Kearney Urban Area – COVID-19 Status Report 20 Nov 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. The largest urban areas are Holdrege (~5439 people), Lexington (~10,024 people), and Kearney (~33,835 people), meaning that over half of the residents of TRPHD live in three urban areas, and over a third live in Kearney city alone.

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

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

In the fifth edition of this document, we will

a) Look at the overall course of the COVID-19 pandemic in TRPHD from **April - November** (33 weeks) and identify the outbreaks in each of the three urban areas.

b) Analyze total (cumulative) cases in **Lexington and Kearney** cities from **March 19 – November 17.**

c) Analyze the total (cumulative) COVID-19 cases in **Lexington, Holdrege and Kearney** cities, comparing the total cases by 10,000 population in each city [2]

d) Describe 7-day rolling average of cases in **Kearney** area by age and city of residence from **July 01 – November 17**.

e) Describe the 7-day rolling average of COVID-19 cases from **Oct 20 – Nov 17** (4 weeks) across cities in **Buffalo and Dawson** county. Present the same case counts/10,000 persons for cities with populations over 1100 people.

f) Present a brief weekly overview and analysis for **Kearney**

In summary, Kearney city and Kearney urban area continue to witness rapid rise in COVID-19 cases. Average daily case counts have more than doubled since November 1, and the rate of increase in cases seems to show signs of acceleration. Healthcare services in Two Rivers District are reporting increased COVID-related hospitalizations, and ICU availability is about half the previous 3 month average. Residents are advised to exercise utmost caution and adhere to strict preventive measures (social distancing, correct and consistent masking) 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 – November 17** 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.

7 Day Rolling Average of COVID-19 Cases by area

Graph displays data from April 1th to November 17th
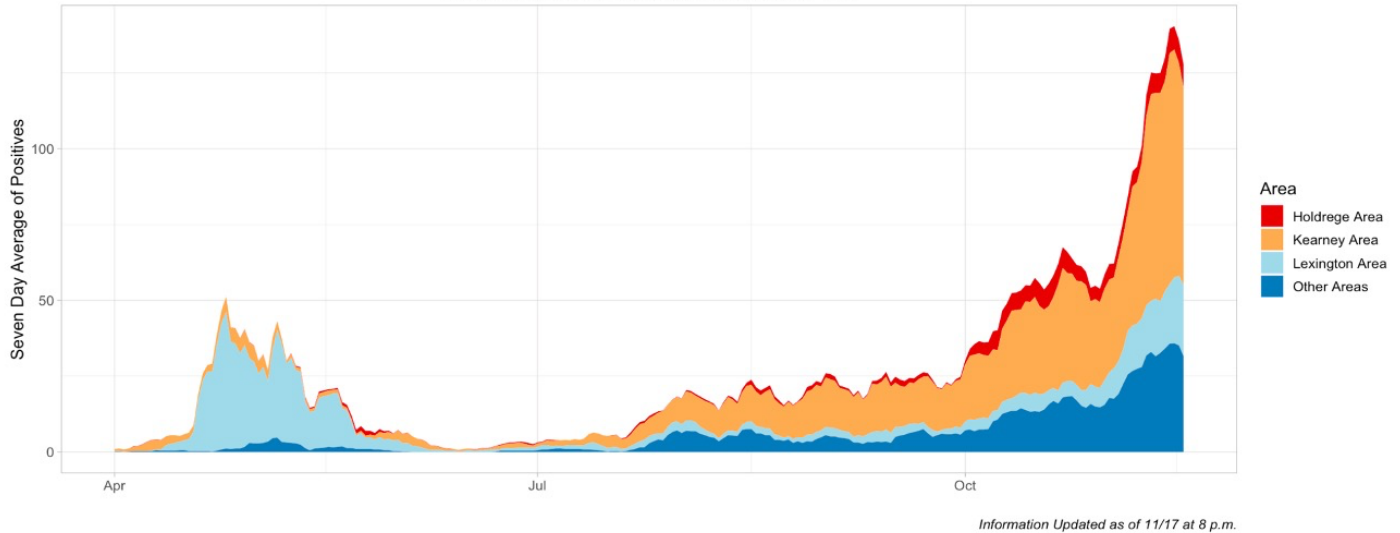
Information Updated as of 11/17 at 8 p.m.

