Holdrege Urban Area – COVID-19 Status Report 4 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 urban areas, 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).

- **There has been widespread data discontinuity across the country due to Thanksgiving week. Fewer testing sites were open last week, lab work was likely slower, and hospitalizations and deaths may not have been reported with immediate urgency. This may have resulted in lower testing and reporting within the system. Typically, this discrepancy corrects itself over the next few weeks as unmet testing demand is fulfilled and the reporting catches up with daily counts.**
- **Following a statewide change in conventions for data presentation, we are shifting from reporting *case positivity rates* (positive cases/ all persons tested) to *test positivity rates* (positive cases/ all tests conducted) in our weekly reports. We are in the process of updating datasets to reflect this change.**
- **For the above reasons, we would caution against reading too closely into the drop in cases recorded in the past week. The most recent week's decrease in numbers, observable as a secular trend across cities in the district, is likely to be influenced by data discontinuity issues and may not be attributable to actual reduction in new infections.**

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

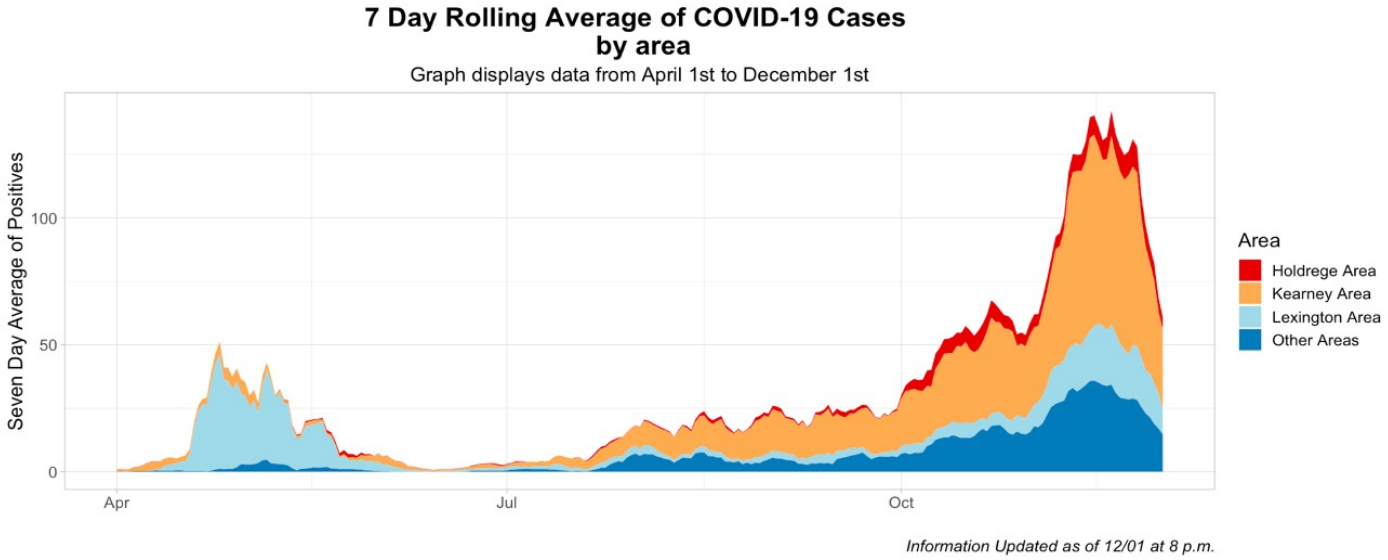
In the seventh edition of this document, we will

