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Social Determinants of Health among Rural American Indian and Alaska Native Populations

This policy brief is the third in a series of four policy briefs prepared by the Rural and Minority Health Research Center on the topic of social determinants of health.

- Rural American Indian/Alaska Native (AI/AN) populations experience both personal and community disadvantage. In 2016, rural AI/AN residents were:
 - More likely to live in poverty (28.8%) than their rural white peers (10.4%).
 - More likely to live in counties falling in the highest quartile in the U.S. for the proportion of households in poverty (60.9% of AI/AN rural residents versus 46.0% of rural white residents).
 - More likely to live in persistent poverty counties (37.4% of rural AI/AN residents versus 8.9% rural white residents).
- Rural AI/AN adults were much more likely to live in counties where $\geq 16\%$ of the population lacks health insurance (55.1% versus 18.8% of rural white residents.)
- Rural AI/AN age-adjusted mortality rates were higher than those for rural white residents.

Introduction

American Indian/Alaska Native (AI/AN) individuals are defined as persons originating from North, Central, and South America who maintain tribal or community affiliation.¹ AI/AN populations are extremely diverse as the category includes more than 550 different tribes. In 2016, America included 2.7 million AI/AN residents accounting for about 0.8 percent of the total population of the country.² Approximately 1 million AI/AN persons lived in non-metropolitan (rural) counties in 2016 or about 1.7% of the rural population.* A higher proportion of the AI/AN population resides in rural areas (46.1%) than is true of the U.S. population as a whole.

The geographic distribution of the AI/AN population reflects both historical settlement and forced resettlement areas with high concentrations in North Carolina, Oklahoma, the Four Corners region (Arizona, New Mexico, Colorado and Utah), and northern Mountain and North West Central states (Minnesota, North Dakota, South Dakota, Montana), as well as Alaska.[†]

* In this brief, rurality is defined at the county level, with non-metropolitan counties considered as rural. The terms “rural” and “non-metro” are used interchangeably. Data are drawn from the 2016 Census and pertain to AI/AN and non-Hispanic white rural residents. In the 2010 Census, a substantial portion of all persons who self-identified as AI/AN also noted one or more other races (2.9 million of 5.2 million). The analysis reported here is restricted to individuals who identified only as AI/AN, without an additional race.

[†] Map available at <https://www.ruralhealthinfo.org/rural-maps/mapfiles/american-indian-alaskan-native-population.jpg>.

The rural AI/AN population was younger than the non-Hispanic white (hereafter, white) rural population in 2016. Children aged less than 18 years constituted 30.0% of the rural AI/AN population compared with 20.5% among rural white residents (See Table A-1). Urban differences between AI/AN and white populations are similar with children making up 25.9% of the AI/AN urban population versus 18.5% of the white urban group. At the other end of the spectrum, 10.6% of rural AI/AN residents were 65 years or older versus 20.1% of rural white residents. Again, urban populations had the same pattern: 9.3% of urban AI/AN residents were age 65 or older compared to 19.0% among urban white residents.

Social determinants of health among AI/AN rural residents

Social determinants of health, as defined by the World Health Organization, are “the conditions in which people are born, grow, live, work and age,”³ a definition paralleled by the Centers for Disease Control and Prevention.⁴ Social determinants include both individual factors such as income, education, and access to health care as well as community conditions such as housing, safety, and the availability of employment. A general discussion of the social determinants of health for rural residents is available at the Rural Health Information Hub.⁵

AI/AN populations have faced long term social and economic disparities due to colonization, forced migration, land loss, and cultural devastation.⁶ In consequence, AI/AN populations remain disadvantaged with higher proportions of less educated adults, unemployed or low wage workers, and higher rates of poverty.^{7,8,9} Education, employment, income, and living conditions play a fundamental role in social and economic development.¹⁰ The economic challenges for AI/AN populations include geographic isolation and fewer job opportunities.

Educational attainment

The AI/AN rural population falls behind the white population in educational attainment. A higher proportion of rural AI/AN (19.7%) than rural white residents (10.4%) had less than a high school education in 2016 (Table A-1). High school completion values for urban AI/AN adults were similar with 20.4% lacking a high school diploma. At the other end of the educational spectrum, a smaller percentage of rural AI/AN adults (44.5%) than rural white adults (54.7%) have a college education or better.

