

COVID-19 Update

March 4, 2021

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Introduction

- COVID-19 is the name of the respiratory illness caused by SARS-CoV-2 which is a novel Coronavirus which originated in bats.
- This family of viruses causes a broad range of symptoms ranging from the common cold to more severe infections and pneumonia.
- Prior Coronavirus outbreaks include severe acute respiratory syndrome (SARS-CoV; 2002-2003) and the Middle Eastern respiratory syndrome (MERS-CoV; 2012-present)
- Coronaviruses that cause the common cold represent 10-30% of respiratory infections in adults and primarily cause infection in the winter months.

Early Outbreak

- Since initially being noted in December 2019 in Wuhan, China, COVID-19 has rapidly expanded to become a global pandemic and is a rapidly evolving public health emergency.
- Initially, a cluster of pneumonia cases of unknown etiology were reported to the Chinese public health authorities in which most patients had exposure to the Wuhan seafood market which was closed on Jan 1, 2020.
- A novel coronavirus was first reported on 1/7/20
- The first fatal case occurred on 1/11/20
- The first case outside of China was reported in Thailand 1/13/20
- The first US case was reported 1/20/20
- Initially, all cases reported outside of China were in returning travelers from Wuhan province and their close contacts.

Case Reports - Worldwide

- September 9 - 27,417,497 cases with 894,241 deaths.
- March 2, 2021 - 113,989,973 cases with 2,531,542 deaths.
- The case fatality rate (CFR) is 2.22%. Cases have been described in 223 countries/territories. The total number of cases is much higher than occurred in the SARS-CoV and MERS-CoV outbreaks.
- The CFR and percentage of patients with severe disease are both lower than reported for SARS-CoV and MERS-CoV. For comparison, 774/8098 (9.6%) of patients with SARS-CoV died, and 858/2494 (34.4%) of patients with MERS-CoV died.

Case Reports - US

- Sep 9, 2021 - 6,287,363 cases
- March 2, 2021 – 28,405,925 cases

- The state with the most cases are:
 - California 3,475,562 = 8796/100K
 - Florida 1,874,154 = 8726/100K
 - Texas 2,644,024 = 9119/100K
 - New York 1,648,893 = 8691/100K
 - Georgia 1,006,521 = 9480/100K
 - Illinois 1,186,696 = 9365/100K

Case Report - US

- Sept 9, 2020 - 188,688 confirmed deaths. The CFR is 3.0%
- March 2, 2021 – 511,839 deaths. The CFR is 1.80%
- The states with the highest total deaths are:

• New York	32,714 = 282/100K	47304 = 162 + 350/100K
• New Jersey	15,991 = 179/100K	23182 = 261/100K
• California	13,726 = 34/100K	51762 = 131/100K
• Texas	13,492 = 47/100K	42912 = 148/100K
• Florida	11,871 = 55/100K	30713 = 143/100K

Case Reports – Texas

- In Texas –The highest cases are recorded in: TX CFR 1.9%
- | | <u>9/9/20</u> | <u>3/2/21</u> | |
|--------------|---------------|---------------|-----------------|
| • Harris | 111,525 | 350,201 | |
| • Dallas | 73,961 | 245,278 | |
| • Tarrant | 40,222 | 206,094 | |
| • Bexar | 38,849 | 167,756 | |
| • El Paso | | 123,979 | |
| • Hidalgo | 28,732 | 50,791 | 2302 (4.5% CFR) |
| • Travis | | 75,636 | |
| • Cameron | | 37,239 | 1348 (3.6% CFR) |
| • Montgomery | 9,164 (#16) | 36,794 (#15) | |

