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Social Determinants of Health Among American Indians and Alaska Natives and Tribal Communities: Comparison with Other Major Racial and Ethnic Groups in the United States, 1990–2022

Gopal K. Singh, PhD, MS, MSc, DPS¹, Hyunjung Lee, PhD, MS, MPP, MBA², Lyoung Hee Kim, PhD, MPA, MA³, Shanita D. Williams, PhD, MPH, APRN⁴

¹The Center for Global Health and Health Policy, Global Health and Education Projects, Inc., Riverdale, MD, ²Department of Public Policy and Public Affairs, John McCormack Graduate School of Policy and Global Studies, University of Massachusetts Boston, Boston, MA, ³Institute on Health Care Systems, The Heller School for Social Policy and Management, Brandeis University, Waltham, MA, ⁴Independent Researcher, Rockville, MD, United States



*Corresponding author:

Gopal K Singh, Center for Global Health and Health Policy, Global Health and Education Projects, Inc., Riverdale, MD, United States.

Tel: +1-301-443-0765

gsingh@mchandaids.org

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ABSTRACT

Background and Objective: Limited research exists on health inequities between American Indians and Alaska Natives (AIANs), tribal communities, and other population groups in the United States. To address this gap in research, we conducted time-trend analyses of social determinants of health and disease outcomes for AIANs as a whole and specific tribal communities and compared them with those from the other major racial/ethnic groups.

Methods: We used data from the 1990–2022 National Vital Statistics System, 2015–2022 American Community Survey, and the 2018–2020 Behavioral Risk Factor Surveillance System to examine socioeconomic, health, disability, disease, and mortality patterns for AIANs.

Results: In 2021, life expectancy at birth was 70.6 years for AIANs, lower than that for Asian/Pacific Islanders (APIs) (84.1), Hispanics (78.8), and non-Hispanic Whites (76.3). All racial/ethnic groups experienced a decline in life expectancy between the pre-pandemic year of 2019 and the peak pandemic year of 2021. However, the impact of COVID-19 was the greatest for AIANs and Blacks whose life expectancy decreased by 6.3 and 5.8 years, respectively. The infant mortality rate for AIANs was 8.5 per 1,000 live births, 78% higher than the rate for non-Hispanic Whites. One in five AIANs assessed their physical and mental health as poor, at twice the rate of non-Hispanic Whites or the general population. COVID-19 was the leading cause of death among AIANs in 2021. Risks of mortality from alcohol-related problems, drug overdose, unintentional injuries, and homicide were higher among AIANs than the general population. AIANs had the highest overall disability, mental and ambulatory disability, health uninsurance, unemployment, and poverty rates, with differences in these indicators varying markedly across the AIAN tribes.

Conclusion and Global Health Implications: AIANs remain a disadvantaged racial/ethnic group in the US in many health and socioeconomic indicators, with poverty rates in many Native American tribal groups and reservations exceeding 40%.

Keywords: American Indians and Alaska Natives, Tribal Communities, Social Determinants, Life Expectancy, Mortality, Cause of Death, Infant Mortality, Disparities, Cancer Screening, Chronic Disease

INTRODUCTION

Although substantial progress has been made in improving the health and well-being of all Americans, health inequities between American Indians and Alaska Natives (AIANs), tribal communities, and other population groups have persisted. AIANs differ greatly from other major racial/ethnic groups in social determinants of health (SDOH) and related health outcomes.^[1–4]

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They are more likely than other communities to live in less favorable socioeconomic and material living conditions that have historically placed them at a considerable disadvantage in health and socioeconomic attainment and in advancement toward health equity.^[4] Available research shows that AIANs have the highest rates of low educational attainment and literacy, unemployment, poverty, suicide, homicide, mental distress, disability, and residence in adverse neighborhood conditions, and have one of the lowest life expectancies and high rates of premature mortality, infant and maternal mortality, injuries, and mortality from major chronic conditions.^[1–4] Recent analyses show substantial disparities in disability, healthcare access, and socioeconomic conditions across the major tribes.^[4]

Historical forced relocation, trauma, and exclusion that AIAN populations experience, including loss of land, interference with traditional language, cultural practices and identity, and social marginalization, impact their health outcomes and are reflected in their current disadvantaged health and social standing.^[5] AIAN populations and communities have a unique burden from historical, intergenerational trauma that affects physical and mental health and welfare,^[6] which has become a significant risk factor for AIANs resulting in severe health disparities. Many studies have found associations between historical trauma and severe health disparities among AIAN populations, not limited to physical health but also psychological and behavioral health.^[4,7,8]

There is a dearth of high-quality health data on AIANs in the federal data systems due to their relatively small population size or racial/ethnic misclassification.^[4] According to the 2020 Census, there were 3.7 million AIANs alone who did not identify with any other race.^[9] In 2020, there were 9.7 million AIANs alone or in combination with one or more races, accounting for 2.9% of the total US population.^[9] AIANs represent a culturally heterogeneous population consisting of 574 federally recognized tribes and more than 100 state recognized tribes.^[4] Tribal-specific health and socioeconomic data are generally limited, except for those that are numerically large enough to be identified in decennial censuses and the American Community Survey (ACS).^[4,10,11] In order to develop effective policy responses to reduce marked health inequities among the AIAN population and other racial/ethnic groups, a comprehensive examination of health and socioeconomic challenges faced by the Native American population, including tribal communities, is urgently needed.

To address the gaps in data and research and to monitor health and social inequalities among AIANs, this study provides the latest contemporary and time-trend analysis of SDOH and health and disease outcomes for AIANs as a whole and specific tribal communities and compares them with those from the other major racial/ethnic groups in the US.

METHODS

Temporal data from the 1990–2022 National Vital Statistics System (NVSS), the 2015–2019 American Community Survey (ACS) Public Use Microdata Sample, the 2022 ACS, and the 2018–2020 Behavioral Risk Factor Surveillance System (BRFSS) were used to examine socioeconomic, health, healthcare, disability, disease, and mortality patterns for AIANs compared to the other racial/ethnic groups and the general population.

National Vital Statistics System

The National Vital Statistics System (NVSS) has been the primary source for life expectancy and mortality analyses in the US by age, sex, race/ethnicity, cause of death, geographic area, and time period for over a century.^[4,10,12,13] The NVSS consists of both mortality and natality data systems based on birth certificate and death certificate data for approximately 3.6 million births and 2.8 million deaths each year in the US.^[4,10,12–15] National mortality data at the individual- and county-level were also linked to the census and ACS-based Area Deprivation Index (ADI) to examine socioeconomic disparities in mortality by race/ethnicity.^[3,4,16–18] The ADI, a factor analytic index developed by Singh *et al.*, is a powerful tool for monitoring population health inequalities across time and space. The 2014–2018 ADI consisted of 20 ACS-based socioeconomic indicators, which may be viewed as broadly representing educational opportunities, labor force skills, economic, and housing conditions in each county, community, or neighborhood.^[16–18] The 2016–2019 linked birth/infant death data file, a component of the NVSS, was used to examine racial/ethnic disparities in age- and cause-specific infant mortality.^[19]

American Community Survey

The ACS is the primary census database for producing socioeconomic, demographic, housing, labor force, disability, and health insurance characteristics of various population groups, including children, at the national, state, county, and local levels.^[4,11,20] All ACS data are based on self-reports and obtained via mail-back questionnaires, telephone, and in-home personal interviews.^[4,11,20] In this study, we used the pooled 2015–2019 ACS microdata sample and the 2022 ACS to analyze socioeconomic, health insurance, and disability data for racial/ethnic groups, including AIANs and 35 of the largest AIAN tribes.^[20] Substantive and methodological details of the ACS are available in the census and other publications.^[4,11,20]

Behavioral Risk Factor Surveillance System

The Behavioral Risk Factor Surveillance System (BRFSS) is an annual health-related telephone survey conducted by the

Centers for Disease Control and Prevention (CDC).^[21] The purpose of the survey is to provide national and state-specific prevalence estimates for a variety of adult health indicators, chronic health conditions, health-related risk behaviors, and use of preventive health services.^[21-23] The annual BRFSS, with a sample of more than 400,000 adults, is representative of the noninstitutionalized adult population (≥ 18 years) of the US and is the largest continuously conducted health survey system in the world.^[21-23]

Analytic Strategies

Three-year or five-year pooled data from NVSS, ACS, and BRFSS were used to derive robust and reliable health, morbidity, and mortality estimates for the AIAN population. Health and mortality patterns for AIANs were compared with those for non-Hispanic Whites, the total US population, and other major racial/ethnic minority groups. Life tables, age-adjusted mortality rates, prevalence, and risk ratios were used to examine health inequalities.^[3,13] The Chi-square statistic was used to test the overall association between race/ethnicity and health and healthcare measures. The *t*-test was used to test the difference in prevalence, incidence, or mortality rates between two time periods or between AIANs and the other racial/ethnic groups. Statistical tests of significance were carried out at the 0.05 or 0.01 level.

RESULTS

Disparities in Social Determinants of Health

Racial/ethnic minorities, including AIANs, have historically been disadvantaged in terms of social and economic attainment and living conditions.^[1-4] The 2022 ACS data in Figure 1 indicates two times higher poverty rates among AIANs (21.7%), Black/African Americans (21.3%), Hispanics (16.8%), and Native Hawaiians and other Pacific Islanders (17.6%) compared with non-Hispanic Whites (9.5%). AIANs have the lowest educational attainment and highest uninsured rate. In 2022, 16.8% of AIANs had a college degree compared with 57.4% of Asians and 39.5% of non-Hispanic Whites. In 2022, 18.5% of AIANs lacked health insurance compared with 5.5% of Asians and 5.3% of non-Hispanic Whites. Ethnic-minority groups, including AIANs, are less likely to own a house and more likely to speak a language other than English and less likely to have English language proficiency compared with non-Hispanic Whites [Figure 1].

