



## Kearney Urban Area - COVID-19 Status Report 1 Jan 2021

### **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 alone.

To better understand COVID transmission in TRPHD <sup>1</sup>, 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, Elwood, Johnson Lake and Cozad (15,700 people)
- “Holdrege area” includes Holdrege, Loomis and Funk (5967 people).

In the twelfth edition of this document, we will

- a) Look at the overall course of the COVID-19 pandemic in TRPHD from **April - December** (39 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 29**.
- c) Describe the **total (cumulative) cases per 10,000 people<sup>2</sup>** in Kearney, Lexington, Holdrege, Minden and Gothenburg and compare the trajectory of COVID spread in each of these cities to cumulative rates across the whole district (**April 1 - December 29**).
- d) Describe 7-day rolling average of cases in **Kearney** area by age and city of residence from **July 01 - December 29**.
- e) Describe the 7-day rolling average of COVID-19 cases from **Dec 1 - Dec 29** (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 **Kearney urban area**.

*To conclude, daily rates of COVID-19 are at the lowest level of the past 4 months in Kearney urban area and Kearney city, reflecting broader trends across Two Rivers Health District. The incidence of newly detected cases in seniors is low. ICU availability and COVID-related hospital bed utilization remains steady across the district and Kearney city. We remain encouraged by the downward trend in incident cases. Residents are advised to continue to adhere to strict preventive measures (social distancing, correct and consistent masking) at all times to protect themselves and others.*

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<sup>1</sup> For complete explanation of data sources, please see appendix 1

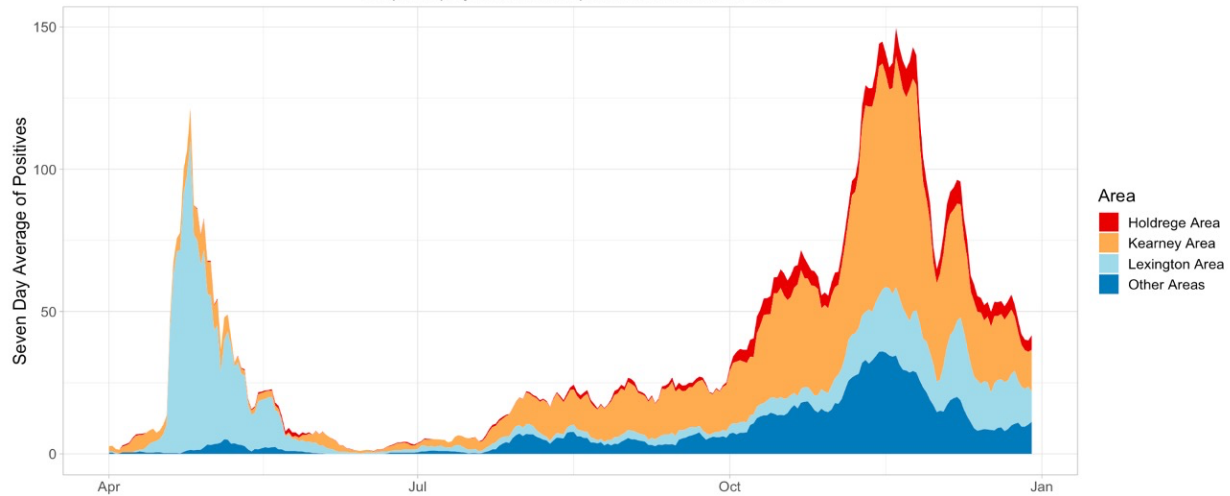
<sup>2</sup> For complete explanation of definitions and data sources, please see appendix 2



- The graph below describes daily COVID-19 cases in TRPHD from **April 1 – December 29** 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’s contribution.
- The second graph describes the 7-day rolling average of COVID-19 cases in **Lexington, Kearney and Holdrege** cities from **April 1- December 29**.

