



COVID-19 Current State Analysis and Forecasting for the DFW Region

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Data as of May 19-20 (Models change daily)

About the Model

The following slides illustrate a model of how COVID-19 is spreading across the DFW region based on real patient data we have received from Collin, Dallas, Denton and Tarrant counties. The slides capture a snapshot based on data available as of May 19-20. Every time we receive new data, we re-run the model and refine the graphs.

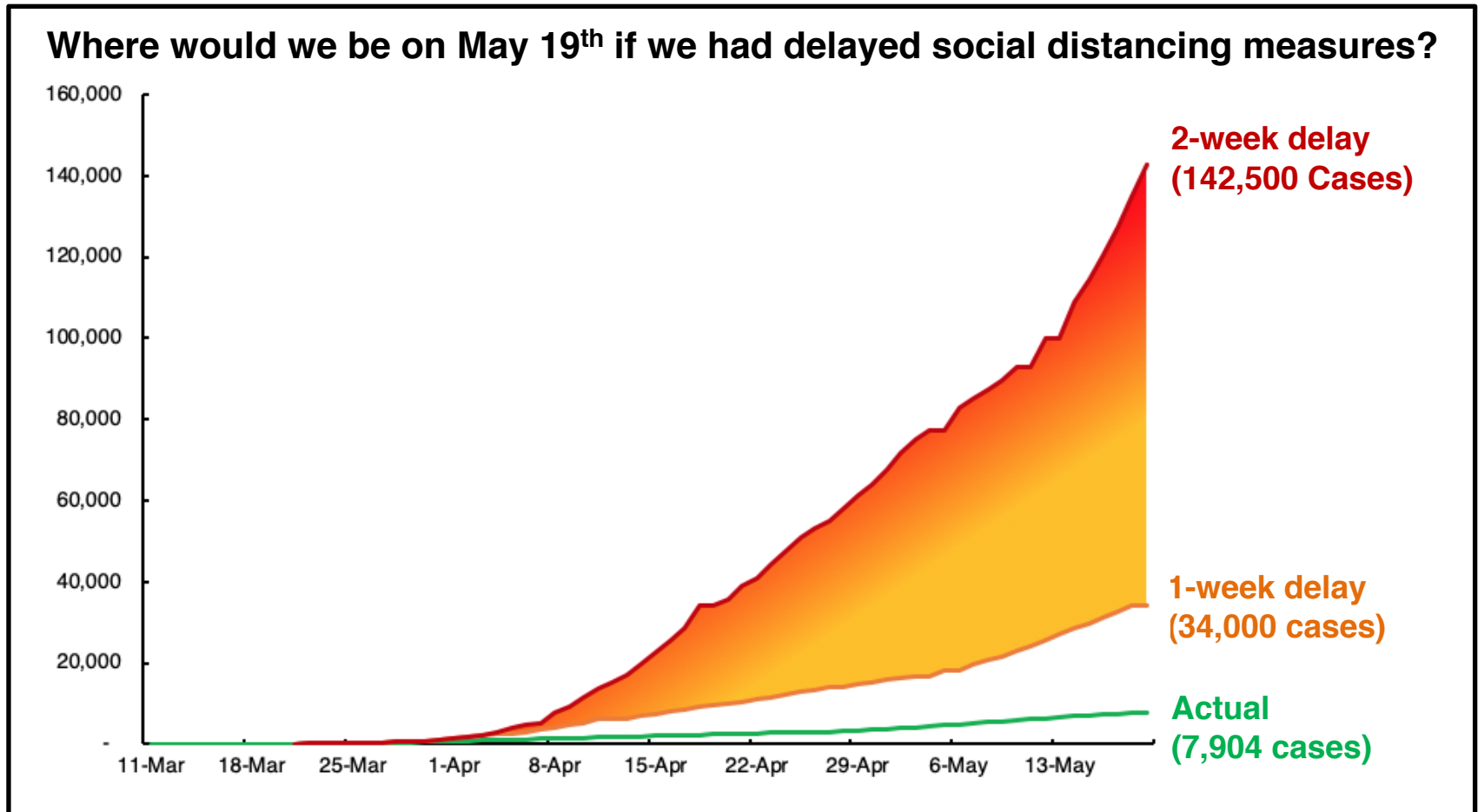
In the following slides we examine how well preventive measures including masking, staying at home, social distancing, handwashing and others have limited infection, and what might happen looking forward.

