

NHLBI Research and Training Highlights in

Native American Health



The Strong Heart Study

The Strong Heart Study is the largest, longest-running study of cardiovascular disease in American Indians and is sponsored by the National Heart, Lung, and Blood Institute (NHLBI), part of the National Institutes of Health (NIH). The goal of the study is to better understand heart disease and its risk factors — and, ultimately, to improve heart health — in American Indian communities.

The study began in 1988 in partnership with 13 sovereign tribal nations — three in and around Phoenix, Arizona; seven in southwestern Oklahoma; and three in the Aberdeen area of North and South Dakota. The study started with about 4,500 tribal members, ages 45 to 74, who received clinical exams to look for heart disease and its risk factors.

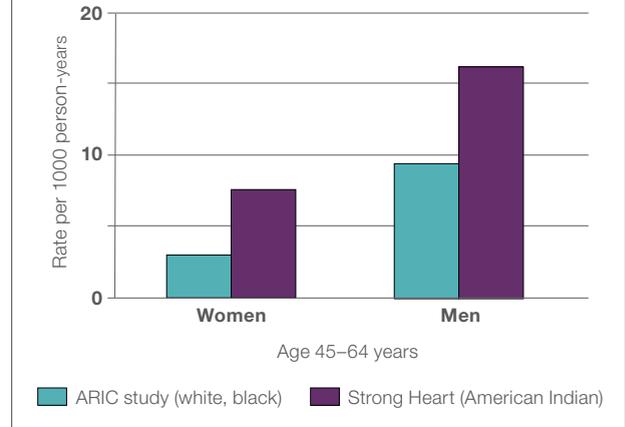
In 2001, the Strong Heart Family Study launched to recruit family members of the original participants and better understand how heart disease runs in American Indian families. Researchers have continued to follow these participants; with new funding from the NHLBI in February 2019, the study will continue to advance research to improve the health of American Indian communities.



Before Strong Heart

- American Indians appeared to have lower rates of death from cardiovascular disease (CVD) than whites, but some studies suggested American Indians had a higher prevalence of CVD. Little was known about cardiovascular risk factors in American Indians.
- In 1986, a federally sponsored expert panel,

High Coronary Heart Disease Rates in Strong Heart Participants (1999)



including officials from NIH and NHLBI, recommended support for more systematic research on CVD mortality, disability, and risk factors in American Indians. The Strong Heart Study began less than two years later.

Major Findings and Impact of Strong Heart

- Rates of CVD among American Indians are higher than in other U.S. groups.
- Type 2 diabetes is a leading cardiovascular risk factor in American Indians.
- Findings have helped inform beneficial health policies, programs, and practices:
 - the Special Diabetes Program for Indians
 - American Indian-specific risk calculators for CVD, high blood pressure, and diabetes*

*<https://strongheartstudy.org/Community/Risk-Calculators>



Research Studies and Findings Building From Strong Heart

Ancillary studies have relied on Strong Heart participants and data to address treatment of blood pressure and cholesterol, the connection between heart and brain health, and risks of CVD from arsenic exposure and lack of access to affordable, nutritious food.

- The Stop Atherosclerosis in Native Diabetics Study (SANDS) evaluated whether aggressive treatment of blood pressure and cholesterol in American Indians with diabetes could lower their risk of heart disease. After three years, the treatment led to major reductions in signs of CVD detected by ultrasound imaging. Researchers working with the Indian Health Service (IHS) developed guidelines for lipid and blood pressure management in American Indians with diabetes.
- Some studies are examining links between heart health and brain health in Strong Heart communities. These studies have used brain imaging (such as magnetic resonance imaging, or MRI) and cognitive tests to detect signs of dementia (memory loss). The researchers have found that people with enlarged hearts in midlife (average age 56) are more likely to have poor cognition and changes in the brain's memory center by their early 70s.
- There is limited access to fresh meat in many American Indian and rural communities, leaving canned meats as the common alternative. Consumption of canned meat has been linked to a twofold higher risk of diabetes in Strong Heart communities. These findings helped inform an interventional study, led by a First Nations researcher, in the Cheyenne River Sioux community in South Dakota. The study will develop and test a culturally tailored food selection and cooking program to see if it can help people with diabetes make healthier food choices.

Future Strong Heart Activities

- Continued health surveillance of current participants
- New clinical exams in 2022-2024, with annual follow-up contact
- Tribal health education events and programs
- Training of junior American Indian investigators
- Continued support for studies that build off of Strong Heart
- Set-aside funds for community-based projects

Additional Ongoing Studies to Improve Native American Health

Ongoing studies to improve Native health are targeting interventions that can address the health challenges identified in Strong Heart and other observational studies.

Collaboration to Reduce Childhood Asthma Disparities within the Navajo Nation

The prevalence of asthma among children within the Navajo Nation is two to three times that of the general population and is linked to disparities that include poverty, environmental pollutants, and large distances to health care. Researchers are working with





Navajo leaders to develop community-based interventions for asthma that focus on improved provider training, asthma education, and monitoring for flare-ups at home and school. This is part of the NHLBI's Asthma Care Implementation Programs initiative.

Diet Interventions for Hypertension: Adaptation and Dissemination to Native Communities

The Dietary Approaches to Stop Hypertension (DASH) eating plan emphasizes eating foods rich in fiber and protein and limiting foods high in saturated fat and added sugars. In several NHLBI-funded studies, DASH was found to lower blood pressure and low-density lipoprotein (LDL), or “bad,” cholesterol, but the plan has not been tested in American Indians. This study has developed a DASH eating plan that includes traditional American Indian foods high in protein and fiber, such as nuts and beans. This plan will be tested in American Indian communities in Washington and Oklahoma to see if it helps reduce high blood pressure.

