



Kearney Urban Area - COVID-19 Status Report 11 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. The largest cities are Holdrege (pop. 5408), Lexington (pop. 10115) and Kearney (pop. 33867) meaning that well over half the residents of TRPHD live in three cities, and over a third are 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 (39,412 people)
- “Lexington area” includes Lexington city, Overton, Johnson Lake and Cozad (15,017 people)
- “Holdrege area” includes Holdrege city, Loomis and Funk (5967 people).

In the ninth edition of this document, we will

- a) Look at the overall course of the COVID-19 pandemic in TRPHD from **April - December** (35 weeks) and identify the 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 8.
- c) Describe 7-day rolling average of cases in **Kearney** area by age and city of residence from **July 01 - December 8**.
- d) Describe the 7-day rolling average of COVID-19 cases from **Nov 10 - Dec 8** (4 weeks) across cities in Two Rivers Health District. Present the same case counts/10,000 persons.
- e) Present a brief weekly overview and analysis for **Kearney urban area**.

To conclude, Kearney city and Kearney urban area are seeing slightly lower rate of increase of COVID-19 cases over the past two weeks as compared to the preceding month. While absolute number of cases continues to increase, the rate of growth of new cases seems to be slowing, especially in Kearney city. There continues to be improved ICU availability and COVID-related medical/surgical bed usage across hospitals in the district this week compared to previous weeks. While these are early trends, there is justification for cautious optimism regarding spread of COVID-19 in Kearney area. Residents are however advised to continue to exercise caution and adhere to strict preventive measures (social distancing, correct and consistent masking) at all times to protect themselves and others.

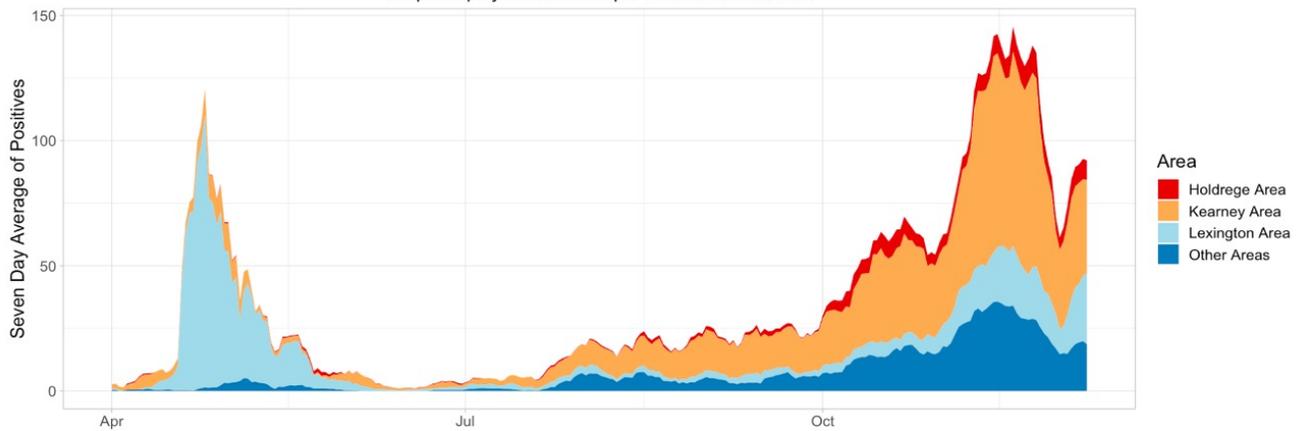
¹ For complete explanation of definitions and data sources, please see appendix 1
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- The graph below describes daily COVID-19 cases in TRPHD from **April 1 - December 8** broken down by **urban area** (Holdrege, Lexington, Kearney and all others). The 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 8**

