

# A Citizen's Science Approach to Surveillance of COVID-19 Symptoms in Texas: A Call to Action

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# The Need

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COVID 19 Pandemic

# What is COVID 19?

- ▶ COVID-19 is caused by a new coronavirus. The SARS-CoV-2 virus is a betacoronavirus, like MERS-CoV and SARS-CoV. All three of these viruses have their origins in bats (animal to person spread)
- ▶ Person to person spread:
  - ▶ Between people who are in close contact with one another (within about 6 feet).
  - ▶ Through respiratory droplets produced when an infected person coughs, sneezes or talks.
  - ▶ These droplets can land in the mouths or noses of people who are nearby or possibly be inhaled into the lungs.
  - ▶ Some recent studies have suggested that COVID-19 may be spread by people who are not showing symptoms.

Source: Centers for Disease Control and Prevention at <https://www.cdc.gov/coronavirus/2019-ncov/cases-updates/summary.html>

# Symptoms of COVID 19

- ▶ Fever
- ▶ Cough
- ▶ Shortness of breath or difficulty breathing
- ▶ Chills
- ▶ Repeated shaking with chills
- ▶ Muscle pain
- ▶ Headache
- ▶ Sore throat
- ▶ New loss of taste or smell



# State of the World and the United States

## WORLD (4/22/2020)

- ▶ **Coronavirus Cases: 2.6 M +**
- ▶ **Deaths: 183,520**
- ▶ **185 countries/regions**

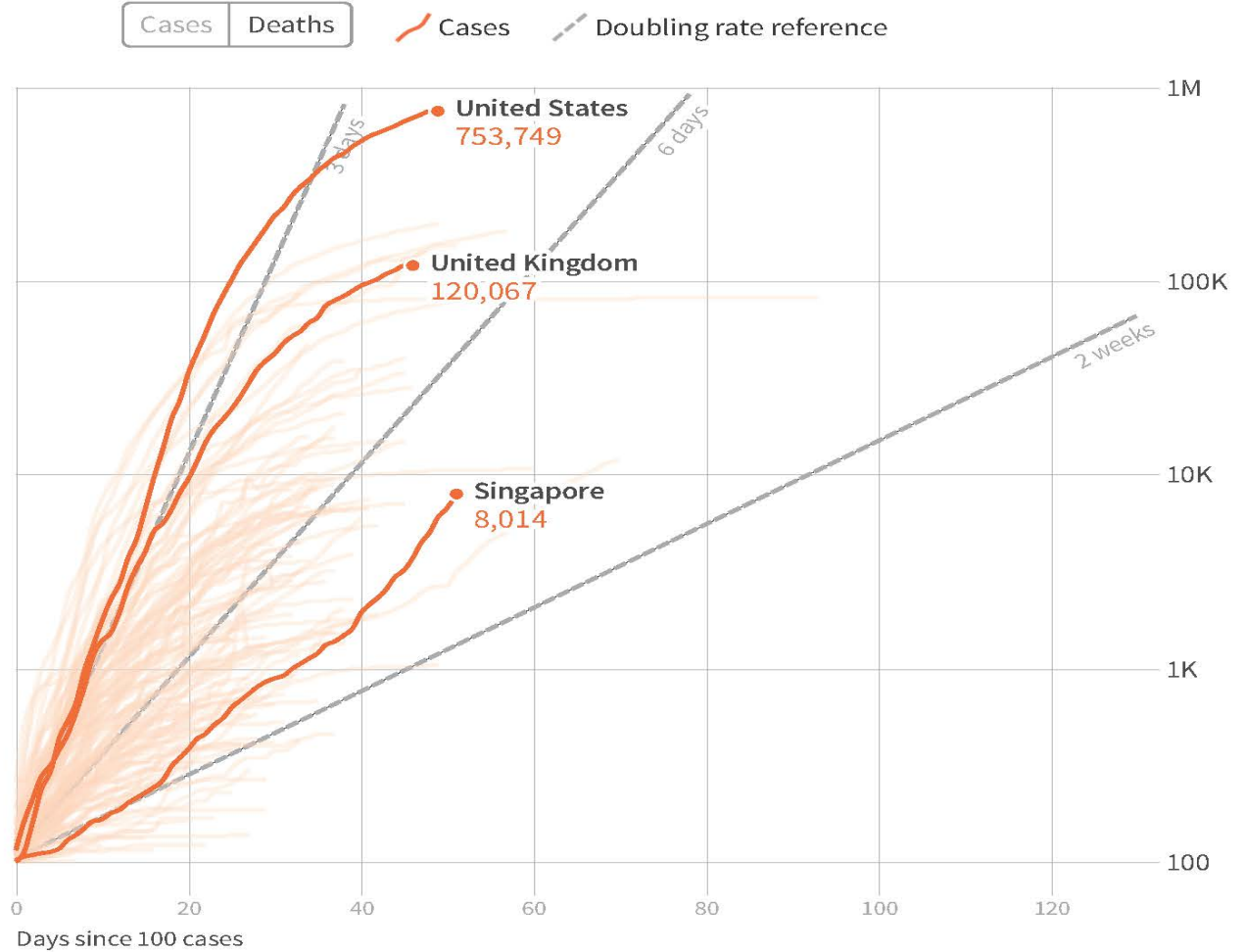
## UNITED STATES (4/22/2020)

