Covid Cases and Deaths EDA in Pennsylvania

SURE 2024
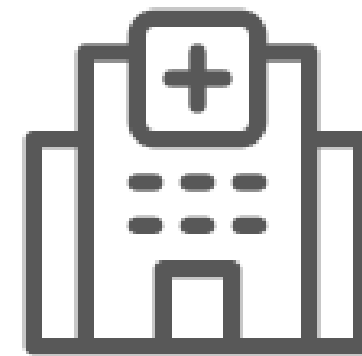
By Jade Kay, Lissandro Alvarado, and Nicole Sorensen

Understanding 2020 COVID-19 trends will improve future health crisis readiness

Current COVID-19 Impact: 1 - 3% of all deaths in early 2024
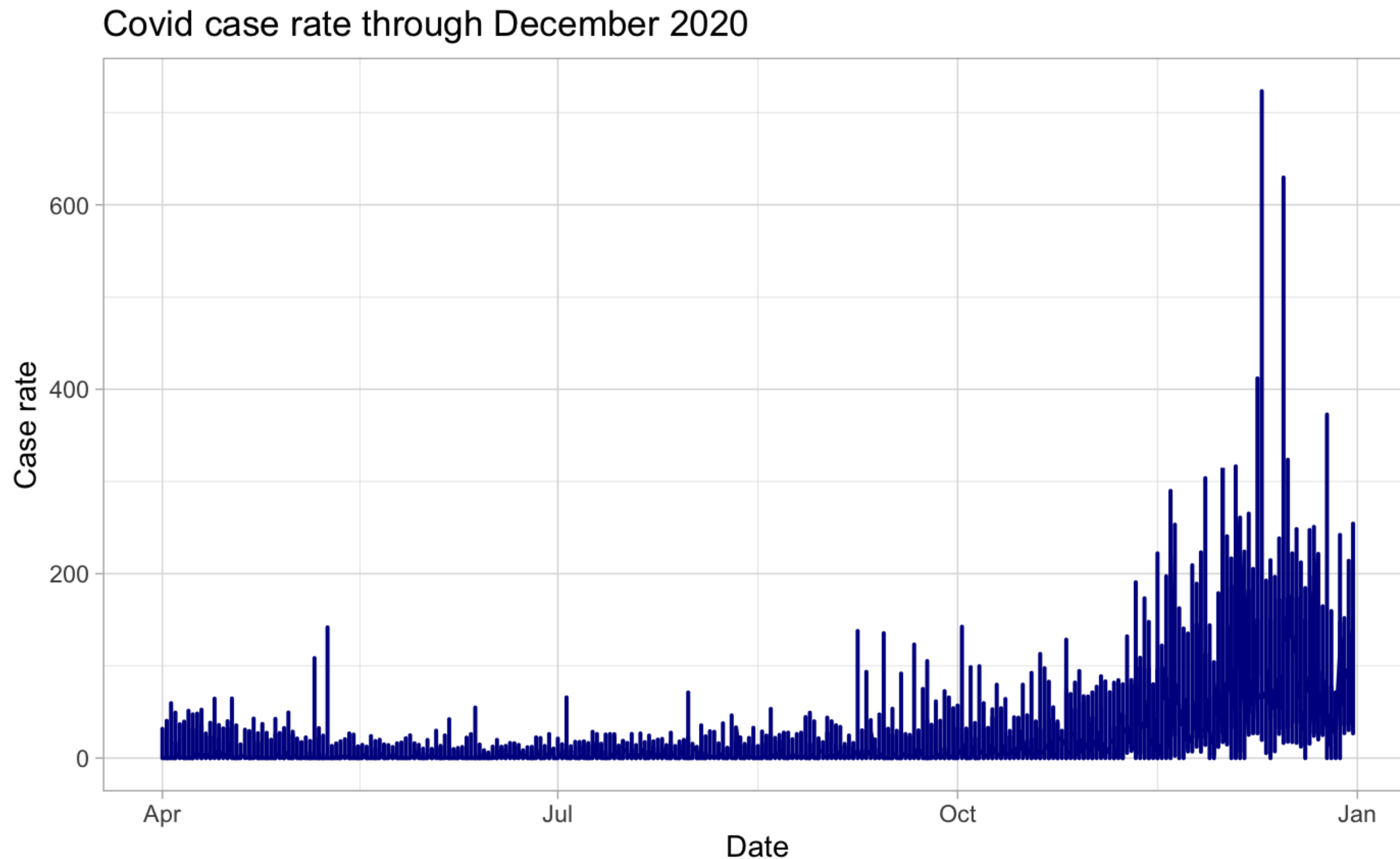
Why this analysis matters:

- Improve healthcare management:

  ○ Identify stress points to better manage crises.

- Inform targeted public health interventions

  ○ Identify which areas are most affected

Key Variables

- **Case Rate** - new confirmed and probable cases reported that date per 100,000 population
- **Cumulative Case Rate** - number of cumulative confirmed and probable cases reported through that date per 100,000 population
- **Death Rate** - new deaths per 100,000 population
- **County**
- **Population**

