends for Tulsa County, OK, Mar. 1-July 7, 2020**

***Creek County, OK***

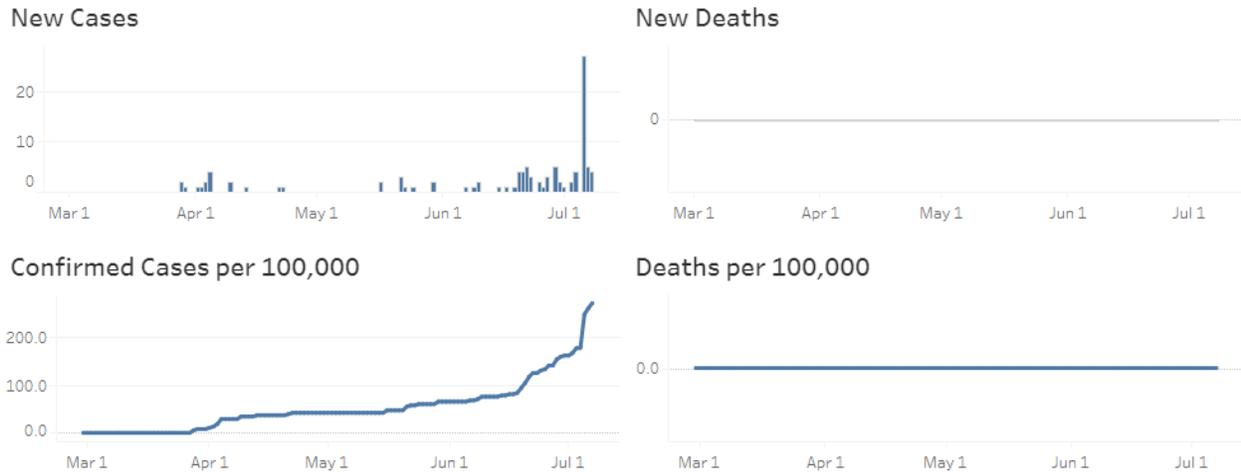
As of July 7, 2020, there were 185 confirmed COVID-19 cases (rate=258.7 per 100,000 persons) and seven deaths (rate=9.8 per 100,000 persons) in Creek County, Oklahoma. There were new case clusters in late-March and mid-April. There were no new cases throughout most of May, and then a few new cases per day throughout most of June and early-July. Creek County has a medium health risk index score of -0.3 (avg=0) and ranks 52<sup>nd</sup> out of 77 counties.



**Figure 13. COVID-19 Case Count and Death Trends for Creek County, OK, Mar. 1-July 7, 2020**

***Okmulgee County, OK***

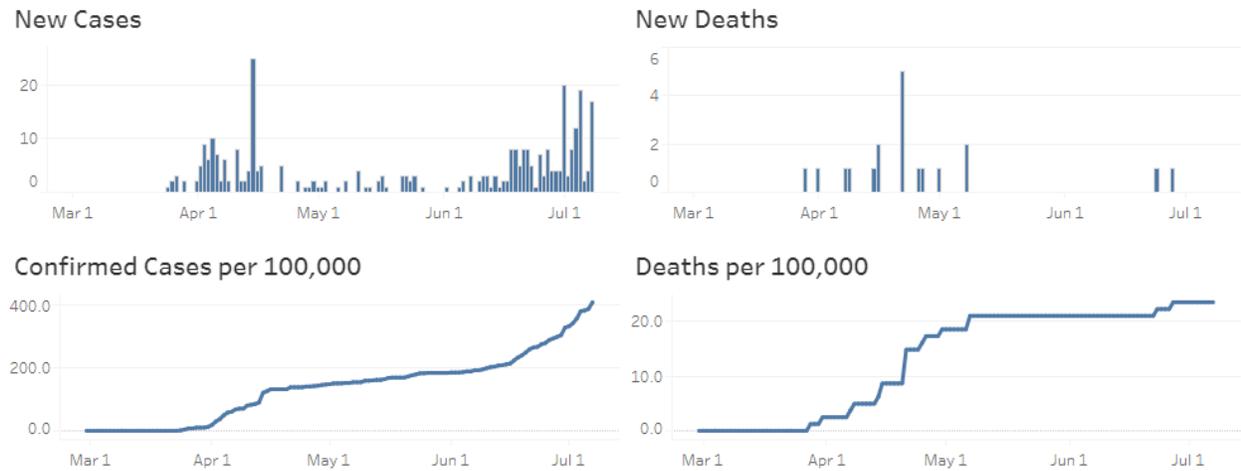
As of July 7, 2020, there were 104 confirmed COVID-19 cases (rate=270.4 per 100,000 persons) and no deaths in Okmulgee County, Oklahoma. There were only a few confirmed cases in April-June, followed by a spike of 27 cases on July 5. Okmulgee County has a medium health risk index score of -0.1 (avg=0) and ranks 48<sup>th</sup> out of 77 counties.



