Subcommittee on Food and Nutrition

US Senate Committee on Agriculture, Nutrition, & Forestry

The State of Nutrition in American 2021

November 2, 2021

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Introduction

Chairman Booker, Ranking Member Braun, and Members of the Subcommittee,

Thank you for the invitation to speak with you today. My name is Dr. Donald Warne and I am on faculty at the University of North Dakota School of Medicine & Health Sciences where I serve as the Associate Dean of Diversity, Equity & Inclusion and Director of both the Public Health Program and the Indians Into Medicine (INMED) Program. I am a family physician and have a Master of Public Health, and I am an enrolled member of the Oglala Lakota Nation from South Dakota.

In addressing the state of nutrition in America in 2021, we need to recognize that for American Indians we have a crisis of nutritional disparities and subsequent health disparities. Less access to healthy foods and dependence on inexpensive, processed foods leads to weight gain. Obesity rates for American Indians and Alaska Natives (AI/ANs) are at a critical level. According to the CDC, 48% of the AI/AN population 18 years of age and over are obese as compared to 30% of the Non-Hispanic White population.

Age-adjusted percentage of persons 18 years of age and over who were obese, 2018. (Body Mass Index (BMI) of 30 or greater)		
American Indian/Alaska Native	**Non-Hispanic White**	**American Indian/Alaska Native / Non-Hispanic White Ratio**
48.1	30.0	1.6

Source: CDC 2020. Summary Health Statistics: National Health Interview Survey: 2018. Table A-15a. https://www.cdc.gov/nchs/nhis/shs/tables.htm

Obesity is a significant risk factor for Type 2 diabetes and heart disease—two of the leading causes of death among AI/ANs. Although we have seen some modest improvements in recent years, AI/ANs still have the highest prevalence of diabetes in the nation, and AI/AN adults are almost three times more

likely than non-Hispanic white adults to be diagnosed with diabetes. According to the CDC, 23.5% of AI/AN adults have diabetes as compared to 8% of Non-Hispanic Whites.

Age-adjusted percentage of persons 18 years of age and over with diabetes, 2018		
American Indian/Alaska Native	**Non-Hispanic White**	**American Indian/Alaska Native / Non-Hispanic White Ratio**
23.5	8.0	2.9

Source: CDC 2021. Summary Health Statistics: National Health Interview Survey: 2018. Table A-4a. http://www.cdc.gov/nchs/nhis/shs/tables.htm

Heart disease is the leading cause of death among AI/ANs, and the prevalence of Coronary Heart Disease is about 50% greater for AI/ANs as compared to Non-Hispanic Whites.

Diagnosed Cases of Coronary Heart Disease:

Age-adjusted percentage of coronary heart disease among persons 18 years of age and over, 2018		
American Indian/Alaska Native	**Non-Hispanic White**	**American Indian/Alaska Native / Non-Hispanic White Ratio**
8.6	5.8	1.5

Source: CDC 2021. Summary Health Statistics: National Health Interview Survey: 2018. Table A-1a. http://www.cdc.gov/nchs/nhis/shs/tables.htm

In my personal experience, I served as a family physician with the Gila River Indian Community in Arizona—a community with among the highest rates of diabetes in the world. I have seen first-hand the challenges in managing diabetes in a population that has limited access to healthy food sources. Also, I am from Kyle, SD on the Pine Ridge Indian Reservation, and the nearest supermarket is 90 miles away in Rapid City. As a result, many of my family members contend with significant barriers to accessing healthy foods, and many of them are suffering from diabetes and heart disease. In many of our Tribal communities, substantial expenditures are made to manage the complications of diabetes, such as

dialysis for kidney failure, coronary artery bypass grafting for heart disease, and amputations for diabetic neuropathy. With kidney failure, people are automatically eligible for Medicare, and in many of our communities, people who are confined to wheel chairs due to amputations utilize social programs that will build a ramp for them to access their homes. Rather than the significant financial expenses and decreases in quality of life associated with addressing complications of diabetes and heart disease, would it not make more sense to invest in healthy food in the first place.