- ▶ **Coronavirus Cases: 844,440**
- ▶ **Deaths: 47,227**

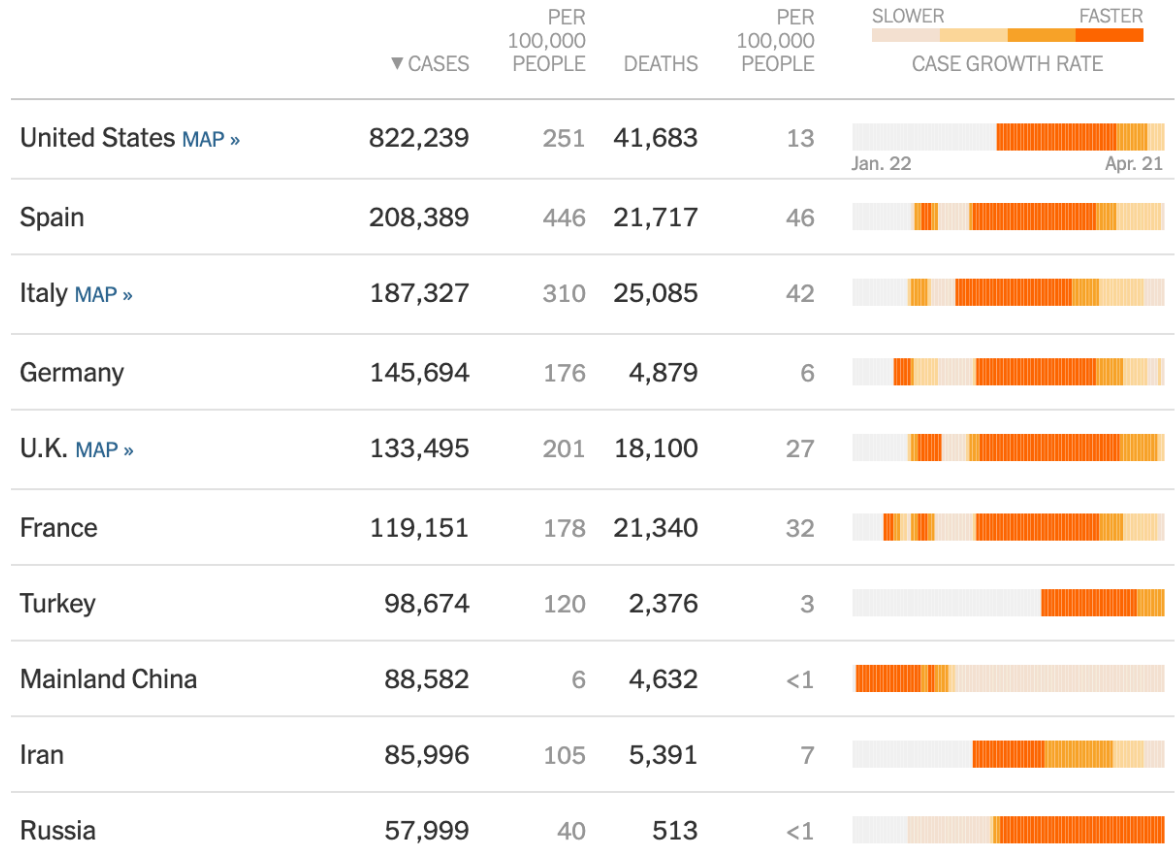
# COVID-19

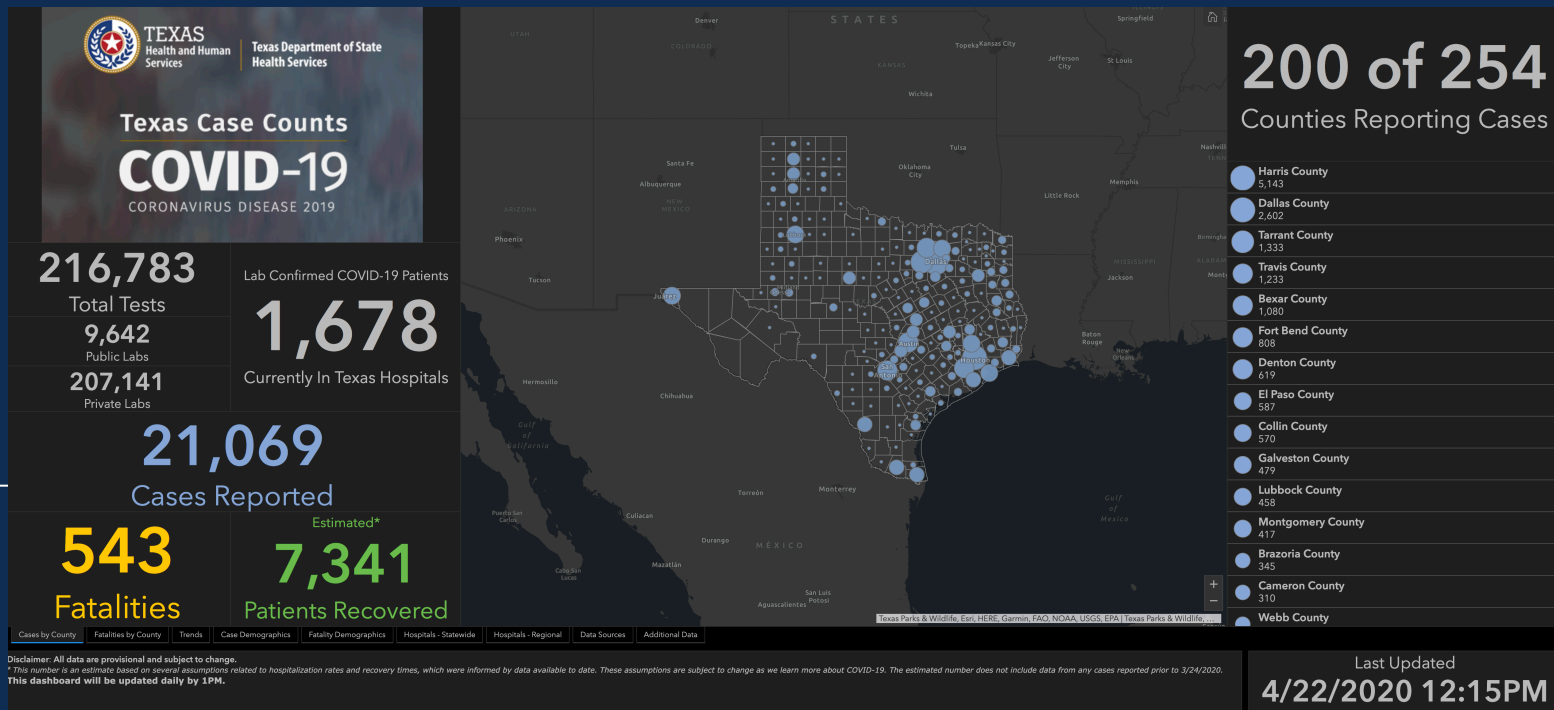
## US Case Count

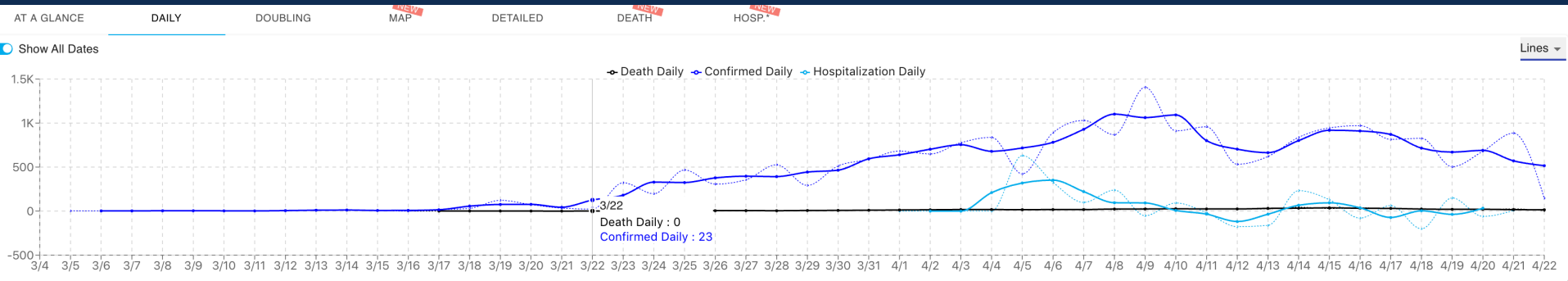
4/20/2020



# COVID19 – Where are cases increasing?







# What do we need to de-implement mitigation?

- Broad availability of rapid and accurate viral nucleic acid testing
- Establish a statewide system and portal to assess and manage the supply chain for key testing reagents and supplies and PPE and report and anticipate supply shortages
- Comprehensive contact tracing
- Monitor increase in cases weekly and be ready to implement/de-implement mitigation as needed
- **Tracking of COVID-19 symptom activity**
- Will need this approach until:
  - Tests are readily available
  - Effective anti-viral medications are available
  - Vaccine is available

To summarize, thus far we have been playing catch up with COVID-19.

But now we need to get ahead of it. So that we can,

Detect early

Prevent the spread

Monitor over time

Make data-driven decisions for policy and planning

# COVID 19 Symptom Tracking – Why?

- ▶ Symptoms of COVID-19 infection vary widely, with some individuals harboring infection without any symptoms
