



## Kearney Urban Area - COVID-19 Status Report 25 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 <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 tenth edition of this document, we will

- a) Look at the overall course of the COVID-19 pandemic in TRPHD from **April - December** (38 weeks) and identify outbreaks in each of the three urban areas.
- b) Describe the **daily case averages (7-day rolling) per 100,000 people<sup>2</sup>** in the three urban areas, and compare the relative extent of spread in each of the three areas from **April 1 - December 22**.
- c) Analyze daily case averages (7-day rolling) in **Lexington, Holdrege and Kearney** cities from **April 1 - December 22**.
- d) Describe 7-day rolling average of cases in **Kearney** area by age and city of residence from **July 01 - December 22**.
- e) Describe the 7-day rolling average of COVID-19 cases from **Nov 24 - Dec 22** (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**.

*Daily rates of COVID-19 continue to drop across the Kearney urban area and Kearney city, reflecting broader trends across Two Rivers Health District. Daily case counts are about a third of the count a month previously. ICU availability and Med-Surg hospital bed utilization remains steady across the district and Kearney city. The drop in case counts over the last four weeks is an encouraging sign. 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 definitions and data sources, please see appendix 1

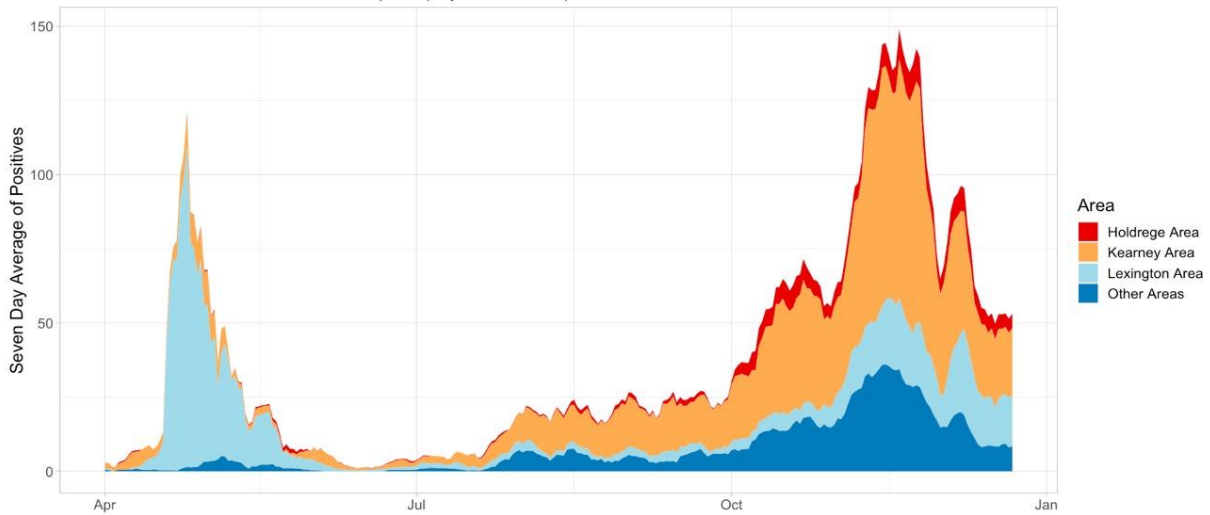
<sup>2</sup> For complete explanation of definitions and data sources, please see appendix 2



- The graph below describes daily COVID-19 cases in TRPHD from **April 1 – December 22** 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 below describes daily cases (7-day rolling average) per 100,000 population in **Lexington, Holdrege and Kearney urban areas** from **April 1- December 22**

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

Graph displays data from April 1st to December 22nd



Information Updated as of 12/22 at 8 p.m.

