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Health Conditions and Health Care Use Among American Indian and Alaska Native Adults by Tribal Land Residential Status: United States, 2019–2021

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Abstract

Objective—This report presents estimates for selected health conditions and health care use among American Indian and Alaska Native (AIAN) adults by tribal land residential status.

Methods—Data from the National Health Interview Survey collected during 2019–2021 were used to estimate the percentage of AIAN adults with a) selected circulatory, endocrine, and rheumatological conditions; b) access to and who used healthcare services, including selected vaccinations; and c) regular feelings of anxiety and depression and access to mental health treatment, by tribal land residential status. Unadjusted prevalence estimates and both unadjusted and adjusted prevalence ratios with 95% confidence intervals are presented for each measure.

Results—In 2019–2021, the percentage of AIAN adults who ever had diagnosed diabetes was significantly higher for those living on tribal lands (18.9%) compared with those living off tribal lands (11.5%). While AIAN adults living on tribal lands were more likely to have a usual place of care, they also were more likely to have an emergency room visit in the past 12 months compared with those living off tribal lands. The percentage of AIAN adults who received an influenza vaccination in the past 12 months was higher among those living on tribal lands (49.6%) compared with those living off (39.2%). AIAN adults living on tribal lands were less likely to delay or not receive mental health treatment due to cost in the past 12 months compared with AIAN adults living off tribal lands (2.2% compared with 8.3%, respectively; p < 0.05). Each of these associations remained after adjusting for differences in education level between the two groups.

Keywords: health care use • health disparities • diabetes • influenza vaccination • National Health Interview Survey

Introduction

According to the 2020 U.S. Census, 9.7 million people identify as American Indian or Alaska Native (AIAN), alone or in combination with another race group (1). There are 574 federally recognized AIAN tribes and more than 100 state-recognized

tribes (2,3). Among the 9.7 million people in the AIAN population, about 13.2% live on tribal lands (4). The Indian Health Service (IHS), an agency within the U.S. Department of Health and Human Services, provides health services to this population. These services may be provided directly, through tribal nations and organizations, or through Urban Indian Organizations that receive IHS grants and contracts (2,5,6). Most IHS funds are provided for AIAN people who live on or near tribal reservations or Alaska villages (5,6). Because some of these locations may be in more remote areas of the country, it may be difficult for AIAN people not living near these areas to access these services (5-7).

Persistent health disparities exist between AIAN adults and adults from other racial and ethnic groups in the United States (8–12). Data from the 2014–2018 National Health Interview Survey (NHIS) have shown that AIAN adults were more likely to be in fair or poor health and have a disability, diagnosed hypertension, diagnosed diabetes, or multiple chronic conditions compared with adults from other racial and ethnic groups (11). Similarly, an analysis of data from the 2017 Behavioral Risk Factor Surveillance System showed that AIAN adults were more likely than





adults from other racial and ethnic groups to experience health-related risk factors, such as physical inactivity, smoking, and obesity (12). Moreover, these differences remained when examined by region. Research suggests that exploring the diversity within the AIAN population is important to expand knowledge of the varied health needs of this population (12).

Limited information exists on the potential variation in health status of and health care use by AIAN adults by tribal land residential status. Data from the 2005–2014 National Survey on Drug Use and Health showed that AIAN adults living on tribal lands were as likely as those living off tribal lands to have a mental illness in the past year but were more likely to have a substance use disorder in the past year (13). AIAN adults living on tribal lands also were less likely to receive substance use treatment compared with those living off tribal lands.

Building on previous research, this report uses data from the 2019–2021 NHIS to examine differences in estimates of selected health conditions and health care use between AIAN adults living on and off tribal lands.

Methods

Data source and study population

Data from NHIS collected during 2019, 2020, and 2021 were used for this analysis, excluding 2019 respondents who were reinterviewed in 2020. NHIS is a nationally representative household survey of the U.S. civilian noninstitutionalized population. It is conducted continuously throughout the year by the National Center for Health Statistics. Interviewers from the U.S. Census Bureau typically conduct interviews in respondents' homes, with some follow-up over the telephone. One sample adult aged 18 or over is selected randomly from each household to answer more detailed questions about their own health status, health-related behaviors, and health care access and use. If the sample adult is physically or mentally incapable of responding to the survey,

a knowledgeable proxy can provide answers.