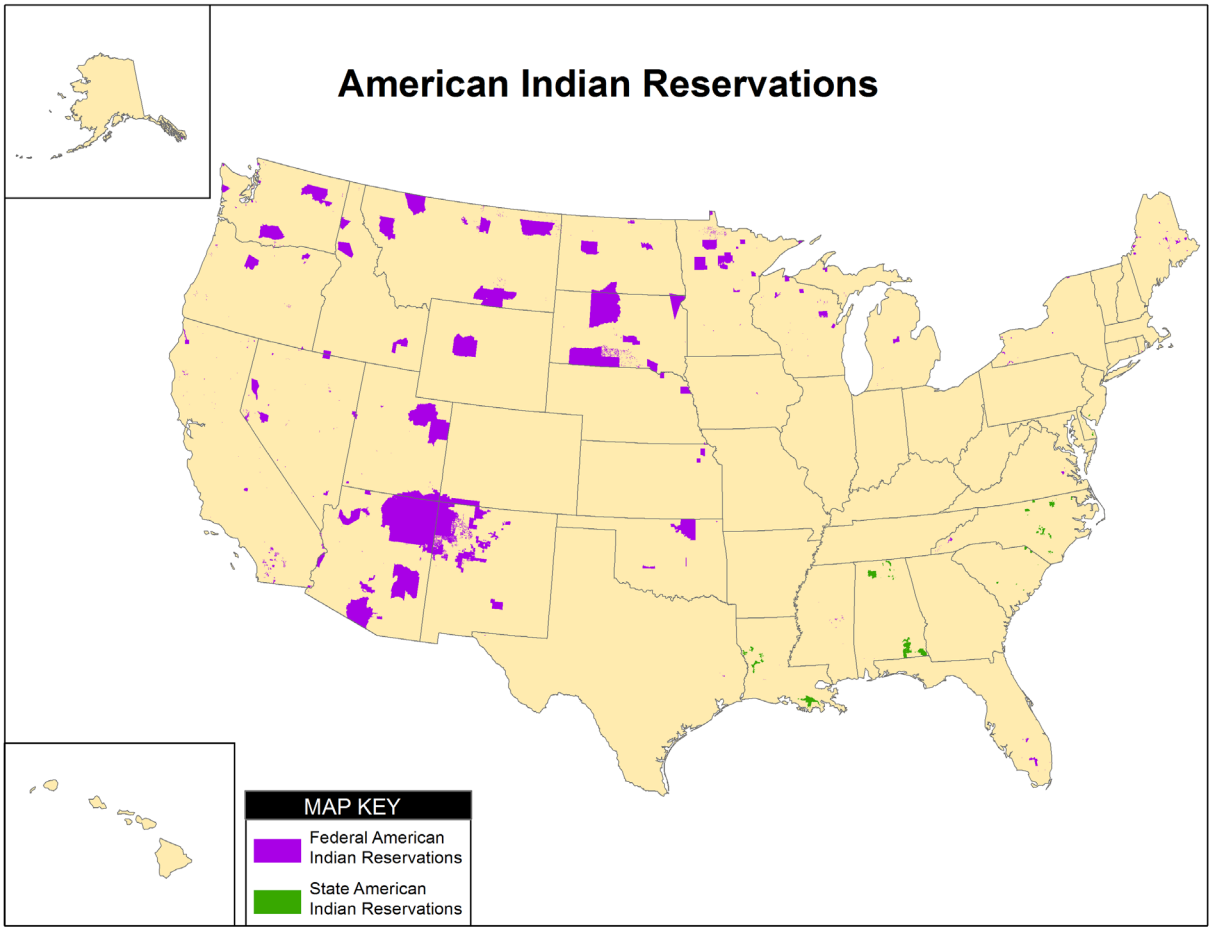
AI/AN populations are diverse in terms of history, culture, disease patterns, and nutritional health. Expanded research and evaluation of individual community health and nutritional status is needed to make informed policy decisions that will appropriately apply to the multitude of AI/AN populations. However, much is known about the broader social determinants of AI/AN health that suggests *nutrition is a significant concern*. The World Health Organization defines the social determinants of health as the conditions in which people are born, grow, live, work and age (1). These factors are influenced by the pattern of resource distribution in a population. The social determinants of health have a significant impact on health inequities, access to healthy food, and preventable disparities in health status seen across populations. We need to improve our understanding of the systemic reasons and policy bases for unhealthy diets observed in many AI/AN populations so the most effective interventions can be crafted. For example, what are the policy and social bases for food deserts that we observe in many Tribal communities?