- The graph below describes the total (cumulative) cases in **Lexington and Kearney cities** from **April 1- November 17.**

Total (Cumulative) Cases: Lexington & Kearney Mar 19 - Nov 17
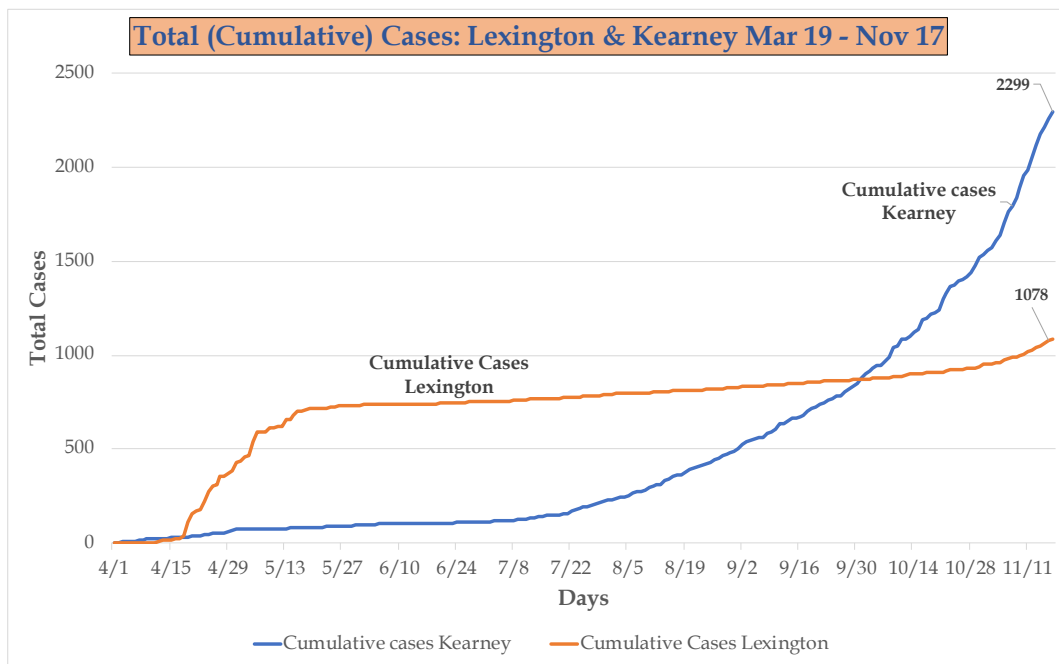
- The graph below describes the total (cumulative) cases/10,000 persons in **Lexington, Kearney and Holdrege cities** from **April 1- November 17.** The graph tries to estimate what proportion of each city would have tested positive were its population equal to 10,000 (about the size of Lexington). The graph presents the same numbers for Two Rivers Health District for reference.