Model-building is an iterative process with inherent uncertainty in its predictions. It is intended to provide help in formulating plans but should not be the sole basis for policies or management decisions addressing the COVID-19 challenge. Please do check back every few weeks to see how well we in the DFW region are doing to keep COVID-19 at bay.

We would like to thank the local health departments, hospitals, and health systems that have contributed data to help us build this model.

Did social distancing work? Yes!

If Dallas County had not put into place social distancing measures when it did, our confirmed case counts could be significantly higher than they are today.

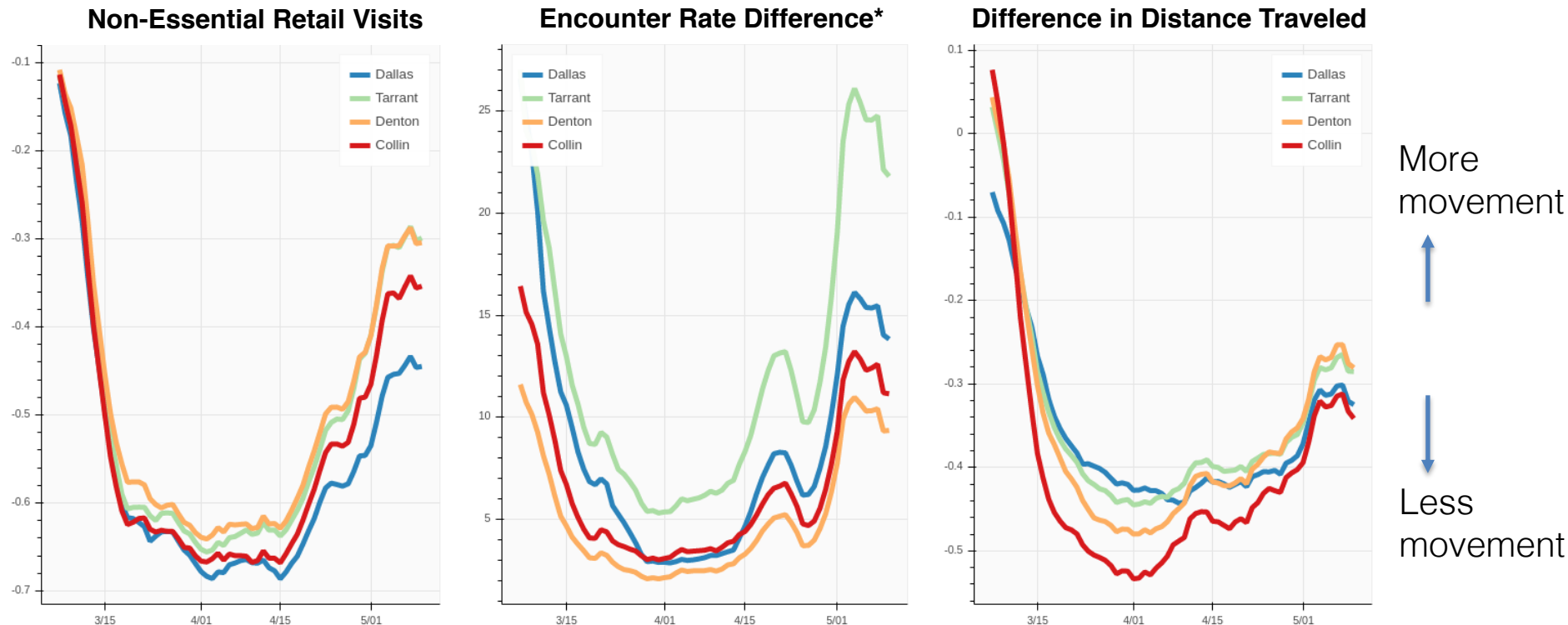


Source: JHU CSSE COVID-19 US Confirmed Case Data, Accessed May 19, 2020

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Methods: Hypothetical scenarios assume that Dallas County policies maintained pre-March 22 trajectory of doubling cases every 2.5 days for 1 week or 2 weeks respectively, then resumed its actual daily growth progression thereafter