- ▶ There is insufficient data defining demographic, clinical, lifestyle, and molecular risk factors for COVID-19 infection and outcomes.
- ▶ In the context of limited testing and contact tracing infrastructure, **tracking symptoms of COVID19** can help:
  - ▶ identify "hot spots" of COVID symptoms
  - ▶ target testing to at-risk and vulnerable communities



# COVID 19 Symptom Tracking – Why?

- ▶ There is an urgent need to capture in real-time the spectrum of symptom onset, diagnosis, treatment, and clinical outcomes of COVID-19 because of
  - ▶ the novelty of the virus
  - ▶ the speed of the pandemic
  - ▶ the short interval between exposure, symptoms, and clinical outcomes, and
  - ▶ lack of widespread or systematic testing

# COVID-19 Symptom Tracker App

- ▶ The COVID-19 symptom tracker was created by doctors and scientists at Massachusetts General Hospital, the Harvard T.H. Chan School of Public Health, King's College London and Stanford University School of Medicine, working codeveloped with ZOE – a health science company.
- ▶ UTHealth School of Public Health is partnering with MGH and Harvard Medical School to set up a surveillance of COVID 19 symptom tracking in Texas.
- ▶ UTHealth will receive de-identified data from Harvard Medical School for the state of Texas for analysis.

