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Hospitalizations for COVID-19 Among American Indian and Alaska Native Adults (≥ 18 Years Old) — New Mexico, March–September 2020

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Abstract

To assess the presence of racial disparity during the COVID-19 pandemic, the New Mexico Department of Health (NMDOH) sought to compare the case rate and risk of hospitalization between persons of American Indian and Alaska Native (AI/AN) race and persons of other races in New Mexico from March 1 through September 30, 2020. Using NMDOH COVID-19 surveillance data, age-standardized COVID-19 case and hospitalization risks were compared between adults (≥ 18 years old) of AI/AN and other races. We compared age, sex, and comorbidities between hospitalized adults of AI/AN and other races. Among AI/AN persons, age-standardized COVID-19 case and hospitalization risks were 3.7 (95% CI 3.6–3.8) and 10.5 (95% CI 9.8–11.2) times as high as persons of other races. Hospitalized AI/AN patients had higher proportions of diabetes mellitus (48% vs. 33%, $P < 0.0001$) and chronic liver disease (8% vs. 5%, $P = 0.0004$) compared to hospitalized patients of other races. AI/AN populations have disproportionately higher risk of COVID-19 hospitalization compared to other races in New Mexico. By identifying etiologic factors that contribute to inequity, public health partners can implement culturally appropriate health interventions to mitigate disease severity within AI/AN communities.

Keywords COVID-19 · American Indian/Alaska Native · COVID-19 hospitalization · Diabetes mellitus

Introduction

Severity of disease and mortality caused by SARS-CoV-2 infection (COVID-19) has been associated with older age, presence of comorbidities, and race/ethnicity [1–3]. The American Indian and Alaska Native (AI/AN) population was identified early in the pandemic as disproportionately affected by COVID-19 with 3.5 times the cumulative incidence of COVID-19 compared to non-Hispanic White populations [4]. That measure provides evidence of health disparity across 23 states, but the distribution of race varies considerably across US health jurisdictions. While AI/AN persons make up 1.3% of the general US population (United States Census 2019 Population Estimates. https://www.census.gov/), they represent 9% of the population of New Mexico, a state of just over 2 million people (New Mexico 2019 Population Estimates, University of New Mexico, Geospatial and Population Studies (GPS) Program. https://gps.unm.edu/). Over 10% of the state's land area is designated as tribal land, representing 23 American Indian Tribes, Pueblos, and Nations. Historically, AI/AN populations have been disproportionately affected by other infectious diseases. Between 2004 and 2017 in New Mexico, non-Hispanic AI/AN persons experienced two to three times the rate of influenza and pneumonia deaths compared to Hispanic, non-Hispanic White, non-Hispanic Black, and non-Hispanic Asian/Pacific Islander persons [5]. Similarly, in a study comparing rates in 12 selected states, AI/AN persons had four times the mortality rate due to the 2009 pandemic H1N1 influenza virus when compared to all other races and ethnicities [6].

While disparities among COVID-19 case and mortality risk has been identified for the AI/AN population compared with other racial and ethnic groups [3, 4, 7],

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risk of hospitalization among AI/AN has not been fully documented. Furthermore, comorbidities and their impact on COVID-19 disease severity within this group have not yet been characterized. Researchers with the New Mexico Department of Health (NMDOH) analyzed COVID-19 surveillance data to characterize patients of AI/AN race hospitalized for COVID-19 in New Mexico from March 1, 2020, through September 30, 2020. We explored differences in age, sex, and comorbidities between AI/AN patients and patients of other races hospitalized for COVID-19.