One major historical consideration is the forced relocation of AI people from their ancestral lands to reservations (2), thereby severely restricting access to traditional food systems that historically included regionally-specific hunting, gathering, fishing, and farming (3, 4). The loss of traditional food sources also resulted in dependence on federal government programs such as the Food Distribution Program on Indian Reservations (FDPIR) that included the distribution of foods such as lard, canned meats, white

flour, salt, sugar, etc. (5, 6). While this testimony focuses on the social determinants affecting the current population and the disparities that ensue, these historic policies and resultant changes in lifestyle are unique to AI people and have led to intergenerational harm to population health.

American Indian Demographics and Health Disparities

Based on the history of colonization, the Indian Removal Act of 1830 (7), and similar policies, the AI/AN population is located primarily in the western half of the United States (Figure 1). As of the 2020 Census, there were approximately 9.7 million people in the U.S. who self-identified as AI/AN, either alone or in combination with other races and ethnicities (8).



The AI/AN population suffers from significant health disparities. Rates of death due to unintentional injuries (9), infant mortality (10), and chronic diseases (11) are consistently higher among AI/ANs than the general U.S. population. According to the North Dakota Department of Health, the average age at death between 2009 and 2019 for AIs was 56.8 years as compared to 76.6 years for the white population (12). AI/ANs in many regions of the U.S. live in conditions that are comparable to developing nations, and a significant national effort is needed to promote collaboration and to solve the AI/AN public health crisis. Social adversity, historical events, and poverty in many communities have led to exacerbations of health disparities resulting from decreased access to healthy foods and subsequent poor nutrition. Described below are common risk factors, social determinants of health, and nutritionally-related chronic diseases disparities among the AI/AN population.

Risk Factors and Social Determinants of Health

Historical Trauma

Historically traumatic events have been described as “cataclysmic” events in a population that result in long-standing and inter-generational adverse outcomes. For AI/ANs, the loss of land, traditional food systems, culture, language, traditional ceremonies, and self-sufficiency over the last several centuries has led to a collective sense of loss and social injustice. For example, prior to colonization, the entire continent was inhabited by Indigenous peoples. As seen in Figure 1, the amount of tribally-controlled territory is minimal. Also, the marginalization of traditional AI/AN cultures and languages can be measured through the Historical Loss Associated Symptoms Scale and demonstrates a negative emotional response associated with perceived

sense of historical loss among AI/ANs (13). Several researchers have examined the impact of historical trauma and its negative impact on health (14, 15). Emerging evidence from epigenetic studies demonstrate the possibility that historical trauma may lead to transgenerational stress inheritance (16, 17). This area of inquiry deserves further study.

Boarding School Experiences

The boarding school era in the 19th and 20th centuries encompassed multiple generations of children being taken away from their homes, communities, and families, and being placed in residential schools that could be more than a thousand miles away (18). Unfortunately, physical, emotional, and sexual abuse was not uncommon in boarding schools, and the negative consequences include subsequent poor health status (18). In addition, the mortality rates among boarding school residents was high, and many of the schools are adjacent to large cemeteries in which dozens of AI/AN children are buried (19). The survivors of the boarding school experience endured abuse, neglect, and the loss of playmates and friends (20). Traditional parenting and nurturing of children from a cultural perspective was disrupted, resulting in harmful impacts of boarding schools across generations (20). In addition, AI/AN children were removed from healthy traditional food systems and were exposed for the first time to institutional nutrition programs that included simple sugars, refined carbohydrates, and less access to natural foods. The boarding school experience is not ancient history—my own mother is a survivor of boarding schools.