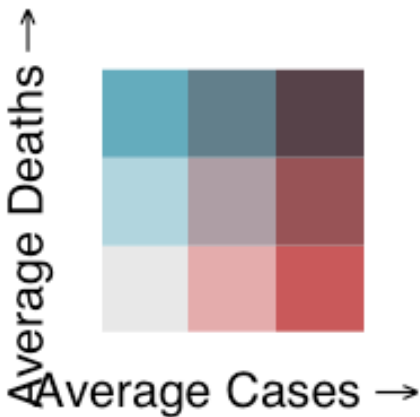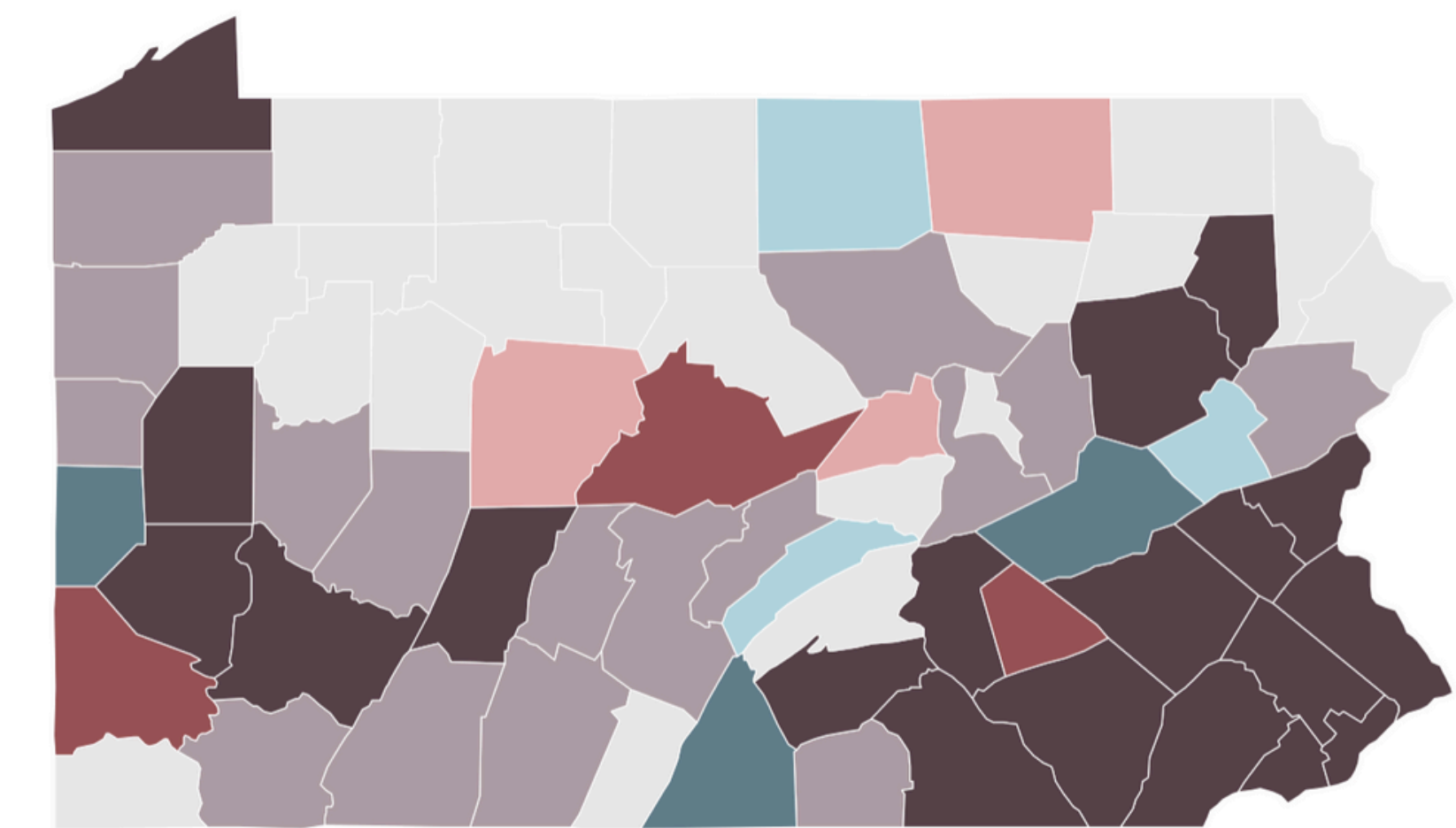# Pennsylvania saw higher COVID-19 case rates during the holidays

Covid case rate through December 2020

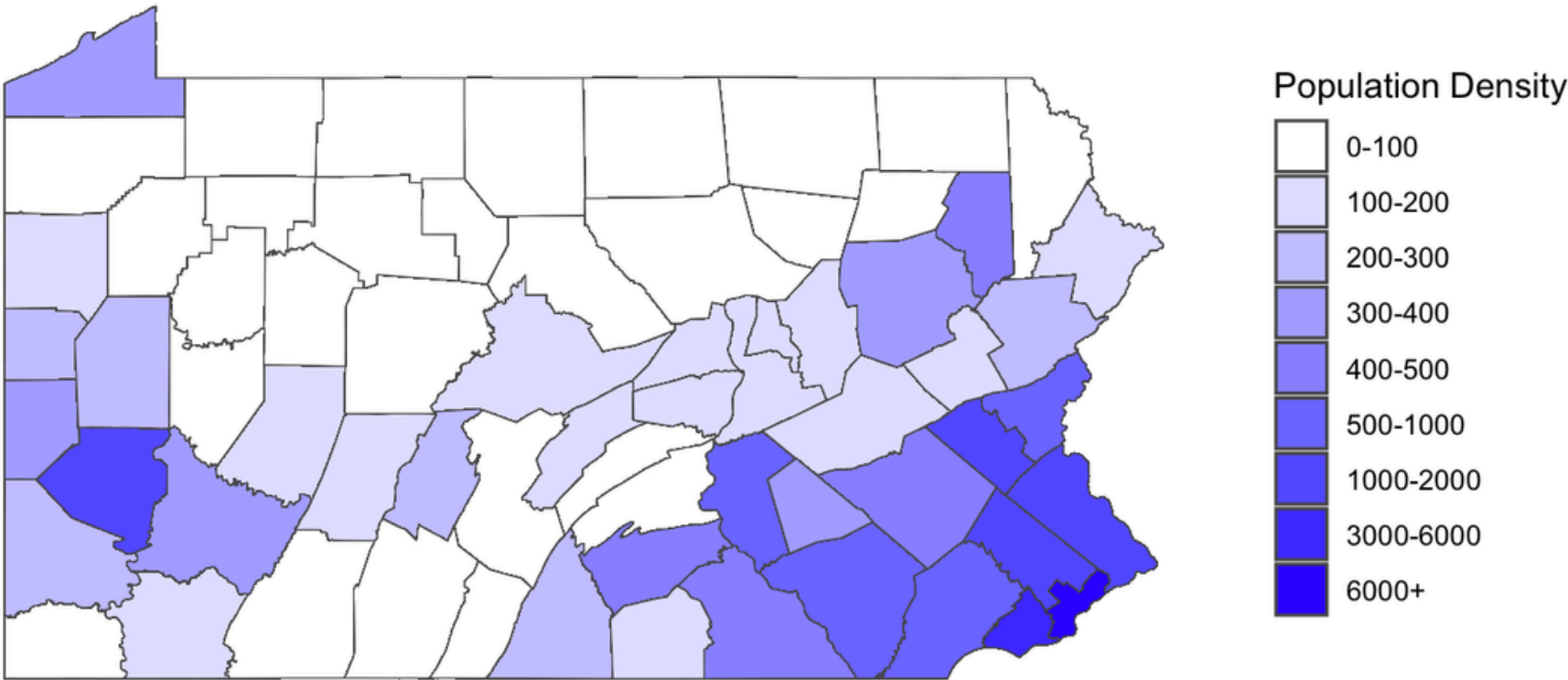Higher covid cases during holidays - Why?