Methods

Data Collection

In March 2020, NMDOH began requiring notification and subsequent investigation of positive SARS-CoV-2 laboratory reports in New Mexico residents. Data from laboratory reports, case investigation interviews, and COVID-19 hospitalization reports were stored in the New Mexico Electronic Disease Surveillance System (NMEDSS) and supplemented with a separate case investigation data system beginning July 2020. NMEDSS (Infectious Disease Epidemiology Bureau, Epidemiology and Response Division, New Mexico Department of Health) is a web-based system used by public health staff throughout the state to track investigations of suspected, probable, and confirmed cases of notifiable infectious diseases. NMDOH relies on health care providers, laboratories, hospitals, clinics, institutions, and individuals to report suspected and confirmed notifiable infectious diseases in accordance with New Mexico Administrative Code 7.4.3.13. After NMDOH receipt of a positive FDA-authorized SARS-CoV-2 RNA or antigen laboratory report in a New Mexico resident, epidemiologists from NMDOH, Albuquerque Area Southwest Tribal Epidemiology Center (AASTEC), or Indian Health Service (IHS) began a standardized case investigation. Case investigators interviewed patients or their proxies (such as a parent or spouse in the event of death, incapacitation, or age of minority) to confirm demographic information including date of birth, sex, address, race, and (if applicable) tribal affiliation, and to ascertain SARS-CoV-2 exposure history, occupation, symptoms, comorbidities, hospitalization status, intensive care unit admission, mechanical ventilation status, and mortality. NMDOH and AASTEC case investigators entered interview data directly into NMEDSS while IHS case investigators completed a case report form which was later entered into NMEDSS by NMDOH staff. Beginning in July 2020, a newly formed NMDOH case investigation unit began conducting interviews and entering data using the New Mexico Salesforce/MTX COVID-19 Case Investigation Platform (Salesforce.com, Inc., San Francisco, CA). In all, approximately 80% of the 25,990 COVID-19 cases reported in New Mexico adults from March 1 through September 30, 2020, were interviewed. Salesforce-based investigators interviewed 4796 (18%) patients, of which 3135 (65%) were matched to NMEDSS data for analysis.

Case Definitions

NMDOH defined a case of COVID-19 as detection of SARS-CoV-2 RNA or antigen by an FDA-approved molecular assay of a respiratory specimen collected from a New Mexico resident in accordance with laboratory confirmed and presumptive case definitions by the Centers for Disease Control and Prevention (CDC) (https://ndc.services.cdc.gov/case-definitions/coronavirus-disease-2019-2020-08-05/). For this analysis, COVID-19 cases were restricted to those among adults ≥ 18 years and with complete race data. Race was determined by self-report during interviews with patients or their proxies. If the patient could not be contacted, race was inferred based on one or more sources including race information on hospital and laboratory reports, inquiries to hospital staff by the NMDOH COVID-19 hospitalization follow-up team, inquiries to tribal leaders by the NMDOH COVID-19 tribal team, and residence on tribal lands. Of 25,990 COVID-19 cases reported among adults in New Mexico from March 1 through September 30, 2020, there were 24,853 (96%) cases with complete race data.

A COVID-19 hospitalization was defined as a SARS-CoV-2 infection requiring hospitalization for at least 24 h confirmed by an FDA-approved RNA or antigen molecular assay of a respiratory specimen. Hospitalizations were ascertained by patient self-report and/or notification by hospital and inpatient facilities. The NMDOH COVID-19 hospitalization follow-up team confirmed adherence to the hospitalization case definition by medical record review.

Data Analysis

We calculated risk per 1000 population for COVID-19 cases and hospitalizations reported from March 1 through September 30, 2020, stratifying by age group (18–29 years, 30–39 years, 40–49 years, 50–59 years, 60–69 years, 70–79 years, and ≥ 80 years) and race (AI/AN vs. all other races, including African American or Black, Asian, Native Hawaiian or Pacific Islander, and White) and using 2019 New Mexico population estimates as denominators. Individuals reporting AI/AN race were included into the AI/AN category, regardless of any additional races reported. Risk was age-standardized to the 2000 US standard population [8], and 95% confidence intervals (CI) were calculated using the Byar approximation to the Poisson distribution [9]. Case and hospitalization risks were compared between AI/AN and all

other races using standardized risk ratios (RR). Due to the large proportion of COVID-19 patients with unknown hospitalization status ($n = 8380$; 34% of the 24,853 cases with complete race data), a sensitivity analysis was performed to evaluate the effect of differential missing information by race on hospitalization risk ratios. Hypothetical hospitalization risk ratios were calculated varying hospitalization prevalence among patients with unknown hospitalization status from 0 to 20%, allowing this prevalence to differ by race.