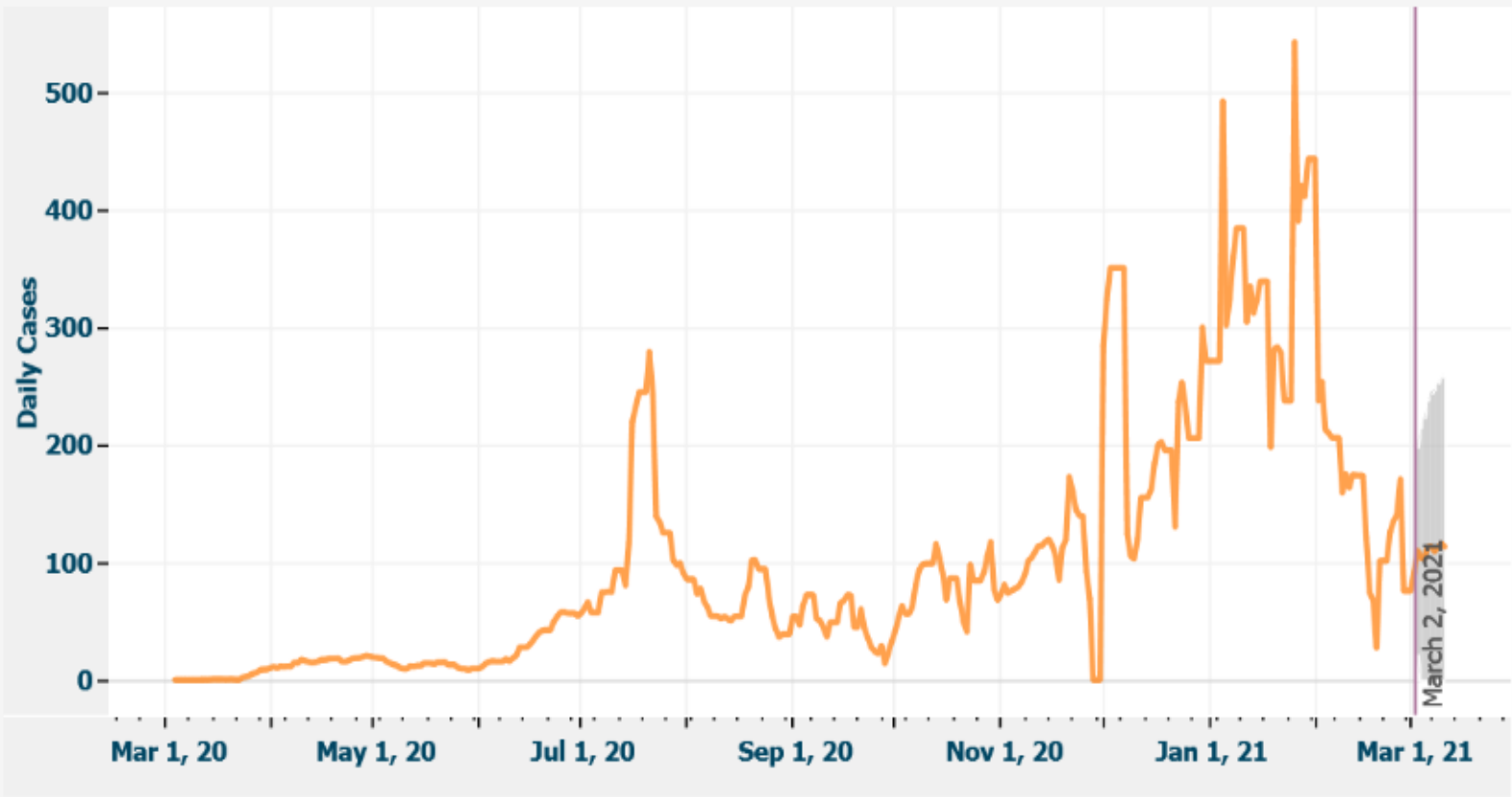
Case Reports – Montgomery County

- As of Sept 9, 2020, there were 9,466 cases
- Total deaths 129 – CFR 1.36%

- As of March 2, 2021, there were 36,794 cases
- Total deaths 450 – CFR 1.22%

Prediction of number of new cases in the next 10 days with 95% confidence intervals

Predictions in **Montgomery**. If the upper band for the predictions is approximately below the current number of new cases, cases are expected to decrease. If the lower band for the predictions is approximately above the current numbers of new cases, cases are expected to increase. Otherwise, they are not expected to increase or decrease significantly. For dates prior to the predictions, the 7-day moving average is shown.



