DIET AND HEALTH AMONG NATIVE AMERICAN PEOPLES:
USING THE PAST TO COMBAT THE PRESENT THREAT OF TYPE II DIABETES

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Abstract

Type II diabetes is a significant problem among many Native American communities. Incorporating elements of prehistoric diets, said to be much lower in fats and sugars than the ubiquitous processed foods of contemporary times, holds some promise in mitigating indigenous peoples’ predisposition to the condition. These diets were usually much more varied and plant-based than those of today, and first-hand collection and processing of foods expended more energy than a trip to the grocery store. A look at prehistoric health also reveals that agriculture was, like the industrial production of food is today, a significant event for human health, making food more accessible but less healthy. Diabetes is high in Native Americans for genetic, cultural, and socio-economic reasons; it originated in abrupt and often forced transitions to processed low-cost foods. The Indian Health Service, the health organization that serves many American Indians and Alaska Natives, is increasingly addressing diabetes, but its power is limited by funding shortages and cultural differences between the biomedical realm it inhabits and Native American cultures. Community organization and grassroots programs, as well as increased tribal control over health facilities, may make diabetes treatment and prevention programs more effective. Native American efforts to curb the diabetes epidemic may also provide models for other groups facing rising diabetes rates, mostly in supporting the tailoring of programs and diabetes education to people with specific histories and identities.
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Introduction: Food for Thought

This project explores the type II diabetes epidemic among many Native American communities, especially in the southwestern United States. With some American Indian communities having three or four times the rate of the United States’ general population, the problem is severe enough to have sparked a host of literature and decades of medical research. The transition from traditional diets and lifestyles to sedentary styles of living and obtaining food largely from trading posts or grocery stores was abrupt enough to spark this epidemic, but it is not the first large-scale dietary change indigenous peoples have experienced. The transition to agriculture from foraging and hunting subsistence, though it did not occur in every culture, drastically altered living patterns, diet, and health among prehistoric peoples. This project grounds a lengthy discussion of diabetes and Native American health care systems in that history, through an interdisciplinary approach.

The Scope of the Project

Native American populations have often been the subject of health studies, especially about how far and how severely European contact spread infectious diseases to New World populations. Building a history of responses to such diseases is an important component of Native American or Colonial studies; it is also important to geneticists and biologists who study the relationships between pathogens and bodies or who want to understand why Native Americans are more susceptible to some diseases even today (Ramenofsky et al. 2003).
Another major set of questions, one with which this project concerns itself, asks why certain Native American populations have experienced a rise in diet-related disorders, such as obesity, diabetes, and heart failure (Rhoades 2000). Are these differences cultural, genetic, environmental, or due to a mixture of influences? What role might traditional diets and lifestyles play in alleviating high obesity and diabetes rates within Native American communities?

This project addresses these questions, though to answer them fully is far beyond its scope, as several researchers have and will continue to write books discussing them within their respective disciplines. My primary case study focuses on the Akimel O’odham, who have the highest known rates of diabetes and have been studied by the National Institute of Health for decades. In order to frame my discussion I start with an archaeological glimpse at the Hohokam, ancestors of the Akimel O’odham and related peoples. It is significant that unlike many Native American groups, who were forcibly moved by the United States government to reservations often hundreds of miles from their ancestral lands, the Akimel O’odham remained in the Southwest, though they have been affected by the historic treatment of native populations in other ways. This continued presence grants more validity to comparisons of diet, lifestyle, and environment in different time periods. However, I also bring in information about other Native American groups, especially in later chapters, for the diabetes epidemic is widespread, as are the issues behind it.

As the scope of my project is quite broad, I focused on interpretation and synthesis of existing data rather than the collection of new data. I gathered information from scholars, ethnographers, government documents, investigative non-fiction, tribal websites, and indigenous news articles. My main goal is to present the problem of diabetes in Native
American communities and explore its causes and possible strategies against it. It is positive in aspect. I could have focused much more on deciding who is to blame for the perpetuation of diabetes in at-risk communities and on exactly how treatment and prevention programs should be run or patients should behave. However, in looking at multiple perspectives, the only conclusion I can truly come to is that the issue is multifaceted. Native Americans with diabetes or at risk for it seem to benefit from the ability to start their own programs and interpret the disease in their own ways, but the Western medical institutions in place still have a responsibility to train, teach, and treat.