The distribution of demographics (i.e., age and sex) and comorbidities among hospitalized COVID-19 patients of AI/AN race were compared to the distribution among other races. Patients with unknown hospitalization status were considered non-hospitalized patients. This assumption was made due to the requirement by NMDOH that New Mexico hospitals and inpatient facilities report hospitalized COVID-19 cases to the NMDOH COVID-19 hospitalization follow-up team, who update the database accordingly. Therefore, if a patient is missing hospitalization status, the authors feel it is a reasonable assumption that the individual was likely not hospitalized. Comorbidities were ascertained by self-report from a list of yes/no questions in the case investigation form. Because the COVID-19 response was an evolving effort, the case investigation form was modified several times during the study period. While most questions remained constant over this time, several comorbidity questions (obesity, hypertension, autoimmune conditions, psychological or psychiatric conditions, and substance misuse) were inconsistently included in the interview form. Although smoking was included in the case investigation, the question did not differentiate cigarette smoking from ceremonial pipe practices and so was excluded. For this reason, only chronic lung disease, diabetes mellitus, cardiovascular disease, chronic renal disease, chronic liver disease, and immunocompromised conditions were included in the analysis. Of these comorbidities, examples were only consistently provided for chronic lung disease (as in asthma, emphysema, and chronic obstructive pulmonary disease). The number of comorbidities present in a single patient was also compared among groups by counting the number of conditions reported and categorizing into none and one or more comorbidities. Any records with all unknown or missing comorbidities were treated as missing the number of comorbidities.

Two-sample Wilcoxon rank sum tests were used to compare the difference in age among hospitalized patients by AI/AN status. Chi-squared tests were used to compare difference in proportions for all other variables. Differences in the proportions of data completeness of age, sex, and comorbidity variables were compared between AI/AN and all other races among hospitalized patients using Fisher's exact and Chi-squared tests. Due to systematic differences in completeness by hospitalization status and race group, more complex analyses, such as multivariate regression models, were not attempted. All analyses were performed using SAS v.9.4, and figures were created using the ggplot2 package in R v.4.0 [10].

This activity was reviewed by CDC and was conducted consistent with applicable federal law and CDC policy (see, e.g., 45 C.F.R. part 46.102(l)(2), 21 C.F.R. part 56; 42 U.S.C. §241(d); 5 U.S.C. §552a; 44 U.S.C. §3501 et seq.).

Results

Of 24,853 COVID-19 cases included in this analysis with complete race data reported among adults in New Mexico from March 1 through September 30, 2020, 7810 (31%) individuals were identified as AI/AN. Although ethnicity was not considered in this analysis, 247 (3%) of the 7810 patients categorized as AI/AN were also identified as Hispanic or Latino ethnicity. During March–May 2020, there were more COVID-19 cases among the AI/AN population compared to other race groups (Fig. 1). This period was followed by more COVID-19 cases among non-AI/AN persons through September 2020. Case risk among AI/AN adults was greater than those among other races across all age groups (Table 1; Fig. 2), with the largest differences among cases aged 60–69 years (RR: 6.5, 95% CI 6.1–7.1) and 70–79 years (RR: 6.7, 95% CI 6.0–7.5). After adjusting for age as a covariate, the case risk among AI/AN persons was 3.7 (95% CI 3.6–3.8) times the risk among other races. Similarly, hospitalization risk was higher in AI/AN populations across all age groups. AI/AN adults aged 60–69 years had the largest difference compared to other races (RR: 13.9, 95% CI 11.9–16.2) (Table 1; Fig. 2). After age-standardization, risk of COVID-19 hospitalizations among AI/AN persons was 10.5 (95% CI 9.7–11.2) times the risk among other races.

