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Race and Hispanic-origin Disparities in Underlying Medical Conditions Associated With Severe COVID-19 Illness: U.S. Adults, 2015–2018

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Abstract

Objective—This report calculates the prevalence of selected conditions by race and Hispanic origin among U.S. adults (aged 20 and over) during 2015–2018.

Methods—Interview, physical examination, and laboratory data were used from the National Health and Nutrition Examination Survey. Conditions included asthma, chronic obstructive pulmonary disease, and heart disease based on self-report; and obesity, severe obesity, diabetes, chronic kidney disease, smoking, and hypertension based on physical measurements. Estimates accounted for survey design.

Results—Seventy-six percent of adults and 86.4% (95% CI: 83.5–89.0) of non-Hispanic black adults had at least one condition. Obesity and diabetes were highest among non-Hispanic black (47.9% CI: 45.0–50.8; 19.2% CI: 16.7–21.8, respectively) and Hispanic adults (45.7% CI: 42.9–48.6; 21.3% CI: 19.0–23.7, respectively).

Conclusions—Non-Hispanic black and Hispanic adults had a disproportionate burden of some conditions, including obesity and diabetes. Understanding populations at highest risk for severe coronavirus disease 2019-related illness could help inform prevention strategies.

Keywords: chronic disease • epidemiology • COVID-19 • National Health and Nutrition Examination Survey

Introduction

In the United States, over 30 million confirmed cases of coronavirus disease 2019 (COVID-19) were reported by early April 2021 (1). Emerging evidence has shown higher risk for severe COVID-19-related illness and death among older adults and those with certain underlying medical conditions (2). In addition, compared with non-Hispanic white

adults, non-Hispanic black and Hispanic adults have more than two times the rate of hospitalization (3).

The strongest and most consistent evidence (2) supporting an increased risk for severe COVID-19 illness is available for the following conditions: obesity (especially severe obesity), diabetes, chronic obstructive pulmonary disease (COPD), serious heart conditions (heart failure, coronary artery disease,

cardiomyopathies), smoking, and chronic kidney disease (CKD). Mixed evidence exists for hypertension and asthma (2). This analysis aims to calculate the prevalence of these underlying conditions by race and Hispanic origin, using pre-COVID-19 data from interviews, physical examinations, and laboratory measurements among U.S. adults (aged 20 and over) during 2015–2018. Understanding the prevalence of these underlying conditions could inform COVID-19 response efforts.

Methods

Analyses were conducted using data from the National Health and Nutrition Examination Survey (NHANES), a cross-sectional national survey of the U.S. civilian noninstitutionalized population (4). NHANES includes a household interview and in-person examinations, with biospecimen collection conducted in mobile examination centers (MEC). Survey participants were randomly assigned to a morning, afternoon, or evening examination. NHANES was approved by the National Center for Health Statistics (NCHS) Research Ethics Review Board. This activity was reviewed by the Centers for Disease



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Control and Prevention (CDC) and was conducted consistent with applicable federal law and CDC policy (for CDC policy, see e.g., 45 C.F.R. part 46; 21 C.F.R. part 56; 42 U.S.C. §241(d); 5 U.S.C. §552a; 44 U.S.C. §3501 et seq.). The analyses included two NHANES data cycles (2015–2016 and 2017–2018). The adult examination response rate was 54.8% in 2015–2016 and 45.3% in 2017–2018 (4).

Self-reported COPD, serious heart disease, and current asthma were obtained during household interviews. COPD was defined as COPD, emphysema, or current chronic bronchitis. Adults aged 40 and over were asked questions about serious heart disease, defined as diagnosed congestive heart failure, coronary heart disease, angina, or heart attack, as well as angina grades 1 or 2 determined by the Rose Angina Questionnaire (5).

