



## COVID-19

# Underlying Medical Conditions Associated with Higher Risk for Severe COVID-19: Information for Healthcare Providers

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For the general public, see [People with Certain Medical Conditions](#) for an overview of medical conditions and resources. For information on the evidence used to update the list of underlying medical conditions, see the [Science Brief](#).

## Purpose

An updated list of high-risk underlying conditions, based on what has been reported in the literature as of August 31, 2021 is provided below. The conditions are grouped by the level of evidence, with the highest level at the top. The list of underlying medical conditions is not exhaustive and will be updated as the science evolves. CDC is currently reviewing additional underlying conditions, and some of these might have sufficient evidence to be added to the list. This list should not be used to exclude people with underlying conditions from recommended preventive measures such as booster doses of vaccines or needed therapies. The process and evidence used to update the list is found in the brief of [Scientific Evidence for Conditions that Increase Risk of Severe Illness](#).

This webpage provides an **evidence-based resource for healthcare providers** caring for patients with underlying medical conditions who are at higher risk of developing severe outcomes of COVID-19. Severe outcomes are defined as hospitalization, admission to the intensive care unit (ICU), intubation or mechanical ventilation, or death.

This page summarizes data from published reports, scientific articles in press, unreviewed pre-prints, and internal data that were included in a literature review conducted by subject matter experts as of August 31, 2021. The information reflects current evidence regarding underlying medical conditions and is intended to help healthcare providers make informed decisions about patient care and increasing the awareness of risk among their patients.

## Background

We continue to learn more about the risk factors for severe COVID-19 outcomes. Age is the strongest risk factor for severe COVID-19 outcomes. Approximately 54.1 million people aged 65 years or older reside in the United States; in 2020 this age group accounted for 81% of U.S. COVID-19 related deaths, and as of September 2021 the mortality rate in this group was more than 80 times the rate of those aged 18-29.<sup>(1, 2)</sup> In 2020, residents of long-term care facilities made up less than 1% of the U.S. population but accounted for more than 35% of all COVID-19 deaths.<sup>(3-7)</sup> Additionally, adults of any age with certain underlying medical conditions are at increased risk for severe illness from COVID-19.<sup>(8)</sup>

Studies have shown that COVID-19 does not affect all population groups equally. The risk of severe COVID-19 increases as the number of underlying medical conditions increases in a person.<sup>(9-11)</sup> People with disabilities are more likely than people without disabilities to have chronic health conditions, live in congregate settings, and face more barriers to healthcare.<sup>(12-14)</sup> Studies have shown that some people with certain disabilities are more likely to get COVID-19 and have worse outcomes.<sup>(15-17)</sup> Some chronic medical conditions occur more frequently or at a younger age in certain racial or ethnic minority populations. Moreover, data has also shown that compared to non-Hispanic White people, members of certain racial and ethnic minority groups are dying from COVID-19 at younger ages.<sup>(18)</sup> Based on mortality data from CDC's National Vital Statistics System

(NVSS), from February 1, 2020 to September 30, 2021, there have been an estimated 700,000 excess deaths in the United States. The largest percentage increases in mortality occurred among adults aged 25–44 years and among [Hispanic or Latino people](#).<sup>(19)</sup>

Additionally, we are still learning about how conditions that affect the environments where people live, learn, and work can influence the risk for infection and severe COVID-19 outcomes. These social determinants of health include neighborhood and physical environment, housing, occupation, education, food security, access to healthcare, and economic stability.

## Summary of Conditions with Evidence

1. Comorbidities that are supported by at least one **meta-analysis or systematic review** or by review method defined in [Scientific Evidence](#) brief.

- Cancer
- Cerebrovascular disease
- Chronic kidney disease\*
- Chronic lung diseases limited to:
  - Interstitial lung disease
  - Pulmonary embolism
  - Pulmonary hypertension
  - Bronchopulmonary dysplasia
  - Bronchiectasis
  - COPD (chronic obstructive pulmonary disease)
- Chronic liver diseases limited to:
  - Cirrhosis
  - Non-alcoholic fatty liver disease
  - Alcoholic liver disease
  - Autoimmune hepatitis
- Diabetes mellitus, type 1 and type 2\*
- Heart conditions (such as heart failure, coronary artery disease, or cardiomyopathies)
- Mental health disorders limited to:
  - Mood disorders, including depression
  - Schizophrenia spectrum disorders
- Obesity (BMI  $\geq 30$  kg/m<sup>2</sup>)\*
- Pregnancy and recent pregnancy
- Smoking, current and former

2. Comorbidities that are supported by at least one **observational study** (e.g., cohort, case-control, or cross-sectional):

These studies might include systematic review or meta-analysis that represents one condition in a larger group of conditions (for example, kidney transplant under the category of solid organ or blood stem cell transplantation).