Poverty status

Poverty is closely associated with adverse health outcomes and health risk behaviors including a sedentary lifestyle, unhealthy diet, and smoking.¹¹ Higher unemployment, lower earnings, and living in isolation are major contributors to poverty in AI/AN households.⁷ A markedly higher proportion of rural AI/AN residents (28.8%) lived below the federal poverty line in 2016 than did their rural white peers (10.4%; Table A-1). Poverty rates were also high among urban AI/AN residents (24.6%). Of note, the prevalence of poverty is higher among rural AI/AN populations than among rural African American residents (24.1%) or rural Hispanic residents (21.3%; see related briefs). AI/AN persons constitute the poorest minority group within the rural U.S.

Disability

Rural AI/AN residents had higher disability rates than their rural white peers (16.8% vs 15.6%; Table A-1). We found comparable disability rates in urban (17.1%) and rural AI/AN populations (16.8%). These findings parallel previous research.¹²

Veteran status

Historically, AI/AN populations have served in the U.S. armed forces at disproportionate levels compared to other populations. During World War II, for example, 44,000 AI/AN individuals served out of an estimated population of 350,000 (12.6%).¹³ In 2016, the proportion of veterans among the AI/AN rural population was lower than among white residents, 6.8% vs 9.9% respectively (Table A-1). In part, the smaller proportion of current AI/AN veterans may be due to shorter life spans among rural AI/AN residents (see Figure 1). For example, while 15.6% of all living white veterans served in World War II or the Korean Conflict only 7.7% of living AI/AN veterans served during this period.¹³

Nativity

Nearly all AI/ANs rural residents (98.5%) were born in the U.S, a value comparable to that of white rural residents (98.8%; Table A-1).

Computer and broadband

Despite widespread use of digital technologies and the internet, rural access to broadband is still limited. Access to computer and internet services was markedly lower among AI/AN rural residents than white individuals. First, 20.3% of AI/AN rural households versus 9.0% of white rural households lack a computer defined as any computer, tablet, or smartphone. Only 11.1% of urban AI/AN households lacked a computer, highlighting the rural nature of this disparity. Similarly, only 61.4% of rural AI/AN households reported having broadband internet service compared to 78.0% of urban AI/AN households and 82.5% of rural white households (Table A-1).

Concentration in high-risk counties

AI/AN individuals are more likely to live in remote, socially, and economically disadvantaged areas facing higher poverty, lower wages, unemployment, and lower standards of education.¹⁴ The social, economic, and political inequalities among AI/AN populations are associated with chronic stress⁶ which has been associated with risky behaviors, chronic diseases, and adverse health outcomes.¹⁵ County of residence is associated with several health-risk behaviors and health outcomes including life expectancy.^{16,17} Recent reports show that the gap in life expectancy has been widening between low- and high-risk counties.¹⁸ This section examines disparities of place: differing concentrations of white and non-white populations across the 1,976 rural counties.

The AI/AN rural population is concentrated in counties falling in the highest quartile for poverty. Among AI/AN rural residents, 60.9% lived in high-poverty counties versus 46.0% of their white peers. Relatedly, 50.7% of AI/AN rural residents versus 26.0% of white residents lived in counties in the highest quartile for unemployment rates (Table A-2).

At the county level, poverty can be an enduring phenomenon. The U.S. Department of Agriculture characterizes counties as having “persistent poverty” if 20% or more of the population have lived in poverty for the past 30 years. Of the 1,976 non-metropolitan counties, 301 are characterized as persistent poverty counties. Among rural AI/AN residents, 37.4% live in persistent poverty counties compared to 8.9% among rural white residents. (Data not in table).

Similarly, the USDA has designated 558 counties as “persistent child poverty” counties in which 20% or more of children have lived below the poverty line in each Census since 1980. Across rural America, 558 counties are labeled persistent child poverty counties; 28.2% of the rural population lives in these areas. Again, racial disparities are marked. More than half of rural AI/AN residents (52.7%) live in persistent child poverty counties versus 20.9% of white residents. (Data not in table).

