

DISABILITY AMONG OLDER AMERICAN INDIANS AND ALASKA NATIVES: DISPARITIES IN PREVALENCE, HEALTH-RISK BEHAVIORS, OBESITY, AND CHRONIC CONDITIONS

Objectives: To estimate the prevalence of disabilities among older American Indians and Alaska Natives (AIANs) and compare these estimates with those of other major racial/ethnic groups. To estimate, within the population with disabilities, the health-risk behaviors, obesity, and chronic conditions of older AIANs and compare them with estimates for other racial/ethnic groups.

Design: State-based surveillance system that collects data on a monthly basis using an independent probability sample of households with telephones among the noninstitutionalized population aged ≥ 18 years.

Methods: We analyzed data on 434,972 noninstitutionalized adults aged ≥ 50 years from the 2003–2005 Behavioral Risk Factor Surveillance System.

Results: Among older AIAN adults, the unadjusted prevalence of disability (38.4%) was higher than among Whites (29.7%), Blacks (33.5%), Asians (15.6%), and Hispanics (26.9%). Among older adults with disabilities, AIANs were younger than their counterparts in other groups and were as likely to be male as female. After adjustment for age and self-rated health, both AIAN men and women with disabilities had the highest prevalence of current smoking, heart disease, and asthma.

Conclusions: Efforts to prevent, delay, and reduce disabilities and associated secondary conditions in persons with disabilities must be culturally sensitive and targeted toward reducing racial/ethnic disparities in health-risk behaviors and chronic conditions. (*Ethn Dis.* 2007;17:686–692)

Key Words: Older Adults, American Indians, Alaska Natives, Disabilities, BRFSS

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INTRODUCTION

The prevalence of disability is higher among older American Indians and Alaska Natives (AIANs) than in all other major racial/ethnic groups in the United States, and its onset begins substantially earlier.^{1–3} For example, AIANs, 20 years of age, can anticipate living more than a quarter of their remaining lives with a disability; the figure is $\approx 16\%$ for same-aged Whites.² Furthermore, in contrast to the general population and most other racial/ethnic groups where women have a higher prevalence of disability than men, among AIANs there is no difference by sex in the prevalence of disability.⁴ In addition, older AIANs are more likely to die from injuries and chronic diseases than are other racial/ethnic populations in the United States.⁵ Correspondingly, the life expectancy for AIANs is nearly five years shorter than for the rest of the US population.⁶ AIANs are also more likely than other groups to lack health insurance, live in poverty, and be unable to work because of a disability.⁷

To improve the health of all Americans, the US Department of Health and Human Services set forth two overarching goals in Healthy People 2010: to increase quality and years of healthy life and to eliminate health disparities.⁸ As Americans grow older, emphasis must be placed on health

promotion to prevent, delay, and reduce disabilities and associated secondary conditions. This has special relevance among the growing population of AIANs aged ≥ 50 years. This age group is expected to increase from approximately 444,000 (17% of this population) in 2000 to approximately 616,000 (22%) by 2010.⁹ Accordingly, monitoring indicators of health status among older AIANs takes on special meaning, particularly for those with disabilities; one purpose is to develop interventions in health promotion and disease prevention to decrease health disparities between AIANs and other racial/ethnic populations. Furthermore, in order to develop appropriately targeted interventions for older AIANs with disabilities, it is essential to identify the health-risk behaviors and chronic conditions that are most prevalent among this population.

We used data from the Centers for Disease Control and Prevention's (CDC) Behavioral Risk Factor Surveillance System (BRFSS) to estimate and compare: 1) the prevalence of disabilities among older AIANs with that of other racial/ethnic groups and 2) within the population with disabilities, the prevalence of health-risk behaviors, obesity, and chronic conditions.

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METHODS

The BRFSS is a state-based surveillance system operated by state health departments in collaboration with CDC. A detailed description of the survey methods is available elsewhere.^{10,11} Briefly, the primary purpose of BRFSS is to collect data on behaviors associated with the leading causes of morbidity and mortality; it represents the community-dwelling US population aged ≥ 18 years. The BRFSS has numerous strengths for making population estimates because of its standardized data collection protocols and methods. Data from BRFSS assist in characterizing racial/ethnic-specific health behaviors related to chronic disease, the presence of chronic conditions, and disability patterns, and the information can be used to plan activities in health promotion as well as enhance existing programs. In addition, a systematic review of the evidence for the reliability and validity of BRFSS data has demonstrated that most of its measures are reliable and valid.¹² Of particular note, the BRFSS is the only source of continuously collected state-based population data regarding the health of AIANs. Moreover, the substantial sample allows for estimates of relatively small subgroups such as AIANs. For the present study, data from 2003–2005 surveys were combined to provide a sufficient number of respondents ($N = 904,531$).