### Seven Day Rolling Averages of Cases per 100,000 Residents by Area

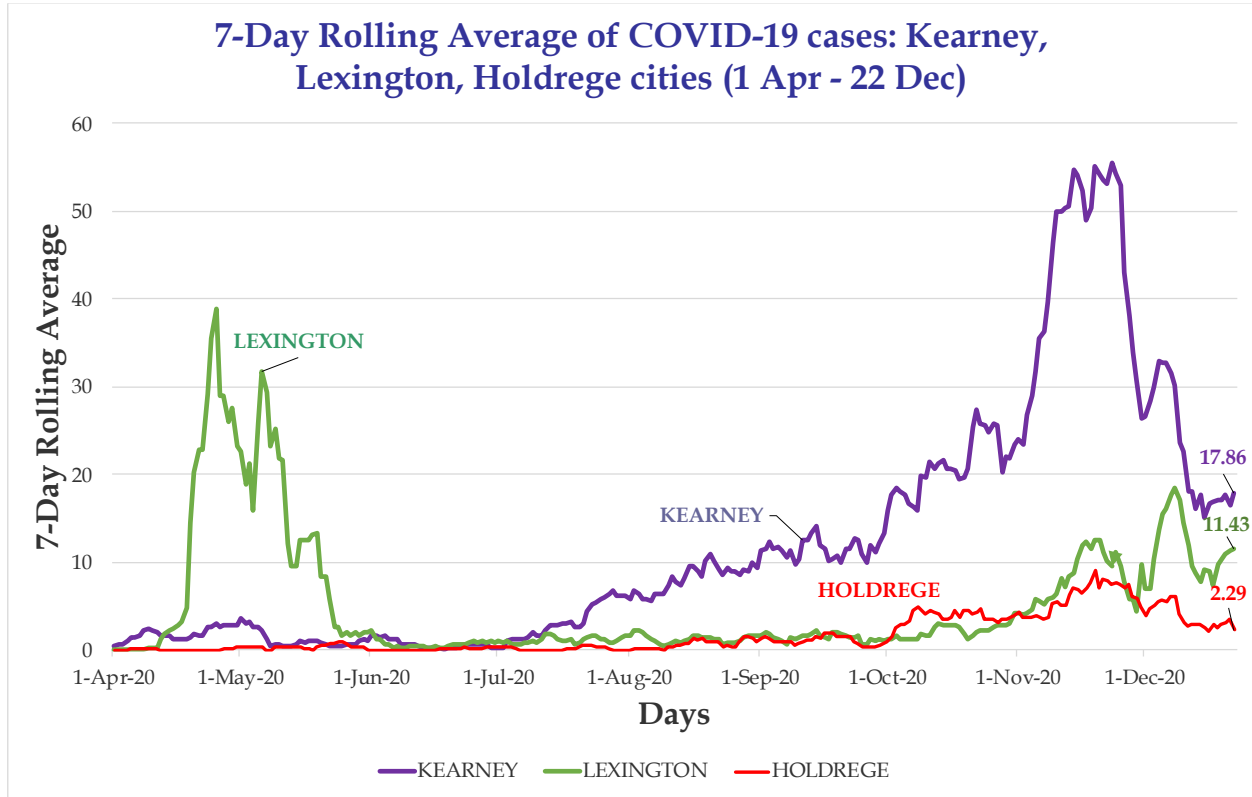
Graph displays data from April 1st to December 22nd



Information Updated as of 12/22 at 8 p.m.



- The graph below describes the 7-day rolling average<sup>3</sup> of COVID-19 cases in **Lexington, Kearney, and Holdrege cities** from April 1- December 22. .