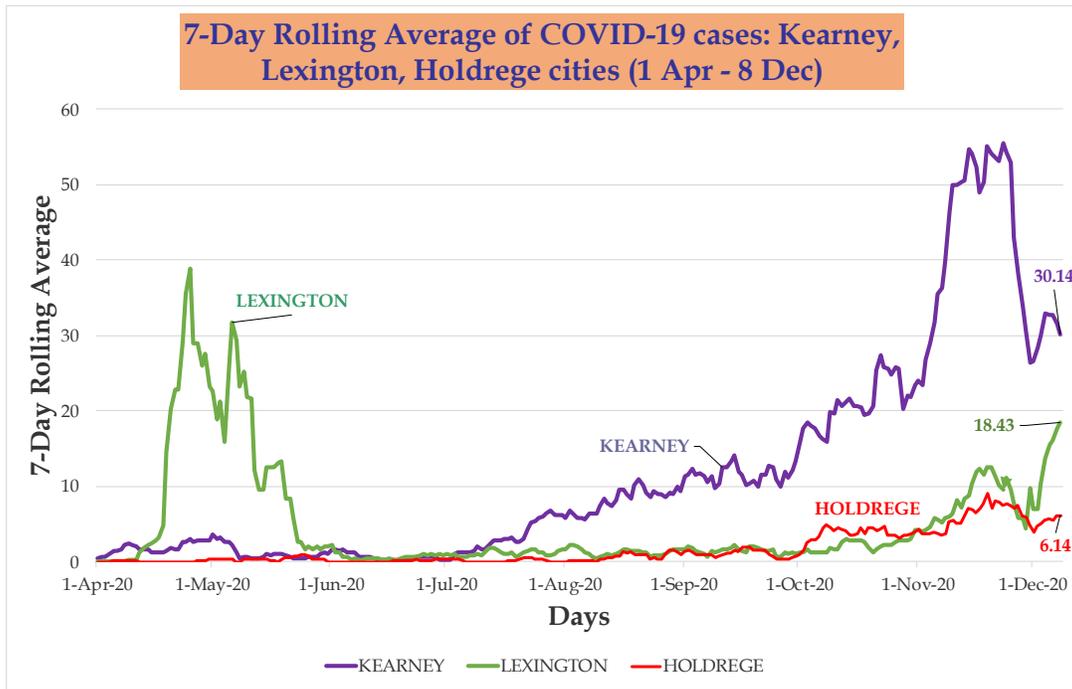
**7 Day Rolling Average of COVID-19 Cases
by area**

Graph displays data from April 1st to December 8th



Information Updated as of 12/08 at 8 p.m.

**7-Day Rolling Average of COVID-19 cases: Kearney,
Lexington, Holdrege cities (1 Apr - 8 Dec)**

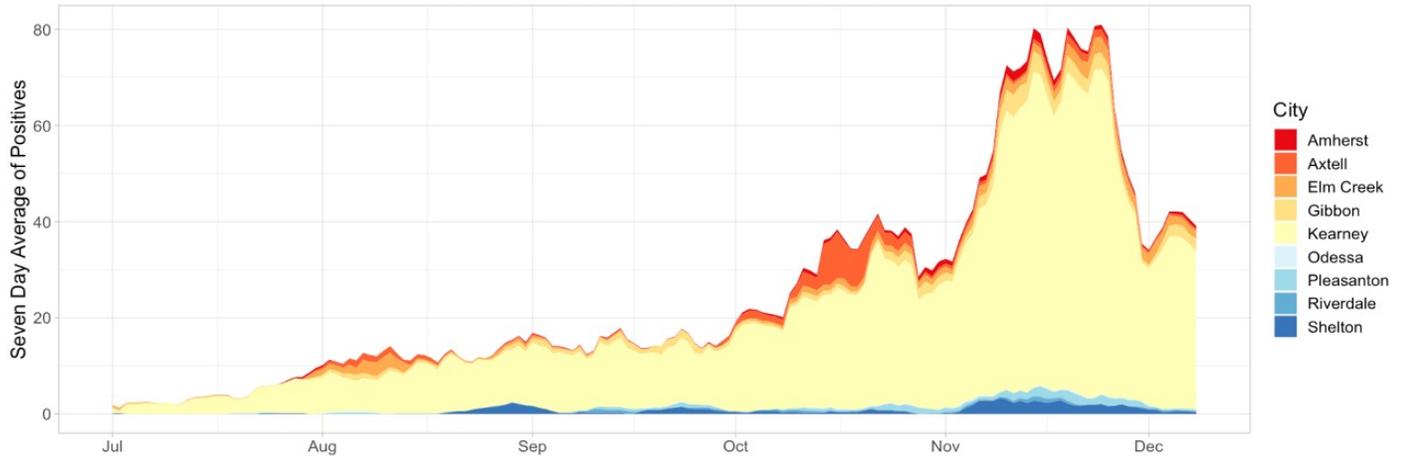




- The graph below shows COVID-19 cases in **Kearney** area from **July 1 - December 8**, describing positive cases by city. The height of the graph corresponds to the daily case count and the thickness of each colored band corresponds to a city's contribution.
- The second graph describes cases by age during the same period in the **Kearney** area.