AI/AN residents and health care resources

Nearly all rural residents are challenged by reduced availability of health care providers and facilities.¹⁹ Non-metropolitan America’s sparse population and relatively low financial resources have not been conducive to attracting or retaining health care personnel. In consequence, many non-metro counties are Health Professional Shortage Areas (HPSAs).[‡] AI/AN rural residents were more likely than their white peers to live in a county that is a whole county health professions shortage area across each of the three health disciplines measured (Table 1, at right).

Rural AI/AN residents were slightly less likely than white rural residents to live in a county that lacks a hospital or that lacks a Federally Qualified Health Center. However, AI/AN residents are more likely to live in a county without a skilled nursing facility, a home health agency, or a Rural Health Clinic than their white peers (Table 1).

One factor leading to health care provider shortages is the absence of a substantial paying patient base to support institutions and individuals. Compared to white residents, rural AI/AN populations were disproportionately concentrated in rural counties that are above the median for the proportion of their population that lacks health insurance. More than half (55.1%) of all rural AI/AN individuals live in counties falling into the top quartile for the proportion of the population lacking health insurance (16% or more; Table 2).

The AI/AN population is unique in that the U.S. government, through treaties and agreements developed over time, is committed to the provision of medical care for these groups.^{20,21} The Indian Health Service (IHS) provides care for qualifying AI/AN individuals through a combination of its own network of hospitals and clinics and through contracts with other providers.²² The existence of the IHS, however, is not the same as insurance. AI/AN individuals who are eligible for IHS services have access to whatever services the agency is able to provide, but they are not guaranteed access to services they may need. Analysts suggest that the IHS has remained underfunded and express concern that the quality of care provided may lag other sources.^{20,21} In addition, not all AI/AN rural residents live in a region served by IHS facilities.

Table 1: Health care resource availability, by race

Percent of population living in counties with indicated designation or facility status	White	AI/AN
Health Care Personnel Shortages		
Primary Care HPSA*	17.5%	30.6%
Dental HPSA*	11.7%	17.5%
Mental Health HPSA*	74.1%	81.4%
Health Care Facility Gaps		
No hospital	8.8%	6.0%
No skilled nursing facility	3.6%	9.1%
No home health agency	25.5%	31.1%
No Rural Health Clinic	40.2%	42.9%
No Federally Qualified Health Center	40.4%	24.5%
<i>Source: Area Health Resource File, 2015. Population data in this file are drawn from the American Community Survey 2009 – 2013.</i>		
<i>* Whole County Health Professions Shortage Area</i>		

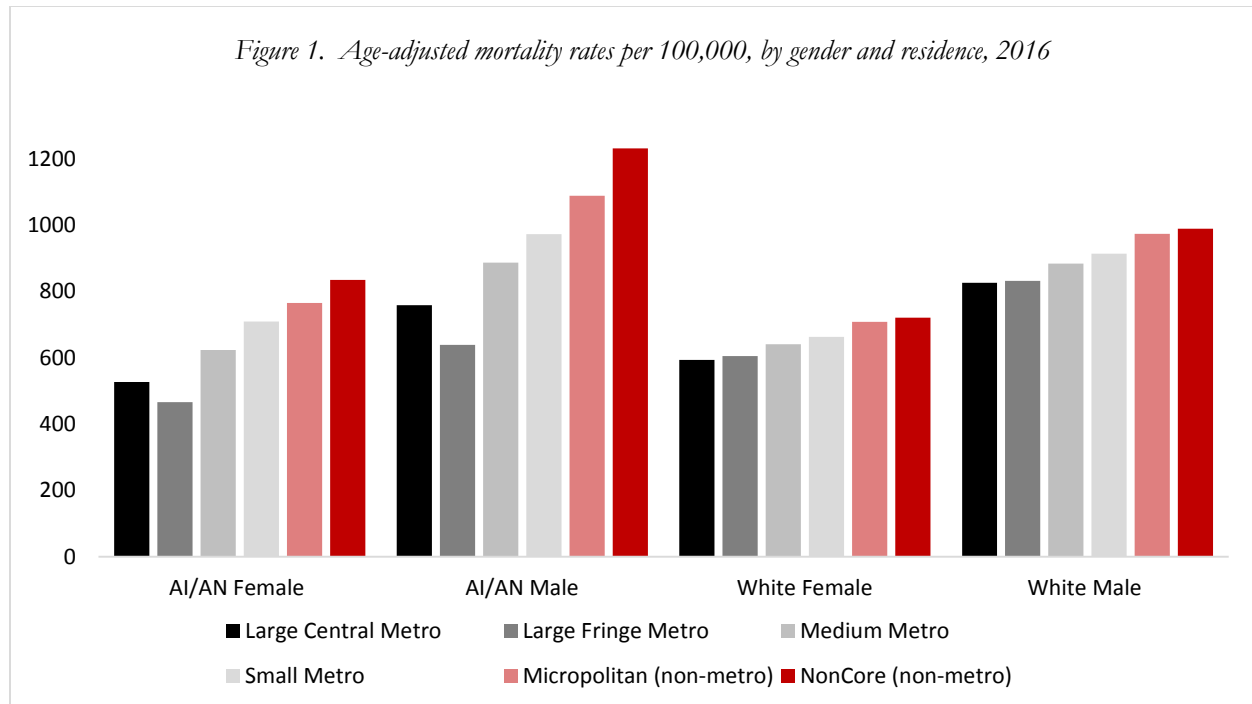
Table 2: Rural population distribution by quartiles of health insurance coverage, by race