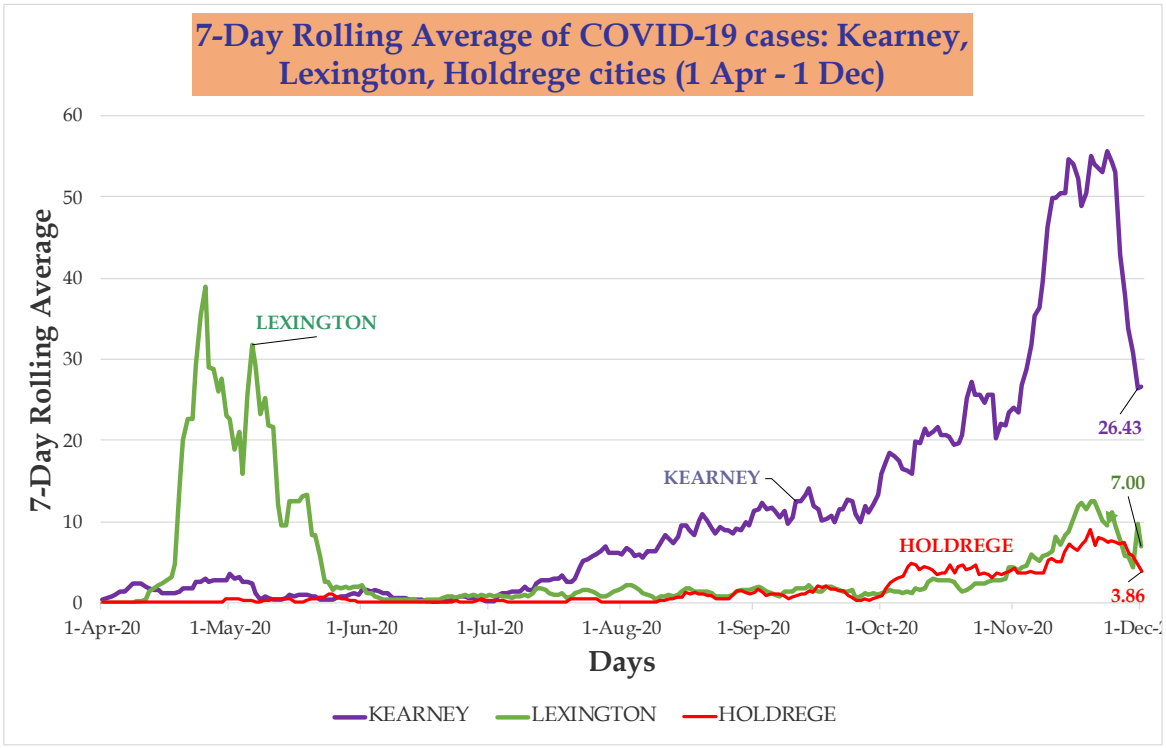
a) Look at the overall course of the COVID-19 pandemic in TRPHD from **April - December** (35 weeks) and identify the outbreaks in each of the three urban areas.
b) Analyze daily case averages (7-day rolling) in **Lexington, Holdrege and Kearney** cities from **April 1 – December 1**.
c) Analyze the total (cumulative) COVID-19 cases in **Lexington, Holdrege, Kearney and Minden** cities, comparing the total cases by 10,000 population in each city [2]
d) Describe 7-day rolling average of cases in **Holdrege** 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 with more than 1100 residents in Two Rivers Health District. Present the same case counts/10,000 persons.
f) Present a brief weekly overview and analysis for **Holdrege urban area.**

To conclude, even as data delays and testing shortfalls have likely disrupted daily reporting, long term trends seem to point towards rising case counts across all urban areas in Two Rivers District. Incident cases among individuals aged 50 or more in Holdrege area have accounted for over 55% of all positives in the last month. Half of all COVID deaths in TRPHD have occurred in the previous 6 weeks. Meanwhile, there appears to be slightly improved ICU availability and COVID-related medical/surgical bed usage across hospitals in the district the last week compared to previous weeks. 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.

