

Breaking Barriers to American Indian Nutrition Research

Over the past 2 years, Jacqueline S. Gray, an ARS postdoctoral scientist, took a four-wheel-drive past scenic vistas, through undeveloped pastures, and across rugged terrain to attend powwows and health fairs on reservations and other American Indian communities. Alongside, during each trip, was a mobile nutrition research laboratory, developed by scientists at the Grand Forks Human Nutrition Research Center in Grand Forks, North Dakota, to bring nutrition research to underserved populations. Aided by summer interns and graduate students, Gray, of Choctaw and Cherokee descent, collected information about the diets, physical and mental health, physical activity, and access to healthy foods of hundreds of American Indians.

American Indians are among the most impoverished of minority groups in

America. They experience a disproportionately high incidence of diabetes, obesity, and cardiovascular disease. Their rate of diabetes is about three times that of the U.S. population as a whole, approaching 40 to 50 percent in adults. And depression is thought to be pervasive within the more than 500 federally recognized tribes that make up the population. Native Americans have the highest per capita suicide rate—nearly 250 percent the national average, and nearly 430 percent the rate among 15- to 24-year-olds.

The goal of the research project is to determine the role of nutrition and physical activity in the development and course of diabetes, heart disease, depression, and other health problems faced by these U.S. communities. The research study was led by psychologist James G. Penland and physiologist Henry C. Lukaski, with the Grand Forks center's Mineral Nutrient Functions Research Unit. The researchers anticipate that the resulting data will be useful in designing and implementing effective interventions to improve health and quality of life among American Indians.

To gain the access to reservations and powwows necessary to conduct the research, Gray met with four tribal councils, two tribal community college presidents, and the chair of the Trenton Indian Service Area.

“Because Indian tribes are considered to be sovereign domestic nations, professionals who want to collect data from them must first obtain permission,” says Gray. “We had to present what we wanted to do and describe how the research would benefit the communities. We also had to discuss who would own the data.”

Several of the center's summer interns helped to facilitate and present the information to governing groups on the reservations.

“We had 458 participants whom we classified as Northern Plains Indians, or those coming from Minnesota, North and South Dakota, Montana, and Wyoming,” says Gray.

Building Bridges

Most participants completed a questionnaire about their access to adequate food supplies. Their answers showed that 74 percent lived in households that were “food secure”—meaning they had access at all times to enough foods for an active, healthy life for all household members. Ten percent were food insecure, with moderate to severe hunger, and the remaining 16 percent were food insecure, but without hunger.

“That meant that during the past 12 months, those 16 percent experienced limited or uncertain

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Ellen Wilson (left), summer intern from the Three Affiliated Tribes, New Town, North Dakota, uses a wrist monitor to take the blood pressure of Donna Grandbois, Turtle Mountain Chippewa from Belcourt, North Dakota, outside the Mobile Nutrition Research Laboratory. The researchers traveled over 7,000 miles to powwows and other community gatherings during the American Indian study to gather data on study participants.



Dancing is an important form of aerobic exercise for American Indians who participate in powwows. Many native dancers took part in the nutrition research project while competing in powwows around the Northern Plains. Gandi Shaw, member of the Spirit Lake Sioux Tribe, performs above.

availability of nutritionally adequate and safe foods or limited or uncertain ability to acquire acceptable foods in socially acceptable ways,” Penland says.

Depending on income and availability, many American Indians’ diets are based on government-provided commodities—foods that are very different from traditional native fare. To learn more about the effects of these differences on such a diverse population, the researchers collected information from participants about the types of foods they’d eaten during the last month.

“Future research could reveal whether there is a difference in blood sugar control between those who consume a diet composed of traditional native foods and those who consume a diet of commodities foods,” says Gray.

Measuring the extent of depression among the participants was also key. “We found that depression questionnaires originally developed for use with the general population could successfully be used with Northern Plains Indians,” she says. Measures of depression were found

to be strongly associated with measures of generalized distress.

The researchers also found that depression-related symptoms were associated with poorer health, less exercise, food insecurity, and tobacco use in both males and females, and with carbohydrate intake in males and higher body mass index in females. Overall, factors such as gender, socioeconomic status, and a strong cultural identity were found to significantly influence self-reported depression scores taken from the questionnaires. Depression scores were higher in those reporting lower income, more children, and food insecurity. Depression scores were lower in those reporting stronger identity with native culture and language.

Last, on many reservations, diabetes proved to be the major issue. More than 60 percent of participants indicated that a family member had been diagnosed with it. The researchers also found instances of chronic health problems—such as kidney and heart disease—that could be traced back to diabetes.

Results To Buoy Grants

When they received permission to do the study, the research group pledged to return to the reservations after the data had been analyzed. They promised to share and discuss the results with the tribes before they were published, so that the tribes could remain in control of, and engaged in, the process.

Tribal representatives hope the research data will provide a foundation for programs to identify, prevent, or treat health problems such as diabetes and obesity, as well as to fund health-education programs highlighting the link between nutrition and chronic diseases.

“Once the final analysis is done, we’ll prepare a technical report for each tribal group. That data will then be available to them as a reference when applying for grants,” says Penland.—By **Rosalie Marion Bliss**, ARS.

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Richard Street (left), a champion grass dancer and member of the Mesquakie Tribe, talks with ARS postdoctoral fellow Jacqueline Gray about the American Indian health study after a dance event. Street participated in the study during the first summer.



Research psychologist James Penland (left) and Jacqueline Gray review data from the American Indian health study.