Lexington Urban Area – COVID-19 Status Report 18 Dec 2020

Background

The Two Rivers Public Health Department (TRPHD) covers 7 counties in central Nebraska, reaching 97,132 people who live and work in the health district spread across roughly 4663 square miles. Over three quarters of residents live in Buffalo and Dawson county, a tenth live in Phelps county, and the remaining 15% is spread somewhat comparably among the four counties of Kearney, Harlan, Franklin and Gosper in decreasing order of population. Well over half the residents of TRPHD live in the three largest cities - Holdrege (pop. 5408), Lexington (pop. 10115) and Kearney (pop. 33867), over a third in Kearney city alone.

To better understand COVID transmission in TRPHD [1], we decided to analyze case numbers in Kearney, Lexington and Holdrege urban areas, defined as the city and surrounding smaller towns

- "Kearney area" includes Kearney city, Elm Creek, Pleasanton, Amherst, Riverdale, Gibbon, Shelton and Axtell (39,412 people)
- "Lexington area" includes Lexington, Overton, Johnson Lake and Cozad (15,017 people)
- "Holdrege area" includes Holdrege, Loomis and Funk (5967 people).

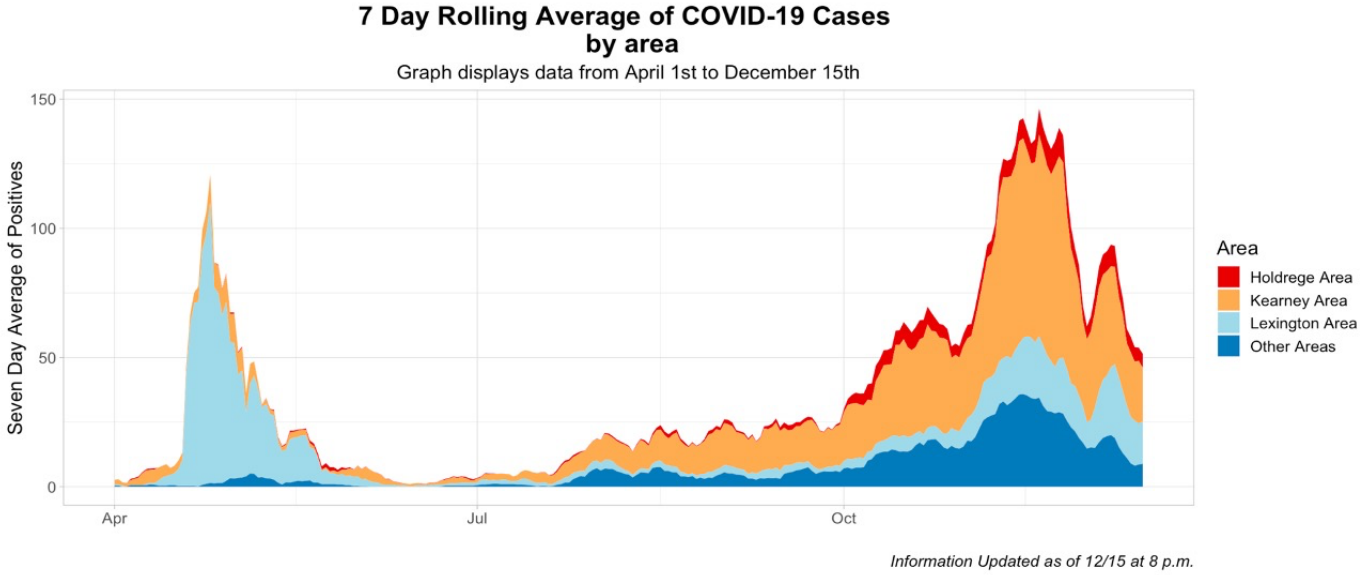
In the tenth edition of this document, we will

