



TEXASCARES

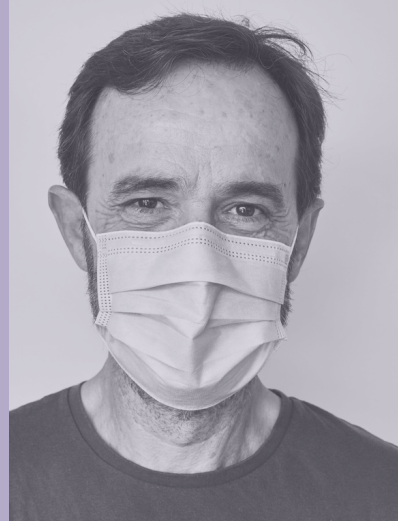
TEXAS CORONAVIRUS ANTIBODY RESPONSE SURVEY

October 2021



TEXAS
Health and Human
Services

Texas Department of State
Health Services





TEXASCARES

Texas CARES

UTHealth School of Public Health
1200 Pressler St, Houston, TX, 77030
713-500-9441
TexasCARES@uth.tmc.edu
www.TexasCARESProject.org

This project has been approved by the UTHealth Committee for Protection of Human Subjects, IRB# HSC-SPH-20-0825, and is funded by the Texas Department of State Health Services.



TEXAS
Health and Human
Services

Texas Department of State
Health Services

Table of Contents

01	Executive Summary & Overview
04	Methods & Looking at Antibodies Over Time
07	Texas CARES – Where We Are
08	Findings: Adults
12	Findings: Children
15	Summary & Next Steps for Texas CARES



01 Executive Summary & Overview

Executive Summary of Texas CARES

The Texas Coronavirus REsponse Survey, or Texas CARES for short, is helping us better understand how COVID-19 antibody response plays out across our state, in different communities and populations as well as over time. It also allows us to estimate the percentage of people in Texas who have natural antibodies and may not have had a previous positive COVID-19 test. Participating Texans help us measure things like how many people in the survey have COVID-19 antibodies and how long those antibodies last.

As of October 3, 2021, the percentage of the Texas population with SARS-CoV-2 antibodies who presumably benefit from some degree of protection from COVID-19 is 75.5%. Antibody levels peak about 120 days after infection and then decrease, but still remain detectable after 275 to 500 days. Unvaccinated individuals with a previous infection have lower antibodies to the spike protein compared to fully vaccinated individuals. More than a third of children have antibodies to the virus, and of those, 50.8% reported never having had symptoms. A substantial proportion (44.9%) of parents report their child's mental/emotional health has been negatively impacted by the COVID-19 pandemic.

Overall, we estimate that three-quarters of Texans have SARS-CoV-2 antibodies, generated either from a prior natural infection or from a vaccine, and therefore possess some level of protection from COVID-19. Importantly, Texas CARES data illustrate that fully vaccinated participants showed significantly higher antibody levels than those with a natural infection only, suggesting that vaccination may provide the highest level of protection, even for those who have had prior COVID-19 infections and developed antibodies.



Visit our website for more information:
texascareproject.org

View our latest data at:
sph.uth.edu/projects/texascare/dashboard

What we do

To identify what percent of the Texas population has antibodies in their blood, we use two antibody tests. The results are especially important for detecting previous infections in people who had few or no symptoms.

- One test, called the N-test, looks for antibodies in the blood made in response to a COVID-19 infection.
- The second antibody test, called the S-test, is used to test for the presence of spike-protein antibodies, which, in the absence of a positive N-test, are the antibodies arising as a response to the COVID-19 vaccine.

We review the results of both antibody tests, along with responses to surveys, to help understand what things could contribute to the broad differences in COVID-19 symptoms and diagnoses.

Why does it matter?

There is still a lot we don't know about COVID-19 antibodies.

People with antibodies to COVID-19 from a previous infection may have an immune response to a future infection, but we don't have enough evidence to know who may be protected, and how much this happens.

Even if antibodies do provide some level of protection, we don't know the amount of antibodies needed for immunity and how long that protection might last.

Texas CARES survey will provide us with a better understanding of how COVID-19 antibody response plays out over time. The knowledge we get from Texas CARES may help answer these questions and may in turn inform local and state policies.

In other words, Texas CARES is helping Texas in the effort to combat COVID-19 at a local, state and national level.

The Team

Texas CARES is managed by a collaborative team from the University of Texas Health Science Center at Houston (UTHealth) School of Public Health, in partnership with Texas Department of State Health Services (DSHS), Clinical Pathology Laboratories, and the University of Texas System. Texas CARES is funded by Texas DSHS.

By the Numbers

According to the Texas Department of State Health Services, as a result of COVID-19, the state has seen:

- 64,590 deaths
- 3,392,081 cases
- 42,362,032 total COVID-19 lab tests reported
- 14,928,063 people (62.02% of the eligible population) fully vaccinated against the virus
- Over 72% of Texans ages 12 and older are at least partially vaccinated

*as of 10/2/2021

More information at:

www.dshs.texas.gov/coronavirus

What is seroprevalence?

The percentage of individuals in a population who have antibodies to an infectious agent is called seroprevalence.

