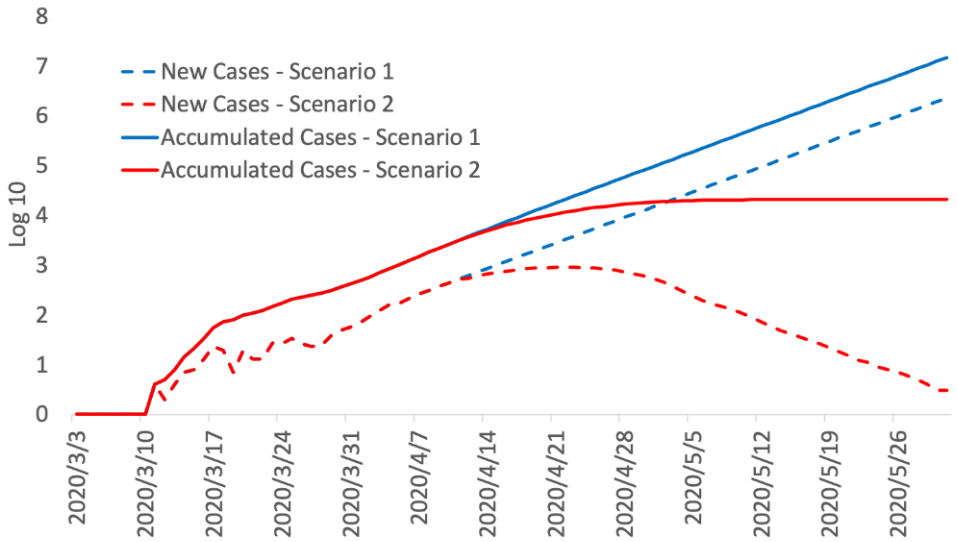
UTHealth
The University of Texas
Health Science Center at Houston
School of Public Health

Why do we model?

- Predict the future (e.g. weather)

- Predict the impact of an intervention (e.g. stay home, work safe, mask wearing, etc)



How do we model?

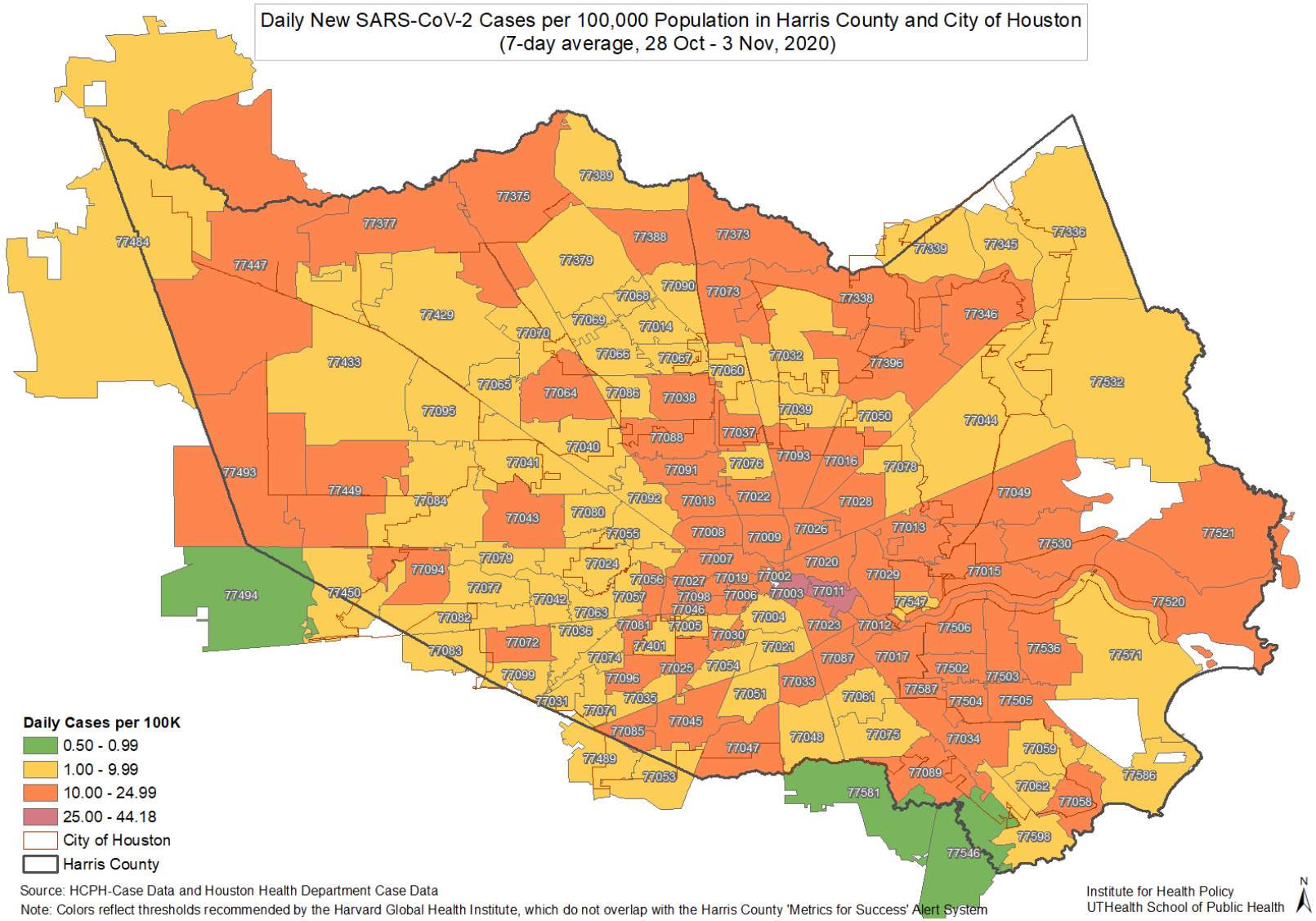
UTHealth
The University of Texas
Health Science Center at Houston
School of Public Health

