



Kearney Urban Area

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.

Methods

To better understand the course of the COVID-19 pandemic in these three cities, 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.

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.

In the first edition of this document, we will look at the course of the COVID-19 pandemic in TRPHD, identify two distinct phases and focus on the second phase, largely driven by the continuing rise in newly detected cases in Kearney area. Analyzing data from the previous four weeks, we will try to explore positivity rates and absolute numbers in specific age groups to better understand risk and transmission dynamics

Overview

- Figure 1 (a) describes the COVID-19 pandemic for all counties in TRPHD from April 1 2020 to October 6, 2020. Figure 1 (b) describes the cases in Lexington and Kearney areas during the same period. Two clear phases are visible: an initial outbreak in Lexington (April-May) that subsided by early June and a more gradual but steady rise in cases mostly in Kearney that began mid- July and continues into October.
- Figure 2 describes cases in Kearney and Lexington from Sep 9 – Oct 6 (1 month); the continuing increase in daily cases in Kearney can be clearly observed.
- Table 1 describes the persons tested, positive cases and positivity rate by gender and city of residence of all persons tested between Sep 6 – Oct 6 in Kearney area. The city of Kearney accounted for 87% of all persons tested and 82% of all positives in Kearney area during this time period. The positivity rate of 17% in Kearney area is higher than that of entire TRPHD for the past month (15%).



Fig 1(a) (below) describes the 7-day rolling average of all COVID-19 cases in TRPHD from April 1- Oct 6, 2020

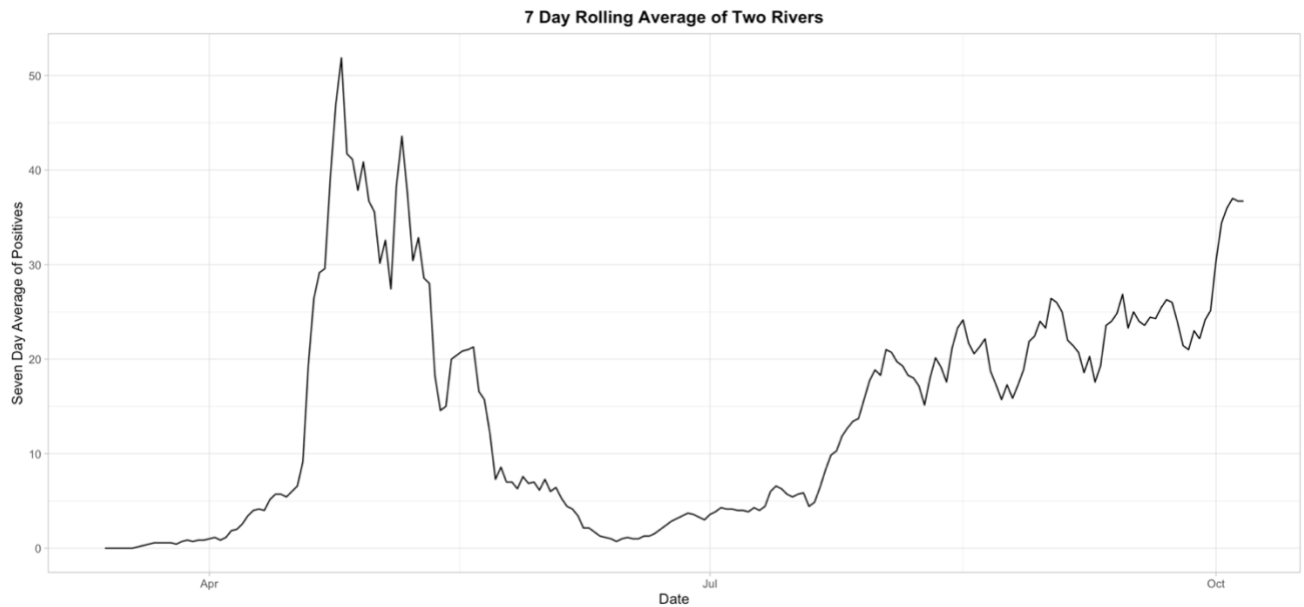


Fig 1(b) (below) describes the 7-day rolling average of all COVID-19 cases in Kearney and Lexington areas from April 1- Oct 6, 2020