Texas CARES uses antibody tests to estimate the percentage of people in Texas who have antibodies against SARS-CoV-2. This can tell us how many people in Texas may have been previously infected with SARS-CoV-2.

A small sample of people participating in the survey represents a larger population, which could be a community, state, or special population (like healthcare workers or teachers). Participation in Texas CARES is voluntary. The sample may not be representative of all Texans.

What are antibody tests?

Texas CARES antibody tests look for antibodies in blood samples to determine if an individual has had a past infection with a virus like the one that causes COVID-19. Antibody tests can help identify people who may have been infected with the virus or have recovered from COVID-19.

Researchers do not know whether the presence of antibodies means that you are immune to COVID-19; or if you are immune, how long it will last. Antibody testing is not recommended to determine whether you are immune or protected from COVID-19.

What are PCR and antigen tests?

PCR tests are used to detect genetic material from viruses like SARS-CoV-2. Antigen tests are used to detect proteins from a virus. These tests detect the presence of a virus at the time of the test, typically during an active infection. Texas CARES is not using PCR or antigen testing.

Texas CARES uses two tests

to detect your antibodies to the virus indicating previous infection or vaccination.

- **Roche Elecsys® Anti-SARS-CoV-2 (N-test** does not detect antibodies developed from vaccination)
- **Roche Elecsys® Anti-SARS-CoV-2 S (S-test** detects antibodies developed from previous infection and/or vaccination)



02 Methods & Looking at Antibodies Over Time

What are the survey's goals?

Texas CARES focuses on these key goals:

- To estimate how many people in Texas have been infected with, and recovered from SARS-CoV-2.
- To estimate how many people have been vaccinated for SARS-CoV-2 and develop antibodies.
- To test how long COVID-19 antibodies last in someone's system.
- To identify the characteristics of people who develop COVID-19 antibodies.
- To identify the characteristics of people who never develop COVID-19 antibodies.

Who participates in Texas CARES?

Any Texan between the ages of 5–90 years of age!

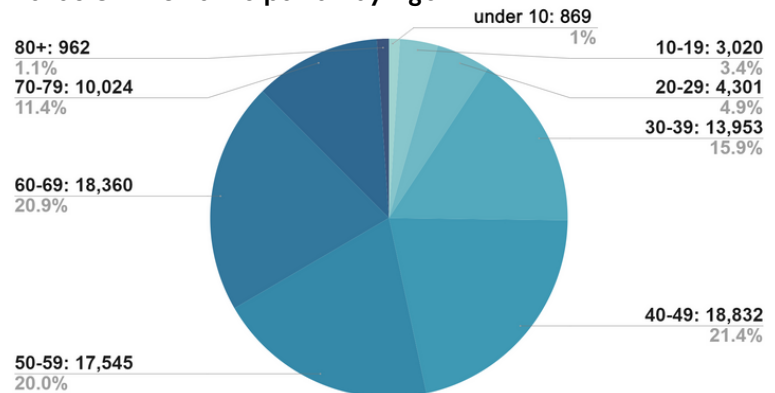
Once a person enrolls and a CPL partner lab is identified, participants may go to the lab for the free blood draw and complete the testing over time – three tests in total, over six to eight months.

Given the volunteer enrollment of Texas CARES and the large sample size, we do note that the percentages of those enrolled do not represent the current Texas population. We are striving to use lessons learned through our current outreach to implement targeted recruitment and retention strategies to diversify our sample population.

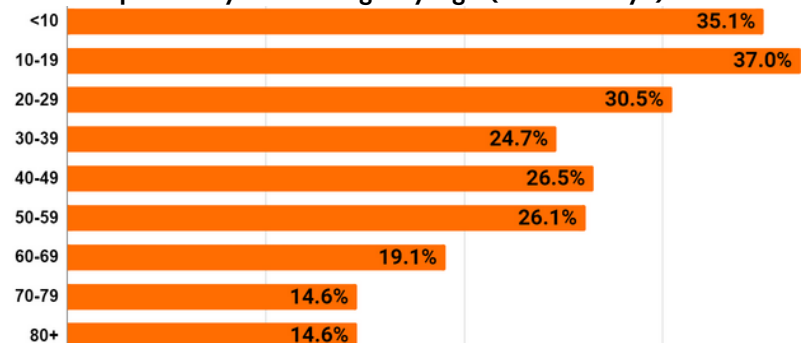
- 87,866 people enrolled as of October 4, 2021
- Current enrollees are between 5 and 90 years of age
- 67.2% of participants are female
- 20.8% of participants are 20–39 years of age
- 14.8% of participants are Hispanic

*The N-test looks for antibodies in the blood made in response to a COVID-19 infection.