Proportion of county residents lacking health insurance (age ≤ 64)	White	AI/AN
< 8.6% (lowest quartile)	33.8%	8.5%
≥ 8.6% - < 12.2%	24.8%	16.6%
≥ 12.2% - < 16.0%	22.5%	19.8%
≥ 16.0% (highest quartile)	18.8%	55.1%
<i>Source: Area Health Resource File, data for 2015</i>		

[‡] For a full definition of shortage areas, see <https://bhwh.hrsa.gov/shortage-designation/hpsas>

Mortality among rural AI/AN residents

Research has documented higher mortality among AI/AN populations than among their white counterparts.²³ The leading causes of mortality among AI/AN individuals include tobacco use, heart disease, and unintentional injuries.²³ For the present report, data from the Centers for Disease Control and Prevention (CDC Wonder) were used to calculate 2016 age-adjusted death rates among AI/AN and white populations by residence and gender (Figure 1 and Table A-3).²⁴



Age-adjusted mortality rates within each gender illuminate both race-based and residence-based disparities. Age-adjusted mortality rates per 100,000 residents were highest among AI/AN men living in noncore rural counties (1,232 per 100,000) followed by micropolitan rural counties (1,090/100,000). The death rate among AI/AN men in noncore counties was the highest of any racial group in any residence category. Overall, death rates for AI/AN men in micropolitan counties were 19% higher than those of white residents, and rates in noncore counties were 24% higher.

Age-adjusted death rates for AI/AN women living in micropolitan and noncore rural counties (766 and 836 per 100,000, respectively) were modestly higher than for white women in these counties (709 and 722, respectively). Death rates were 8% higher among AI/AN micropolitan women and 16% higher for AI/AN women in noncore counties than among their white peers.

Risk factors in high AI/AN concentration rural counties

Rural residents generally engage more in high-risk health behaviors and are more likely to report their health as poor.²⁵ Prior research has found that the AI/AN population overall experiences a higher prevalence of poor health status, risky behaviors such as tobacco use and binge drinking, obesity, substance abuse, mental health conditions, suicide, road traffic accidents, and teenage pregnancy.²⁶ Due to data restrictions on residence information, we were not able to use publicly available data to assess health-related quality of life or relevant behaviors among rural AI/AN residents directly. As an approximation, we used County Rankings data from the Robert Wood

Johnson Foundation (<http://www.countyhealthrankings.org/>) to look at outcomes in rural counties that have a proportionately high representation of AI/AN residents (more than 20% of their population reporting race as AI/AN alone and not in combination with other races (n=56; hereafter, high AI/AN concentration counties)) and compared them to other rural counties. The underlying assumption is that in the “higher concentration AI/AN” counties, AI/AN residents would contribute more to total overall health than in other counties. Details are provided in Table A-4.