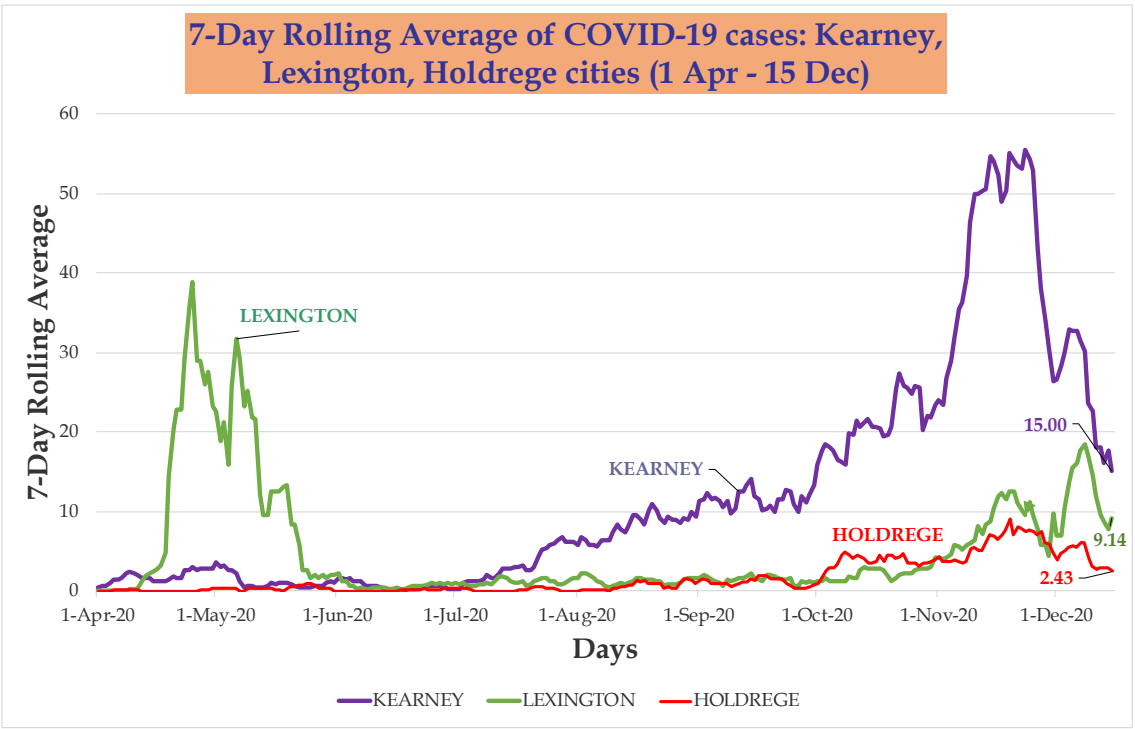
a) Look at the overall course of the COVID-19 pandemic in TRPHD from **April - December** (36 weeks) and identify outbreaks in each of the three urban areas.
b) Analyze daily case averages (7-day rolling) in **Lexington, Holdrege and Kearney** cities from **April 1 – December 15.**
c) Plot total (cumulative) COVID-19 cases in **Lexington, Holdrege, Kearney, Gothenburg and Minden** cities from **April - December** , displaying total cases by 10,000 population in each city [2]
d) Describe 7-day rolling average of cases in **Lexington** area by age and city of residence from **July 01 – December 15**.
e) Describe the 7-day rolling average of COVID-19 cases from **Nov 17 – Dec 15** (4 weeks) across cities in Two Rivers Health District. Present the same case counts/10,000 persons.
f) Present a brief weekly overview and analysis for **Lexington urban area.**

To conclude, daily rates of COVID-19 have decreased over the past week in Lexington city and Lexington urban area. Daily case rates that had begun to rise last week have dropped across all cities in the Two Rivers Health District, although the rate of decrease is less dramatic in Lexington. There is improved ICU availability and lower COVID-related medical/surgical bed usage across hospitals in TRPHD this week compared to the previous 4 weeks. Rising cases in Overton and an ongoing outbreak in Elwood are cause for concern. Residents are advised to continue to adhere to strict preventive measures (social distancing, correct and consistent masking, hand sanitizing) at all times to protect themselves and others