- Increased family gatherings
- High airport traffic and travel

High population density corresponds to high COVID case rate and death rate

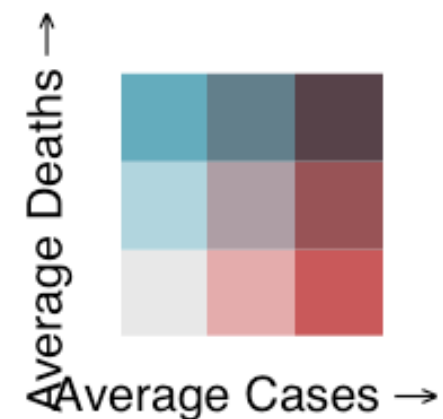Average COVID-19 cases and deaths of counties in Pennsylvania
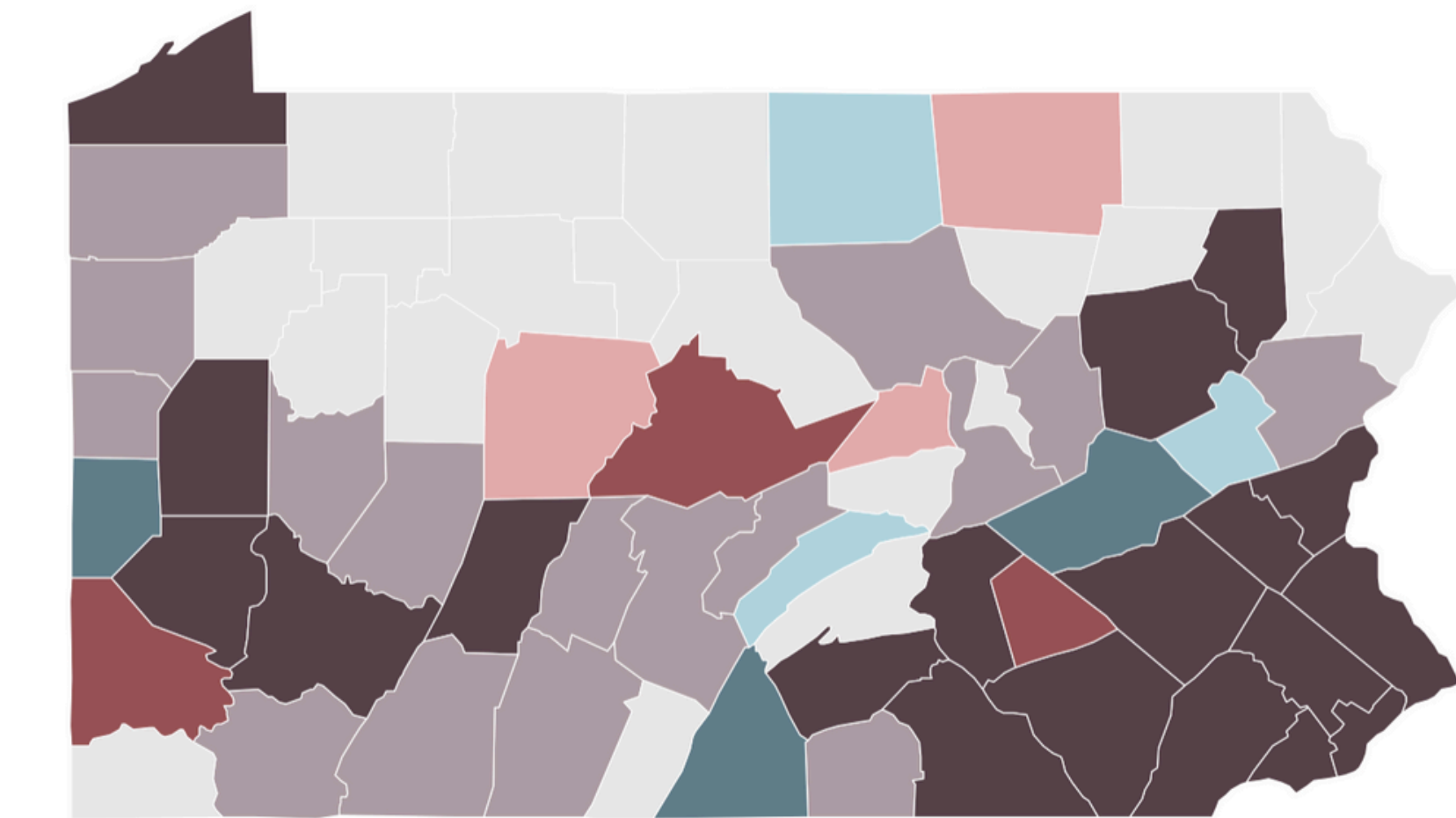
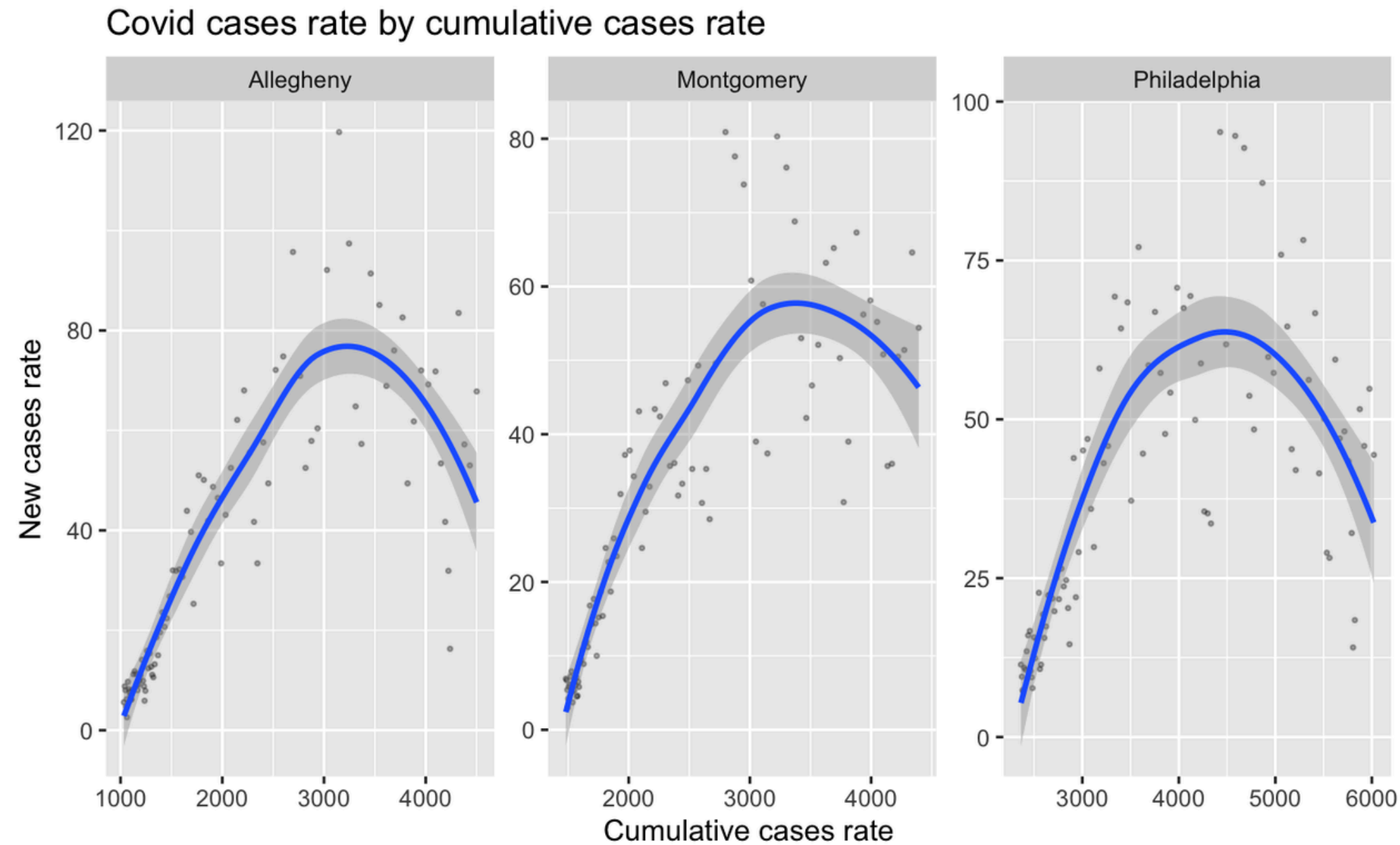Population density of counties in Pennsylvania

High population density corresponds to high COVID case rate and death rate

Average COVID-19 cases and deaths of counties in Pennsylvania

- High population counties have higher average deaths and cases.

