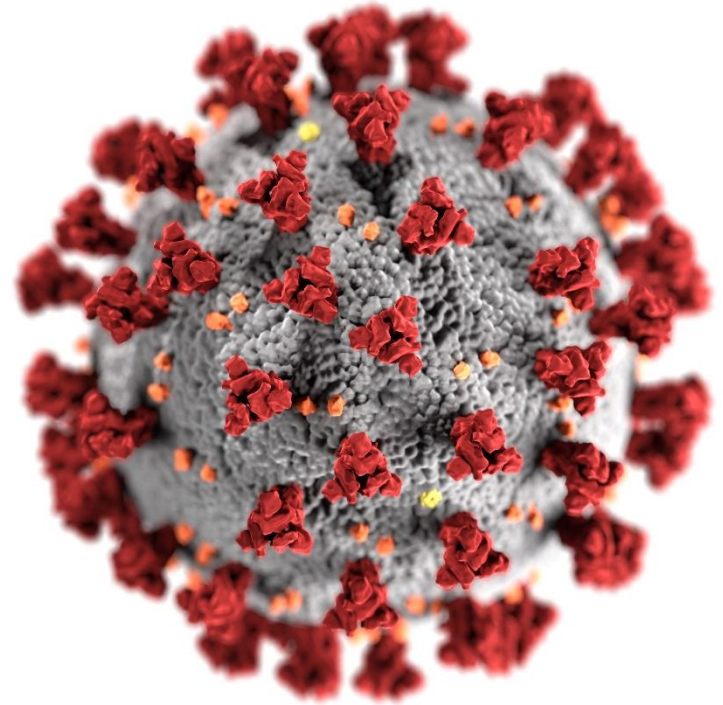


COVID-19-Associated Hospitalization Surveillance Network (COVID-NET)



Overview of Coronavirus Disease 2019- Associated Hospitalization Surveillance Network (COVID-NET)



COVID-NET Overview

- Population-based surveillance for laboratory-confirmed COVID-19-associated hospitalizations in all ages
- Catchment area: >250 acute care hospitals in 99 counties in 14 states, representing all 10 HHS regions and 10% of U.S. population
- Created using existing infrastructure of FluSurv-NET and RSV-NET (Respiratory virus hospitalization surveillance platforms)
- Surveillance was initiated on March 1, 2020

COVID-NET Surveillance Overview

States participating in COVID-NET



- Patients must be a resident of the surveillance area and have a positive SARS-CoV-2 test within 14 days prior to or during hospitalization
- Charts reviewed and abstracted by trained surveillance officers using a standardized case report form