Of the 17,043 patients of all other races, 1552 (9%) were hospitalized, compared to 1636 (21%) AI/AN patients. Hospitalized AI/AN COVID-19 patients tended to be younger (median age 55 years; IQR: 42–66) compared to hospitalized patients of all other races (median age 62 years; IQR: 47–75; $P < 0.0001$) (Table 2). Among hospitalized patients, completeness of comorbidity data was less among AI/AN patients (range: 73.5–75.4%) compared with non-AI/AN patients (77.3–79.8%; $P < 0.05$) (Supplemental Table). Although the frequency of one or comorbidities was greater among hospitalized AI/AN patients compared to those of all other races (proportion with ≥ 1 comorbidities: 68% vs. 64%, respectively, $P = 0.04$), hospitalized AI/AN patients had higher proportions of only two of the available conditions: diabetes mellitus (48% vs. 33%, $P < 0.0001$) and chronic liver disease (8% vs. 5%, $P = 0.0004$). The remaining comorbidities were either similar or lower in proportion

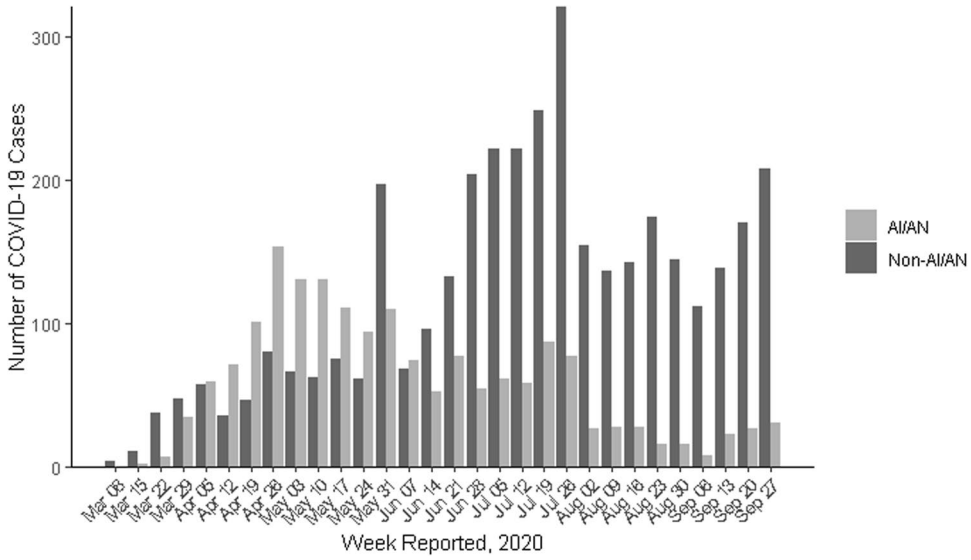

Fig. 1 Weekly confirmed COVID-19 cases among persons of American Indian/Alaska Native race and persons of other race, New Mexico, March 1–September 30, 2020

Table 1 Crude, age-specific, and age-standardized COVID-19 case and hospitalization risk per 1000 population for American Indian/Alaska Native (AI/AN) and all other races, New Mexico, March 1–September 30, 2020

