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 February 21-22. 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 rapidly in most age groups. The local Rt value, which represents how effectively the virus is spreading, has been well below 1 and falling, indicating that the epidemic is declining in the region. However, infection rates are declining more slowly in those over 65 compared to other age groups. If current trends continue, our medium-term forecast predicts that hospitalizations will return to levels observed before the Omicron wave by mid-March. Masking behavior has started to decline, and mobility trends have returned to pre-holiday levels; the impact of these behavioral shifts on our medium-term forecast remains to be seen.

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. The Omicron sub-lineage know as BA.2 has been detected in our samples in recent weeks but remains rare in the region.

Use of high-quality masks, physical distancing, increased ventilation, staying home when feeling unwell, and other interventions recommended by health experts will help continue to 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) have been rapidly declining this month.

- The blue line shows the estimated number of hospitalizations for the last three weeks, as well as our 21-day forecast starting from 2/22.

- Dallas County total COVID-19 hospitalizations peaked late last month above 1,400 concurrent hospitalizations but should be below 200 by mid-March if current trends hold.

- New COVID-19 infections are projected to fall below roughly 500 new COVID-19 infections per day by mid-March.
Hospitalization levels are expected to continue to decline over the next several months.

Masking behavior has started to decline, and mobility trends have returned to pre-holiday levels. The impact of these behavioral shifts on the medium-term forecast below remains to be seen.

This week’s inclement winter weather should help maintain trends over the near term.

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

Orange is if we continue behaviors of February ’22 (current level of mask wearing/s 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)

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 been rapidly declining this month.
- The blue line shows the estimated number of hospitalizations for the last three weeks, as well as our 21-day forecast starting from 2/22.
- Tarrant County total COVID-19 hospitalizations peaked late last month above 1,400 concurrent hospitalizations but could be under 200 by mid-March.
- New COVID-19 infections are projected to fall below roughly 500 new COVID-19 infections per day by mid-March.

Source: NCTTRAC EMResource Master Data Set - County Level for data through 8/1/20-2/21/22

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 **Rt**, 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 February 19 based on cell phone data. Visits to workplaces have rebounded to pre-holiday levels and time spent at home has decreased accordingly. Visits to other sites outside the home have increased as well.
Based on survey responses, rates of observed mask usage in public places and self-reported mask usage rose during the peak of the last surge but have declined again recently. Masking is still an important tool to reduce transmission in public given current infection rates and the high transmissibility of the omicron variant.

The percentage of people reporting that they have been or are willing to be vaccinated remains high but flat.
Cases of COVID-19 That Require Hospitalization and Test Positivity Rates Are Declining in North Texas

Percent Positive COVID-19 Tests in Texas

- Roughly 8% of COVID-19 tests are positive in the state of Texas.

Confirmed COVID-19 Patients in North Texas Hospitals

- Hospital volumes for COVID-19 have decreased 34% compared to one week ago and decreased 67% compared to one month ago.

Source (left): TX DSHS data through 2/20/22, Accessed 2/22/22
Source (right): TX DSHS Combined Hospital Data by TSA Region data through 2/22/2022
“North Texas” is defined as Trauma Service Area E, % increases compare trailing 7-day averages
COVID-19 Hospital Admissions Are Declining Rapidly From Record Levels

Hospital admissions for COVID-19 across all age groups and counties in the DFW area are now declining rapidly from record levels.

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 8/1/20-2/21/22

Undisclosed ages imputed using average regional age mix on the reported date
Includes both lab-confirmed and suspected COVID-19 admissions
COVID-19 Hospital Admissions Reached Record-High Levels in Most Age Groups but Are Now Declining Rapidly

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 declining rapidly.

Source: Admissions - NCTTRAC EMResource Master Data Set - County Level for data through 8/1/20-2/21/22
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 Declining Across Across All Age Groups

- The redder the rectangle, the more cases per 100,000 people.
- Infection rates are declining across all age groups, though the decline is slower among those over 65.
- 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 2/22/22; data for positive tests with a specimen collection date of 2/12/22 or earlier
Infection Rates in All Dallas County Cities Are Declining

- The redder the rectangle, the more cases per 100,000 people.
- Infection rates are broadly declining across Dallas County.
- 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 2/22/22, data for positive tests with a specimen collection date of 2/12/22 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 well below 1 in Dallas and Tarrant County.

Note: Reporting delays may make more recent $R_t$ values appear artificially low.

Source: Dallas County HHS, Accessed Feb 22; up to specimen collection date of Feb 17; Tarrant County PH, Accessed Feb 22; data for positive tests with a specimen collection date of Feb 17 or earlier