Geographic patterns in percentage of population with a college degree across all US counties and 28 counties with predominantly AIAN populations are shown in Figure 2. The Southeastern region of the US has the lowest percentage of adults with a college degree. Most of the 28 AIAN counties have significantly lower percentages of adults with a college

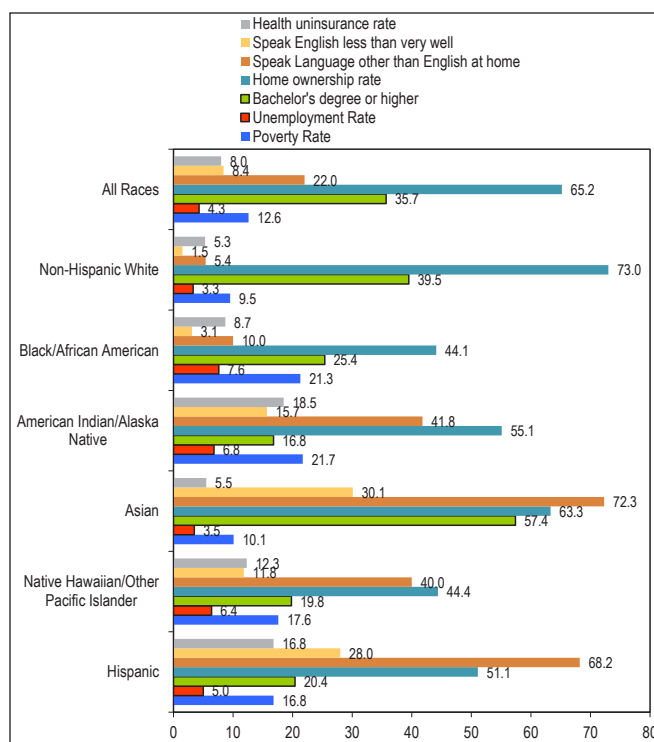


Figure 1: Selected Sociodemographic Characteristics (%) by Race/Ethnicity, United States, 2022

Source: US Census Bureau. 2022 American Community Survey.

degree. Geographic patterns in poverty rates across all US counties and the 28 AIAN counties are shown in Figure 3. Counties in the Southeastern and Southwestern regions experience higher poverty rates than those in the other regions of the US. Twenty-five of the 28 AIAN counties have a poverty rate of 21% or greater, with Todd County, South Dakota (55.5%), and Mellette County, South Dakota (52.8%), having the highest poverty rates.

Disparities in Life Expectancy and Decline in Life expectancy due to COVID-19 Pandemic

In 2021, life expectancy at birth was 70.6 years for AIANs, lower than that for APIs (84.1), Hispanics (78.8), non-Hispanic Whites (76.3), and slightly higher than the life expectancy of Black/African Americans (70.3) [Figures 4a and b]. Life expectancy for males ranged from a low of 66.5 years for Black/African Americans and 68.1 years for AIANs to a high of 81.6 years for APIs. Life expectancy for females ranged from a low of 73.4 years for AIANs and 74.2 years for Black/African Americans to a high of 86.4 years for APIs.

The adverse impact of the COVID-19 pandemic can be measured by comparing life expectancies in the pre-pandemic period of 2019 and the peak pandemic year of 2021. All racial/ethnic groups experienced a substantial decline in life

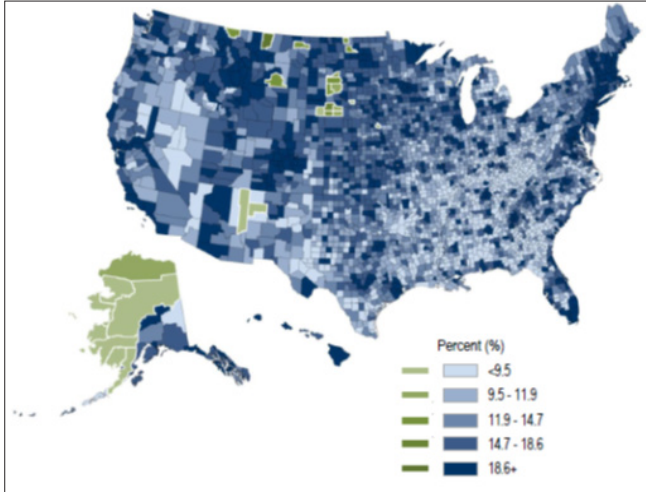


Figure 2: Percentage of Population Aged ≥ 25 Years with At Least a College Degree, All 3,143 US Counties and 28 American Indian and Alaska Native (AI/AN) Counties, 2015–2019

Source: Data derived from the 2015–2019 American Community Survey.

AI/AN counties (shown in green) are defined as those counties in which AI/ANs make up at least 50% of the population. These counties are located in Alaska, Arizona, Montana, New Mexico, North Dakota, South Dakota, and Wisconsin.

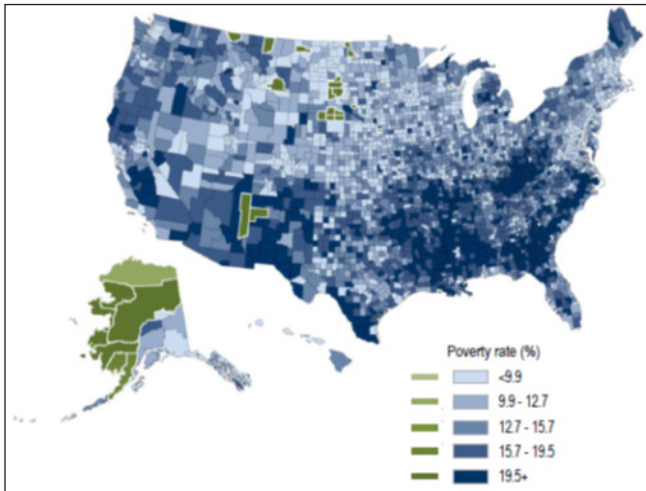


Figure 3: Percentage of Population Below the Federal Poverty Level, All 3,143 US Counties and 28 American Indian and Alaska Native (AI/AN) Counties, 2015–2019

Source: Data derived from the 2015–2019 American Community Survey.

AI/AN counties (shown in green) are defined as those counties in which AI/ANs make up at least 50% of the population. These counties are located in Alaska, Arizona, Montana, New Mexico, North Dakota, South Dakota, and Wisconsin.

expectancy between 2019 and 2021. However, the impact of COVID-19 was the greatest for AIANs and Blacks whose life expectancy decreased by 6.3 and 5.8 years, respectively [Figure 4c].

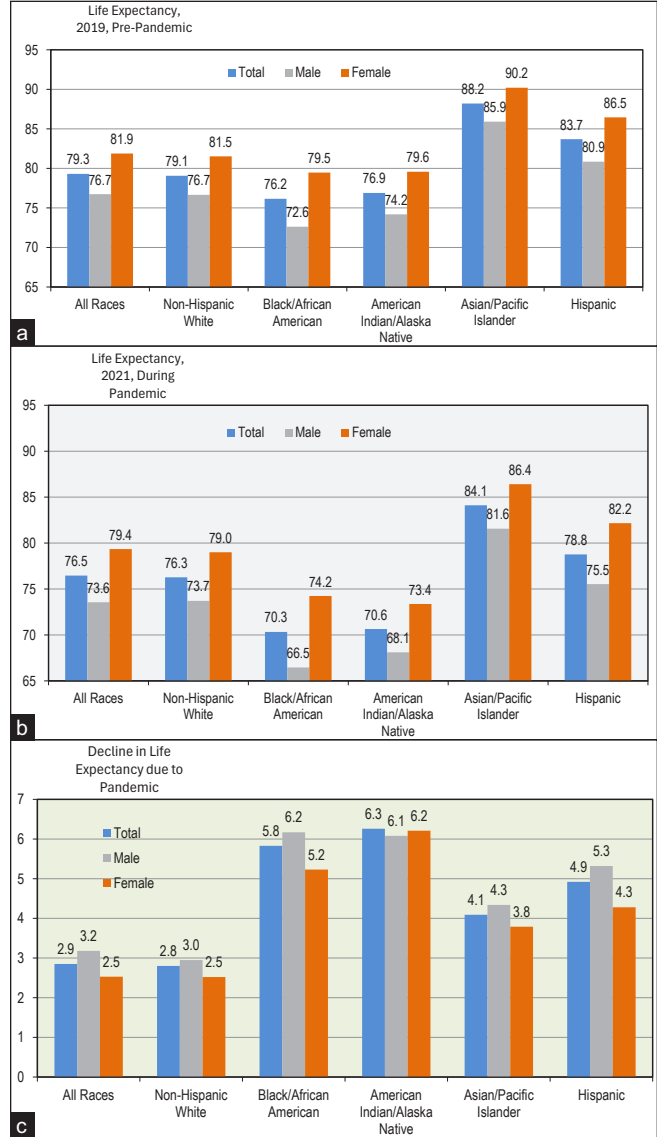


Figure 4(a-c): Life Expectancy at Birth (Years) by Race/Ethnicity and Sex, United States, 2019 and 2021

Source: Data derived from the National Vital Statistics System.