**Figure 14. COVID-19 Case Count and Death Trends for Okmulgee County, OK, Mar. 1-July 7, 2020**

***Wagoner County, OK***

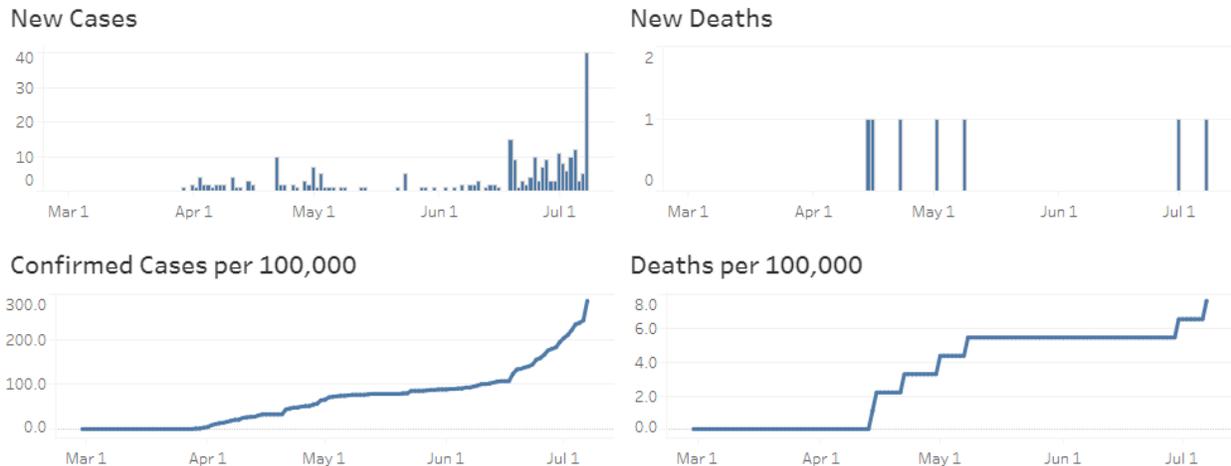
As of July 7, 2020, there were 331 confirmed COVID-19 cases (rate=407.2 per 100,000 persons) and 19 deaths (rate=23.4 per 100,000 persons) in Wagoner County, Oklahoma. There were increases in new cases throughout April and then cases held fairly steady in May and early-June. Cases have grown since mid-June with large spikes in early-July. Wagoner County has a low health risk index score of -1.1 (avg=0) and ranks 68<sup>th</sup> out of 77 counties.



**Figure 15. COVID-19 Case Count and Death Trends for Wagoner County, OK, Mar. 1-July 7, 2020**

***Rogers County, OK***

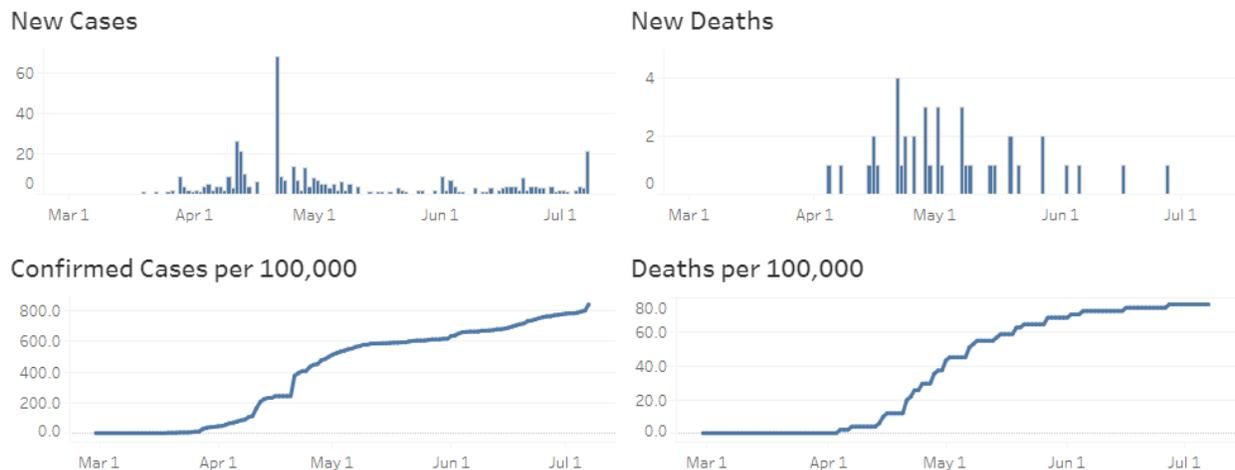
As of July 7, 2020, there were 262 confirmed COVID-19 cases (rate=283.4 per 100,000 persons) and seven deaths (rate=7.6 per 100,000 persons) in Rogers County, Oklahoma. There were only a handful of new cases daily throughout most of April through June. However, cases began to increase in late-June and early-July and then spiked on July 7. Rogers County has a low health risk index score of -0.7 (avg=0) and ranks 57<sup>th</sup> out of 77 counties.