Because of the COVID-19 pandemic, NHIS data collection switched to a telephone-only mode beginning on March 19, 2020. Personal visits to households resumed in selected areas in July 2020 and in all areas of the country in September 2020. However, interviews were still attempted by telephone first, and most were completed by telephone. The telephone-first data collection method ended in April 2021. Prepandemic interviewing procedures with initial contact attempts by personal visit resumed in May 2021. However, nearly two-thirds of sample adult interviews were conducted at least partially by telephone in 2021 (62.8%). For more information about NHIS, visit https://www.cdc.gov/nchs/nhis.htm. The final sample adult response rates were 59.1% in 2019, 48.9% in 2020, and 50.9% in 2021, for total annual sample sizes of 31,997, 21,153, and 29,482, respectively (14-16).

Data from these 3 survey years were combined for this analysis, and the analytic sample was limited to adults who identified as AIAN by indicating either AIAN by itself or in addition to other races in response to the survey question, "What race or races [do you/does person] consider [yourself/himself/herself] to be?" (number = 1,405).

Measures

AIAN classification

AIAN classification was based on responses to the following question, "What race or races do you consider yourself to be? Please select 1 or more of these categories: White, Black or African American, American Indian, Alaska Native, Native Hawaiian, Other Pacific Islander, Asian, or some other race." Adults were classified as part of the AIAN population if they selected either American Indian or Alaska Native.

Tribal land residential status

Determination of residence on or off tribal lands was based on whether the sample adult's address fell within AIAN legal and statistical entities for which the U.S. Census Bureau publishes data. Legal entities include federally recognized American Indian reservations or off-reservation trust land areas and state-recognized American Indian reservations (17). Statistical entities include Alaska Native Village statistical areas, Oklahoma tribal statistical areas, tribal designated statistical areas, and state-designated tribal statistical areas (17).

Selected chronic conditions

Arthritis—Based on a "yes" response to the question, "Have you ever been told by a doctor or other health professional that you had some form of arthritis, rheumatoid arthritis, gout, lupus, or fibromyalgia?"

Current asthma—Based on "yes" responses to the following questions: "Has a doctor or other health professional ever told you that you had asthma?" and "Do you still have asthma?"

Diagnosed diabetes—Based on a "yes" response to the question, "Has a doctor or other health professional ever told you that you had diabetes?" Respondents were advised not to include diagnoses of gestational diabetes or prediabetes.

Diagnosed high cholesterol—Based on "yes" responses to the following questions: "Have you ever been told by a doctor or other health professional that you had high cholesterol?" and "During the past 12 months, have you had high cholesterol?" Alternatively, the respondent could answer yes to the first question and yes to the question, "Are you now taking any medication prescribed by a doctor to help lower your cholesterol?"

Diagnosed hypertension—Based on "yes" responses to the following series of questions: "Have you ever been told by a doctor or other health professional that you had hypertension, also called high blood pressure?," "Were you told on two or more different visits that you had hypertension or high blood pressure?," and "During the past 12 months, have you had hypertension or high blood pressure?" Alternatively, the respondent could answer yes to the first question and yes to the question, "Are you now taking

any medication prescribed by a doctor for your high blood pressure?"

Heart attack—Based on a "yes" response to the question, "Have you ever been told by a doctor or other health professional that you had a heart attack, also called myocardial infarction?"

Regularly having feelings of depression or anxiety—Based on a series of questions on the frequency and extent of feelings of depression and anxiety. Adults were classified as regularly having feelings of depression or anxiety if they had feelings of a) depression or b) worry, nervousness, or anxiety, either daily, and describing the level of those feelings as "somewhere in between a little and a lot" or "a lot," or weekly, and describing the level of those feelings as "a lot."

Health care access and use

Any mental health treatment—A composite measure based on a "yes" response to at least one of the following questions: "Do you take prescription medication for these feelings [of worry, nervousness, or anxiety]?," "Do you take prescription medication for depression?," "During the past 12 months, did you take prescription medication to help you with any other emotions or with your concentration, behavior, or mental health?," or "During the past 12 months, did you receive counseling or therapy from a mental health professional such as a psychiatrist, psychologist, psychiatric nurse, or clinical social worker?"