Disparities in Infant, Neonatal, and Postneonatal Mortality

During 2016–2019, the infant mortality rate for AIANs was 8.49 per 1000 live births, significantly higher than the rates for non-Hispanic Whites (4.78), APIs (3.95), and Hispanics (4.99). Racial/ethnic patterns in neonatal mortality (during the first 27 days of life) were similar to those in overall infant mortality, with AIAN infants experiencing a lower risk of neonatal mortality than Black infants but higher risks of neonatal mortality than the other racial/ethnic groups. The postneonatal mortality rate (between 28 days and one year of age) for AIANs was the highest of all the major racial/ethnic groups [Figure 5].

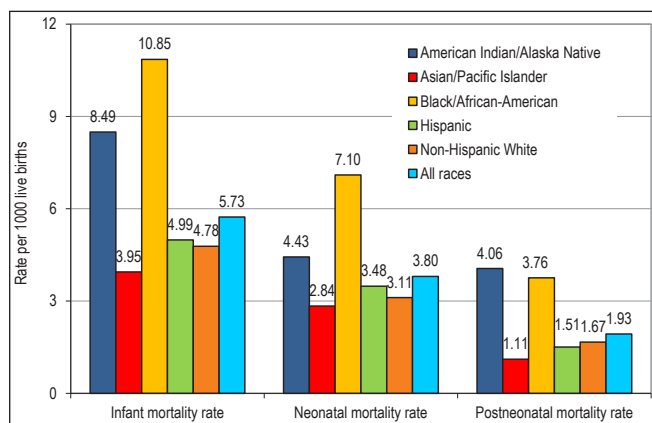


Figure 5: Infant, Neonatal, and Postneonatal Mortality Rates per 1000 Live Births, By Race/Ethnicity, United States, 2016–2019 (N = 15,340,627 Live Births and 87,922 Infant Deaths)
Source: Data derived from the 2016–2019 Period Linked Birth and Infant Death Files.

Disparities in Infant Mortality by Cause of Death

During 2016–2019, AIAN infants experienced higher risks of mortality from three leading causes of death, including birth defects (congenital anomalies), sudden infant death syndrome (SIDS), and unintentional injuries compared with the other racial/ethnic groups [Figures 6a and b]. The rate of SIDS mortality for AIAN infants was 86.64 per 100,000 live births, 634% higher than the rate for API infants and 156% higher than the rate for non-Hispanic White infants. The rate of unintentional injury mortality for AIAN infants was 72.90 per 100,000 live births, 483% higher than the rate for API infants and 132% higher than the rate for non-Hispanic White infants [Figure 6b]. AIAN infants also experienced significantly higher mortality risks from maternal complications and perinatal conditions than non-Hispanic Whites, Hispanics, and APIs.

Disparities in Infant Mortality by Race/Ethnicity and ADI

During 2016–2020, infant mortality rates were generally higher in communities with higher deprivation levels [Figure 7]. This pattern held for AIANs and other racial/ethnic groups. The infant mortality rate for AIAN infants was 5.8 per 1000 live births in the most deprived counties [Figure 7]. This rate was 4.3 times higher than the infant mortality rate for AIANs in the least deprived counties (5.8 vs. 1.4).

Disparities in Child and Adolescent Mortality by Race/Ethnicity and ADI

During 2016–2020, child and adolescent mortality rates were generally higher in areas with higher deprivation levels for

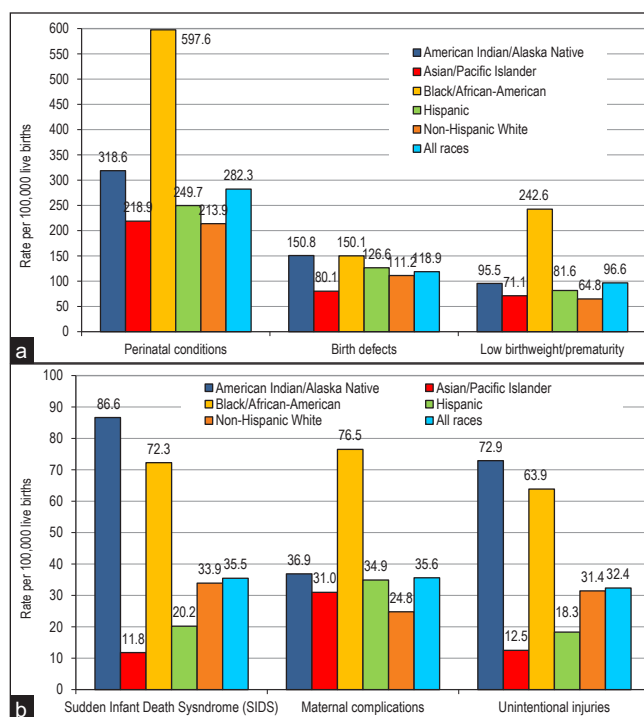


Figure 6 (a,b): Infant Mortality from Selected Major Causes of Death, By Race/Ethnicity, United States, 2016–2019 (N = 15,340,627 Live Births and 43,302 Infant Deaths from Perinatal Conditions, 18,233 Infant Deaths from Birth Defects, 14,826 Infant Deaths from Low Birthweight/Prematurity, 5440 Infant Deaths from SIDS, 5464 Infant Deaths from Maternal Complications, and 4963 Infant Deaths from Unintentional Injuries)
Source: Data derived from the 2016–2019 Period Linked Birth and Infant Death Files.

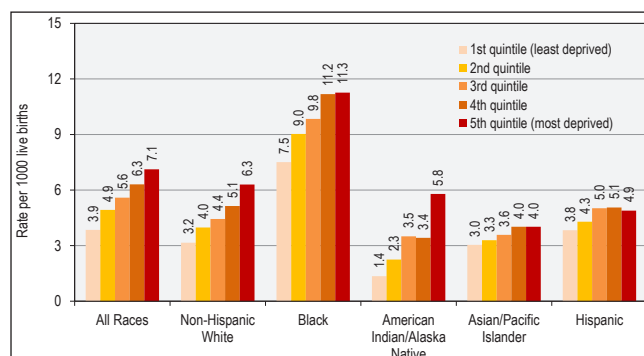


Figure 7: Infant Mortality by Race/Ethnicity and Area Deprivation Index, United States, 2016–2020
Source: Data derived from the 2016–2020 National Vital Statistics System.

AIANs and other racial/ethnic groups [Figure 8]. The child/adolescent mortality rate for AIANs was 41.9 deaths per 10,000 population in the most deprived counties; this rate was five times higher than the mortality rate for AIANs in the least deprived counties (41.9 vs. 8.5).

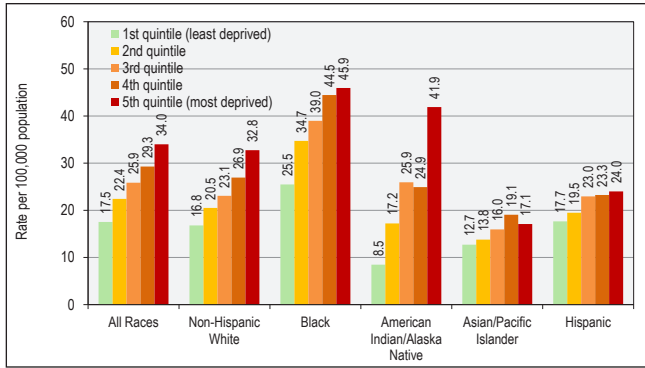


Figure 8: Child and Adolescent (1–19 Years) Mortality by Race/Ethnicity and Area Deprivation Index, United States, 2016–2020
Source: Data derived from the 2016–2020 National Vital Statistics System.

Disparities in Mortality from Leading Causes of Death, 2021

COVID-19, cardiovascular disease (CVD), including heart disease and stroke, cancer, unintentional injuries, chronic liver disease and cirrhosis, diabetes, chronic obstructive pulmonary disease (COPD), suicide, nephritis/kidney disease, and Alzheimer's disease were the top ten leading causes of death among AIANs and accounted for 78.4% of all deaths among them in 2021 [Table 1]. All-cause mortality and mortality from CVD and cancer were significantly lower among AIANs compared with non-Hispanic Whites and the total US population. COVID-19 was the leading cause of death among AIANs with 5009 deaths in 2021. The COVID-19 mortality rate for AIANs (133.9 deaths per 100,000 population) was 43% higher than the rate for non-Hispanic Whites (93.5) and 29% higher than the rate for the total US population (104.1). The risk of diabetes mortality among AIANs was 65% higher than that for non-Hispanic Whites. Liver cirrhosis mortality among AIANs was at least 3.2 times higher than that for non-Hispanic Whites and the total population. Alcohol-related mortality was almost four times higher among AIANs than non-Hispanic Whites and the total US population. The homicide rate for AIANs was 2.5 times higher than the rate for non-Hispanic Whites [Table 1].

Trends and Disparities in Working-Age Mortality, 1990–2022

Working-age mortality between ages 15 and 64 years is sensitive to social and economic fluctuations and is greatly influenced by deaths due to suicide, homicide, injuries, drug overdoses, alcohol-related causes, CVD, and cancer.^[18] While working-age mortality rates declined consistently between 1990 and 2010, there was an upward trend in mortality between 2010 and 2021 for all AIANs and rural AIANs as

well as for non-Hispanic Whites and the total US population [Figure 9]. The increase in working-age mortality between 2010 and 2021 was much more rapid for rural AIANs and for all AIANs than for non-Hispanic Whites and the total population. In 2021, rural AIANs were 2.3 times more likely to die prematurely in working ages than the total population.

