Kearney Urban Area – COVID-19 Status Report 6 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.

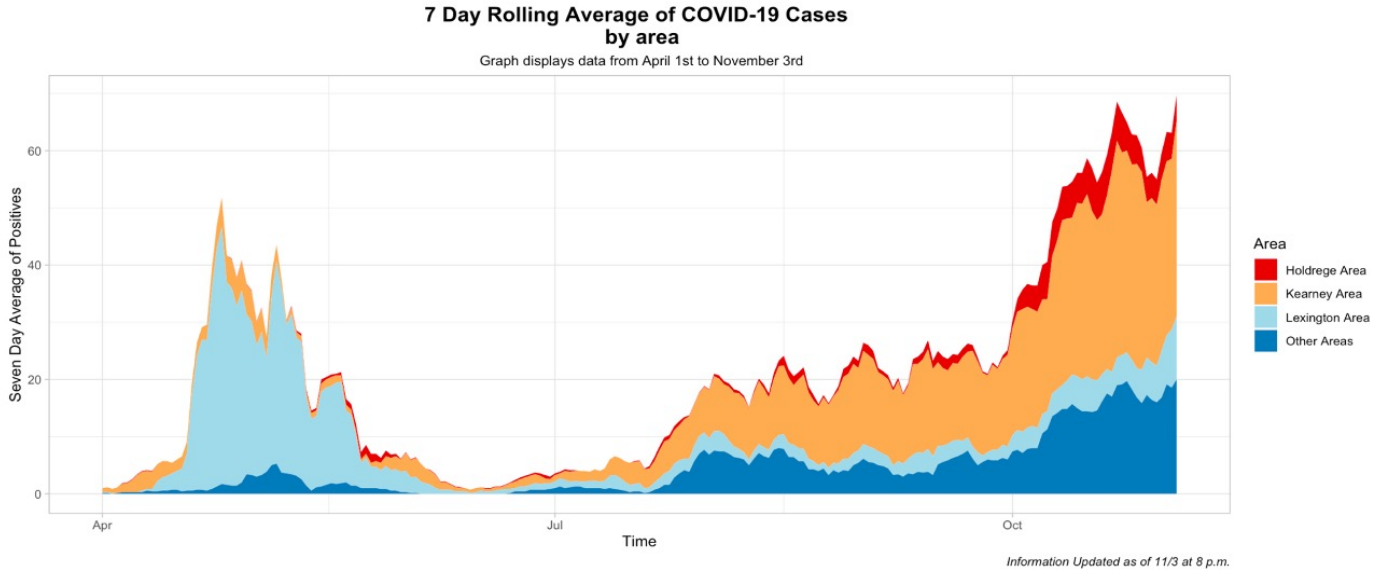
In the fifth edition of this document, we will