Total (cumulative) Cases/ 10,000 Population: April 1 - Nov 11

PUBLIC HEALTH DEPARTMENT
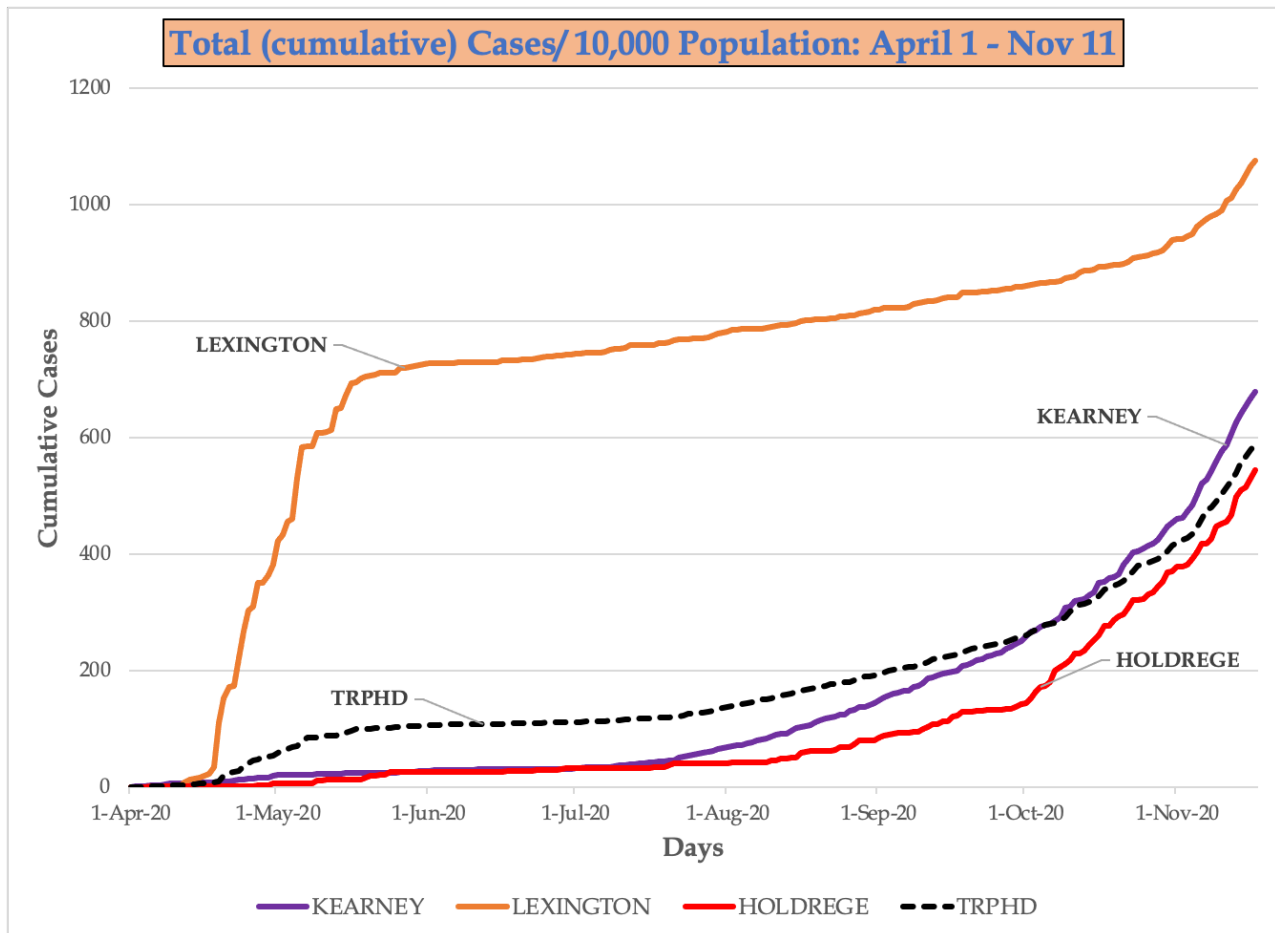
- The graph below shows COVID-19 cases in **Kearney** area from **July 1 – November 17**, describing positive cases by city. The height of the graph corresponds to the daily case count and the thickness of each colored band corresponds to a city's contribution.
- The second graph describes cases by age during the same period in the **Kearney** area.


