Compared with other racial/ethnic groups, American Indians/Alaska Natives (AI/AN) have a lower life expectancy, lower quality of life, and are disproportionately affected by many chronic conditions (1,2). Arizona has the third largest population of AI/AN in the United States (approximately 266,000 in 2017), and is home to 22 federally recognized American Indian tribal nations.* The small AI/AN sample size in previous Behavioral Risk Factor Surveillance System (BRFSS) surveys has presented analytic challenges in making statistical inferences about this population. To identify health disparities among AI/AN living in Arizona, the Arizona Department of Health Services (ADHS) and CDC analyzed data from the 2017 BRFSS survey, for which AI/AN were oversampled. Compared with whites, AI/AN had significantly higher prevalences of sugar-sweetened beverage consumption (33.0% versus 26.8%), being overweight or having obesity (76.7% versus 63.2%), diabetes (21.4% versus 8.0%), high blood pressure (32.9% versus 27.6%), report of fair or poor health status (28.7% versus 16.3%), and leisure-time physical inactivity during the past month (31.1% versus 23.0%). AI/AN also reported a lower prevalence of having a personal doctor or health care provider (63.1%) than did whites (72.8%). This report highlights the need to enhance surveillance measures at the local, state, and national levels and can inform interventions centered on confronting social inequities, developing culturally competent prevention strategies, and facilitating access to care to improve population health and work toward health equity.

BRFSS† is a telephone (landline and cellular) survey conducted annually in all 50 states, the District of Columbia, and U.S. territories to collect information on health-related behavioral risk factors, health care access, and chronic conditions among noninstitutionalized U.S. adults aged ≥18 years. To increase sample size and representation of AI/AN, the U.S. Department of Health and Human Services Office of Minority Health collaborated with CDC to oversample AI/AN in 11 states to improve understanding of their health status.§ Data from the 2017 Arizona BRFSS (15,004) were used to examine the prevalence of selected sociodemographic characteristics, lifestyle health-related behaviors, and chronic conditions among AI/AN, compared with prevalences among whites and other races. In 2017, Arizona BRFSS landline and cellular response rates were 52.3% and 79.6%, respectively. Race was categorized as white or AI/AN according to the BRFSS variable denoting preferred race category¶¶ based on the response to the following question: “Which one or more of the following would you say is your race?” The preferred race category was selected to avoid missing or excluding persons self-identifying as AI/AN, regardless of Hispanic ethnicity. Other races** (others) were defined as any race category apart from white or AI/AN. Age-adjusted prevalences standardized to the projected 2000 U.S. population†† with 95% confidence intervals (CIs) were calculated for sociodemographic characteristics (sex, marital status, education level, income, and employment status), access to care§§ (health care coverage and having a personal doctor or health care provider), lifestyle indicators¶¶ (current smoking, current smokeless tobacco use, physical inactivity, current alcohol use, current dietary sugar-sweetened beverage consumption), and chronic conditions: diabetes, high blood pressure, obesity, and chronic inactivity during the past month.

** Respondents were defined as selecting any race category other than white or AI/AN, including black or African American, Asian, Native Hawaiian or other Pacific Islander, Other race, or No preferred race, regardless of Hispanic ethnicity.

†† https://pub.azdhs.gov/health-stats/report/hspam/2016/index.php

§§ https://www.cdc.gov/nchs/data/statnt/statnt20.pdf

¶¶ https://www.cdc.gov/brfss/data_documentation/pdf/brfss_ssb-userguide.pdf

* https://www.azdhs.gov/health-stats/report/hspam/2016/index.php

† https://www.cdc.gov/brfss/index.html

§ https://minorityhealth.hhs.gov/omh/browse.aspx?lvl=2&lvlid=89.

5 Respondents were identified as AI/AN, whites, or others according to the BRFSS variable denoting preferred race category, a calculated race variable. Response options available to respondents included White, Black or African American, American Indian or Alaska Native, Asian, Pacific Islander. Respondents who did not select a single race were defined as “Don’t know/Not sure” or “Refused” and were coded as missing and not included in the analysis.