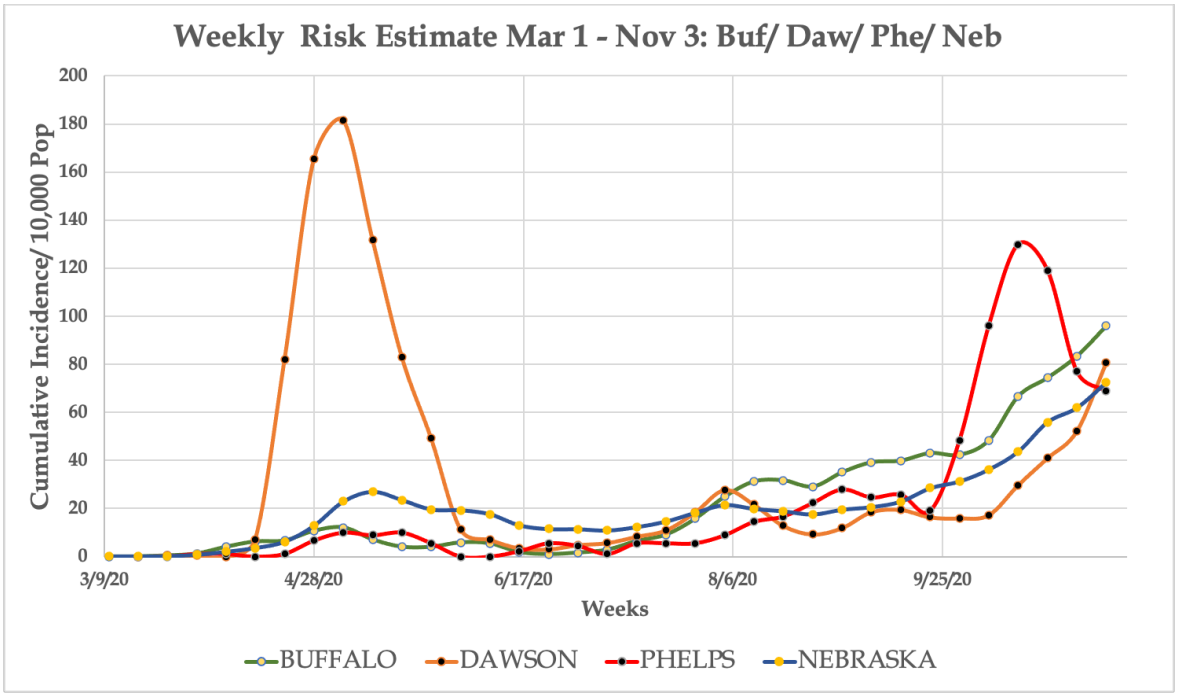
a) Look at the overall course of the COVID-19 pandemic in TRPHD from **April - November** (32 weeks) and identify the outbreaks in each of the three urban areas.
b) Track weekly estimated risk for Buffalo, Dawson and Phelps counties from **March – November** (36 weeks)**,** identifying the onset of county-level outbreaks.
c) Analyze data from **July 01 – November 3** (18 weeks) to see daily cases across Kearney area by age and city of residence.
d) We will also describe average daily positivity rates in the past 18 weeks, comparing it to Phelps, Dawson and the state of Nebraska[2]
e) Describe the progress of COVID-19 cases from **Oct 7 – Nov 3** (4 weeks) across cities in Buffalo and Dawson counties.
f) Present a brief weekly overview and analysis for Kearney

In summary, Kearney city and Kearney urban area continue to display a step-ladder pattern in daily growth of new cases. Community spread is rampant, and contact tracing staff have reported multiple outbreaks across the urban area, at least one of which was in a facility setting. The sudden recent rise in positivity rates and the sharp increase in weekly risk estimates point towards continuing rise in total cases across the Kearney urban area. Residents of Kearney and surrounding towns are strongly advised to avoid non-essential travel and follow standard preventive practices like masking and social distancing to avoid incident infection.

[1] For complete explanation of definitions and data sources, please see appendix 1
[2] Errata: An earlier version of this graph misrepresented the positivity rates for Nebraska. The error has been rectified. For data about Nebraska and other states COVID-19 testing and cases, visit the covid tracking project: https://covidtracking.com/data