# COVID 19 Symptom Tracker App

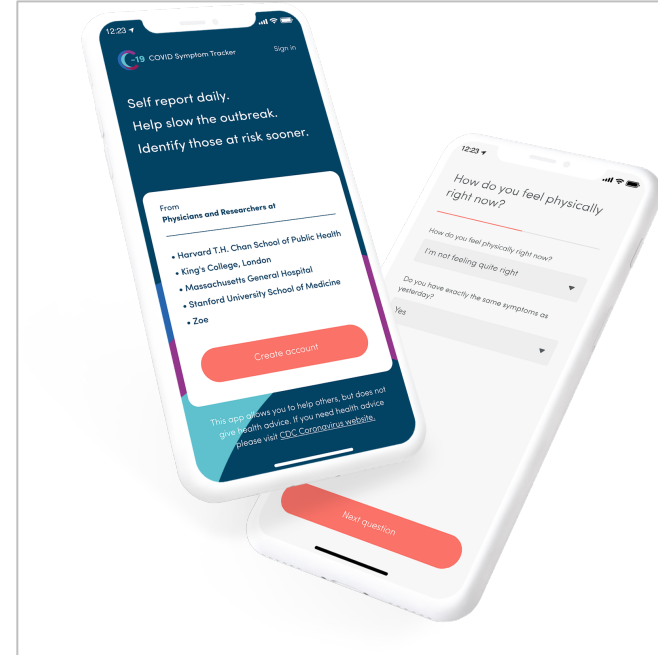


## COVID Symptom Tracker

- ▶ Easy to use app to track COVID 19 symptoms. Takes 1-3 minutes to complete. Includes informed consent (IRB approved, HIPAA compliant)
- ▶ Can be downloaded in the App store on the iPhone or get it on Google Play
- ▶ For Apple: <https://apps.apple.com/us/app/covid-symptom-tracker/id1503529611?ls=1>
- ▶ For Android/Google: [https://play.google.com/store/apps/details?id=com.joinzoe.covid\\_zoe](https://play.google.com/store/apps/details?id=com.joinzoe.covid_zoe)

# COVID 19 Symptom Tracker App

- ▶ Take 1-minute to report daily, even if you are well.
- ▶ Help us scientists identify:
  - ▶ High-risk areas
  - ▶ Who is most at risk, by better understanding symptoms linked to underlying health conditions
  - ▶ How fast the virus is spreading in your area



# COVID 19 Symptom Tracker App – Initial Questions

- Personal characteristics
- Health Status
- COVID-19 Status

The image displays four sequential screens of the COVID-19 Symptom Tracker App, each shown on a smartphone mockup. The screens are titled 'About you.', 'About your health.', 'COVID-19 status', and 'How do you feel physically right now?'. Each screen contains various input fields and dropdown menus for user information and health status. The 'About you.' screen includes fields for year of birth, sex, height, weight, and zipcode. The 'About your health.' screen includes questions about health problems, pregnancy, heart disease, diabetes, lung disease, and smoking. The 'COVID-19 status' screen includes questions about COVID-19 testing. The 'How do you feel physically right now?' screen includes a question about physical feelings. Each screen has a 'Next question' button at the bottom.

**Screen 1: About you.**

- What year were you born?  
Year of birth
- What sex were you assigned at birth?  
Choose one of the options
- Your height  
ft in ft/in
- Your weight  
lbs lbs
- Zipcode (where you currently live)  
Zipcode
- Have you EVER been exposed to someone with documented or presumed COVID-19 infection (such as co-workers, family members, or others)? Please check all that apply.  
No
- In general, do you have any health problems that require you to stay at home?  
No

**Screen 2: About your health.**

- In general, do you have any health problems that require you to limit your activities?  
Yes
- Are you pregnant?  
No
- Do you have heart disease?  
No
- Do you have diabetes?  
No
- Do you have lung disease or asthma?  
No
- Do you smoke?  
No

**Screen 3: COVID-19 status**

- Have you had a test for COVID-19?  
No
- Did you test positive for COVID-19?  
No

**Screen 4: How do you feel physically right now?**

- How do you feel physically right now?  
Choose one of the options

# COVID 19 Symptom Tracker App – Daily Questions

**Daily questions**

12:23

Describe the symptoms you are experiencing right now.

Do you have a fever?

No

If you are able to measure it, what is your temperature?

°F °F

Do you have a persistent cough (coughing a lot for more than an hour, or 3 or more coughing episodes in 24 hours)?

No

Are you experiencing unusual fatigue?

No

Do you have a headache?