- Children with certain underlying conditions
- Down syndrome
- HIV (human immunodeficiency virus)
- Neurologic conditions, including dementia
- Overweight (BMI  $\geq 25$  kg/m<sup>2</sup>, but  $< 30$  kg/m<sup>2</sup>)
- Sickle cell disease
- Solid organ or blood stem cell transplantation
- Substance use disorders

- Use of corticosteroids or other immunosuppressive medications

3. Comorbidities that are supported by mostly **case series, case reports, or, if other study design, the sample size is small** (and no systematic review or meta-analysis available was available to review):

Defined as having an association in one or more case series studies. If there are cohort or case-control studies, the sample size was small. Conditions included might be less common.

- Cystic fibrosis
- Thalassemia

4. Comorbidities that are supported by **mixed evidence**:

Defined as having an association in at least one meta-analysis or systematic review and additional studies or reviews that reached different conclusions about risk associated with a medical condition.

- Asthma
- Hypertension, possibly\*
- Immune deficiencies (except people with moderate to severe immune compromise due to a medical condition or receipt of immunosuppressive medications or treatments)

Footnote:

\* indicates underlying conditions for which there is evidence for pregnant and non-pregnant people

## Actions Providers Can Take

- Approved and authorized COVID-19 vaccines (initial doses and boosters) are safe and effective and should be administered to people at higher risk including [people with some underlying medical conditions](#). Reassure patients that clinical trials demonstrated similar safety and efficacy profiles in people with some underlying medical conditions, including those that place them at [higher risk for severe COVID-19](#) symptoms, compared to people without underlying medical conditions.
- Check out [additional information for your patients](#), including a link to your state or territorial health department's website on eligibility for and [locations for COVID-19 vaccination](#).
- Encourage patients to keep appointments for routine care and adhere to treatment regimens.
- Consider use of telehealth in coordination with community-based organizations, family members, or other providers, when appropriate, although some patients may not have knowledge of or access to appropriate technology or internet service.
- Encourage patients with underlying medical conditions to continue practicing preventive measures, such as [wearing a mask](#) and [physical distancing](#), to avoid infection with the virus that causes COVID-19. This becomes even more important with increasing age and number and severity of underlying conditions.
- Carefully consider potential additional risks of COVID-19 illness for patients who are members of certain racial and ethnic minority groups, and how to facilitate access to culturally and linguistically appropriate resources. These patients are often younger when they develop chronic medical conditions, might be at higher risk of having more than one underlying medical condition, and at higher risk for acquisition of COVID-19. Studies have shown that people in certain ethnic and racial minority groups are dying from COVID-19 at younger ages.