Doctor's visit—Based on a response of "within the past year" to the question, "About how long has it been since you last saw a doctor or other health professional about your health?" Adults selected from the following options: "Never," "Within the past year (anytime less than 12 months ago)," "Within the last 2 years (1 year but less than 2 years ago)," "Within the last 3 years (2 years but less than 3 years ago)," "Within the last 5 years (3 years but less than 5 years ago)," "Within the last 10 years (5 years but less than 10 years ago)," and "10 years ago or more."

Hospital emergency room visit— Based on a response of at least "one" to the question, "During the past 12 months, how many times have you gone to a hospital emergency room about your health?"

Influenza vaccination—Based on a "yes" response to the question, "There are two types of flu vaccinations. One is a shot and the other is a spray, mist, or drop in the nose. During the past 12 months, have you had a flu vaccination?"

Pneumococcal vaccination—Based on a "yes" response to the question, "A pneumonia shot is also known as a pneumococcal vaccine. Have you ever had a pneumonia shot?"

Unmet medical care need due to cost, past 12 months—Based on a "yes" response to at least one of the following two questions: "During the past 12 months, have you delayed getting medical care because of the cost?" and "During the past 12 months, was there any time when you needed medical care, but did not get it because of the cost?"

Unmet mental healthcare need due to cost, past 12 months—Based on a "yes" response to at least one of the following questions: "During the past 12 months, have you delayed getting counseling or therapy from a mental health professional because of the cost?" and "During the past 12 months, was there any time when you needed counseling or therapy from a mental health professional, but did not get it because of the cost?"

Urgent care center visit—Based on a response of at least "one" to the question, "During the past 12 months, how many times have you gone to an urgent care center or a clinic in a drug store or grocery store about your health?"

Usual place of care—Based on a "yes" response to the question, "Is there a place that you usually go to if you are sick and need health care?" Respondents who answered "hospital emergency room" to the follow-up question, "What kind of place is it?" were excluded.

Wellness visit—Based on a response of "within the past year" to the question, "About how long has it been since you last saw a doctor or other health professional about your health?" and a "yes" response to the follow-up question, "Was this a wellness visit, physical, or general purpose check-up?" Alternatively, the respondent can answer "within the past year" to the question, "About how long has it been since you last saw a

doctor or other health professional for a wellness visit, physical, or general purpose check-up?"

Sociodemographic characteristics

Sociodemographic characteristics included age group (18–44, 45–64, and 65 and over), sex (men and women), and education level (less than high school, high school diploma or GED, some college, and bachelor's degree or higher). Based on initial analyses showing correlation between education level and family income, only education level was included in analyses as a proxy for socioeconomic status.

Statistical analyses

Percentages for each health measure were calculated by tribal land residential status excluding unknown values from the denominators, and differences between percentages were assessed with two-sided pairwise tests at the 0.05 alpha level. Differences in the distribution of sociodemographic variables by tribal land residential status were evaluated with chi-square tests. Because significant differences by education were observed between AIAN adults living on and off tribal lands, education-adjusted prevalence ratios were calculated for each outcome using multivariable logisticregression models.

All estimates were weighted, and analyses were conducted using SAS 9.4 with SAS-callable SUDAAN 11.0.3 software (18) to account for the complex sample design of NHIS. Data for 2019 and 2021 were weighted with the annual sample adult weight (WTFA A), and 2020 data were weighted with the partial weight (WTSA P) to limit the analysis to the original 2020 adult respondents, excluding 2019 sample adults reinterviewed in 2020 (15). A new adjusted weight was created to produce the estimates for the analysis accounting for the number of data years by dividing each sample weight by three. All estimates presented meet National Center for Health Statistics data presentation standards for proportions (19).

Results

In 2019–2021, more than one in five AIAN adults lived on tribal lands (23.0%). Table 1 shows selected sociodemographic characteristics of AIAN adults grouped by whether they lived on tribal lands. AIAN adults had a similar age and sex distribution regardless of area of residence. However, a significant difference was observed in the distribution of education level by tribal land residential status. For example, compared with those living on tribal lands, AIAN adults living off tribal lands were more likely to have more education.