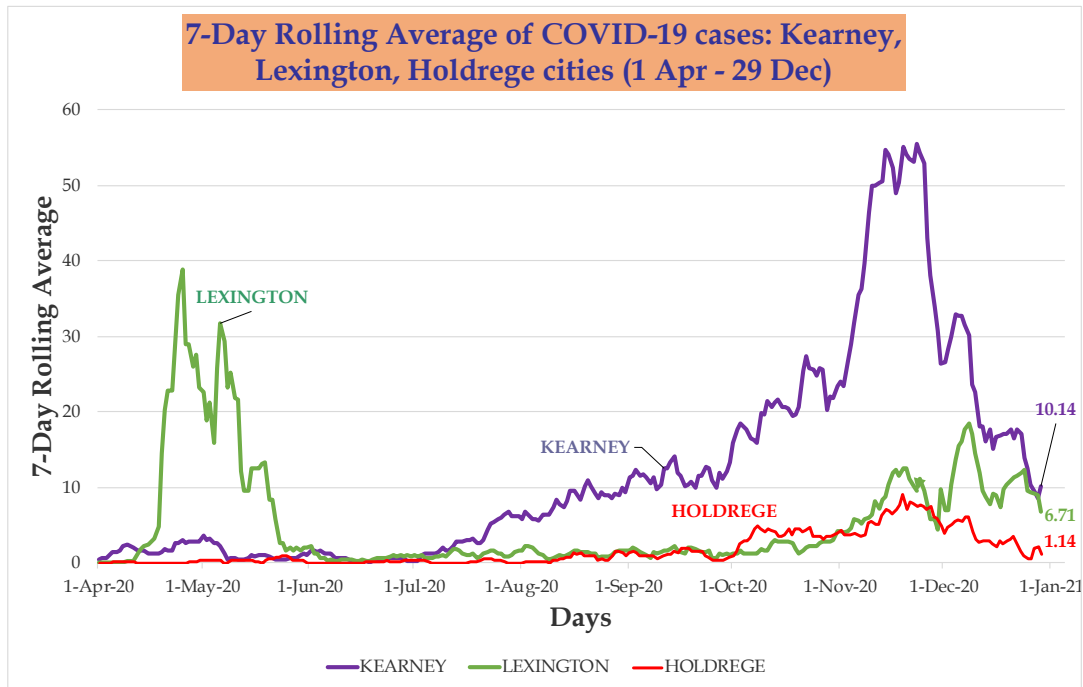
### 7 Day Rolling Average of COVID-19 Cases by area