## Key Findings from One Large Cross-Sectional Study

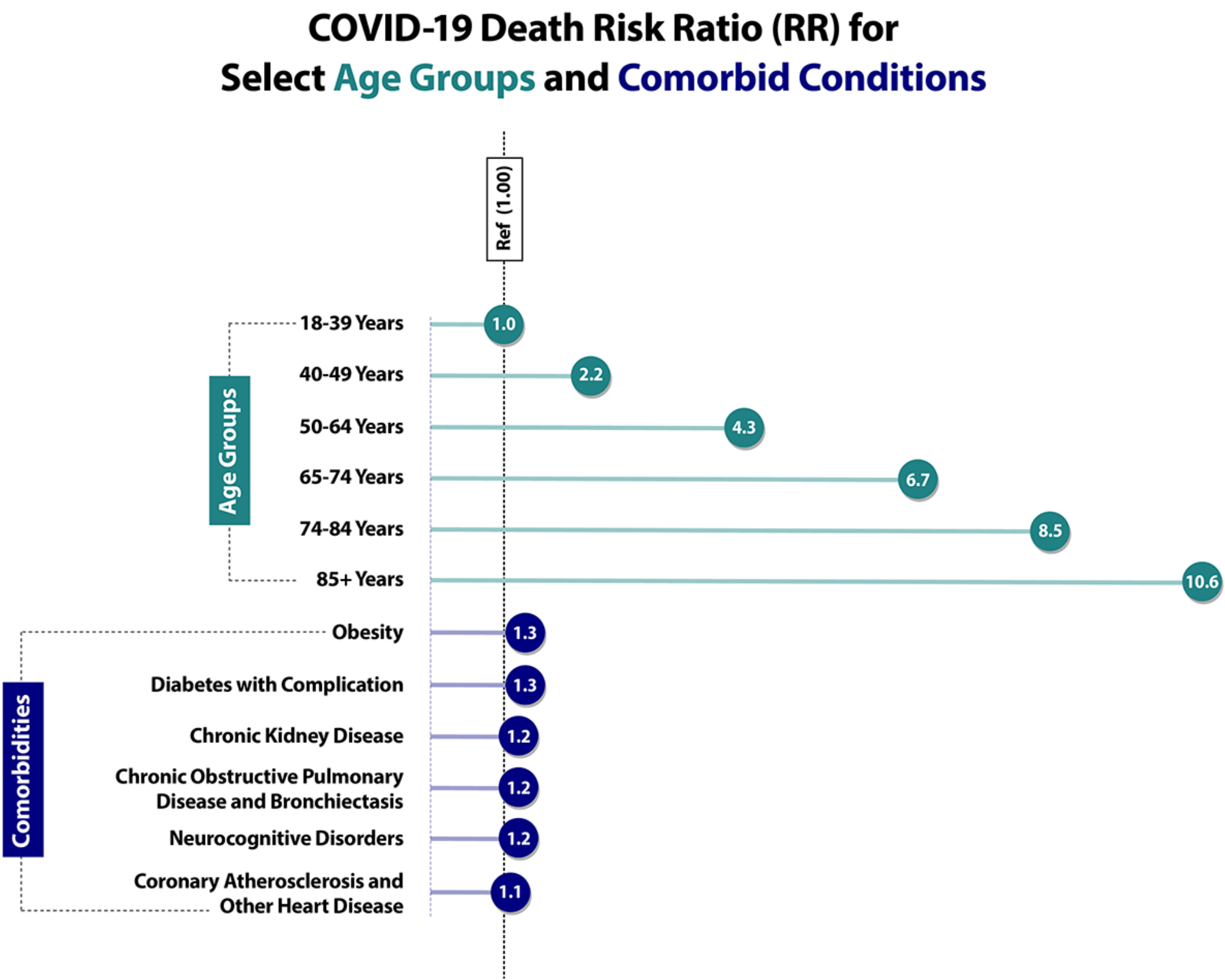
Underlying Medical Conditions and Severe Illness Among 540,667 Adults Hospitalized With COVID-19, March 2020–March 2021

This [study](#) used data from the Premier Healthcare Database, which represents approximately 20% of all inpatient admissions in the United States since 2000. This cross-sectional study of 540,667 adults hospitalized with COVID-19 included both inpatients and hospital-based outpatients with laboratory-diagnosed COVID-19 from March 1, 2020, through March 31, 2021. The database included reports from 592 acute care hospitals in the United States. The study was designed to examine risk factors associated with severe outcomes of COVID-19 including admission to an ICU or stepdown unit, invasive mechanical ventilation (IMV), and death.

## Main Findings

- Certain underlying medical conditions increased risk for severe COVID-19 illness in adults.
- Having multiple conditions also increased risk.
- Obesity, diabetes with complications, and anxiety and fear-related disorders had the strongest association with death.
- The risk associated with a condition increased with age.