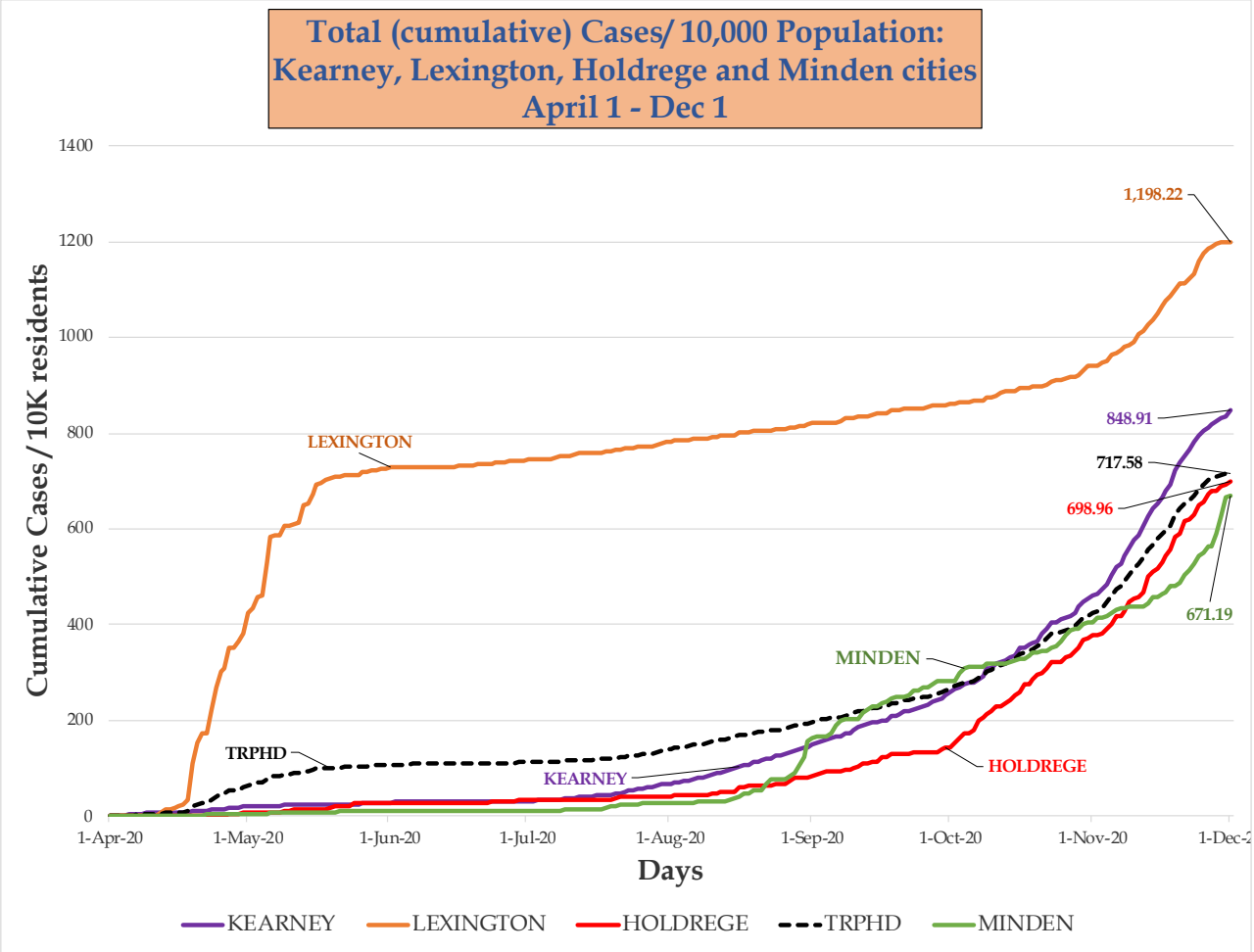
[2] For complete explanation of definitions and data sources, please see appendix 2

- The graph below describes daily COVID-19 cases in TRPHD from **April 1 – December 1** 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 1.**