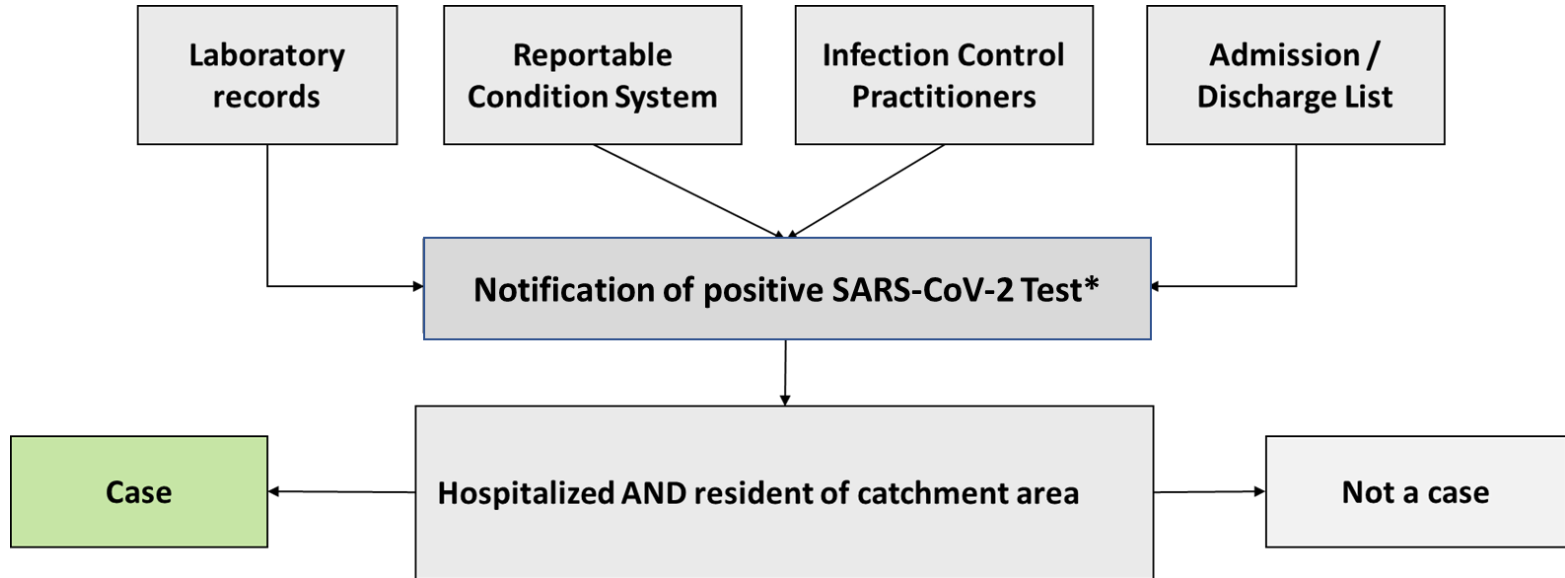


MMWR April 17, 2020

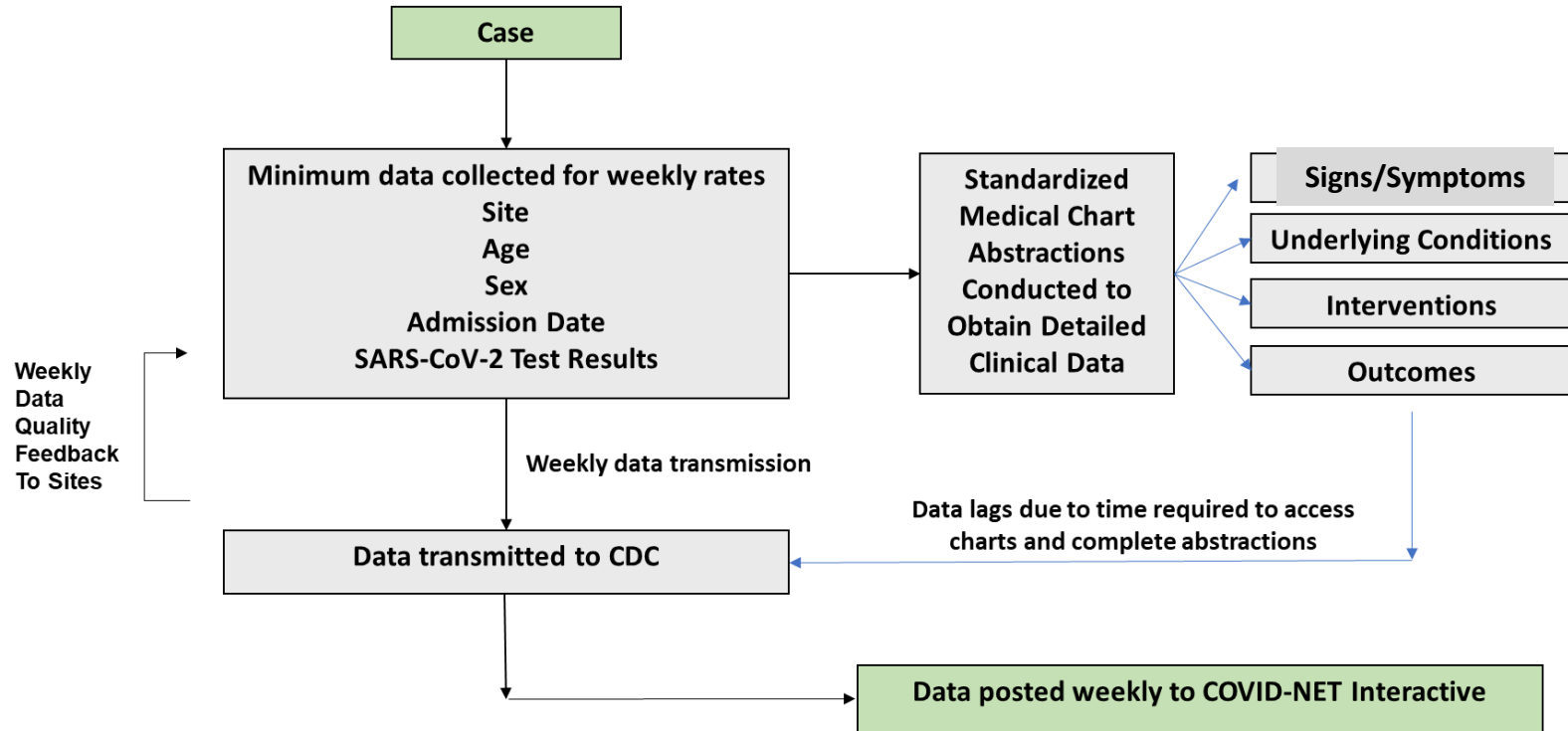
<https://www.cdc.gov/mmwr/volumes/69/wr/mm6915e3.htm>

COVID-NET = COVID-19-Associated Hospitalization Surveillance Network

Case Ascertainment



Data Collection and Flow



COVID-NET Interactive: Hospitalization Rates by Age, Sex, Race/Ethnicity and Site

COVID-NET

A Weekly Summary of U.S. COVID-19 Hospitalization Data



Laboratory-Confirmed COVID-19-Associated Hospitalizations

Preliminary cumulative rates as of Aug 29, 2020 (https://gis.cdc.gov/grasp/COVIDNet/COVID19_3.html)

Additional demographic and clinical data
https://gis.cdc.gov/grasp/COVIDNet/COVID19_5.html

Download Data

Display by:

Cumulative Rate Weekly Rate

View Rates by

Age Group

Age Group:

- 5-17 yr
- >= 18
- 18-49 yr
- 18-29 yr
- 30-39 yr
- 40-49 yr
- 50-64 yr
- 65+ yr
- 65-74 yr
- 75-84 yr
- 85+

Additional Charts:

Surveillance Site

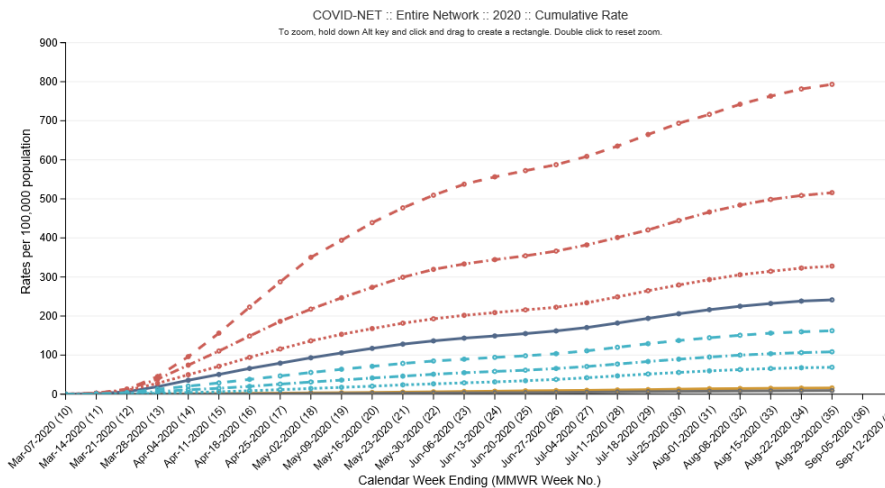
Surveillance Site:

- COVID-NET
- EIP
- California
- Colorado
- Connecticut
- Georgia
- Maryland

Mar-07-2020 (10) Mar-28-2020 (13) Apr-18-2020 (16) May-09-2020 (19) May-30-2020 (22) Jun-20-2020 (25) Jul-11-2020 (28) Aug-01-2020 (31) Aug-22-2020 (34) Sep-12-2020 (37)



Date (MMWR Week No.)



The Coronavirus Disease 2019 (COVID-19)-Associated Hospitalization Surveillance Network (COVID-NET) hospitalization data are preliminary and subject to change as more data become available. In particular, case counts and rates for recent hospital admissions are subject to lag. As data are received each week, prior case counts and rates are updated accordingly. COVID-NET conducts population-based surveillance for laboratory-confirmed COVID-19-associated hospitalizations in children (less than 18 years of age) and adults. COVID-NET covers nearly 100 counties in the 10 Emerging

COVID-NET Interactive: Hospitalization Characteristics

COVID-NET

A Weekly Summary of U.S. COVID-19 Hospitalization Data



COVID-19 Laboratory-Confirmed Hospitalizations

Preliminary data as of Aug 29, 2020

https://gis.cdc.gov/grasp/COVIDNet/COVID19_5.html

Choose Components to View ▾

Download Data

Help

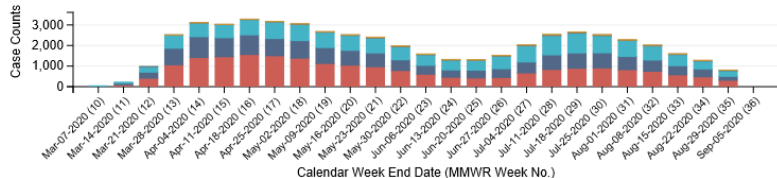
Additional rate data [https://gis.cdc.gov/grasp/COVIDNet/COVID19_3.html]