Working-age mortality varied greatly in relation to ADI [Figure 10]. During 2016–2020, AIANs living in the most deprived counties had 3.6 times higher premature mortality than AIANs in the least deprived counties (478.3 deaths vs. 132.2 deaths per 100,000 population). Similar socioeconomic patterns in premature mortality can be found for the other racial/ethnic groups, including rural AIANs.

Disparities in Disability, Chronic Conditions, Health Insurance, and Risk Factors by Race/Ethnicity and Native American Tribe

The overall disability rate was highest among AIANs [Table 2]. Approximately 17.7% of the AIAN population reported a disability during 2015–2019, compared with 14.5% of non-Hispanic Whites, 14.6% of African Americans, 7.3% of APIs, 9.2% of Hispanics, and 13.1% of the total US population. AIANs also reported significantly higher mental and ambulatory disability rates than other racial/ethnic groups.

Disability rates varied among AIAN tribes. Cherokee (24.0%), Blackfeet (21.9%), and Apache (20.2%) had the highest disability rates, while Crow (12.1%), Hopi (12.8%), and Pima (13.7%) had the lowest disability rates. Blackfeet (12.4%), Cherokee (10.2%), and Cheyenne (10.2%) had the highest mental disability rates and Cherokee (14.6%), Tlingit-Haida (12.6%), and Blackfeet (12.5%) had the highest ambulatory disability rates.

During 2015–2019, among the AIAN tribes, Seminole (31.7%), Crow (30.6), Comanche (29.6%), Pima (28.1%), and Blackfeet (26.2%) had the highest uninsured rates, while South American Indians (12.5%), Lumbee (13.5%), and Iroquois (14.1%) had the lowest rates of uninsured [Table 3].

During 2015–2019, poverty, unemployment, and education varied considerably across the AIAN tribes [Table 3]. The poverty rate was highest among Sioux (40.9%), followed by Tohono O'odham (40.6%), Pima (35.0%), Navajo (32.0%), Apache (30.1%), Blackfeet (29.4%), Yup'ik (28.9%), and Hopi (28.5%). Several tribes reported high rates of unemployment, such as Yup'ik (22.5%), Tohono O'odham (19.5%), Crow (18.5%), Inupiat (18.3%), and Alaskan Athabascan (16.8%).

Both computer and internet use have had measurable effects not only on individual empowerment, educational attainment, economic growth, and community development, but also on accessing healthcare, health-related information,

Table 1: Age-Adjusted Death Rates from Selected Leading Causes of Death Among American Indians/Alaska Natives (AIAN), Non-Hispanic Whites (NHW), and the Total Population, United States, 2021

	AIAN	AIAN	Non-Hispanic Whites		Total Population		AIAN	NHW	US
	Deaths	Death rate	Deaths	Death rate	Deaths	Death rate	Percent	Percent	Percent
All Causes of Death	28,941	787.49	2,548,809	893.91	3,464,231	879.68	100.0	100.0	100.0
Major Cardiovascular Diseases (CVD)	5280	155.24	696,709	235.65	925,923	231.79	18.2	27.3	26.7
Heart Disease	4019	116.66	531,162	179.78	695,547	173.78	13.9	20.8	20.1
Stroke	868	26.90	117,809	39.83	162,890	41.14	3.0	4.6	4.7
COVID-19	5009	133.88	271,253	93.51	416,893	104.12	17.3	10.6	12.0
All Cancers Combined	3394	93.86	462,601	153.74	605,213	146.55	11.7	18.1	17.5
Lung Cancer	701	19.79	109,126	35.07	134,592	31.75	2.4	4.3	3.9
Colorectal Cancer	349	9.63	39,425	13.56	54,121	13.36	1.2	1.5	1.6
Breast Cancer	214	10.49	30,760	19.76	42,310	19.37	0.7	1.2	1.2
Prostate Cancer	143	10.46	23,941	18.43	32,563	18.96	0.5	0.9	0.9
Cervical Cancer	58	2.83	2680	2.18	4366	2.27	0.2	0.1	0.1
Liver & IBD Cancer	289	7.21	19,016	6.11	28,719	6.68	1.0	0.7	0.8
Stomach Cancer	105	2.90	5991	2.03	10,894	2.67	0.4	0.2	0.3
Accidents and Adverse Effects	3235	78.15	153,897	69.96	224,935	64.71	11.2	6.0	6.5
Chronic Liver Disease and Cirrhosis	1993	48.19	39,824	15.21	56,585	14.47	6.9	1.6	1.6
Diabetes Mellitus	1365	36.93	65,789	22.36	103,294	25.41	4.7	2.6	3.0
COPD	874	25.61	122,054	39.92	142,342	34.71	3.0	4.8	4.1
Suicide	733	16.80	36,681	17.44	48,183	14.09	2.5	1.4	1.4
Pneumonia and Influenza	356	10.25	30,673	10.43	41,917	10.53	1.2	1.2	1.2
Alzheimer's disease	408	15.24	96,522	32.62	119,399	30.96	1.4	3.8	3.4
Nephritis and Kidney Diseases	426	12.19	36,444	12.28	54,358	13.55	1.5	1.4	1.6
Septicemia	312	8.24	29,455	10.02	41,281	10.22	1.1	1.2	1.2
Homicide	356	8.33	6215	3.28	26,031	8.17	1.2	0.2	0.8
Viral Hepatitis	66	1.54	2217	0.78	3589	0.85	0.2	0.1	0.1
Drug Overdose Mortality	1588	37.47	73,225	38.17	111,219	33.64	5.5	2.9	3.2
Alcohol-Related Causes	2319	56.00	38,117	15.56	54,258	14.42	8.0	1.5	1.6
Firearm Injuries	531	12.32	26,054	12.33	48,830	14.65	1.8	1.0	1.4
Firearm Injuries (Rural)	269	22.19	6348	17.81	8402	18.24	0.9	0.2	0.2

Death rates are directly standardized to the 2000 US standard population. IBD = Intrahepatic bile duct. COPD = Chronic obstructive pulmonary diseases.

Source: CDC/NCHS. National Vital Statistics System. 2021 Mortality Detail File.

and health education and promotions efforts, and are increasingly being recognized as an important SDOH.^[1,24–26] During 2015–2019, 71.4% of AIANs reported having access to broadband (high-speed) internet service compared with 89.4% of APIs, 84.2% of non-Hispanic Whites, 77.4% of African Americans, and 77.9% of Hispanics [Table 4]. AIANs reported the lowest rate of computer (including smartphone) use (82.7%) compared with 95.5% of APIs and 90.9% of

non-Hispanic Whites. There were significant disparities in broadband internet and computer access among AIAN tribes. Hopi (79.6%), Iroquois (78.0%), and Chippewa (77.8%) had the highest rates of broadband access, while Yup'ik (49.3%), Tohono O'odham (50.3%), and Inupiat (60.3%) reported the lowest rates of broadband access. Navajo (66.5%), Tohono O'odham (73.9%), and Pueblo (75.3%) reported the lowest rates of computer use.

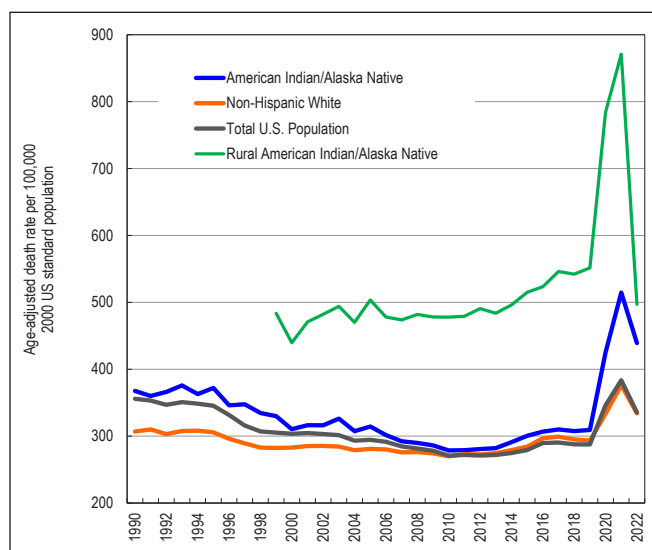


Figure 9: Trends in Working-Age (15–64) Mortality among American Indians and Alaska Natives, Non-Hispanic Whites, and the Total US Population, 1990–2022

Source: Data derived from the National Vital Statistics System. Data for 2022 are provisional.

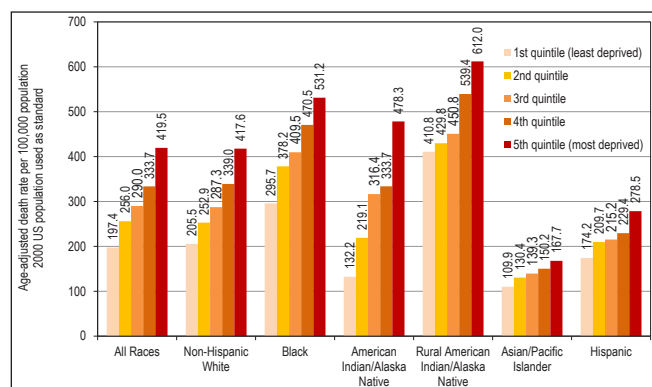


Figure 10: Working-Age (15–64 Years) Mortality by Race/Ethnicity and Area Deprivation Index, United States, 2016–2020

Source: Data derived from the National Vital Statistics System.