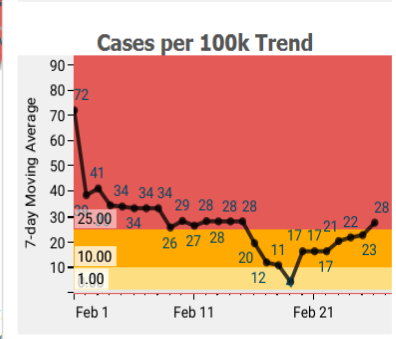
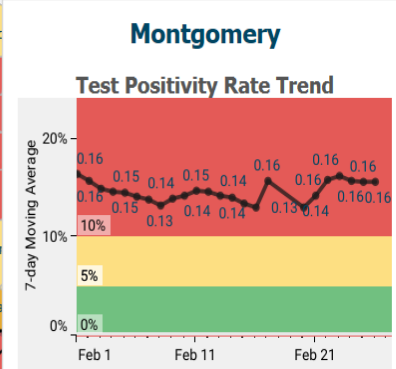
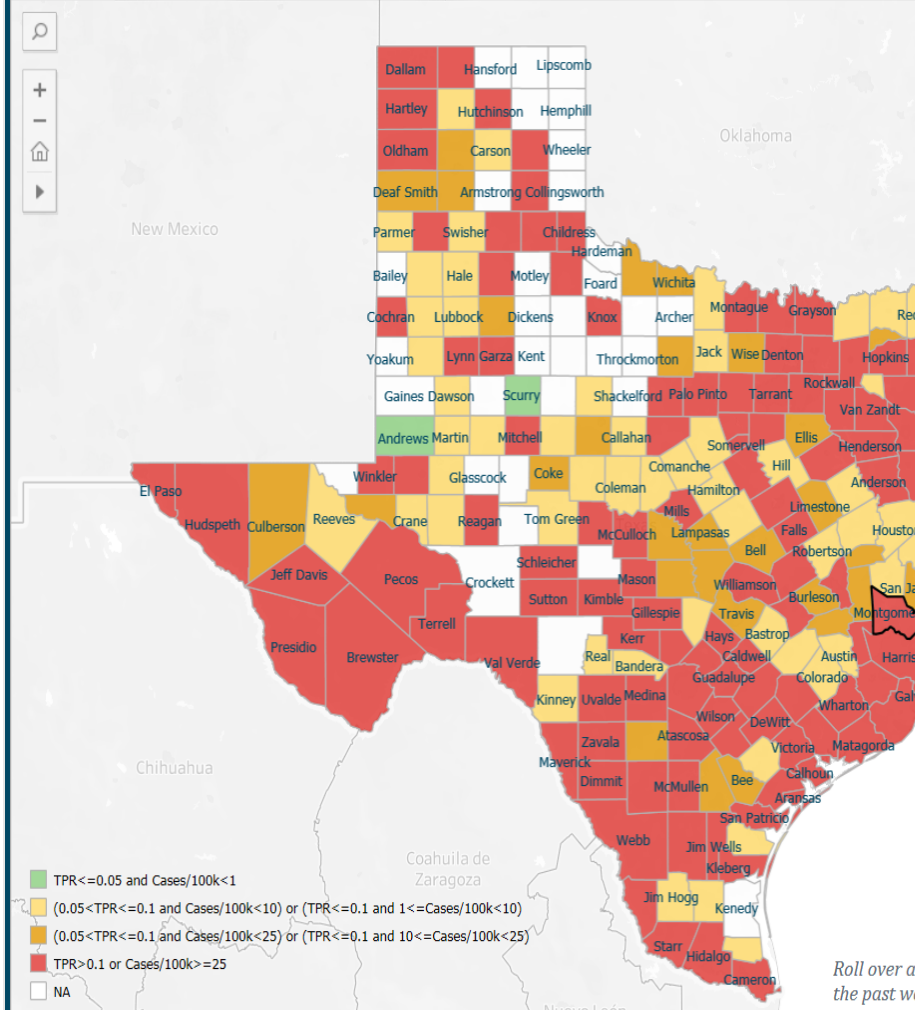
[View Predictions for multiple Counties, TSAs, PHRs or Metro/non >](#) 

Test positivity rate (TPR) compared to the number of Cases per 100,000 population in each county

2/26/2021

Test Positive Rate is an indicator of "Are we testing enough?". While Cases per 100k is an indicator of spread of the disease in the communities. A TPR of >10% and >25 per 100k indicates that not only is there substantial community spread but we are not testing sufficiently in the community to identify all those who may be potentially infected. Wide spread testing is key to containing continued community spread. We recommend these metrics be use collectively as an indicator for COVID-19 risk of spread at the county level.

County	Test positivity rate	Cases/100k
Anderson	■	■
Andrews	■	■
Angelina	■	■
Aransas	■	■
Archer	■	■
Armstrong	■	■
Atascosa	■	■
Austin	■	■
Bailey	■	■
Bandera	■	■
Bastrop	■	■
Baylor	■	■



Spread of the Virus

- We are still learning how COVID-19 spreads, but person-to-person transmission is the most common means of transmission. Based on how other coronaviruses spread, droplet transmission is presumed but airborne precautions are recommended out of an abundance of caution.
- Most cases of known transmissions have been in cases of close contact (<6 feet), not using PPE, for >15 minutes, usually associated with talking, yelling, singing, coughing, sneezing.

Symptoms

- Patients with COVID-19 have most commonly reported symptoms of:
- Fever
- Cough
- Shortness of Breath
- Other symptoms have included myalgias or fatigue and sputum production. Less commonly, headaches, diarrhea, and hemoptysis have been reported
- The spectrum of illness in patients with acute respiratory infection with SARS-CoV-2 can range from uncomplicated illness to mild pneumonia, severe pneumonia, acute respiratory distress syndrome, sepsis and septic shock

Diseases with Similar Symptoms

- Influenza A/B
- Respiratory syncytial virus
- Adenovirus
- Human metapneumovirus
- Classic coronaviruses (not SARS-CoV-2)
- Parainfluenza
- Other respiratory diseases like exacerbation of chronic obstructive pulmonary disease and community-acquired pneumonia should also be considered

Treatment

The vast majority of cases of COVID-19 require no treatment. For those who are more symptomatic, therapy is generally supportive and symptom control.