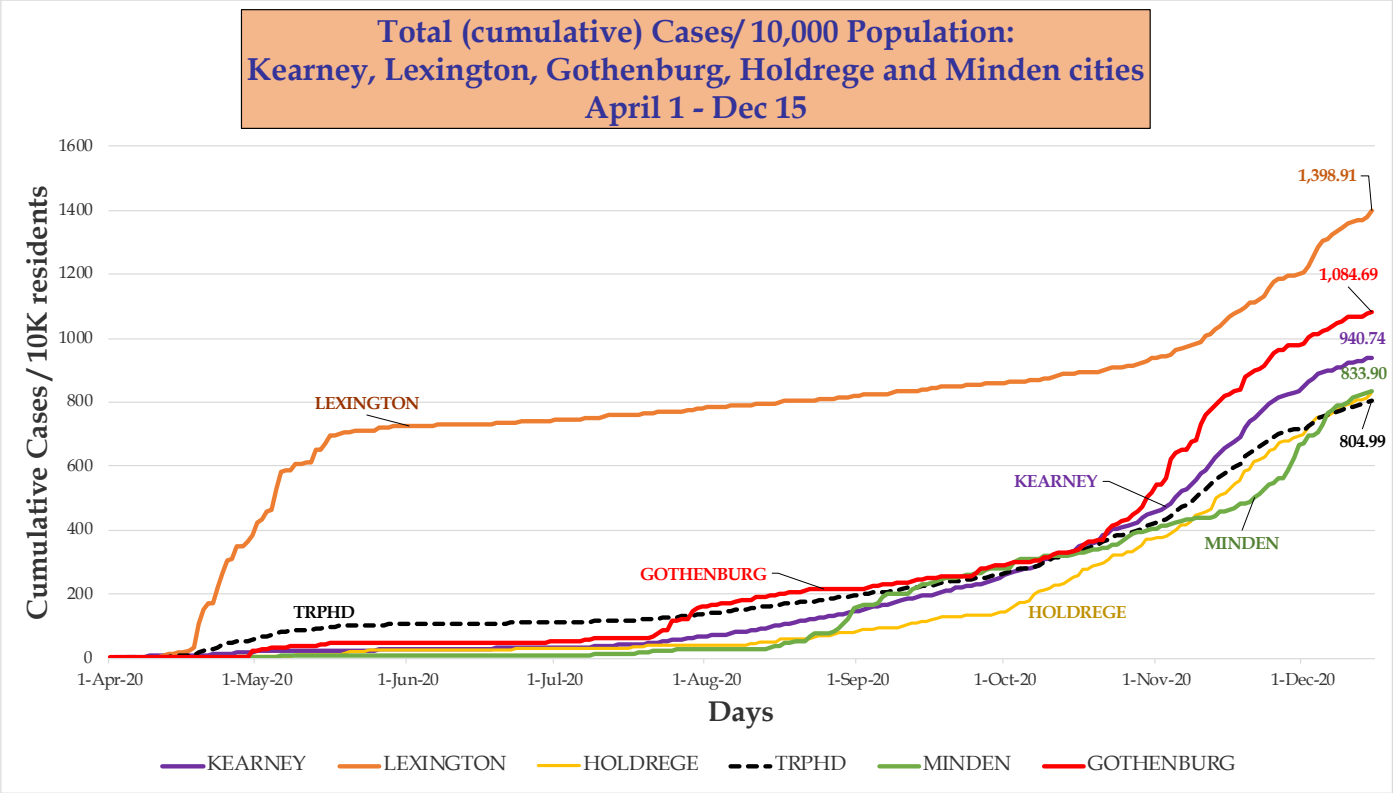
[1] For complete explanation of definitions and data sources, please see appendix 1
[2] For complete explanation of definitions and data sources, please see appendix 2

- The graph below describes daily COVID-19 cases in TRPHD from **April 1 – December 15** broken down by **urban area** (Holdrege, **Lexington**, Kearney and all others). The height of the graph corresponds to the daily case count and the thickness of each colored band corresponds to the urban area.
- The second graph below describes daily cases (7-day rolling average) in **Lexington, Holdrege and Kearney cities** from **April 1- December 15**