No

Do you have a headache?

No

Are you experiencing unusual shortness of breath?

No

Do you have a sore throat?

No

Do you have loss of smell/taste?

No

Do you have an unusually hoarse voice?

No

Are you feeling an unusual chest pain or tightness in your chest?

No

Do you have an unusual abdominal pain?

No

Are you experiencing diarrhea?

No

# COVID 19 Symptom Tracker App - Treatment

When users are experiencing symptoms, we collect more data

The image displays three sequential screens of the COVID-19 Symptom Tracker App. Each screen is shown within a smartphone frame with a status bar at the top displaying the time 12:23, signal strength, and battery level.

**Screen 1: Where are you right now?**

This screen features a title "Where are you right now?" followed by four selectable options in rounded rectangular buttons:

- I'm at home. I have not been to hospital for suspected COVID symptoms
- I am at the hospital with suspected COVID symptoms
- I am back from the hospital, I'd like to tell you about my treatment
- I am back from the hospital, I've already told you about my treatment

**Screen 2: What treatment are you receiving right now?**

This screen features a title "What treatment are you receiving right now?" followed by five selectable options in rounded rectangular buttons:

- None
- Oxygen and fluids\*  
\*Breathing support administered through an oxygen mask, no pressure applied
- Non-invasive ventilation\*  
\*Breathing support administered through an oxygen mask, which pushes oxygen into your lungs
- Invasive ventilation\*  
\*Breathing support administered through an inserted tube. People are usually asleep for this procedure
- Other treatment

**Screen 3: Thank you for your help and vital contribution to the study of COVID-19.**

This screen features a title "Thank you for your help and vital contribution to the study of COVID-19. We hope you'll feel better soon." followed by two paragraphs of text:

Given you have reported some symptoms, please look at the [CDC Coronavirus](#) for the latest advise on Coronavirus (COVID-19).

We would appreciate it if you could check back in **tomorrow** if you feel up to it.

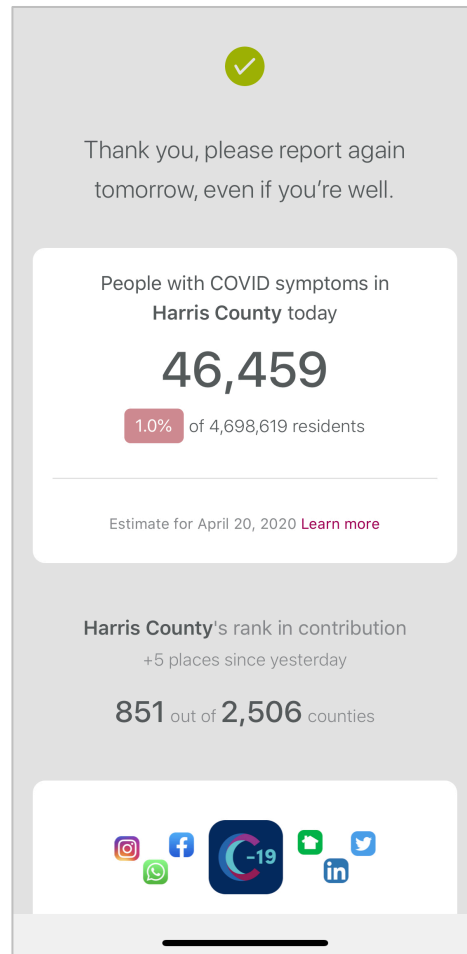
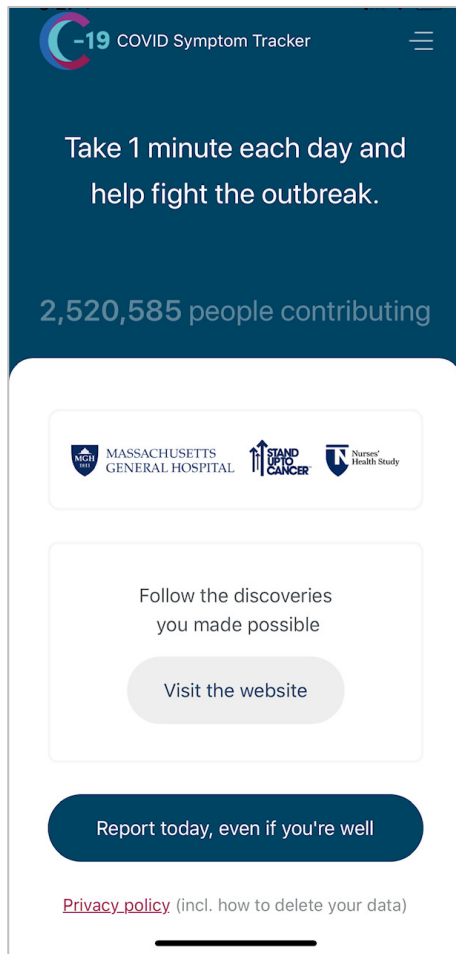
Knowing how you are progressing is extremely helpful for our research.

Below the text is a section titled "Please share this app" with a subtext "The more people report their symptoms, the more we can help those at risk." and a red button labeled "Share this app".

# COVID-19 Symptom Tracker

Allow  
Notifications so  
it prompts you  
to track every  
day!