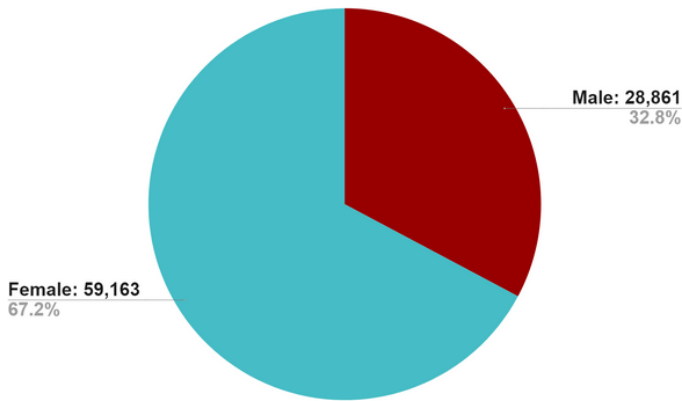
Texas CARES Participation by Age



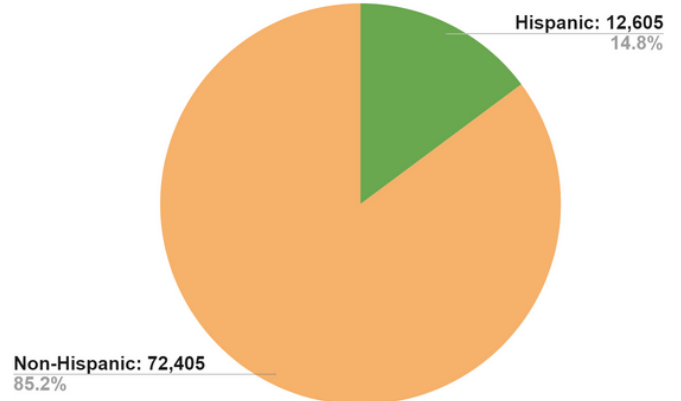
Seropositivity Percentage by Age (N-test only*)



Texas CARES Participation by Sex



Texas CARES Participation by Ethnicity



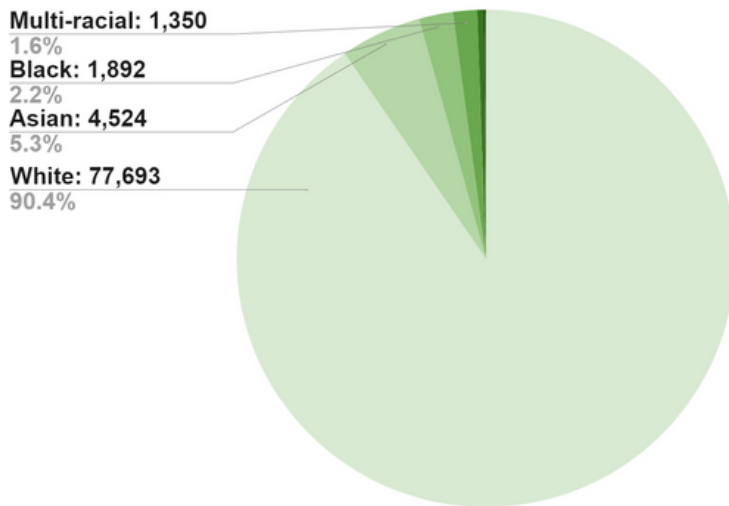
Seropositivity Percentage by Sex (N-test only*)



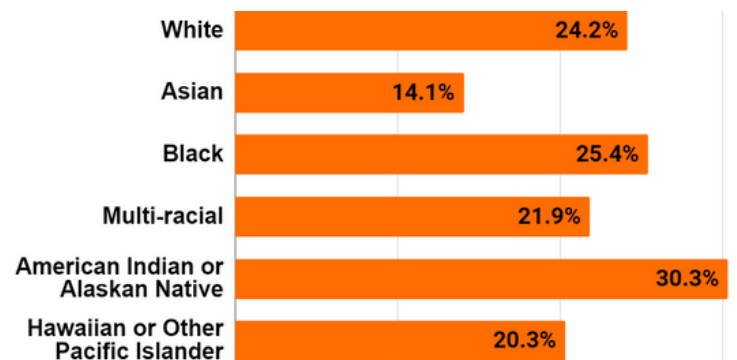
Seropositivity Percentage by Ethnicity (N-test only*)



Texas CARES Participation by Race



Seropositivity Percentage by Race (N-test only*)



* N-test, looks for antibodies in the blood made in response to a COVID-19 infection.

What we do?

All protocols were reviewed and approved by the University of Texas Health Science Center at Houston Institutional Review Board prior to contacting and enrolling anyone.

- Participants enroll by completing a survey that will allow us to understand who is participating. Their key demographics, including age, history of chronic disease, and previous COVID-19 exposure, as well as vaccination status, are reported.
- Once the survey is completed, the individual goes to a partner CPL laboratory for their free blood draw.
- Results are available within 2-3 days of the draw, and are delivered via text message and an online lab portal.
- After three months, participants receive a text message reminding them to go in for their second antibody test.
- After six months, a third text message is sent to remind them to go in for their third test.

This information is used to estimate the natural and vaccine antibody response across all participants and children over time.

Why over time?

We look at the response over time to better understand who and why a population may have natural and/or vaccine antibodies and how long the protection will last.

This information can be used to determine how the protective antibody response plays out over time and may protect an individual from reinfection.

We also look at breakthrough infections to better understand who gets reinfected, and what other factors may contribute to the illness – is it age, a previous history of chronic illness, or other factors like whether or not they work at home or in an office, or are a younger student? These patterns can help us to better understand how COVID-19 impacts Texans!