COVID-19-ASSOCIATED HOSPITALIZATIONS BY AGE

Display: Number Percent

Download Image

0-4 yr 5-17 yr 18-49 yr 50-64 yr 65+ yr



CHARACTERISTICS OF COVID-19-ASSOCIATED HOSPITALIZATIONS

Display by Major Category

Demographics

and Sub-Category

Age

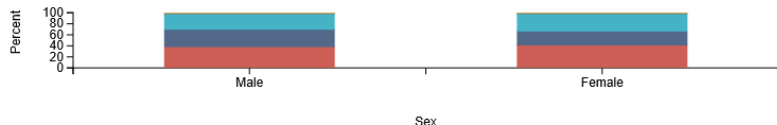
stratified by

Sex

Download Image

Age by Sex

0-4 yr 5-17 yr 18-49 yr 50-64 yr 65+ yr



SELECTED UNDERLYING MEDICAL CONDITIONS

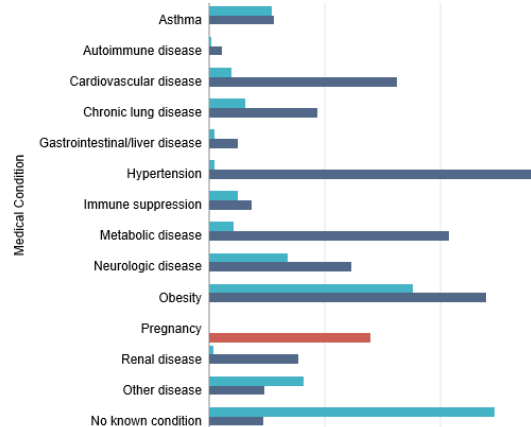
Display data: Horizontally Vertically

Download Image

Pediatric Adult Pregnant

Choose Medical Conditions...

Select All



COVID-NET Surveillance Updates

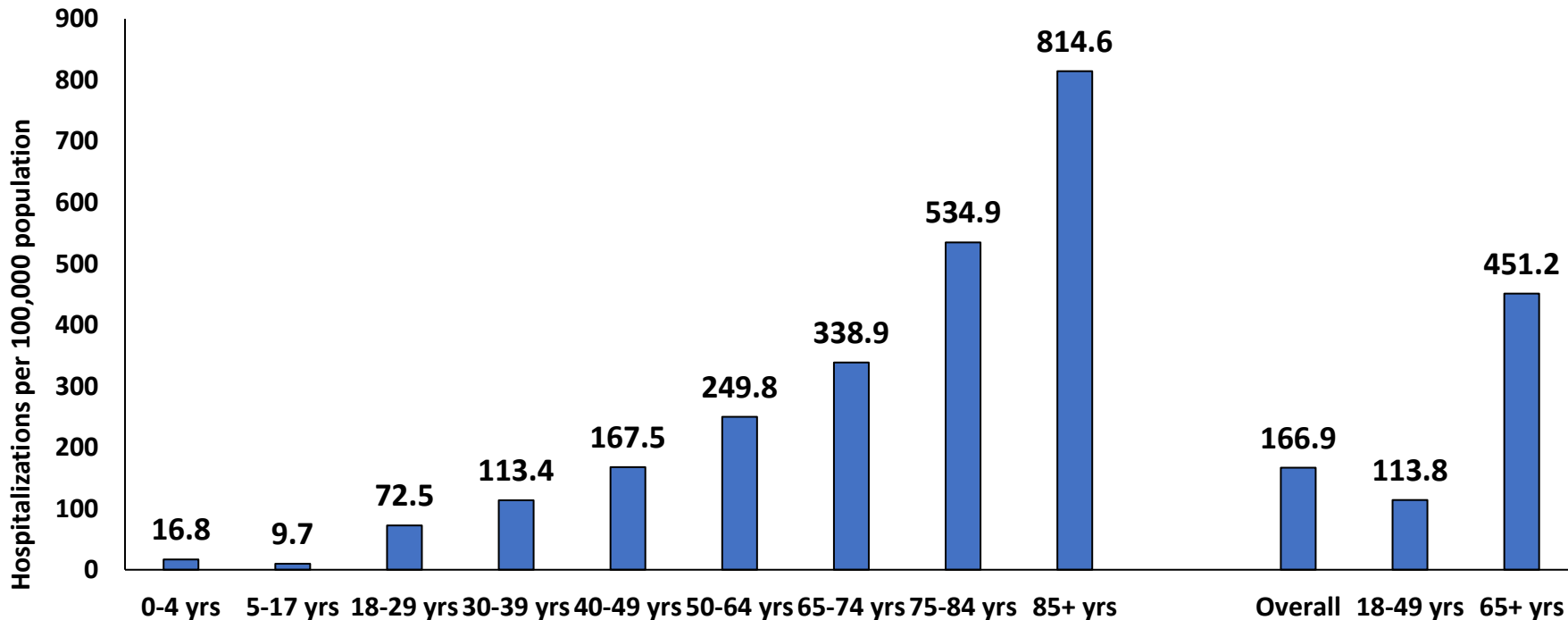
March 1–September 5, 2020



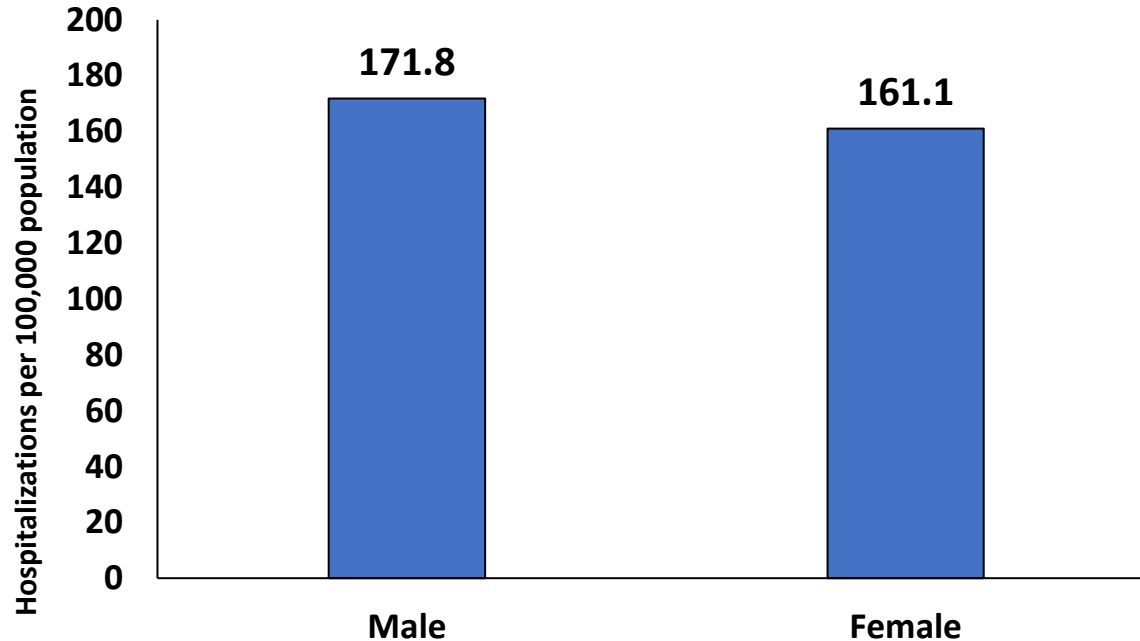


Y

Laboratory-Confirmed COVID-19-Associated Hospitalization Rates by Age — COVID-NET, March 1–September 5, 2020 (n=54,425)