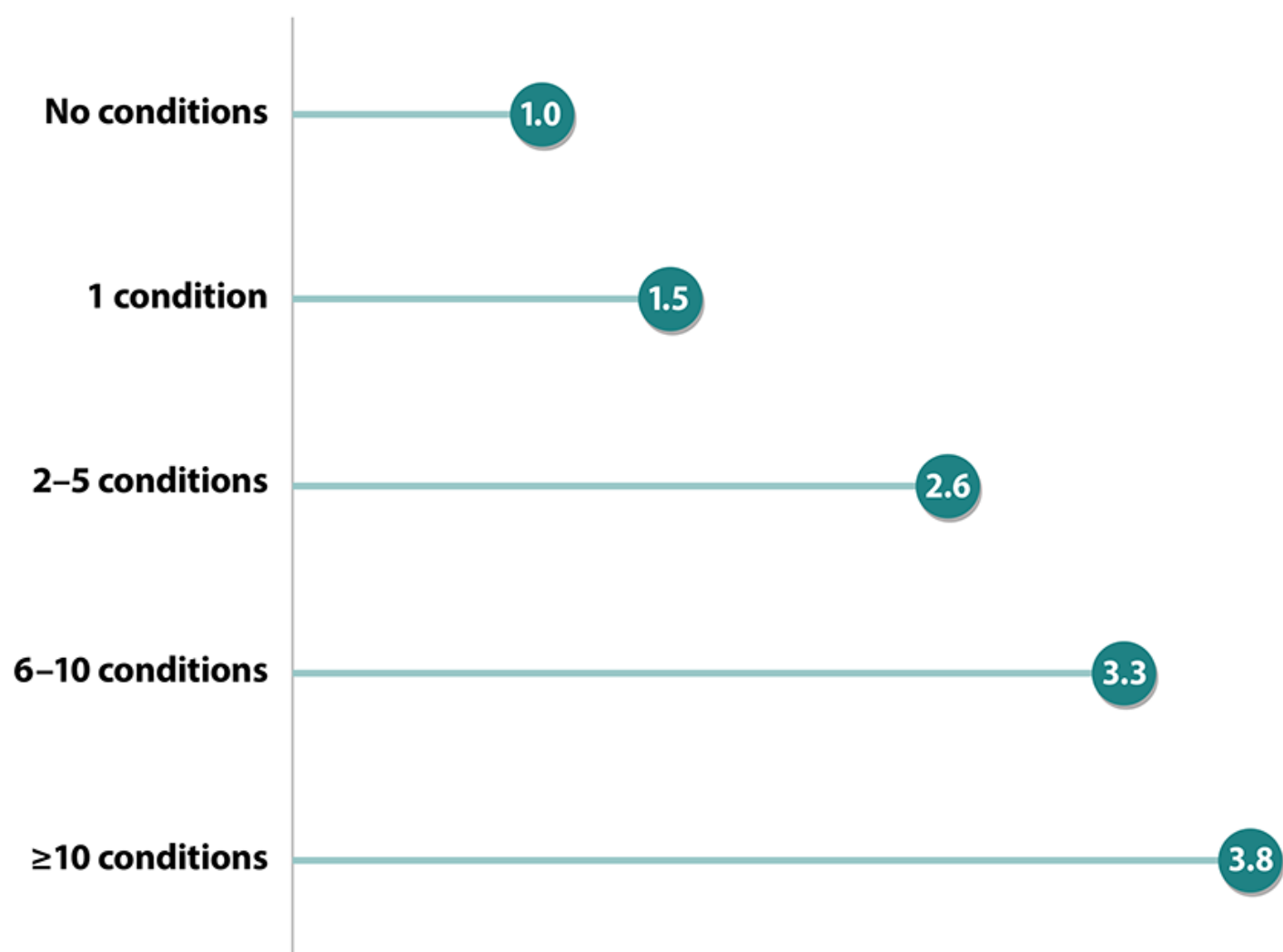
**Reference:** Kompaniyets L, Pennington AF, Goodman AB, Rosenblum HG, Belay B, Ko JY, et al. Underlying Medical Conditions and Severe Illness Among 540,667 Adults Hospitalized With COVID-19, March 2020–March 2021. *Prev Chronic Dis* 2021;18:210123. DOI: <http://dx.doi.org/10.5888/pcd18.210123> [↗](#).



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Source: Kompaniyets L, Pennington AF, Goodman AB, Rosenblum HG, Belay B, Ko JY, et al. Underlying Medical Conditions and Severe Illness Among 540,667 Adults Hospitalized With COVID-19, March 2020–March 2021. To learn more, visit the *Preventing Chronic Disease* article: [https://www.cdc.gov/pcd/issues/2021/21\\_0123.htm](https://www.cdc.gov/pcd/issues/2021/21_0123.htm)



# COVID-19 Death Risk Ratio (RR) Increases as the Number of Comorbid Conditions Increases



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Source: Kompaniyets L, Pennington AF, Goodman AB, Rosenblum HG, Belay B, Ko JY, et al. Underlying Medical Conditions and Severe Illness Among 540,667 Adults Hospitalized With COVID-19, March 2020–March 2021. To learn more, visit the *Preventing Chronic Disease* article: [https://www.cdc.gov/pcd/issues/2021/21\\_0123.htm](https://www.cdc.gov/pcd/issues/2021/21_0123.htm)

## More Information

- CDC strongly encourages healthcare providers, patients and their advocates, and health system administrators to regularly consult the [COVID-19 Treatment Guidelines](#)  by the National Institutes of Health (NIH).
- Information about enrolling in clinical trials related specifically to COVID-19 can be found at [CombatCovid.hhs.gov](https://www.combatcovid.gov) , and includes opportunities for people with and without COVID-19.
- Visit CDC's [COVID Data Tracker](#) for current data.
- Visit CDC's [COVID-19 Vaccination](#) for vaccine information and resources.
- Visit CDC's [Demographic Trends of COVID-19 Cases and Deaths in the U.S.](#) for COVID-19 hospitalization and death data by race/ethnicity.
- Visit CDC's [Health Equity](#) page for health equity considerations for racial and ethnic minority groups.





Please [contact your state, tribal, local, or territorial health department](#) for more information on COVID-19 vaccination in your area.

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