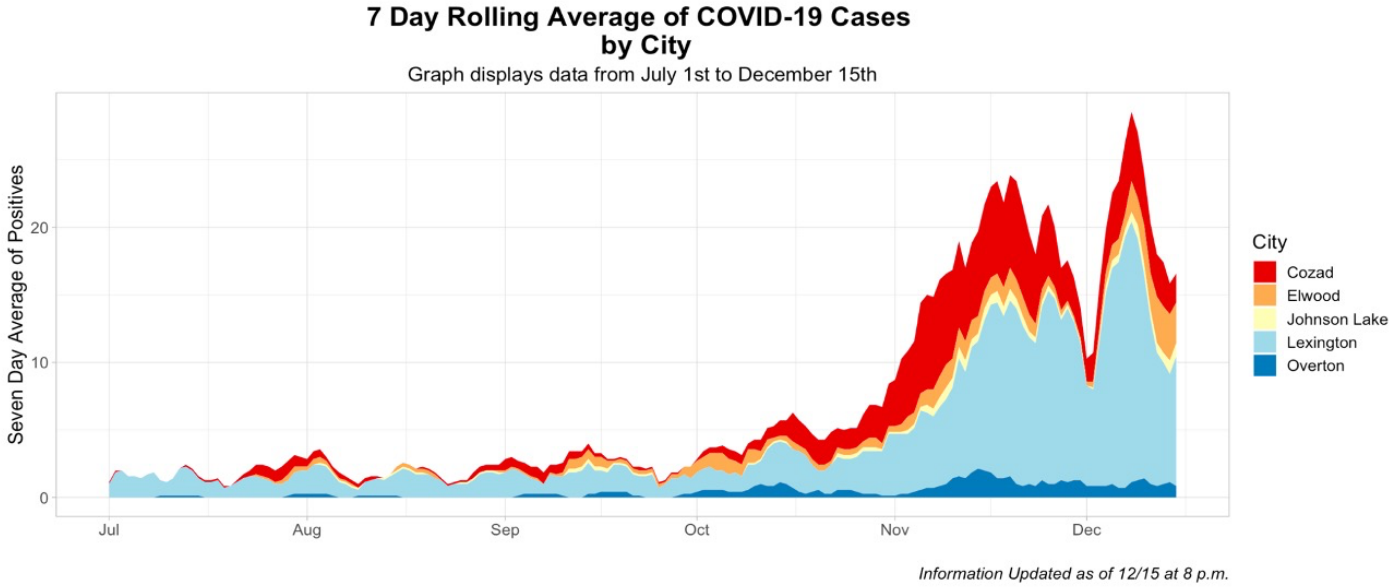


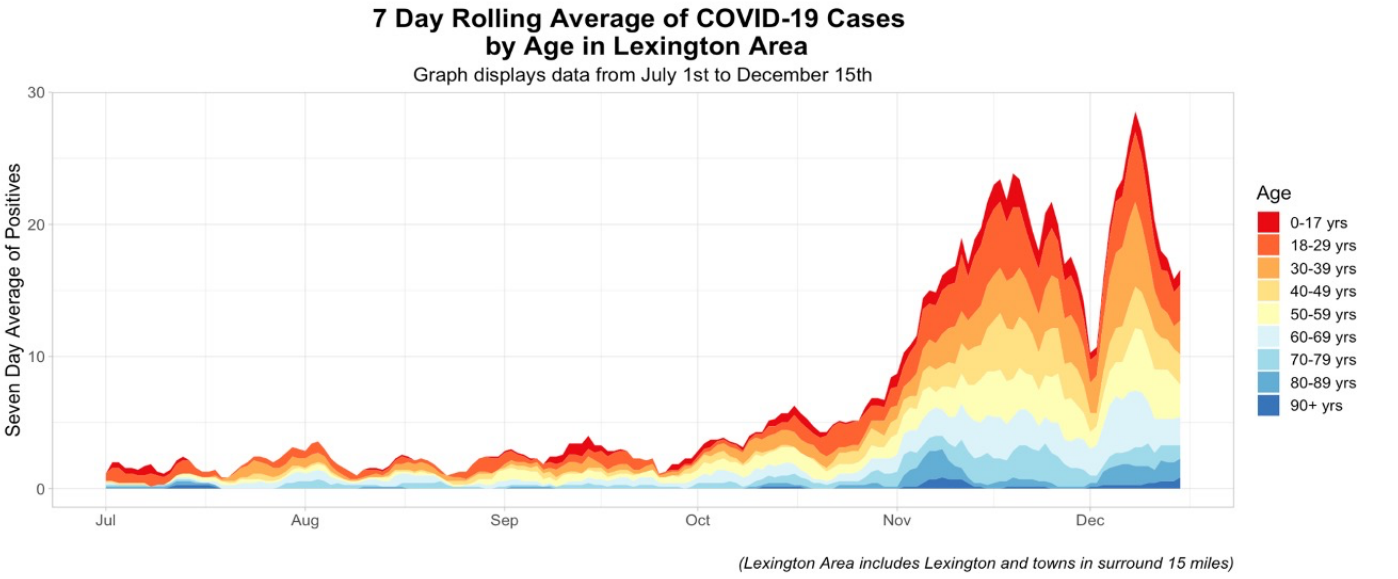


- The graph below describes the total (cumulative) cases/10,000 persons in **Lexington, Kearney, Holdrege, Gothenburg and Minden cities** from **April 1- December 15.** The graph attempts to estimate what proportion of each city would have tested positive by December 15 were its population equal to 10,000 (about the size of Lexington). The graph presents the same proportions for the entire Two Rivers Health District for reference.