7 Day Rolling Average of COVID-19 Cases by City

Graph displays data from July 1th to November 17th

City
- Amherst
- Axtell
- Elm Creek
- Gibbon
- Kearney
- Pleasanton
- Riverdale
- Shelton
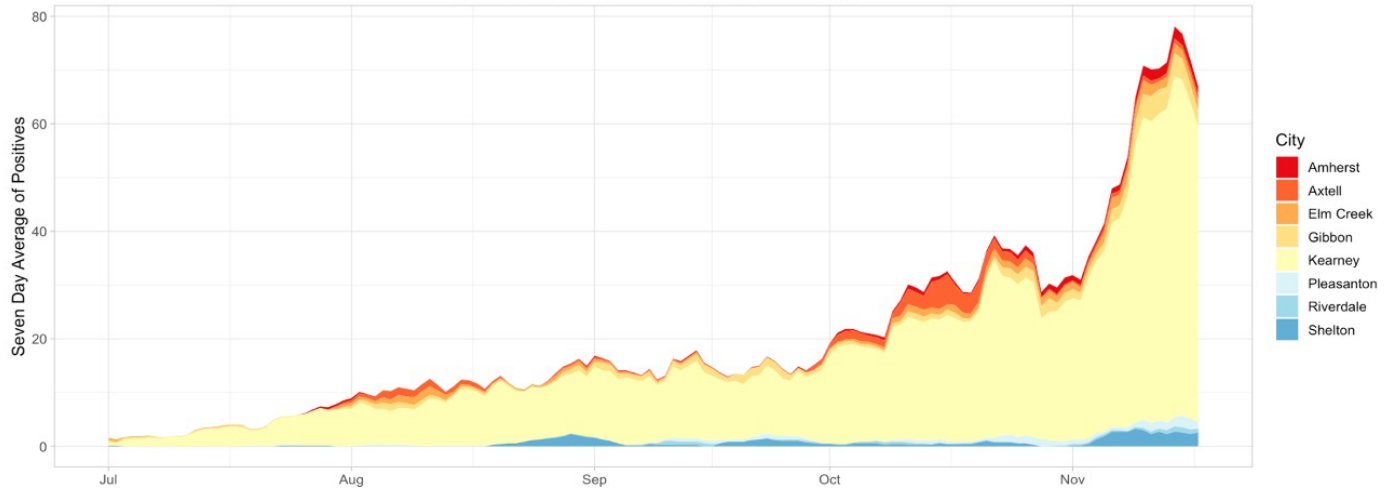
Information Updated as of 11/17 at 8 p.m.

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

Graph displays data from July 1th to November 17th

Age
- 0-17 yrs
- 18-29 yrs
- 30-39 yrs
- 40-49 yrs
- 50-59 yrs
- 60-69 yrs
- 70-79 yrs
- 80-89 yrs
- 90+ yrs
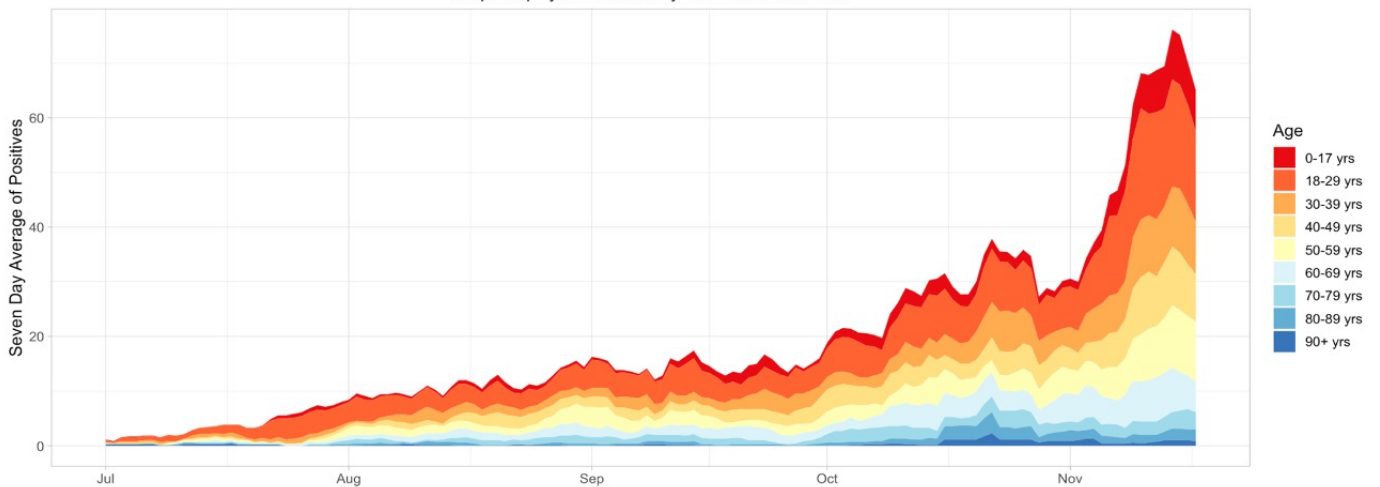
(Kearney area includes Kearney and towns in surrounding 20 miles)