**Organization of the Project**

This thesis is divided into four chapters. It first examines the environment and subsistence practices of the Hohokam and the potential nutritional pathologies within that prehistoric culture. Chapter Two covers what the diabetes epidemic is and the factors contributing to it continuation. It discusses in particular the case study of the Akimel O’odham. Chapter Three looks at official mechanisms for addressing Native American health, specifically the Indian Health Service, and some of the problems with relying solely upon those. Finally, I explore the potential of community-driven diabetes prevention and treatment programs and the obstacles that they face. I believe that a change of diet and lifestyle is especially important in curbing diabetes, and that making these changes culturally relevant for Native Americans is essential.
Before I can begin discussion of the diabetes epidemic facing many Native American communities, especially the Akimel O’odham, I wish to present some information about prehistoric food processing and consumption. Diabetes is a metabolic disorder, related to what people eat and in what proportions, so it is important to first look at what prehistoric people ate and how their diet affected their health. In this section I focus on the Hohokam in the southwestern United States because the Akimel O’odham, descendents of the Hohokam, have the highest known rates of diabetes among Native Americans today, and because the Hohokam peoples’ environment was extremely harsh. However, many of the relationships and strategies described through my examination of Hohokam subsistence may apply to indigenous peoples in other regions as well. For health effects of prehistoric diets, I turn to the general bioarchaeological literature, because the Hohokam cremated their dead (Gumerman and Haury 1979). Diabetes was not common until recent decades for these groups. Instead, iron deficiency and other signs of stress or malnutrition were more common.

The Sonoran Desert

The Southwest is an arid environment, meaning that the air is dry and rainfall is scant. However, the region – stretching from Arizona and Southern Utah to New Mexico and southern Colorado – is not uniform in elevation, rainfall, or habitation. Richard MacNeish
(1992) and others give a thorough description of the Southwest topographically and environmentally. MacNeish describes four main regions within the area. From roughly northeast to southwest, they are the Rocky Mountains, the Colorado Plateau, the Mogollan Highlands, and the basin-range subarea. Most of these regions are not part of my discussion, as they have their own which is not my concern in this discussion as it has its own regional archaeology and cultures. For instance, the Anasazi culture lived on the Colorado Plateau and the Mogollon culture lived in the eastern region of the Southwest. The entire Southwest is dry, and moisture is the most significant limiting factor for vegetation in this area (Cordell 1997).

The Sonoran Desert in central and southern Arizona, the home of the Hohokam, receives rain in a bimodal pattern – in the summer and winter – because it lies between the winter-rain zone and the summer-rain zone (Downum 1993; Fish and Fish 2001). It is hotter than the upland areas, and often drier because much of the area is in rain shadows – blocked from rain by mountain ranges.

Overall, the uplands get a little over twice as much rain annually as the desert lowlands (Cordell 2000).
High evaporation rates due to higher temperatures and aridity also limit the moisture accessible to the flora and fauna of the region (Cordell 1997, Downum 1993). The average rainfall in the desert is 20 cm, but the actual annual amount can vary widely (Cordell 1997: 38). Half of the sparse rainfall happens in the summer during brief, intense storms. The ground is usually so dry that it is not able to absorb the summer rain, and the water is lost as runoff, which quickly evaporates (Cordell 1997). Changes in air currents during the winter may deprive the region of winter rains as well, making the Sonoran Desert one of the most difficult environments for prehistoric peoples in the entire Southwest (Cordell 1997).

No large or broad-leafed trees are indigenous to the Sonoran Desert, because the arid environment would too easily desiccate them. Instead, leguminous trees such as mesquite, paloverde, and ironwood and cacti of notable size such as cholla, saguaro, and prickly pear could grow in the Sonoran Desert because of adaptations to their arid environment (Fish and Fish 2001). These plants have very small leaves or spines, allowing as little water as possible to escape, and trees and bushes often shed leaves during droughts to further conserve water (Cordell 1997). Cacti and succulents such as agave also have the ability to store water; other plants have a waxy coating to slow moisture loss (Cordell 1997). Some of the plants from this region only flower or photosynthesize when there is enough rainfall to do so; others developed long tap roots that connected them to groundwater (Cordell 1997).

**Subsistence in the Agricultural Southwest**

Cultures in the Sonoran Desert needed to know how to exploit the resources at hand in order to survive in this harsh region. The plants listed above furnished edible pods, fruit,
and flesh. Agave was particularly significant and was usually roasted. Few large or medium-sized animals lived in the Sonoran desert, so it was upon rodent-size game such as jack rabbits, cottontails, and kangaroo rats, as well as snakes and lizards, that prehistoric peoples relied upon for meat (Cordell 1997). The Hohokam, however, did not only gather plants and hunt or trap animals; they were also agriculturalists.