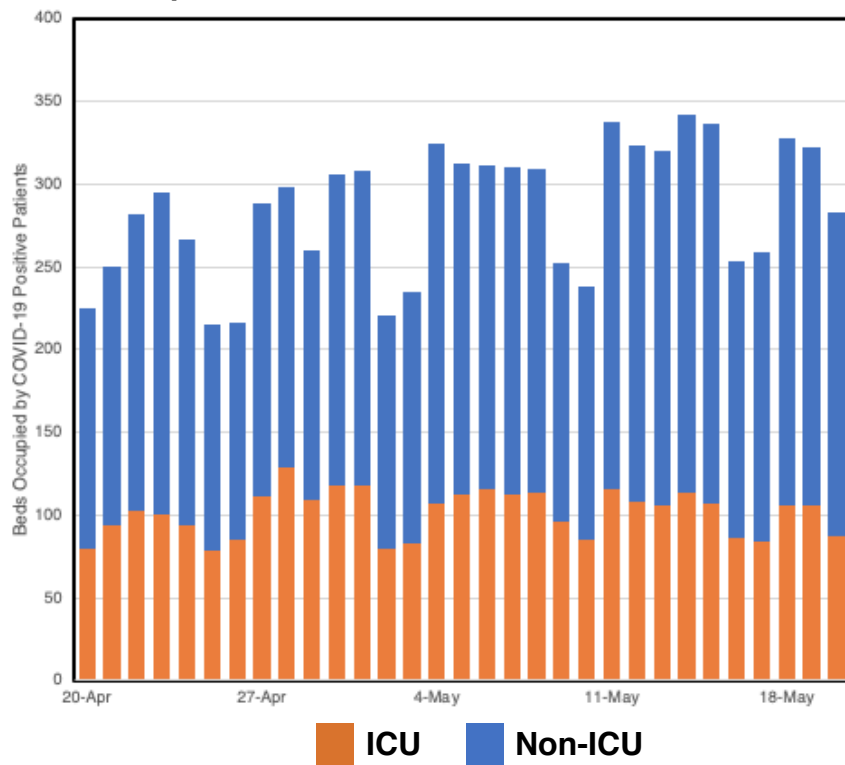
Are North Texans on the move?



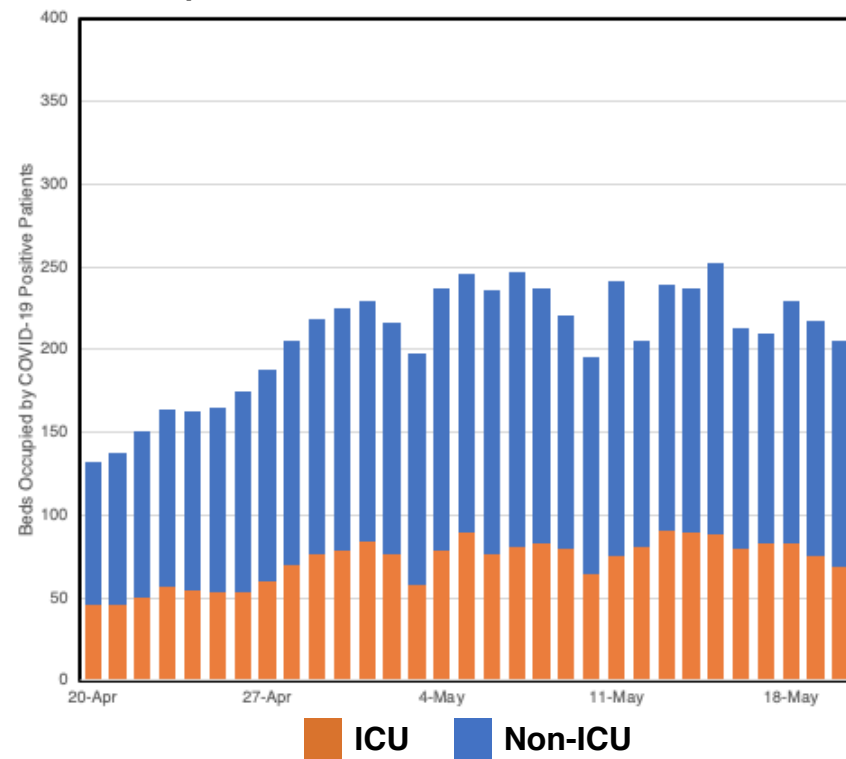
Visits to non-essential stores, encounters between people, and the overall distance that people traveled fell sharply from mid-March to early April. Beginning in the 3rd week of April, movement rapidly increased but has leveled off or fallen slightly in recent days. We follow these trends closely to understand how well people are social distancing, which in turn helps us revise our model to predict any trouble on the horizon.