Health conditions

Figure 1 shows the unadjusted percentage of AIAN adults with selected cardiovascular and endocrine conditions

by tribal land residential status. In 2019–2021, the percentage of AIAN adults who ever had diagnosed diabetes was significantly higher among those living on tribal lands (18.9%) compared with those living off tribal lands (11.5%). While the percentages of AIAN adults who had diagnosed hypertension or high cholesterol in the past 12 months were also higher among adults living on tribal lands, these differences were not significant at the 0.05 level. Lifetime prevalence of a heart attack was similar for AIAN adults who lived on and off tribal lands (4.2% and 4.4%, respectively).

Figure 2 shows the unadjusted percentage of AIAN adults with selected respiratory and rheumatological conditions by tribal land residential status. Current asthma and a lifetime experience of arthritis were lower, but

not statistically different, for AIAN adults living on tribal lands compared with those living off tribal lands (11.1% compared with 13.0% and 23.5% compared with 26.1%, respectively).

Health care access and use

Differences in the unadjusted percentages of AIAN adults who indicated a usual place of health care, had a doctor's visit in the past 12 months, and noted an unmet medical care need due to cost in the past 12 months are shown by tribal land residential status in Figure 3. A higher percentage of AIAN adults living on tribal lands indicated a usual place of care (92.2%) compared with AIAN adults living off tribal lands (82.1%; p < 0.05). The percentage of AIAN adults who had a doctor's visit in the past 12 months was higher but

Figure 1. Percentage of American Indian and Alaska Native adults with selected cardiovascular and endocrine conditions, by tribal land residential status: United States, 2019–2021

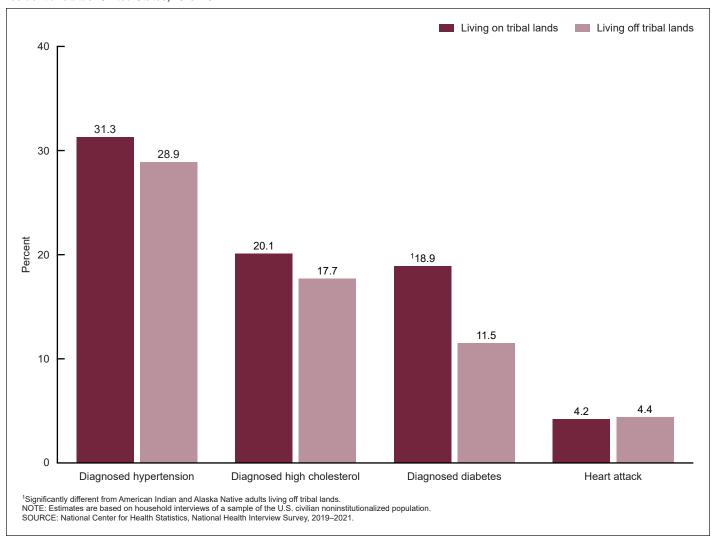


Figure 2. Percentage of American Indian and Alaska Native adults with selected respiratory and rheumatological conditions, by tribal land residential status: United States, 2019–2021

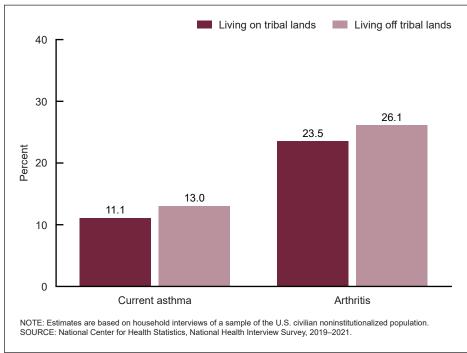
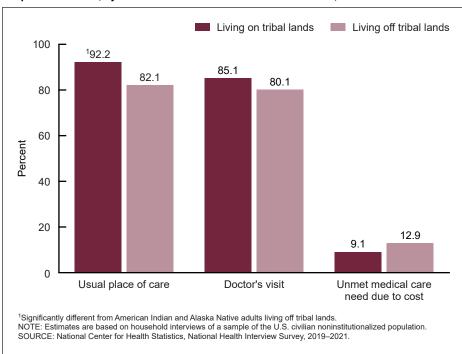


Figure 3. Percentage of American Indian and Alaska Native adults who had a usual place of care, a doctor's visit in the past 12 months, or an unmet medical care need due to cost in the past 12 months, by tribal land residential status: United States, 2019–2021



not significantly different among AIAN adults living on tribal lands (85.1%) compared with AIAN adults living off tribal lands (80.1%). Lastly, a lower percentage of AIAN adults living on tribal lands indicated an unmet medical care need due to cost in the past 12

months (9.1%) compared with AIAN adults living off tribal lands (12.9%), but this difference was not significant.