- The graph below shows COVID-19 cases across 9 cities in **Buffalo and Dawson** counties from **Oct 20 – Nov 17.** 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] **Kearney** is represented by the dark blue line

7 Day Rolling Average of COVID-19 Cases
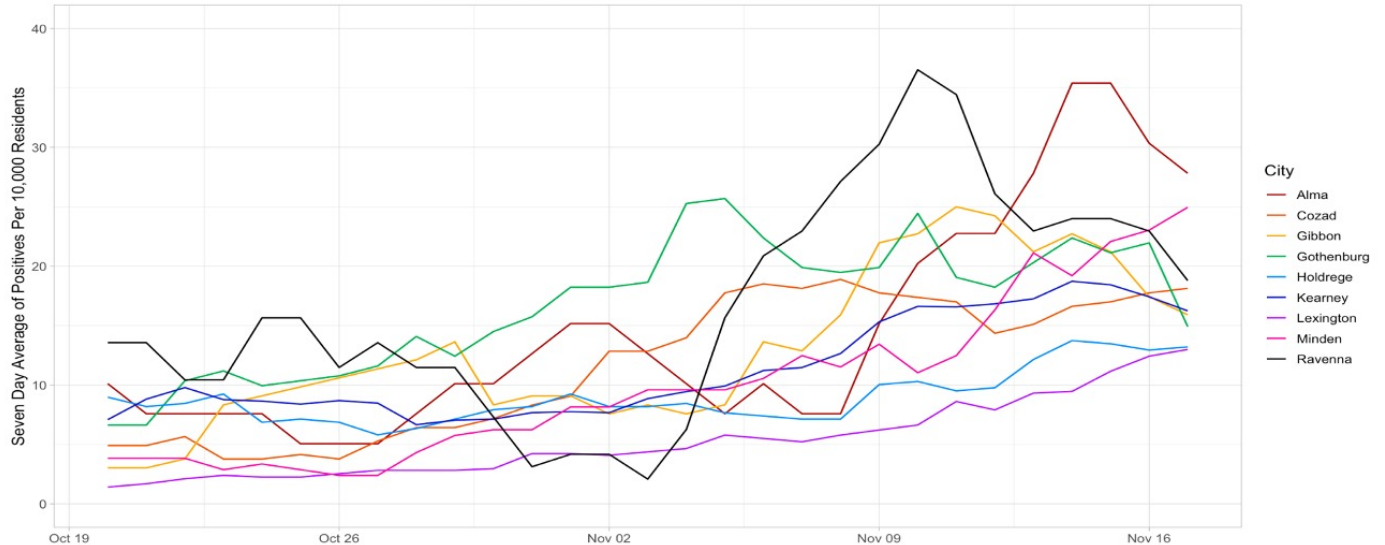**Buffalo and Dawson County**
Graph displays data from October 20th to November 17th
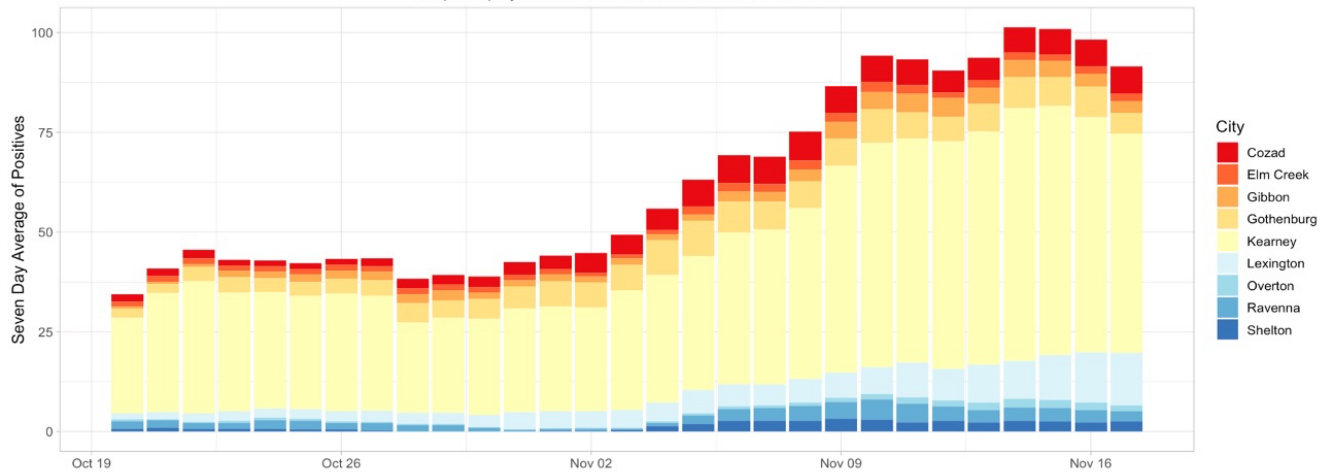
Information Updated as of 11/17 at 8 p.m.