You can track  
for other family  
members.





# COVID-19 Symptom Tracking in Texas

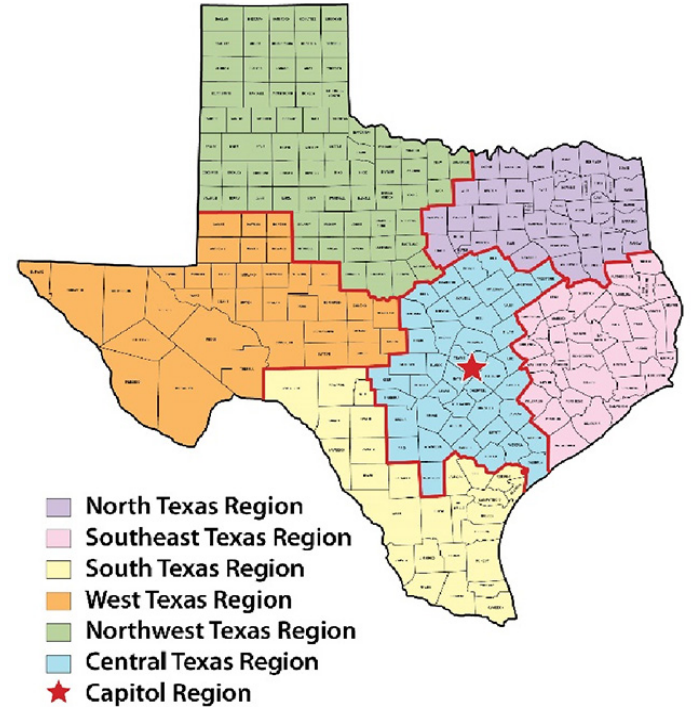
- ▶ **Establish a surveillance system of COVID 19 symptom tracking for the entire state of Texas**
- ▶ **Estimate the potential incidence and spread of COVID 19 in Texas**
- ▶ **Support and inform public health decision making for COVID 19 in Texas**

# COVID-19 Symptom Tracking in TX

n=6762 Texans  
tracking  
symptoms  
(4/22)

15% reporting  
symptoms of  
COVID-19

11% fever  
27% Persistent cough  
50% Fatigue  
75% shortness of breath  
11% loss of smell/taste  
25% chest pain  
21% Diarrhea

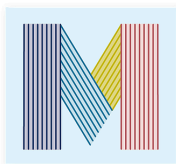


# COVID-19 Symptom Tracker in the United Kingdom and the U.S.

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Andy Chan, MD, MPH, Harvard Medical School





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## CORonavirus Pandemic Epidemiology (COPE) Consortium

### Call for Investigators of Cohort and Clinical Studies

We are reaching out to investigators of cohort and clinical studies to join our efforts through a **CORonavirus Pandemic Epidemiology (COPE)** consortium in which cohorts (e.g., population based, clinic, etc.) and clinical studies could deploy this tool at no cost. There are opportunities to customize for your specific needs. We are also working hard to get central IRB approval, if that is of interest. This will offer you an opportunity to rapidly introduce an easy-to-use data collection tool to track COVID-19 exposure, symptoms, and outcomes in real-time during the acute phase of this pandemic, which will be invaluable for your studies. Ultimately, we will be in a position to pool data to address key research questions as a collective. We recognize that this is an extremely busy and uncertain time, but it is important to act quickly given the speed at which the virus is affecting our participants.

**If you are interested, please contact us at [predict@mgh.harvard.edu](mailto:predict@mgh.harvard.edu) and provide us details about your cohort or clinical study, specific needs, and ideas about how this might complement work you are already planning or doing around COVID-19.**

Download the App



- ▶ A call for collaboration
- ▶ Free tool to implement in your ongoing cohorts
- ▶ Embedded in 14 longitudinal cohorts (e.g. NHS/HPFS)

Download at: [Covid.joinzoe.com/us](https://Covid.joinzoe.com/us)



# COVID Symptom Tracker

*Smartphone app to track COVID-19 for real-time epidemiology*



COVID Symptom Tracker

[About](#)

[FAQs](#)

[Research Blog](#)



COVID Symptom Tracker

**Take 1 minute each day and help fight the outbreak in your community**

- Report your health daily even if you feel well
- Get a daily estimate of COVID in your area
- Help slow the outbreak near you



Join millions of people helping to fight COVID-19

4:27 [status bar icons]



COVID Symptom Tracker



**Take 1 minute each day and help fight the outbreak.**

2,519,057 people contributing



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Follow the discoveries  
you made possible

[Visit the website](#)