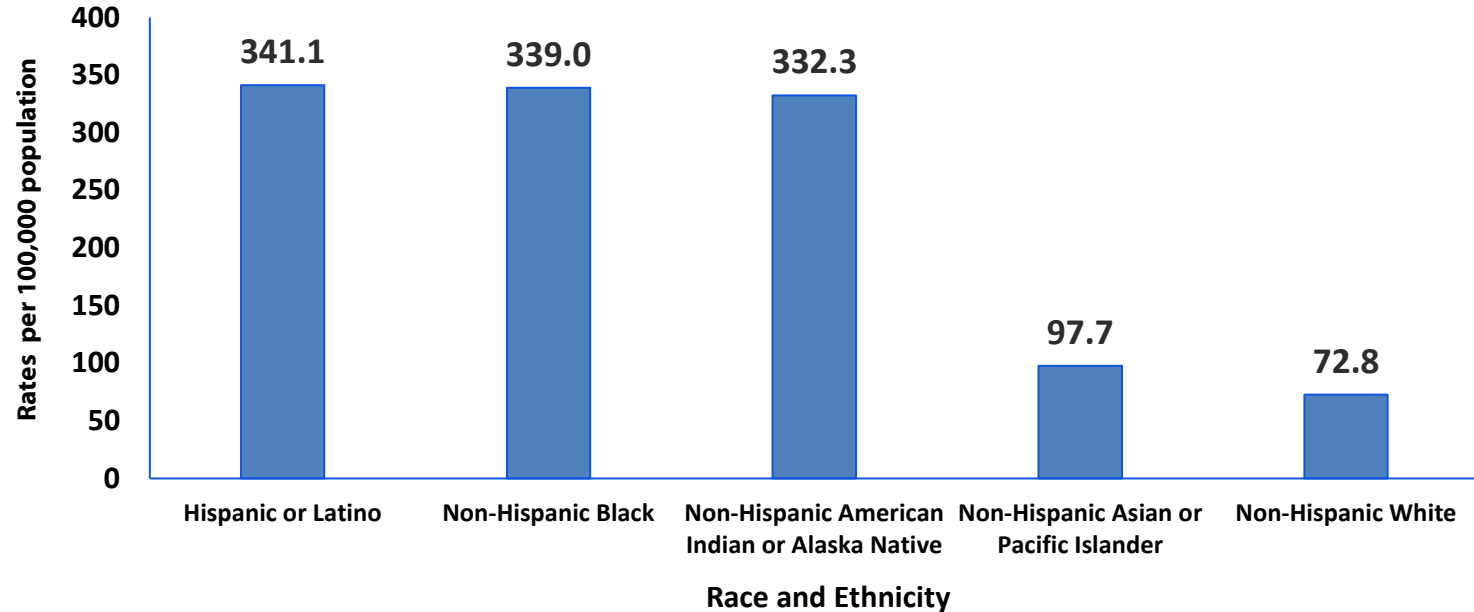


Laboratory-Confirmed COVID-19-Associated Hospitalization Rates by Sex— COVID-NET, March 1–September 5, 2020 (n=54,425)*



*184 cases missing sex

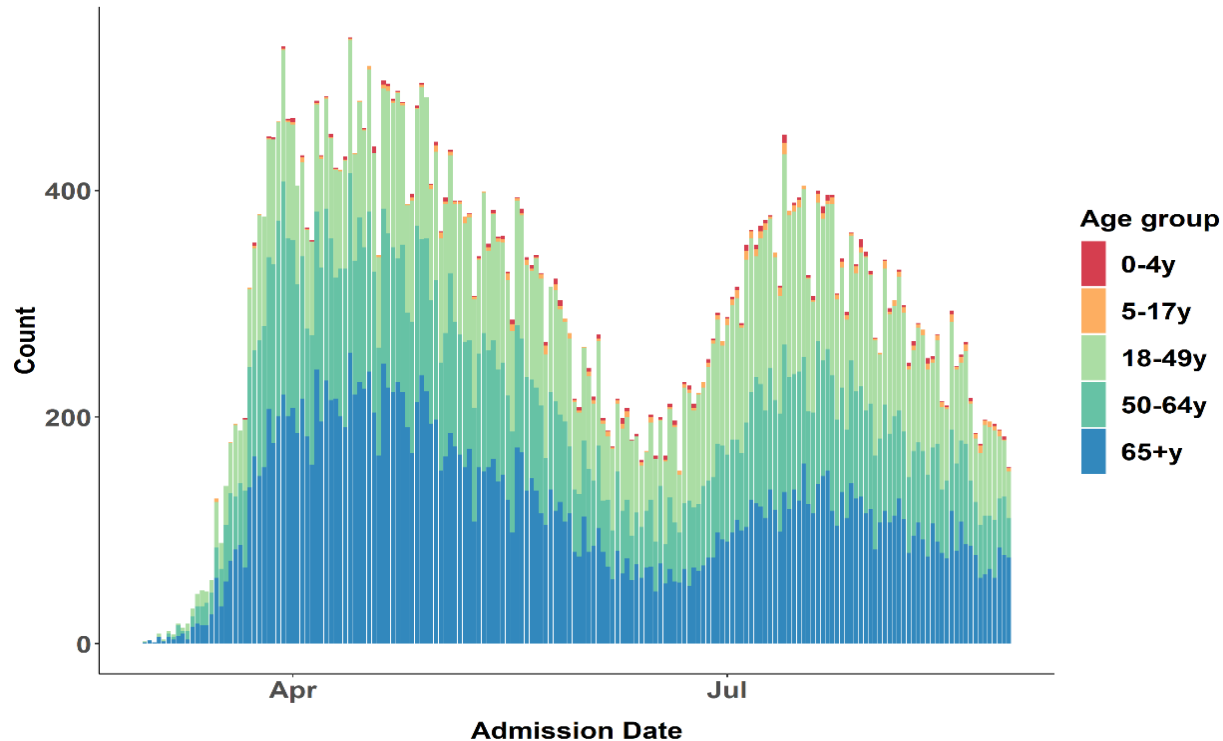
Age-adjusted Laboratory-Confirmed COVID-19-Associated Hospitalization Rates^{*†} by Race/Ethnicity — COVID-NET, March 1–September 5, 2020



*Calculated using hospitalized COVID-NET cases with known race/ethnicity for the numerator and NCHS bridged-race population estimates (https://www.cdc.gov/nchs/nvss/bridged_race.htm) for the denominator. Rates are adjusted to account for differences in age distributions within race/ethnicity strata in the COVID-NET catchment area.

†Race and ethnicity missing for 5.8% of cases.