- The graph below shows COVID-19 cases in **Lexington** area from **July 1 – December 15**, describing positive cases by city. The height of the graph corresponds to the daily case count and the thickness of each colored band corresponds to a city's contribution.
- The second graph describes cases by age during the same period in the **Lexington** area.





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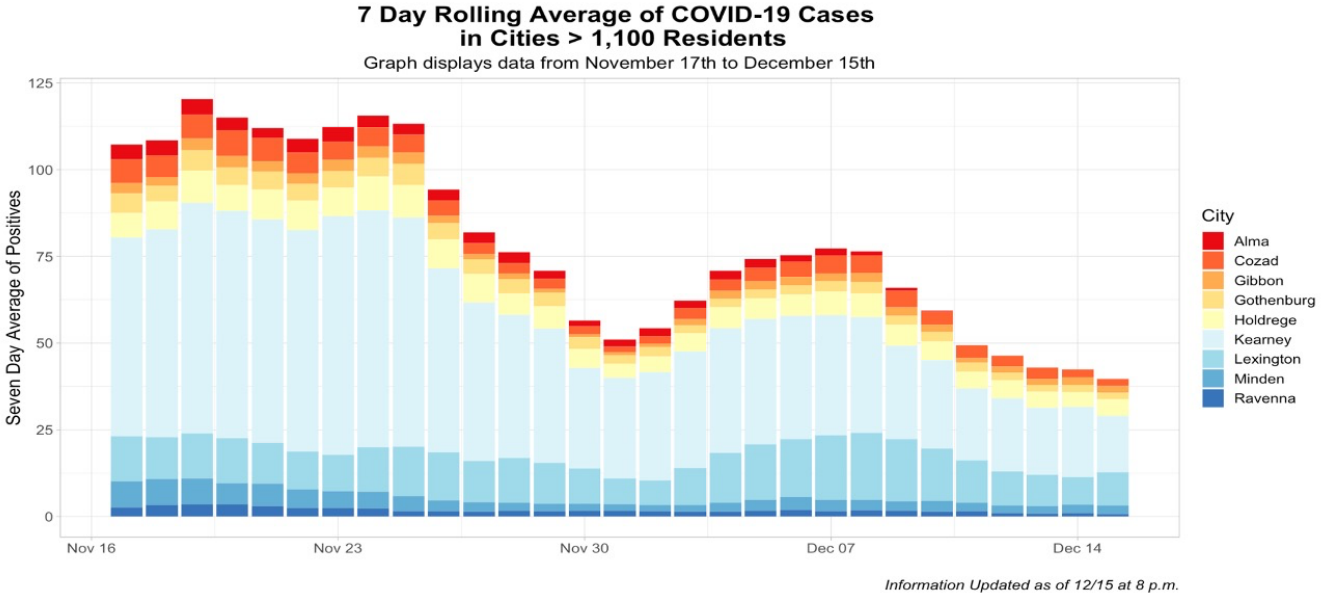
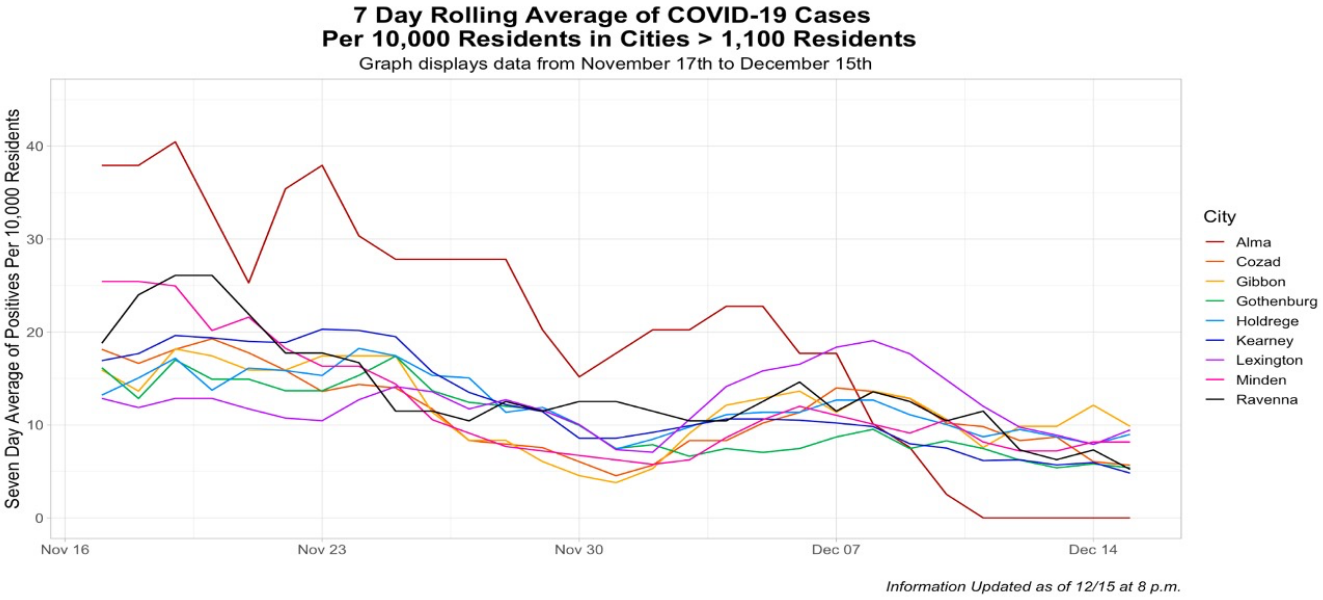