**Report today, even if you're well**

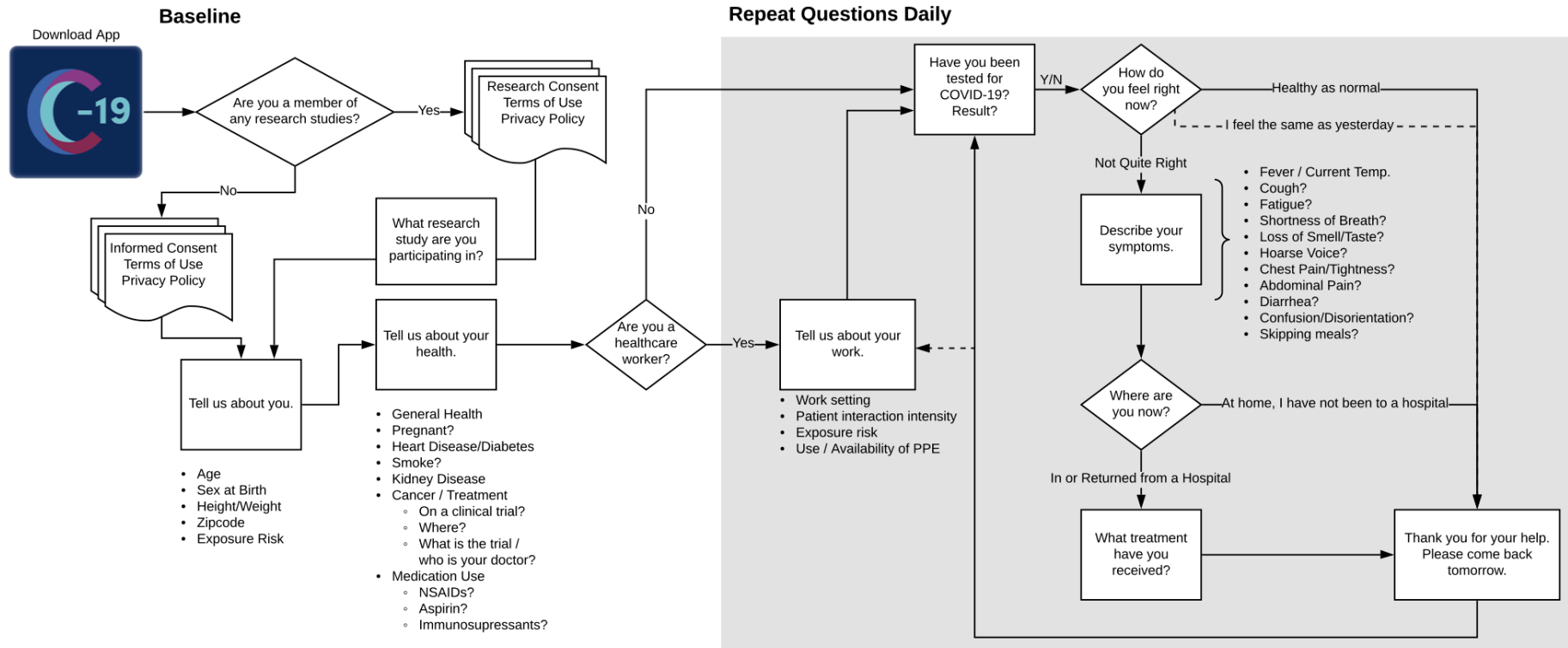
[Privacy policy](#) (incl. how to delete your data)



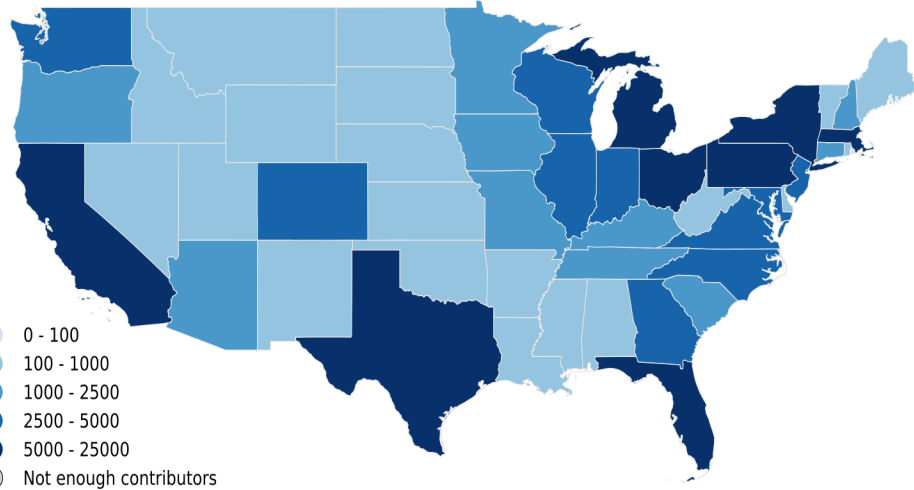
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ZOE

