

# Barriers to Diabetes Prevention and Control Among American Indians

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North Carolina's American Indian population experiences a disproportionate diabetes burden, in terms of both a high prevalence of the disease and excess diabetes-related death and disability. Concerted efforts need to be made to provide culturally appropriate and easily accessible education, health care, and health-promoting resources in these vulnerable communities.

American Indians and Alaska Natives have the highest rates of diabetes of any racial/ethnic group in the United States [1]. The diabetes burden in American Indian and Alaska Native communities has been referred to as an "epidemic" [2], a term that is generally reserved for infectious illnesses. Moreover, the physical and economic toll associated with complications of diabetes in these communities is devastating [3, 4]. The prevalence of type 2 diabetes, the most common form of diabetes and a condition once thought to be limited to adults, is alarmingly high among American Indian youths [5]. In fact, much of the early evidence of type 2 diabetes in youths was generated from studies in American Indian populations [6].

North Carolina has the largest American Indian population east of the Mississippi River, with >100,000 residents [7]. Evidence indicates that the diabetes burden facing American Indians across the nation is similarly shared by our state's first peoples [7]. Data from the 2006-2008 Behavioral Risk Factor Surveillance System indicated that the prevalence of self-reported diabetes among North Carolina's American Indian population was 13.3%, a value >40% higher than that for non-Hispanic whites (9.4%) [7]. During 2004-2008, the frequency of death due to diabetes, the fifth leading cause of death for North Carolina's American Indians, was 45.0 cases per 100,000 population, a value more than double that for the non-Hispanic white population in the state (Table 1) [7]. Data from the Eastern Band of Cherokee Indians (ECBI), the only fully federally recognized tribe among the 8 organized tribes in North Carolina, indicate that approximately 1 in 3 ECBI men and approximately 1 in 4 ECBI women self-reported having received a diagnosis of diabetes [8].

The reasons for the high frequencies of diabetes and associated sequelae among American Indians remain elusive but are likely multifactorial. One strong factor contrib-

**TABLE 1.** Diabetes Prevalence, Diabetes Mortality, and Indicators of Socioeconomic Status in North Carolina, by Race

Indicator	American Indian	African American	White
Diabetes prevalence, individuals, %	13.3	14.8	9.4
Diabetes mortality, deaths per 100,000 population	45.0	51.0	19.5
Living below FPL, families, %	21.2	21.3	6.7
No health insurance, individuals, %	28.3	23.1	14.2
No formal education beyond high school, adults, <sup>a</sup> %	58	...	40

Note. Data are from [7]. FPL, federal poverty level.  
<sup>a</sup>Defined as individuals aged ≥25 y.

uting to this disparity is the excess socioeconomic burden in most American Indian communities. Evidence from across the globe has consistently shown an inverse association between indicators of socioeconomic status and prevalence of diabetes [9]. Persons with a high level of economic means and formal education are more likely to have access to resources that promote healthy lifestyles to prevent disease and to adequate health care to treat disease. Buescher and colleagues [10] recently estimated that \$225 million in diabetes-related expenditures could be saved each year by the North Carolina Medicaid program if diabetes-related racial and economic disparities were eliminated.

Unfortunately, American Indians do not fare well with regard to access to these resources. The poverty prevalence for North Carolina's American Indian population (21.2%) is more than 3 times that for the non-Hispanic white population (6.7%). More than 58% of American Indian adults ≥25 years of age have no formal education beyond high school, compared with 40% for whites (Table 1) [7].

What solutions are available to American Indian communities to eliminate the disparities associated with diabetes? Community-level and community-driven efforts are most

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# Cherokee Choices: A Diabetes Prevention Program in Cherokee, North Carolina

Jeff Bachar

In 1999, Cherokee Choices received funds from the Centers for Disease Control and Prevention to prevent diabetes among members of the Eastern Band of Cherokee Indians. Cherokee Choices' 3 primary components—a mentoring program for elementary school students, a worksite wellness program for adults working in tribal offices, and a wellness program for church members [1]—provide a bottom-up approach to diabetes prevention by mobilizing community members to play an active role in their well-being [2]. The intervention has resulted in several beneficial changes in the community and has revealed several lessons and keys to which the program's success can be attributed.

According to teachers at Cherokee Elementary School, the elementary school mentoring component has yielded changes in the culture of the school, such as the creation of a School Health Advisory Council, and changes in the learning environment, including a greater emphasis on health-promoting events and lessons. These changes extend beyond the activities implemented directly by Cherokee Choices. For example, teachers are incorporating more lessons that involve physical activity and are urging parents to supply healthy food for classroom events. Surveys conducted before and after implementation of this component show that elementary school students who participated in in-class and after-school activities sponsored by Cherokee Choices had better attendance and were more likely to look forward to being at school,

compared with students who did not participate.

The workplace-wellness component of Cherokee Choices has resulted in many improvements in working conditions for tribal employees. For instance, a major policy change that allows employees time off to participate in Cherokee Choices-sponsored events was achieved. In addition, the tribal human resources program received education about best practices for achieving worksite wellness, which contributed to the implementation of health risk appraisals (including evaluation of lipid profile and calculation of body mass index) for all tribal employees. There is now substantial demand among employees for these and related services provided by Cherokee Choices, such as exercise classes, lifestyle coaching, and cooking demonstrations.