5 Respondents were defined as respondents selecting any race category other than white or AI/AN, including black or African American, Asian, Native Hawaiian or other Pacific Islander, Other race, or No preferred race, regardless of Hispanic ethnicity.

†† https://www.cdc.gov/nchs/data/statnt/statnt20.pdf

§§ https://www.cdc.gov/brfss/data_documentation/pdf/brfss_ssb-userguide.pdf

¶¶ https://www.cdc.gov/brfss/data_documentation/pdf/brfss_ssb-userguide.pdf

Physical inactivity was defined according to a non-confirmatory response to the following question: “During the past month, other than your regular job, did you participate in any physical activities or exercises such as running, calisthenics, golf, gardening, or walking for exercise?”

BRFSS is a telephone (landline and cellular) survey conducted annually in all 50 states, the District of Columbia, and U.S. territories to collect information on health-related behavioral risk factors, health care access, and chronic conditions among noninstitutionalized U.S. adults aged ≥18 years. To increase sample size and representation of AI/AN, the U.S. Department of Health and Human Services Office of Minority Health collaborated with CDC to oversample AI/AN in 11 states to improve understanding of their health status. Data from the 2017 Arizona BRFSS (15,004) were used to examine the prevalence of selected sociodemographic characteristics, lifestyle health-related behaviors, and chronic conditions among AI/AN, compared with prevalences among whites and other races. In 2017, Arizona BRFSS landline and cellular response rates were 52.3% and 79.6%, respectively. Race was categorized as white or AI/AN according to the BRFSS variable denoting preferred race category based on the response to the following question: “Which one or more of the following would you say is your race?” The preferred race category was selected to avoid missing or excluding persons self-identifying as AI/AN, regardless of Hispanic ethnicity. Other races (others) were defined as any race category apart from white or AI/AN. Age-adjusted prevalences standardized to the projected 2000 U.S. population with 95% confidence intervals (CIs) were calculated for sociodemographic characteristics (sex, marital status, education level, income, and employment status), access to care (health care coverage and having a personal doctor or health care provider), lifestyle indicators (current smoking, current smokeless tobacco use, physical inactivity, current dietary sugar-sweetened beverage consumption), and chronic conditions: diabetes, high blood pressure, obesity, and chronic inactivity during the past month.
binge drinking, consumption of sugar-sweetened beverages, and physical inactivity), and health status and chronic conditions (frequent mental distress, being overweight or having obesity, and doctor-diagnosed coronary heart disease, asthma, chronic obstructive pulmonary disease, diabetes, arthritis, high blood pressure, high blood cholesterol, and depression). Group differences were assessed with pairwise tests (AI/AN versus whites and AI/AN versus others) with statistical significance defined as p<0.05. Only statistically significant results are presented. Statistical software was used to account for survey weights and complex survey design.

Among all 15,004 respondents, 766 (5.1%) identified their race as AI/AN, 12,472 (76.3%) as white, and 1,766 (18.6%) as other. Among AI/AN, the prevalences of having less than a high school diploma (23.2%), reporting $<\$15,000 annual income (22.8%), and reporting unemployment (11.6%) were higher than those among whites (11.8%, 6.7%, and 5.9%, respectively) (Table 1). The prevalence of having health care coverage was higher among AI/AN (74.1%) than that among whites (71.7%) and others (65.3%), but the prevalence among AI/AN of having a personal doctor or health care provider (63.1%) was lower than that among whites (72.8%) and others (67.6%) (Table 1). The prevalences among AI/AN reporting fair or poor health status (28.7%), being overweight or having obesity (76.7%), and having diabetes (21.4%) were higher than those among whites (16.3%, 63.2%, and 8.0%, respectively) and others (23.6%, 65.9%, and 13.1%, respectively) (Table 2). In addition, among AI/AN, the prevalences of leisure-time physical inactivity (31.1%), daily sugar-sweetened beverage consumption (33.0%) and high blood pressure (32.9%) were higher than those among whites (23.0%, 26.8%, and 27.6%, respectively) (Table 2).