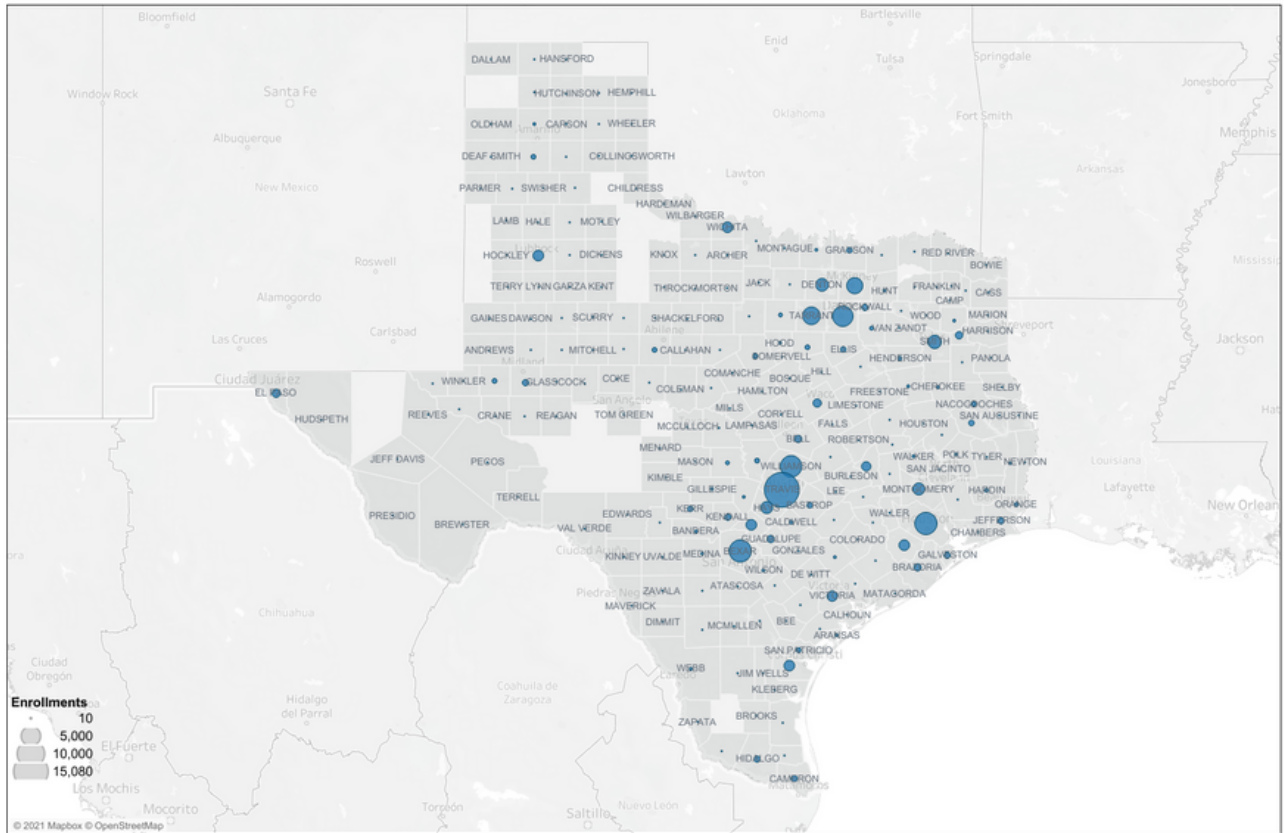
*It costs
nothing, and
you have
nothing to
lose, but you
gain
A LOT!*

A teacher from the Houston area



03 Map of Texas CARES Reach

Texas CARES Enrollment Map



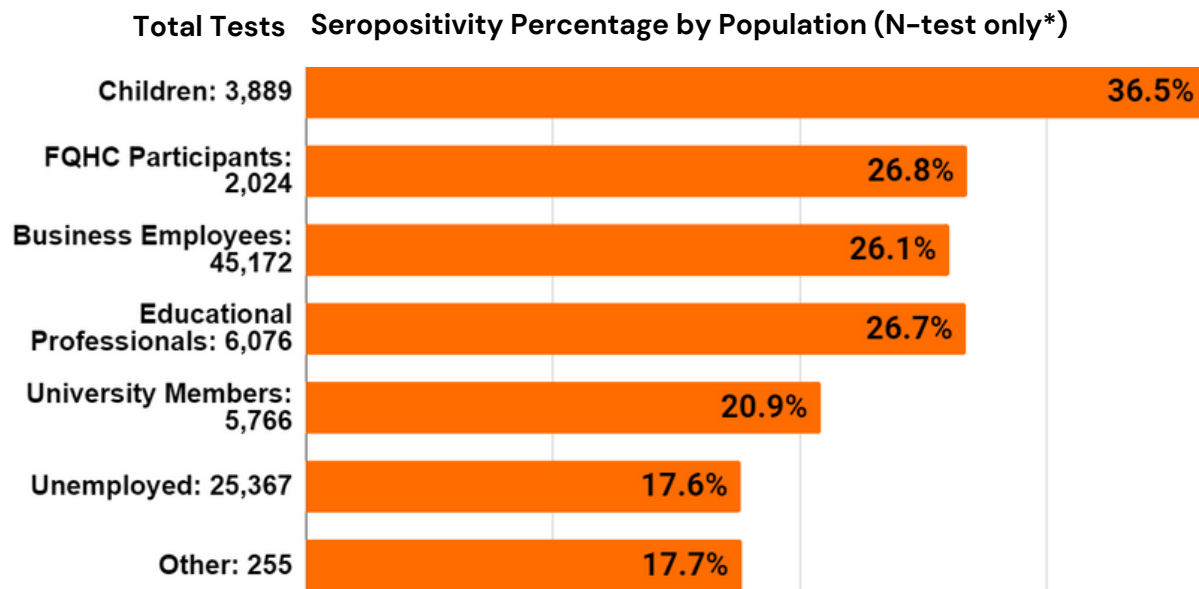
Circle size corresponds to the number of participants in each county. Blank counties indicate that there was no participation from any individuals living there.