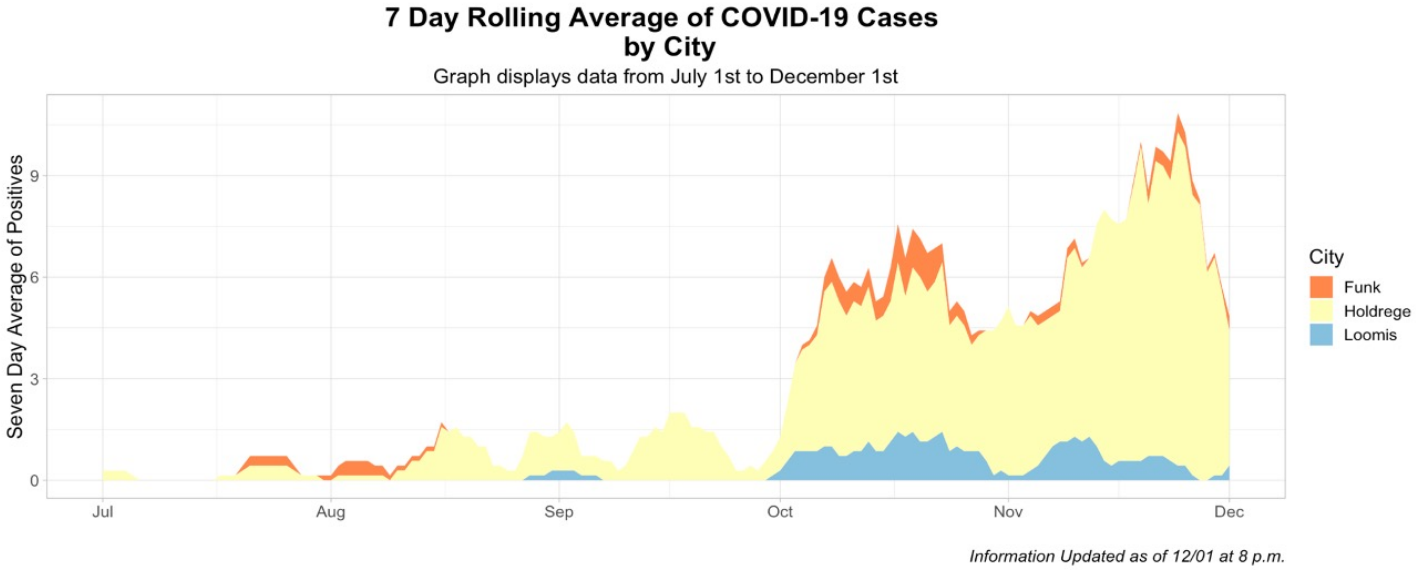


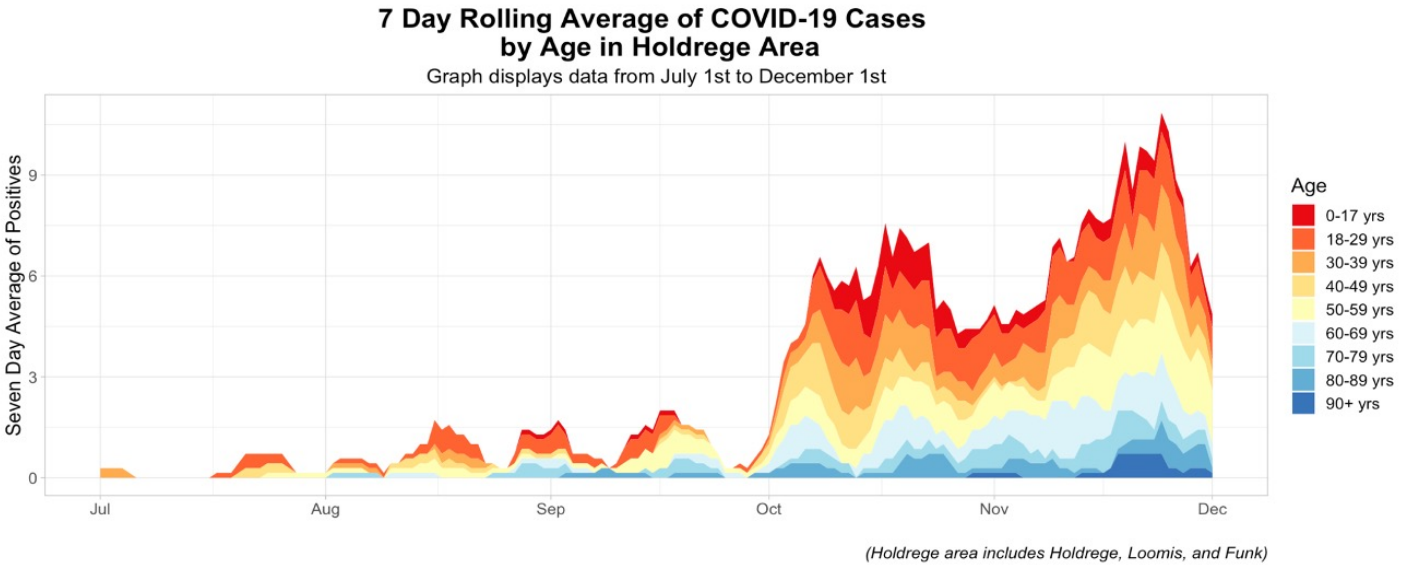


- The graph below describes the total (cumulative) cases/10,000 persons in **Lexington, Kearney, Holdrege and Minden cities** from **April 1- December 1 .** The graph presents the same numbers for Two Rivers Health District for reference.