Obesity, severe obesity, diabetes, CKD, smoking, and hypertension were defined using physical measures, along with self-reported information for diabetes, smoking, and hypertension. Obesity and severe obesity were defined as body mass index (BMI) greater than or equal to 30 kg/m² or greater than or equal to 40 kg/m², respectively. Fasting plasma glucose (FPG) was obtained on a subsample (for example, those seen for the morning examination at the MEC after an 8- to 24-hour fast). Total diabetes was defined as self-reported diabetes or FPG greater than or equal to 126 mg/dL or hemoglobin A1c greater than or equal to 6.5%. CKD was defined as estimated glomerular filtration rate (eGFR) less than 60 (stages 3–4), excluding eGFR less than 15 (stage 5) and using a forward equation for adjustment because of methods changes (4). Smoking was self-reported and defined as at least 100 cigarettes over a lifetime and currently smoking every day or some days, or serum cotinine greater than 10 ng/mL. Hypertension was defined as mean (less than or equal to three measurements) systolic blood pressure greater than or equal to 130 mmHg or mean (less than or equal to three measurements) diastolic blood pressure greater than or equal to 80 mmHg, or self-reported current hypertension medication use.

The number of underlying conditions was categorized as having at least one, at least two, or at least three of the underlying medical conditions. Severe obesity was excluded because it is a subset of obesity.

The estimated number of adults in the United States with each underlying condition was calculated using crude prevalence estimates and the population totals from the American Community Survey for 2015 and 2017 (4).

Pregnant women ($n = 125$) were excluded from estimates for obesity, severe obesity, CKD, diabetes, hypertension, and multiple conditions. Interview, examination, or fasting sample weights were used to account for sampling, nonresponse, and noncoverage. All variance estimates accounted for the complex survey design using Taylor series linearization. Korn and Graubard 95% confidence intervals (CI) were calculated (6). Prevalence estimates were evaluated using NCHS presentation standards (6). Prevalence estimates were age adjusted to the projected U.S. Census 2000 population using the direct method and age groups 20–39 years, 40–64, and 65 and over. Differences between groups were tested using a 2-sided t statistic at the $p < 0.05$ significance level. All data analyses were conducted in Stata version 16.1 (StataCorp) and R version 3.6.0 (R Foundation for Statistical Computing).

Results

A maximum of 11,288 adults were included in the analyses. Sample sizes varied based on the sample (interview, exam, or fasting laboratory testing) and item nonresponse, which ranged from 0.0%–6.2% across various conditions. Maximum sample sizes by race and Hispanic origin were 3,798 (non-Hispanic white), 2,496 (non-Hispanic black), 1,501 (non-Hispanic Asian), and 3,015 (Hispanic).

An estimated 180.3 million (crude prevalence 76.2%, 95% CI: 73.1–79.1) U.S. adults had at least one condition during 2015–2018. Overall, the age-adjusted prevalence of underlying conditions were: hypertension (46.5%), obesity (41.0% including 8.4% severe obesity), smoking (25.2%), diabetes (15.0%), serious heart conditions

(12.7%), asthma (9.0%), CKD (6.3%), and COPD (5.2%) (Table A).

Approximately 86.4% (95% CI: 83.5–89.0%) of non-Hispanic black adults had at least one condition, 58.5% (95% CI: 55.0–61.9) had at least two conditions, and 29.0% (95% CI: 26.2–32.0) had at least three conditions; these prevalence estimates were significantly higher than among other race and Hispanic-origin groups. Compared with non-Hispanic white adults, non-Hispanic black adults had higher rates of obesity, severe obesity, diabetes, smoking, and hypertension. Compared with non-Hispanic white adults, Hispanic adults had higher rates of obesity and diabetes. Non-Hispanic Asian adults had lower rates of at least one condition, but higher rates of diabetes compared with non-Hispanic white adults.

Non-Hispanic black women were more likely to have multiple conditions, obesity, severe obesity, diabetes, and hypertension compared with non-Hispanic white women (Table B). Non-Hispanic black men were more likely to have one or more conditions and hypertension compared with non-Hispanic white men. Hispanic men were more likely to have diabetes compared with non-Hispanic white men.

Discussion

This study shows that more than 75% of U.S. adults, or approximately 180.3 million adults, had at least one of the chronic underlying conditions that have been shown to increase a person's risk of severe illness or death from COVID-19. Non-Hispanic black and Hispanic adults had a disproportionately higher burden of both obesity and diabetes compared with non-Hispanic white adults.