Self-reported health has been noted as a single, valid, and robust indicator associated with adverse health outcomes.²⁷ The prevalence of self-reported poor/fair health in high concentration AI/AN counties (23.0%) exceeds that in other rural counties (16.4%). The average reported number of physically unhealthy days (mean= 5.0 per adult in the past 30 days) and mentally unhealthy days (mean= 4.5 per adult in the past 30 days) were higher in rural counties with more than 20% AI/AN residents than in other rural counties (3.9 days for each; see Table A-4).

The greatest behavioral gap between high concentration AI/AN and other counties surrounded smoking. In high AI/AN counties, 25.9% of adults report smoking, 45% percent more than those in other rural counties (17.9%). Despite a lower perception of access to exercise opportunities in high concentration AI/AN counties with 47.9% of adults reporting such opportunities versus 60.6% in other rural counties, the proportion of adults reporting no physical activity outside work was similar in high concentration AI/AN and other rural counties (27% in each). Nonetheless, the rate of obesity was higher in AI/AN concentration counties (34.9%) than in other rural counties (31.7%). Potentially contributing to the obesity problem, high AI/AN counties contained a poorer environment for healthy eating, as measured by the Food Environment Index (FEI) developed by the County Health Rankings authors. The FEI combines the two concepts of access to food as measured by income and geographic proximity to a grocery store and food insecurity, measured by consistent access to food. It is measured on a scale of 0-10, where 0 reflects the worst and 10 reflects the best possible situation. The FEI within high concentration AI/AN counties (5.3) was markedly lower than that within other rural counties (7.5; data not in table).


The teen birth rate (63.7 vs 32.8 per 1,000 live births) and HIV prevalence (137.9 vs 102.7 cases per 100,000 residents) were both higher in rural counties with more than 20% AI/AN residents compared to other rural counties. Both disparities may stem from a shortage of preventive services and appropriate counseling. The proportion of infants who are low birth weight was similar across both high concentration AI/AN and other rural counties (7.3% and 7.5%, respectively). Despite differences in reported obesity, the proportion of adults reporting that they had been diagnosed with diabetes was similar in high AI/AN as well as other rural counties (12.0% and 11.3%, respectively; Table A-4). This calculation of diabetes prevalence, based on county rates, may underestimate the person-specific prevalence of the disease. It has been estimated that the overall prevalence of diabetes among AI/AN adults is 17.6% versus 7.3% for white populations.²⁸

Conclusions

AI/AN populations living in rural counties face socioeconomic challenges. The most obvious of these is poverty at both the individual and the community level. More than a quarter (28.8%) of AI/AN rural residents experience household poverty; this is more than twice the proportion among white rural residents. In addition, more than half of rural AI/AN residents (60.9%) live in counties that fall into the worst quartile for poverty. Relatedly, half of rural AI/AN individuals (50.7%) live in counties falling in the worst quartile for unemployment. Persons living in a high-poverty, low-opportunity context are hampered in efforts to change individual and family status.

Community poverty translates into a shortage of healthcare resources. AI/AN rural residents are more likely than their white peers to live in counties that are health professional shortage areas. This situation is not fully alleviated by AI/AN access to IHS facilities and providers. Persons receiving care from the IHS are considered medically uninsured as there is no standard benefit that must be provided. Absence of standards is perceived to allow for historic underfunding of this service.²⁹ Other options for providing access to care, such as Medicaid, vary regionally. Several states with high concentrations of rural AI/AN residents have not expanded Medicaid (South Dakota, Wyoming, Oklahoma).³⁰ In addition, multiple states are considering or have acquired a waiver allowing the imposition of work requirements on adult Medicaid beneficiaries (Arizona, New Mexico, Montana, South Dakota, Utah) which may be difficult to meet in counties that have high levels of unemployment.

In the remote counties where many rural AI/AN populations live, options for rapidly improving health are difficult to envision. Governmental and philanthropic entities may wish to develop targeted programs for empowering AI/AN communities to improve local educational structures and to recruit potential employers as a necessary first step to improving health. Recruitment and retraining for AI/AN health professionals is also needed.^{31,32} Technological solutions, such as telehealth, should be addressed cautiously; standards need to reflect the culture and needs of varying populations.³³

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APPENDIX

Supporting Tables

Table A-1. Characteristics of non-Hispanic white and American Indian / Alaska Native populations (AI/AN), by metropolitan status of county of residence, 2016