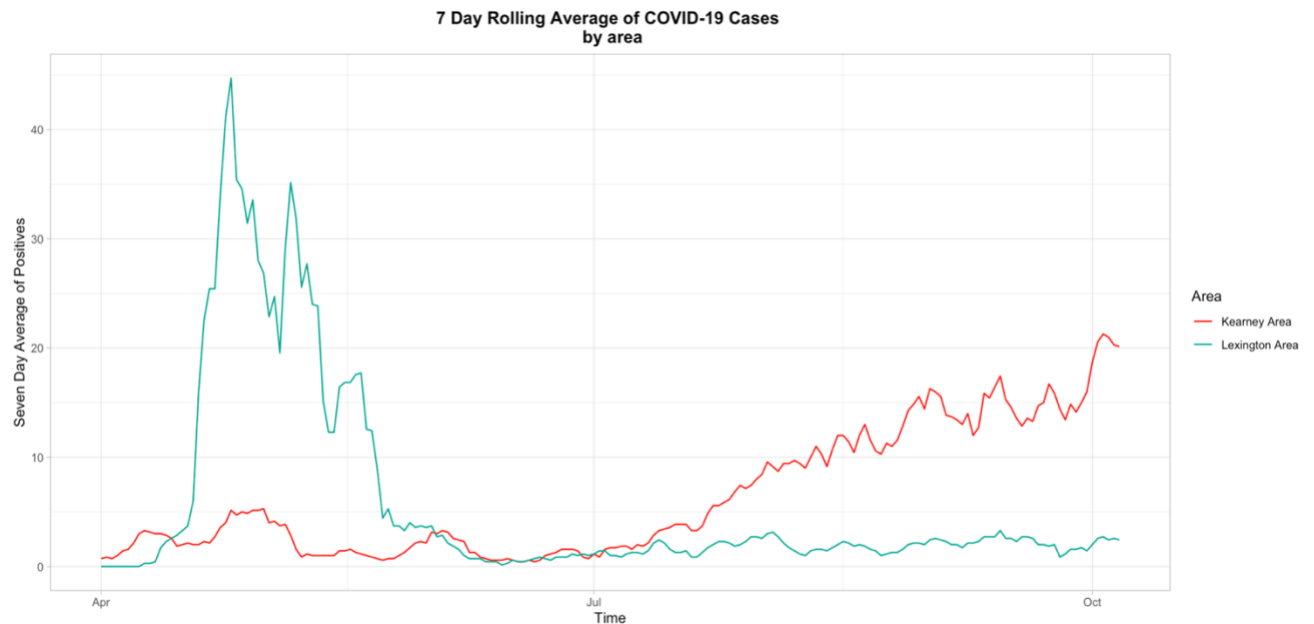




Fig 2 (below) describes the 7-day rolling average of all COVID-19 cases in Kearney and Lexington areas from Sep 6 - Oct 6, 2020