- Typically, we train models on the past in order to predict the future, but COVID is an experiment with N=1. Houston is not Wuhan, and Texas is not Italy or New York

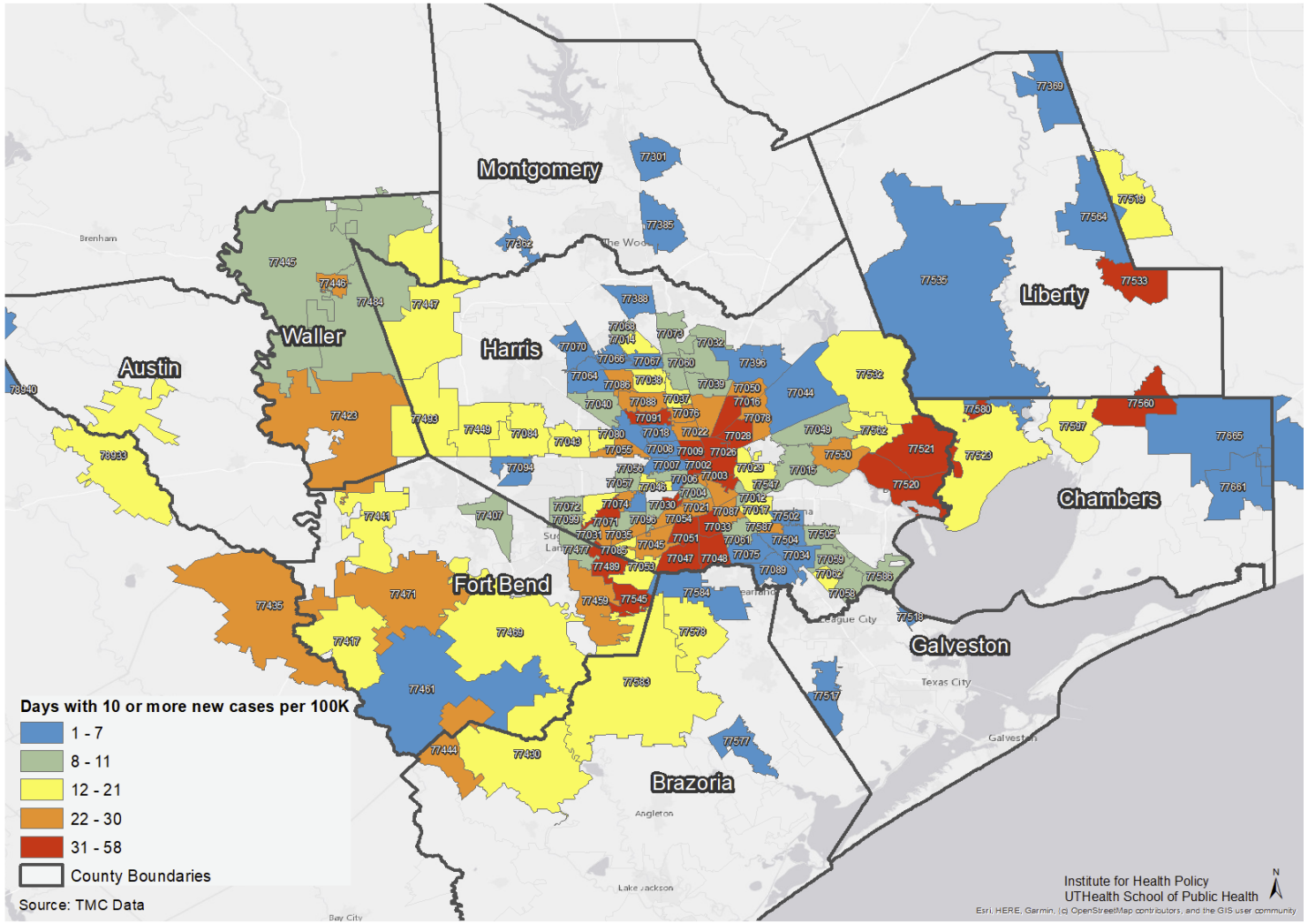
- Modeling the virus is easy; modeling human behavior is difficult