**Figure 16. COVID-19 Case Count and Death Trends for Rogers County, OK, Mar. 1-July 7, 2020**

### ***Washington County, OK***

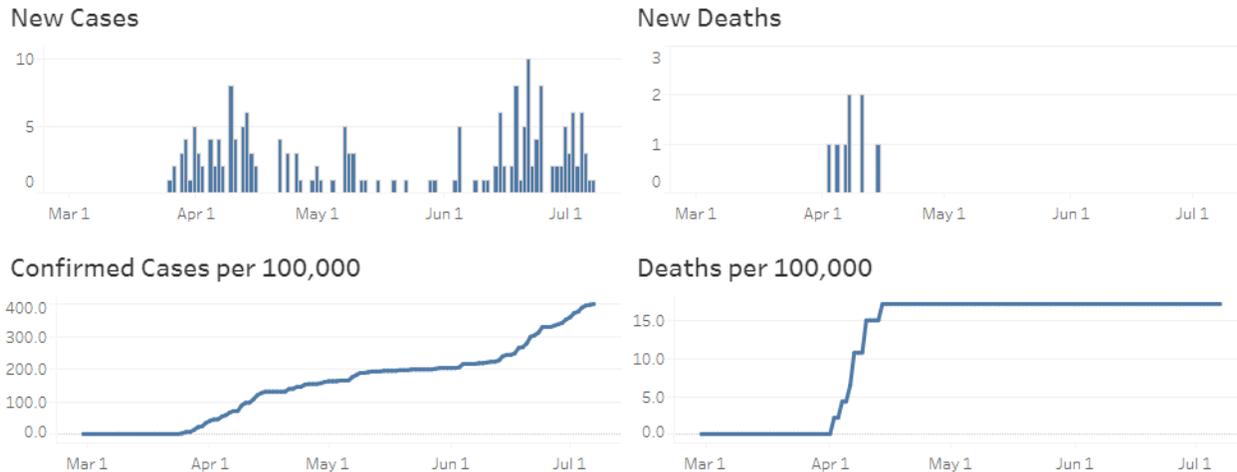
As of July 7, 2020, there were 431 confirmed COVID-19 cases (rate=836.5 per 100,000 persons) and 39 deaths (rate=75.7 per 100,000 persons) in Washington County, Oklahoma. Cases increased in April, spike on April 21, then declined through May and held low and steady throughout June and early-July. July 7 saw the highest new case count since April 22. Washington County has a medium health risk index score of 0.4 (avg=0) and ranks 32<sup>nd</sup> out of 77 counties.



**Figure 17. COVID-19 Case Count and Death Trends for Washington County, OK, Mar. 1-July 7, 2020**

### ***Osage County, OK***

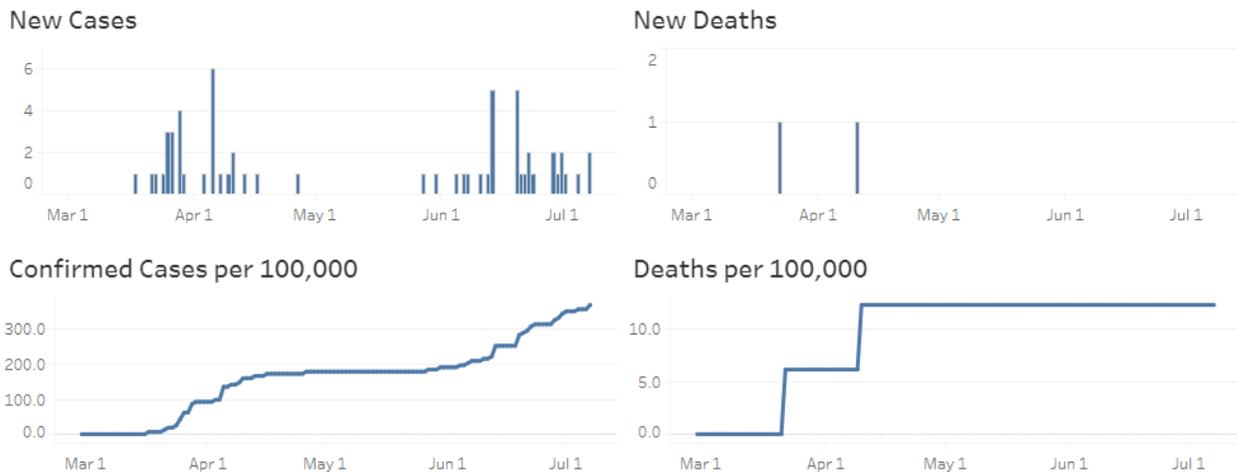
As of July 7, 2020, there were 187 confirmed COVID-19 cases (rate=398.2 per 100,000 persons) and eight deaths (rate=17.0 per 100,000 persons) in Osage County, Oklahoma. New cases have fluctuated since April, with spikes observable in mid-April, late-June, and early-July. There have been no new deaths since April 14. Osage County has a high health risk index score of 0.6 (avg=0) and ranks 23<sup>rd</sup> out of 77 counties, meaning that if there is a surge in cases, it could mean high rates of hospitalization and death in this county.