88,091 Texans from 234 counties across the state participated in Texas CARES.



04 Findings: Adults

Who is participating in Texas CARES?



* The N-test looks for antibodies in the blood made in response to a COVID-19 infection.

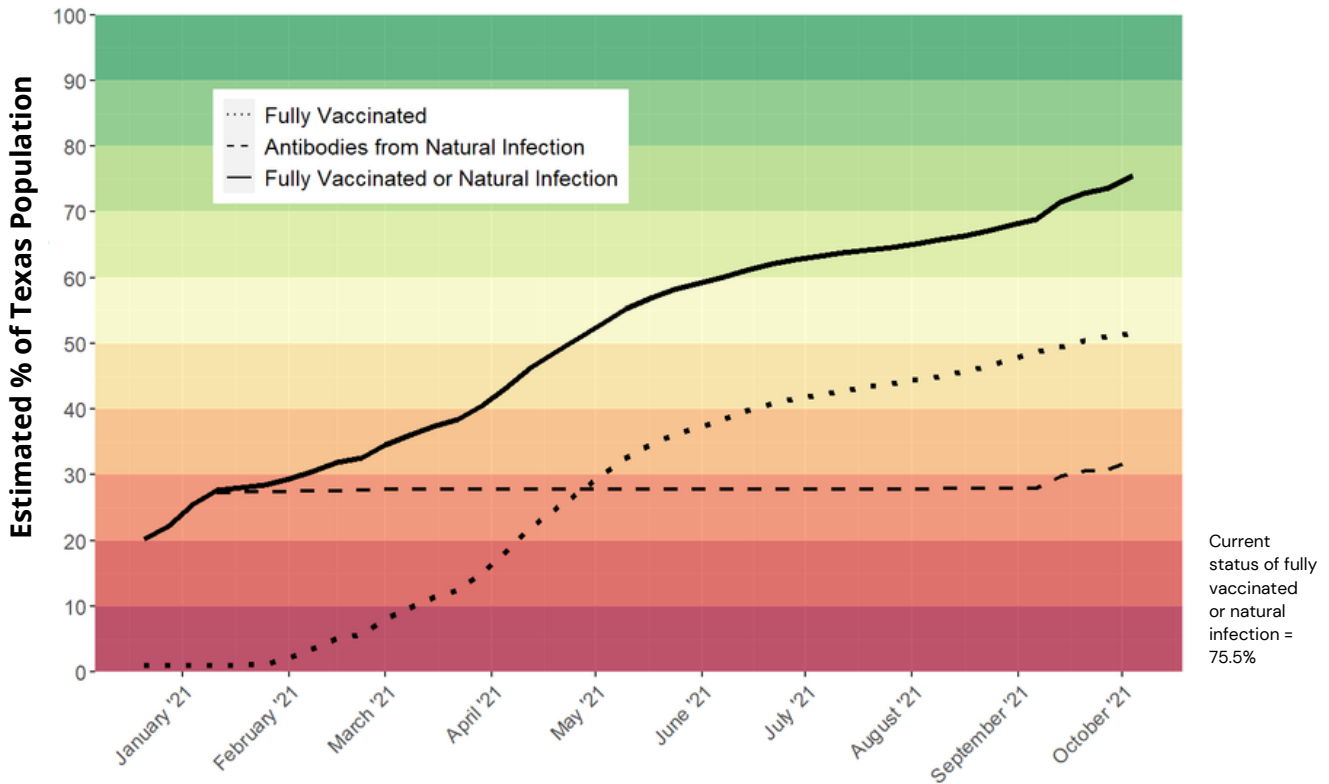
Overall Key Findings

- Federally Qualified Health Centers (FQHC) participants (both staff and patients) had the second-highest seroprevalence at 26.8%.
- Unemployed and other groups had the lowest seroprevalence – perhaps due to retired individuals, or populations who remain at home: 17.6%, and 17.7% respectively.
- Educational professionals (all school staff) had 26.7% seroprevalence.
- The highest seroprevalence is found in school-aged children: 36.5%.

Looking at Estimated Antibody Status Over Time (January – October 2021)

Texas CARES estimates the proportion of Texans with antibodies against SARS-CoV-2. These antibodies can arise in two ways: from a naturally occurring infection, or from the vaccine. Texas CARES is measuring both.