MacNeish (1992) pictures four primary centers where agriculture began, based on the earliest archaeological evidence collected thus far. These centers are the Near East, the Far East, Mesoamerica, and the Andes. The Southwestern United States developed agriculture at a later date, as did the Southeast, and it was likely through interaction with Mesoamerica that the technology spread. However, very few of the crops grown in Mesoamerica were adopted in the Southwest, showing that the indigenous peoples in the Sonoran Desert were selective about what they wanted to grow (Cordell 1997). Maize and squash were accepted long before cotton, and according to the existent archaeological evidence, chili peppers were not grown in the Southwest until the historic period (Cordell 1997). There were likely cultural barriers as well as environmental ones that complicated the adoption of agriculture in the Southwest as well (Cordell 1997).

Agriculture did not necessarily exclude other forms of food. Even during the agricultural period, plants from Mesoamerica, a few local crops, and earlier subsistence practices such as foraging or fishing all contributed to Southwestern diets. Local crops included little barley, Mexican crucillo, devil’s claw, and tepary beans (Cordell 1997). Wills (1988) proposes a model for the Southwest by which the choice to cultivate domesticates results from a decision to choose subsistence options that would lessen environmental uncertainty. For the same reason, the Hohokam likely encouraged the growth of edible
weeds such as amaranth – in cases where their normal crops had not yet matured or were not doing well, the weeds provided a backup food source (Fish and Fish 2001). Preceramic and early ceramic people cultivated crops 1000 years before the Hohokam emerged in A.D. 200, possibly even staying in villages for lengthy periods and creating canals (Fish and Fish 2001). The Hohokam amplified earlier techniques, building complicated arrays of irrigation canals and managing to cultivate plants far beyond natural water sources.

In southern Arizona where the Hohokam developed, the agriculture was more entrenched than in other areas in the Southwest, as can be seen through tooth wear patterns, ceramic patterns, and irrigation canals (MacNeish 1992). The Hohokam near present-day Phoenix, where the Salt River and the Gila River flow today, used canal irrigation heavily, while communities not near reliable water sources used the technique on a smaller scale and a variety of methods that took advantage of fleeting or seasonal waterways (Fish and Fish 1990, 2001). The Hohokam also made many small piles of rocks in areas without a permanent water source to break up runoff and rain to give the water time to soak in (Fish and Fish 2001). This technique is called akchin farming by one of the historic cultures descended from the Hohokam, the Tohono O’odham (Cordell 1997). In general, Hohokam agricultural sites can be recognized by their “rockpiles, rock alignments, check dams, and other features and artifacts such as hoes or tabular knives (suitable for harvesting and processing agave leaves)” (Downum 1993:34). The crops grown in these fields could be corn, beans, squash, cotton, or amaranth, depending on when they were planted.

At least 13 different crop plants were found in one archaeologist’s survey. In addition 15 food processing sites have been found, indicated by the presence of roasting pits,
knives, manos and metates\textsuperscript{1} and other plant or animal processing tools (Downum 1993). Agave, which was first cultivated in Mesoamerica, was a good crop because it could be roasted and eaten, providing sugar and carbohydrates (Fish and Fish 1990). Further up in elevation, and farther from water, the Hohokam likely gathered saguaro fruit. Whether settlements and agricultural areas were in close proximity depended on the soil, topography, and climate of an area. Some zones were devoted entirely to large-scale crops or settlements, while some included smaller settlements and crops which were planted quite near each other (Fish and Fish 1990). The Hohokam also built terraces on the Tucson Mountains, for both permanent dwellings and agricultural plots.

Along with being intensive agriculturalists, the Hohokam of the Sonoran Desert hunted and fished (James 2003). Hunting and procuring firewood may have involved greater travel than farming and gathering, as both large animals and large trees are hard to find in the desert (Fish and Fish 1990, 2001; James 2003). However, small animals such as jack rabbits and cottontails that were attracted to the agricultural fields could easily have been trapped, and their bones are often found in settlements (Fish and Fish 2001). Fish, muskrat, and beaver were consumed in far greater quantities than expected by most archaeologists, but the size of the fish available to the Hohokam in the Salt and Gila rivers from A.D. 1150 to 1450 may have decreased over time due to resource depletion (James 2003).