Graph displays data from April 1st to December 29th



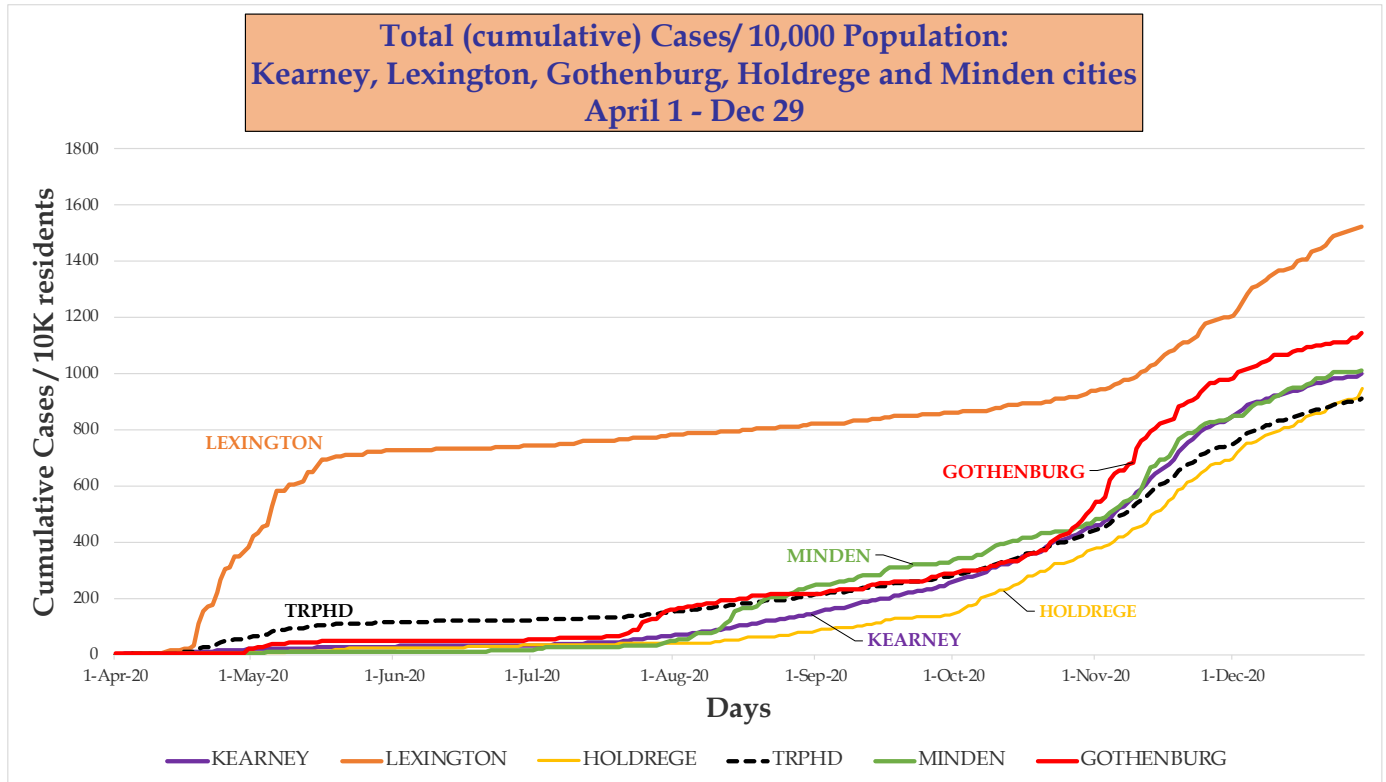
Information Updated as of 12/29 at 8 p.m.

### 7-Day Rolling Average of COVID-19 cases: Kearney, Lexington, Holdrege cities (1 Apr - 29 Dec)





- The graph below describes the **total (cumulative) cases per 10,000 people<sup>3</sup>** in the cities of **Kearney, Lexington, Holdrege, Minden and Gothenburg**, comparing it to total cases/10,000 people in Two Rivers Health District (**April 1 - December 29**).
- Between 9-11% of residents of all cities except Lexington tested positive for COVID-19 at some point in the last 10 months (about 15% of Lexington’s population tested positive during this time).



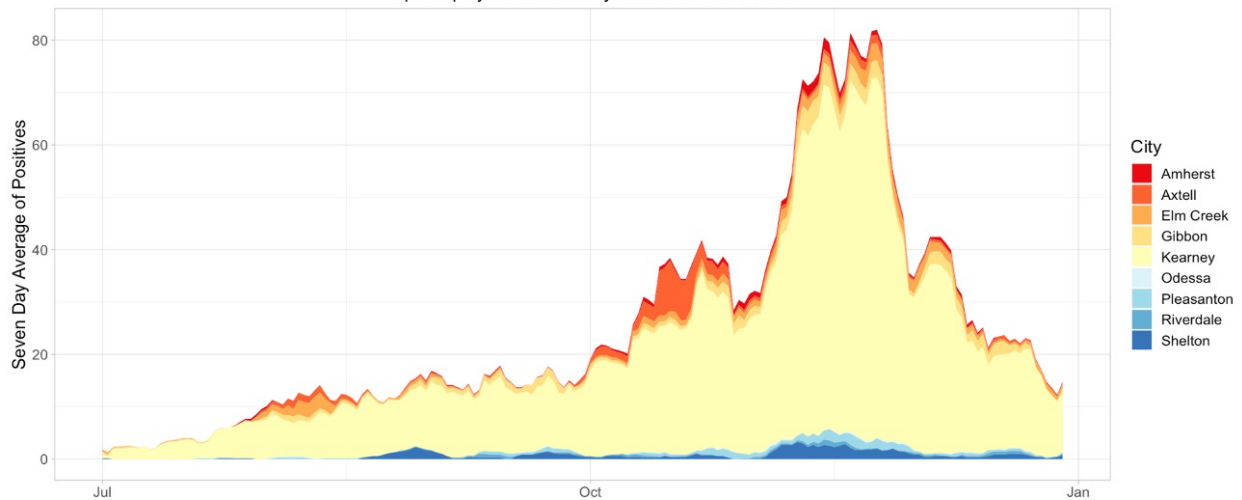
<sup>3</sup> For complete explanation of definitions and data sources, please see appendix 2  
 516 W 11<sup>th</sup> Street, Suite 108  
 Kearney, NE 68845