- Medium population counties have higher average cases or deaths.

- Low population counties have lower average deaths and cases.

The decrease in new case rates suggests a potential herd immunity effect
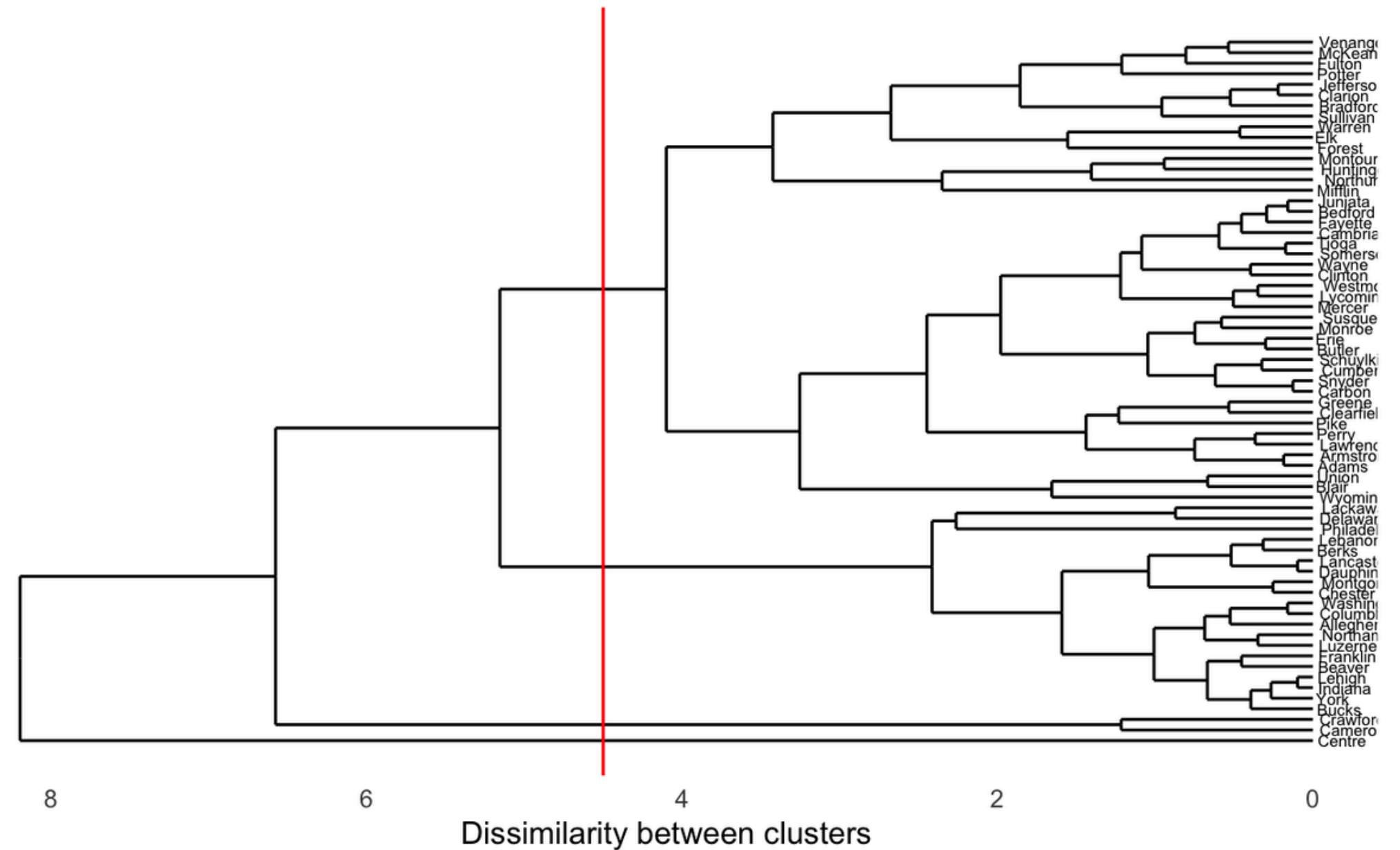