Discussion

BRFSS estimates in this report were based on an oversampling of AI/AN in Arizona, to obtain data to inform strategies for mitigating health disparities among AI/AN (3,4). Consistent with other findings (5), these data indicate lower levels of educational attainment and income, and higher levels of unemployment among AI/AN, compared with those among whites and others, indicative of the disadvantages faced by AI/AN. Addressing these issues is important to decreasing the high prevalence and incidence of chronic conditions among AI/AN (6).

In 2017, the prevalence of self-reported health care coverage was higher among AI/AN than among whites and others. An example of health care coverage listed in the BRFSS question is Indian Health Service (IHS), which is a health care system that provides clinical, behavioral, and limited specialty health care services to enrolled members of federally recognized AI/AN tribes.††† With IHS, access to health care services is only available at federal hospitals and clinics operated or funded by IHS and might not ensure that AI/AN have ready access to health interventions or coverage to see non-IHS providers. Thus, although respondents reported having health care coverage, many might not be able to access care beyond IHS facilities. Review of the BRFSS question on health care coverage might be necessary to distinguish between respondents reporting Medicare, Medicaid, IHS, Veterans Administration, private health insurance, or being uninsured.

Prevalence of having a personal doctor or health care provider was lower among AI/AN than among whites and others. Historically, IHS facilities are located in geographically isolated areas on reservations (6). As the AI/AN population has become younger and more racially diverse, larger numbers of AI/AN are residing in cities, limiting continuity of care through IHS (5,7) and possibly the ability of AI/AN to obtain and retain a personal doctor or health care provider. Studies have highlighted additional barriers preventing AI/AN from accessing providers, including long wait times; travel time to an IHS facility; and lack of or limited access to transportation, culturally and linguistically appropriate providers, a full range of services, preventive care, screening, and early treatment for health conditions (3,8,9).

††† https://www.ihs.gov/forpatients/.
In 2015, the top five leading causes of death for AI/AN in Arizona were unintentional injury, cancer, coronary heart disease, chronic liver disease and cirrhosis, and diabetes (10). When compared with the entire U.S. population, diabetes and chronic liver disease and cirrhosis are more common causes of death among the AI/AN population. Population-level behavioral and policy interventions are needed to reduce disparities in diabetes and chronic liver disease and cirrhosis mortality in the AI/AN population. These current analyses indicated a higher prevalence of sugar-sweetened beverage intake, leisure-time physical inactivity, being overweight or having obesity, and having diabetes or high blood pressure among AI/AN compared with whites in Arizona. Population-specific data on these indicators is crucial to formulating data-informed strategic plans and priority setting at ADHS. The Arizona Health Improvement Plan provides a structure to link networks of partners to align resources and programs to improve the health of persons and communities across Arizona using evidence-based preventive health strategies.

https://azdhs.gov/documents/operations/managing-excellence/azhip.pdf.
### TABLE 2. Age-adjusted* weighted prevalence of lifestyle health-related behaviors and chronic conditions among American Indians/Alaska Natives, whites, and adults aged ≥18 years with other race (total estimated population = 5,192,000) — Behavioral Risk Factor Surveillance System, Arizona, 2017