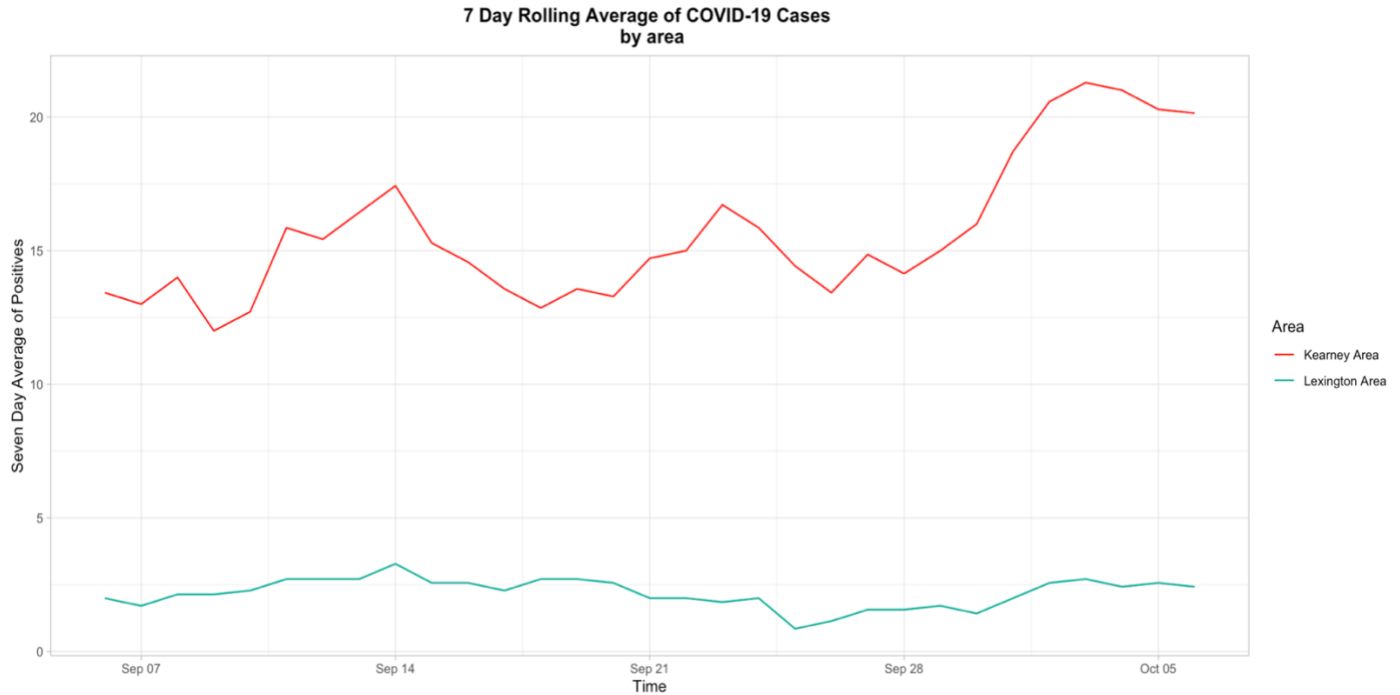


Table 1: Persons tested in Kearney area by gender and city of residence: Sep 6 – Oct 6

	Persons tested	Positive results	Positivity Rate
City of Residence			
Amherst	22	7	31.8%
Axtell	95	10	10.5%
Elm Creek	51	8	15.7%
Gibbon	90	27	30.0%
Kearney	2440	389	15.9%
Pleasanton	27	10	37.0%
Riverdale	17	8	47.1%
Shelton	64	14	21.9%
Total	2806	473	16.9%
Gender			
Female	1,117	235	21.0%
Male	945	207	21.9%
Missing	744	31	4.2%
Total	2,806	473	16.9%



Age analysis

Figure 3 shows the age breakup of persons who tested positive in Kearney area between September 6 and October 6, 2020.

- Persons aged 18-29 years account for a majority of cases, followed by 40-49 and 50-59 year olds. It is likely that this represents household transmission between young people and their parents. The rising number of cases in 70-79 year olds is also of concern.
- Although not representing a large number of absolute cases, the daily case rates among minors shows a fluctuating trend.
- The temporal shifts in case numbers for 40-49 and 70-79 year olds closely track 18-29 year olds. Older persons (40-49 & 70-79 year olds) show an increase in cases a couple weeks after cases spike in younger persons, although there is no direct evidence of causation.

Table 2 shows the education-specific age breakup of persons who tested positive in Kearney area between September 6 and October 6, 2020.

- In light of school and college reopening, we conducted a detailed analysis of age categories that approximated educational milestones among persons in Kearney area. Persons aged 0-29 were further divided into 0-4, 5-10, 11-13, 14-17, 18-23 and 24-29 year olds. Total tests, positives and positivity rates are presented in table 2.
- The remaining age categories were retained with 10-year intervals (30-39, 40-49, etc)
- Over 38% of persons tested in the Kearney area were less than 30 years of age, and this age group accounted for the same proportion of positive results in that period (38%)
- 18-23 year olds (including currently enrolled undergraduate students) have high positivity rates (over 21%) and account for almost a fifth of all positive cases in the previous month
- High school aged children in the Kearney area (14-17 years) showed higher positivity rates than would be expected for this age group.
- By contrast, 40-49 and 70-79 year olds both have positivity rates over 20%, although they have been tested at far lower rates (about a sixth of all tests conducted) than college students.
- ***In summary, minors and young people under 30 in Kearney area are accessing testing at high rates, and also have consistently high positivity rates. The more recent increase in cases among older age groups, especially 70-79 year olds in the area is worrying.***