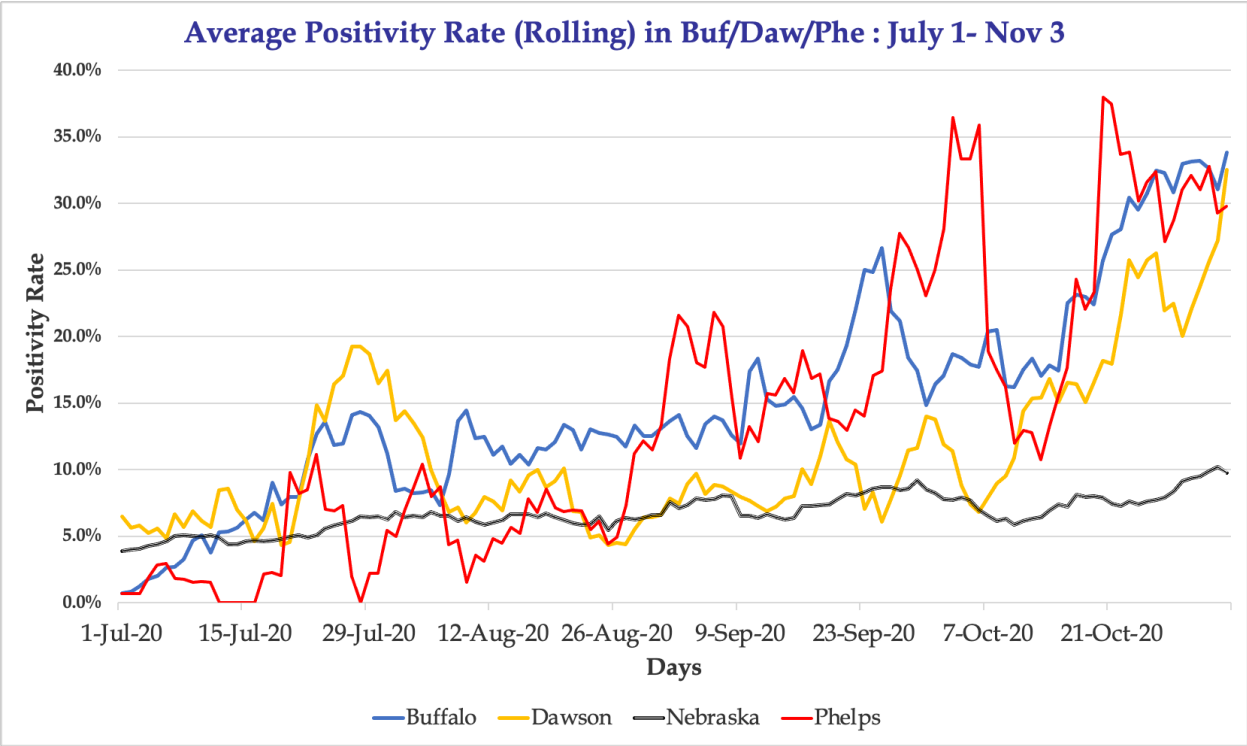
- The graph below describes daily COVID-19 cases in TRPHD from **April 1 – November 3** broken down by urban area (Holdrege, Lexington, **Kearney** and all others)
- The second graph is a scatter plot with fitted line describing weekly risk estimates (cumulative incidence) [3] for **Buffalo**, Dawson and Phelps counties from **Mar 3 – Nov 3**