Covid cases rate by cumulative cases rate

- Chose 3 most highly populated counties

- New case rates decline towards end of year

- Suggests potential herd immunity effect but there could be other explanations

Which counties share similar trends in the progression and rates of COVID-19 cases?
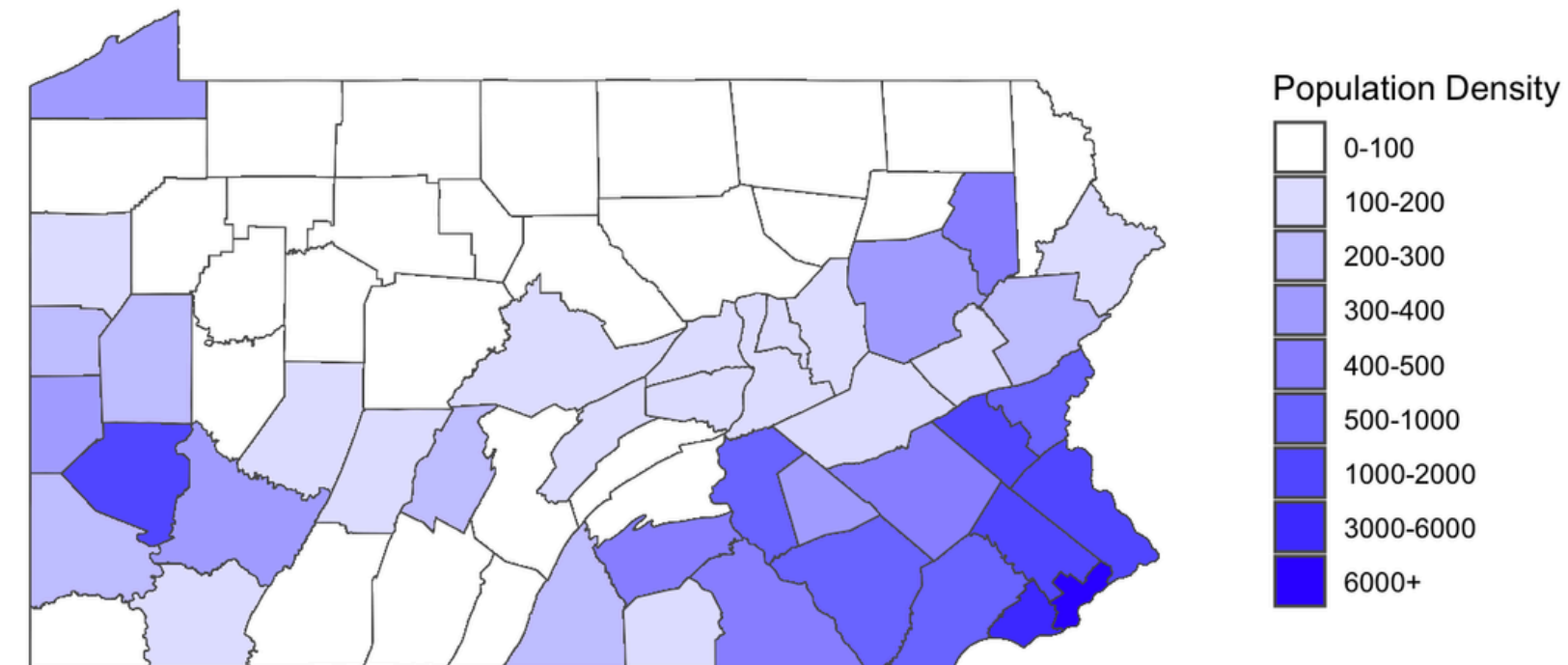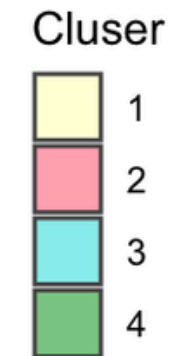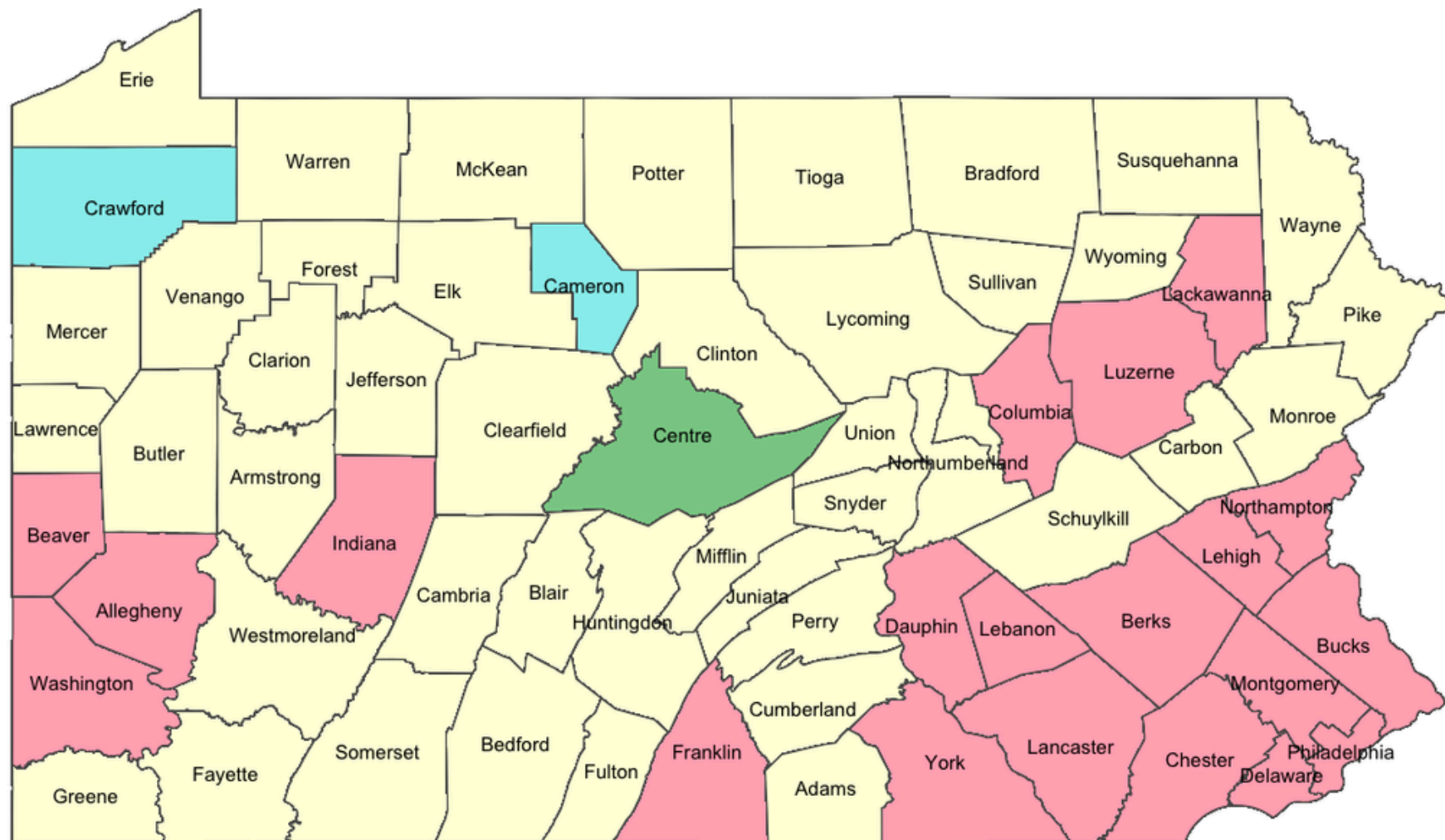
Variables clustering by:

- max case rate

- date of max case rate

- median case rate

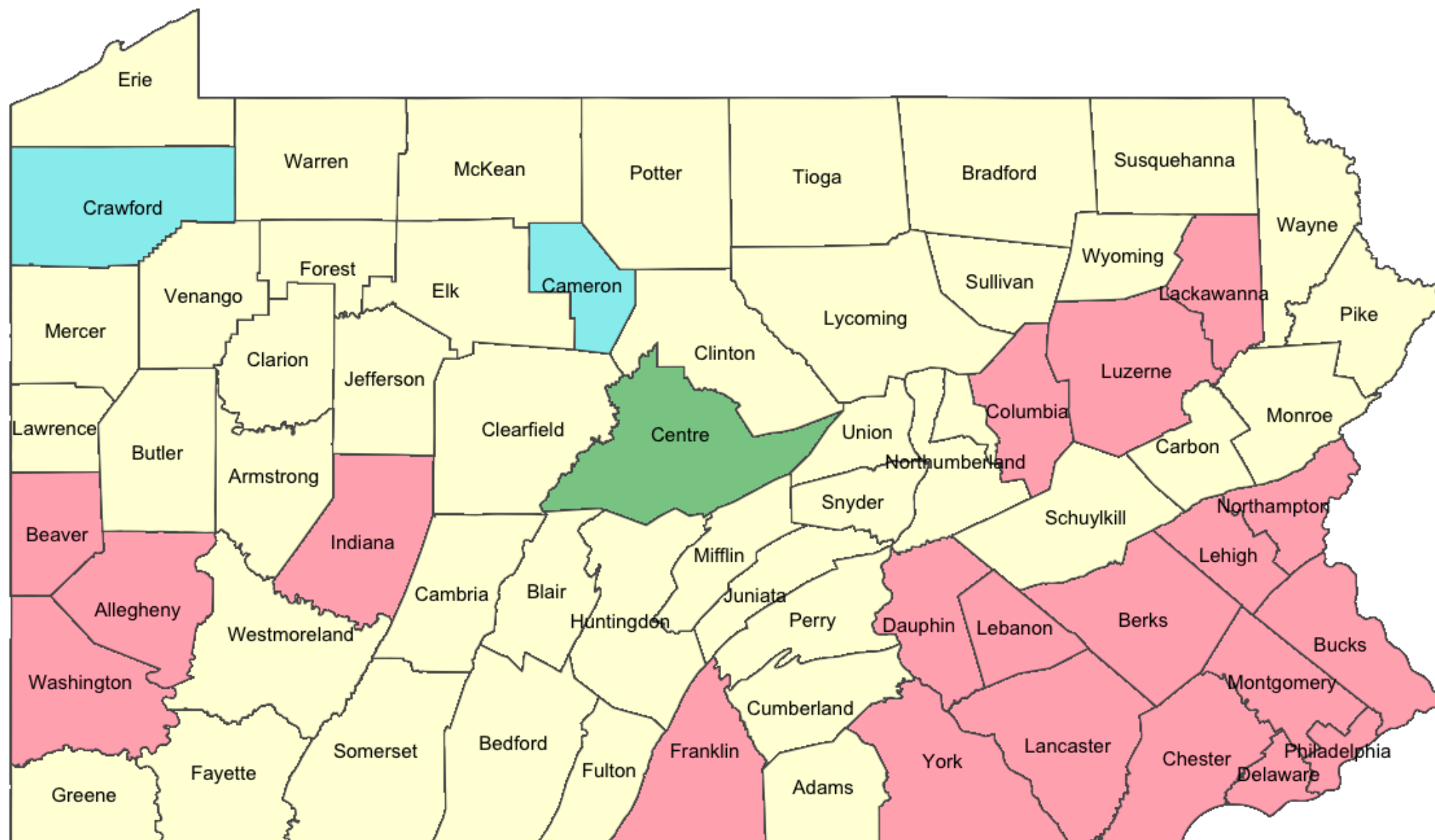Dendrogram of County Clustering Based on COVID-19 Metrics