- "The Future is Independent of the Past given the **Present**" If you want to know if it is going to rain tomorrow, have a deep understanding of the weather today.

Helping our Communities



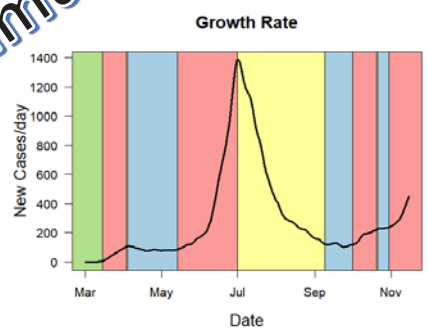
Analytics for Our Hospitals

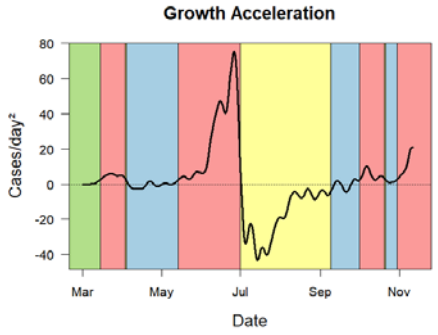


Number of Days ZIP Codes Had 10 or More Daily New Cases per 100,000 Pop, Greater Houston (March-November 2020)

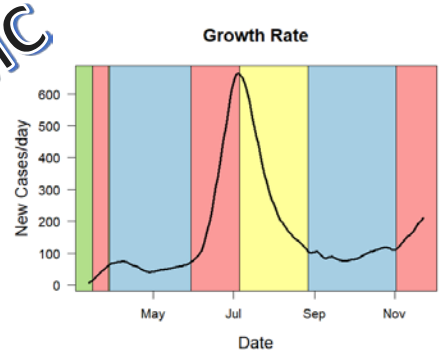
Putting it All Together

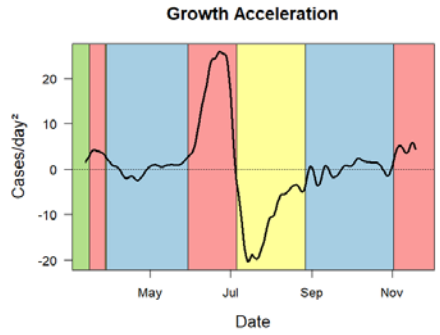
Community





TMC





April 8, 2020 (baseline)

May 16, 2020 case growth phase begins in the community (day 38)

July 2, 2020 deceleration phase begins in the community (day 85)

September 10, 2020 stationary phase begins in the community (day 155)

October 2, 2020 growth phase begins in the community (day 178)

May 31, 2020 case growth phase TMC hospitals begins (day 53)

July 7, 2020 deceleration phase TMC begins (day 90)

August 28, 2020 stationary phase TMC begins (day 142)

November 3, 2020 growth phase TMC begins (day 210)

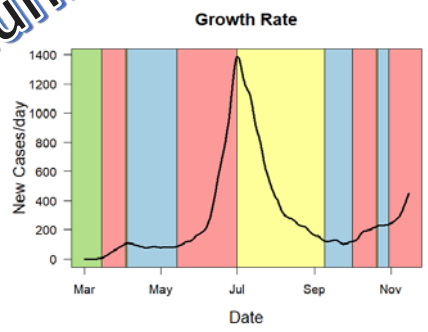
☐ Harris County community (source: HCPH Case Data)