	COVID-19 cases		COVID-19 hospitalizations	
Population	AI/AN ($N=7810$)	All other races[1] ($N=17{,}043$)	AI/AN ($N=1636$)	All other races[1] ($N=1552$)
Age group	Risk (95% CI)	Risk (95% CI)	Risk (95% CI)	Risk (95% CI)
18–29 years	36.4 (34.7–38.2)	16.2 (15.8–16.7)	2.3 (1.8–2.7)	0.4 (0.3–0.4)
30–39 years	50.8 (48.4–53.3)	14.1 (13.6–14.6)	7.0 (6.2–8.0)	0.6 (0.5–0.8)
40–49 years	52.3 (49.6–55.1)	13.9 (13.4–14.4)	10.1 (8.9–11.3)	0.8 (0.7–1.0)
50–59 years	49.0 (46.4–51.8)	11.0 (10.6–11.4)	13.0 (11.7–14.5)	1.2 (1.0–1.3)
60–69 years	47.0 (44.0–50.0)	7.2 (6.8–7.5)	17.4 (15.7–19.3)	1.3 (1.1–1.4)
70–79 years	39.0 (35.3–42.9)	5.8 (5.4–6.2)	18.0 (15.6–20.8)	1.8 (1.6–2.0)
80 + years	55.6 (49.4–62.4)	9.5 (8.8–10.2)	23.1 (19.2–27.6)	3.3 (2.9–3.7)
All ages – crude	45.9 (44.9–46.8)	11.7 (11.5–11.9)	9.6 (9.2–10.1)	1.07 (1.01–1.12)
All ages – age-standardized	46.7 (45.6–47.7)	12.5 (12.3–12.7)	10.1 (9.6–10.6)	0.97 (0.92–1.02)

[1]All other races include African American or Black, Asian, Native Hawaiian or Pacific Islander, and White

among hospitalized AI/AN patients compared to hospitalized non-AI/AN patients (Table 2).

In a sensitivity analysis to assess the impact of missing hospitalization status, when the hospitalization proportion among cases with missing data resembled that of cases with known hospitalization status (20% among AI/AN persons and 10% among other races), the age-standardized risk ratio (10.2, 95% CI 9.6–10.8) was comparable to the risk ratio in the main analysis (Supplemental Figure). The age-standardized risk ratio decreased moderately when both race groups had equal hospitalization proportions among cases with missing data at 10% (RR: 8.9, 95% CI 8.4–9.5) and 20% (RR: 8.1, 95% CI 7.6–8.5); however, the greatest decrease occurred when hospitalization proportion was less among AI/AN persons with missing hospitalization status compared to other races (10% vs. 20%) (RR: 4.3, 95% CI 4.1–4.6). Even with a reversal in the proportion of hospitalizations among cases with missing data compared to the expectation provided by those with complete data, AI/AN persons still had a significantly higher risk of hospitalization compared to other races.

Discussion

During the first 7 months of the COVID-19 pandemic in New Mexico, AI/AN populations had markedly higher risk of COVID-19 cases and hospitalizations compared to all other races, across all age groups and after age adjustment. Our findings contribute to a growing body of evidence documenting significant inequities in COVID-19 disease burden and severity for persons identifying as AI/AN. On the