**Figure 18. COVID-19 Case Count and Death Trends for Osage County, OK, Mar. 1-July 7, 2020**

### *Pawnee County, OK*

As of July 7, 2020, there were 60 confirmed COVID-19 cases (rate=366.4 per 100,000 persons) and two deaths in Pawnee County, Oklahoma. There has been little discernible pattern in new cases, though no new cases were reported throughout much of May. Pawnee County has a high health risk index score of 0.5 (avg=0) and ranks 27<sup>th</sup> out of 77 counties, again meaning that if there is a surge in cases, it could lead to high rates of hospitalization and death in this county.



**Figure 19. COVID-19 Case Count and Death Trends for Pawnee County, OK, Mar. 1-July 7, 2020**

## 5. Summary

The COVID-19 landscape is in constant flux. Very few of the counties highlighted in this report have a discernible pattern that enables prediction related to future trends in infections and deaths. In general, the increase in COVID-19 cases in both Missouri and Oklahoma began around early-April and accelerated in mid-June. Trends do not look promising for the coming weeks. The most consistent pattern nationwide has been that when a state or locality relaxes social distancing regulations too quickly, particularly without mandates related to mask-wearing and prohibition of large crowds, infections surge.

During the early stages of the COVID-19 surge in the U.S., rural areas appeared to be protected, due in large part to their low population density and comparatively low commuting to urban centers. However, the U.S.'s rural areas, including in Missouri and Oklahoma, are increasingly at risk given reluctance of the residents in these places to engage in social distancing and wear masks and the reluctance of local leaders to mandate such actions and/or to enforce state mandates. This is concerning because there are [several features of rural communities](#) that increase their risk of high rates of hospitalization and death should cases surge, including their older age composition, higher prevalence of several chronic health conditions, and lower access to vital health care resources (including ICU beds).

In Missouri, McDonald County has the highest rate of confirmed COVID-19 infections as of July 7, 2020 (2855.0 per 100,000 persons). This high rate is due in large part to an outbreak at the Tyson chicken plant. Both Jasper County and Newton County have very high COVID-19 case rates (above 600.0 per 100,000 persons), with rapid increases in recent weeks. If these new cases have been concentrated among vulnerable populations (those with weakened immune systems, chronic health conditions, older age groups), we will likely see increases in hospitalization rates in the coming two weeks and increases in deaths within the next four weeks. Also concerning are potential spillover effect. Although both Dade and Barry counties have relatively low COVID-19 case rates thus far, they rank high on health vulnerability. High rates of infection in in Jasper County and McDonald counties, respectively could spill over into Dade and Barry counties.

Among the counties of interest in Oklahoma, Washington County has the highest COVID-19 case rates (836.5 per 100,000 persons) (in all of OK, the highest rate is in Texas County). Tulsa, Wagoner, Osage, and Pawnee counties also have COVID-19 case rates above 300.0 per 100,000 persons. As for health vulnerability, Oklahoma performs poorly in general relatively to the U.S. as a whole, but both Osage and Pawnee counties are at especially high risk. Given their adjacency to Tulsa and Washington counties, they are also at risk of infections spilling over into their counties.

We want to remind the reader that the case counts, and rates we report here represent only confirmed positive cases. States and counties have varied dramatically in the timing of testing and the share of the population that has been tested. Therefore, the case count data described in this report are subject to variation in testing across counties and to reporting error. The positive cases reported here are most certainly undercounts, as not everyone who has been infected has received a test. As of July 5, 2020, about 6.5% of tests were coming back as positive in [Missouri](#) and about 8.1% were coming back as positive in [Oklahoma](#).

### **About the Authors**

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