\textsuperscript{1} Manos and metates are used to grind seeds, much as a mortar and pestle are used to grind herbs. The mano is held in the hand or in this case in both hands. The metate was the surface on which substances such as maize were laid. The manos were ground against the metates to break the kernels into smaller pieces. This is how cornmeal and other similar substances were made. Both were made of stone.
**Bioarchaeological Interpretations of Prehistoric Nutritional Health**

The kinds of food people ate, the amount to which those foods were processed, and the ratios in which they ate the food affected nutrient levels and overall health. Bioarchaeologists can study human remains – usually skeleton fragments, teeth, hair and other preserved body parts – to look for pathologies that left permanent marks. Bioarchaeology is a large sub-discipline that spans osteology and paleopathology, studying infectious diseases, congenital conditions, trauma, and general wear and tear on the body along with nutritional status. Today, most bioarchaeologists concerned with nutritional health look for signs of ‘stress’, which manifests itself in a variety of ways on the skeletal and dental remains. Quite often the stress is in part dietary, but especially for children, called *subadults* in many analyses, it is hard to determine due to small sample size whether the stress was widespread, when in life it occurred, or even how old the children were when they died (Goodman and Martin 2002). This last is due to the fact that low levels of vitamins, calories, and protein can stunt growth, making subadults look younger than they are.

Skeletons and teeth can each show signs of nutritional stress or growth problems and by extension may indicate the diet of prehistoric peoples. All of the pathologies below have been found in prehistoric North American societies at varying levels, and it is generally agreed that health from what can be determined grew worse after the transition to agriculture in many areas (Martin 1994). People in the Hohokam civilization cremated their dead, so there are few human remains from which to gather bioarchaeological data, but the health problems below have been found in skeletal and dental remains from several cultures all over North America. Anemia and stunted or abnormal growth are indicated by skeletal remains, while linear enamel hypoplasias, caries, and wear can be found in teeth.
Anemia

Anemia is a nutritional pathology that manifests in the skull and skeletal limbs. It can be caused either by iron deficiency in a person’s diet or by infectious diseases that prevent healthy absorption of nutrients, along with a number of rare genetic disorders (Larsen 1997). Children’s health depended on that of their mothers; for instance, women who were pregnant or nursing were especially susceptible to anemia, as were their children (Whittlesey 2002). This in turn made them more susceptible to disease. Females who were not in these conditions had a rate of anemia roughly equal to that of men, but sometimes showed signs of having less to eat (Whittlesey 2002).

Porotic hyperostosis, or porous lesions on the back or side of the skull, the roof of the eye sockets, and the ends of long bones such as thighs or arms, marks the presence of anemia in skeletal remains (Goodman and Martin 2002). This effect is caused by increased production of red blood cells and bone marrow, which in turn often stems from iron deficiency. The effects of anemia are general weakness – lowered work capacity and weaker mental concentration (Goodman and Martin 2002). It also leads to immune system weakness in children, as signs of disease and anemia often appear to have formed at the same time on subadult skeletons (Goodman and Martin 2002). However, anemia was likely not the cause of death for most prehistoric people, but rather a condition that predisposed them to illness and fatigue (Goodman and Martin 2002). Interestingly, a few scholars have theorized that iron-deficiency anemia, rather than being simply a symptom of poor diet, could be an adaptation against disease, as pathogens or parasites requiring iron would not be able to stay
in the body; likewise, giving iron supplements to completely healthy infants has been known to make them more susceptible to infections (Stuart-Macadam 1992; Weinburg 1992).

**Stunted or Abnormal Skeletal Growth**

The growth of children who are not getting enough nutrients, especially protein, is often stunted. Their skeletons usually show the pathologies outlined above, and if they reach adulthood they are on average shorter than people who did not experience malnutrition in their first few years of life (Larsen 1997). Individuals whose ‘skeletal age’ is younger than their ‘dental age’, which is not as affected by malnutrition and environmental stress as skeletal growth, probably suffered nutrient deficiency in their formative years (Larsen 1997). Other problems arise if even just one vitamin is lacking. For example, complete shortage of vitamin D causes rickets, which can be seen the archaeological record via pelvic deformation. The vertebral neural canal size is smaller in people who have experienced nutritional stress, even if it was not for the majority of their childhood. This can be seen in the skeletal remains of individuals who were able to get better food after only a few years, helping them grow to a normal height but leaving them with a smaller area for their spinal cord to move around in (Larsen 1997).