Laboratory-Confirmed COVID-19-Associated Hospitalization Cases by Admission Date— COVID-NET, March 1–August 29*, 2020

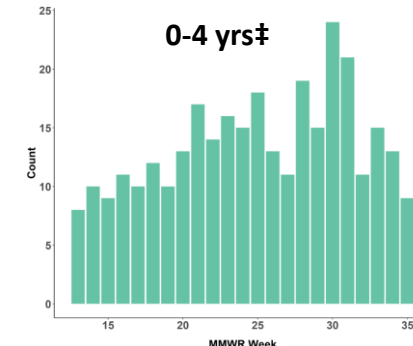
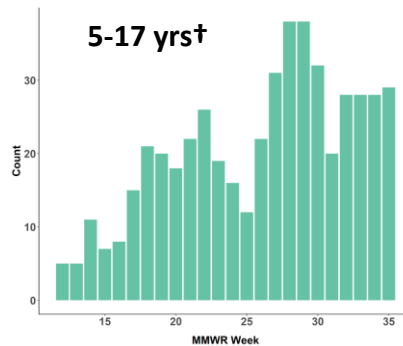
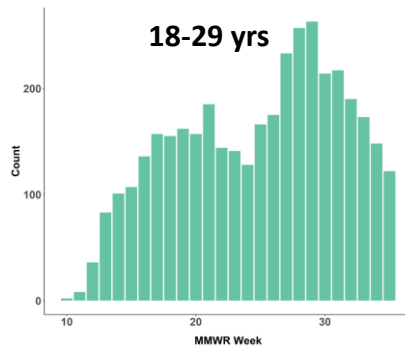
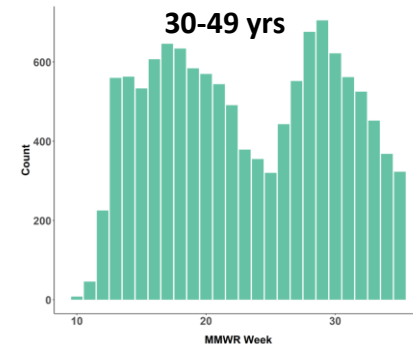
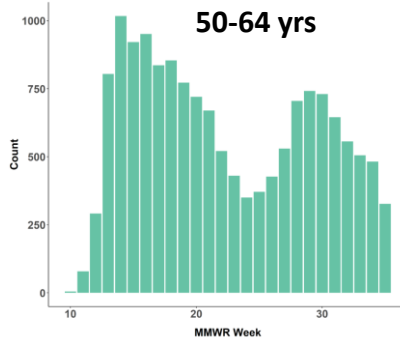
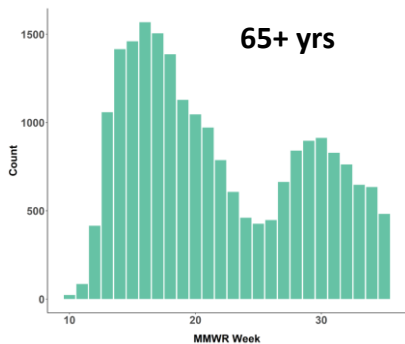


*Cases submitted to CDC through September 5, 2020 with an admission date *through* August 29, 2020 are included. Cases submitted to CDC with admission dates after August 29 are excluded from the curve. Case counts for cases with admission dates after August 29 have a higher likelihood of backfill as compared to those with admission dates prior to August 29.



Y

COVID-19-Associated Hospitalization Cases* by MMWR Week and Age Group, COVID-NET, March 1–August 29, 2020

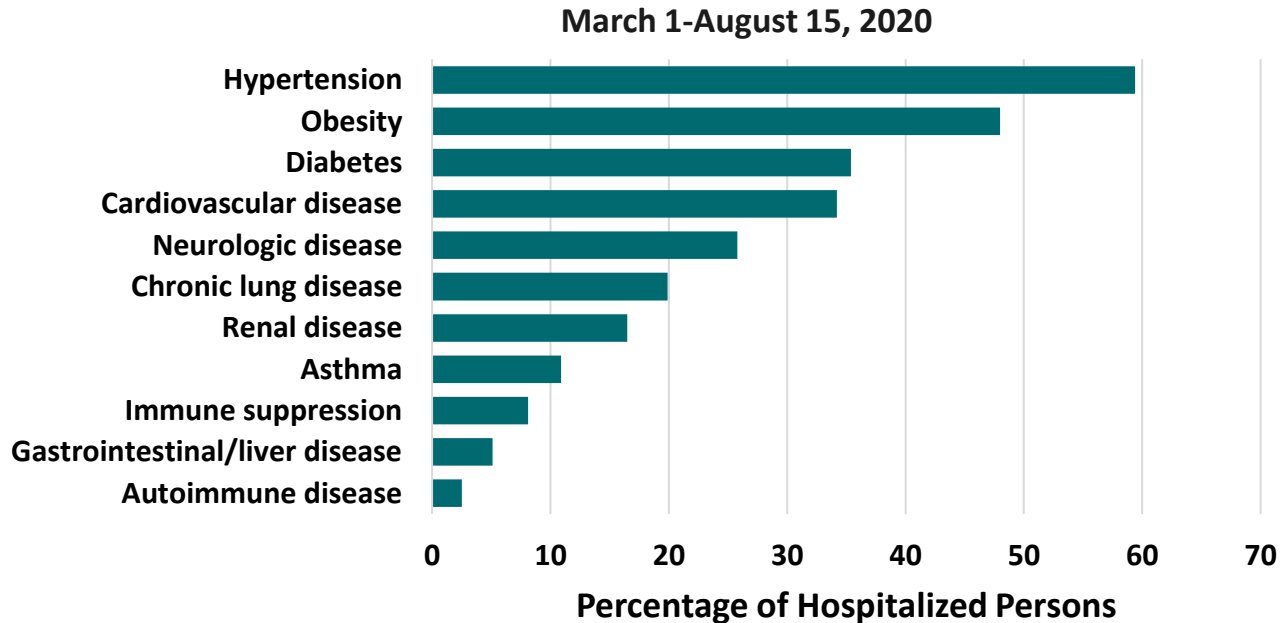


*Y-axis scale varies by age group; †Weeks 10–11 not included for 5–17 year age group as no cases were reported; ‡Weeks 10–12 not included for 0–4 year age group as no cases were reported

Clinical Characteristics of and Risk Factors for Severe Disease Among Hospitalized Patients with COVID-19, COVID-NET