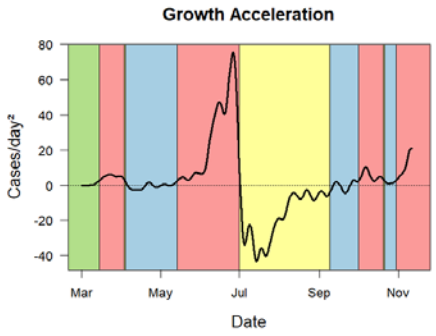
○ TMC patients

Lagging *Growth* *Deceleration* *Stationary*

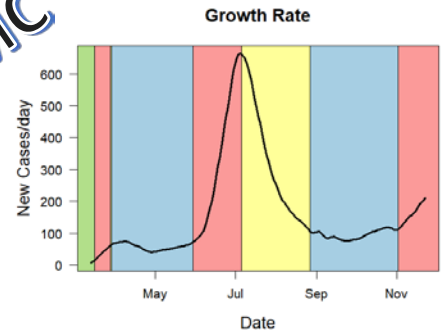
Predicting the Future: December and January

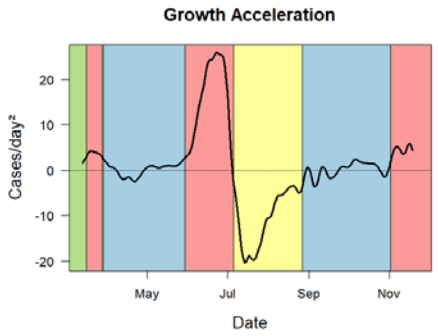
Community





TMC





You are in a car that is driving too fast, and it is accelerating. You can either:

1. Slow down (e.g. personal action; policy action)
2. Crash (e.g. overwhelm healthcare)

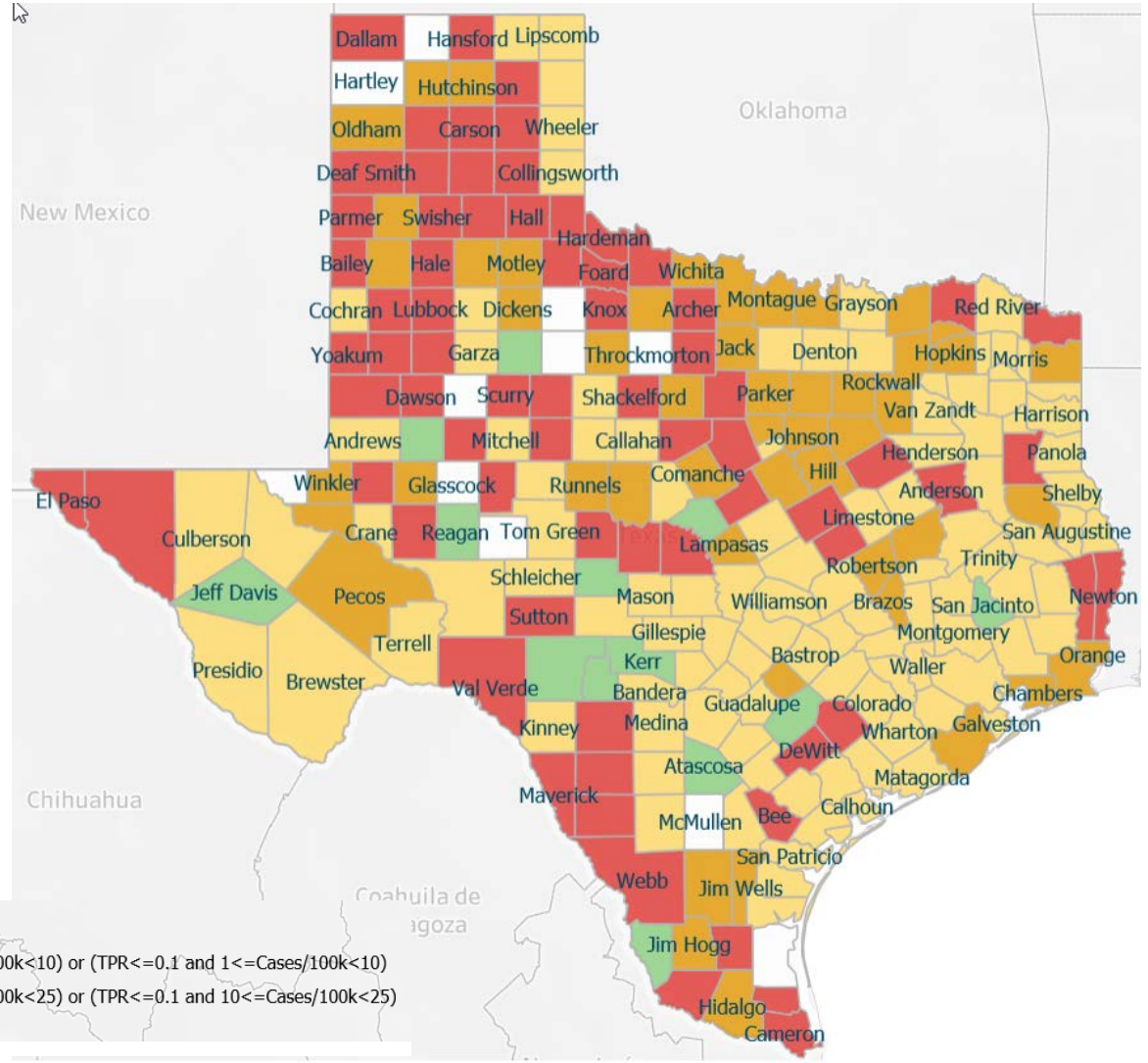
☐ Harris County community (source: HCPH Case Data)