Technology Innovations for Supporting Health in Alaska Native People

With community input, researchers in this study developed a technology-based approach to supporting heart-healthy lifestyle changes tailored to Alaska Native people. Health counselors in Anchorage will use telemedicine to connect with Alaska Native people living in rural home villages and will work with them for one year. Some participants will receive counseling to reduce tobacco use



and increase physical activity; others will receive guidance on reducing blood pressure and LDL cholesterol through healthier eating and medication adherence.

Tribal Health and Resilience in Vulnerable Environments (THRIVE) Study

This study, led by a Choctaw investigator, examined barriers to healthy food access in the Chickasaw and Choctaw Nations in Oklahoma and then developed a community-based intervention to improve access to healthy food. The investigators worked with the communities to improve the amount, variety, convenience, advertisement, and pricing of fruits, vegetables, and other healthy foods in several tribally owned convenience stores. Over the course of a year, these changes increased the availability of healthy foods at the stores, translating to healthier purchases by the stores' regular shoppers.

Recent Meetings and Workshops

Forum on Heart, Lung, and Sleep Disorders in Native American Youth

Little is known about prevalence, risk factors, and intervention strategies for heart, lung, and sleep disorders in Native youth, compared with the adult population. In August 2016, the NIH and IHS held a forum to examine the current state of science and future directions for addressing these disorders in American Indian, Alaska Native, and Native Hawaiian youth. The forum included discussion of research gaps and culturally appropriate interventions to improve health outcomes. Half of the speakers were American Indian/Alaska Native/Native Hawaiian researchers and community members. A videocast of the forum can be viewed at <https://www.nhlbi.nih.gov/forum-ai-an-nh-youth>.



Convening on Native American Women's Heart Health

Heart disease is a leading cause of death for all American women and has a disproportionate impact on American Indian women. In December 2018, the NHLBI and WomenHeart: The National Coalition for Women with Heart Disease brought together experts in American Indian health and research, women's cardiovascular health, and public health programs to explore challenges, priorities, and evidence-based approaches to improve prevention of heart disease in American Indian women and enhance support for those living with heart disease. A report is forthcoming.

New Programs and Funding Opportunities

DECIPHeR

A new NHLBI program launched in March 2019, Disparities Elimination through Coordinated Interventions to Prevent and Control Heart and Lung Disease Risk (DECIPHeR), aims to help bring evidence-based interventions to communities with a high burden of CVD and lung diseases. Researchers will be required to form partnerships with local health care systems, government agencies, and community organizations that can help design, test, and sustain effective approaches to deliver proven interventions.

Shared Decision Making for Heart, Lung, Blood, and Sleep Diseases

In January 2019, the NHLBI issued a funding opportunity for research on increasing shared decision making (SDM) between doctors and patients in medically underserved communities. SDM has been shown to improve health care quality and outcomes. Greater use of SDM could help reduce the large burden of CVD and other chronic diseases seen in underserved communities. Projects could address, but are not limited to, issues such as health care education on SDM, assistance for patients with low health literacy, and development of record keeping and other system processes for supporting SDM.

New Strong Heart Ancillary Studies

Strong Heart Study investigators regularly seek ancillary study ideas from other researchers, including studies to examine additional health conditions or outcomes, or to test new interventions. For information about how to propose an ancillary study, visit <https://strongheartstudy.org/>.





Native American Research Internship Program graduates: (from left to right) Sam Hawkins (Muscogee Creek) – University of Utah School of Medicine, Cynthia Wilson (Navajo) – University of Utah Dietetics, Steven Just (Sisseton Wahpeton Oyate) – University of Minnesota College of Pharmacy, Kali Dale (White Earth Ojibwe) – University of Utah Biological Chemistry

The Next Generation of Healers

Programs to Increase Diversity among Individuals Engaged in Health-Related Research (PRIDE)

The NHLBI-funded PRIDE initiative was designed to prepare postdoctoral students and junior faculty from underrepresented backgrounds for successful careers in research. It includes Summer Institutes where participants receive training in research skills and grant writing and can form lasting networks and collaborations. In 2019, the NHLBI is supporting nine PRIDE Summer Institutes. <https://www.nhlbi.nih.gov/pride>.

NHLBI Diversity Supplements

The NHLBI participates in the NIH Diversity Supplement Program, through which researchers with existing NIH grants can apply for additional funding to support the diversity of their research team. The program encourages applications from students, postdocs, and junior faculty from underrepresented groups, including racial/ethnic minorities, individuals with disabilities, and those from disadvantaged backgrounds. <https://www.nhlbi.nih.gov/research-support-guidelines>.

Native American Research Internship Program

This program, funded by NHLBI and two other NIH Institutes, supports American Indian and Alaska Native undergraduates from across the country in paid summer research internships at the University of Utah. The program was developed in partnership with American Indian and Alaska Native elders, faculty, students, and community organizations. Students receive cultural and professional mentorship from community members and renowned scientists conducting research in child health, diabetes, cancer, and in heart, lung, blood, and sleep disorders. Since its inception, the program has supported 128 students from 65 tribal nations. Several graduates have been recognized by the Society for Advancement of Chicanos/Hispanics and Native Americans in Science for their outstanding work. <https://medicine.utah.edu/pediatrics/research/education/nari.php>.