Disparities in Disability and Socioeconomic Characteristics Across 75 Largest American Indian and Alaska Native Tribal Areas

Selected socioeconomic and disability characteristics for the 75 largest AIAN tribal areas in terms of the AIAN population size during 2015–2019 are shown in Table 5. Socioeconomic characteristics varied greatly among the 75 largest tribal areas. Poverty rates were highest for Rosebud Indian Reservation and Off-Reservation Trust Land, SD (63.3%), Spirit Lake Reservation, ND (50.7%), and Standing Rock Reservation, SD—ND (50.6%), and lowest for Nome ANVSA (Alaska Native Village Statistical Area), AK (10.5%),

Knik ANVSA, AK (11.2%), and Saint Regis Mohawk Reservation, NY (12.1%). Among all tribal areas with at least 40 AIAN residents, Eklutna ANVSA, AK (94.6%), and Gakona ANVSA, AK (88.9%), had the highest poverty rates (data not shown).

Disparities in Physical and Mental Health, Health-Related Behaviors, and Cancer Screening: The 2018–2020 BRFSS

Approximately 19.1% of AIAN adults reported experiencing 14 or more days of poor mental health during the past month compared with 13.3% of the total US adult population. AIAN adults were 65% more likely to experience 14 or more days of poor physical health during the past month than their US counterparts (19.3% vs. 11.6%). AIAN adults reported higher prevalence of obesity, diabetes, physical inactivity, current smoking, and heavy drinking than the general US population [Figure 11].

AIANs' adults had a significantly higher prevalence of cancer, heart disease, and COPD than the general US population. AIAN adults were significantly less likely to report breast, cervical, prostate, and colorectal cancer screening than their US counterparts. Although more than 85% of AIAN adults reported having access to health insurance, they were 33% more likely than the general US population to report not being able to see a doctor in the past year due to cost [Figure 12].

DISCUSSION

In this study, we have analyzed major health and social inequality trends and patterns among AIANs. Documenting long-term trends and patterns in mortality from leading causes of death among AIANs using a comparative ethnic framework and analyzing tribe/tribal area-specific data on disability, health insurance, and socioeconomic conditions are two novel features of this study.

We found striking disparities in several health indicators, with AIANs experiencing shorter life expectancy compared to other racial/ethnic groups except Black Americans, high rates of premature mortality, infant and child mortality, diabetes, liver cirrhosis, alcohol-related mortality, suicides, and unintentional injuries than the general population and other major racial/ethnic groups.

Our study is consistent with an earlier study that analyzed mortality data for 2019.^[4] However, compared to the pre-pandemic year of 2019, mortality rates for AIANs increased significantly in the peak pandemic year of 2021 for the following major causes of death: CVD, including heart disease and stroke, cervical cancer, unintentional injuries, diabetes, COPD, Alzheimer's disease, suicide, homicide, cirrhosis, alcohol-related causes, drug overdose, and firearm injuries.

Table 2: Racial/Ethnic and American Indian and Alaska Native Tribe-Specific Differences in Rates (%) of Overall Disability and Disability Type, United States, 2015–2019

Race/Ethnicity and American Indian and Alaska Native Tribe	Total	Hearing	Vision	Cognitive	Ambulatory	Selfcare	Independent Living
	Disability Rate	Disability Rate	Disability Rate	Disability Rate Population aged 5+	Disability Rate Population aged 5+	Difficulty Rate Population aged 5+	Difficulty Rate Population aged 15+
Total population	13.12	3.67	2.44	5.46	7.31	3.00	6.09
Non-Hispanic White	14.52	4.62	2.46	5.64	8.05	3.21	6.47
Black/African American	14.58	2.24	3.11	6.78	8.86	3.71	7.25
Asian and Pacific Islander	7.27	2.03	1.45	2.91	3.87	1.87	3.97
Hispanic	9.18	2.09	2.19	4.40	4.77	2.19	4.38
American Indian and Alaska Native (AIAN)	17.67	4.93	3.95	7.91	9.99	3.61	7.88
Apache	20.19	6.00	4.87	8.53	12.24	3.77	7.96
Blackfeet	21.88	5.51	4.55	12.35	12.51	4.84	8.88
Cherokee	24.00	6.97	5.37	10.23	14.58	4.98	9.93
Cheyenne	17.03	4.06	4.17	10.18	11.54	3.27	7.04
Chickasaw	15.52	4.77	3.19	6.95	8.44	3.16	5.95
Chippewa	18.30	4.54	3.27	9.05	9.52	3.75	7.84
Choctaw	18.30	4.81	4.10	7.87	9.88	3.10	7.98
Comanche	17.35	7.22	3.98	6.29	8.09	3.26	5.60
Creek	16.75	4.19	3.00	6.11	10.09	2.60	6.52
Crow	12.08	3.05	1.98	4.57	7.19	1.96	5.12
Hopi	12.82	4.11	4.10	6.19	6.59	2.83	7.67
Iroquois	18.90	5.27	2.76	6.94	11.35	2.68	8.36
Lumbee	16.52	3.95	3.42	7.02	11.16	4.12	7.56
Mexican American Indian	10.68	2.54	2.29	5.21	5.04	2.12	4.27
Navajo	13.78	4.85	3.96	6.06	7.15	2.88	6.61
Pima	13.71	3.20	3.67	5.41	8.52	3.29	7.53
Potawatomi	17.47	4.22	3.23	5.85	9.57	3.82	6.77
Pueblo	15.33	5.05	3.98	6.00	7.51	2.90	6.54
Puget Sound Salish	13.83	4.72	2.58	6.03	7.53	3.30	6.88
Seminole	16.26	4.92	3.06	7.43	10.91	2.61	6.60
Sioux	15.97	4.13	3.21	7.48	9.28	3.25	7.18
South American Indian	14.35	1.73	3.10	7.08	7.98	2.97	5.72
Tohono O'odham	15.62	4.13	4.18	6.91	8.84	3.20	8.13
Yaqui	18.16	5.04	3.74	9.69	10.28	4.16	9.76
Other specified AI tribes alone	16.55	4.57	3.00	7.06	9.49	3.16	7.65
All other specified AI tribe combinations	18.09	4.83	3.84	8.29	10.03	3.59	8.11
American Indian, tribe not specified	18.24	4.61	4.83	7.96	10.81	4.31	7.63
Alaskan Athabascan	19.96	7.04	3.49	8.49	10.04	3.63	8.47
Tlingit-Haida	19.68	7.60	4.06	7.57	12.59	4.24	8.96
Inupiat	13.93	6.84	3.89	4.81	6.82	1.92	6.32
Yup'ik	13.82	6.98	3.23	5.44	6.25	1.51	5.11
Aleut	18.28	6.95	4.34	8.27	9.17	2.92	7.46
Other Alaska Native	18.42	6.07	3.70	8.88	7.89	3.71	9.12
Other AIAN specified	25.22	6.91	5.49	12.50	14.43	5.26	12.34
AIAN, not specified	19.27	4.46	4.41	9.12	11.04	4.38	9.12

Source: Data derived from the 2015–2019 American Community Survey, AI: American Indian.

Table 3: Racial/Ethnic and American Indian and Alaska Native Tribe-Specific Differences in Educational Attainment, Median Household Income, Home Ownership, Poverty, Unemployment Rates (%), Occupation, and Health Uninsurance, United States, 2015–2019