| Characteristic                        | American Indians/Alaska Natives | Whites | Others | n = 766; weighted % = 5.1 | n = 12,472; weighted % = 76.3 | n = 1,766; weighted % = 18.6 |
|---------------------------------------|---------------------------------|--------|--------|---------------------------|-------------------------------|-------------------------------|
|                                       | Unweighted sample size, no.     | Estimated population, no. | Weighted % (95% CI) | Unweighted sample size, no. | Estimated population, no. | Weighted % (95% CI) | Unweighted sample size, no. | Estimated population, no. | Weighted % (95% CI) |
| Health-related behaviors              |                                 |                     |                     |                           |                           |                           |                           |                           |                     |
| Current smoker                        | 89                              | 38,900              | 15.7 (11.9–19.5)   | 1,596                      | 601,700                     | 16.7 (15.6–17.7)          | 240                      | 128,500                     | 14.8 (12.7–16.9)     |
| Current smokeless tobacco users       | 47                              | 12,400              | 4.8 (2.9–6.7)      | 275                        | 109,600                     | 3.2 (2.7–3.7)             | 36                       | 18,900                      | 2.2 (1.3–3.0)        |
| Binge drinking**                     | 81                              | 41,700              | 17.6 (13.6–21.6)   | 1,310                      | 553,000                     | 16.9 (15.8–18.0)          | 207                      | 126,400                     | 14.0 (12.0–16.1)     |
| Sugar-sweetened beverage ≥1 time per day†† | 178                            | 65,100              | 33.0 (27.9–38.1)   | 2,031                      | 793,500                     | 26.8 (25.4–28.2)          | 390                      | 224,700                     | 31.4 (28.4–34.4)     |
| Leisure-time physical inactivity†     | 186                            | 66,900              | 31.1 (26.4–35.8)   | 2,804                      | 873,900                     | 23.0 (21.9–24.1)          | 398                      | 212,700                     | 27.6 (24.8–30.3)     |
| Health status and chronic conditions |                                 |                     |                     |                           |                           |                           |                           |                           |                     |
| Fair/Poor health status               | 219                             | 75,000              | 28.4 (24.3–33.0)   | 2,195                      | 686,000                     | 16.3 (15.4–17.2)          | 398                      | 214,400                     | 23.6 (21.2–26.0)     |
| Frequent mental distress             | 103                             | 40,700              | 15.1 (11.5–18.8)   | 1,291                      | 474,700                     | 12.8 (11.9–13.7)          | 212                      | 115,900                     | 12.1 (10.3–13.9)     |
| Asthma                               | 88                              | 30,000              | 11.8 (8.5–15.1)    | 1,271                      | 408,100                     | 10.5 (9.7–11.3)           | 158                      | 75,800                      | 7.9 (6.3–9.3)        |
| Overweight or having obesity††       | 519                             | 183,800             | 76.7 (72.6–80.7)   | 7,394                      | 2,323,900                   | 63.2 (61.9–64.6)          | 1,062                    | 546,200                     | 65.9 (63.0–68.7)     |
| Coronary heart disease               | 50                              | 13,700              | 5.8 (3.9–7.8)      | 1,143                      | 263,100                     | 5.2 (4.8–5.7)             | 103                      | 34,900                      | 4.7 (3.6–5.8)        |
| Chronic obstructive pulmonary disease | 41                              | 12,700              | 5.3 (3.3–7.3)      | 1,119                      | 289,800                     | 6.4 (5.8–6.9)             | 93                       | 31,000                      | 3.9 (3.0–4.7)        |
| Diabetes††                           | 179                             | 52,800              | 21.4 (18.0–24.7)   | 1,507                      | 381,800                     | 8.0 (7.5–8.6)             | 256                      | 103,300                     | 13.1 (11.5–14.8)     |
| Arthritis                            | 169                             | 52,200              | 21.5 (17.5–25.2)   | 4,347                      | 1,076,700                   | 23.4 (22.5–24.3)          | 379                      | 140,700                     | 17.4 (15.6–19.2)     |
| High blood pressure††                | 262                             | 81,000              | 32.9 (29.1–36.8)   | 4,970                      | 1,264,200                   | 27.6 (26.6–28.5)          | 595                      | 246,800                     | 29.6 (27.4–31.9)     |
| High cholesterol                     | 464                             | 164,200             | 74.1 (69.6–78.5)   | 6,626                      | 2,179,800                   | 69.6 (68.4–70.8)          | 1,038                    | 588,100                     | 72.0 (69.6–74.5)     |
| Depression**                         | 121                             | 45,700              | 17.2 (13.6–20.8)   | 2,387                      | 797,600                     | 20.7 (19.6–21.7)          | 280                      | 132,100                     | 13.7 (11.9–15.5)     |
| Total estimated population           |                                 |                     |                     | 266,000                    | 3,960,000                    | 966,000                    |                           |                           |                     |

**Abbreviation:** CI = confidence interval.

* https://www.cdc.gov/nchs/data/statnt/statnt20.pdf.