How many people with COVID-19 have been hospitalized in Dallas and Tarrant Counties?

Total Hospitalized COVID-19+ Patients in Dallas County

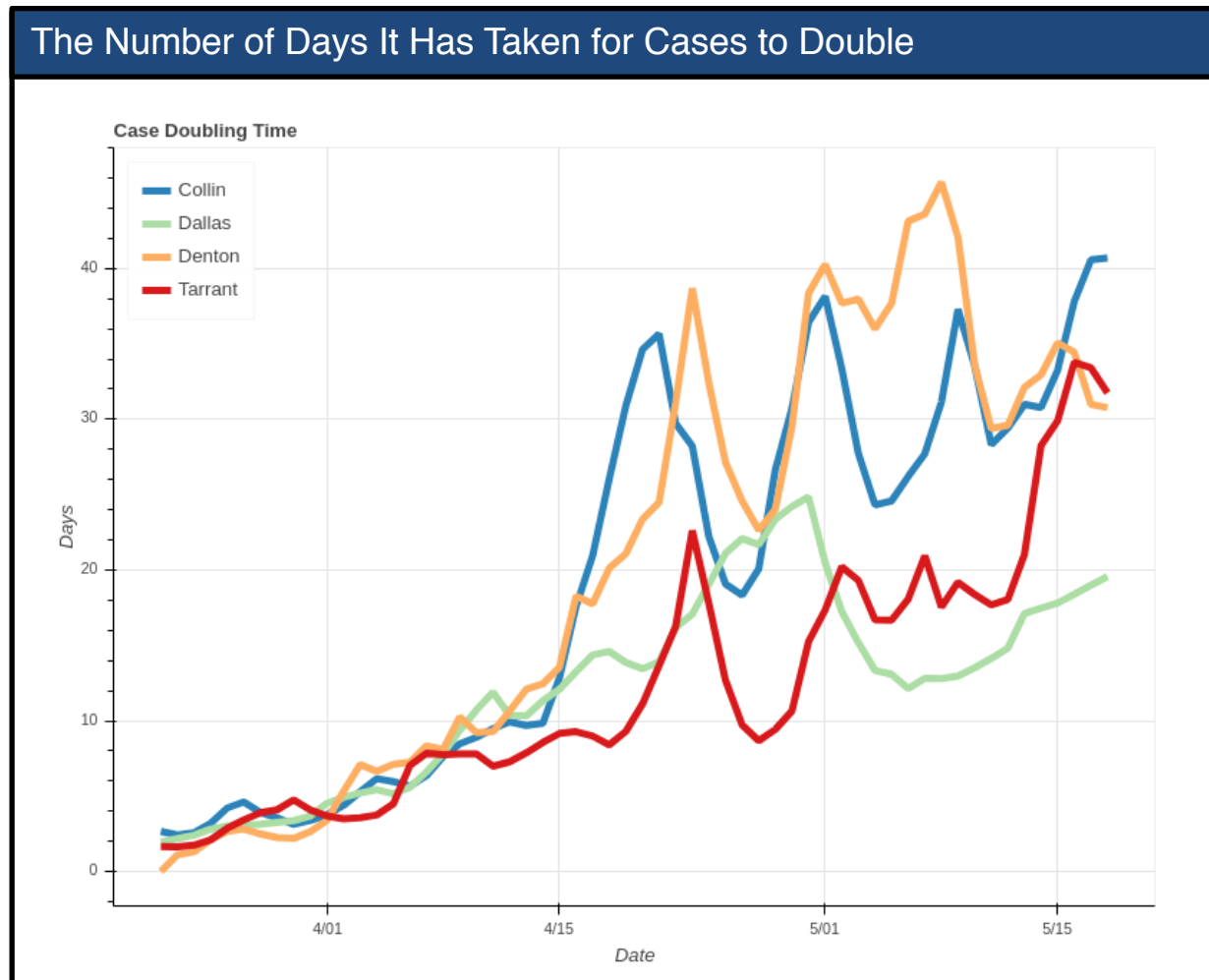


Total Hospitalized COVID-19+ Patients in Tarrant County



We closely track daily hospitalizations, since this is a reliable way to monitor the severity of the outbreak in DFW.