Persons who had a disability were defined as respondents who answered “yes” to either one of two questions: “Are you limited in any way in any activities because of physical, mental, or emotional problems?” or “Do you now have any health problem that requires you to use special equipment, such as a cane, a wheelchair, a special bed, or a special telephone?” Persons for whom responses to both questions were missing, “don’t know,” or “refused” were excluded from the analysis.

Three questions were used to assess race/ethnicity: 1) “Are you Hispanic or Latino?”; 2) “Which one or more of the following would you say is your race: White, Black or African American, Asian, Native Hawaiian or other Pacific Islander, American Indian, Alaska Native, or other?”; and 3) “Which one of these would you say best represents your race?” Respondents were classified as AIAN if they reported only AIAN race or, when more than one race was reported, they indicated that AIAN best represented their race (regardless of Hispanic ethnicity). Of the remaining respondents, those who reported that they were Hispanic or Latino were classified as Hispanic; otherwise, they were classified as the race they reported or, if more than one race was reported, the race they said best represented them. Persons who reported “other” race, responded “don’t know,” or who refused to respond were excluded from the analysis. Because their sample was small, Native Hawaiians/other Pacific Islanders were also excluded.

To examine whether older AIANs adults with disabilities may be at increased risk for health problems and premature death relative to their peers in other racial/ethnic groups, we assessed current smoking, heavy drinking, binge drinking, no leisure-time physical activity, inadequate consumption of fruits/vegetables, and obesity. All of these health-risk behaviors and obesity have been identified as major contributors to the disablement process.^{13–19} Respondents were considered current smokers if they had smoked ≥ 100 cigarettes and were currently smoking. Men aged 50–65 years were considered heavy drinkers if they consumed more than two drinks/day on average, as were men aged ≥ 66 years and women aged ≥ 50 years who consumed more than one drink/day.²⁰ Binge drinking was considered the consumption of five or more drinks on at least one occasion in the past month. No leisure-time physical activity was defined as the absence

of such activity in the past 30 days. Respondents were determined to have an inadequate consumption of fruits and vegetables if they consumed fewer than five servings of fruits/vegetables daily.²¹ We defined obesity as a body mass index (BMI) ≥ 30 kg/m² by using self-reported weight and height.²² Among older adults with disabilities, seven chronic conditions were assessed: diabetes, hypertension, hypercholesterolemia, heart disease, stroke, arthritis, and asthma.

We first calculated the unadjusted prevalence of disability among older adults by race/ethnicity. Second, to compare older AIAN adults with other racial/ethnic groups within the disabled population by sociodemographic characteristics, we age-adjusted estimates to the 2000 US standard population. Finally, we used logistic regression analysis to estimate conditional marginal probabilities of health-risk factors, obesity, and chronic conditions. All analyses were adjusted for age and general health. Because of the potential problem of multiple comparisons, differences were considered significant only when P was $< .01$.

SUDAAN statistical software (Research Triangle Institute, Research Triangle Park, NC) was used to account for the complex sampling design. Each year of BRFSS data (ie, 2003–2005) was directly weighted to account for the probability of selection of a telephone number, the number of adults in a household, and the number of telephones in a household. Finally, each year of data was poststratified to adjust for nonresponse and noncoverage of households without telephones, weighted to each state’s adult population, and aggregated for the analysis. Three design variables, year, stratum, and primary sampling unit, were used to conduct the analysis.

Our study is based on 434,972 respondents aged ≥ 50 years for whom information was complete on age, race/ethnicity, sex, self-rated health, and

Table 1. Characteristics of Adults Aged ≥ 50 Years with Disabilities by Race/Ethnicity, Behavioral Risk Factor Surveillance System, 2003–2005