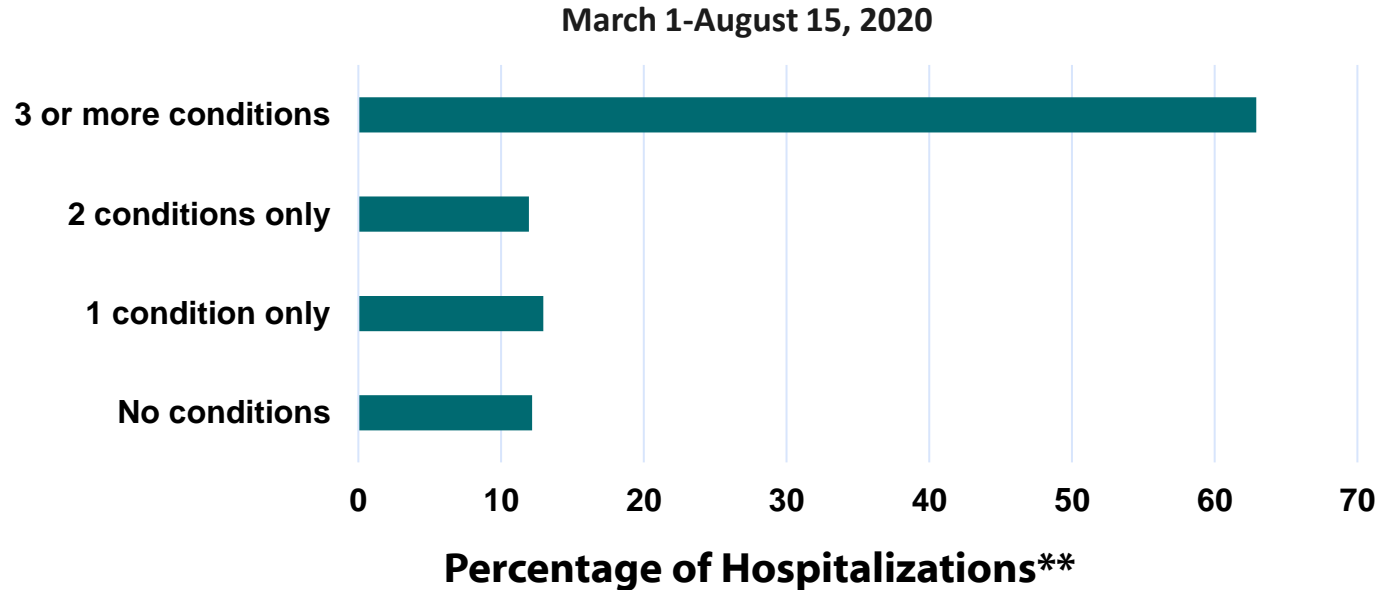
Underlying conditions are common among adults aged 18 years or older with COVID-19 associated hospitalizations



*COVID-19 associated hospitalizations reported to Coronavirus Disease 2019 (COVID-19)-Associated Hospitalization Surveillance Network (COVID-NET) surveillance system between March 1 and August 15, 2020. The denominator is restricted to cases with a discharge disposition and for which chart review was completed. COVID-NET is a population-based surveillance system that collects data on laboratory-confirmed COVID-19-associated hospitalizations among children and adults through a network of over 250 acute-care hospitals in 14 states. https://gis.cdc.gov/grasp/COVIDNet/COVID19_5.html



Nearly 90% of hospitalized adults 18 years or older have at least one of the selected underlying medical conditions*, and over 60% have 3 or more



*Defined as one or more of hypertension, obesity, diabetes, cardiovascular disease, neurologic disease, chronic lung disease, renal disease, asthma, immune suppression, gastrointestinal/liver disease, and autoimmune disease. **Unadjusted for age or other demographic variables.

COVID-19 associated hospitalizations reported to Coronavirus Disease 2019 (COVID-19)-Associated Hospitalization Surveillance Network (COVID-NET) surveillance system between March 1 and August 15, 2020. The denominator is restricted to cases with a discharge disposition and for which chart review was completed. COVID-NET is a population-based surveillance system that collects data on laboratory-confirmed COVID-19-associated hospitalizations among children and adults through a network of over 250 acute-care hospitals in 14 states.



The most common underlying medical conditions among hospitalized adults vary by age group

March 1-August 15, 2020

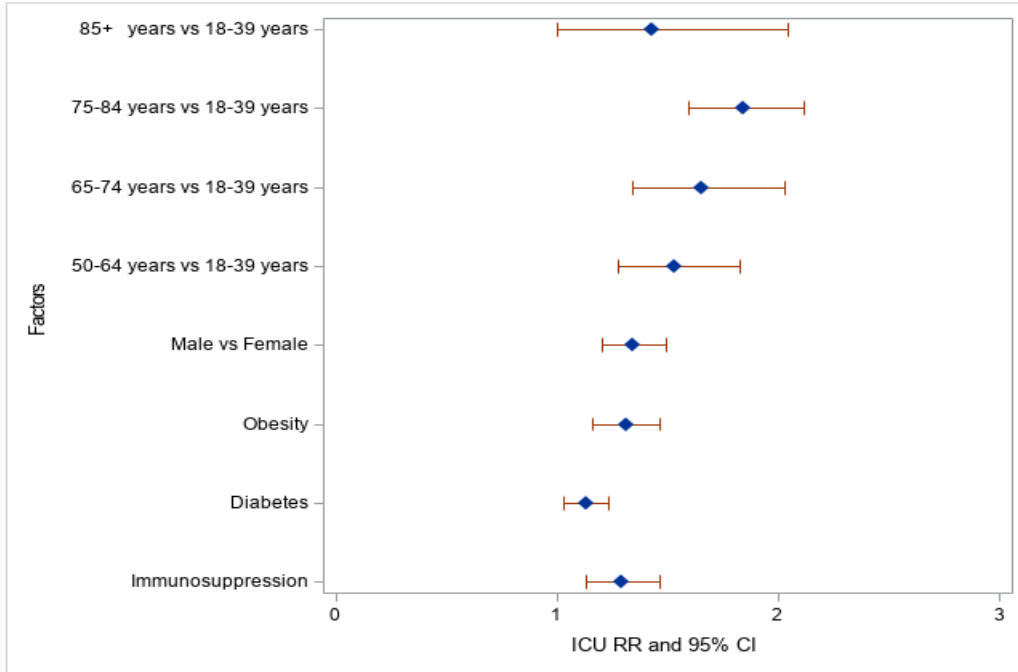
18-49 years	50-64 years	65+ years
Obesity (61.5%)	Hypertension (60.5%)	Hypertension (77.8%)
Hypertension (27.2%)	Obesity (56.5%)	Cardiovascular disease (55.2%)
Diabetes (21.8%)	Diabetes (37.9%)	Neurologic disease (42.5%)
Asthma (14.1%)	Cardiovascular disease (26.3%)	Diabetes (41.8%)
Chronic lung disease (9.8%)	Chronic lung disease (18.8%)	Obesity (34.6%)



*COVID-19 associated hospitalizations reported to Coronavirus Disease 2019 (COVID-19)-Associated Hospitalization Surveillance Network (COVID-NET) surveillance system between March 1 and August 15, 2020. The denominator is restricted to cases with a discharge disposition and for which chart review was completed. COVID-NET is a population-based surveillance system that collects data on laboratory-confirmed COVID-19-associated hospitalizations among children and adults through a network of over 250 acute-care hospitals in 14 states. https://gis.cdc.gov/grasp/COVIDNet/COVID19_5.html