	Rural			Urban		
	NH* White residents	AI/AN residents	All Rural Residents	NH* White residents	AI/AN residents	All Urban Residents
Age						
< 18 years	20.5%	30.0%	22.1%	18.5%	25.9%	22.9%
18 – 44 years	28.5%	35.1%	29.8%	34.4%	41.0%	37.3%
45 – 64 years	31.0%	24.4%	29.7%	28.1%	23.8%	25.2%
65 years and older	20.1%	10.6%	18.4%	19.0%	9.3%	14.5%
Education (adults, 25 and older)						
< 9 years	3.2%	6.3%	4.3%	1.9%	8.3%	5.6%
< High school	7.2%	13.4%	8.1%	4.6%	12.1%	7.0%
High school	34.9%	35.7%	34.6%	24.8%	29.2%	25.4%
College or more	54.7%	44.5%	53.1%	68.6%	50.5%	62.0%
Poverty**						
Poor	10.4%	28.8%	12.3%	9.9%	24.6%	14.5%
Disability status						
Disabled (yes)	15.6%	16.8%	15.3%	13.6%	17.1%	12.3%
Veteran status						
Veteran (yes)	9.9%	6.8%	9.4%	8.8%	7.2%	7.0%
Nativity						
Born outside the US	1.2%	1.5%	3.5%	5.0%	9.2%	15.9%
Computer Broadband (household)†						
Broadband Internet subscription	82.5%	61.4%	81.0%	89.1%	78.0%	86.2%
Dial-up Internet subscription alone	0.6%	0.7%††	0.6%	0.3%	0.3%††	0.3%
No Internet subscription	7.9%	17.7%	8.8%	5.1%	10.7%	7.2%
No computer	9.0%	20.3%	9.6%	5.5%	11.1%	6.3%
<i>Source: US Census Bureau, 2016.</i>						
<i>*Non-Hispanic.</i>						
<i>**Poverty uses the Federal Poverty Level income guidelines. In 2016, the FPL was \$24,300 for a family of four.</i>						
<i>† "Computer" includes any computer, tablet or smartphone.</i>						
<i>†† The number of observations for AI/AN populations is below 10; estimates are unreliable.</i>						

Table A-2. American Indian and Alaska Native populations (AI/AN), by county-level economic status, 2015

Counties, by quartile based on national distribution of values	Proportion living in these counties among:	
	Rural White Residents	Rural AI/AN Residents
Population in poverty (in quartiles, low to high)		
<11.5%	12.1%	8.0%
≥ 11.5 - < 15.2%	15.0%	12.2%
≥ 15.2 - <19.7 %	26.8%	18.8%
≥ 19.7 %	46.0%	60.9%
Unemployment (in quartiles, low to high)		
<4.2%	18.9%	10.5%
≥ 4.2 - <5.3%	21.8%	20.4%
≥ 5.3 - <6.6%	33.3%	18.4%
≥ 6.6%	26.0%	50.7%
Median household income (in quartiles, low to high)		
< \$40,426	26.5%	47.7%
≥ \$40,426 - < \$46,800	32.3%	29.4%
≥ \$46,800 - < \$54,153	26.4%	13.8%
≥ \$54,153	14.9%	9.1%
<i>Source: Area Health Resource File, 2015</i>		
<i>Note: AHRF data in this file are drawn from the American Community Survey 2009 – 2013 and thus do not directly parallel the data in Table A-1.</i>		

Table A-3. Age adjusted mortality rates per 100,000 residents, by gender and race, 2016.

Rural/Urban Status of County, based on 2013 Urbanization Codes	AI/AN Female	AI/AN Male	White Female	White Male
Large Central Metropolitan	528	760	594	827
Large Fringe Metropolitan	466	639	606	833
Medium Metropolitan	624	888	642	885
Small Metropolitan	710	974	663	915
Micropolitan (non-metro or rural)	766	1090	709	974
Noncore (non-metro or rural)	836	1232	722	990

Table A-4. Characteristics of adults in rural counties with > 20% AI/AN residents, versus rural counties without a high concentration of minority residents, selected health indicators, 2015 County Health Rankings data