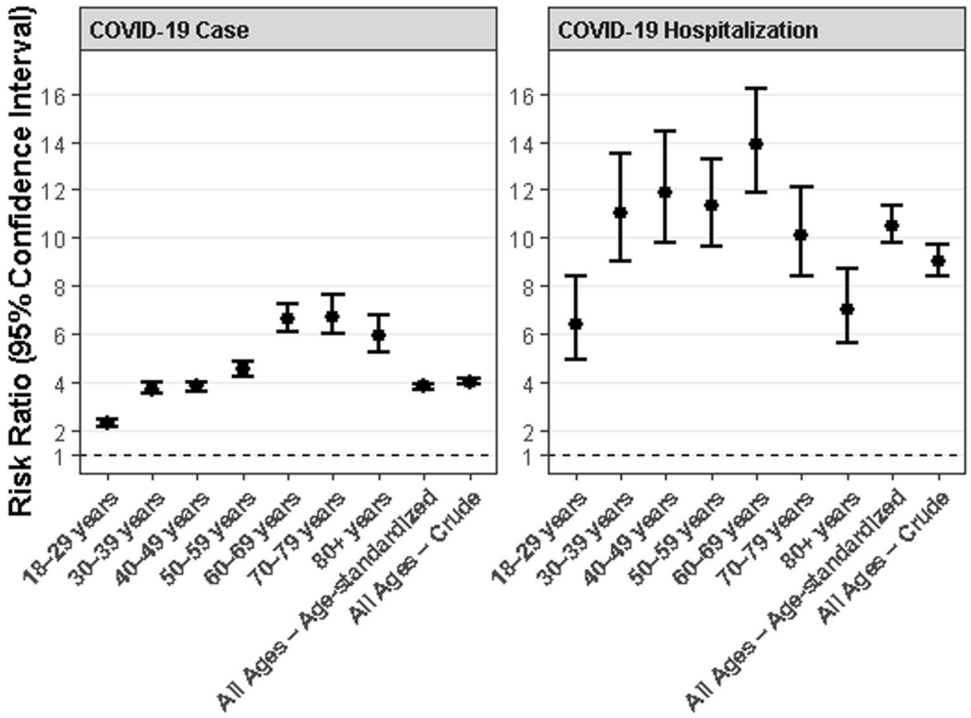

Fig. 2 Age-specific and age-standardized COVID-19 case and hospitalization risk ratios for American Indian/Alaska Native (AI/AN) compared to all other races, New Mexico, March 1–September 30, 2020

Table 2 Comparison of demographic characteristics and comorbidities among adults hospitalized with COVID-19 of American Indian/Alaska Native (AI/AN) vs other races, March 1–September 30, 2020

	AI/AN ($N=1636$) No. (%)	All other races[1] ($N=1552$) No. (%)	*P* value
Median age, years (IQR)	55 (42 – 66)	62 (47 – 75)	< 0.0001
Sex			0.002
Female	888 (54.7)	763 (49.2)	
Male	735 (45.3)	787 (50.8)	
One or more comorbidities	840 (68.1)	795 (64.2)	0.04
Chronic lung disease (asthma/emphysema/COPD)	206 (17.0)	287 (23.7)	< 0.0001
Diabetes mellitus	586 (48.2)	402 (33.2)	< 0.0001
Cardiovascular disease	284 (23.6)	353 (29.2)	0.002
Chronic renal disease	115 (9.6)	160 (13.3)	0.004
Chronic liver disease	100 (8.3)	57 (4.7)	0.0004
Immunocompromised condition	53 (4.4)	107 (8.9)	< 0.0001

IGR Interquartile range; *COPD* chronic obstructive pulmonary disease

[1]All other races include African American or Black, Asian, Native Hawaiian or Pacific Islander, and White

national scale, AI/AN persons are overrepresented among COVID-19 confirmed cases; the proportion of COVID-19 case patients who identify as AI/AN was 30% higher than the proportion of AI/AN persons within the general US population [3]. In addition, of US cases reported between February 1 and July 22, 2020, the rate of years of potential life lost before the age of 65 per 100,000 persons was about nine times as high for the non-Hispanic AI/AN population as compared to the non-Hispanic White population [11]. While both studies are limited due to the incompleteness of race and ethnicity data reported on a national scale, evidence of racial inequities remain when evaluating a subset of health jurisdictions with adequate race data. For example, across 23 states, COVID-19 incidence among the AI/AN population was 3.5 times that of the non-Hispanic White population [4]. Similarly, in a report of 14 states, age-adjusted COVID-19 mortality rates of AI/AN populations were almost double that of White persons overall but between 8 and 12 times that of White persons among individuals aged 20 to 49 years old [7]. Identifying and addressing the causes of such disparity is critical to mitigating the impact of the COVID-19 pandemic on AI/AN populations.