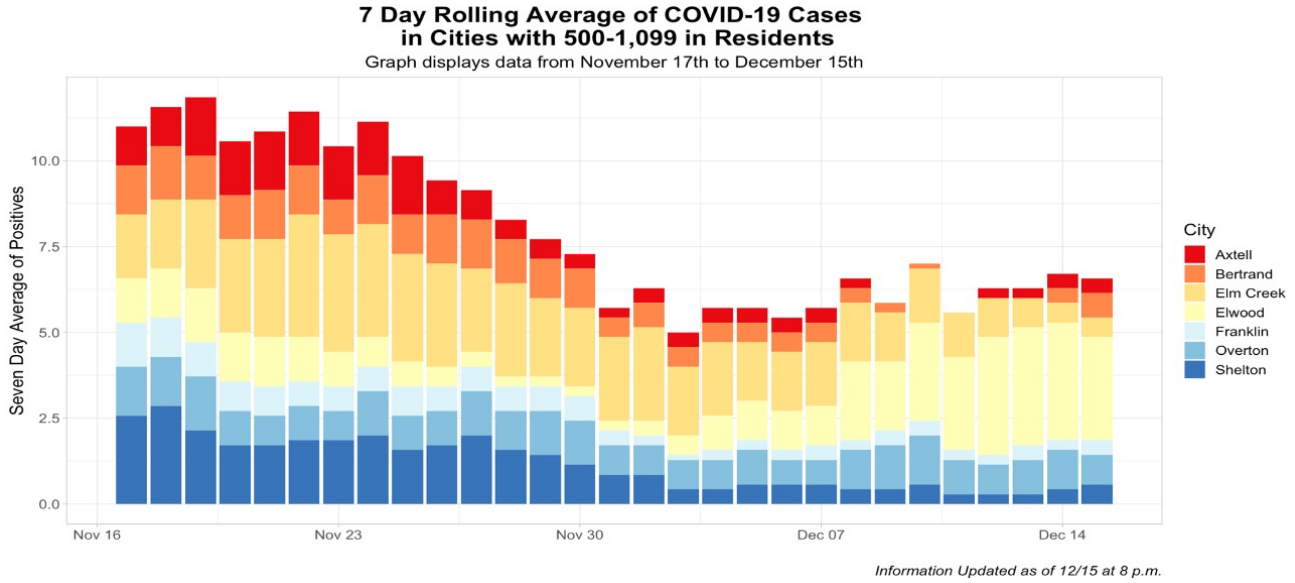
- The graph below shows COVID-19 cases across 9 cities in TRPHD with population greater than 1100 from **Nov 17 – Dec 15.** The height of the bar corresponds to the daily case count and the thickness of each colored band corresponds to a city's contribution.
- The second graph describes cases per 10,000 residents in cities with population>1100 during this time period. [3] **Lexington city** is represented by the dark pink line and **Cozad** by the orange line.