- The graph below shows COVID-19 cases in **Kearney** area from **July 1 - December 29**, 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 **Kearney** area. The height of the graph corresponds to the daily case count and the thickness of each colored band corresponds to each age group.

### 7 Day Rolling Average of COVID-19 Cases by City

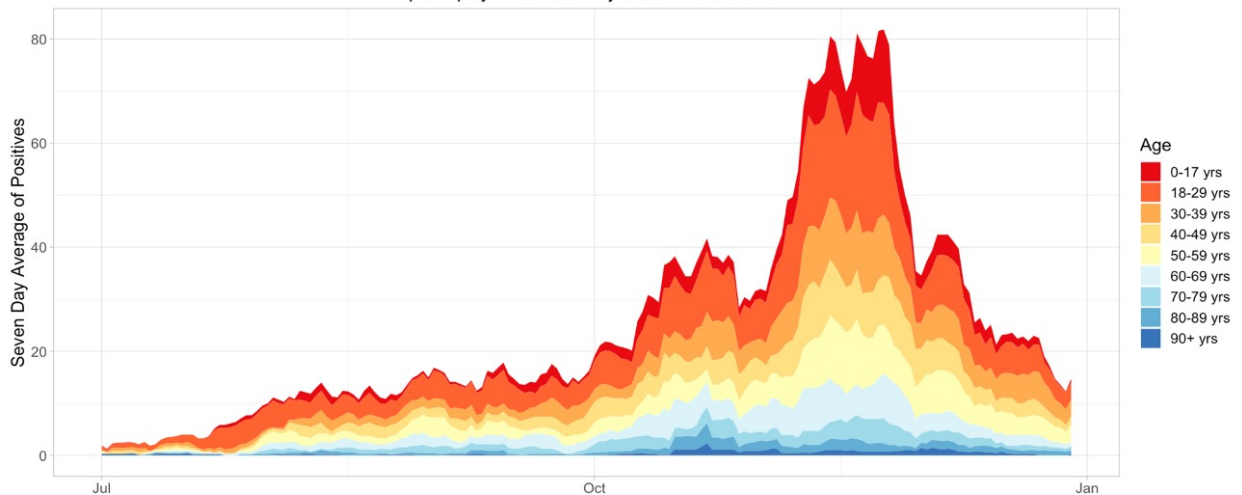
Graph displays data from July 1st to December 29th



Information Updated as of 12/29 at 8 p.m.