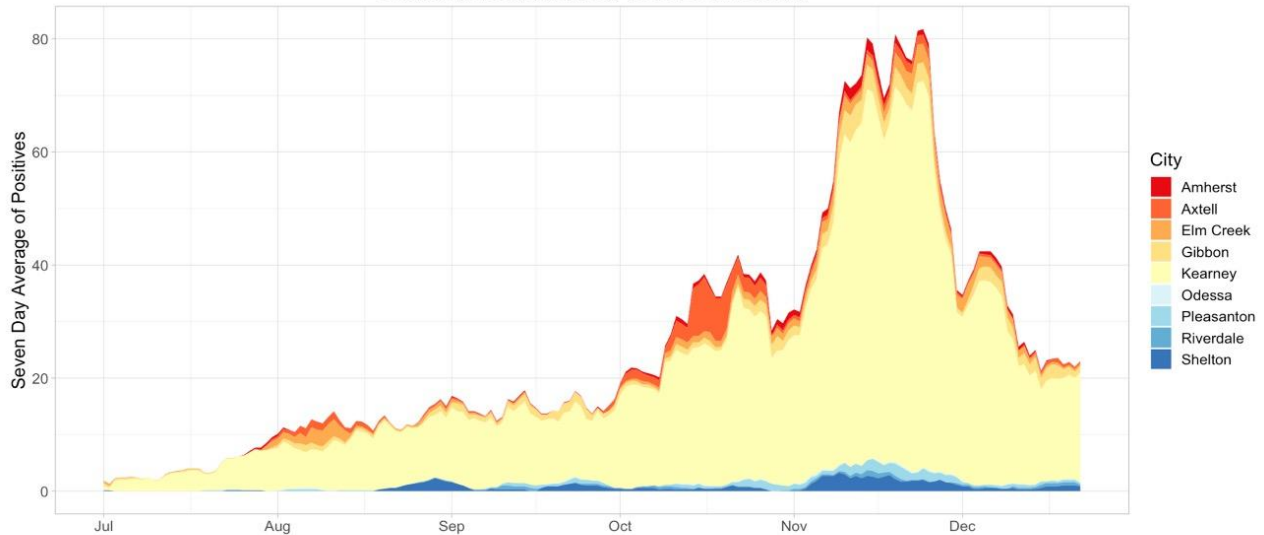
<sup>3</sup> For complete explanation of definitions and data sources, please see appendix 2  
516 W 11<sup>th</sup> Street, Suite 108  
Kearney, NE 68845



- The graph below shows COVID-19 cases in **Kearney** area from **July 1 - December 22**, 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.

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

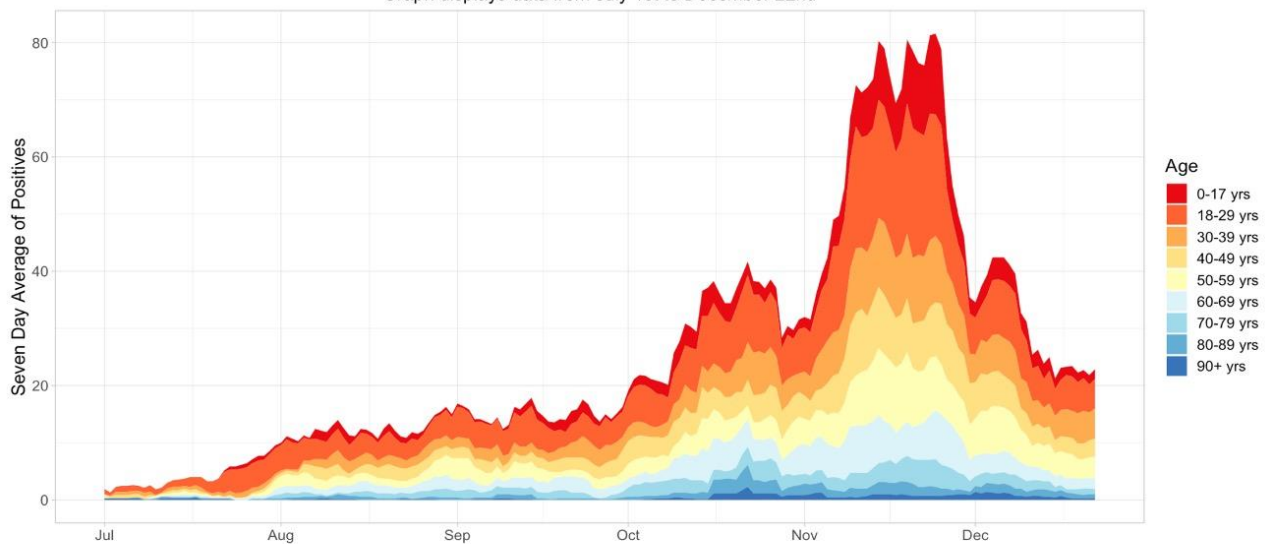
Graph displays data from July 1st to December 22nd



Information Updated as of 12/22 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 22nd