	Rural counties with >20% AI/AN residents (n=56)	Other rural counties* (n=1413)
Health indicators:		
Self-reported poor or fair health (%)	23.0%	16.4%
Unhealthy days in the last 30 days		
Physical health days	5.0 days	3.9 days
Mental health days	4.5 days	3.9 days
Health-related behaviors:		
Adult smoking (%)	25.9%	17.9%
Adult obesity (%)	34.9%	31.7%
Physical inactivity (%)	27.2%	27.4%
Access to exercise opportunities (%)	47.9%	60.6%
Health outcomes:		
Average Teen birth rate (per 1,000)	63.7	32.8
Average Low birth weight rate (%)	7.3%	7.5%
Average HIV prevalence rate (per 100,000 residents)	137.9	102.7
Average Diabetes prevalence (%)	12.0%	11.3%

Source: Robert Wood Johnson Foundation County Health Rankings, 2015.

* "Other" counties are those in which no single minority population, defined as African American, Hispanic, American Indian/ Alaska Native, and Asian and Pacific Islander populations, makes up more than 20% of the population.

Health indicator data are drawn from the 2006 – 2012 Behavioral Risk Factor Surveillance System.

Health-related behaviors are drawn from the 2006 – 2012 Behavioral Risk Factor Surveillance system (smoking); the 2011 CDC Diabetes Interactive Atlas (obesity and physical inactivity); and the 2010 and 2013 Business Analyst and map data (opportunities to exercise).

Health outcomes data are drawn from 2006 – 2012 National Center for Health Statistics natality files (teen birth rate and low birth rate); 2010 National Center for HIV/AIDS, Viral Hepatitis, STD and TB Prevention (HIV prevalence); and the 2011 CDC Diabetes Interactive Atlas (diabetes prevalence)

References

- ¹ U.S. Census Bureau. *The American Indian and Alaska Native Population: 2010*. 2012.
- ² U.S. Census Bureau. *American Indian and Alaska Native Heritage Month: November 2015*. 2016
- ³ World Health Organization. (2018). *Social Determinants of Health*. Retrieved from http://www.who.int/social_determinants/sdh_definition/en/
- ⁴ Centers for Disease Control and Prevention. *Social Determinants of Health: Know What Affects Health*. 2018.
- ⁵ Rural Health Information Hub. *Social Determinants of Health for Rural People*. 2017.
- ⁶ Walters KL, Mohammed SA, Evans-Campbell T, Beltrán RE, Chae DH, Duran B. Bodies don't just tell stories, they tell histories: Embodiment of historical trauma among American Indians and Alaska Natives. *Du Bois Review: Social Science Research on Race*. 2011;8(1):179-189.
- ⁷ Algernon Austin. Economic Policy Institute. *Native Americans and Jobs*. 2013
- ⁸ Tootle DM. American Indians. *Racial/Ethnic Minorities in Rural Areas: Progress and Stagnation, 1980-90*. 1996:100.
- ⁹ James C, Schwartz K, Berndt J. *A profile of American Indians and Alaska Natives and their health coverage*. Henry J. Kaiser Family Foundation Menlo Park, CA; 2009.
- ¹⁰ Woolf SH, Braveman P. Where health disparities begin: the role of social and economic determinants—and why current policies may make matters worse. *Health Affairs*. 2011;30(10):1852-1859.
- ¹¹ Braveman, P., & Gottlieb, L. (2014). The social determinants of health: it's time to consider the causes of the causes. *Public Health Reports*, 129(1_suppl2), 19-31.
- ¹² Harley DA. American Indians and Alaska Natives with Disabilities in Rural, Tribal Lands, Frontier Regions, and Plain States. In: Harley DA, Ysasi NA, Bishop ML, Fleming AR, eds. *Disability and Vocational Rehabilitation in Rural Settings: Challenges to Service Delivery*. Cham: Springer International Publishing; 2018:239-268
- ¹³ Department of Veterans Affairs. American Indian and Alaska Native Veterans: 2013 American Community Survey. Washington, DC. May 2015.
- ¹⁴ Council HA. Housing on Native American Lands. *Rural Research Report*. 2013.
- ¹⁵ Myers HF. Ethnicity-and socio-economic status-related stresses in context: an integrative review and conceptual model. *Journal of Behavioral Medicine*. 2009;32(1):9-19.
- ¹⁶ Choi, J. Y. (2012). A portrait of rural health in America. *Journal of Rural Social Sciences*, 27(3), 1.
- ¹⁷ Singh, G. K., Azuine, R. E., Siahpush, M., & Kogan, M. D. (2013). All-cause and cause-specific mortality among US youth: socioeconomic and rural–urban disparities and international patterns. *Journal of Urban Health*, 90(3), 388-405.
- ¹⁸ Singh, G. K., & Siahpush, M. (2014). Widening rural–urban disparities in life expectancy, US, 1969–2009. *American Journal of Preventive Medicine*, 46(2), e19-e29.
- ¹⁹ National Rural Health Association. *Health Care Workforce Distribution and Shortage Issues in Rural America*. 2012.
- ²⁰ Warne D, Frizzell LB. American Indian health policy: historical trends and contemporary issues. *American Journal of Public Health*. 2014;104(S3):S263-S267.
- ²¹ Sequist TD, Cullen T, Acton KJ. Indian Health Service innovations have helped reduce health disparities affecting American Indian and Alaska Native people. *Health Affairs*. 2011;30(10):1965-1973.
- ²² Kaiser Family Foundation. Health Coverage and Care for American Indians and Alaska Natives. Issue Brief, October 2013.
- ²³ Espey DK, Jim MA, Cobb N, et al. Leading causes of death and all-cause mortality in American Indians and Alaska Natives. *American journal of public health*. 2014;104(S3):S303-S311.
- ²⁴ Centers for Disease Control and Prevention; CDC Wonder; <https://wonder.cdc.gov/ucd-icd10.html>
- ²⁵ Singh, G. K., Daus, G. P., Allender, M., Ramey, C. T., Martin, E. K., Perry, C., ... Vedomuthu, I. P. (2017). Social determinants of health in the United States: addressing major health inequality trends for the nation, 1935-2016. *International Journal of MCH and AIDS*, 6(2), 139.
- ²⁶ James CV, Moonesinghe R, Wilson-Frederick SM, Hall JE, Penman-Aguilar A, Bouye K. Racial/Ethnic Health Disparities Among Rural Adults — United States, 2012–2015. *MMWR Surveill Summ* 2017;66(No. SS-23):1–9.