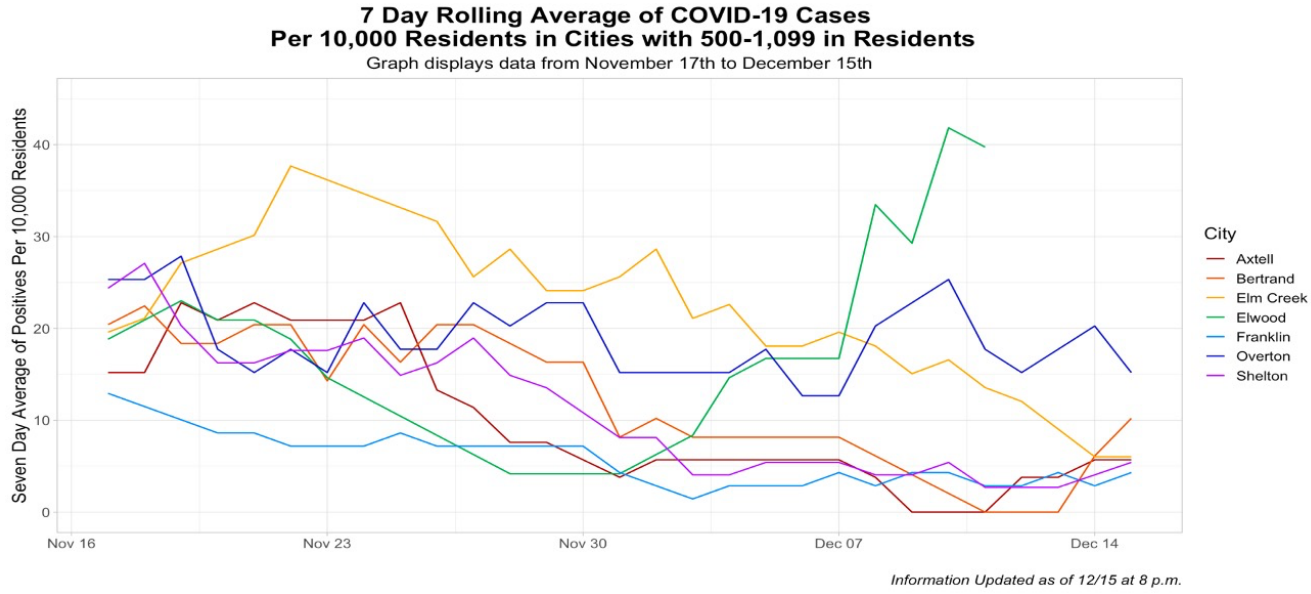




[3] Note: We have used 10,000 residents as reference population to better compare cities across the district.

- The graph below shows COVID-19 cases across 9 cities in TRPHD with population less than 1100 from **Nov 17 – Dec 15.** The height of the bar corresponds to the daily case count and the thickness of each colored band corresponds to a city's contribution.
- The second graph describes cases per 10,000 residents in cities with population<1100 during this time period. [4] **Overton** is represented by the dark blue line and **Elwood** by the green line.





[4] Note: We have used 10,000 residents as reference population to better compare cities across the district.

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Weekly Summary Report

Viewing the graphs from **April – December**, some broad trends are noticeable:

- Daily case counts of COVID-19 in Lexington city and urban area have dropped over the past 7 days after rising the previous week.
- After briefly rising last week, the daily average of new cases has dropped by over 60% across TRPHD, compared to 4 weeks previously.
- Although cumulative case counts are rising, they seem to be doing so at slower rates across the biggest cities in TRPHD. Lexington is still adding cases at a faster rate than other cities in the comparison.

On analyzing COVID cases from **July – December**, some details become clear:

- Lexington and Overton account for a majority of cases in the Lexington area this week. Case counts have, however, dropped across all cities
- The contribution of persons aged 60 years and over to overall positive case counts has increased slightly, seniors aged 60 or more account for about a third of new cases in Lexington area.

On analyzing cases from **November – December**, we are able to observe:

- All cities with 1100 or more residents reported dropping case numbers over the past week. Lexington's rate of decrease was more gradual than those of other cities.
- Overton's case counts have risen in the last week, and there is an ongoing outbreak at a long term care facility in Elwood that we are closely monitoring. Although Elwood is not within the Lexington area, its proximity to Johnson Lake and Lexington make the progress of the outbreak of interest to Lexington area dynamics.