Estimated Antibody Status in Texas



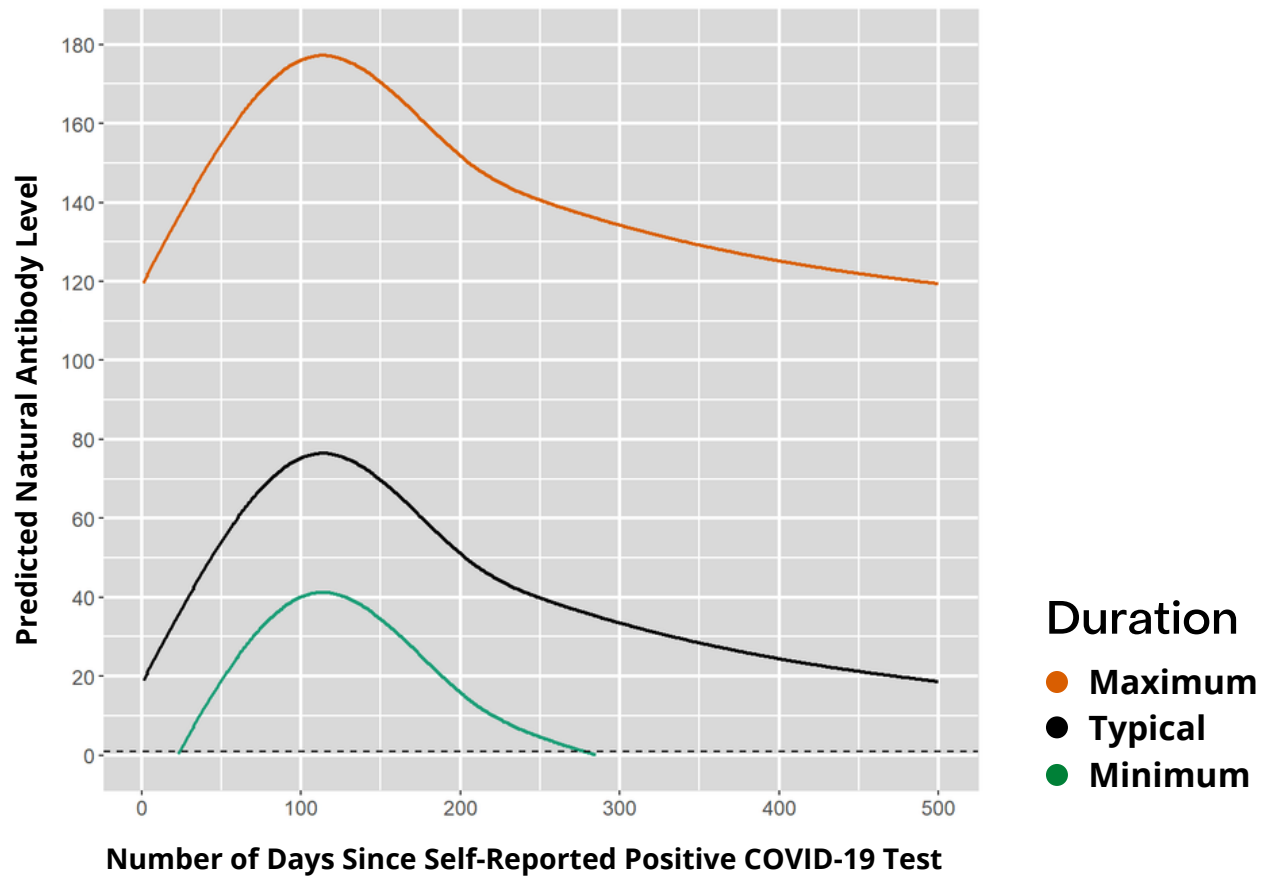
One cannot simply add up the proportion of people with evidence of natural infection with the proportion of people having evidence of the vaccine, because some people have had both and we do not want to double-count them.

Key Finding #1

- The amount of protection from naturally acquired antibodies compared to antibodies from vaccination is still unknown.
- Estimated percentage of the Texas population with SARS-CoV-2 antibodies: 75.5% (as of October 3, 2021). This proportion of the population benefited from some degree of protection from COVID-19.*

Predicted Natural Antibody Levels Over Time (N-Test Value)

Using a comparison sample of infected, white females between the ages of 50–64, we predicted the minimum, maximum, and typical response of natural antibody levels over time.



Key Finding #2

- Values over time for **natural antibody levels** may peak at around 120 days.
- Natural antibody test values **may return to undetectable levels** in 275–500 days.
- Predictive model indicates that **some level of protection from natural antibody levels may last on average 275–500 days, supporting vaccination even after infection to maintain protection.** Other forms of immune response are excluded from this model.