7 Day Rolling Average of COVID-19 Cases
Per 10,000 Residents in Cities > 1,100 Residents
Graph displays data from October 20th to November 17th

Information Updated as of 11/17 at 8 p.m.

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

Weekly Summary Report

Viewing the graphs from **April – November**, some broad trends are noticeable:
- The COVID-19 outbreak in Kearney city and urban area continues to accelerate, and the daily case rate shows an inexorable upward trend that is comparable to the rapid increase in cases in Lexington in the Spring.
- Cumulative case counts in Kearney city are more than double those in Lexington, the cumulative count per 10,000 population continues to rise, now at a steeper rate.

On analyzing graphs of COVID cases from **July – November**, some details become clear:
- The growth in new cases since November 1 in Kearney area seem to be mostly in Kearney city, with smaller contributions from Shelton & Gibbon.
- Cases are rising rapidly among all age groups. Almost a third of people over the age of 60 in Kearney area tested positive in the past two weeks. Positivity rates are over 40% among 40-60 year olds.

On analyzing graphs of COVID cases from **October – November**, we are able to observe the following:
- Daily case counts across Kearney city have more than **doubled** in the past two weeks, and average case counts per 10,000 residents continue to show a steady rate of increase since late October.
- Kearney area is seeing a sharp rise in daily average case counts, contributed primarily by Kearney city. However, rising cases in Gibbon and Shelton are indicative of a possible rise in the weeks to come.
- Across Two Rivers Health district, ICU bed availability is less than 24%, over 40% of all occupied beds are by COVID-19 patients.

In summary, Kearney city and Kearney urban area continue to witness rapid rise in COVID-19 cases. Average daily case counts have more than doubled since November 1, and the rate of increase in cases seems to show signs of acceleration Healthcare services in Two Rivers District are reporting increased COVID-related hospitalizations, and ICU availability is about half the previous 3 month average. Residents are advised to exercise utmost caution and 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
TRPHD total	**97,132**
Nebraska state	1,934,408

Thus "Kearney area" includes Kearney city as well as Elm Creek, Pleasanton, Amherst, Riverdale, 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.

For presenting data, we selected 3 time frames:
   a) April 1 – Nov 10 (From the beginning of the pandemic to current)
   b) July 01 – Nov 10 (From the beginning of second sustained 'wave' in daily case counts to current)
   c) Oct 14 – Nov 10 (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 simply the sum of all cases for that day and 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 different areas (counties v/s state of Nebraska, for eg), we present the count per 100,000 population(except when explicitly stated). 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

Total (cumulative) cases per 10,000 population

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), expressed as a fraction of the 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 corresponds to the population of Holdrege (~5439 people), Lexington (~10,024 people), and Kearney (~33,835 people).

Populations 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

The Total cases/ 10,000 persons is calculated as:

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