Preventive care

Figure 4 shows two measures of preventive care: wellness visits and vaccinations (influenza and pneumococcal). The unadjusted percentages of AIAN adults living on tribal lands who had a wellness visit in the last 12 months or ever had a pneumococcal vaccination were similar to those living off tribal lands. However, AIAN adults living on tribal lands were more likely to have an influenza vaccination in the past 12 months (49.6%) compared with AIAN adults living off tribal lands (39.2%).

Emergency room and urgent care visits

Differences by tribal land residential status in the unadjusted percentages of AIAN adults who had at least one emergency room visit or urgent care visit in the past 12 months are highlighted in Figure 5. AIAN adults who lived on tribal lands were more likely to have at least one emergency room visit in the past 12 months (34.4%) than those who lived off tribal lands (25.0%). While the percentage of AIAN adults who had at least one visit to an urgent care center in the past 12 months was 7.7 percentage points higher among those who lived on tribal lands (32.6%) compared with those who did not (24.9%), this difference was not significant.

Mental health, mental health treatment, and unmet mental healthcare need

Figure 6 shows data for various measures of mental health, including feelings of anxiety or depression, treatment, and unmet mental healthcare needs. Unadjusted estimates show a lower percentage of AIAN adults living on tribal lands who reported regular feelings of anxiety or depression (15.8%) or received any mental health treatment in the past 12 months (20.8%) compared with AIAN adults living off tribal lands (20.9% and 23.9%, respectively). However, neither difference was significant. AIAN adults living on tribal lands were less likely to delay or not receive mental health treatment due to

Figure 4. Percentage of American Indian and Alaska Native adults who had a wellness visit in the past 12 months, an influenza vaccination in the past 12 months, or a pneumococcal vaccination in their lifetime, by tribal land residential status: United States, 2019–2021

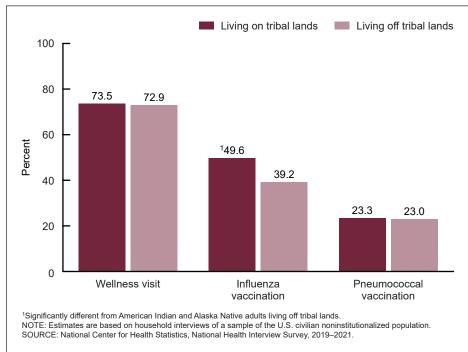
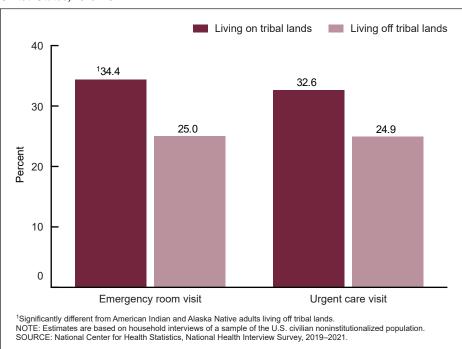


Figure 5. Percentage of American Indian and Alaska Native adults who had an emergency room visit or an urgent care visit in the past 12 months, by tribal land residential status: United States, 2019–2021



cost in the past 12 months compared with AIAN adults living off tribal lands (2.2% compared with 8.3%; p < 0.05).