In our analysis, although the proportion of hospitalized AI/AN patients with one or more comorbidities was slightly greater than that of other races, hospitalized AI/AN patients were younger and had lower or similar prevalence of many comorbidities compared to hospitalized patients of all other races. While this might suggest a population with lower or comparable susceptibility to severe COVID-19, our data show that the New Mexico AI/AN population has almost 11 times the risk of COVID-19 hospitalizations compared to the non-AI/AN population. Of the analyzed comorbidities, diabetes mellitus and chronic liver disease were more frequently reported among hospitalized AI/AN patients compared to hospitalized non-AI/AN patients. The proportion of hospitalized AI/AN patients with chronic liver disease was 77% greater than hospitalized patients of other races. For context, between 2014 and 2017 in New Mexico, AI/AN persons experienced six times the mortality rate due to chronic liver disease and cirrhosis compared to non-Hispanic White persons, indicating underlying distributions of this comorbidity across racial groups in the general population might be reflected in COVID-19 hospitalized patients [12]. In our analysis, almost half of hospitalized AI/AN adults with complete comorbidity data reported diabetes mellitus, the most common comorbidity among both racial groups evaluated. In comparison, the prevalence of diabetes mellitus was approximately 20% within the New Mexico non-Hispanic AI/AN population during 2015–2017 compared to 6% in the non-Hispanic white population [5], suggesting persons with diabetes mellitus are over-represented among patients hospitalized with COVID-19. Diabetes mellitus has been associated with COVID-19 hospitalization, intensive care unit admission, and mortality [13–16]. Although diabetes mellitus prevalence among AI/AN has decreased in recent years nationwide [17], the AI/AN population continues to have the highest prevalence of diagnosed diabetes mellitus (15%) compared to other racial groups (Hispanic/Latino: 13%; non-Hispanic Black: 12%; non-Hispanic Asian: 9%; non-Hispanic White: 8%) [18], which may partially explain this population's susceptibility to COVID-19 hospitalization, but does not seem to account for it fully.

Persisting racial inequities secondary to the historic and continuing trauma of colonial practices and policies have contributed to disparities in political, structural, and socioeconomic factors that adversely affect the health of AI/AN populations and increase susceptibility to SARS-CoV-2 infection [19, 20]. Poverty and inadequate infrastructure increase an individual's risk of infection by increasing exposure to the virus [3, 21]. This includes crowded households, lack of running water, and work in low income occupations that require in-person attendance [3, 22, 23]. Increased risk of infection alone does not explain the disparities observed in COVID-19 hospitalizations. Factors that compromise individual health or delay early intervention may result in more severe disease including hospitalization, intensive care unit admission, and death. The disproportionate prevalence of chronic conditions such as diabetes is secondary to factors such as poverty, lack of access to nutritious foods, and lack of access to healthcare [17]. Delays in diagnosis and care for both chronic conditions and COVID-19 may be caused by fear of COVID-19 exposure, large geographic distances to health care facilities, lack of transportation, insufficient public health infrastructure, and limited access to specialty medical care on tribal lands. These can affect any racial population but might have more severe consequences in a population with a greater burden of chronic conditions. The health of patients with unmanaged chronic diseases might more easily decompensate during COVID-19, resulting in a course of disease complicated by comorbidities. Delays in early intervention due to mistrust in or lack of access to healthcare might result in more severe COVID-19 outcomes that might have been avoided if acted upon earlier.