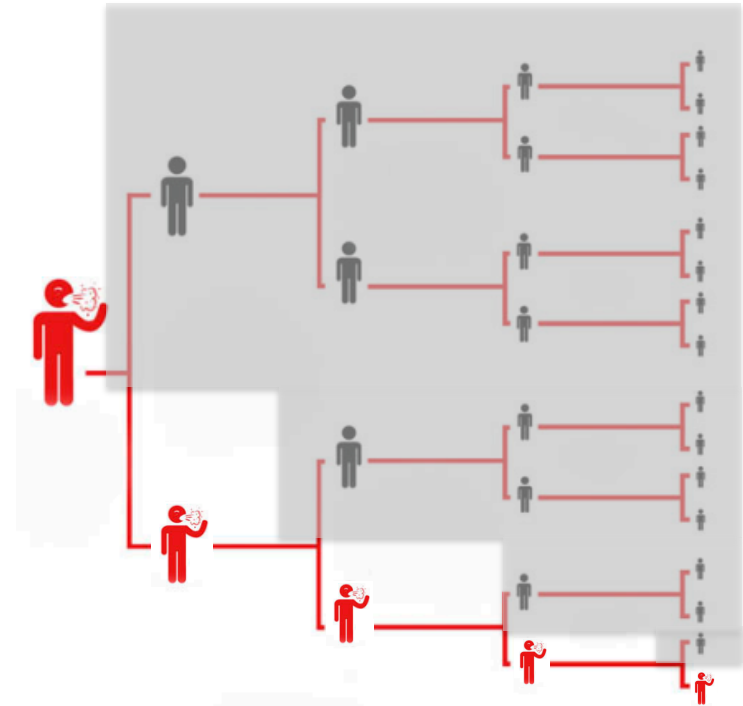
How quickly is COVID-19 spreading in North Texas?



As the spread of disease slows, it takes longer for COVID-19 cases to double.