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





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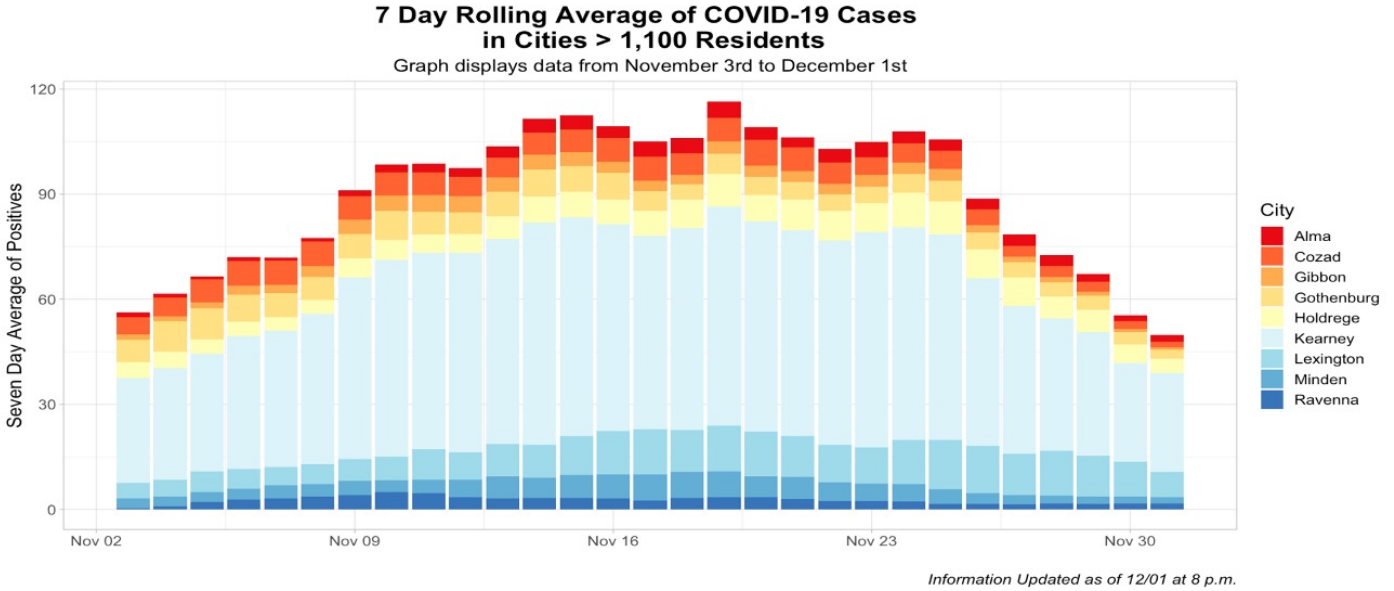
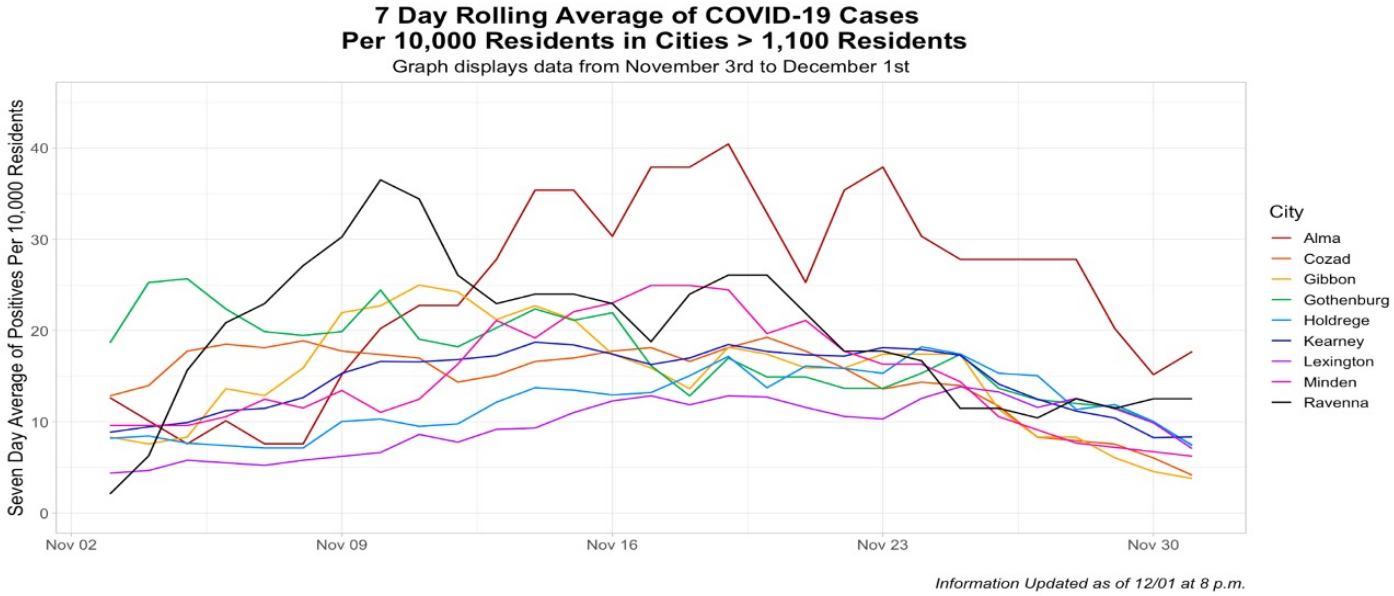
- The graph below shows COVID-19 cases across 9 cities in TRPHD counties with population greater than 1100 from **Nov 3 – Dec 1.** The height of the bar corresponds to the daily case count and the thickness of each colored band corresponds to a city's contribution.
- The second graph describes cases per 10,000 residents in cities with population>1100 during this time period. [3] **Holdrege city** is represented by the light blue line