In addition, an analysis of **healthcare capacity** in Two Rivers Health District reveals:

- COVID-19 related ICU occupancy has decreased drastically in the past month. Over 45% of ICU beds are now available, the first time in 6 weeks. COVID-related hospitalizations have also dropped across TRPHD. (see https://www.trphd.org/covid-19/ for details)

To conclude, daily rates of COVID-19 have decreased over the past week in Lexington city and Lexington urban area. Daily case rates that had begun to rise last week have dropped across all cities in the Two Rivers Health District, although the rate of decrease is less dramatic in Lexington. There is improved ICU availability and lower COVID-related medical/surgical bed usage across hospitals in TRPHD this week compared to the previous 4 weeks. Rising cases in Overton and an ongoing outbreak in Elwood are cause for concern. Residents are advised to continue to adhere to strict preventive measures (social distancing, correct and consistent masking, hand sanitizing) at all times to protect themselves and others

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APPENDIX 1

Methods & Definitions

To better understand the course of the COVID-19 pandemic in Kearney, Lexington and Holdrege, we created 'urban areas' that included both the city and its surrounding towns. We included all towns within 20 miles of Kearney city, 15 miles of Lexington and 10 miles of Holdrege within each city's urban area. The respective populations of all 7 counties in TRPHD are shown below. Kearney city accounts for over third of the population of TRPHD.

County	Population
Buffalo	49,659
Dawson	23,595
Franklin	2,979
Gosper	1,990
Harlan	3,380
Kearney	6,495
Phelps	9,034
TRPHD total	**97,132**
Nebraska state	1,934,408

Thus "Kearney area" includes Kearney city as well as Elm Creek, Pleasanton, Amherst, Riverdale, Odessa, Gibbon, Shelton and Axtell.
"Lexington area" includes Lexington city as well as Overton, Johnson Lake and Cozad.
"Holdrege area" includes Holdrege city, Loomis and Funk.

The populations of cities and villages included is described below.

CITY	POPULATION
Kearney	33867
Elm Creek	949
Axtell	751
Pleasanton	359
Riverdale	179
Amherst	253
Gibbon	1869
Shelton	1055
Odessa	130
KEARNEY URBAN AREA (TOTAL)	**39412**
Lexington	10115
Overton	567

Johnson Lake	600
Cozad	3735
LEXINGTON URBAN AREA (TOTAL)	**15017**
Holdrege	5408
Funk	183
Loomis	376
HOLDREGE URBAN AREA (TOTAL)	**5967**

For presenting data, we selected 3 time frames:

a) April 1 – Dec 8 (From the beginning of the pandemic to current)
b) July 01 – Dec 8 (From the beginning of second sustained 'wave' in daily case counts to current)
c) Nov 10 – Dec 8 (Previous 4 weeks)

- Data is presented as 7-day rolling averages for daily numbers and absolute counts for cumulative cases. The 7-day rolling average is the sum of all cases reported on that day plus the previous six divided by 7.
- Cumulative cases refer to all cases that have been confirmed in the district since the beginning of the pandemic in TRPHD (March 19)
- Average positivity rate refers to a seven-day rolling average positivity rate, which is the sum of all cases for that day and the previous six divided by the sum of all tests done in that day and the previous six
- In cases that call for comparison across larger areas (counties v/s state of Nebraska, for eg), we present the count per 100,000 population. 100,000 roughly corresponds to the population of Two Rivers Health District (97,132)
- In cases that call for comparison between cities, (Kearney v/s Minden for eg), we present a count per 10,000 population. 10,000 roughly corresponds to the population of Lexington (10,115), the second largest city in TRPHD.
- For calculation, we use the 2019 mid- year estimate (American Community Survey, ACS) and data from The Atlantic's COVID tracking project (https://covidtracking.com/data)

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APPENDIX 2

Cases per 10,000 population

Daily case counts are the **7-day rolling average** of cases expressed as a fraction of the population of the area, and standardized to 10,000 persons.

The total/ cumulative case counts are the **total** cases counted in an area (county, city, urban region or health district) from the first recorded case in the area (in case of TRPHD this is March 19, 2020). This is expressed as a fraction of the total population of the area and standardized to 10,000 persons.

10,000 is used while describing cities in Two Rivers District as it offers a rough mean value that is comparable across the populations of Holdrege (pop. 5408), Lexington (pop. 10115) and Kearney (pop. 33867).

Population numbers used are from the American Community Survey (ACS 2019 mid-year estimates). For further detail, see: https://www.census.gov/programs-surveys/acs/data.html

7-Day rolling average/ 10,000 persons is calculated as:

[(Sum of case counts for the most immediate 7 days) / 7)] / (mid-year population) * 10,000

Total cases/ 10,000 persons is calculated as:

(Total COVID cases)/ (mid-year population)*10000