This study improves upon and expands prior studies by using the validated Rose questionnaire for angina and objective measurements to assess obesity, diabetes, CKD, and hypertension. Previous studies have reported prevalence of conditions by race and ethnicity (7), county and urbanicity (8), income (7), and employment and household composition (9) using only self-reported data. Measured data are more accurate than self-reported data and

Table A. Prevalence of select underlying medical conditions associated with severe COVID-19 illness, by race and Hispanic origin: United States, 2015–2018

Underlying medical condition	Sample size	All			Non-Hispanic white	Non-Hispanic black	Non-Hispanic Asian	Hispanic
		Population (in millions) (95% CI)	Crude percent (95% CI)	Adjusted percent (95% CI)	Adjusted percent (95% CI)	Adjusted percent (95% CI)	Adjusted percent (95% CI)	Adjusted percent (95% CI)
Hypertension	10,181	114.9 (110.8–119.0)	48.5 (46.8–50.3)	46.5 (44.6–48.4)	¹ 44.9 (42.3–47.5)	^{2,3,4} 57.8 (55.6–59.9)	¹ 47.4 (44.6–50.2)	¹ 45.4 (43.5–47.3)
Obesity	10,457	97.4 (91.6–103.3)	41.2 (38.7–43.6)	41.0 (38.5–43.6)	^{1,2,3} 40.2 (36.9–43.6)	^{2,4} 47.9 (45.0–50.8)	^{1,3,4} 15.0 (13.0–17.1)	^{2,4} 45.7 (42.9–48.6)
Severe obesity	10,457	19.7 (17.2–22.4)	8.3 (7.3–9.5)	8.4 (7.4–9.6)	^{1,2} 8.3 (7.0–9.8)	^{2,3,4} 12.3 (10.5–14.2)	^{1,3,4} 1.2 (0.7–1.9)	^{1,2} 8.4 (7.0–9.9)
Smoking	10,115	58.4 (54.3–62.6)	24.7 (23.0–26.5)	25.2 (23.4–27.1)	^{1,2,3} 26.6 (24.0–29.3)	^{2,3,4} 34.3 (31.2–37.5)	^{1,3,4} 11.1 (8.9–13.6)	^{1,2,4} 17.0 (14.8–19.5)
Diabetes	4,518	37.7 (34.0–41.7)	16.0 (14.4–17.6)	15.0 (13.6–16.6)	^{1,2,3} 13.1 (11.2–15.1)	⁴ 19.2 (16.7–21.8)	^{3,4} 17.2 (14.2–20.5)	^{2,4} 21.3 (19.0–23.7)
Serious heart disease	7,536	19.7 (17.7–21.9)	13.0 (11.7–14.5)	12.7 (11.4–14.1)	² 12.4 (10.8–14.2)	² 14.1 (12.0–16.5)	^{1,3,4} 7.8 (5.6–10.5)	² 12.1 (10.3–14.1)
Asthma	11,249	21.1 (19.2–23.1)	8.9 (8.1–9.8)	9.0 (8.1–9.8)	^{2,3} 9.3 (8.0–10.6)	^{2,3} 11.1 (9.5–12.8)	^{1,3,4} 5.1 (3.9–6.4)	^{1,2,4} 6.8 (5.7–8.1)
Chronic kidney disease	9,926	16.9 (14.7–19.2)	7.1 (6.2–8.1)	6.3 (5.6–7.1)	^{2,3} 6.6 (5.7–7.6)	^{2,3,7} 3 (6.3–8.5)	^{1,4} 4.0 (2.6–6.0)	^{1,4,4} 3.6 (3.6–5.4)
COPD	11,288	12.9 (10.6–15.5)	5.5 (4.5–6.6)	5.2 (4.2–6.2)	^{2,3} 5.7 (4.4–7.1)	^{2,3} 5.0 (4.0–6.1)	^{1,3,4} 1.4 (0.8–2.1)	^{1,2,4} 2.9 (2.1–3.9)
At least one condition	4,525	180.3 (173.0–187.1)	76.2 (73.1–79.1)	75.3 (72.1–78.2)	^{1,2} 73.9 (69.3–78.1)	^{2,3,4} 86.4 (83.5–89.0)	^{1,3,4} 61.3 (57.3–65.3)	^{1,2,7} 5.9 (72.7–78.9)
At least two conditions	4,525	110.9 (103.2–118.6)	46.9 (43.6–50.1)	45.4 (42.3–48.6)	^{1,2} 44.9 (40.5–49.4)	^{2,3,4} 58.5 (55.0–61.9)	^{1,3,4} 26.8 (22.8–31.0)	^{1,2} 44.1 (40.7–47.6)
At least three conditions	4,525	50.8 (46.0–55.8)	21.5 (19.4–23.6)	20.4 (18.5–22.5)	^{1,2} 19.1 (16.6–21.8)	^{2,3,4} 29.0 (26.2–32.0)	^{1,3,4} 10.0 (7.5–12.9)	^{1,2} 20.1 (17.5–23.0)