[3] 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:

- The COVID-19 outbreak in Holdrege city and urban area was accelerating till the previous week, when daily case counts fell across the district. The 7-day rolling average on December 1 in Holdrege city was about half the rate seen previous week.
- A drop in daily case rates can be observed across all three urban areas in TRPHD as well as the rest of the district over the past week. It seems likely that this sharp decrease is related to reduced uptake of testing and delays in lab reporting last week related to Thanksgiving Holiday. Possibly, some of the unmet need for testing over the past week will influence case counts over the coming few weeks, inflating daily case rates across the district and in Holdrege.
- Holdrege city remains the primary driver of cases in the Holdrege urban area. About half of all COVID cases in Holdrege were reported in the past month.
- Cumulative case counts per 10,000 population continue to rise. About 7% of Holdrege city's residents have tested positive for COVID-19 at some point in the last nine months.

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

- The drop in cases over the last week has occurred across all cities in Holdrege area.
- Cases continue to rise rapidly among older residents, almost 55% of all persons testing positive in the Holdrege area last week was aged 50 years or more, and 18% were aged 65 or more.

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

- COVID cases in Holdrege city have dropped in the past week, similar to other cities in thee area. Cities if similar sizes display similar trends in per-capita rates, indicating a possible data issue
- Deaths due to COVID-19 have increased across Two Rivers Health Department. 72 deaths due to COVID have been confirmed in the district, half of those occurring in the last six weeks.

To conclude, even as data delays and testing shortfalls have likely disrupted daily reporting, long term trends seem to point towards rising case counts across all urban areas in Two Rivers District. Incident cases among individuals aged 50 or more in Holdrege area have accounted for over 55% of all positives in the last month. Half of all COVID deaths in TRPHD have occurred in the previous 6 weeks. Meanwhile, there appears to be slightly improved ICU availability and COVID-related medical/surgical bed usage across hospitals in the district the last week compared to previous weeks. 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.

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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 respective 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 1 (From the beginning of the pandemic to current)
b) July 01 – Dec 1 (From the beginning of second sustained 'wave' in daily case counts to current)
c) Nov 3 – Dec 1 (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

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 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

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

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