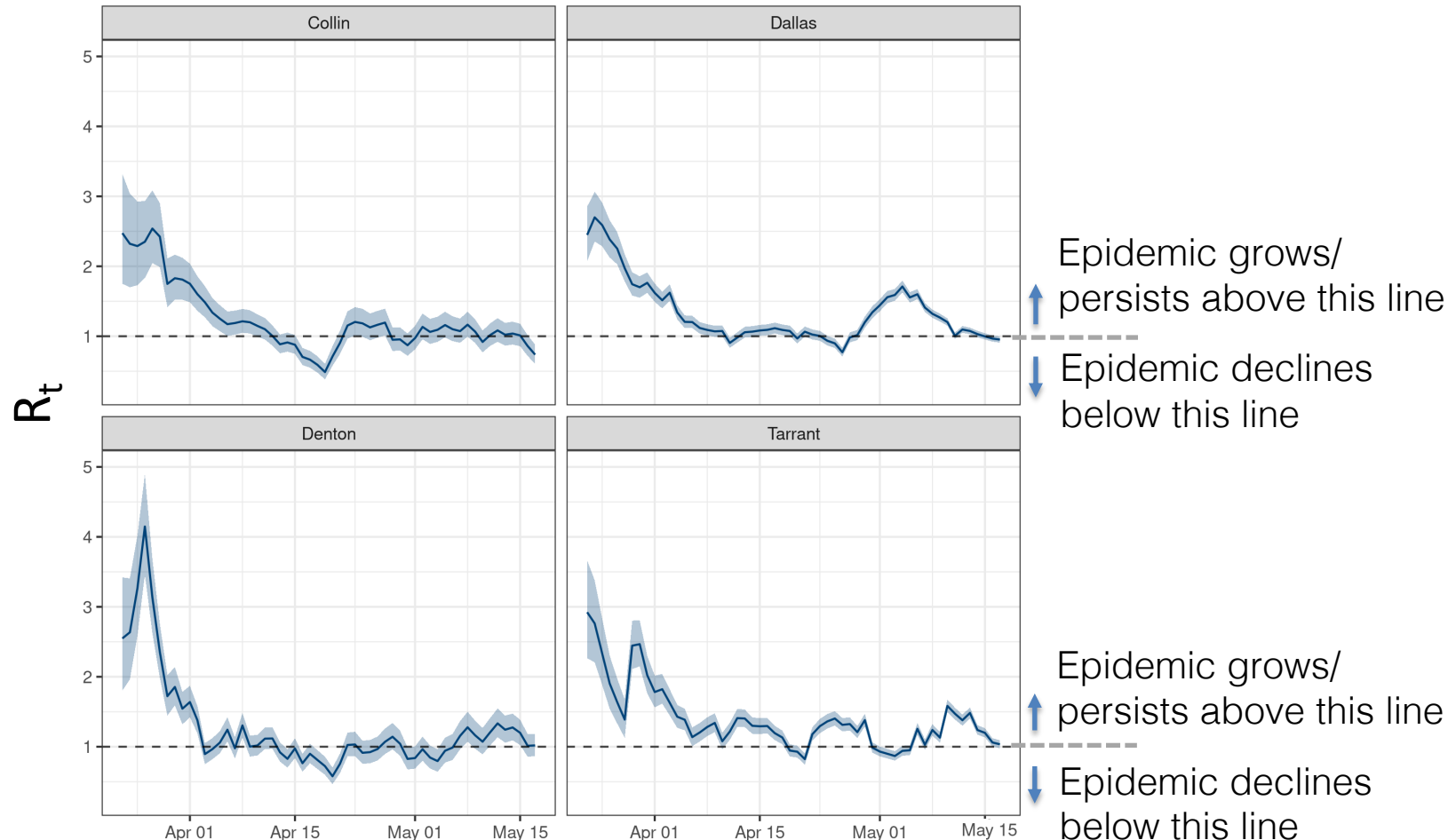
R_t Represents contagiousness

- R_t helps us measure how effective social distancing measures are after they are put into place.
- If social distancing and measures like masking are effective, then the number of secondary infections is dramatically reduced.
- In this scenario where social distancing measures were 50% effective, then only **five people** end up infected, rather than the original 31.



How contagious is COVID-19 in DFW now?

Each line represents how contagious COVID-19 has been in DFW counties over the last few weeks. Contagiousness depends on how well we social distance, wear masks, limit travel, clean high touch surfaces, etc. During the stay-at-home time, the virus was not that contagious but has since gotten more so and will continue to fluctuate.