Characteristic*	AIAN % (95% CI)	White % (95% CI)	Black % (95% CI)	Asian % (95% CI)	Hispanic % (95% CI)
Sex					
Female	50.4 (45.7–55.2)	56.0 (55.5–56.5)	61.1 (59.0–63.1)†	47.9 (38.3–57.7)	60.1 (56.6–63.4)†
Age, years					
Mean	61.8 (60.8–62.8)	66.5 (66.4–66.6)†	64.3 (63.8–64.7)†	63.7 (62.1–65.3)	63.8 (63.1–64.5)†
50–59	50.3 (45.5–55.2)	34.4 (33.9–34.9)†	41.8 (39.9–43.8)†	36.6 (27.7–46.5)	44.1 (40.8–47.6)
60–69	28.8 (24.7–33.3)	25.9 (25.5–26.3)	27.8 (26.0–29.6)	35.4 (25.2–47.2)	26.0 (23.3–29.0)
≥ 70	20.9 (17.2–25.0)	39.7 (39.2–40.2)†	30.4 (28.5–32.3)†	28.0 (20.3–37.3)	29.8 (26.7–33.1)†
Education					
Less than high school	29.5 (25.2–34.4)	12.9 (12.5–13.2)†	31.1 (29.2–32.9)	5.0 (2.9–8.5)†	45.3 (41.9–48.7)†
High school graduate	30.5 (26.1–35.2)	32.2 (31.7–32.7)	31.3 (29.5–33.2)	16.5 (11.1–23.9)†	25.9 (23.0–29.0)
More than high school	40.0 (35.7–44.5)	55.0 (54.4–55.5)†	37.6 (35.7–40.0)	78.6 (70.8–84.7)†	28.8 (25.8–32.1)†
Marital status					
Married	47.8 (43.0–52.7)	59.2 (58.7–59.7)†	36.8 (34.8–38.8)†	73.6 (65.6–80.3)†	57.5 (54.2–60.8)†
Previously married	46.5 (41.8–51.3)	35.2 (34.7–35.6)†	52.2 (50.2–54.2)	17.5 (12.4–24.2)†	35.6 (32.7–38.8)†
Never married	5.7 (3.7–8.5)	5.6 (5.4–5.9)	11.1 (9.9–12.3)†	8.9 (5.0–15.4)	6.8 (5.3–8.8)
Employment					
Employed	19.3 (16.1–22.8)	27.0 (26.6–27.4)†	15.5 (14.2–16.9)	42.1 (33.9–50.7)†	17.3 (15.1–19.7)
Unemployed	5.9 (3.9–8.9)	4.0 (3.8–4.2)	6.2 (5.2–7.3)	9.5 (3.5–23.5)	4.8 (3.8–6.1)
Unable to work	32.1 (27.4–37.3)	17.5 (17.1–17.9)†	31.7 (30.0–33.4)	7.6 (4.7–12.1)†	32.1 (28.9–35.4)
Retired/other	42.7 (38.0–47.5)	51.6 (51.2–52.0)†	46.7 (45.0–48.4)	40.8 (31.9–50.3)	45.8 (42.6–49.1)
Fair/poor health status	60.5 (55.3–65.4)	47.5 (47.0–48.0)†	60.8 (58.8–62.8)	41.4 (31.9–51.5)†	64.4 (61.0–67.7)

AIAN = American Indian/Alaska Native; CI = confidence interval.

* Characteristics (except age) were age adjusted to the 2000 US standard population.

† $P < .01$ for comparison to AIAN.

disability status. Of these respondents, 137,047 were disabled (2808 AIANs, 119,460 Whites, 9823 Blacks, 726 Asians, and 4230 Hispanics).

RESULTS

Overall, the unadjusted prevalence of disability among older adults was 29.7% (95% confidence interval [CI] 29.5%–30.0%), including 17.9% (95% CI 17.6%–18.1%) with activity limitations only, 3.1% (95% CI 3.0%–3.2%) with assistive technology use only, and 8.8% (95% CI 8.6%–8.9%) with both. Among older AIANs, the unadjusted prevalence of disability was significantly higher than among Whites, Blacks, Asians, or Hispanics (38.4% vs 29.7%, 33.5%, 15.6%, and 26.9%; $P < .01$). Among older adults with disabilities, AIANs (39.5%) and Blacks (38.2%) had the highest prevalence of both activity limitations and use of assistive technology, followed by Whites

(28.5%), Hispanics (28.0%), and Asians (21.9%) ($P < .01$ for pairwise comparisons with AIANs except for Blacks).

Older AIANs with disabilities tended to be younger than those in other groups and were equally as likely to be male as female (Table 1). Compared with Whites and Asians, AIANs were more likely to have less than a high school education, to be unable to work, and to be in fair/poor health, and they were less likely to be married than any other group except Blacks. Hispanics, on the other hand, were more likely to have less than a high school education than AIANs.