In the church-wellness component, health professionals such as nutritionists, dieticians, and fitness experts lead activities to promote healthy eating, physical activity, and awareness of health services available to tribal members [1]. Pastors have complemented these efforts with sermons that promote the cultivation of healthy physical and spiritual lives. The Walk to Jerusalem program, in which 150 church members each walked a distance equivalent to that between Cherokee and Jerusalem, is one of the components' highlights.

Cherokee Choices has revealed several lessons about the implementation of interventions and the keys to their success. First, political astuteness among intervention leadership can

effective in ensuring that culturally relevant approaches are developed. A critical first step is increasing awareness of the behaviors associated with diabetes prevention and control. This is the goal of the American Indian and Alaska Native Workgroup of the National Diabetes Education Program, with initiatives such as the Move It and the Power to Prevent campaigns. These initiatives focus on encouraging increased exercise, healthy eating, and maintenance of healthy body weight by American Indian youths and adults, lifestyle behaviors that were shown by the Diabetes Prevention Program to reduce the risk of diabetes [11].

Furthermore, community-level policies need to encourage access to healthy foods and safe and affordable venues to exercise. A 2009 study showed that residents who lived in neighborhoods with more of these resources had a 38% lower risk of developing diabetes, compared with those in neighborhoods with fewer resources [12]. Given that many of the state's American Indians live in rural areas, this presents some challenges. However, community-based organizations that are important in American Indian communities, such as faith-based institutions, can play an important role in disseminating health education information and in providing places to exercise and share healthy foods. The training and support of lay health educators has been shown to be a

cost-effective approach to impart this education [13].

Another important component in reducing diabetes-related disparities in American Indian communities involves ensuring that culturally competent health care professionals with particular expertise in diabetes management are available. Again, since many of the state's American Indians live in rural populations with limited means for transportation, this is a major challenge. An additional complicating factor is that many in the state's American Indian populations have limited or no health insurance, making access to diabetes specialty care even more difficult [14]. Even among members of the EBCL, who have access to health care through the Indian Health Service, resources for treating the large number of residents with diabetes, many of whom live long distances from health care facilities, are limited.

Finally, researchers need to work with American Indian communities to translate findings from diabetes prevention and control research studies in order to generate the broadest impact. As an example, Katula and colleagues [15] recently demonstrated promising results in translating the Diabetes Prevention Program intervention for use by low-income African Americans in Forsyth County, North Carolina. This collaborative approach requires a high level of trust and a mutual respect among partners.

help navigate the intervention through policy-related challenges. Policy change might be best approached in phases, by initially building buy-in among stakeholders and then acting in full force once a foundation of support has been laid.

Second, fearlessness and prudence are useful for overcoming the view that the current way of doing things is the best. One must be willing to try new approaches yet to hold back until opportunities for more-assertive actions arise. As with policy change, one path toward success involves implementation of the intervention in phases.

Third, regular receipt of feedback from community members allows the intervention to be sensitive to cultural needs, can mitigate problems early during the intervention's existence, and can serve as an incubator for new ideas and solutions to problems. Listening to community members during the design phase can be time-consuming, however, owing to the need to convince people that their feedback will be used. People might not be accustomed to being involved in intervention design, and their initial input can be hard to obtain and of low quality. Trust must therefore be established, and intervention leadership must remain patient and persistent until individuals feel sufficiently comfortable to share their thoughts.

Fourth, one-on-one support, in terms of establishing and sustaining relationships, enables the intervention to delve below the surface of health issues and address, directly or through an effective referral system, underlying causes of adverse health, such as past trauma, racism, and abuse.

Fifth, collaborative activities have made partners outside of the health system, such as transit agencies, city planners, and businesses, relevant to the health of the community. Wellness, when framed as an economic issue, resonates with

these organizations, and Cherokee Choices has capitalized on this message by working with these organizations and other tribal programs on initiatives to increase the number of greenways, sidewalks, and parks in Cherokee.

Finally, even a minimal amount of contact with stakeholders can promote continuity in the intervention and lead to its long-term sustainability. Cherokee Choices uses multiple channels of communication, including group meetings, telephone calls, and social marketing, to reinforce messages and maintain a link to clients.

Cherokee Choices has shown that beneficial health-related changes can be achieved community wide through targeted, hands-on programs in multiple settings. The intervention has demonstrated the importance of involving a variety of stakeholders from multiple levels of the community stratum and can serve as an example for the creation and implementation of interventions that address other health conditions. **NCMJ**

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Diabetes disparities are persistent in American Indian communities in North Carolina and across the United States. The factors that contribute to these disparities may largely be driven by the limited socioeconomic means in American Indian communities. The ability to address these disparities is largely dependent on the development of community-driven approaches that are culturally sensitive and accessible and have the widest reach. Health care professionals, policymakers, researchers, and the community at large need to develop a concerted approach to addressing these disparities. **NCMJ**

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