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- ²⁷ Idler EL, Benyamini Y. Self-rated health and mortality: a review of twenty-seven community studies. *Journal of Health and Social Behavior*. 1997;21-37.
- ²⁸ U.S. Department of Health and Human Services Office of Minority Health. Diabetes and American Indian / Alaska Natives. 2016. Available at <https://minorityhealth.hhs.gov/omh/browse.aspx?lvl=4&lvlid=33>
- ²⁹ Donald Warne, MD, Linda Bane Frizzell, PhD American Indian Health Policy: Historical Trends and Contemporary Issues. *Am J Public Health*. 2014 June; 104(Suppl 3): S263–S267.
- ³⁰ Kaiser Family Foundation, Medicaid Waiver Tracker: Which States Have Approved and Pending Section 1115 Medicaid Waivers?. August 29, 2018. Available at https://www.kff.org/medicaid/issue-brief/which-states-have-approved-and-pending-section-1115-medicaid-waivers/?utm_source=web&utm_medium=trending&utm_campaign=waivers
- ³¹ Jones CB, Toles M, Knafl GJ, Beeber AS. An untapped resource in the nursing workforce: Licensed practical nurses who transition to become registered nurses. *Nurs Outlook*. 2018 Jan - Feb;66(1):46-55. doi: 10.1016/j.outlook.2017.07.007. Epub 2017 Jul 20.
- ³² Weintraub J, Walker J, Heuer L, Oishi M, Upadhyay K, Huang V, Lindquist C, Cushman LF, Ripp J. Developing capacity for the American Indian health professional workforce: an academic-community partnership in Spirit Lake, North Dakota. *Ann Glob Health*. 2015 Mar-Apr;81(2):283-9.
- ³³ Shore JH, Goss CW, Dailey NK, Bair BD. Methodology for Evaluating Models of Telemental Health Delivery Against Population and Healthcare System Needs: Application to Telemental Healthcare for Rural Native Veterans. *Telemed J E Health*. 2018 Aug 21.