Race/Ethnicity and	Home	Median		Unemp-	White		Without	With at least	Health
	Ownership	Household	Poverty	loyment	Collar	Service	High School	Bachelor's	Uninsurance
American Indian and Alaska Native Tribe	Rate (%)	Income (\$)	Rate (%)	Rate (%)	Occupation (%)	Occupation (%)	Diploma Pop 25+ (%)	Degree Pop 25+ (%)	Rate (%)
Total population	63.66	62,667	13.65	5.40	58.54	18.70	12.03	32.03	9.21
Non-Hispanic White	71.66	68,690	9.80	4.35	63.54	15.67	7.16	35.71	6.21
Black/African American	41.40	41,820	23.31	9.50	50.09	25.43	14.03	21.58	11.12
Asian and Pacific Islander	58.82	86,642	11.35	4.29	69.01	17.32	12.80	53.21	6.91
Hispanic	46.79	51,573	20.03	6.12	41.90	25.52	31.41	16.30	18.53
American Indian and Alaska Native (AIAN)	54.39	43,527	25.04	10.26	45.53	25.39	19.53	15.22	19.84
Apache	49.34	40,810	30.11	15.35	45.56	27.68	20.77	11.39	14.22
Blackfeet	53.94	32,205	29.35	11.24	47.91	29.05	14.42	19.15	26.24
Cherokee	60.74	47,232	20.97	7.71	51.33	21.27	14.10	19.66	18.91
Cheyenne	49.45	43,321	26.67	13.49	48.30	29.27	13.12	19.93	23.38
Chickasaw	68.66	60,609	14.01	4.80	56.02	21.30	9.62	23.27	21.39
Chippewa	55.07	42,501	25.33	11.21	45.00	28.09	14.69	14.66	17.10
Choctaw	63.61	52,730	17.22	7.11	50.38	21.66	13.25	21.92	21.84
Comanche	50.21	48,487	23.49	10.72	49.41	19.46	10.16	21.67	29.61
Creek	63.78	49,186	17.98	7.64	52.28	21.42	11.27	20.67	20.48
Crow	46.84	43,321	26.63	18.51	49.76	22.69	10.01	13.81	30.64
Hopi	54.38	43,344	28.54	8.53	51.98	26.54	10.33	11.30	16.15
Iroquois	54.96	43,321	21.20	9.26	51.88	20.88	12.72	19.53	14.08
Lumbee	67.78	42,931	23.85	6.38	46.56	19.36	23.26	16.63	13.46
Mexican American Indian	43.94	49,566	20.44	6.49	33.41	26.36	44.02	12.92	25.35
Navajo	57.57	36,700	32.03	11.37	43.68	26.28	19.64	10.90	22.16
Pima	45.52	33,747	35.02	14.29	38.76	35.37	27.37	9.33	28.12
Potawatomi	66.67	56,893	17.18	8.65	54.08	19.12	10.69	22.04	17.44
Pueblo	62.59	42,938	25.55	11.00	51.67	24.83	14.66	15.82	22.89
Puget Sound Salish	56.77	52,835	18.66	11.96	52.36	26.98	16.08	12.82	18.78
Seminole	52.48	50,094	22.61	8.73	53.78	22.61	12.44	16.16	31.73
Sioux	41.52	35,651	40.87	15.35	43.55	29.52	18.13	12.96	25.02
South American Indian	41.63	51,573	18.23	7.25	46.69	26.06	19.92	26.00	12.52
Tohono O'odham	36.01	30,253	40.60	19.45	35.66	34.16	27.97	5.19	20.05
Yaqui	47.85	47,477	25.65	10.75	43.63	31.44	22.63	11.08	18.02
Other specified AI tribes alone	53.68	42,817	23.86	10.56	45.73	25.96	18.35	15.43	19.45
All other specified AI tribe combinations	54.06	45,962	22.79	11.10	47.57	25.90	15.19	15.10	17.96
American Indian, tribe not specified	53.97	50,452	19.44	7.40	46.59	26.56	20.64	18.75	15.65
Alaskan Athabascan	62.45	45,952	18.97	16.79	44.51	26.82	17.36	14.71	23.97
Tlingit-Haida	57.83	45,348	17.66	8.91	54.53	22.51	9.34	15.88	20.76
Inupiat	57.52	53,017	26.86	18.27	47.41	20.87	18.28	10.95	24.67
Yup'ik	61.09	45,085	28.85	22.46	44.12	24.89	21.08	4.24	21.30
Aleut	54.68	57,761	18.55	11.79	42.82	22.82	12.05	17.07	24.02
Other Alaska Native	52.44	48,776	28.53	13.63	46.07	24.66	20.13	9.19	25.50
Other AIAN specified	45.72	38,493	24.76	16.12	43.41	26.08	17.72	13.18	20.88
AIAN, not specified	47.64	42,138	24.82	8.97	39.93	27.08	27.73	13.73	17.55

Source: Data derived from the 2015–2019 American Community Survey, AI: American Indian.

Table 4: Racial/Ethnic and American Indian and Alaska Native Tribe-Specific Differences in Broadband Internet Access and Computer Use, United States, 2015–2019

Race/Ethnicity and American Indian and Alaska Native Tribe	Broadband	95%	95%	Computer	95%	95%
	Internet	Confidence	Confidence	Use	Confidence	Confidence
	(%)	Interval (lower)	Interval (upper)	(%)	Interval (lower)	Interval (upper)
Total population	82.83	82.80	82.80	90.32	90.20	90.40
Non-Hispanic White	84.15	84.20	84.20	90.86	90.80	91.00
Black/African American	77.35	77.20	77.40	85.81	85.80	86.00
Asian and Pacific Islander	89.41	89.20	89.60	95.52	95.40	95.60
Hispanic	77.90	77.80	78.00	89.85	89.80	90.00
American Indian and Alaska Native (AIAN)	71.43	70.80	72.00	82.68	82.40	83.00
Apache	75.93	72.80	79.00	81.10	79.00	83.20
Blackfeet	67.06	62.20	71.80	79.84	76.00	83.60
Cherokee	70.29	69.00	71.60	84.83	84.00	85.80
Cheyenne	73.39	63.00	83.80	82.79	77.60	88.00
Chickasaw	72.88	68.20	77.60	92.54	90.00	95.00
Chippewa	77.80	75.80	79.80	85.44	84.00	86.80
Choctaw	70.17	67.80	72.60	87.30	86.00	88.60
Comanche	63.59	55.60	71.40	88.91	84.40	93.40
Creek	66.92	63.00	70.80	87.34	85.20	89.40
Crow	74.76	64.60	85.00	85.18	79.40	91.00
Hopi	79.58	73.00	86.20	80.12	75.60	84.60
Iroquois	78.01	75.00	81.00	85.36	83.00	87.60
Lumbee	73.95	71.80	76.20	79.27	77.40	81.20
Mexican American Indian	72.44	70.00	74.80	88.96	87.20	90.60
Navajo	63.55	61.40	65.60	66.47	65.40	67.60
Pima	70.57	64.20	77.00	78.09	74.20	82.00
Potawatomi	73.85	69.80	77.80	90.41	87.60	93.20
Pueblo	68.33	64.00	72.60	75.29	73.20	77.20
Puget Sound Salish	73.35	67.20	79.40	88.07	84.80	91.40
Seminole	73.99	68.40	79.60	85.17	81.00	89.20
Sioux	74.58	72.00	77.20	77.72	75.80	79.60
South American Indian	84.24	81.20	87.40	94.92	93.20	96.60
Tohono O'odham	50.32	42.80	57.80	73.85	69.00	78.60
Yaqui	69.19	63.60	74.60	88.88	85.80	92.00
Other specified AI tribes alone	72.19	70.20	74.20	86.19	84.80	87.60
All other specified AI tribe combinations	73.65	72.20	75.20	87.12	86.20	88.00
American Indian, tribe not specified	76.07	72.80	79.20	88.36	86.40	90.40
Alaskan Athabaskan	73.99	67.80	80.20	81.79	78.20	85.40
Tlingit-Haida	66.83	58.80	75.00	88.37	84.60	92.20
Inupiat	60.27	55.20	65.40	85.93	83.00	89.00
Yup'ik	49.29	44.20	54.40	82.50	79.40	85.60
Aleut	75.81	68.00	83.60	89.03	85.40	92.80
Other Alaska Native	67.10	58.80	75.40	86.02	81.00	91.00
Other AIAN specified	68.74	65.20	72.20	86.65	84.40	88.80
AIAN, not specified	70.68	69.20	72.20	80.81	79.80	81.80

Source: Data derived from the 2015–2019 American Community Survey, AI: American Indian.

Table 5: Selected Socioeconomic and Health Characteristics of the 75 Largest American Indian and Alaska Native (AIAN) Tribal Areas, United States, 2015–2019

Tribal/Geographic Area Name	Total AIAN Population	Median Household Income	White collar Occupation %	Home Ownership Rate %	Poverty Rate %	Unemployment Rate %	Without High School Diploma %	Bachelor's Degree and Above %	Total Disability Rate %
Navajo Nation Reservation and Off-Reservation Trust Land, AZ–NM–UT	166,464	\$27,053	42.77	78.42	39.20	8.87	25.55	6.93	15.40
Cherokee OTSA, OK	87,389	\$44,554	48.20	67.65	21.87	5.26	14.54	16.07	17.60
Lumbee (state) SDTSA, NC	65,793	\$34,386	41.55	69.44	27.89	4.87	25.78	12.11	17.50
Creek OTSA, OK	59,647	\$46,961	54.16	59.72	19.46	4.55	13.10	18.97	14.80
Choctaw OTSA, OK	27,249	\$39,174	46.06	62.19	22.87	5.66	15.27	14.44	19.30
Chickasaw OTSA, OK	23,079	\$51,042	49.38	69.04	16.12	4.29	13.61	15.26	16.40
Pine Ridge Reservation, SD–NE	17,179	\$31,097	46.56	47.19	49.12	9.67	29.15	8.84	14.20
Fort Apache Reservation, AZ	14,795	\$29,367	45.26	61.27	44.09	13.25	30.49	4.96	16.80
Rosebud Indian Reservation and Off-Reservation Trust Land, SD	10,107	\$17,106	57.18	42.89	63.26	4.16	24.69	10.18	6.30
San Carlos Reservation, AZ	9696	\$33,929	45.80	64.60	47.00	15.94	28.28	4.32	12.60
Kiowa-Comanche-Apache-Fort Sill Apache OTSA, OK	9694	\$38,427	46.13	52.30	21.94	9.99	14.64	12.32	17.70
Gila River Indian Reservation, AZ	9506	\$22,241	41.17	44.49	44.95	6.67	33.29	4.37	14.10
Citizen Potawatomi Nation-Absentee Shawnee OTSA, OK	9232	\$49,894	47.96	78.39	14.63	3.37	13.49	13.50	14.20
Tohono O'odham Nation Reservation and Off-Reservation Trust Land, AZ	9052	\$27,875	42.28	62.51	47.59	16.03	25.31	4.27	20.60
Hopi Reservation and Off-Reservation Trust Land, AZ	8891	\$37,299	46.40	73.70	37.42	5.36	12.15	6.43	9.50
Blackfeet Indian Reservation and Off-Reservation Trust Land, MT	8865	\$30,469	59.99	55.64	35.14	6.73	12.47	20.27	7.50
Turtle Mountain Reservation and Off-Reservation Trust Land, MT–ND–SD	8776	\$36,059	48.79	69.51	32.23	6.43	13.64	17.26	17.80
Zuni Reservation and Off-Reservation Trust Land, NM–AZ	8713	\$37,668	40.89	84.00	36.71	13.50	22.16	4.90	16.80
United Houma Nation (state) SDTSA, LA	8036	\$42,361	44.19	65.45	25.13	4.23	36.01	7.77	15.20
Flathead Reservation, MT	7988	\$35,532	49.37	56.94	32.77	9.75	14.01	19.15	13.20
Wind River Reservation and Off-Reservation Trust Land, WY	7794	\$42,367	42.62	57.96	25.94	10.75	11.25	8.58	13.00
Mississippi Choctaw Reservation, MS	7398	\$33,559	39.18	71.94	39.36	8.47	25.96	7.75	16.80
Cheyenne-Arapaho OTSA, OK	7190	\$53,348	59.52	52.85	17.49	7.51	15.66	12.60	11.90