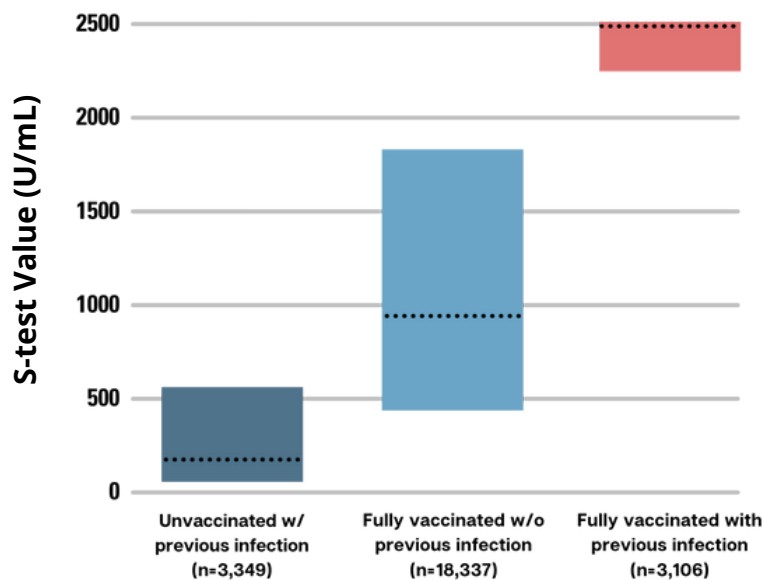
Antibody Levels by Vaccination Status and Prior Infection (S-Test)

The S-test detects and measures antibody levels developed in response to spike proteins from vaccination and/or previous infection.

Texas CARES uses the N-test results to identify previously infected individuals and then compares S-test values of people across three scenarios:

1. Unvaccinated participants *with* previous infection
2. Fully vaccinated participants *without* previous Infection
3. Fully vaccinated participants *with* previous infection

25 and 75 Percentile of S-test Value Based on History of COVID Infection (Positive N-test) & Vaccine Status



- Unvaccinated with previous infection: Range 71.8–543 with a median of 89.6 U/mL
- Fully vaccinated without previous infection: Range 452–1,832 with a median of 952 U/mL
- Fully vaccinated with previous infection: Range 2,259–2,500 with a median of 2,500 U/mL (half of these values are greater than 2,500 U/mL)
- n = the number of people in this category

Key Finding #3

Unvaccinated individuals with a previous infection have the lowest median S-test value. Fully vaccinated participants with previous infection have the highest proportion of those showing the maximum value of the S-test (83.1%) and the highest possible median S-test value (2,500 U/mL).

Fully vaccinated participants show significantly higher antibody levels as compared to those with a natural infection only. Therefore, if you have tested positive for the virus, with or without symptoms, it is still important that you get the COVID vaccination in order to enjoy the highest level of antibody protection against re-infection.

05 Findings: Children

As of October 7, 2021, over 6 million children in the United States have tested positive for COVID-19. Over 750,000 cases were added over the past 4 weeks.

This recent uptick suggests that the delta (B.1.617.2) variant is more transmissible among children compared to the alpha (B.1.1.7) variant. These data are particularly troubling because they coincide with school openings and increased hospital admissions among children due to COVID-19 illness compared to earlier waves.

Of hospitalized children, one-third are admitted to intensive care where approximately six percent receive mechanical ventilation, and a very small number develop Multisystem Inflammatory Syndrome in Children (MIS-C) that includes low blood pressure, severe abdominal pain, and heart problems.

Texas CARES Child Participants (n=3889)

- 37.2% are 15–19 years old
- 40.5% are 10–14 years old
- 22.3% are 5–9 years old
- 50.4% are girls
- 22.9% are Hispanic
- 6.0% are Asian
- 5.0% are multiracial
- 2.5% are non-Hispanic Black



I signed my son up for Texas CARES to help our community.

A parent to a 13 year old male in Houston

Key Finding #1

More than a third of children had antibodies to the virus, and of those, 50.8% reported never having had symptoms.

Our analysis that included 3,889 children ages 5-to-19 years showed 36.5% (95% CI, 35.0%–38.1%) of the sample were SARS-CoV-2 antibody positive in fully adjusted estimates. A total of 23.1% (95% CI, 22.9%–23.4%) of adults (n=83,977) in the sample were antibody positive. Over half (50.8%) of the children with positive antibody status were reportedly asymptomatic. The risk of having a positive antibody status was 23% higher in 15-to-19 year olds than adults (relative risk 1.23, 95% CI, 1.14– 1.32). The risk was also 18% (relative risk 1.18, 95% CI, 1.10–1.25) higher in 10-to-14 year olds, and 15% (relative risk 1.15, 95% CI 1.05–1.26) higher in 5-to-9 year olds than adults, respectively.