### 7 Day Rolling Average of COVID-19 Cases by Age in Kearney Area

Graph displays data from July 1st to December 29th



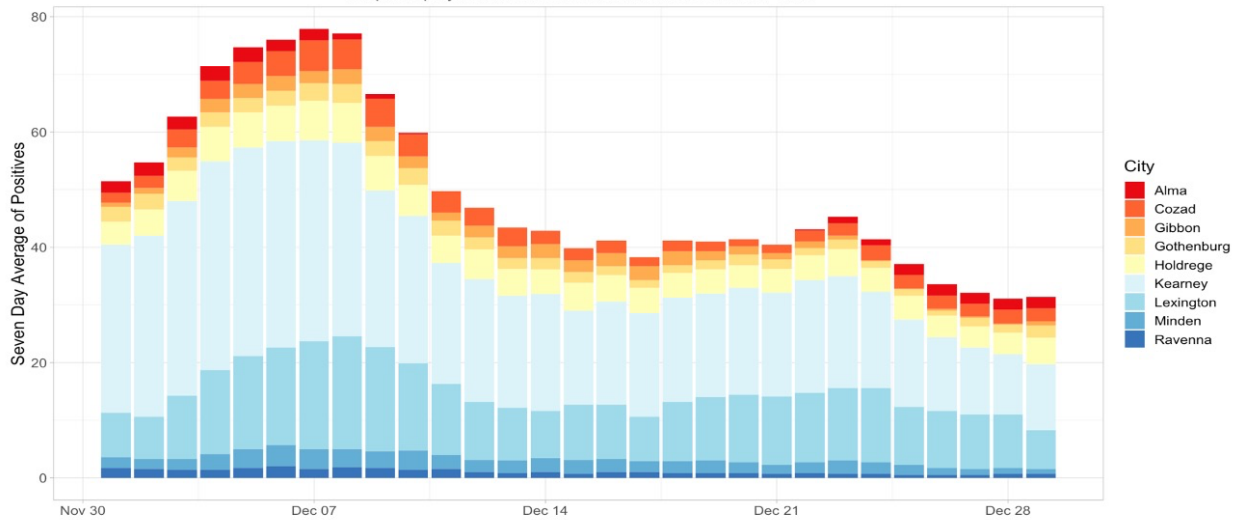
(Kearney area includes Kearney and towns in surrounding 20 miles)



- The graph below shows COVID-19 cases across 9 cities in TRPHD with population >1100 from Dec 1 - Dec 29. 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. **Kearney** city is represented by the dark blue line and **Gibbon** by the yellow line.

**7 Day Rolling Average of COVID-19 Cases in Cities > 1,100 Residents**

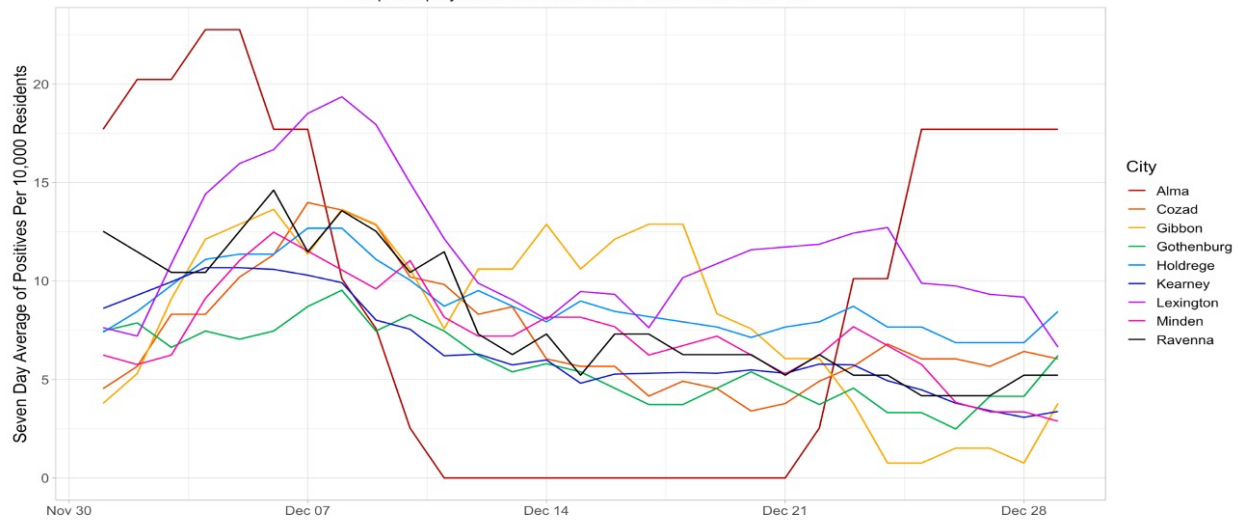
Graph displays data from December 1st to December 29th



Information Updated as of 12/29 at 8 p.m.