7 Day Rolling Average of COVID-19 Cases by City

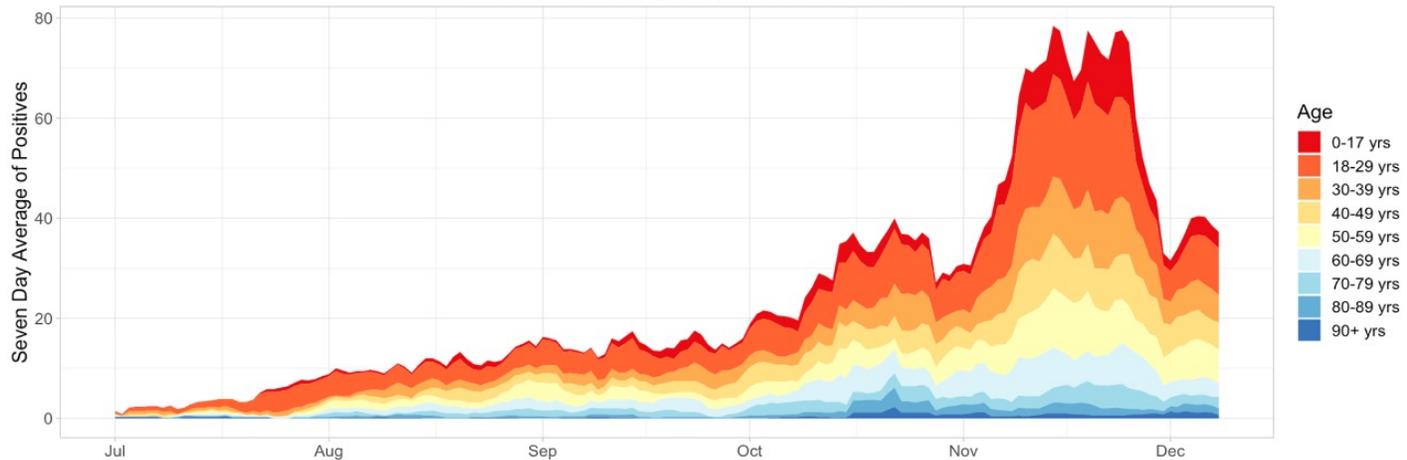
Graph displays data from July 1st to December 8th



Information Updated as of 12/08 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 8th



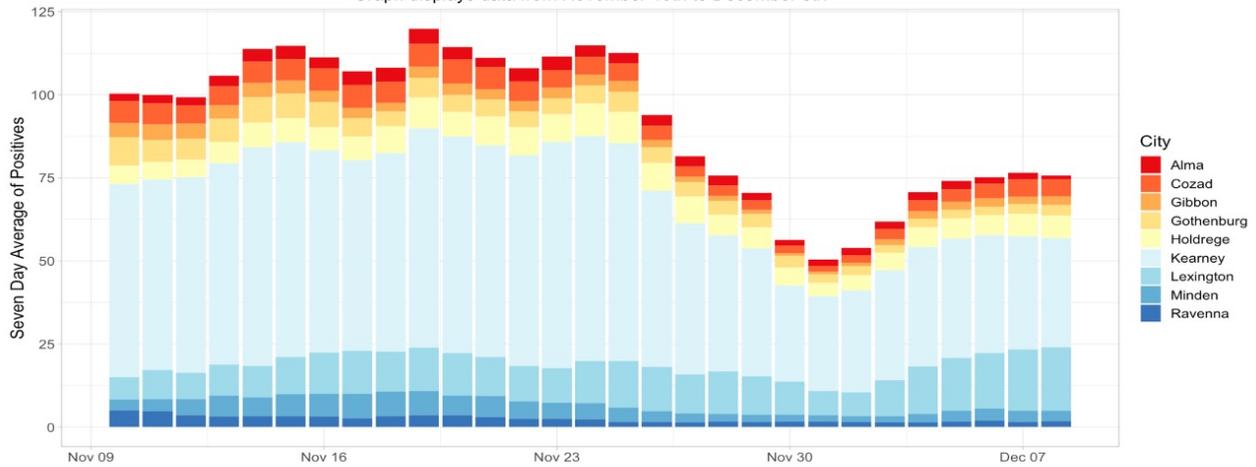
(Kearney area includes Kearney and towns in surrounding 20 miles)



- The graph below shows COVID-19 cases across 9 cities in TRPHD counties with population greater than 1100 from **Nov 10 - Dec 8**. 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. ² **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 10th to December 8th



Information Updated as of 12/08 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 10th to December 8th



Information Updated as of 12/08 at 8 p.m.