Adverse Childhood Experiences

The groundbreaking Adverse Childhood Experiences (ACEs) study showed the cumulative negative health consequences of adverse experiences in childhood (21). ACEs are categorized

into ten domains among the categories of abuse, neglect, and household dysfunction. Adversity in childhood has a negative impact on neurological and social development, and subsequent behavioral challenges are correlated with worse academic, social, and health outcomes. These circumstances ultimately lead to higher prevalence of disease, lower socio-economic status, and early death (22). The total number of ACEs one experiences is correlated with poor adult health outcomes, including depression (21, 23), anxiety, post-traumatic stress (24), substance abuse (21, 25), diabetes (21, 25, 26), cancer (27), and heart disease (21, 23), among other conditions (21). The original ACE study included predominantly caucasian participants, however, data from recent studies show that ACEs are more prevalent in many AI communities (28, 29). Although it is not classified as an ACE based on the original study design, food insecurity is an additional adverse childhood experience for many AI/AN and impoverished children. Hence, the intergenerational patterns of poverty and food insecurity in AI/AN populations may be exacerbated by ACEs.

Poverty

Poverty is correlated with poor health status. Nationally, 2.4 times as many AI/ANs as whites live at or below the federal poverty level (30), and in some areas of the Indian Health Service (IHS), including the Great Plains, disparities in poverty are even more pronounced (31). Some of the programs designed to address the nutritional needs of impoverished communities administered by the U.S. Department of Agriculture (USDA), including the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) and school breakfast and lunch programs have had a negative impact on nutritional health over time. Fortunately, these programs have seen improvement in nutritional value in recent decades. Significant

improvements in breast feeding promotion have been made to the WIC program in recent years, however, in many AI/AN and other impoverished communities, the population health outcome of WIC has been higher rates of formula feeding and lower rates of breast feeding (32). It is well established in the scientific literature that children who are breast fed have lower rates of obesity and type 2 diabetes than children who were formula-fed (33). In addition, nutritional profiles of school breakfast and lunch programs historically have contributed to nutritionally-based health disparities with historically higher intake of saturated fat (34).

Obesity

As mentioned in the introduction, obesity rates among AI/ANs are higher than almost all other racial and ethnic groups (35). Poverty combined with the history of federally-sponsored food programs, such as the Food Distribution Program on Indian Reservations (FDPIR) operated by the USDA, led to diets that were high in calories and had poor nutritional value (36). Foods historically available in the FDPIR (also known as the commodity food program) consisted of bleached flour, refined sugar, lard, vegetable shortening, sugar-sweetened beverages, pure corn

syrup, canned meat, and cheese (36). The image above shows a large container of corn syrup with directions to “use in baby formula.” Loss of access to traditional food systems combined with limited financial opportunities on many AI reservations are key social determinants that place the AI population at higher risk for obesity and its associated chronic disease outcomes.

Chronic Disease Disparities

Several nutritionally-related chronic diseases occur at disproportionate prevalence among AI/ANs, including diabetes, heart disease, and cancer.

Diabetes

AIs have the highest prevalence of diabetes and the highest diabetes mortality rates in the nation (37). The basis for this disparity is multi-faceted in the field of social policy and social determinants of health, with poverty-related lack of access to healthy foods. Unfortunately, many AI reservation communities are food deserts with limited or no access to a supermarket, less access to school or community based physical activity programs, and possibly genetic predisposition. In terms of population-based nutritional support, federal food programs need to continue to improve their nutritional profiles to reduce the diabetes prevalence in the AI/AN population.

Heart Disease

As is the case in many populations, heart disease is the leading cause of death for AI/ANs (9). This is not surprising given the elevated prevalence of obesity and diabetes nationally, unhealthy diets, and high rates of smoking among Plains Indians and Alaska Natives (9). Nationally, AI/AN men and women have a 21% greater mortality rate from heart disease, and

AIs in the Northern Plains have a 58% greater heart disease mortality rate as compared to the white population (38).

Cancer

Significant regional disparities in cancer mortality exist in the AI population. Not surprisingly, cancer incidence and mortality rates correlate closely with commercial tobacco use (39). Foods commonly consumed in AI/AN and impoverished populations, including processed meat, red meat, and alcohol, as well as excess abdominal body fat are associated with colorectal cancer (CRC) risk. Due to underfunding of the IHS and to lack of access to appropriate screening, AI/ANs are the only population in the U.S. with increasing mortality due to CRC (40). Poverty, lack of insurance, limited IHS resources and cultural factors are key social determinants that have led to lower rates of CRC screening and subsequent increases in mortality among AIs (41).

