

Strong Heart, Weak Heart

By KATHY A. FACKELMANN



American Indians
show surprising
differences in
heart disease

In the movie "Dances With Wolves," Kevin Costner plays a Civil War soldier who rides out on a buffalo hunt with a band of whooping Sioux Indians. That episode solidifies the young soldier's growing admiration for his new Sioux friends. And it also demonstrates the Sioux's nomadic way of life more than a century ago.

Modern-day ancestors of the Sioux no longer hunt buffalo on the windswept plains. Like much of American society, the Sioux and other tribes have slid into a sedentary lifestyle, one that often includes hours of television viewing and an occasional automobile trip to the store to stock up on fatty junk foods and sugary soft drinks.

There's no question that this modern way of life has taken its toll on North American Indians. One hundred years ago, heart disease rarely afflicted people of North American Indian heritage. Today, it ranks as the top killer of American Indians, according to Everett R. Rhoades, director of the Indian Health Service, which is part of the U.S. Public Health Service.

Heart disease, diabetes, and other chronic ailments are known as modern afflictions because of their prevalence in societies where people eat unhealthy diets, rarely exercise, and lead high-stress lives. Epidemiologists know that Indian tribes ranging from the Sioux to the Pimas have turned from their active lifestyles to a "couch potato" way of life. Yet despite the universal penchant for fatty foods and TV viewing, new data suggest that Indian groups vary widely in their vulnerability to heart disease.

Indeed, findings from an ongoing investigation called the Strong Heart Study show that coronary artery disease hits the Sioux hard—much harder than other North American tribes. "We've taken a look at the preliminary data and have seen very large differences in risk factors and also fairly sizable difference in disease rates," says Strong Heart project administrator Richard Fabsitz of the National Heart, Lung, and Blood Institute (NHLBI), which funds the study.

The study bears the same name as a once-powerful Sioux organization called the Strong Heart warrior society, notes Calvin Sitting Bull, a historian at Oglala Lakota Community College in Kyle, S.D. Sioux men had to complete a dangerous buffalo hunt and perform other acts of bravery in order to join this society, which was charged with protecting the tribe, he says.

To participate in the Strong Heart Study, modern-day Indians don't have to kill a buffalo, but they do have to belong to one of 12 tribes now living in Arizona, the Dakotas, or Oklahoma. Principal investigator Thomas K. Welty and his colleagues at the Public Health Service Indian Hospital in Rapid City, S.D., are collecting data on the three different tribes of Sioux Indians: the Cheyenne River Sioux, the Devil's Lake Sioux, and the Oglala Sioux. The Sioux Indians, a warrior nation that long fought the encroachment of whites, now live on reservations in North and South Dakota.

A group of Southeastern and Plains Indian tribes are being studied by epidemiologist Elisa T. Lee and her co-workers at the University of Oklahoma College of Medicine in Oklahoma City. Volunteers in the Oklahoma project represent seven diverse tribes, including the Apache, Caddo, Comanche, and Wichita.

A third research team is investigating the Pima and Maricopa Indians. Both tribes, now living on reservations near Gila River and Salt River, Ariz., are descendants of peaceful Indians who once farmed the same regions.

The investigators started out with the goal of recording the prevalence of coronary artery disease and identifying risk factors that increase an Indian's chance of developing this illness. While smoking and a high-fat diet remain well-publicized risk factors for heart disease among Caucasians, investigators aren't certain whether the same factors are important in explaining heart disease among Native Americans.

The Strong Heart researchers began their inquiry by asking 4,500 men and women, age 45 to 74, about their medical

history, stress, and other aspects of lifestyle that may be related to disease. The investigators also measured each participant's blood pressure, drew a sample of blood, and performed an electrocardiogram, a test that can reveal abnormal electrical activity of the heart.

An early analysis of the data shows that the Sioux run twice the risk of developing heart disease compared with the Pima and Maricopa. Indians with heart disease had electrocardiograms suggesting heart damage caused by insufficient blood supply, Welty notes. He presented the data in June at an NHLBI-sponsored conference on minority health issues, held in Washington, D.C.