- Symptom control with analgesics, antipyretics, cough suppressants
- For patients with hypoxia (low blood oxygen) – hospitalization for oxygen (nasal cannula, Vapotherm high flow, mechanical ventilation, ECMO) along with supportive measures for blood pressure and other organ dysfunction
- Active interventions

Treatment – Active Intervention

- Dexamethasone – 33% decreased mortality in patients requiring high flow oxygen or mechanical ventilation. No improvement in patients requiring low level oxygen support. Possible harm in outpatients by prolonging the illness, increasing viral shedding.
- Remdesivir – decreased length of stay and length of illness in hospitalized patients. No mortality reduction.
- Convalescent Plasma – First given in US at TMH on 3/28/20, safely administered in a very large number of patients. No clear outcome benefit in preliminary data. TMH study showed reduced 28 day mortality ($p=0.047$) in those transfused within 72h of admission

Treatment – Active Intervention

- Monoclonal Antibodies have been authorized by the FDA via Emergency Use Authorization.
- 2 products: Bamlanivimab (Lilly)
- Casirivimab-Imdevimab (Regeneron)
- These are artificial anti-SARS CO V 2 Antibodies which neutralize the virus to prevent entry into the cell. This prevents replication and spread of the virus within the body.
- Both products are administered intravenously over 1 hour and have been shown to reduce hospitalizations (10 to 3%)
- Criteria: Age>65, BMI>35, CKD, DM, Immunocompromising condition or treatment or Age>55 with CVD, HTN, COPD
- Pediatrics: Age12-17 with BMI>85th %, Sickle Cell, Congenital Heart Disease, Neurodevelopmental d/o, Medical intervention, Asthma

Treatment – Active Interventions

- Hydroxychloroquine (Plaquenil) – no benefit
- Atovoquone/Proguanil (Malarone) – no benefit
- Azithromycin – no benefit
- Lopinavir/Ritonovir (Kaletra) – no benefit
- Tocilizumab (Actemra) – no benefit?
- Ivermectin – benefit in vitro but not in vivo
- Vitamin C – no benefit for treatment
- Zinc - ?
- Heparin/Lovenox/Aspirin/other anticoagulants – no benefit outside of the hospitalized patient who requires anticoagulation

Prevention – Vaccines

- Multiple vaccines are still in development in the US. There are phase III trials for AstraZeneca, Janssen, Novavax.
- 3 vaccine candidates are now FDA authorized via Emergency Use Authorization in the US
 - Pfizer – 2 shots 3 weeks apart, -80 degree storage, mRNA
 - Moderna – 2 shots 4 weeks apart, -4 degree storage, mRNA
 - Johnson and Johnson – 1 shot, refrigerated, live adenovirus vector

As of 3/2/21, there have been 102,353,940 doses distributed and 78,631,601 administered in the US

Viral Variants

- As all viruses replicate, errors are made which lead to mutations. SARS CO V 2 mutates less frequently than other viruses like HIV and HCV, but the mutations do occurs which lead to variants.
- Mutations can offer advantages, disadvantages or be neutral for the virus.
 - Advantages – more easily transmitted, more resistant to immune protection
 - Disadvantages – replicate more slowly, more difficult to enter cells

Viral Variants

- Current SARS CO V 2 variants include UK, South African, Brazilian
- At this point, these variants appear to spread more efficiently (more contagious) and so have spread quickly and will become the dominant variants within months.
- Although these variants spread more easily, they are not necessarily associated with higher mortality. However, higher case numbers will result in higher overall number of deaths even if the mortality rate is the same.
- The South African strain seems to illicit less immune response from infected persons, so there is a risk of becoming infected again.
- Currently, the Pfizer and Moderna vaccines appear to confer protective immunity to all noted variants. Moderna is currently changing future vaccines for better variant coverage.

Schools

- School transmission in CISD has been exceedingly low.
- There are no documented cases of spread within classrooms as long as mask utilization rules have been followed.
- Some school districts, like NCISD have not followed Local Health Authority recommendations to require masks for all students (only 4th grade and older in accordance with the Governor's Order) and have had spread within the classroom and high quarantine requirements.
- There has been spread on sports teams, cheerleading, after school groups who did not follow mask guidelines.
- No school quarantines have been required; very limited whole-class quarantines have been required.

What Can You Do?

- Keep calm
- Keep yourself informed and do not spread misinformation
- Wear a mask whenever leaving the house
- Avoid crowds or crowded areas (entryway, hallways)
- Stay home when you are ill
- Cover your cough
- Wash your hands frequently
- Do not touch your face, nose, eyes except after washing your hands
- Avoid those who are sick
- Get your flu shot
- Get a SARS-CoV-2 Vaccine when available