¹Significantly different from non-Hispanic black persons.
²Significantly different from non-Hispanic Asian persons.
³Significantly different from Hispanic persons.
⁴Significantly different from non-Hispanic white persons.

NOTES: Data from the National Health and Nutrition Examination Survey; all estimates except sample sizes are weighted. Korn and Graubard 95% confidence intervals (CI) were calculated. Hypertension was defined as mean (less than or equal to three measurements) systolic blood pressure greater than or equal to 130 mmHg or mean (less than or equal to three measurements) diastolic blood pressure greater than or equal to 80 mmHg, or self-reported current hypertension medication use. Obesity was defined as BMI greater than or equal to 30. Severe obesity was defined as BMI greater than or equal to 40. Smoking was defined as self-reported smoking at least 100 cigarettes over a lifetime and currently smoking every day or some days, or serum cotinine greater than 10 ng/mL. This definition could potentially capture users of tobacco products that are not burned (for example, smokeless tobacco and e-cigarettes) or that do not use smoked tobacco products. Diabetes was defined as self-reported diabetes or fasting plasma glucose greater than or equal to 126 mg/dL, or hemoglobin A1c greater than or equal to 6.5%. Adults aged 40 and over self-reported serious heart disease, defined as diagnosed congestive heart failure, coronary heart disease, angina, or heart attack, as well as angina grades 1 or 2 determined by the Rose Angina Questionnaire. Asthma was defined as self-reported asthma. Chronic kidney disease was defined as estimated glomerular filtration rate (eGFR) less than 60 (stages 3–4), excluding eGFR less than 15 (stage 5), and using a forward equation for adjustment because of methods changes. COPD is chronic obstructive pulmonary disease and was defined as self-reported diagnosed COPD, emphysema, or current chronic bronchitis. Unless specified as crude, estimates were age adjusted to the projected 2000 U.S. Census population using the direct method and the age groups 20–39, 40–64, and 65 and over. Pregnant women were excluded from hypertension, obesity, severe obesity, diabetes, and chronic kidney disease.

SOURCE: National Center for Health Statistics, National Health and Nutrition Examination Survey, 2015–2018.

Table B. Prevalence of select underlying medical conditions associated with severe COVID-19 illness, by race and Hispanic origin and sex: United States, 2015–2018