Among both men and women with disabilities, AIANs had the highest adjusted prevalence of smoking, heart disease, and asthma (Table 2). AIAN men were significantly more likely to smoke than White, Asian, and Hispanic men (26.6% vs 16.4%, 5.0%, and 15.1%, respectively) and to have heart disease than Hispanic men (31.1% vs

17.8%); they had more than twice the prevalence of asthma seen in Asian and Hispanic men (13.6% vs 4.7% and 6.3%). AIAN women were significantly more likely to smoke than Black, Asian, and Hispanic women (17.7% vs 12.7%, 6.4%, and 7.5%, respectively), to have heart disease than White, Asian, and Hispanic women (31.5% vs 17.5%, 7.4%, and 16.8%, respectively), and to have asthma than Asian and Hispanic women (20.2% vs 7.9% and 13.3%). On the other hand, Black women and men were significantly more likely to be hypertensive than their AIAN counterparts (women: 78.8% vs 62.0%; men: 71.1% vs 55.5%).

Among men, AIANs also had the highest prevalence of heavy and binge drinking, not consuming fruits/vegetables five or more times/day, obesity, and arthritis. AIAN men were significantly more likely to drink heavily than Asian men (8.8% vs 1.1%). Black (13.8%) and AIAN (11.1%) men had a higher prevalence of stroke than other racial/

Table 2. Adjusted Prevalence of Health-Risk Behaviors, Obesity, and Chronic Conditions among Adults Aged ≥ 50 Years with Disabilities by Race/Ethnicity, Behavioral Risk Factor Surveillance System, 2003–2005

Category*	Sex	AIAN % (95% CI)	White % (95% CI)	Black % (95% CI)	Asian % (95% CI)	Hispanic % (95% CI)
Health-risk behavior						
Current smoking	Men	26.6 (19.7–33.5)	16.4 (15.7–17.0)†	22.7 (20.1–25.2)	5.0 (1.3–8.7)†	15.1 (11.4–18.8)†
	Women	17.7 (14.2–21.2)	14.1 (13.6–14.6)	12.7 (11.2–14.1)†	6.4 (0.2–12.6)†	7.5 (5.8–9.1)†
Heavy drinking	Men	8.8 (3.4–14.3)	6.8 (6.3–7.2)	3.5 (2.1–4.8)	1.1 (0.05–2.1)†	5.7 (3.2–8.1)
	Women	1.1 (0.3–1.9)	2.6 (2.4–2.8)†	1.1 (0.6–1.6)	3.7 (0–9.5)	1.3 (0.3–2.3)
Binge drinking	Men	13.2 (8.2–18.1)	7.8 (7.3–8.3)	7.0 (5.6–8.4)	4.8 (0–11.3)	8.8 (6.2–11.4)
	Women	0.8 (0.2–1.3)	1.5 (1.3–1.6)	1.4 (1.0–1.9)	0.4 (0–0.8)	1.4 (0.8–2.0)
No leisure-time physical activity	Men	39.0 (31.1–47.0)	35.5 (34.7–36.4)	42.6 (38.9–46.3)	37.3 (23.1–51.5)	48.1 (41.9–54.2)
	Women	51.7 (45.2–58.2)	46.6 (46.0–47.3)	51.8 (49.3–54.3)	33.1 (20.2–46.0)	49.9 (45.4–54.4)
<5 fruit/vegetable servings/day†	Men	83.4 (78.2–88.6)	79.6 (78.7–80.4)	81.3 (77.6–84.9)	76.1 (61.0–91.1)	76.6 (70.1–83.2)
	Women	73.2 (67.5–78.9)	69.5 (68.8–70.2)	73.6 (70.9–76.2)	51.9 (35.4–68.5)	64.3 (58.8–69.7)
Obesity	Men	33.0 (26.0–40.0)	31.5 (30.6–32.3)	30.9 (27.7–34.0)	17.6 (6.7–28.4)	32.3 (26.7–37.9)
	Women	34.5 (29.1–39.9)	34.0 (33.3–34.6)	50.4 (48.0–52.9)†	12.3 (5.9–18.8)†	40.0 (35.2–44.8)
Chronic condition						
Diabetes	Men	27.0 (19.7–34.3)	20.9 (20.2–21.6)	31.0 (27.5–34.4)	25.7 (11.8–39.6)	28.8 (23.1–34.6)
	Women	26.6 (20.4–32.8)	17.2 (16.7–17.7)†	30.5 (28.2–32.7)	22.4 (11.3–33.4)	22.8 (19.5–26.0)
Hypertension‡	Men	55.5 (46.9–64.0)	55.5 (54.5–56.5)	71.1 (67.0–75.2)†	56.4 (39.3–73.6)	55.7 (49.0–62.4)
	Women	62.0 (55.0–69.0)	56.0 (55.2–56.8)	78.8 (76.6–81.0)†	40.3 (25.9–54.7)†	56.6 (51.3–61.9)
Hypercholesterolemia‡	Men	41.1 (32.9–49.4)	52.5 (51.5–53.5)†	48.5 (44.4–52.6)	56.5 (39.7–73.3)	42.1 (35.4–48.7)
	Women	46.6 (39.6–53.6)	51.6 (50.8–52.3)	50.6 (47.7–53.6)	55.6 (40.5–70.7)	42.2 (37.2–47.2)
Heart disease§	Men	31.1 (23.0–39.1)	29.3 (28.0–30.5)	20.4 (16.3–24.4)	18.8 (3.0–34.5)	17.8 (12.2–23.3)†
	Women	31.5 (22.1–40.9)	17.5 (16.6–18.3)†	19.4 (16.5–22.3)	7.4 (3.1–11.7)†	16.8 (12.4–21.3)†
Stroke§	Men	11.1 (6.8–15.4)	8.2 (7.5–9.0)	13.8 (10.7–16.9)	3.9 (0.7–7.2)†	9.4 (5.1–13.6)
	Women	16.8 (9.5–24.1)	9.1 (8.5–9.7)	15.6 (12.4–18.9)	7.1 (0.8–13.4)	8.5 (5.2–11.7)
Arthritis‡	Men	67.8 (59.8–75.8)	62.2 (61.2–63.2)	65.1 (61.0–69.2)	57.2 (40.5–74.0)	54.4 (47.6–61.2)
	Women	77.8 (72.2–83.4)	76.7 (76.1–77.4)	80.6 (78.4–82.9)	62.8 (47.6–78.0)	71.5 (67.0–76.1)
Asthma	Men	13.6 (7.5–19.7)	10.0 (9.5–10.6)	8.8 (7.0–10.5)	4.7 (0.7–8.7)†	6.3 (4.1–8.4)
	Women	20.2 (15.8–24.5)	16.0 (15.5–16.4)	15.3 (13.8–16.9)	7.9 (3.7–12.1)†	13.3 (10.5–16.1)†