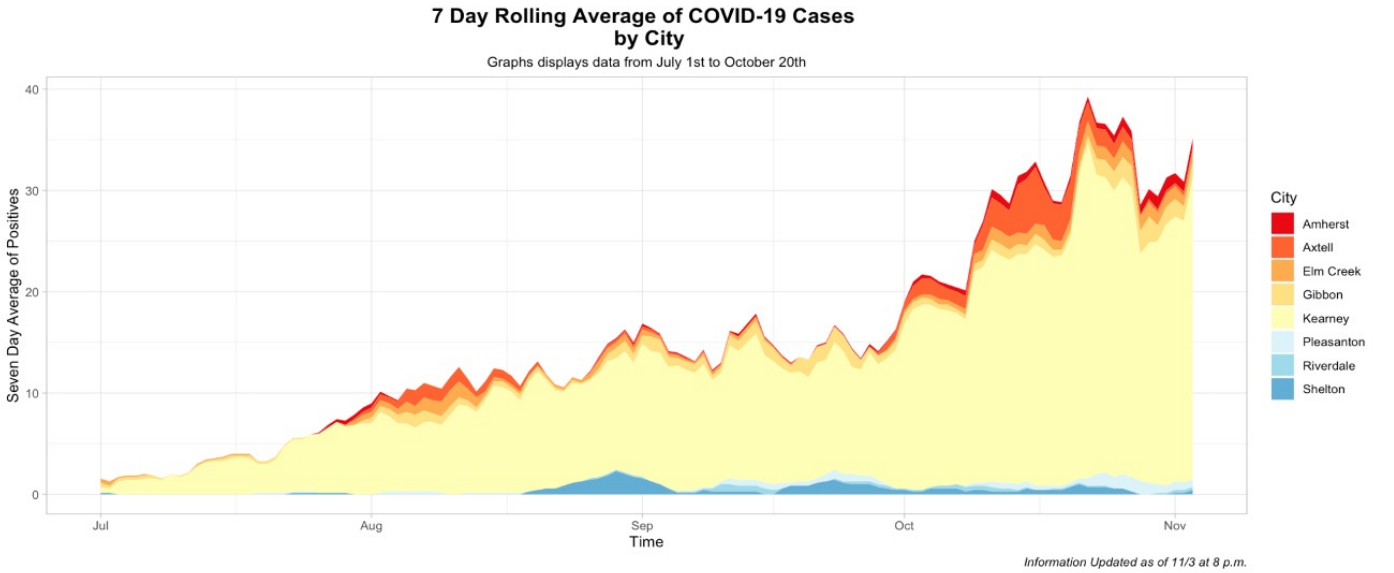


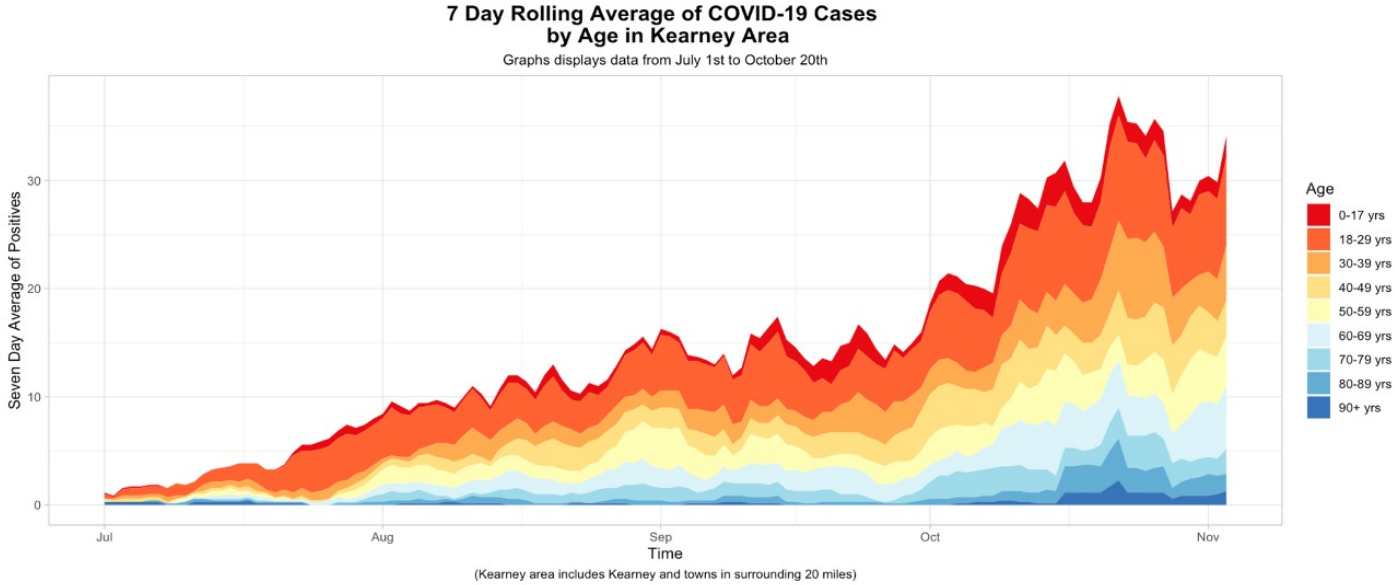
[3] For further details on calculating **risk** (or **cumulative incidence,** or **attack rate),** please see CDC webpage https://www.cdc.gov/csels/dsepd/ss1978/lesson3/section2.html

- The graph below describes average daily positivity rates (7-day rolling) from **July 1 – November 3** presented per 100,000 population in **Buffalo**, Dawson, Phelps and the state of Nebraska.