Underlying medical condition	All		Non-Hispanic white		Non-Hispanic black		Non-Hispanic Asian		Hispanic	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
	Percent (95% CI)									
Hypertension	¹ 51.0 (48.5–53.6)	² 41.6 (39.6–43.7)	^{1,3} 50.3 (46.8–53.9)	^{2,3} 39.0 (36.3–41.9)	^{4,5,6} 58.5 (55.5–61.4)	^{4,5,6} 56.8 (54.0–59.7)	^{1,3} 51.8 (47.8–55.7)	^{2,3} 43.3 (39.4–47.2)	^{1,3} 50.7 (47.6–53.7)	^{2,3} 39.7 (37.2–42.3)
Obesity	¹ 40.4 (36.8–44.1)	² 41.5 (38.9–44.2)	⁴ 41.4 (36.6–46.3)	^{3,4,5} 39.1 (35.4–42.8)	^{1,4,5} 38.6 (35.0–42.2)	^{2,4,5,6} 55.6 (52.4–58.8)	^{3,5,6} 13.5 (10.7–16.7)	^{3,5,6} 16.0 (13.4–18.9)	^{3,4} 44.2 (40.9–47.7)	^{3,4,6} 47.0 (43.8–50.2)
Severe obesity	¹ 6.2 (5.1–7.5)	² 10.5 (9.1–12.2)	^{1,4} 6.4 (5.0–8.1)	^{2,3,4} 10.2 (8.3–12.3)	^{1,4,7} 5 (6.0–9.2)	^{2,4,5,6} 16.2 (13.7–19.0)	^{3,5,6} 1.4 (0.5–3.1)	^{3,5,6} 0.9 (0.3–2.2)	^{1,4,5} 8 (3.9–8.3)	^{2,3,4,1} 11.0 (9.3–12.8)
Smoking	¹ 30.9 (28.4–33.4)	² 19.9 (18.2–21.6)	^{1,3,4,5} 31.6 (28.3–35.1)	^{2,4,5} 21.8 (18.8–25.0)	^{1,4,5,6} 44.6 (40.8–48.6)	^{2,4,5} 25.9 (22.5–29.5)	^{1,3,6} 19.1 (14.4–24.5)	^{2,3,5,6} 4.2 (2.9–6.1)	^{1,3,6} 22.4 (19.1–26.1)	^{2,3,4,6,1} 17 (9.5–14.3)
Diabetes	¹ 17.2 (15.2–19.3)	² 13.2 (11.3–15.2)	^{1,5} 15.5 (12.5–18.8)	^{2,3,5} 10.9 (8.6–13.6)	⁵ 18.8 (15.3–22.6)	^{4,6} 19.5 (16.2–23.2)	²⁰ 4 (15.8–25.6)	^{3,5} 14.4 (10.7–18.9)	^{3,6} 23.2 (19.8–26.8)	^{4,6} 19.8 (16.7–23.2)
Serious heart disease.	¹ 15.0 (13.2–16.8)	² 10.8 (9.3–12.5)	^{1,4} 15.3 (12.9–18.0)	^{2,3,4} 9.9 (8.1–12.0)	¹³ 9 (11.3–16.8)	^{4,6} 14.4 (11.4–17.8)	^{1,6} 10.6 (7.5–14.5)	^{2,3,5,6} 5.6 (3.5–8.3)	¹³ 0 (10.8–15.6)	⁴ 11.5 (9.2–14.1)
Asthma	¹ 5.8 (5.0–6.6)	² 11.9 (10.4–13.7)	^{1,5} 7 (4.4–7.2)	^{2,4,5} 12.7 (10.6–15.1)	^{1,4,5} 7.9 (6.0–10.1)	^{2,4,5} 13.8 (11.8–15.9)	³ 4.6 (2.9–7.0)	^{3,5,6} 5.4 (3.9–7.2)	^{1,3} 4.8 (3.3–6.6)	^{2,3,4,6,8,9} 9 (7.6–10.4)
Chronic kidney disease.	¹ 5.7 (4.8–6.6)	² 6.8 (5.9–7.8)	^{1,5} 8 (4.7–7.1)	^{2,4,5} 7.2 (6.0–8.6)	⁵ 6.9 (5.4–8.6)	^{4,5,7} 6 (6.1–9.5)	⁵ 2 (3.4–7.6)	^{3,6} 3.2 (1.5–5.8)	³ 4.5 (3.3–6.0)	^{3,6,4} 4.4 (3.4–5.6)
COPD	⁴ 8 (3.8–5.9)	⁵ 6 (4.4–7.0)	^{4,5} 5.0 (3.9–6.3)	^{4,5,6} 3 (4.6–8.4)	⁴ 4.5 (3.3–6.0)	^{4,5} 5.4 (4.0–7.1)	^{3,5,6} 1.1 (0.5–2.2)	^{3,6} 1.6 (0.8–2.8)	^{4,6} 3.2 (1.9–4.9)	^{3,6,2} 7 (1.7–3.9)
At least one condition	¹ 79.9 (75.8–83.6)	² 70.8 (67.4–73.9)	^{1,3,7} 9.0 (73.0–84.2)	^{2,3,4,6,8} 8 (63.9–73.4)	^{4,5,6} 88.2 (83.8–91.7)	^{4,5,6} 84.9 (80.7–88.5)	^{1,3,5} 71.6 (65.0–77.6)	^{2,3,5,6} 52.1 (46.3–57.8)	^{1,3,4} 80.5 (76.4–84.2)	^{2,3,4,7} 11 (67.4–74.6)
At least two conditions	¹ 48.2 (44.0–52.5)	² 42.7 (39.1–46.4)	^{1,4,4,9} 7 (43.7–55.8)	^{2,3,4,4,0} 0 (34.6–45.6)	^{1,4,5} 53.8 (49.1–58.5)	^{2,4,5,6} 62.2 (57.8–66.4)	^{1,3,5,6} 30.8 (25.4–36.6)	^{2,3,5,6} 23.3 (17.5–29.8)	^{3,4} 46.7 (42.2–51.1)	^{3,4,4} 1.7 (36.8–46.7)
At least three conditions	²⁰ 5 (18.2–23.0)	²⁰ 3 (18.1–22.8)	⁴ 19.8 (16.4–23.4)	^{3,4} 18.6 (15.7–21.7)	^{1,4} 24.5 (20.6–28.7)	^{2,4,5,6} 32.5 (28.4–36.8)	^{1,3,5,6} 13.0 (8.9–18.1)	^{2,3,5,6} 7.3 (4.7–10.8)	⁴ 20.5 (16.3–25.2)	^{3,4} 19.5 (16.3–23.1)