Counties with similar population density had similar COVID trends

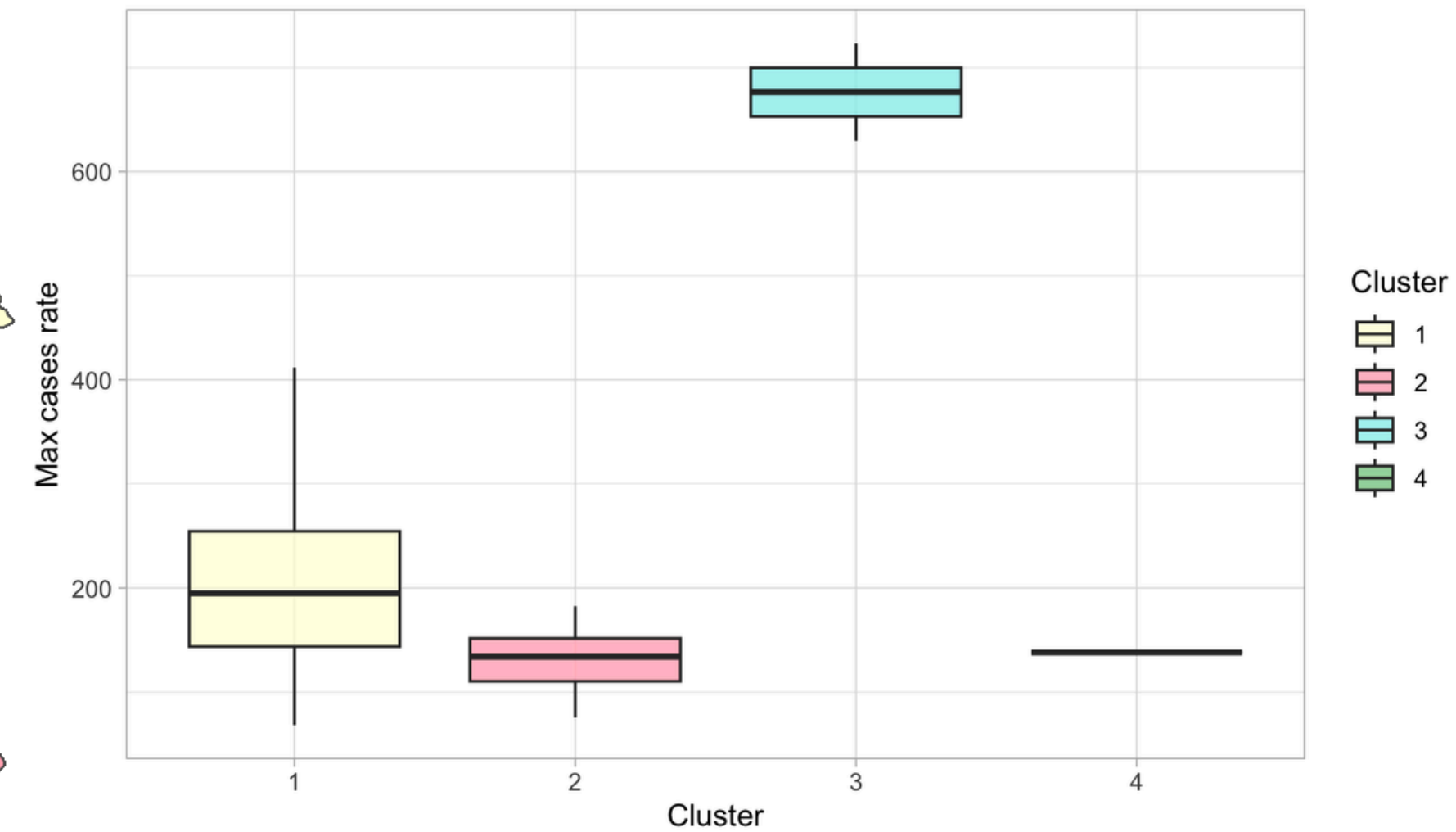Choropleth Map of Pennsylvania Counties by Cluster

