About the Model

The following slides illustrate a model of how COVID-19 is spreading across the DFW region based on real patient data. This provides a snapshot based on data available as of December 20-21. 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 vaccinations, masking, staying at home, physical distancing, hand hygiene and others have limited the spread of COVID-19, and what might happen looking forward.

Model-building is an iterative process with inherent uncertainty in its predictions. It facilitates planning and should not be the sole basis for policies or management decisions for any emerging infection.

We thank the Dallas and Tarrant County health departments, the hospitals, and health systems that have contributed data to help us build this model.
The highly transmissible Omicron variant is rapidly eclipsing the Delta variant across the U.S. and currently accounts for up to 90% of sequenced cases in the region that includes Texas and its surrounding states. In line with these trends, Omicron makes up an increasing share of positive tests sequenced at UT Southwestern. Test positivity rates are rising across the state, including recent sharp jumps in parts of the DFW area. Collin County, where test positivity rates have more than doubled, is currently experiencing the fastest hospital admissions growth in the area. Gaps in data due to the holidays may lead to an underestimation of the current number of people hospitalized for COVID-19, which in turn may lead to an underestimation of the trajectory of hospitalizations in this forecast. The number of people hospitalized in Dallas County is projected to increase in the near-term and medium-term.

Holiday gatherings have the potential to supercharge transmission levels in our region, so we urge everyone to use multiple layers of prevention measures to increase the safety of any gatherings that go forward. These measures include gathering outdoors whenever possible, using high-quality masks indoors, increasing ventilation, using rapid tests just before the gathering, and staying home when feeling unwell. Visit the CDC website for further guidance on safer ways to celebrate the holidays. Anyone who is experiencing symptoms or exposed to someone with COVID-19 is encouraged to get tested and quarantine to break the chain of transmission. There is a high likelihood of exposure at any large gathering because of the prevalence and high transmissibility of the Omicron variant, and self-isolation for 3-5 days and testing are recommended for those who attend such gatherings. Onward transmission may be possible as soon as 36 hours after exposure. Masking, physical distancing and other interventions recommended by health experts help protect the health of Texans who are currently unvaccinated, unable to be vaccinated, or who may be immunocompromised.

A compelling study released by TX DSHS found that unvaccinated Texans were twenty times more likely to die from COVID-19. Vaccination remains our most powerful tool for preventing severe COVID-19. The vast majority of patients admitted to the hospital for COVID-19 in our area are unvaccinated. All Texans over the age of 5 are now eligible for vaccination, and everyone over the age of 16 is encouraged to get a booster. As part of our ongoing commitment to an equitable, effective, and efficient vaccination rollout, Texans aged 12 and older can schedule a vaccination appointment using UT Southwestern’s online scheduling portal: utswmed.org/vaccines.

The percent test positivity for influenza in Texas has sharply increased. An increasing share of hospital visits are related to influenza like symptoms, and the first death in Dallas from the flu this season has been recorded. These numbers for influenza remain below normal baselines but are much higher than last year.

Visit the CDC website for guidance on which kinds of activities are safe once fully vaccinated, as well as which levels of prevention are recommended. It is important to remember that people arriving at the hospital today were likely infected ~2 weeks ago. Increasing compliance with prevention measures and increasing vaccination rates will help us control transmission in North Texas.
COVID-19 Hospitalizations in Dallas County: Past, Present, and Future Forecasting

Hospitalized COVID-19+ Patients: Past and Predicted

- COVID-19 hospitalizations (black squares) have increased.
- The blue line shows the estimated number of hospitalizations for the last three weeks, as well as our 21-day forecast starting from 12/21.
- Dallas County total COVID-19 hospitalizations are predicted to reach 360 concurrent hospitalized cases by mid-January.
- Roughly 1,000 new COVID-19 infections per day are expected by mid-January.

Source: NCTTRAC EMResource Master Data Set - County Level for data through 8/1/20-12/20/21
Shaded regions in the model’s forecast represent 90% credible interval.
Dallas County’s Trajectory Still Depends on Our Behavior/ Vaccination Success

- COVID-19 appears to be rising after the holidays as hospitalization levels across the region are rising.

- Estimates from this model may be less reliable due to holiday-related reporting distortions.

- These scenarios do not include any potential impact from the Omicron variant as it is too early to estimate any variant-specific parameters such as prevalence, transmissibility or immunity escape as applicable to North Texas.

- It is vitally important for people at higher risk from severe disease to get booster shots if it has been more than 6 months since their last dose, especially those living in congregate settings.

Red is if all behavior returns to unmitigated, pre-pandemic patterns (no masking/social distancing/business restrictions)

Orange is if we continue behaviors of November ’21 (current level of mask wearing/social distancing/business restrictions)

Green is if we return to behavior patterns of Jun/Jul ’20 (limited masking/social distancing/business restrictions)

Blue is if we return to behavior patterns of Oct/Nov ’20 (mask mandate/business restrictions; limited social distancing)
COVID-19 Hospitalizations in Tarrant County: Past, Present, and Future Forecasting

COVID-19 hospitalizations (black squares) have increased.