**7 Day Rolling Average of COVID-19 Cases Per 10,000 Residents in Cities > 1,100 Residents**

Graph displays data from December 1st to December 29th



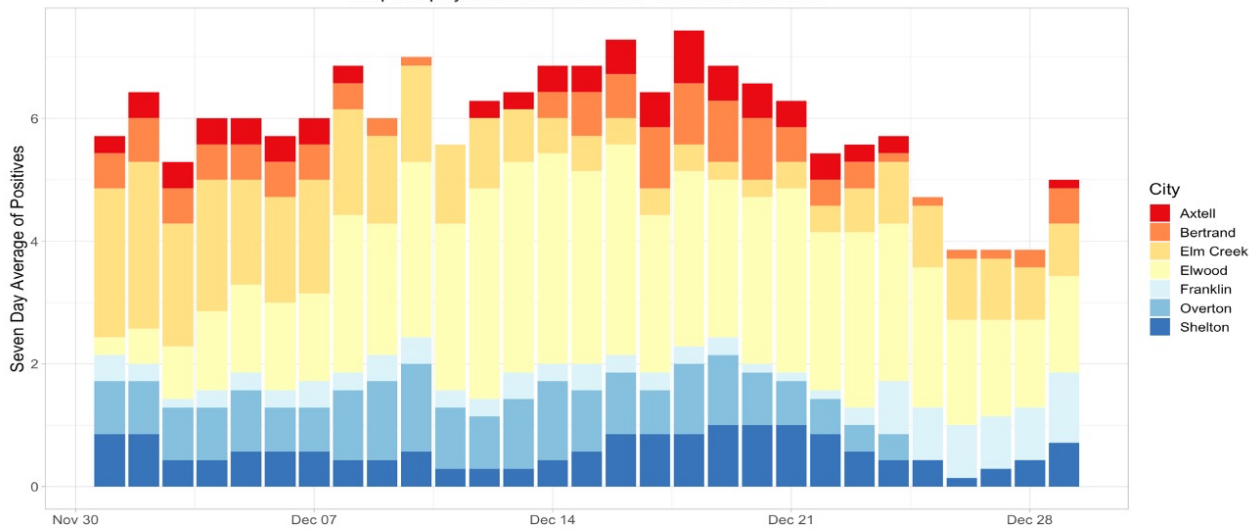
Information Updated as of 12/29 at 8 p.m.



- The graph below shows COVID-19 cases across 9 cities in TRPHD with population less than 1100 from Dec 1 - Dec 29. 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. **Elm Creek** is represented by the yellow line, **Axtell** in dark red and **Shelton** by the dark pink line.

**7 Day Rolling Average of COVID-19 Cases in Cities with 500-1,099 in Residents**

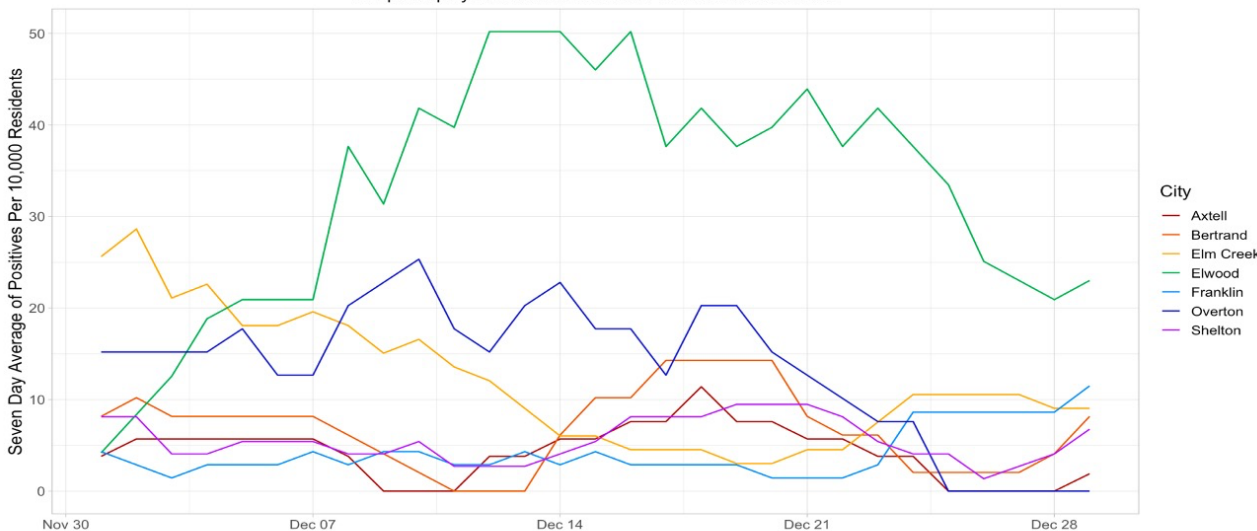
Graph displays data from December 1st to December 29th