AIAN = American Indian/Alaska Native; CI = confidence interval.

* Results are adjusted for age and general health (fair/poor, good-excellent).

† $P < .01$ for comparison to AIAN.

‡ Data available in 2003 and 2005.

§ Data available in 2005.

ethnic male groups. Even so, White men were significantly more likely to have hypercholesterolemia (52.5% vs 41.1%).

Among women, AIANs (16.8%) and Blacks (15.6%) had the highest prevalence of stroke, followed by Whites (9.1%), Hispanics (8.5%), and Asians (7.1%). AIAN women were also significantly more likely than Whites to have diabetes (26.6% vs 17.2%) and to be obese and hypertensive than Asians (34.5% vs 12.3%, 62.0% and 40.3%, respectively). On the other hand, White women were significantly more likely than AIANs to drink heavily (2.6% vs 1.1%), and Black women were more likely than AIANs to be obese (50.4% vs 34.5%).

DISCUSSION

To our knowledge, this is one of the first comprehensive studies to compare health-risk behaviors and chronic conditions in AIAN adults with disabilities, aged ≥ 50 years, with those in other major racial/ethnic populations. We found that AIANs are disproportionately affected by disability, and among those who have disabilities, by risk factors for chronic disease (including smoking, drinking, poor diet, and obesity). In addition, this group is beset with major chronic conditions.

Further research is needed to explore the association between the high prevalence of disabilities among older AIANs and the high prevalence of

unhealthy behaviors, obesity, and chronic disease among those with disabilities. There may also be a connection to the younger mean age of AIANs with disabilities, as there may be to the virtual equality by sex in the distribution of the population with disabilities.

We found that AIANs are disproportionately affected by disability, and among those who have disabilities, by risk factors for chronic disease...