The blue line shows the estimated number of hospitalizations for the last three weeks, as well as our 21-day forecast starting from 12/21.

Tarrant County total COVID-19 hospitalizations are predicted to reach 300 concurrent hospitalized cases by mid-January.

Roughly 400 new COVID-19 infections per day are expected by mid-January.
More About the Measures We Follow to Build the Model

- **Mobility** proxy measures indicate the degree to which residents are compliant with physical distancing, determined using data from cell phones and surveys.

- **Visits to the doctor** for COVID-like symptoms are a leading indicator that will likely rise ahead of hospitalizations.

- **Test percent (%) positivity** is a useful number to follow to make sure that enough tests are being done and to follow over time. If it goes up, then cases and hospitalizations follow. % positivity varies by the population tested. For example, the % positivity of samples from the emergency department would be different than that of a group of asymptomatic individuals.

- **Hospitalizations** trail new infections by 1-2 weeks but are not influenced by testing capacity or test reporting delays, thus giving us a clear picture of severe cases in the community.

- **Vaccinations** indicate the level of protection that is present in the community against severe disease.

- Based on testing and hospitalization data, we calculate **infection rates**, which indicate how prevalent COVID-19 is within an age group or community, and **$R_t$**, which represents how many people 1 individual is likely to infect under current conditions.
How Mobile Are North Texans?

The graphs above show mobility trends through December 18 based on cell phone data. Visits to retail, recreation, and transit are near pre-pandemic levels in some counties. Time spent at home and visits to workplaces have not returned to pre-pandemic levels, likely reflecting a stable shift to working from home for a subset of the population.

Source: Google COVID-19 Community Mobility Reports accessed 12/21, data through 12/18
Based on survey responses, observed mask usage in public places and self-reported mask usage have declined since mid-February, with a steep decrease from May to July. Rates rose from mid-July to September but have fallen and plateaued since then. During the holiday travel season, masking is critically important in public.

Have you already received a COVID vaccine, or if a vaccine were offered to you today, would you definitely or probably choose to get vaccinated?

The percentage of people reporting that they have been or are willing to be vaccinated remains high but flat.

Source: Facebook survey results from Carnegie Mellon University’s Delphi Group. COVIDCast Real-Time Indicators, Accessed 12/21, data through 12/15
Cases of COVID-19 That Require Hospitalization and Test Positivity Rates Are Increasing in North Texas

Roughly 12% of COVID-19 tests are positive in the state of Texas.

Hospital volumes for COVID-19 continue to increase. Gaps in reporting due to the holidays may lead to an underestimation of the current rate of increase.

Source (left): TX DSHS data through 12/19/21, Accessed 12/21/21
Source (right): TX DSHS Combined Hospital Data by TSA Region data through 12/21/2021
"North Texas" is defined as Trauma Service Area E, % increases compare trailing 7-day averages
COVID-19 Hospital Admissions Are Flat or Increasing

- Hospital admissions for COVID-19 are flattening.
  - This is in contrast to several consecutive weeks of large decreases.

- Several counties seeing increases in certain age groups such as 65+ in Collin and all age groups in Dallas.

- Please note the differing scales for each county when reading the graphs at left. Data show location of hospital, not necessarily patients’ resident county.

Source: Admissions - NCTTRAC EMResource Master Data Set - County Level for data through 8/1/20-12/20/21
Undisclosed ages imputed using average regional age mix on the reported date
Includes both lab-confirmed and suspected COVID-19 admissions
Dallas County Infection Rates Growing Across Most Age Groups

- The redder the rectangle, the more cases per 100,000 people.
- Infection rates are rising across most age groups.

Source: Dallas County HHS, Accessed 12/21; data for positive tests with a specimen collection date of 12/11 or earlier
Infection Rates in Many Dallas County Cities Are Climbing

- The redder the rectangle, the more cases per 100,000 people.
- Infection rates are now increasing in many cities in Dallas County.

Source: Dallas County HHS, Accessed 12/21, data for positive tests with a specimen collection date of 12/11 or earlier
$R_t$ 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 Was COVID-19 in DFW Two Weeks Ago?

These graphs show the $R_t$ value as of two weeks ago, calculated using the date positive tests were collected. The $R_t$ value appears to be well above 1 in Dallas County and Tarrant County as of early December.

Source: Dallas County HHS, Accessed 12/21; up to specimen collection date of 12/14; Tarrant County PH, Accessed 12/13; data for positive tests with a specimen collection date of 12/6 or earlier


A. Memorial Day
B. Mask order put into place
C. Colleges/schools reopen
D. Halloween
E. Thanksgiving
F. Christmas
G. Winter Storm

Epidemic grows/
persists above this line

Epidemic declines
below this line