Future Directions and Potential Solutions

The AI/AN population health challenges are significant. Improvements in primary, secondary, and tertiary prevention are needed to solve the substantial disparities in health and social determinants. To be most effective, expanded collaborations among tribes, nutrition programs, public health programs, medical and academic professionals, IHS and other federal agencies are needed to identify, implement, and evaluate effective solutions to address the AI public health crisis. There is a great need to build the evidence-base of effective health promotion and nutrition programs among AI/ANs. Although little can be done to address the distal determinants of health (e.g. colonization, racism) in terms of changing the past, AI/AN communities have opportunities to positively impact proximal and intermediate determinants

of health (e.g. health behaviors, food insecurity, health systems, etc.) (42). Moving forward, a multi-pronged approach in collaboration with numerous stakeholders and organizations is needed to address the upstream social determinants of health and to increase access to healthier foods. Of note, specific strategies will vary based on the laws and policies at the national level. The approaches for Indigenous populations in the U.S. will be different than those taken in Canada, Australia, and other nations. Promising and best practices and strategies for AI/AN populations in the U.S. can be considered in several focus areas, including:

1. Improving existing food programs;
2. Promoting breast feeding and early childhood nutrition;
3. Promoting food sovereignty and increasing access to traditional foods;
4. Expanding locally-cultivated foods; and
5. Taxing unhealthy foods and subsidizing healthier options.

Improving existing food programs

Many AI/AN communities still depend on and utilize federally-sponsored food programs, including FDPIR, school breakfast and lunch programs, and WIC. While nutritional improvements have been made to these programs in recent decades (e.g. breastfeeding promotion by WIC programs) (43), increases in community engagement, participation, and buy-in are needed to ensure that healthier food offerings are provided and that better food choices are nurtured. Anecdotally, when changes are made to food programs, there can be resistance from the community and reluctance to try new options that might be healthier choices. In these settings, it is important to include a *community-engaged approach* to develop champions from the community who can advocate for improved nutrition. As of January 2018, 276 tribes were

receiving food from the FDPIR (44). The Agricultural Act of 2014 included a feasibility study of tribal management of federal nutrition assistance programs instead of state agency administration. Although many Tribes are impoverished and have limited infrastructure, resources, and personnel, they generally prefer to manage programs locally (45). Further research is needed to determine the best strategies to enhance locally-managed and culturally-appropriate food programs. Community education regarding healthy cooking and food tasting opportunities can be effective in promoting consumption of healthier choices. These programs need to be studied and evaluated for their effectiveness, but initial evidence is promising. Federal resources should be invested in advancing this research agenda.

Promoting breast feeding and early childhood nutrition

Breast feeding is a well-established and natural way to promote health (46). Health experts and stakeholder groups, including the American Academy of Pediatrics and the American College of Obstetricians and Gynecologists, strongly support exclusively breastfeeding (no infant formula, juice, or water) for the first six months of life (47). They also support breastfeeding for a minimum of one year with other foods that can be started at six months of age, including vegetables, grains, fruits, and proteins. Many Tribes have implemented culturally-tailored breastfeeding promotion and early childhood nutrition programs, recognizing the potential long-term impact of good nutrition early in life (48, 49). These programs also need to be studied and evaluated in a culturally-relevant manner to demonstrate the health impact, cost analysis, and community member satisfaction. Unfortunately, there is a scarcity of AI/AN-specific research focused on the impact of culturally-relevant strategies to promote infant and early childhood nutrition (50).

Promoting food sovereignty and increasing access to traditional foods

Many Tribes and Tribal Colleges have expanded their focus on food sovereignty—defined as "the right of peoples to healthy and culturally-appropriate food produced through ecologically-sound and sustainable methods, and their right to define their own food and agriculture systems." (51). Indigenous populations around the globe, including AI/ANs, have seen the detrimental impact of colonization on community health and nutrition. Dietary changes, less access to traditional foods, and subsequent poor health outcomes are well described in the health literature. However, the need exists to promote the scientific study of the impact of food sovereignty programs and related social justice initiatives among Indigenous peoples. Many AI/AN communities are reclaiming their access to traditional foods, including buffalo in the Northern Plains, "three sisters" crops (corn, beans, squash), traditional fishing techniques, and other culturally relevant approaches. This area is ripe for expansion of appropriate research and evaluation, and should include partnerships with Tribal Colleges and other tribally-based stakeholder groups to promote culturally competent approaches.