Counties with high population density have lower peak case rates

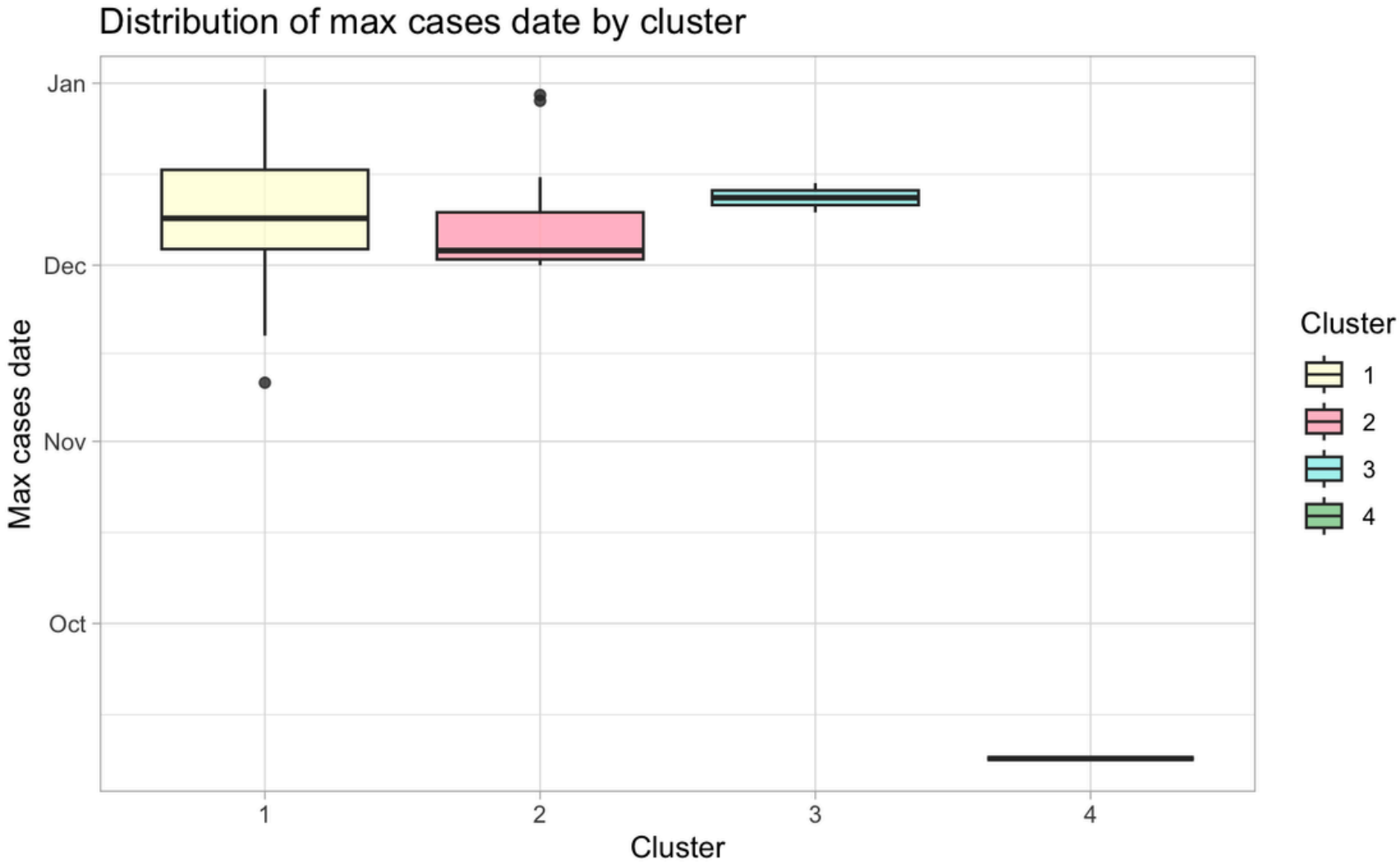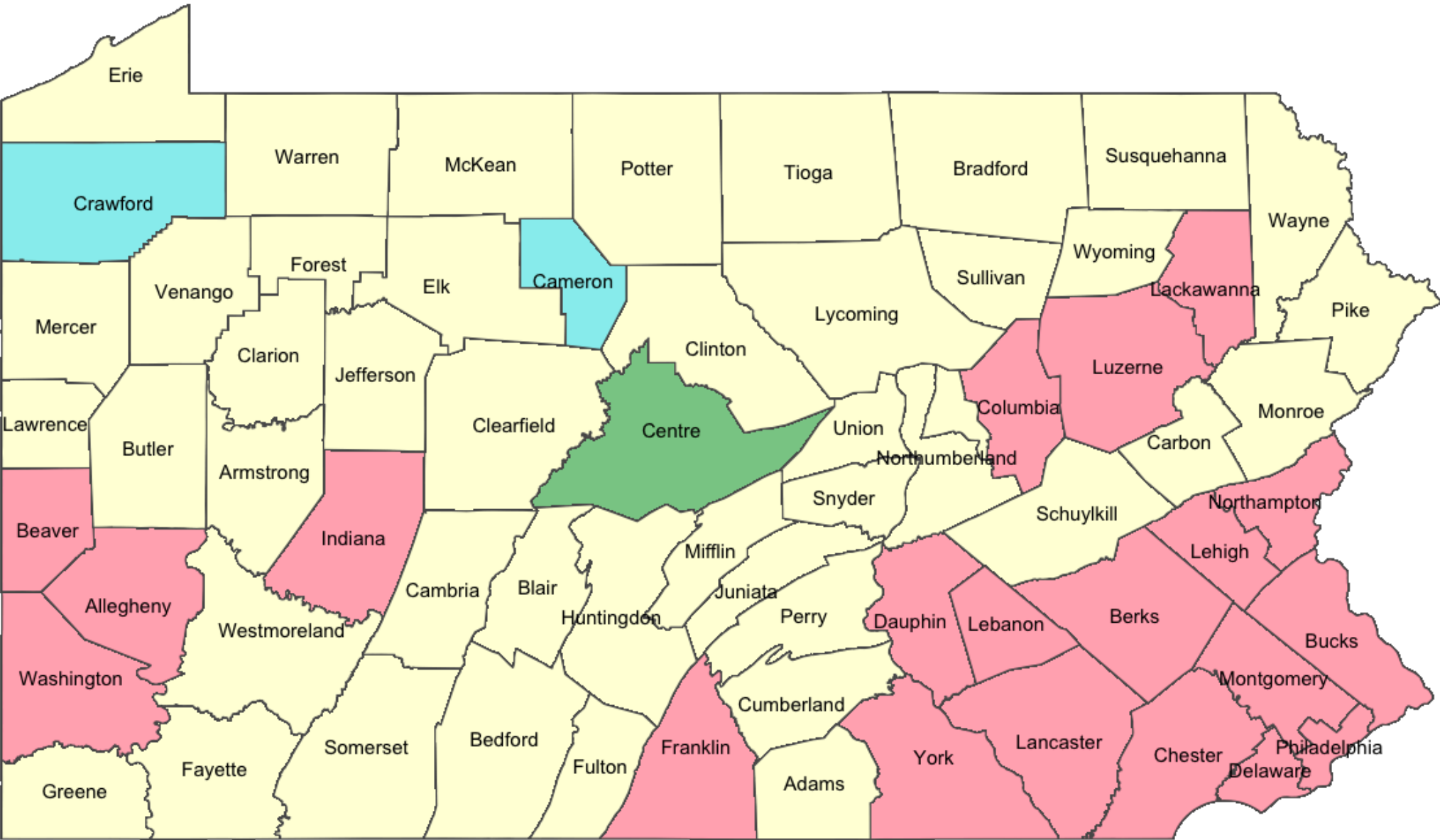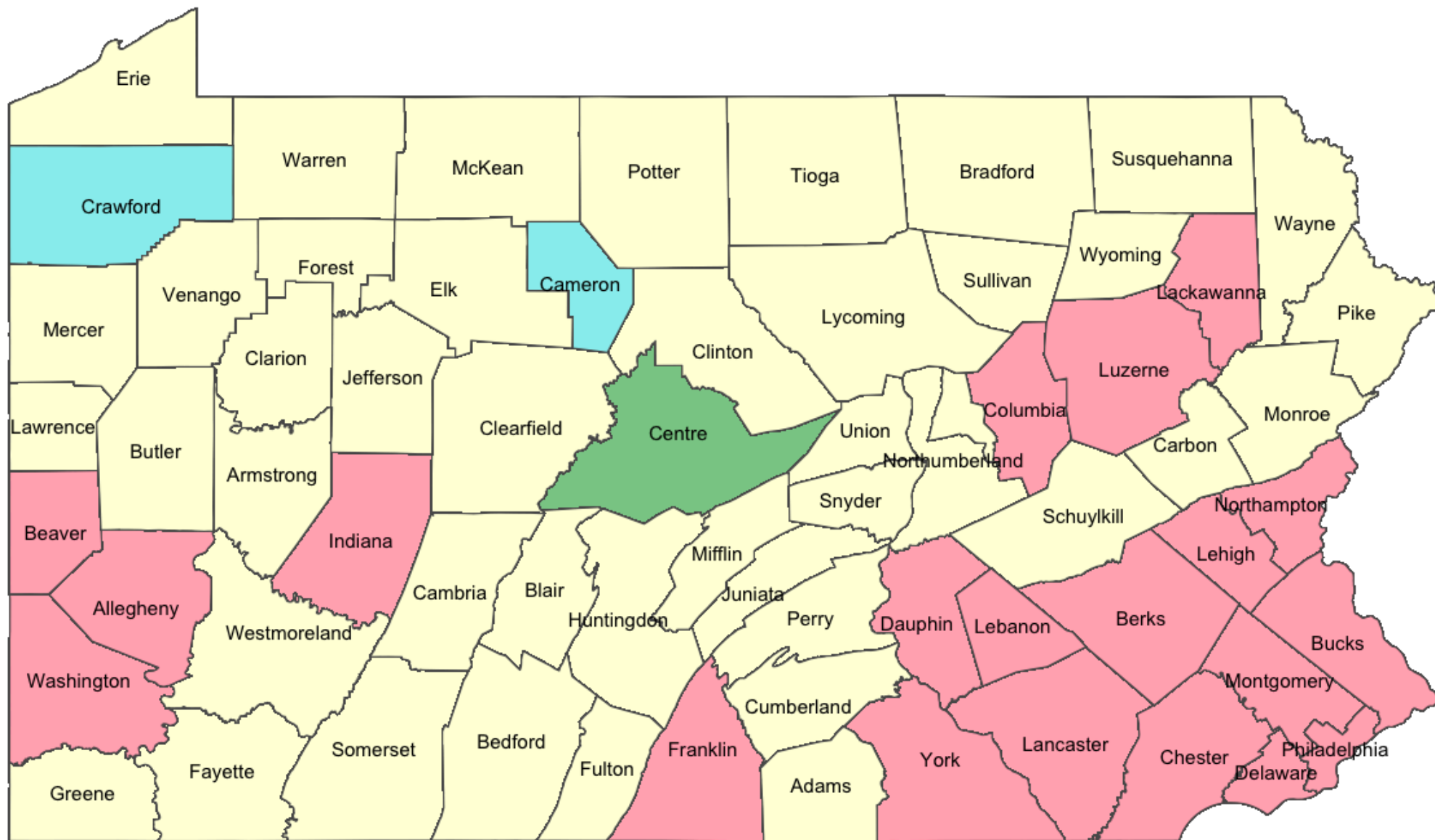Choropleth Map of Pennsylvania Counties by Cluster