Logistic-regression models

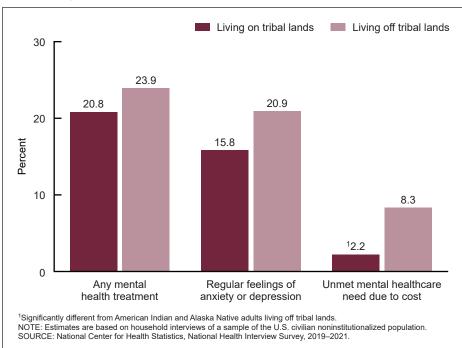
Because AIAN adults who lived off tribal lands were more likely to have higher education levels compared with those who lived on tribal lands, these observed bivariate associations were adjusted for education level. Table 2 includes both unadjusted and adjusted prevalence ratios for each outcome of interest in this analysis. After adjustment for education level, the prevalence of diagnosed diabetes, a usual place of care, an influenza vaccination in the past 12 months, and at least one emergency room visit in the past 12 months remained significantly higher for those who lived on tribal lands compared with those who lived off tribal lands. The inverse association between tribal land residential status and unmet mental healthcare need due to cost in the past 12 months remained significant after adjustment for education level.

Discussion

This report examines variation in selected health conditions and healthcare use measures among AIAN adults living on and off tribal lands using data from the 2019-2021 NHIS. Generally, after adjustment for differences in levels of education between the two groups, AIAN adults living on tribal lands had a higher prevalence of diagnosed diabetes compared with AIAN adults living off tribal lands. In contrast, AIAN adults living on tribal lands had a lower prevalence of current asthma or arthritis compared with AIAN adults living off tribal lands, although this difference was not statistically significant. The prevalence of heart attack was similar between groups.

Compared with AIAN adults living off tribal lands, AIAN adults living on tribal lands had a higher percentage of engaging in both preventive (usual place of care and doctor's visit in past 12 months) and emergent (urgent care visit in past 12 months and emergency room visit in past 12 months) care, although some estimates were underpowered (did not have a sufficiently large sample size) to detect a significant difference. The percentage of AIAN adults with unmet medical or mental healthcare needs in the past 12 months was lower among those who lived on tribal lands compared with those who did not. Regarding mental health, AIAN adults living on tribal lands were less likely to have regular feelings of anxiety or depression

Figure 6. Percentage of American Indian and Alaska Native adults who had any mental health treatment in the past 12 months, regular feelings of anxiety or depression, or unmet mental healthcare need due to cost in the past 12 months, by tribal land residential status: United States, 2019–2021



compared with those living off tribal lands, although this difference was not statistically significant. The percentage of AIAN adults who received any mental health treatment in the past 12 months was similar between these groups. The findings from this report align with previous research using the combined 2005–2014 National Survey on Drug Use and Health regarding tribal land residence and some mental health indicators (13).

Zhao and colleagues (12) used data from the 2017 Behavioral Risk Factor Surveillance System to look at differences in current cigarette smoking, heavy drinking, binge drinking, physical activity, and obesity between non-Hispanic AIAN and non-Hispanic White adults and by region. The authors observed variation in the prevalence of these health-related behavioral risk factors by region. For instance, non-Hispanic AIAN adults in Alaska and the northern plains regions had the highest prevalence of current smoking and binge drinking, while those in the southwest and Pacific Coast regions had the lowest prevalence. Although the current report does not include health behavior estimates because they do not meet National Center for Health Statistics data presentation standards, diseases associated with these behaviors, namely diabetes, also varied by tribal land residence.

Strengths of this analysis include the availability of a broader set of health conditions and health care access and use measures. In turn, these estimates expand knowledge on the physical and behavioral health of AIAN adults living on and off tribal lands. In terms of limitations, this analysis includes a higher percentage of AIAN adults living on tribal lands compared with estimates from the 2020 Census, and this may have affected results. Additionally, 3 years of pooled NHIS data were not sufficient to provide reliable estimates for AIAN adults on tribal lands for measures such as cigarette smoking, electronic cigarette use, and cancer prevalence. Most nationally representative health surveys, including NHIS, have sufficient sample sizes to produce national estimates for AIAN people with 1 or 2 years of data. However, it is often necessary to pool multiple years of data to produce estimates for the AIAN community when one is interested in subgroup differences (12,13,20). Children were not included in these analyses because more than 3 years

of NHIS data are needed to produce reliable estimates. Lastly, note that other characteristics not examined in this analysis may contribute to the observed differences between AIAN adults living on and off tribal lands.

Overall, this report provides a broader look into differences in the percentages of AIAN adults with selected health conditions and health care use by tribal land residential status. This research, along with other research (11–13,20), highlights the diversity among the AIAN population and the value of analyses that extend beyond the national landscape and look more closely at differences by important contextual factors, including area of residence. There are 574 federally recognized AIAN tribes, and more than 100 state-recognized tribes. Consequently, research studying access to and use of health care by the AIAN population at a more detailed level could provide further insights into this diverse population.