Risk factors for ICU Admission, COVID-NET, March 1–May 2, 2020 (N=2490)



aRR 1.43 (1.00, 2.04)[†]

aRR 1.84 (1.6, 2.11)

aRR 1.65 (1.34, 2.03)

aRR 1.53 (1.28, 1.83)

aRR 1.34 (1.20, 1.50)

aRR 1.31 (1.16, 1.47)

aRR 1.13 (1.03, 1.24)

aRR 1.29 (1.13, 1.47)

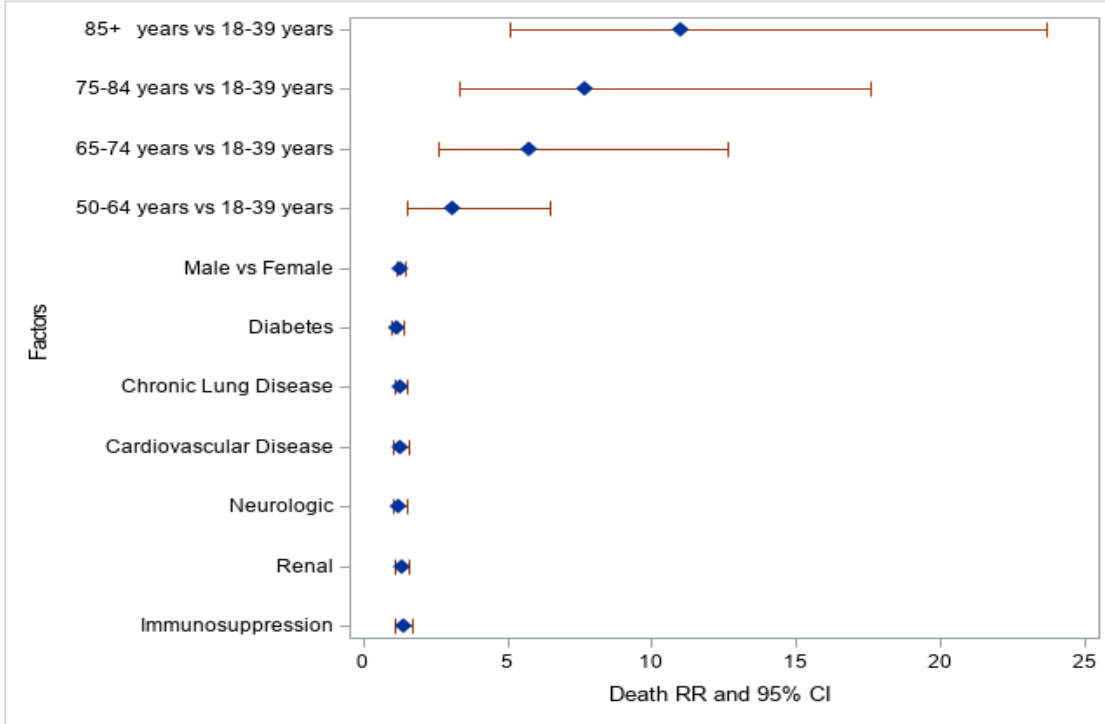
aRR=adjusted risk ratio; RR=risk ratio; CI=confidence interval

*Age 40-49 years, Race/Ethnicity, Hypertension, Smoking, Chronic Lung Disease, Cardiovascular Disease, Neurologic Disease and Renal Disease were included in the model, but not statistically significant; [†]p=0.0494



Y

Risk Factors for In-Hospital Death, COVID-NET, March 1–May 2, 2020 (N=2490)



aRR 10.98 (5.09, 23.69)

aRR 7.67 (3.35, 17.59)

aRR 5.77 (2.64, 12.64)

aRR 3.11 (1.50, 6.46)

aRR 1.30 (1.14, 1.49)

aRR 1.19 (1.01, 1.40)

aRR 1.31 (1.13, 1.52)

aRR 1.28 (1.03, 1.58)

aRR 1.25 (1.04, 1.50)

aRR 1.33 (1.10, 1.61)

aRR 1.39 (1.13, 1.70)

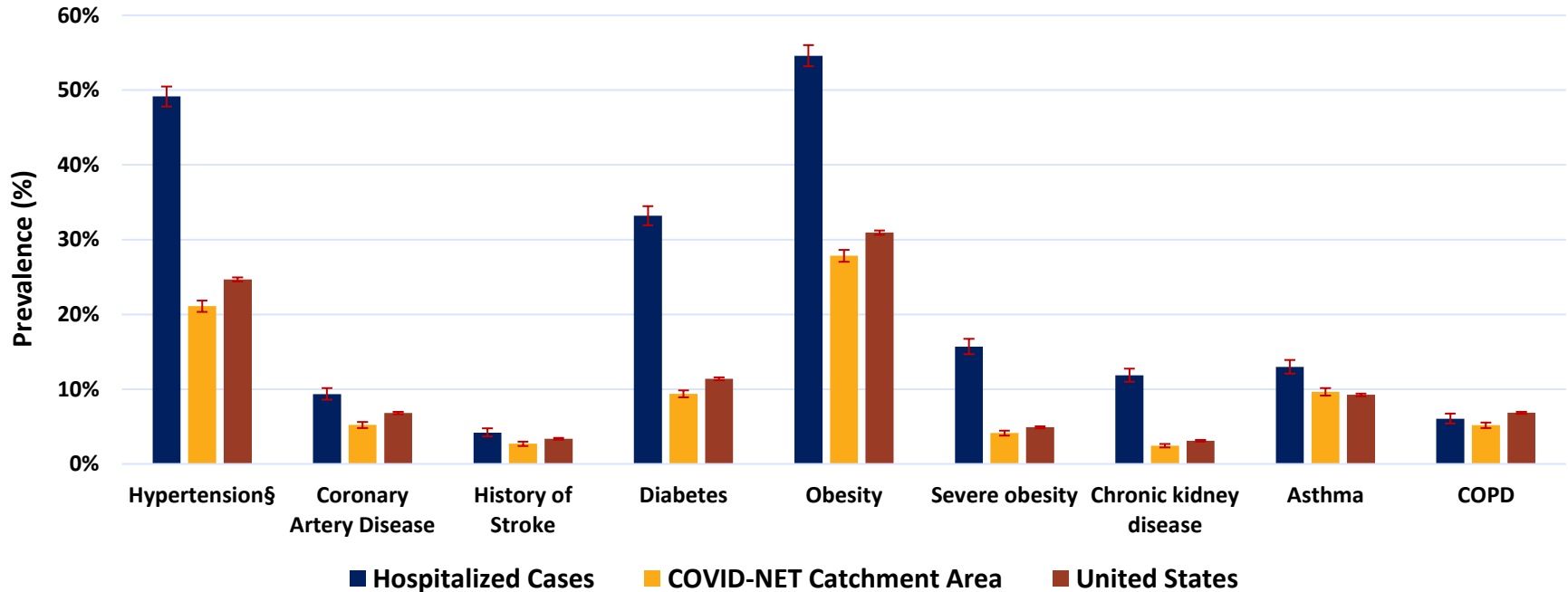
aRR=adjusted risk ratio; RR=risk ratio; CI=confidence interval