(Continued)

Tribal/Geographic Area Name	Total AIAN Population	Median Household Income	White collar Occupation %	Home Ownership Rate %	Poverty Rate %	Unemployment Rate %	Without High School Diploma %	Bachelor's Degree and Above %	Total Disability Rate %
Yakama Nation Reservation and Off-Reservation Trust Land, WA	6902	\$43,699	47.21	54.32	36.23	12.99	19.18	8.59	12.40
Fort Peck Indian Reservation and Off-Reservation Trust Land, MT	6818	\$27,831	42.21	48.92	40.58	12.49	19.05	11.79	12.00
Cheyenne River Reservation and Off-Reservation Trust Land, SD	6691	\$37,122	58.39	51.19	41.86	22.14	18.76	12.66	10.40
Eastern Cherokee Reservation, NC	6669	\$43,094	40.27	72.96	16.03	2.45	18.50	11.52	18.70
Standing Rock Reservation, SD-ND	6518	\$26,750	53.22	35.80	50.60	18.01	20.73	13.40	11.40
Sac and Fox OTSA, OK	6291	\$40,077	51.19	59.28	21.50	4.53	17.17	14.13	14.20
Osage Reservation, OK	6027	\$49,441	51.77	73.33	15.10	5.68	11.00	15.40	16.30
Crow Reservation and Off-Reservation Trust Land, MT	5978	\$46,141	55.08	71.72	32.47	12.18	10.55	14.97	8.70
Salt River Reservation, AZ	5591	\$40,524	41.02	74.52	37.53	19.21	31.88	4.86	16.70
Red Lake Reservation, MN	5560	\$39,645	52.17	53.76	30.75	18.92	24.77	6.85	10.20
Knik ANVSA, AK	4917	\$57,000	47.26	65.91	11.21	7.01	13.57	7.05	12.40
Fort Berthold Reservation, ND	4794	\$52,898	56.01	54.68	23.45	7.05	10.35	18.67	13.40
Lake Traverse Reservation and Off-Reservation Trust Land, SD-ND	4634	\$31,542	46.77	35.49	40.00	9.58	17.20	6.97	9.00
Seminole OTSA, OK	4619	\$37,337	47.70	55.03	28.41	6.36	17.13	12.43	20.40
Leech Lake Reservation and Off-Reservation Trust Land, MN	4555	\$34,659	45.04	54.27	35.08	12.92	12.71	9.18	14.10
Kiowa-Comanche-Apache-Ft Sill Apache/Caddo-Wichita-Delaware joint-use OTSA, OK	4423	\$31,736	47.68	55.51	35.35	10.03	8.20	17.15	15.80
Northern Cheyenne Indian Reservation and Off-Reservation Trust Land, MT-SD	4392	\$47,500	50.58	56.04	27.10	9.70	10.86	12.46	11.00
Oneida (WI) Reservation and Off-Reservation Trust Land, WI	4384	\$43,008	48.59	51.02	24.84	7.12	6.39	18.83	15.70
White Earth Reservation and Off-Reservation Trust Land, MN	4241	\$31,216	40.94	56.70	39.69	9.65	17.25	7.49	16.90
Bethel ANVSA, AK	4154	\$61,050	62.28	36.64	19.63	10.07	13.57	7.02	7.10
Warm Springs Reservation and Off-Reservation Trust Land, OR	3819	\$47,667	44.20	64.99	34.19	15.20	17.88	8.94	15.70

(Continued)

Tribal/Geographic Area Name	Total AIAN Population	Median Household Income	White collar Occupation %	Home Ownership Rate %	Poverty Rate %	Unemployment Rate %	Without High School Diploma %	Bachelor's Degree and Above %	Total Disability Rate %
Colville Reservation and Off-Reservation Trust Land, WA	3791	\$38,480	54.30	63.33	24.69	9.19	15.56	11.14	19.00
Laguna Pueblo and Off-Reservation Trust Land, NM	3724	\$34,250	47.36	83.23	32.13	12.90	9.01	9.37	21.80
Spirit Lake Reservation, ND	3686	\$28,616	44.12	44.62	50.67	5.86	23.18	6.15	18.40
Mescalero Reservation, NM	3588	\$33,603	44.97	57.75	35.04	11.79	18.25	10.70	13.60
Pascua Pueblo Yaqui Reservation and Off-Reservation Trust Land, AZ	3498	\$36,250	39.29	33.49	36.19	8.19	34.28	3.32	18.00
Fort Hall Reservation and Off-Reservation Trust Land, ID	3481	\$35,795	37.83	77.46	25.26	14.48	13.34	8.50	21.40
Rocky Boy's Reservation and Off-Reservation Trust Land, MT	3477	\$30,436	45.64	41.75	33.74	4.83	17.21	10.14	6.60
Isleta Pueblo, NM	3368	\$38,173	53.51	94.37	26.81	7.70	12.92	11.33	18.80
Colorado River Indian Reservation, AZ-CA	3062	\$32,578	37.91	49.03	40.11	12.50	24.29	6.61	16.80
Fort Belknap Reservation and Off-Reservation Trust Land, MT	3002	\$31,711	75.78	48.44	43.67	20.95	12.64	12.06	22.90
Jicarilla Apache Nation Reservation and Off-Reservation Trust Land, NM	2967	\$45,486	59.54	74.66	24.14	19.15	13.84	9.10	17.90
Menominee Reservation, WI	2962	\$31,071	35.97	57.76	41.26	7.88	8.50	10.22	15.30
Yankton Reservation, SD	2904	\$31,375	41.61	38.14	42.56	13.50	24.57	7.54	15.00
Lummi Reservation, WA	2895	\$41,625	61.67	52.49	20.87	4.77	16.90	12.78	20.20
Nez Perce Reservation, ID	2760	\$43,854	51.14	58.40	27.35	10.36	7.76	11.57	18.30
Saint Regis Mohawk Reservation, NY	2709	\$40,383	100.00	85.14	12.11	23.83	0.00	12.54	23.60
Uintah and Ouray Reservation and Off-Reservation Trust Land, UT	2709	\$39,844	51.78	70.50	39.16	10.13	30.23	4.13	11.00
Barrow ANVSA, AK	2678	\$55,956	62.05	59.13	17.08	16.97	20.17	2.16	14.80
Hoopa Valley Reservation, CA	2652	\$38,125	44.18	69.42	37.59	4.71	16.05	12.06	18.40
Acoma Pueblo and Off-Reservation Trust Land, NM	2635	\$46,765	44.84	92.35	19.24	10.14	10.28	11.24	18.20
San Felipe Pueblo, NM	2624	\$41,094	39.51	73.40	26.27	7.88	29.65	6.81	11.50
Santo Domingo Pueblo, NM	2607	\$34,583	46.12	71.75	28.10	2.78	18.66	5.18	9.90
Haliwa-Saponi (state) SDTSA, NC	2504	\$33,566	34.39	78.39	25.96	3.83	33.21	8.15	24.00
Kenaitze ANVSA, AK	2424	\$52,539	34.91	50.76	19.30	9.60	15.78	9.70	13.70
Nome ANVSA, AK	2296	\$61,680	60.58	44.77	10.45	11.00	14.64	7.01	9.50

(Continued)

Tribal/Geographic Area Name	Total AIAN Population	Median Household Income	White collar Occupation %	Home Ownership Rate %	Poverty Rate %	Unemployment Rate %	Without High School Diploma %	Bachelor's Degree and Above %	Total Disability Rate %
Omaha Reservation, NE-IA	2294	\$35,714	52.98	42.71	38.27	19.00	16.62	5.68	14.70
Kotzebue ANVSA, AK	2277	\$58,125	62.40	47.67	25.30	8.27	16.22	4.48	9.10
Kickapoo OTSA, OK	2201	\$40,673	46.52	59.22	27.64	7.78	18.51	12.13	14.00
Kaw/Ponca joint-use OTSA, OK	2195	\$47,976	54.98	51.47	23.59	8.57	16.89	13.61	16.30
Jemez Pueblo, NM	2031	\$41,597	34.46	84.28	24.48	2.20	16.35	6.06	10.70
Isabella Reservation, MI	1970	\$64,152	45.44	72.08	14.78	6.26	25.84	11.06	21.90

Source: Data derived from the 2015–2019 American Community Survey.