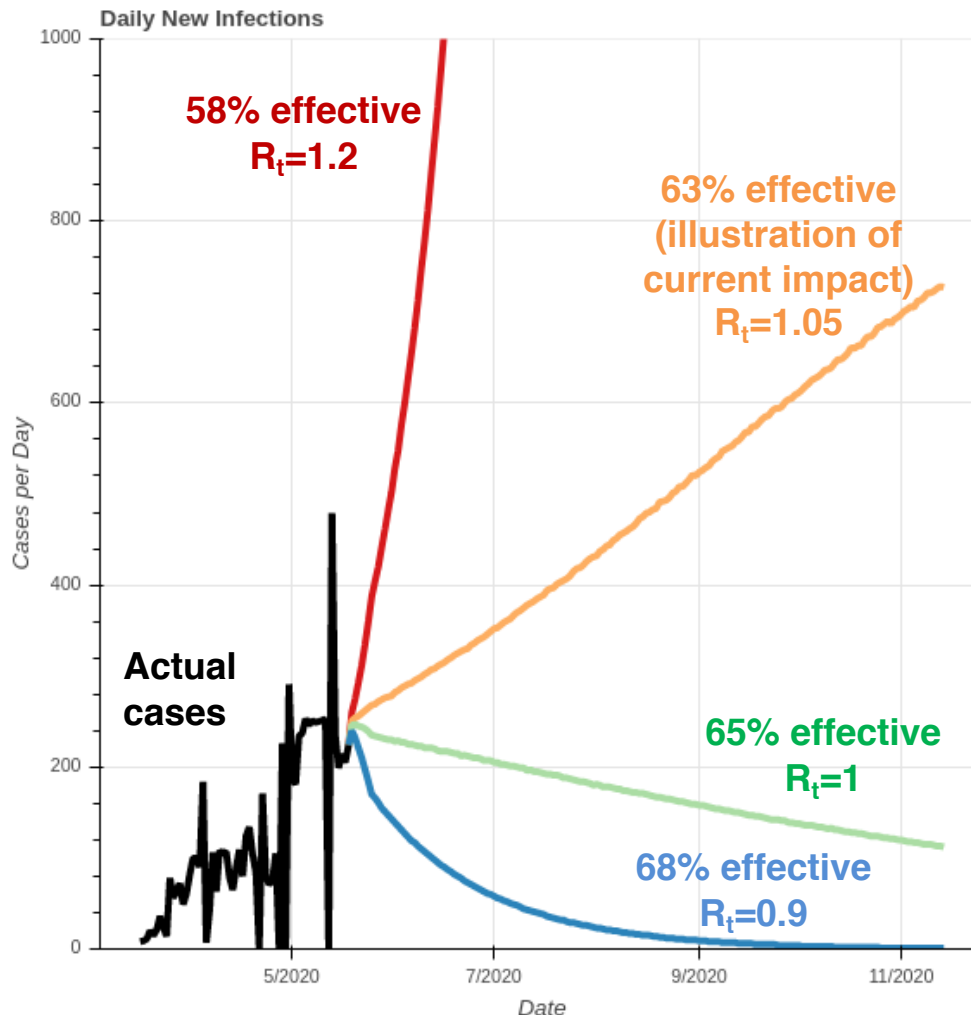


Source: JHU CSSE COVID-19 US Confirmed Case Data, Accessed May 19, data through May 18

- 1) Cori, A. et al. A new framework and software to estimate time-varying reproduction numbers during epidemics (AJE 2013).
- 2) Assumes serial interval follows gamma distribution as calculated in Nishiura, et al. "Serial interval of novel coronavirus (COVID-19) infections." *Int J Infect Dis*. 2020 Mar 4;93:284-286. doi: 10.1016/j.ijid.2020.02.060.

What is the impact of preventative measures on the future spread in Dallas County?

Actual and Predicted Daily New Infections in Dallas County



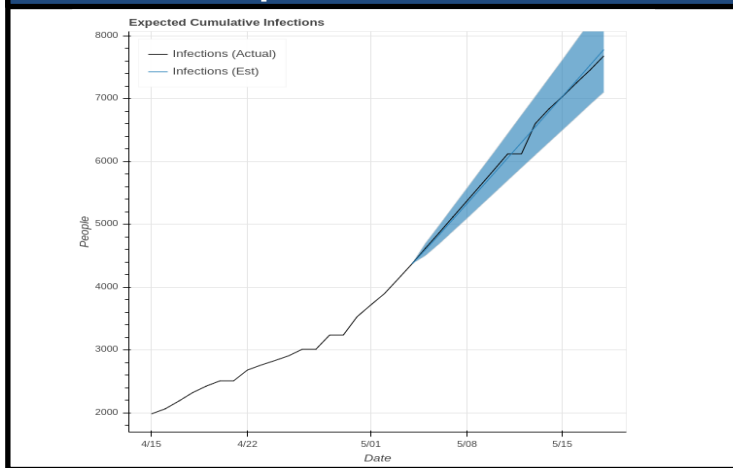
Social distancing & other prevention measures are **currently ~63% effective** at curbing the spread of COVID-19.

- If measures were **58% effective**, the **red line** would happen.
- If measures remain **63% effective**, the **orange line** would happen.
- If measures were **65% effective**, the **green line** would happen.
- If measures were **68% effective**, the **blue line** would happen.

Note: model assumes perfect isolation of hospitalized cases, which has a dampening effect on effective R_t

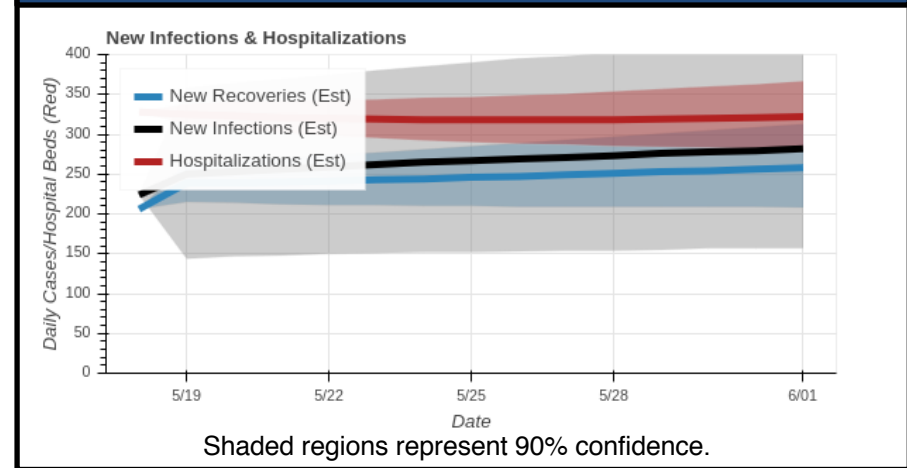
Dallas County – Past Model Accuracy and Future Forecasting

Dallas County 14-day forecast starting from 5/4 compared to actual data



- The graph above demonstrates how well our model would have predicted the past two weeks of COVID-19 cases had we run the current model two weeks ago. Predicted COVID-19 infections are represented by the blue line (shaded area represents 90% confidence interval), and the black line shows actual reported COVID-19 infections. This suggests that the model predicted the number of cases with 90% confidence.