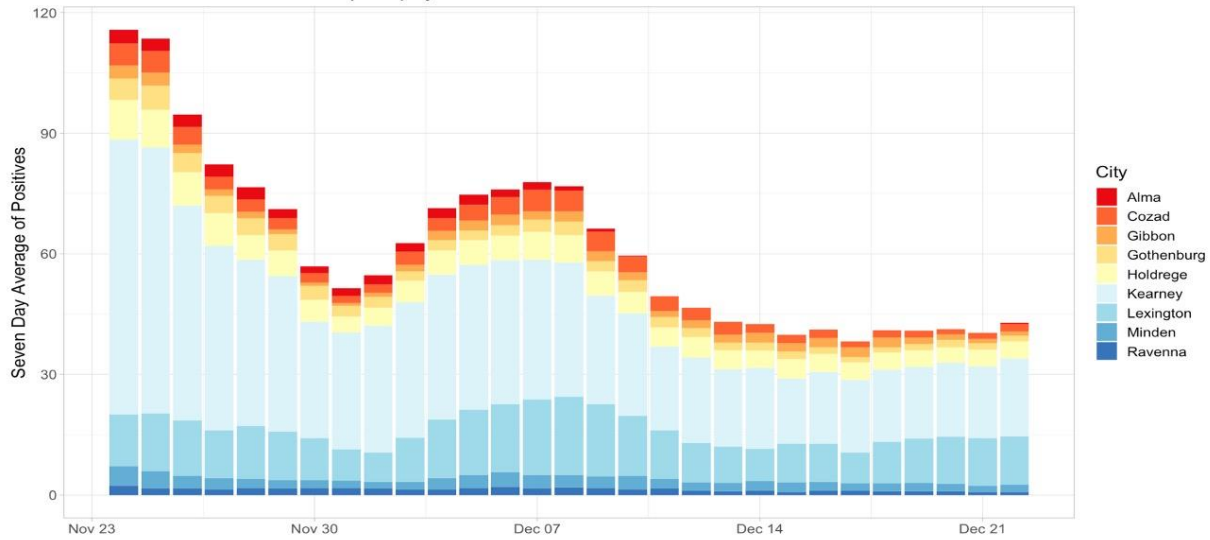
(Kearney area includes Kearney and towns in surrounding 20 miles)



- The graph below shows COVID-19 cases across 9 cities in TRPHD with population >1100 from **Nov 17 - Dec 22**. 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 November 24th to December 22nd



Information Updated as of 12/22 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 November 24th to December 22nd



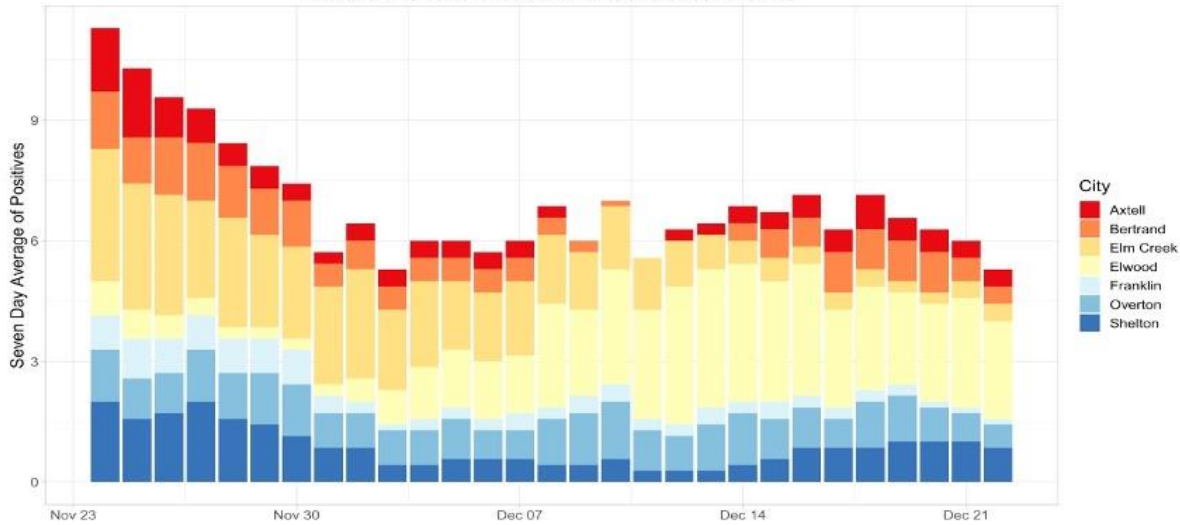
Information Updated as of 12/22 at 8 p.m.