*Age 40-49 years, Race/Ethnicity, Hypertension, Smoking, Obesity, Blood Disorders, and Rheumatologic/Autoimmune Disease were included in the model but not statistically significant

Risk factors for COVID-19-associated hospitalization among U.S. Adults, COVID-NET and BRFSS

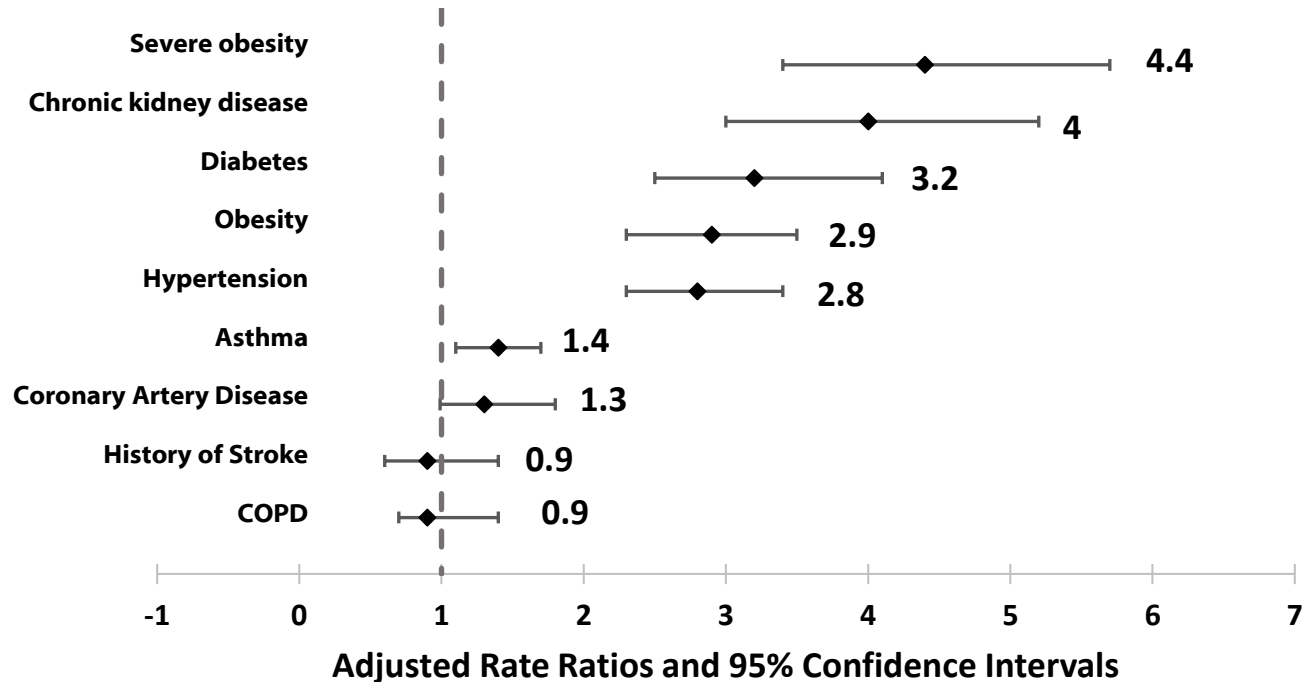


The prevalence of underlying medical conditions was greater in adults with COVID-19 associated hospitalizations compared to COVID-NET catchment areas



§Estimates for hypertension from COVID-NET Catchment Area and Nationwide BRFSS estimates are from 2017, Obesity=BMI $\geq 30\text{kg/m}^2$; Severe obesity = BMI $\geq 40\text{kg/m}^2$

The magnitude of risk for COVID-19 associated hospitalization was greatest for adults with severe obesity, chronic kidney disease, and diabetes.



COPD: Chronic obstructive pulmonary disease

Obesity=BMI $\geq 30\text{kg/m}^2$; Severe obesity = BMI $\geq 40\text{kg/m}^2$

*Each underlying medical condition is in a separate model, adjusted for age, sex, race/ethnicity

The magnitude of risk for hospitalization increased with the number of underlying medical conditions, with the greatest risk among adults with 3 or more conditions.

Unadjusted and Adjusted* Rate Ratios for Number of Underlying Medical Conditions and COVID-19-Associated Hospitalization

	Unadjusted Rate Ratio (95%CI)	Adjusted Rate Ratio* (95%CI)
Number of conditions†		
1	2.8 (2.7, 3.1)	2.5 (2.1, 3.0)
2	5.6 (5.2, 6.1)	4.5 (3.7, 5.5)
3+	7.2 (6.6, 7.9)	5.0 (3.9, 6.3)
Age 45-64 years‡	-----	1.8 (1.5, 2.2)
Age 65+ years‡	-----	2.6 (2.1, 3.1)
Male§	-----	1.2 (1.1, 1.4)
Non-Hispanic black 	-----	3.9 (3.3, 4.7)
Other race/ethnicity 	-----	3.3 (2.8, 3.9)

CI: Confidence Interval; COVID-NET: Coronavirus Disease 2019-Associated Hospitalization Surveillance Network

*Model for number of underlying medical conditions (variable) is adjusted for age, sex, and race/ethnicity

†Reference group is no underlying medical condition; Number of conditions is a sum of underlying medical conditions excluding hypertension; the most recent year of available BRFSS data for hypertension was 2017.

‡Reference group is 18-44 years

§Reference group is female

||Reference group is non-Hispanic white

Summary Points

- Hospitalization rates increase with increasing age
- Hospitalization rates are higher among Hispanic or Latino, non-Hispanic Black, and non-Hispanic American Indian/Alaskan Native persons compared to non-Hispanic White persons
- Underlying conditions are common among hospitalized patients with COVID-19 with obesity, hypertension and diabetes most common
- Older age, male sex, and underlying conditions increase the risk for ICU admission and death among hospitalized patients with COVID-19
- Underlying conditions increase risk for COVID-19 hospitalization



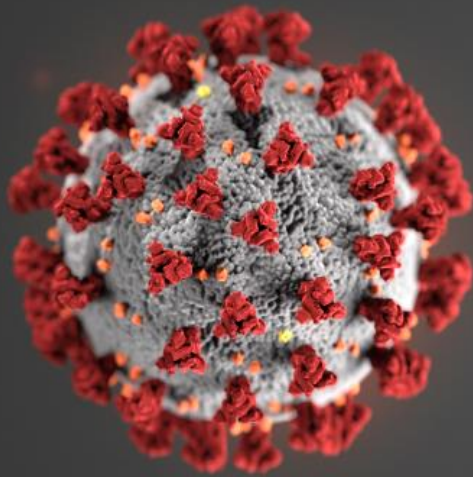
Acknowledgements

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 - Alicia Budd
- COVID-NET Surveillance Sites
- CDC Emerging Infections Program
- CSTE
- NCIRD
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 - Sank Kang
- GRASP
 - Lance Broeker
 - Sheng-Te Tsai





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1-800-CDC-INFO (232-4636)
TTY: 1-888-232-6348 www.cdc.gov

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