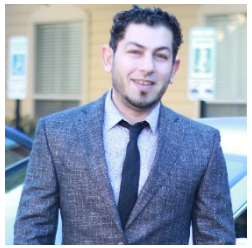
○ TMC patients

Lagging *Growth* *Deceleration* *Stationary*

TexasPandemic.org
“Like watching a cold front”

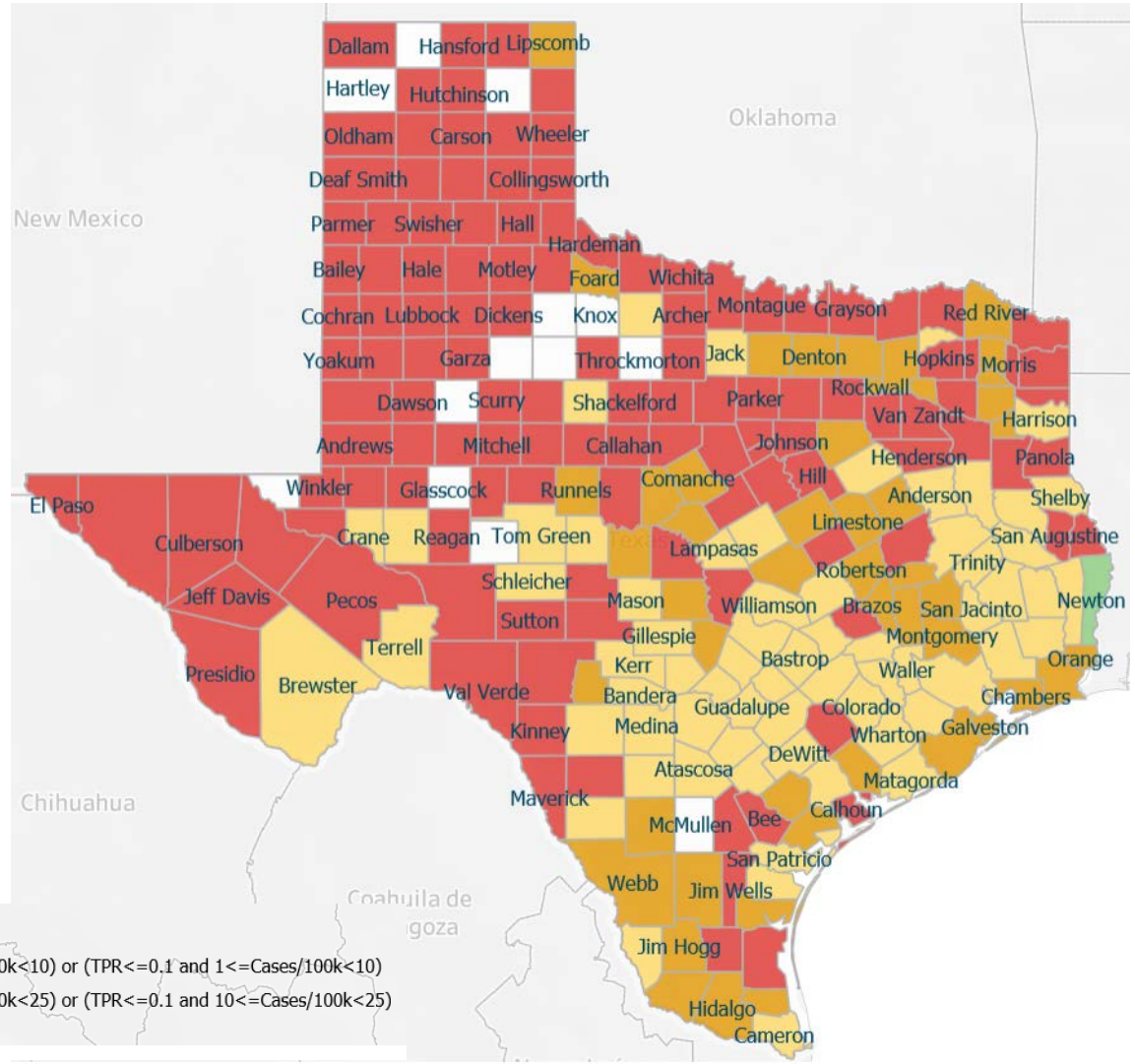
9/30/20

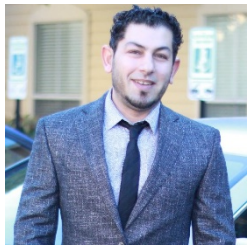




TexasPandemic.org
“Red Wave”