While the rate of heart disease among the Sioux matches or exceeds that of the general U.S. population, the Strong Heart Study indicates that the Pima and Maricopa Indians have a lower-than-average incidence of heart disease. The rate of heart disease among the Oklahoma tribes falls between that of the Sioux and that of the Arizona tribes, Welty adds.

Why do the Sioux outstrip their peers in their risk of heart disease? To answer that question, researchers must sort through clues from the present as well as from the past.

The lifestyle of the Sioux has changed over time, Welty notes. Their ancestors once lived in tepees; today's Sioux live in houses on reservations. Many have no telephones or electricity and must travel hours by car to get to the closest urban area, Welty says.

Traditionally, the Sioux got plenty of exercise by following a nomadic way of life, which included buffalo hunts and foraging trips in which tribe members collected wild plants such as turnips and onions. Today, the typical Sioux simply purchases food from the limited supplies on the shelves of small grocery stores that service the reservation, Welty says.

Tobacco may be one culprit underlying the Sioux's high rate of heart disease. The Strong Heart Study indicates that Indians living in the Dakotas have taken up cigarettes with more passion than their peers. According to Welty, about half the individuals in the Sioux tribes smoke — a rate much higher than that of the general U.S. population and higher than that observed among Indians living in Arizona and Oklahoma, he says.

In addition, the Sioux are more avid smokers than Indians in the other areas. On a daily basis, the average Sioux male smokes 14 cigarettes and the average female smokes about 12. By contrast, Pima men and women average approximately 7 cigarettes per day. "You can see that's a really striking difference in terms of cigarettes consumed," Welty told those attending the conference.

While the Sioux have long used tobacco in their rituals, the modern reliance on

cigarettes is relatively new, he adds. Tobacco played less of a traditional role in Pima and Maricopa societies, a fact that may help explain why Indians in Arizona smoke fewer cigarettes when they take up smoking, adds Barbara V. Howard, lead investigator for the Arizona research effort. Howard, who spent 12 years studying the Arizona tribes, now is president of the Medlantic Research Institute in Washington, D.C.

There's nothing wrong with an occasional puff of the peace pipe, but the chronic use of cigarettes to deal with the stress of daily life probably contributes to the heart disease problem among the Sioux, Welty says. According to the American Heart Association, cigarette smokers run twice the risk of heart attack compared with nonsmokers.

High blood cholesterol also seems to plague the modern-day Sioux, who now typically work in government-service jobs on the reservation or are unemployed. The average Sioux has a blood cholesterol value that hovers at the danger level of 200 milligrams per deciliter (mg/dl). A level of 200 to 239 mg/dl puts people at moderate and increasing risk of heart disease, the American Heart Association says.

High levels of cholesterol, a fat-like substance circulating in the bloodstream, can cause an insidious buildup of fatty plaque inside the artery walls. If this buildup continues, the plaque can choke off the heart's blood supply and cause a heart attack.

Cardiologists know that a diet high in fat tends to raise blood cholesterol levels. Because all Indian groups have developed a yen for fatty foods, the Strong Heart researchers expected to find similarly high blood cholesterol levels when they looked at the blood test results for the Arizona Indians. However, the preliminary data revealed that the Pima and Maricopa have blood cholesterol values of approximately 175 mg/dl, a value that translates to a lower-than-average risk of

heart disease.

But total cholesterol levels tell only part of the story.

A particular type of cholesterol, called low-density-lipoprotein or LDL cholesterol, plays an important role in the development of heart disease. LDL cholesterol is more likely to stick to artery walls, contributing to atherosclerosis.

Compared with the Arizona tribes, the Sioux had much higher blood levels of LDL cholesterol, Welty reports.

While smoking and high blood cholesterol may explain the Sioux's vulnerability to an unhealthy heart, the Strong Heart Study highlights several intriguing facts about the Pima and Maricopa, including their relative protection from coronary artery disease.