¹Significantly different from females.
²Significantly different from males.
³Significantly different from non-Hispanic black persons.
⁴Significantly different from non-Hispanic Asian persons.
⁵Significantly different from Hispanic persons.
⁶Significantly different from non-Hispanic white persons.

NOTES: Data from the National Health and Nutrition Examination Survey; all estimates except sample sizes are weighted. Korn and Graubard 95% confidence intervals (CI) were calculated. Hypertension was defined as mean (less than or equal to three measurements) systolic blood pressure greater than or equal to 130 mmHg or mean (less than or equal to three measurements) diastolic blood pressure greater than or equal to 80 mmHg, or self-reported current hypertension medication use. Obesity was defined as BMI greater than or equal to 30. Severe obesity was defined as BMI greater than or equal to 40. Smoking was defined as self-reported smoking at least 100 cigarettes over a lifetime and currently smoking every day or some days, or serum cotinine greater than 10 ng/mL. This definition could potentially capture users of tobacco products that are not burned (for example, smokeless tobacco and e-cigarettes) or that do not use smoked tobacco products. Diabetes was defined as self-reported diabetes or fasting plasma glucose greater than or equal to 126 mg/dL, or hemoglobin A1c greater than or equal to 6.5%. Adults aged 40 and over self-reported serious heart disease, defined as diagnosed congestive heart failure, coronary heart disease, angina, or heart attack, as well as angina grades 1 or 2 determined by the Rose Angina Questionnaire. Asthma was defined as self-reported asthma. Chronic kidney disease was defined as estimated glomerular filtration rate (eGFR) less than 60 (stages 3–4), excluding eGFR less than 15 (stage 5), and using a forward equation for adjustment because of methods changes. COPD is chronic obstructive pulmonary disease and was defined as self-reported diagnosed COPD, emphysema, or current chronic bronchitis. Unless specified as crude, estimates were age adjusted to the projected 2000 U.S. Census population using the direct method and the age groups 20–39, 40–64, and 65 and over. Pregnant women were excluded from hypertension, obesity, severe obesity, diabetes, and chronic kidney disease.

