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

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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 January 31-February 1. 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.
Commentary

The number of people hospitalized in both Dallas and Tarrant County continues to decline and further decreases are predicted going forward. Supporting this forecast, test positivity rates continue to decline, and both emergency room visits and new hospital admissions are declining or flat in most age groups.

In the data we monitor, we have observed recent increases in masking and increases in time spent at home, likely implying that many people are responsibly quarantining when exposed and/or isolating when sick. Thanks to actions like these, the worst-case scenarios of recent forecasts have been avoided. It is important to note that, while peaking, the surge is not over, and infection rates and thus risk of exposure are still very high. As we know from past surges, an even greater number of infections will occur after the peak compared to the before the peak, despite rates falling. If behavioral patterns were to abruptly shift back to low levels of masking and high levels of mobility, an upward trajectory of cases and hospitalizations would likely resume (see red line on slide 5). Though declining, the current levels of hospitalizations across the region also remain very high and will continue to put a strain on local health systems until they decline further, making continued vigilance important.

Vaccination remains our most powerful tool for preventing severe COVID-19. Although breakthrough infections are more common with Omicron than with previous variants, vaccinated individuals still have a significantly decreased chance of catching COVID-19 compared to unvaccinated individuals, and even more importantly, significantly decreased risk of hospitalization and death. All Texans over the age of 5 are now eligible for vaccination, and everyone over the age of 12 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.

Both nationally and locally, Omicron is now by far the dominant variant of the virus, representing nearly 100% of positive tests sequenced at UT Southwestern. Though declining, test positivity rates remain high, indicating that infection rates are still very high and that the true number of cases is far higher than recorded case counts. Use of high-quality masks, physical distancing, increased ventilation, staying home when feeling unwell, and other interventions recommended by health experts will help curb transmission and protect the health of all Texans, especially those who are currently unvaccinated, unable to be vaccinated, or who may be immunocompromised. 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.
COVID-19 hospitalizations (black squares) rapidly increased in recent weeks and are now declining again.

The blue line shows the estimated number of hospitalizations for the last three weeks, as well as our 21-day forecast starting from 2/1.

Dallas County total COVID-19 hospitalizations likely peaked last week at around 1,400 concurrent hospitalizations but should be closer to 600 by the end of February.

New COVID-19 infections likely peaked above roughly 7,000 new COVID-19 infections per day last week and are now declining.
Hospitalizations appear to have peaked this past week at levels above all past peaks. While levels are now expected to decline, they are still very high, putting a strain on healthcare resources in the region.

The worst-case scenarios of recent forecasts have been avoided thanks to collective behaviors observed in the data we monitor, such as recent increases in masking and increases in case isolation and physical distancing. If behavioral patterns were to abruptly shift back to low levels of masking and high levels of mobility, an upward trajectory of cases and hospitalizations would likely resume (red line below).

The transmissibility of Omicron and shift to older age demographics may make decline in hospitalizations slower than seen in prior waves.

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

Orange is if we continue behaviors of January ’22 (current level of mask wearing/ social distancing/ significant WFH/ strong case isolation)

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)

5 Estimates from this model will be less reliable due to limits on testing and reporting capacity.
COVID-19 Hospitalizations in Tarrant County: Past, Present, and Future Forecasting

Hospitalized COVID-19+ Patients: Past and Predicted

- COVID-19 hospitalizations (black squares) have rapidly increased in recent weeks.

- The blue line shows the estimated number of hospitalizations for the last three weeks, as well as our 21-day forecast starting from 2/1.

- Tarrant County total COVID-19 hospitalizations peaked just above 1,400 concurrent hospitalizations at the end of January but should be closer to 600 by the end of February.

- New COVID-19 infections likely peaked around roughly 5,000 new COVID-19 infections per day last week and are now declining.

Source: NCTTRAC EMResource Master Data Set - County Level for data through 8/1/20-1/31/22
Shaded regions in the model’s forecast represent 90% credible interval.
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 January 28 based on cell phone data. These trends show recent decreases visits to workplaces and retail sites alongside increases in time spent at home, indicating likely increases in quarantine/isolation due to exposure/infection, though the trends are beginning to reverse.
Masking and Vaccination Survey Responses in North Texas

In the past 7 days, did you wear a mask most or all of the time in public?

In the past 7 days, when you were in public places where social distancing is not possible, did most or all other people wear masks?

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?

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, then decreased for a few months, and have risen steadily again since early January. Given the high transmissibility of the omicron variant, masking is critically important in public.

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 2/1/22, data through 1/29/22
Cases of COVID-19 That Require Hospitalization and Test Positivity Rates Are High but Declining in North Texas

Approximately 28% of COVID-19 tests are positive in the state of Texas.

Hospital volumes for COVID-19 have decreased 8% compared to one week ago but are still 179% higher than one month ago.

Source (left): TX DSHS data through 1/30/22, Accessed 2/1/22
Source (right): TX DSHS Combined Hospital Data by TSA Region data through 1/31/2022
“North Texas” is defined as Trauma Service Area E, % increases compare trailing 7-day averages
COVID-19 Hospital Admissions Are Plateauing At High Levels or Declining

- Hospital admissions for COVID-19 across most age groups and counties in the DFW area are plateauing at high levels or starting to decline.

- Please note the differing scales for each county when reading the graphs at left. Data show location of hospital, not necessarily patients’ resident county.
COVID-19 Hospital Admissions Reached Record-High Levels in Most Age Groups but Are Now Declining

COVID-19 Daily Hospital Admissions for Dallas, Tarrant, Collin and Denton County
*By Age Group, % of January 2021 Peak*

- Weekly admissions volumes across all age groups reached or exceeded peaks from January 2021 but are now flat or declining across all age groups.

Source: Admissions - NCTTRAC EMResource Master Data Set - County Level for data through 8/1/20-1/31/22
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 Are Still Very High Across Across All Age Groups but Are Declining

- The redder the rectangle, the more cases per 100,000 people.
- Infection rates across all age groups are starting to decline but remain near record levels.
- Please note that the upper bound of the color scale is now just over 1,400 cases per 100,000 people, as compared to recent upper bounds of 2,000 or 2,500.

Source: Dallas County HHS, Accessed 2/1/22; data for positive tests with a specimen collection date of 1/22/22 or earlier
Infection Rates in All Dallas County Cities Are Still High but Declining

- The redder the rectangle, the more cases per 100,000 people.
- Infection rates remain near record levels across Dallas County but are likely starting to decline.
- Please note that the upper bound of the color scale is now just over 1,400 cases per 100,000 people, as compared to recent upper bounds of 2,000 or 2,500.

Source: Dallas County HHS, Accessed 2/1/22, data for positive tests with a specimen collection date of 1/22/22 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 one-to-two weeks ago, calculated using the date positive tests were collected. The $R_t$ value appears to have been falling from very high levels in Dallas and Tarrant County, indicating that cases are falling. Note: Reporting delays may make more recent $R_t$ values appear artificially low.