Several limitations impact interpretation of this analysis. First, about a quarter of hospitalized cases had missing comorbidity data. In addition, marked differences in data completeness were observed for both hospitalization and AI/AN status. Due to the potential for significant bias, a multivariable regression model evaluating the confounding effect of comorbidities on the association between race and COVID-19 hospitalization was not performed. Further, descriptive comparisons were limited to within the hospitalized patient population, and comparisons with non-hospitalized patients were not performed. Comorbidity proportions may be overestimated if missing data occurred more frequently in those without an underlying health condition; however, the minimal difference in missing between hospitalized AI/AN and non-AI/AN patients might have mitigated its impact. Second, case investigation procedures and forms varied as the COVID-19 pandemic response evolved. For example, the inconsistent inclusion of obesity as a comorbidity in the NMDOH case investigation form prevented its inclusion for analysis. Because obesity is associated with both diabetes mellitus and COVID-19 severity, the role of this medical condition as confounder or causal factor could not be evaluated and might represent an important gap in the conclusions of this report. Third, the evolving response also led to changes in testing and hospitalization priorities over the course of the pandemic. Due to constrained testing capacity early on, COVID-19 tests were restricted to symptomatic patients. Limited access to testing might have underestimated the true number of COVID-19 cases, especially early in the pandemic and in more rural settings. Similarly, during local COVID-19 surges that limited hospital capacity, patients, who at other times would have been admitted, might have been treated as out-patient. Fourth, we did not adjust case and hospitalization risk for population-level prevalence of comorbidities in the evaluated racial groups.

Adjusting risk ratios for comorbidity prevalence might quantify the contribution comorbid conditions have on the association between race and COVID-19 in New Mexico. Fifth, although occupation was included in the structured case investigation, this was not included in the presented analysis due to incompleteness and lack of standardization of responses. Finally, racial misclassification may result in an underestimation of AI/AN COVID-19 cases and hospitalizations as AI/AN individuals are more likely to be classified as other races and ethnicities in public health data [24, 25]. To offset this misclassification and to ensure all individuals who identified as AI/AN were included in this analysis, Hispanic or Latino ethnicity was not considered when categorizing racial groups. This categorization likely had minimal impact on the results of this analysis, as only 247 (3%) of AI/AN individuals identified as Hispanic or Latino.

Our findings emphasize the continued need to identify and address health disparities experienced by AI/AN populations. While measuring health disparities is a critical step, further investigation into the root causes of health inequities, including institutional, systemic, community, and household characteristics, is needed to identify modifiable structural and environmental factors that increase susceptibility to infectious and chronic diseases. By identifying etiologic factors that contribute to such inequity, public health partners can provide evidence for the implementation of effective and culturally appropriate health interventions to mitigate disease severity in AI/AN communities. Collaboration and data sharing between federal, state, local, and tribal governments can help ensure all health jurisdictions have accurate situational awareness to help protect their people's health. This includes the development of innovative solutions to overcome barriers in data sharing among jurisdictions as well as the continued re-training of public health and clinical staff to accurately collect race, ethnicity, and tribal affiliation data. While necessary at all times, efficient means of communication and data sharing is especially critical during a global public health emergency. Continued support to tribal communities with approaches that honor and uphold tribal sovereignty is essential to empower AI/AN communities to overcome disparity and inequity.

Supplementary Information The online version contains supplementary material available at https://doi.org/10.1007/s40615-021-01196-0.

Author Contribution George Khalil proposed and planned the initial analysis. Brooke Doman and Tierney Murphy supervised data collection and analysis. Joseph T. Hicks conducted the analysis and drafted the manuscript. Eleanor Burnett and Almea Matanock provided critical analytical support. Kevin English provided key data interpretation. All authors critically revised the manuscript and have approved the submitted version.

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Data Availability Data may be requested via the New Mexico Department of Health Epidemiology and Response Division.

Code Availability SAS analysis code is available by contacting the corresponding author.

Declarations

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. Use of trade names and commercial sources is for identification only and does not imply endorsement by the US Department of Health and Human Services.

Ethics Approval This activity was reviewed by CDC and was conducted consistent with applicable federal law and CDC policy (see e.g., 45 C.F.R. part 46.102(l)(2), 21 C.F.R. part 56; 42 U.S.C. §241(d); 5 U.S.C. §552a; 44 U.S.C. §3501 et seq.).

Consent to Participate Not applicable.

Consent for Publication Not applicable.

Conflict of Interest The authors declare no competing interests.

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