SOURCE: National Center for Health Statistics, National Health and Nutrition Examination Survey, 2015–2018.

capture undiagnosed conditions (10,11). For example, 2013–2016 NHANES data showed that 30.7% of adults with diabetes were undiagnosed (11), and in 2019, an estimated 90% of adults with CKD were unaware (12) of their condition.

Limitations of the study include that NHANES response rates have declined; however, weighting adjustments have been shown to minimize errors from nonresponse and sample variation (13). Also, the prevalence of several conditions that increase the risk of severe COVID-19 (including pregnancy, solid organ transplants, sickle cell, and Down syndrome) could not be evaluated given that they were not included in NHANES or sample sizes were too small to make statistically reliable estimates (2–4).

Evidence has shown that racial and ethnic minority groups have an increased risk of severe illness and death associated with COVID-19 (3). NHANES measured data show that some of these groups also have higher rates of select conditions that increase risk of severe COVID-19 illness. Understanding populations at highest risk for severe COVID-19-related illness is important for understanding the health burden and for informing prevention strategies.

References

- Centers for Disease Control and Prevention. CDC COVID data tracker. 2020. Available from: https://covid.cdc.gov/covid-data-tracker/#cases_casesinlast7days.
- Centers for Disease Control and Prevention. Evidence used to update the list of underlying medical conditions that increase a person's risk of severe illness from COVID-19. 2020. Available from: <https://www.cdc.gov/coronavirus/2019-ncov/need-extra-precautions/evidence-table.html>.
- Centers for Disease Control and Prevention. Risk for COVID-19 infection, hospitalization, and death by race/ethnicity. 2020. Available from: <https://www.cdc.gov/coronavirus/2019-ncov/covid-data/investigations-discovery/hospitalization-death-by-race-ethnicity.html>.
- National Center for Health Statistics. NHANES questionnaires, datasets, and related documentation. 2020. Available from: <https://wwwn.cdc.gov/Nchs/Nhanes/>.
- Yoon SS, Dillon CF, Illoh K, Carroll M. Trends in the prevalence of coronary heart disease in the U.S.: National Health and Nutrition Examination Survey, 2001–2012. *Am J Prev Med* 51(4):437–45. 2016.
- Parker J, Talih M, Malec D, Beresovsky V, Carroll M, Gonzalez Jr JF. National Center for Health Statistics data presentation standards for proportions. *Vital Health Stat* 2(175). 2017.
- Raifman MA, Raifman JR. Disparities in the population at risk of severe illness from COVID-19 by race/ethnicity and income. *Am J Prev Med* 59(1):137–9. 2020.
- Razzaghi H, Wang Y, Lu H, Marshall KE, Dowling NF, Paz-Bailey G, et al. Estimated county-level prevalence of selected underlying medical conditions associated with increased risk for severe COVID-19 illness—United States, 2018. *MMWR Morb Mortal Wkly Rep* 69(29):945–50. 2020.
- Selden TM, Berdahl TA. COVID-19 and racial/ethnic disparities in health risk, employment, and household composition. *Health Aff (Millwood)* 39(9):1624–32. 2020.
- Flegal KM, Ogden CL, Fryar C, Afful J, Klein R, Huang DT. Comparisons of self-reported and measured height and weight, BMI, and obesity prevalence from National Surveys: 1999–2016. *Obesity (Silver Spring)* 27(10):1711–19. 2019.
- Mendola ND, Chen T-C, Gu Q, Eberhardt MS, Saydah S. Prevalence of total, diagnosed, and undiagnosed diabetes among adults: United States, 2013–2016. NCHS Data Brief, no 319. Hyattsville, MD: National Center for Health Statistics. 2018.
- Centers for Disease Control and Prevention. Chronic kidney disease in the United States, 2019. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention. 2019.
- Fakhouri THI, Martin CB, Chen TC, Akinbami LJ, Ogden CL, Paulose-Ram R, et al. An investigation of nonresponse bias and survey location variability in the 2017–2018 National Health and Nutrition Examination Survey. *National Center for Health Statistics. Vital Health Stat* 2(185). 2020.

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