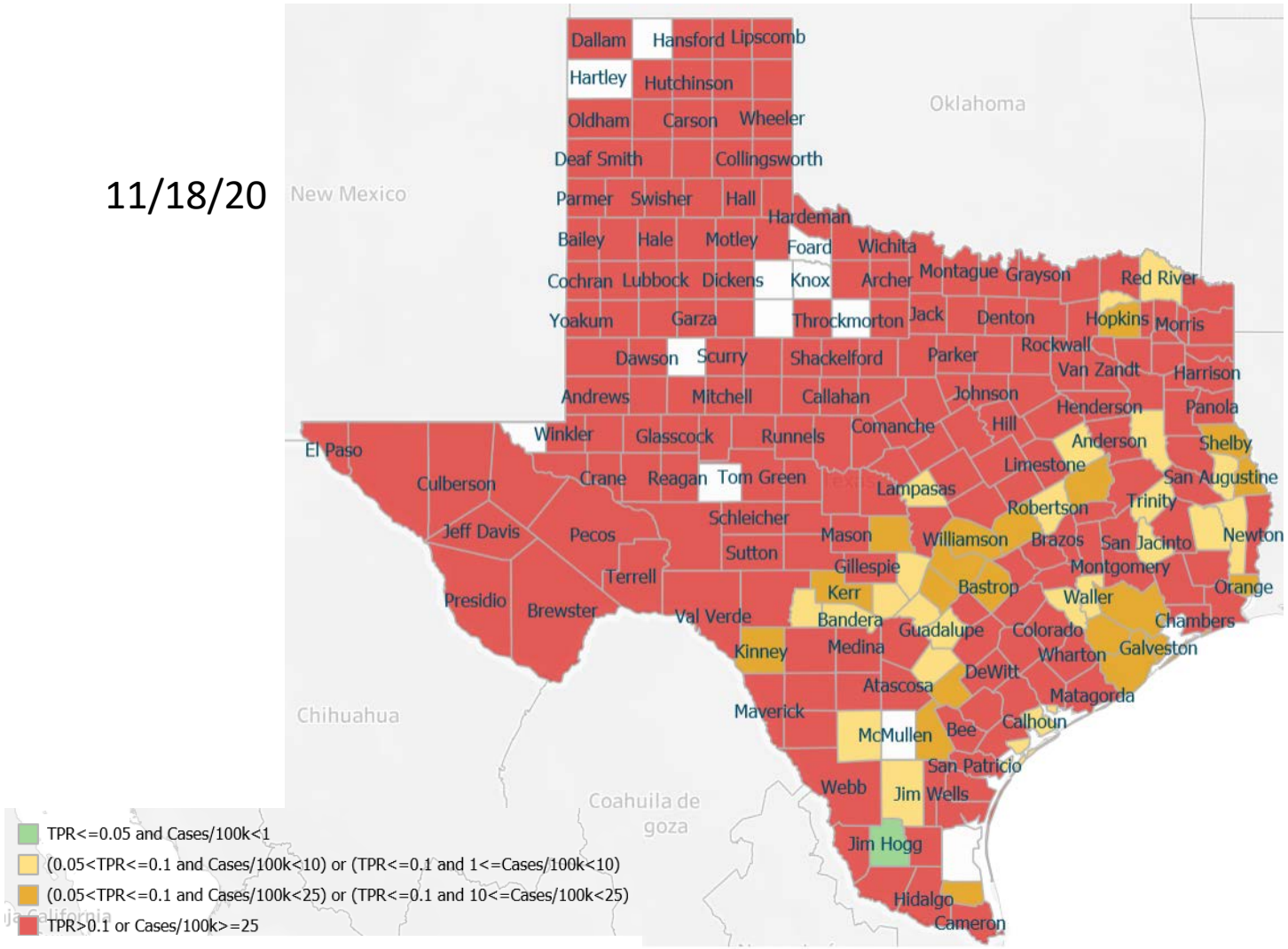
10/28/20

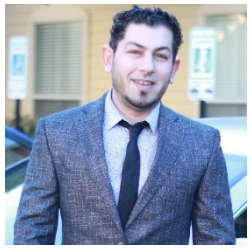




TexasPandemic.org
“Red Wave”

11/18/20





What Have I Learned from this Pandemic

- Data is the new bacon!
- Appreciation for a having a view into both the community and the healthcare settings
- Importance of efficient and cost effective pandemic preparedness. We cannot let this happen again!

UTHealth
The University of Texas
Health Science Center at Houston
School of Public Health

Supplemental Slides

Seroprevalence

UTHealth
The University of Texas Health Science Center at Houston
School of Public Health

TEXAS CARES
Texas Coronavirus Antibody Response Survey

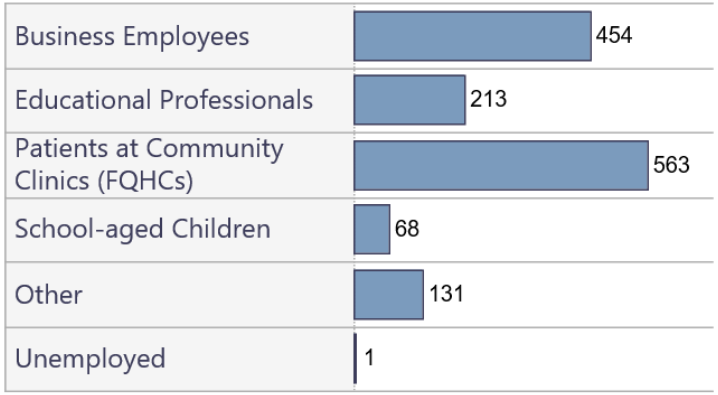
Estimate the prevalence of SARS-CoV-2 antibody positive status across Texas

Roll over any part on each plot for descriptive details. Click on any part on each plot to select and filter-by. To make multiple selection, click and hold the Ctrl key.