- 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. **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**

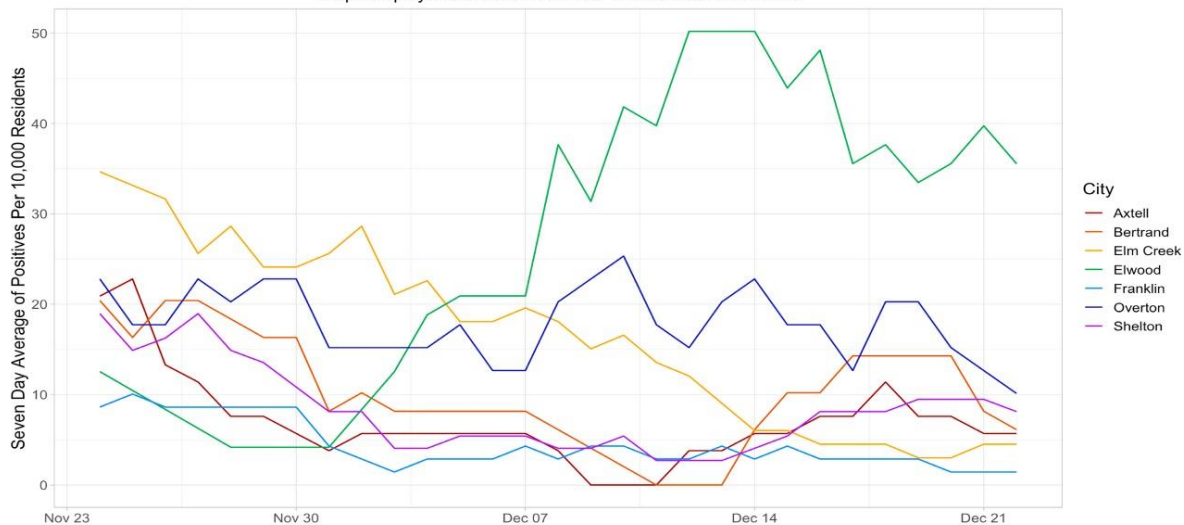
Graph displays data from November 24th to December 22nd



Information Updated as of 12/22 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 November 24th to December 22nd



Information Updated as of 12/22 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 their downward trend.
- The 7-day rolling average of cases expressed as a proportion of the total population in Kearney urban area is about half that of Lexington urban area. Kearney overtook Lexington in daily cases/100,000 population in early August and fell below Lexington in early December.

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

- Kearney city as well as surrounding cities like Gibbon, Axtell and Elm Creek continue to report falling case counts this week, following last week's trend.
- The contribution of persons aged 60 years and over to overall positive case counts has decreased in the Kearney urban area

On analyzing graphs of COVID cases from **November - December**, we are able to observe:

- 7-day rolling average of positive cases in the Kearney urban area have dropped to a third of the number one month previously (17.86 v/s 53.14).
- Positivity rates dropped in both residential facilities and other settings across almost the entire district over the last week, with the exception of Gosper and Franklin counties. Residential facilities across Franklin, Kearney and Harlan counties saw almost no new cases in the past month.

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

- About 40% of ICU beds are currently available across the District, a vast improvement compared to one month previously, when less than 6% ICU beds were available.
- COVID-19 accounts for less than a fifth of patients occupying medical/surgical beds currently in the district (see <https://www.trphd.org/> for details)

*To conclude, daily rates of COVID-19 continue to drop across the Kearney urban area and Kearney city, reflecting broader trends across Two Rivers Health District. Daily case counts are about a third of the count a month previously. ICU availability and COVID-related hospital bed utilization remains steady across the district and Kearney city. The drop in case counts over the last four weeks is an encouraging sign. 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 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
<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>

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:

**$(\text{Total COVID cases}) / (\text{mid-year population}) * 10000$**

### **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:

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