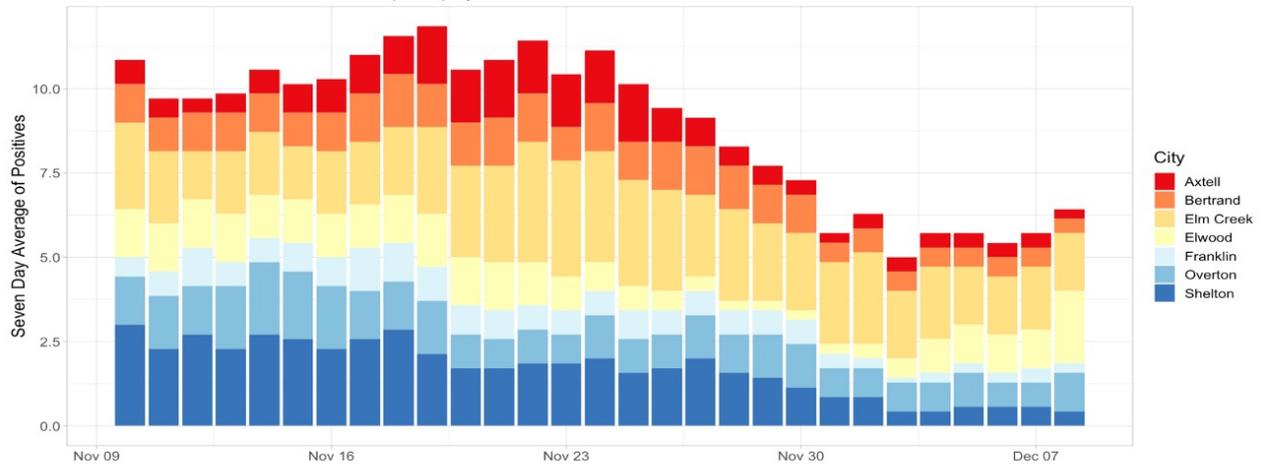
² Note: We have used 10,000 residents as reference population to better compare cities across the district.



- The graph below shows COVID-19 cases across 9 cities in TRPHD counties with population less than 1100 from **Nov 10 - Dec 8**. 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 **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 10th to December 8th



Information Updated as of 12/08 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 10th to December 8th



Information Updated as of 12/08 at 8 p.m.

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 - December**, some broad trends are noticeable:

- Daily case counts of COVID-19 in Kearney city and urban area have picked up after the brief lull over the previous two week.
- Although Kearney city is seeing a reduction in growth rate of cases over the past week, other areas in the urban area like Gibbon, Axtell and Elm Creek are showing rising case counts.

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

- The increase in case rates since the brief drop two weeks previously does not seem to match the rate of growth seen previously.
- The contribution of persons aged 60 years and over to overall positive case counts has reduced in the last week. Both these trends are encouraging, and we remain cautiously optimistic about slowing the spread of cases in Kearney city.

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

- The rate of increase of positive cases in the Kearney urban area has slowed slightly in previous weeks. While daily case counts are undoubtedly rising, the rate of increase is not as dramatic as three weeks previously.

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

- COVID-19 related ICU occupancy has decreased in the past two weeks, as also overall number of COVID-related hospitalizations across the district (see <https://www.trphd.org/covid-19/> for details)
- Although ICU availability is currently 12.5%, most admissions are for non-COVID related reasons.

To conclude, Kearney city and Kearney urban area are seeing slightly lower rate of increase of COVID-19 cases over the past two weeks as compared to the preceding month. While absolute number of cases continues to increase, the rate of growth of new cases seems to be slowing, especially in Kearney city. There continues to be improved ICU availability and COVID-related medical/surgical bed usage across hospitals in the district this week compared to previous weeks. While these are early trends, there is justification for cautious optimism regarding spread of COVID-19 in Kearney area. Residents are however advised to continue to exercise 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, 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>)



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), 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 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:

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