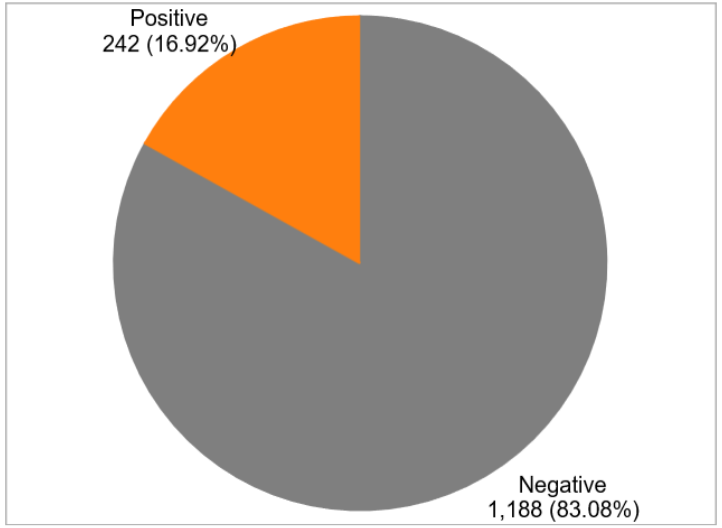
Current Enrollments Total

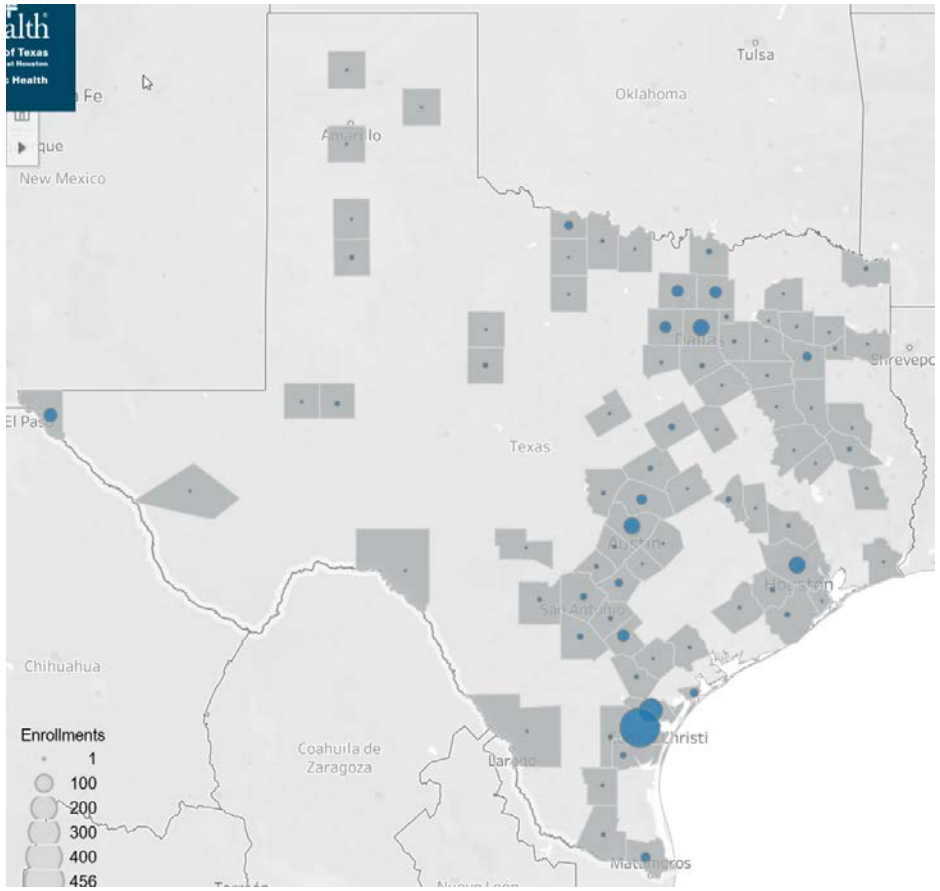
1,430

Study populations - Current enrollment



Antibody Seroprevalence





Texas Epidemic Public Health Institute (TEPHI) – A Public Health Reserve for Texas

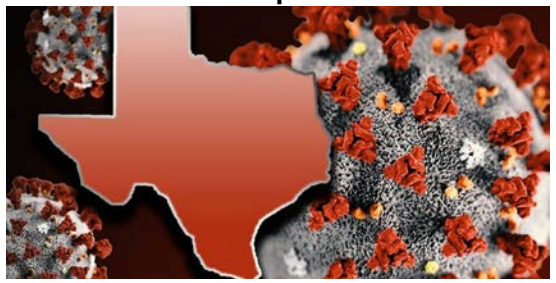
UTHealth
The University of Texas Health Science Center at Houston
School of Public Health

TEPHI's mission is to collaboratively prepare Texas better than any other state for the next public health threat by creating a Public Health Reserve based on a "National Guard" model for pandemic preparedness including:

- Organizing and training a statewide ready reserve and prepare infrastructure that can be repurposed during a public health emergency as a nimble and cost effective solution
- Model and prepare for future epidemics including emphasis on capturing and interpreting accurate and timely data with enhanced privacy and security keeping Texas data in Texas
- An integrated research program on the long-term chronic health impacts of a pandemic, including the current COVID-19 pandemic

Texans did an incredible job of staying home and working safely, but that is not sustainable and has long term education, economic, mental and physical health and other impacts

TEPHI's goal is striking a balance between desirable health and economic outcomes to allow Texans to live safely and work effectively during the next pandemic.



TEPHI PARTNERSHIPS

Key Collaborations

- Department of State Health Services
- Department of Emergency Management
- CDC
- Local Public Health Authorities
- University partners

UTHealth

- Cizik School of Nursing
- McGovern Medical School
- School of Dentistry
- School of Biomedical Informatics
- MD Anderson UTHealth Graduate School of Biomedical Sciences
- School of Public Health (4th largest in the nation)
  - Houston Campus
  - Austin Campus
  - Brownsville Campus
  - Dallas Campus
  - El Paso Campus
  - San Antonio Campus