Information Updated as of 12/29 at 8 p.m.

**7 Day Rolling Average of COVID-19 Cases Per 10,000 Residents in Cities with 500-1,099 in Residents**

Graph displays data from December 1st to December 29th



Information Updated as of 12/29 at 8 p.m.



## Weekly Summary Report

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

- Daily case counts of COVID-19 in Kearney city and urban area continue to drop, average daily cases in Kearney city is about equal to the number 4 months previously.
- Between 9-11% of the residents of Kearney, Holdrege, Minden and Gothenburg have tested positive for COVID-19 at some time during the past 10 months. About 15% of all Lexington residents have tested positive for COVID during the last year. Of these, Lexington experienced a surge in cases in April-May, and other cities in October - November.

On analyzing graphs of COVID cases from **July - December**, some details become clear:

- Almost no new cases have been recorded in surrounding cities of Kearney Urban Area like Gibbon, Axtell and Elm Creek.
- The contribution of persons aged 60 years and over to overall positive case counts has dropped to negligible levels in the Kearney urban area

On analyzing graphs of COVID cases in **December**, we are able to observe:

- The share of new cases in Kearney city seem to be dropping, Kearney's daily count is comparable to Lexington currently.
- The drop in daily case counts across Buffalo county in general and Kearney city in particular seem to be driving down overall incidence rates in TRPHD.

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

- COVID-19 related ICU occupancy continues to decrease across hospitals in TRPHD. Over 40% of ICU beds are available currently.
- COVID-19 accounts for less than a fifth of patients occupying medical/surgical beds currently in the district. (see <https://www.trphd.org/covid-19/> for details)

*To conclude, daily rates of COVID-19 are at the lowest level of the past 4 months in Kearney urban area and Kearney city, reflecting broader trends across Two Rivers Health District. The incidence of newly detected cases in seniors is low. ICU availability and COVID-related hospital bed utilization remains steady across the district and Kearney city. We remain encouraged by the downward trend in incident cases. Residents are advised to continue to adhere to strict preventive measures (social distancing, correct and consistent masking) at all times to protect themselves and others.*



## 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         |
| <b>TRPHD total</b> | <b>97,132</b> |
| 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 is described below. Also included are Minden and Gothenburg, used as comparison points in descriptive statistics about the area.

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





|                                     |               |
|-------------------------------------|---------------|
| Johnson Lake                        | 600           |
| Elwood                              | 683           |
| Cozad                               | 3735          |
| <b>LEXINGTON URBAN AREA (TOTAL)</b> | <b>15,700</b> |
| Holdrege                            | 5408          |
| Funk                                | 183           |
| Loomis                              | 376           |
| <b>HOLDREGE URBAN AREA (TOTAL)</b>  | <b>5967</b>   |
| Gothenburg                          | 3489          |
| Minden                              | 2890          |

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>)



## 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:

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

Total cases/ 10,000 persons is calculated as:

**$(\text{Total COVID cases}) / (\text{mid-year population}) * 10,000$**

### **Cases per 100,000 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 100,000 persons.

A population of 100,000 is used to compare urban areas (like Kearney urban area) as it is comparable to the overall population of Two Rivers Health District (97,032).

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/ 100,000 persons is calculated as:

**$[(\text{Sum of case counts for the most immediate 7 days}) / 7] / (\text{mid-year population}) * 100,000$**