These findings are consistent with earlier studies of the general population.^{2,4} For example, Bradsher reported that contrary to the case in the general population and in most other racial/ethnic groups, where women have a higher prevalence of disability than men, AIANs do not experience such a difference by sex.⁴ These findings are also consistent with an earlier study by Hayward and Heron,² who reported that while AIANs live significantly longer than Blacks or Hispanics, their levels of chronic impairment and years lived with disability are the highest among all the racial/ethnic groups.

Furthermore, our findings are consistent with earlier studies that reported a higher prevalence of adverse health behaviors and chronic disease among AIANs relative to other racial/ethnic groups, and the increased presence of these behaviors and disorders may be predictive of disability.^{6,23-35} Among older AIANs with disabilities, we found a high prevalence of risk factors for heart disease, cancer, and diabetes—the three leading causes of death for AIANs. Not surprisingly, several major chronic conditions, including heart disease, stroke, diabetes, arthritis, and asthma, were also prevalent among AIANs with disabilities.

Ideally, interventions aimed at modifying lifestyles should begin early in life to prevent or minimize the adverse health behaviors that contribute to chronic conditions, and the best way to prevent disability from a chronic condition is to prevent the condition itself.¹⁹ Among persons with disabilities, the presence of adverse health behaviors may compound the effects of their disabilities; intense efforts should focus on reducing or preventing the development of associated secondary conditions. For example, physical inactivity has been found to be a key contributing factor in the worsening health of persons with disabilities;^{36,37} physical activity can enhance muscle strength and fitness and reduce functional lim-

itations.^{15,38} Furthermore, among those with existing chronic conditions, good chronic disease management can play a significant role in impeding the disablement process and improving health-related quality of life.³⁷

There are several limitations to our study. The BRFSS excludes persons without telephones, and telephone coverage is not the same for all populations; the percentage of households with a telephone has been estimated at 83% for AIANs and 96% for Whites.³⁹ Research has found that AIAN adults that do not have telephones are generally less educated, have lower incomes, are less likely to be employed, and are more likely to engage in unhealthy lifestyle practices.⁴⁰ Accordingly, our findings probably underestimate the prevalence of disability, health-risk behaviors, obesity, and chronic conditions among AIANs. In addition, the BRFSS excludes institutionalized persons as well as those unable to complete the survey. Even so, Kinne and Topolski found that population telephone surveys such as the BRFSS do not underrepresent adults with disabilities.⁴¹ Another concern is that interviews in BRFSS are conducted in English or Spanish; not conducting interviews in AIAN languages might mean that a limited number of potential respondents are missed. Moreover, the aggregation of AIANs into one group may mask differences between the tribes; hence, our findings are not generalizable to all AIANs. In addition, while we used the most inclusive criteria possible to classify a respondent as AIAN, the potential for misclassification still exists. Furthermore, these analyses are based on self-reported data that have not been validated. Thus, these results could be influenced by reporting biases.⁴² Finally, the cross-sectional design of the study prevents causal relationships from being assigned.

Our results demonstrate the presence of disparities in disability, adverse health factors, and chronic conditions between AIANs and other racial/ethnic

groups and provide baseline data useful for assessing changes over time in the health status of these populations. Given the early onset of disability in AIANs, their essentially equal rates of disability by sex, and the disproportionate burden of chronic conditions and disability borne by this population, the Indian Health Service and other health agencies will be challenged to find the resources necessary to fund prevention efforts while continuing to maintain services for those in need of treatment for chronic conditions and disabilities.⁴³ Unique issues will need to be confronted when designing prevention programs for this population. For example, limited access to health facilities for those living in remote reservation settings—even more crucial for persons with disabilities who may be out of the traditional support/service networks; competing financial demands faced by those living in poverty, which may limit their ability to respond to recommended changes in lifestyle; and the limited supply of clinical professionals capable of assessing and responding to traditional health beliefs and practices and adapting their communication styles will all have to be addressed. Prevention programs will also need to address the daily challenges of persons living with disabilities and develop health promotion materials accordingly.¹⁷ For example, persons with activity limitations will benefit from brochures that incorporate and depict exercises that can be performed by wheelchair users and those who use assistive devices to walk. Our findings should assist health agencies, tribes, Indian health care professionals, and AIANs with disabilities in planning prevention efforts that begin early in the life course, are culturally sensitive, and that target existing disparities in adverse health factors and chronic conditions. The success of these prevention efforts will depend upon strong collaborations between all partners involved.

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