Fig 3 (below) describes the 7-day rolling average of COVID-19 cases by age in Kearney area from Sep 6 - Oct 6, 2020

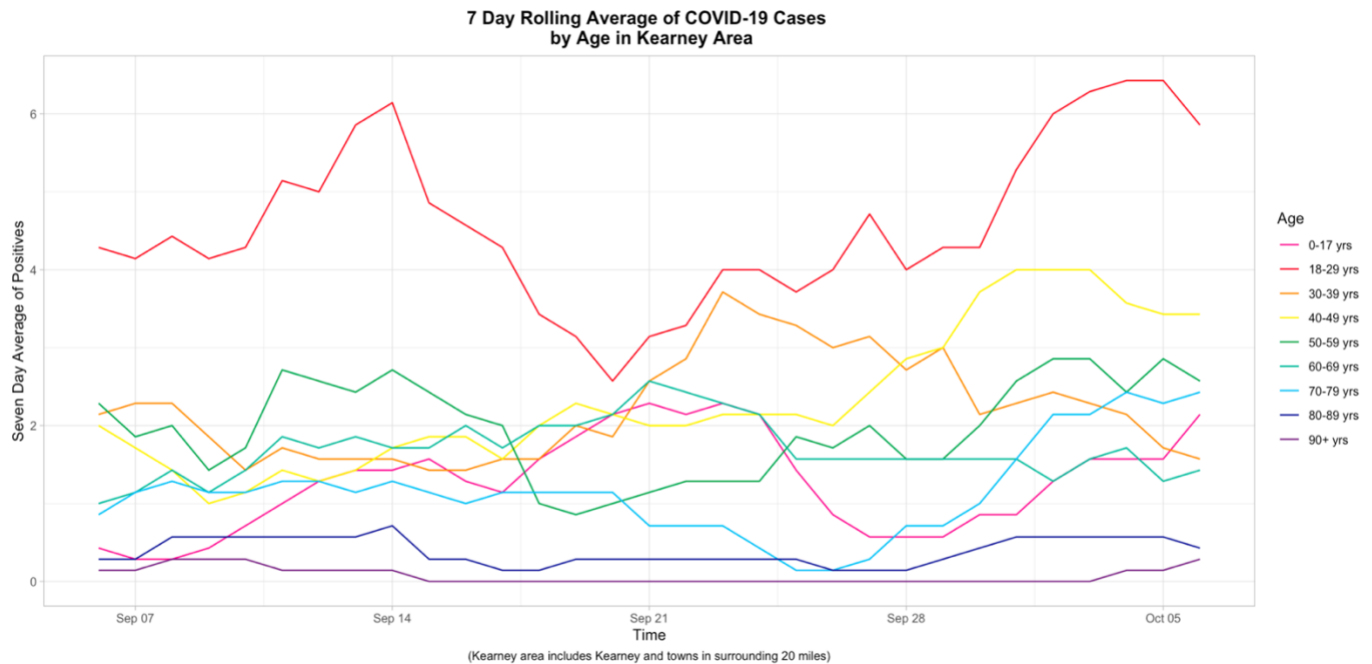


Table 1: Persons tested in Kearney area by gender and city of residence: Sep 6 – Oct 6

Age (in yrs)	Persons tested	Positive results	Positivity Rate
0-4 yrs	55	5	9.1%
5-10yrs	78	6	7.7%
11-13 yrs	74	3	4.1%
14-17 yrs	152	27	17.8%
18-23 yrs	425	90	21.2%
24-29 yrs	292	52	17.8%
30-39 yrs	377	66	17.5%
40-49 yrs	325	70	21.5%
50-59 yrs	319	56	17.6%
60-69 yrs	272	44	16.2%
70-79 yrs	181	38	21.0%
80-89 yrs	150	13	8.7%
90+ yrs	106	3	2.8%
Total	2806	473	16.9%