- The graph below shows COVID-19 cases in **Kearney** area from **July 1 – November 3**, describing positive cases by city.
- The second graph describes cases by age during the same period.





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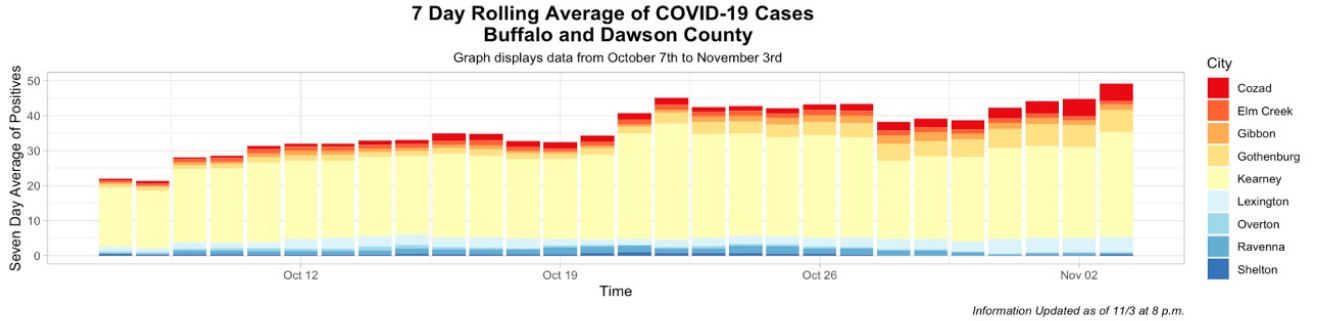
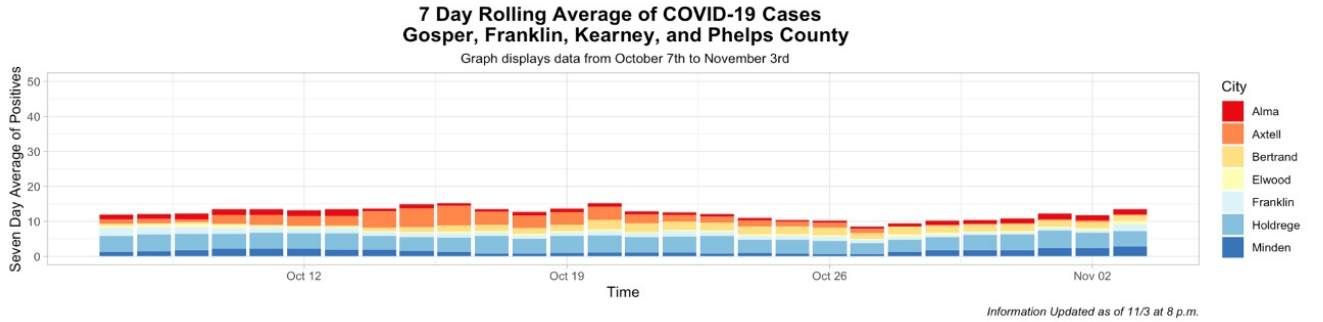
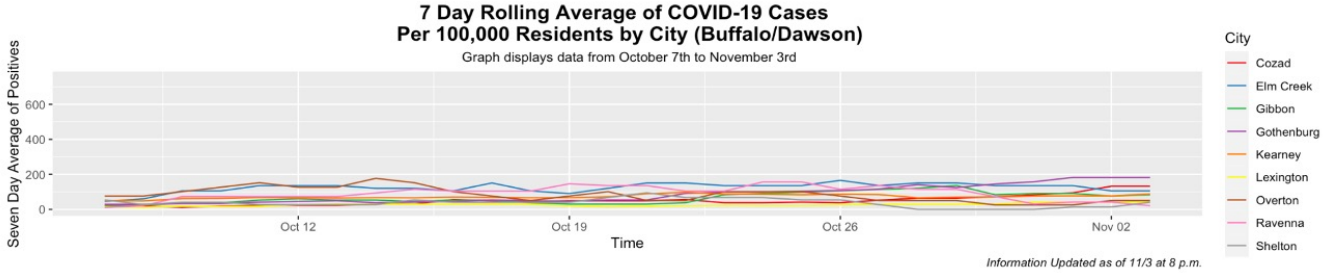
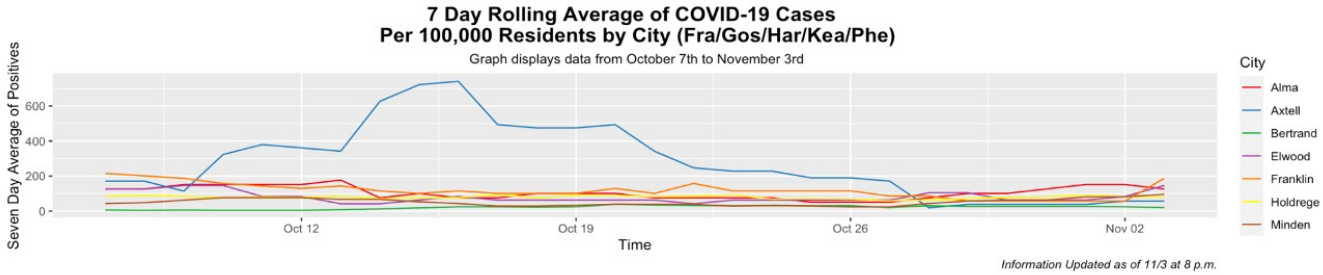
- The graph below shows COVID-19 cases across 16 cities in TRPHD from **Oct 7 – Nov 3. Kearney** is shown along with other cities in Buffalo and Dawson counties. Scales are identical for all cities.
- The second graph describes cases per 100,000 population in the same cities during this time period.