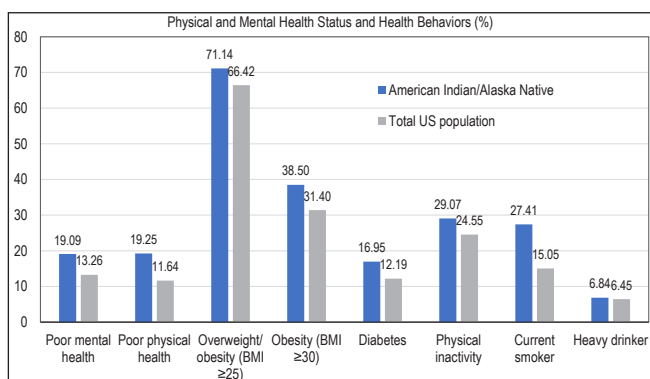


Figure 11: General Health Status, Mental Health Status, and Selected Health-Risk Behaviors among American Indians and Alaska Natives and the US Population aged ≥ 18 Years, United States, 2018–2020
Source: Data derived from the 2018–2020 Behavioral Risk Factor Surveillance System.

Similar increases were also observed for non-Hispanic Whites and the total US population.

Inequities in life expectancy, cause-specific mortality, including COVID-19 mortality, among AIANs might be explained by racial/ethnic differences in socioeconomic characteristics, occupational exposures, social isolation, preventive COVID-related behaviors, COVID-19 vaccinations, severe COVID symptoms at diagnosis, comorbidities, and access to care and treatment, among other factors.^[27]

Inequities in mental and physical health and access to healthcare are very marked. Compared with any other major racial/ethnic groups, AIANs are significantly more likely to rate their physical and mental health as poor.^[4] Almost one in five AIAN adults assess their physical and mental health as poor at nearly twice the rate of non-Hispanic Whites or the general population.^[4] More than 10% of AIAN adults experience serious psychological distress, which is three times higher than the prevalence for non-Hispanic Whites and six times higher than the prevalence for APIs.^[4] AIANs have the highest disability and uninsured rates of all major racial/ethnic groups in the US. Nearly 18% of AIANs report

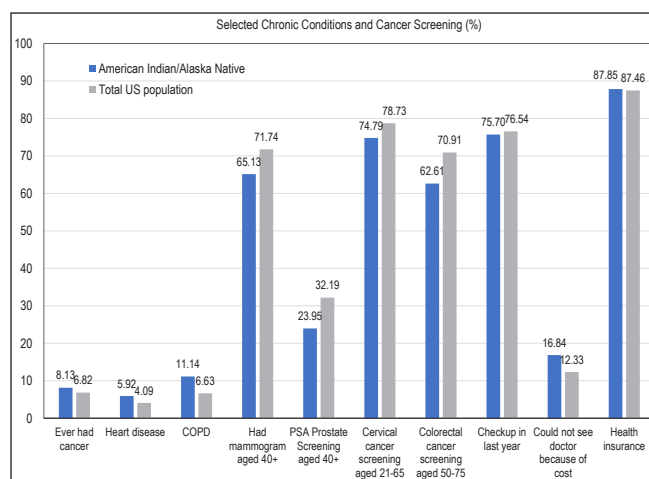


Figure 12: Prevalence of Selected Chronic Conditions and Cancer Screening among American Indians and Alaska Natives and the US Population aged ≥ 18 Years, United States, 2018–2020
Source: Data derived from the 2018–2020 Behavioral Risk Factor Surveillance System.

Notes: Colorectal cancer screening indicates whether respondent met the US Preventive Services Task Force recommendation for screening. Mammogram and PSA screenings are within the past two years, cervical screening within the past three years, and colorectal screening time frame is conditional on type of screening: colonoscopy, virtual colonoscopy or sigmoidoscopy five years, bloodstool test one year, and stool DNA test three years. Delay of doctor visit is for any instance in the previous year where needed care was missed.

a disability and 20% are without health insurance. In certain tribal communities such as Seminole, Crow, and Comanche, 30% of the population or higher lacks health insurance.

AIANs are disadvantaged in their behavioral risk profile that contributes to their poorer health status relative to other groups. Of all the major racial/ethnic groups, AIANs have among the highest rates of adult obesity, smoking, heavy alcohol consumption, and physical inactivity and the lowest rates of breast, cervical, and colorectal cancer screening.^[4] Socioeconomic and material living conditions of AIANs are less favorable compared to other groups. AIANs have the highest poverty rates of any major racial/ethnic group, with

27% of the AIAN population living in poverty. Poverty rates among many of the tribal groups and areas are astonishingly high, with poverty rates in these communities exceeding 60%.

Digital platforms such as telehealth, social media, and digital health literacy have an important role to play in increasing access to physical and mental healthcare and services, improving quality of life, and reducing inequalities in physical and mental health outcomes.^[28–30] However, in the US there is a clear digital divide driven by socioeconomic status (SES) and race and ethnicity.^[31,32] High SES and non-Hispanic White populations have improved access to digital health resources such as reliable and affordable high-speed internet when compared to low SES and racial and ethnic minority populations.^[31,32] According to a recent US study, individuals and communities with little or no broadband access and computer use experience substantial health disparities in terms of seven years shorter life expectancy, higher mortality from various chronic conditions such as cardiovascular, cancer, and diabetes, poor health, disability, mental distress, preventable hospitalization, smoking, obesity, physical inactivity, reduced access to healthcare, lower educational attainment, and higher unemployment and poverty rates.^[26]

Populations that accrue the most health-enhancing benefits of social media are often White populations, younger age, and those with higher education.^[29,33] By contrast, racial and ethnic minority groups, those with low education attainment, and older populations are more likely to have decreased access to digital platform tools such as physical and mental telehealth services that could improve overall health and quality of life.^[29,30,32,33] Therefore, improving digital health literacy could be one way to advance mental and physical health equity for the AIAN populations. To be specific, targeted resources and policies that increase AIANs' access to stable, high-speed internet that support digital platforms, including telehealth services and social media, will be a necessary tool to close the digital divide and increased AIANs' access to health information and services.^[28,29,32,33]

Limitations

Limitations of the study include possible underreporting of mortality statistics for AIANs on the death certificate and inconsistencies in the reporting of AIAN race or ethnicity in mortality (numerator) and population (denominator) data.^[4,12,13,27] Consequently, mortality rates for AIANs based on vital records may be underestimated and life expectancy overestimated, implying a smaller disparity for AIANs than actually is the case. However, cause-specific mortality and mortality rates for AIANs aged 25–64 shown here appear to be consistent with those based on longitudinal databases such as the National Longitudinal Mortality Study and the National

Health Interview Survey-National Death Index Record Linkage Study in which race/ethnicity is self-reported.^[4,12,27] Federal health surveys and administrative databases, including NVSS, do not include tribe-specific data. Although limited health measures such as disability and health insurance are available in the ACS, tribal data on mortality, morbidity, and health conditions are completely lacking.

CONCLUSION AND GLOBAL HEALTH IMPLICATIONS

AIANs remain a disadvantaged racial/ethnic group in several key health indicators and socioeconomic and living conditions, with poverty rates in many tribal communities exceeding 40%. The COVID-19 pandemic worsened their health and well-being relative to the other groups in the US. Declines in life expectancy, high rates of poverty, lack of health insurance, reduced access to healthcare services, and unfavorable socioeconomic conditions of AIAN populations and tribal communities are major areas of concern that require increased policy attention.

Although reduced smoking, greater physical activity, lower obesity, healthy diet, higher seatbelt use, avoiding substance use, and improved access to and use of healthcare services can lead to improvements in the health of AIANs, these factors are themselves primarily influenced by the broader, more upstream social determinants such as education, income, social and welfare services, affordable housing, job creation, labor market opportunities, and transportation.^[3,4] Addressing and finding solutions to reducing these marked inequities in social determinants should be an important policy focus for tackling health inequalities among AIANs and those between AIANs and the other racial and ethnic groups in the US.^[3,4]

Key Messages

- In 2021, life expectancy at birth was 70.6 years for AIANs, significantly lower than that for APIs (84.1), Hispanics (78.8), and non-Hispanic Whites (76.3).
- Between the pre-pandemic year of 2019 and the peak pandemic year of 2021, AIANs experienced the greatest decline in life expectancy of 6.3 years, followed by Blacks (5.8 years).
- COVID-19 was the leading cause of death among AIANs in 2021. Risks of mortality from alcohol-related problems, drug overdose, unintentional injuries, and homicide were markedly higher among AIANs than non-Hispanic Whites or the general population.
- AIANs have the highest disability and uninsured rates of all major racial/ethnic groups in the US. Nearly 18% of AIANs report a disability and 20% are without health insurance.

- Poverty rates among many tribal groups are astonishingly high. Poverty rates exceed 60% in many Native American tribal areas and reservations, including Eklutna, AK (94.6%); Gakona, AK (88.9%); Klamath Reservation, OR (70.4%); and Rosebud Indian Reservation, SD (63.3%).
- Declines in life expectancy, high rates of poverty, lack of health insurance, reduced access to healthcare services, and unfavorable socioeconomic and living conditions of AIAN populations and tribal communities are major areas of concern that require increased policy attention.

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COMPLIANCE WITH ETHICAL STANDARDS

Conflicts of Interest

There are no conflicts of interest.

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Nothing to declare.

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Ethics Approval

Institutional Review Board approval is not required for this study, as it is based on the secondary analysis of several public-use federal databases.

Declaration of Patient Consent

Patient's consent not required as there are no patients in this study.

Use of Artificial Intelligence (AI)-Assisted Technology for Manuscript Preparation

The authors confirm that there was no use of AI-assisted technology for assisting in the writing or editing of the manuscript and no images were manipulated using the AI.

Disclaimer

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