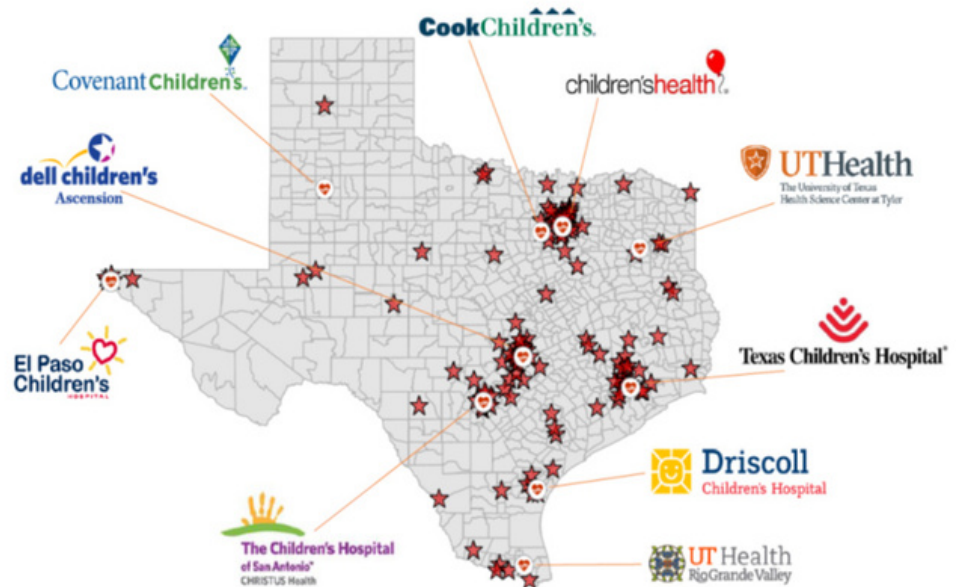
Key Finding #2

From our sample (n=104; mean age 12.6 years, standard deviation 3.9), 98% of those with positive N-test values at the timepoint one assessment continued to have antibodies more than six months later (mean 6.9 months, standard deviation 0.74).

There was **no difference** in the presence of antibodies by self-reported symptom status (asymptomatic versus symptomatic) or severity (mild-moderate versus severe), sex, age group, or body mass index group (underweight, healthy weight, overweight, obesity) over the three antibody measurement timepoints. Antibody values from natural SARS-CoV-2 / COVID infection decreased with each subsequent timepoint.



Texas CARES Partners



Volunteers ages 5-to-19 years were recruited throughout the state from large children's healthcare systems, Federally Qualified Healthcare Centers, urban and rural pediatric and family medicine practices, health insurance providers, and a social media campaign

Key Finding #3

The pandemic is having significant social/mental health impacts on Texas children.

A substantial proportion (44.9%) of parents report their child's mental/emotional health has been negatively impacted by the pandemic, and about a third of parents (31.7%) have a child who did not attend school in-person full-time in the 2020-2021 school year.

In a survey taken before the results of the antibody test were known, over half of the parents (53.4%) of children with a positive antibody test report that they do *not* plan on getting their child vaccinated, versus 22.3% of parents of children with negative antibody tests.



06 Summary & Next Steps for Texas CARES

Summary

Three-quarters of Texans have SARS-CoV-2 antibodies, generated from either a prior natural infection, or from a vaccine, and therefore possess some level of protection from COVID-19.

While natural antibodies from prior infections do offer some protection from the disease, that protection may be fleeting, with antibody levels peaking around 120 days after infection and returning to undetectable levels in 275–500 days on average.

Texas CARES data illustrate that fully vaccinated participants showed significantly higher antibody levels than those with a natural infection only, suggesting that vaccination may provide the highest level of protection, even for those who have had prior COVID-19 infections, and natural antibodies.

The Texas CARES results for children highlight that (1) a majority (63.5%) of children do not have antibodies to SARS-CoV-2, and (2) natural infection-induced antibodies persist and may provide some protection against future infection, for at least half a year. Both of these findings highlight the important role of vaccines in providing protection against COVID-19 for children aged 12 years and older, and for those under 12 as they become eligible.



Next Steps Include:

- Continue to follow antibody levels over a longer period of time
- Continue to enroll children in Texas CARES, especially those belonging to under-served communities
- Work to understand the multitude of reasons why some people do not produce appreciable quantities of antibodies even though they have tested positive for COVID-19 or have been vaccinated
- Work to understand the need for and effect of a possible booster vaccine
- Work to understand the effect of the vaccine on very young children (<12 years of age), once that is approved
- Develop and test a pilot protocol to add upper respiratory swabbing and testing for SARS-CoV-2 antibodies





TEXAS CARES

Texas Coronavirus Antibody
Response Survey

Acknowledgements

This work was supported by the Texas Department of State Health Services (DSHS) and the University of Texas System, and funded through the Texas Department of State Health Services.

This analysis would not have been possible without the partnership of many. The Texas CARES investigation team would like to thank Clinical Pathology Laboratories, Federally Qualified Health Care Centers statewide, and the Texas Association for Community Health Centers for assisting with sharing information with families about this survey.

The Team

Eric Boerwinkle, PhD
Kimberly Aguillard, PhD
Frances Brito, MS
Stacia DeSantis, PhD
Michael Gonzalez
Vinod Hopson
Steven Kelder, PhD, MPH
Bill Kohl III, PhD, MSPH
David Lakey, MD

Luis Leon-Novelo, PhD
Sarah Messiah, PhD, MPH
Stephen Pont, MD, MPH
Jessica Ross
Jennifer Shuford, MD, MPH
Michael Swartz, PhD
Melissa Valerio-Shewmaker, PhD, MPH
Leqing Wu, PhD
Ashraf Yaseen, PhD

Who can I contact if I have questions?

Answers to frequently asked questions may be found at: <https://sph.uth.edu/projects/texascares/faq>

More information about COVID-19 in Texas:

<https://www.dshs.texas.gov/coronavirus>



Texas CARES

UTHealth School of Public Health
1200 Pressler St, Houston, TX, 77030
713-500-9441
TexasCARES@uth.tmc.edu
www.TexasCARESProject.org

This project has been approved by the UTHealth Committee for Protection of Human Subjects, IRB# HSC-SPH-20-0825.