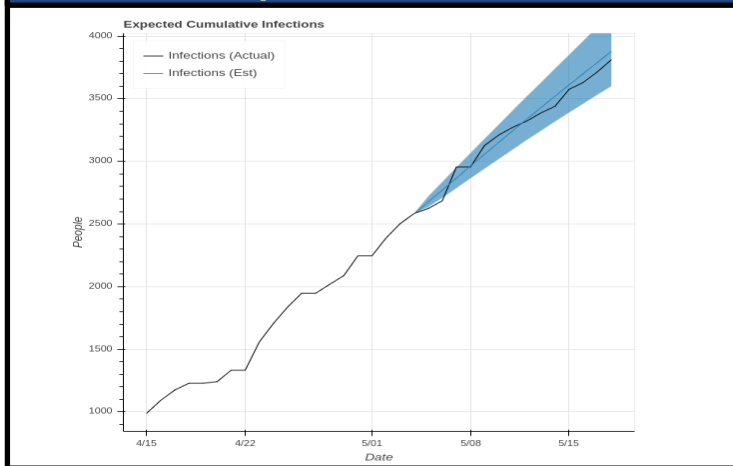
Dallas County 14-day forecast starting from 5/18



- Dallas County COVID-19 hospitalizations (red line) are predicted to remain flat next week but resume their increase the following week, reaching between 280-370 concurrent hospitalized cases by June 1.
- Roughly 280 new COVID-19 infections (black line) per day are expected by June 1.

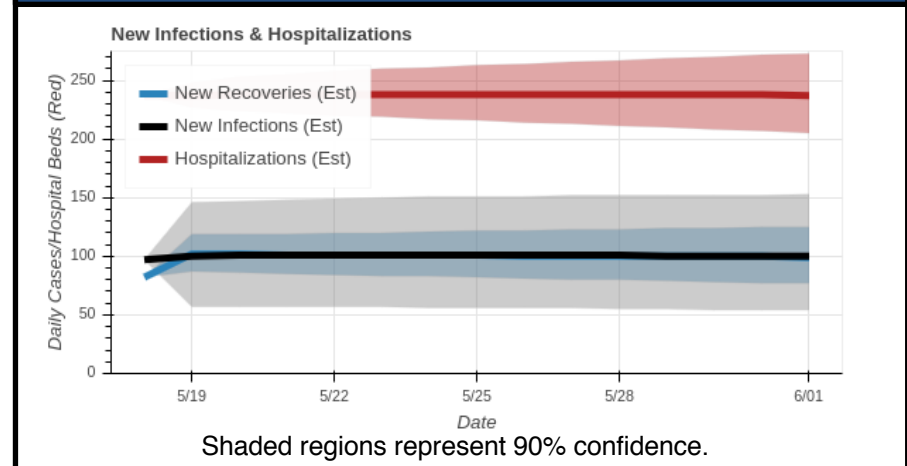
Tarrant County – Past Model Accuracy and Future Forecasting

Tarrant County 14-day forecast starting from 5/4 compared to actual data



- The graph above demonstrates how well our model would have predicted the past two weeks of COVID-19 cases had we run the current model two weeks ago. Predicted COVID-19 infections are represented by the blue line (shaded area represents 90% confidence interval), and the black line shows actual reported COVID-19 infections. This suggests that the model predicted the number of cases with 90% confidence.

Tarrant County 14-day forecast starting from 5/18



- Tarrant County COVID-19 hospitalizations (red line) are predicted to stay between 200-270 concurrent hospitalized cases by June 1.
- Roughly 100 new COVID-19 infections (black line) per day are expected by June 1.
- Importantly, this model currently **excludes** the 636 cases in the Federal Medical Center Fort Worth (a jail hospital in Tarrant County).