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Table 1. Selected sociodemographic characteristics of American Indian and Alaska Native adults, overall and by tribal land residential status: United States, 2019-2021

Characteristic	Overall	Living on tribal lands	Not living on tribal lands
Age group	Percent (95% confidence interval)		
18–44	49.9 (45.9-53.9)	46.0 (34.5-57.9)	51.1 (47.2-54.9)
45–64	34.5 (31.1-38.0)	39.9 (30.5-49.8)	32.9 (29.6-36.3)
65 and over	15.6 (13.4–18.1)	14.1 (9.6–19.7)	16.1 (13.8–18.5)
Sex			
Men	48.2 (44.2-52.1)	51.0 (40.9-61.1)	47.3 (43.4-51.3)
Women	51.8 (47.9–55.8)	49.0 (38.9–59.1)	52.7 (48.7–56.6)
Education ¹			
Less than high school	17.8 (14.3-21.8)	22.0 (16.2-28.7)	16.5 (13.1-20.4)
High school diploma or GED	28.6 (25.6-31.8)	32.1 (26.5-38.2)	27.6 (24.1-31.3)
Some college	37.5 (33.9-41.1)	37.0 (28.4-46.3)	37.6 (33.7-41.6)
Bachelor's degree or higher	16.1 (13.1–19.5)	8.9 (5.7–13.1)	18.3 (15.5–21.3)

 $^{^1}$ Chi-square tests show significant differences between American Indian and Alaska Native adults living on and off tribal lands ($\rho < 0.05$). SOURCE: National Center for Health Statistics, National Health Interview Survey, 2019–2021.

Table 2. Unadjusted and adjusted prevalence ratios for selected health conditions and healthcare use measures among American Indian and Alaska Native adults, by tribal land residential status: United States, 2019–2021

	Ratio of living on tribal lands to living off tribal lands		
Health condition or measure	Unadjusted	Adjusted ¹	
	Prevalence ratio (95% confidence interval)		
Diagnosed hypertension	1.08 (0.91-1.29)	1.07 (0.89-1.28)	
Diagnosed high cholesterol	1.13 (0.78–1.65)	1.10 (0.76–1.58)	
Diagnosed diabetes	†1.65 (1.17–2.32)	†1.58 (1.11–2.23)	
Heart attack	0.96 (0.53-1.75)	0.98 (0.53-1.80)	
Current asthma	0.86 (0.51-1.43)	0.87 (0.51-1.49)	
Arthritis	0.90 (0.61-1.33)	0.87 (0.59-1.30)	
Usual place of care	†1.12 (1.05-1.20)	†1.13 (1.06-1.21)	
Doctor's visit in past 12 months	1.06 (0.98-1.15)	1.08 (1.00-1.17)	
Unmet medical care due to cost in past 12 months	0.70 (0.43-1.14)	0.67 (0.42-1.06)	
Wellness visit in past 12 months	1.01 (0.93-1.10)	1.03 (0.95-1.12)	
Influenza vaccination in past 12 months	†1.27 (1.06–1.51)	†1.34 (1.12–1.60)	
Ever received pneumococcal vaccination	1.01 (0.75-1.36)	1.05 (0.78-1.41)	
Emergency room visit in past 12 months	†1.37 (1.09–1.73)	†1.37 (1.08–1.73)	
Urgent care visit in past 12 months	1.31 (0.90-1.91)	1.34 (0.93-1.92)	
Any mental health treatment in past 12 months	0.87 (0.54-1.41)	0.94 (0.60-1.49)	
Regular feelings of anxiety or depression	0.76 (0.43–1.34)	0.76 (0.43–1.35)	
past 12 months	†0.26 (0.10–0.66)	†0.29 (0.12–0.71)	

[†] Ratio significant; percentage for American Indian and Alaska Native adults living on tribal lands significantly different from American Indian and Alaska Native adults living off tribal lands.

1Adjusted for highest level of education.

SOURCE: National Center for Health Statistics, National Health Interview Survey, 2019–2021.

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