Expanding locally-cultivated foods

Numerous AI/AN communities are developing farmer's markets, community gardens, and similar food programs to promote access to and utilization of locally-cultivated foods. These programs often include traditional foods, but other "non-traditional" foods have also been shown to be well-received in anecdotal reports. Locally-cultivated foods can include meats as well as gathered and farmed foods. In my experience, many AI children have never tasted specific fruits and vegetables, including various berries, persimmon, and numerous types of squash. Tribal farmer's markets that include tasting opportunities for families and youth have

provided successful opportunities to promote healthy food diversity in some families. This is also a potential area for expanded research to examine the health impact of improved access to local foods.

Taxing unhealthy foods and subsidizing healthier options

Some tribes have started a "junk food tax" to limit poor nutritional choices much in the same manner that tobacco taxes can limit cigarette smoking. Preliminary evidence in other populations show potential reductions in obesity associated with taxing unhealthy foods (52, 53). These programs are novel and relatively new with taxes implemented since 2015 (54), and as a result there are limited peer-reviewed analyses of outcomes to date. The tax programs can be controversial in that some community members are reluctant to change long-standing dietary habits and do not want to pay an additional tax. Additionally, some Tribes are providing healthier food and drink options in vending machines at a lower cost than the less-healthy options. For example, higher protein snacks (nuts, jerky, cheese) and bottled water can be subsidized and sold in vending machines at a fraction of the cost of unhealthier snacks and sugar-sweetened beverages. Health policy research could include assessing the health impact of making healthier choices easier and less expensive.

As these strategies are being implemented in numerous AI/AN communities, it is vital that new ideas are studied and reported, and that existing programs are appropriately evaluated. A challenge in expanding public health programming in AI/AN populations is the dearth of Tribally-specific evidence based practices (EBPs). Public health programs are frequently required to use EBPs to acquire grants and other resources. The challenge that we face in AI/AN

communities related to EBPs is “Whose evidence is it?” Food programs that work well in cities or suburbs with predominantly non-AI/AN populations may or may not be applicable in rural, Tribal populations with significant differences in culture, poverty, food preferences, access, transportation, growing seasons, and numerous other factors that can limit the effectiveness of currently accepted EBPs. The need exists to build the AI/AN-specific evidence base and for Tribes to learn from each other regarding the development and implementation of effective nutritional health programs.

Finally, an AI/AN-specific model to frame social determinants of nutritional health in the U.S. should be developed. This would provide a theoretical framework to understand the impact of the unique history and social factors contributing to nutritionally-influenced health inequities among Indigenous peoples in the U.S. Based on the growing and evolving understanding of AI/AN nutrition and health disparities, this testimony provides initial considerations for this model. Strengthening academic partnerships with Tribal communities could assist in this process and can promote research and programming to produce more data and EBPs. Tribal-academic partnerships can also result in expanded formal program evaluation and peer-reviewed publications of these programs to ensure that the growing list of EBPs is culturally-relevant and includes AI populations.

In closing, we need to recognize that we have a crisis of nutritional disparities among AI/ANs. We need to **fundamentally change** our approach to nutrition and to develop new strategies to address nutrition and obesity-related health inequities. I applaud the idea of hosting a 2nd

White House Conference on Nutrition to gather more community-based input regarding potential solutions and action items. We also need a comprehensive policy approach, and we need to understand the nuances of engaging Tribes in these areas. Ideally, we will include stakeholders with lived experience as part of these important discussions moving forward. Finally, please know that I am honored to be here! Addressing nutritional disparities is challenging and complex, and we will not be successful in promoting the health of all Americans with a one-size fits all approach. It is important to include Indigenous voices and perspectives in these discussions. Thank you.

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