† Respondents were identified as American Indians/Alaska Native (AI/AN), white, or others according to the BRFSS variable denoting preferred race category, a calculated race variable. It does not specify Hispanic ethnicity. Response options available to respondents included White, Black or African American, American Indian or Alaska Native, Asian, Pacific Islander. Others were defined as respondents selecting any of the other race categories including Black or African American, Asian, Native Hawaiian or other Pacific Islander, Other race, No preferred race.

†† Respondents who did not select a single race were defined as “Don’t know/Not sure” or “Refused” and were coded as missing and not included in the analysis.

§ Significant association between American Indians/Alaska Natives and others (p<0.05).

¶ Significant association between American Indians/Alaska Natives and whites (p<0.05).

* § Significant association between American Indians/Alaska Natives and whites (p<0.05).

¶ Significance association between American Indians/Alaska Natives and others (p<0.05).

These findings identified a number of health disparities among AI/AN in Arizona, which will require a concerted effort and culturally tailored public health approaches to address. ADHS’s Native American liaison serves as a link between ADHS and tribal communities, tribal health offices, urban Indian health programs, IHS area offices, and other local, state, and federal organizations. Moreover, CDC funding mechanisms (e.g., “Tribal Practices for Wellness in Indian Country” and “Good Health and Wellness in Indian Country”) help to identify culturally tailored public health approaches to reduce risk factors for chronic diseases. Support

https://www.cdc.gov/chronicdisease/tribal/factsheet.htm

https://www.cdc.gov/chronicdisease/tribal/tribalpractices.htm
Summary
What is already known about this topic?
American Indians/Alaska Natives (AI/AN) have a lower life expectancy, a lower quality of life, and a higher prevalence of many chronic conditions.

What is added by this report?
Analysis of 2017 Behavioral Risk Factor Surveillance System data from Arizona found significantly higher prevalences of sugar-sweetened beverage consumption, being overweight or having obesity, diabetes, hypertension, fair or poor health status, and leisure-time physical inactivity and a lower prevalence of having a personal doctor among AI/AN compared to whites.

What are the implications for public health practice?
Culturally tailored public health approaches to reducing risk factors and chronic diseases among AI/AN are needed. Improved surveillance can better equip health professionals to identify priorities and implement interventions to improve health and reduce disparities among AI/AN.

for culturally competent public health approaches over time could potentially facilitate the elimination of health disparities.

The findings in this report are subject to at least seven limitations. First, BRFSS information collected is self-reported; therefore, study findings might be subject to recall and social desirability biases. Second, the prevalence of conditions represents only diagnosed disease, not undiagnosed disease, which is an important factor and might be different among groups. Third, although weighting methods are used to account for nonresponse bias and differential probability of selection in BRFSS data, bias might still exist. Fourth, results presented for AI/AN are intended to be representative of all tribes in Arizona; even so, results do not record variation among different tribal groups in Arizona or other tribes across the United States. Fifth, place of residence (urban, suburban, rural, or reservation) was not elucidated in BRFSS data but might influence the degree to which health disparities or risk behaviors affect certain groups. Sixth, publicly available state-based survey weights from the Arizona BRFSS data set were used, and reported results might slightly differ for the AI/AN population if more precise population-specific survey weights are used. Finally, because this is a cross-sectional study, causality cannot be inferred.

Characterizing health disparities adds to the understanding of AI/AN population health. Enhanced surveillance measures at the local, state, and national level can increase awareness about health challenges faced by this population, which will be instrumental to improving health and working toward health equity. Nonetheless, challenges associated with confronting social inequities, effectively working through cultural differences, increasing health literacy within the AI/AN population, and eliminating roadblocks that limit access to care will need to be overcome (6–9). In addition, tribal, state, and federal entities need to work together to address disparities. Documenting characteristics contributing to the health of AI/AN can better equip health professionals to identify priorities and culturally and linguistically appropriate interventions to improve health and decrease health disparities.

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