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Weekly Summary Report

Viewing the graphs from April – October, some broad trends are noticeable:

- The COVID-19 outbreak in Kearney continues to grow at an accelerated pace, and Kearney city is now the primary driver of the pandemic in Buffalo county, and more broadly in Two Rivers Health District.
- The graph describing weekly risk shows outbreaks in Dawson and Phelps since early March. These peaks coincided with periods of intense community transmission and increased morbidity in these communities.
- While these outbreaks that crested in Dawson and Phelps seem to have subsided for now, Kearney's risk continues to grow without signs of a downturn.

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

- The average daily positivity rate in Buffalo crossed the statewide average in mid July and has remained elevated since then. There has been a dramatic uptick in rates since the first week of October.
- Although Axtell saw an outbreak in cases in early-mid October (that continues to make per-capita rates un-representable on the graph), the caseload in the Kearney urban area is being driven almost exclusively by Kearney city
- Kearney area is continuing the step-ladder pattern of increase in daily cases seen since late September, and cases continue to increase across all age groups. .

In summary, Kearney city and Kearney urban area continue to display a step-ladder pattern in daily growth of new cases. Community spread is rampant, and contact tracing staff report multiple outbreaks across the urban area, at least one of which is in a facility setting. The sudden recent rise in positivity rates and the sharp increase in weekly risk estimates point towards continuing rise in total cases across the Kearney urban area. Residents of Kearney and surrounding towns are strongly advised to avoid non-essential travel and follow standard preventive practices like masking and social distancing to avoid incident infection.

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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, 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 – Oct 27 (From the beginning of the pandemic to current)
b) July 01 – Oct 27 (From the beginning of second sustained 'wave' in daily case counts to current)
c) Sep 28 – Oct 27 (Previous 4 weeks)

- Data is presented as 7-day rolling averages for daily numbers and absolute counts for cumulative cases. This 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. 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)