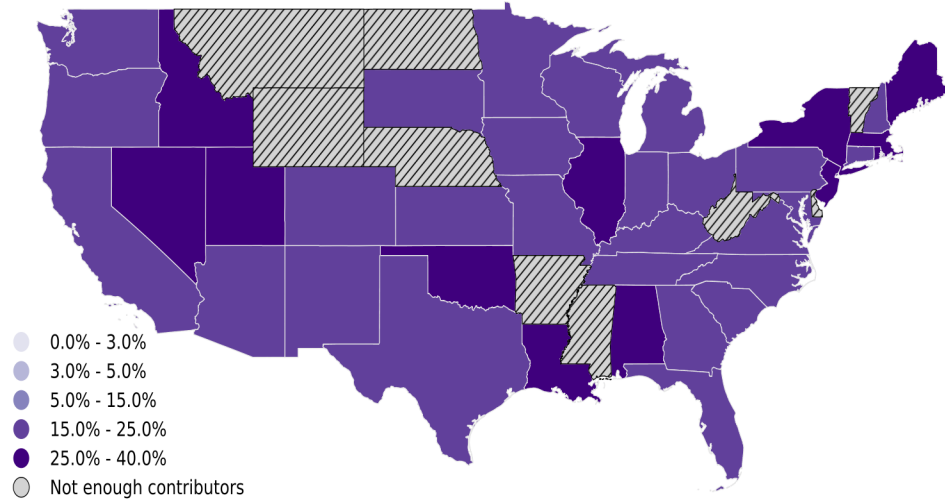


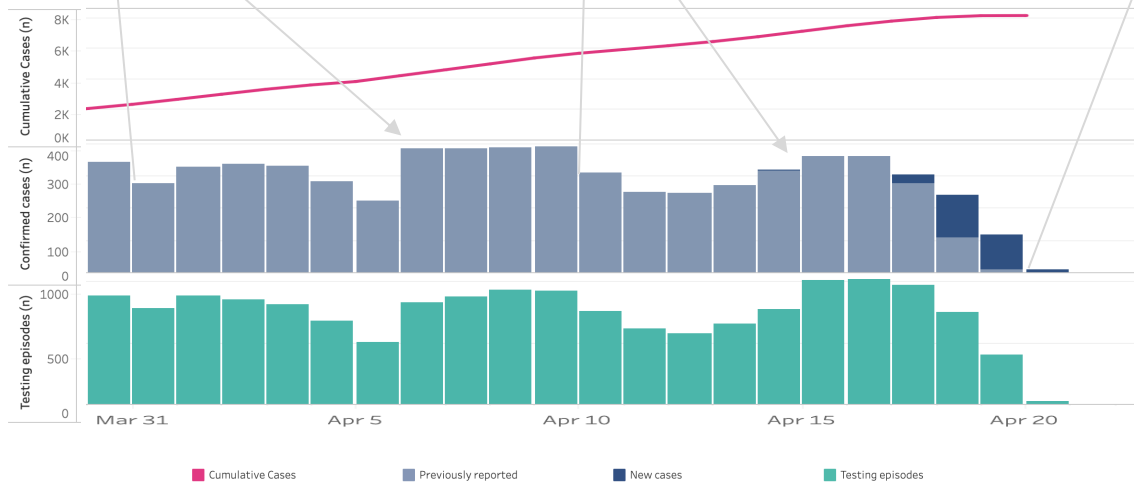
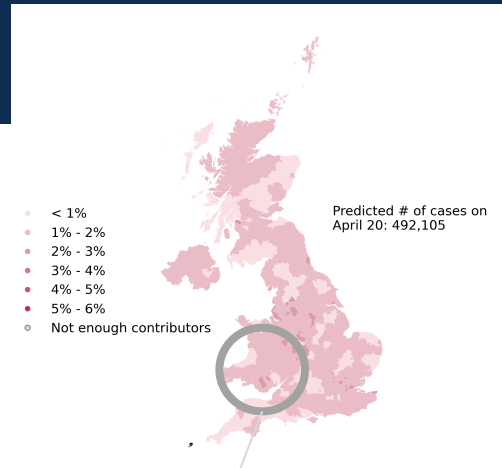
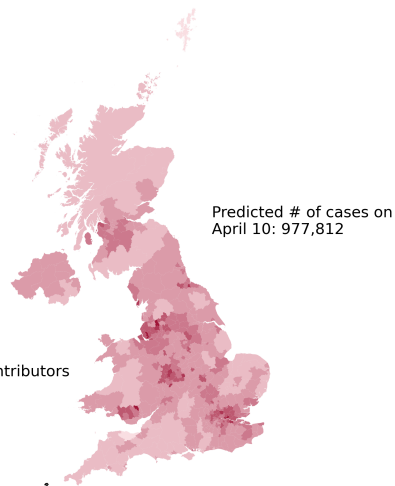


Users of COVID Symptom Tracker App



Users reporting any symptoms







# COVID 19 Symptom Tracking in Texas

## A CITIZENS SCIENCE APPROACH

- ▶ Dissemination of the app statewide across six UTHealth campuses
- ▶ Dissemination through local, county and state level partnerships
- ▶ Citizens share with other citizens. There is power in numbers and we need data-driven decision making.

# COVID 19 Symptom Tracking in Texas –

What can you  
do?

## A CITIZENS SCIENCE APPROACH

- ▶ Download the app and track every day for your self – EVEN IF YOU ARE WELL.
- ▶ Share the app with your co-workers, friends, family. Help them download and track.
- ▶ Share the app information with other organizations.
- ▶ Specifically help disseminate to high risk groups (healthcare workers, elderly, first responders, social service providers, grocery store workers)

Contact Us:

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[Shreela.V.Sharma@uth.tmc.edu](mailto:Shreela.V.Sharma@uth.tmc.edu)

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Download now: [go.uth.edu/COVIDTracker](https://go.uth.edu/COVIDTracker)

Questions?

Thank you