What makes this protection so extraordinary is the fact that both of the Arizona tribes suffer from the highest rate of diabetes in the world (SN: 6/2/90, p.350), Fabsitz says. Their rate of diabetes outstrips that observed among the Sioux or the Oklahoma tribes, Howard adds. Diabetes, an illness in which people can't metabolize blood sugar properly, is a well-known risk factor for heart disease.

Given the astounding rate of diabetes, researchers expected a much higher rate of coronary artery disease among the Arizona Indians, Fabsitz says.

What shields the Pima and Maricopa from raging heart disease? One theory holds that these Indians eat less fat than the Sioux and thus enjoy lower blood cholesterol levels. However, the Strong Heart Study's early data seem to argue against that hypothesis.

The investigators asked 900 people in the entire study group to answer detailed questions about their diets. The preliminary data from that analysis show that all of the Indian tribes studied consume a relatively high-fat diet, with fried foods particularly popular. The findings sug-

Healthy habits start in childhood. A new project will help North American Indian kids build lean bodies and strong hearts.



Mill Lee

gest the Oklahoma tribes consume more fruits and vegetables than the Sioux, perhaps because the Oklahoma Indians live among the general population and thus have access to a wider selection of foods, says nutritionist Ellie Zephier of the University of Oklahoma.

Howard says the Pima/Maricopa diet seems unlikely to play a significant role in protecting against heart disease. Instead, she speculates, these Indians may metabolize blood cholesterol more efficiently than the Sioux.

That theory raises the possibility that certain tribes carry a genetic ability to ward off heart disease. For example, the Pima/Maricopa Indians may carry a gene or genes that help them break down cholesterol more effectively. The Sioux, by contrast, may inherit a tendency to develop heart disease, Welty says. The researchers discovered that the Sioux are more likely to marry non-Indians than are members of the Oklahoma or Arizona tribes. This hints that the same genes that contribute to heart disease in non-Indians may get passed on to the Sioux, Welty says.

Howard predicts that the Arizona Indians will suffer increasingly from heart disease in the future. She notes that obesity and diabetes are on the rise among the Pima and Maricopa tribes. In the past, these tribes irrigated their valley farmlands to reap a harvest of low-

fat vegetables and grains. When dams diverted the precious irrigation water, the Pima and Maricopa generally gave up on farming. Today, most tribe members purchase the limited food selections at markets on the reservation, she notes.

The Strong Heart Study suggests most Indians watch about three hours of television each day — about the same level of TV viewing that exists in the average U.S. household. Welty and others indict a sedentary lifestyle as a primary culprit in cardiovascular disease and bulging waistlines among the nation's tribes.

The National Heart, Lung, and Blood Institute will launch a program next year to help Native Americans shed excess pounds, Fabsitz adds. This so-called "obesity initiative" is expected to target American Indians and Alaskan natives early in life, perhaps in elementary school, before poor eating and exercise habits become ingrained.

The hunting expeditions of the Sioux have vanished along with the buffalo herds that once roamed the plains. Yet the need for a strong heart is as important today as it was in the past. Indians who turn to leaner foods and a more active way of life will surely build a stronger heart, a path that follows the traditions of the Strong Heart warrior society.

And that's a prescription for cardiovascular health that would benefit nearly all Americans. □

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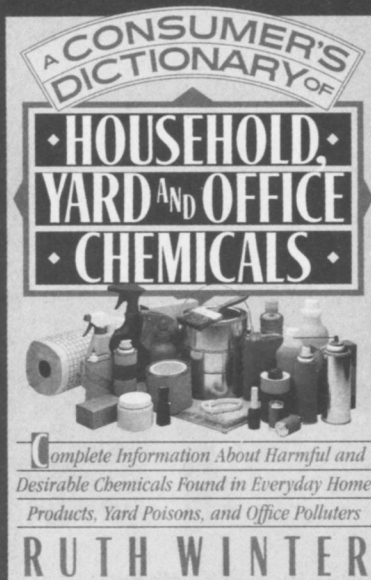
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— from the publisher

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