Most counties had peak cases around December, except Centre county which peaked early

Choropleth Map of Pennsylvania Counties by Cluster

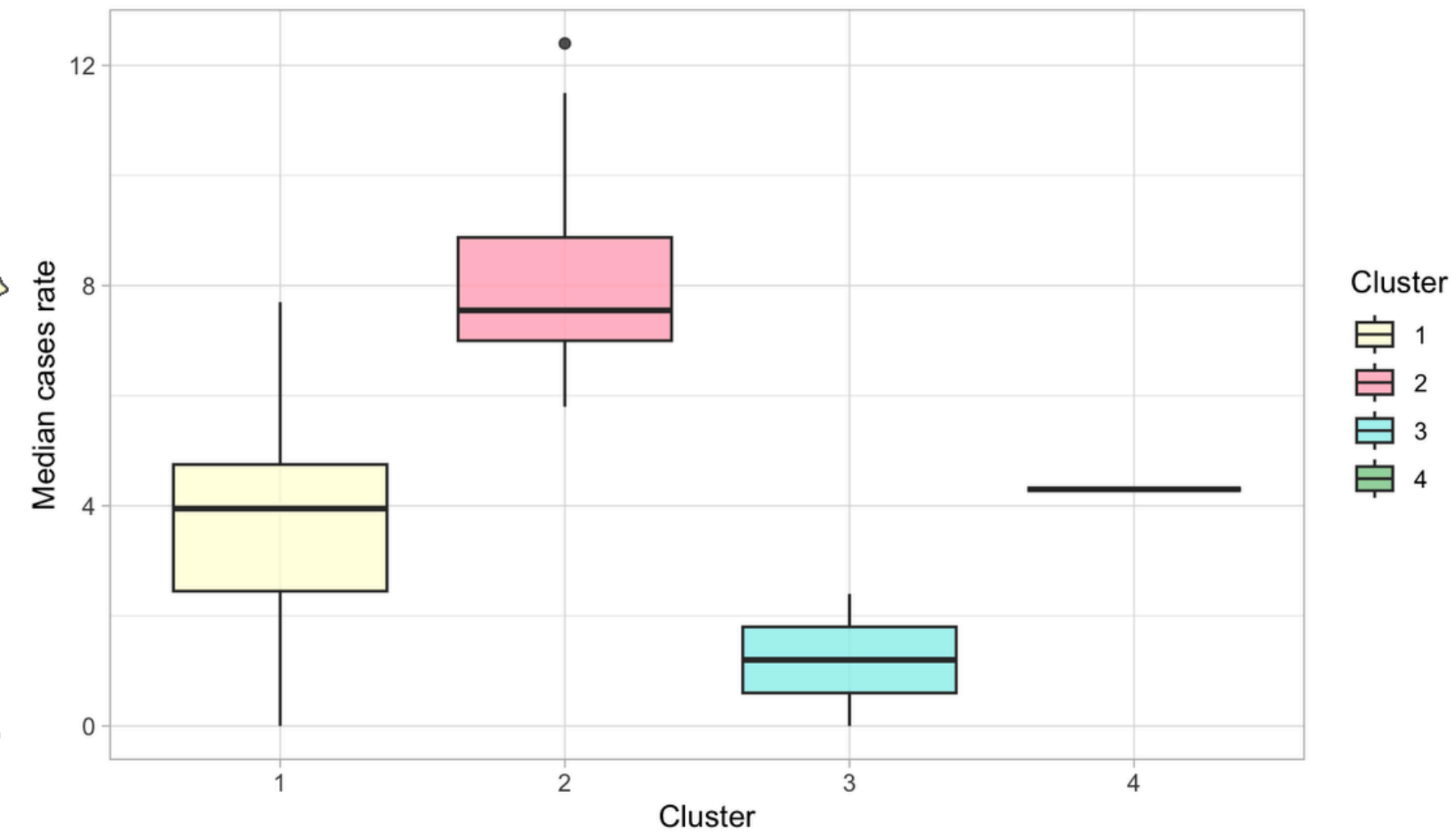Distribution of max cases date by cluster

High population density counties had higher median case rates

Choropleth Map of Pennsylvania Counties by Cluster

Distribution of median cases rate by cluster

Takeaways and Limitations

- Counties with high population density do have higher rates of cases and deaths

- High density counties have higher case rates in general, but lower peaks

- Limited variables

- Data over a single year