**Linear Enamel Hypoplasias (LEH)**

LEH are a result of interrupted or insufficient growth during the times in a child’s life when teeth are developing enamel, which protects them from wear and cavities (Goodman and Martin 2002). If the enamel is not able to form properly, vertical lines of very thin enamel or lines of quite thick enamel will appear at the top of teeth. The kind of hypoplasia
corresponds to a source for the deformity; it could be a hereditary problem, a ‘localized trauma,’ or metabolic stress (Goodman and Martin 2002:23). Because not everyone gets their teeth in at the same age, only developmental age can be determined from the teeth, but it gives a good idea of the span of years that nutrition was insufficient. Linear enamel hypoplasia may also be associated with weaning children off breast milk (Goodman and Martin 2002). Early weaning of children in agricultural societies due to the ability to make soft foods such as gruel for them may be the cause of a higher prevalence of LEH in agricultural communities (Bruhns and Stothert 1999; Goodman and Martin 2002).

**Caries and Tooth Wear as Dental Indicators of Diet**

Teeth are the most commonly found skeletal component found in archaeological sites, and they are often used to determine the age of specimens. Beyond looking for signs of LEH, bioarchaeologists keep track of whether they have caries and where, and whether they have fallen out of the jaw. Caries are simply cavities, places where the tooth starts to decay, usually where the plaque can attach to the enamel (Larsen 1997). Teeth can indicate what kinds of foods a population ate, even who in the population ate what food. Sugary carbohydrate foods such as maize led to increased tooth decay and loss in communities that depended upon them, while chipping or wear patterns on teeth can indicate the extent to which individuals had to bite or grind their food (Crabtree and Campana 2001). Tooth loss resulting from caries, gum diseases, and other oral decay would have limited the foods that could be consumed by individuals and how difficult those foods were to digest (Goodman and Martin 2002). Ironically, the corn that likely increased the frequency of tooth decay also
was one of the first foods in the New World that could be made into soft food such as gruel for children or adults who could not eat solid items (Goodman and Martin 2002).

Moving into the Present Day

Akimel O’odham translates roughly to “River People.” Their communities lie close to the Gila and Salt Rivers in present-day Arizona. This group is one of three O’odham branches. The others are the Tohono O’odham, or “Desert People,” and the Hia Ce-d O’odham, or “Sand People” (Griffin-Pierce 2000: 162). These groups claim to be descended from the Hohokam, a name derived from the O’odham word he hu kam meaning something akin to “old ones” or “those who have gone completely” (Griffin-Pierce 2000: 163; Smith et al. 1994: 407). They also believe that the Hohokam spoke the same language they do (Bahr et al. 1994). The archaeological record for the Hohokam peters out around 1400 A.D., indicating mass abandonment of large settlements and canals (Plog 1997). However, O’odham oral history explains that a period of strife and conflict took place at this time, essentially scattering the Hohokam into several groups, some of whom are represented by contemporary O’odham communities (Cordell 1997).

Archaeologists usually take the link between the Hohokam and the O’odham to be true, though they often point out that there is a dearth of clear and direct evidence to link the canal-building, large, and stratified Hohokam civilization to the smaller rancherias communities encountered by the Spanish (Plog 1997). However, many who identify as Akimel O’odham – or Akimel O’otham, as some indigenous writers spell it – are certain of
the connection; it is part of their cultural history and identity (Allen 2001). This connection is important in imagining why these peoples may be more likely to develop diabetes and in comparing the diets of the Hohokam, the historic O’odham, and O’odham today. In the next chapter, I will outline what type II diabetes is, how several factors combine to make many Native Americans more susceptible to it, and what has been discovered about the epidemic from long-term study of the Gila River Indian Community, which is mostly populated by Akimel O’odham.

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2 There are, then, several names attached to this group. Outside researchers are more likely to have used the name Pima, while recent works and the tribe itself use Akimel O’odham or Akimel O’otham. I use Akimel O’odham unless quoting from a source that uses a different term.
Chapter Two: Obesity and Diabetes Among Native Peoples

The health of indigenous peoples changed drastically when they came into contact with Europeans. Infectious diseases against which they had no immunity, such as smallpox and influenza, ravaged many groups, as did military conflict and persecution. Health care was slow to take hold or to truly benefit indigenous peoples. Over the course of the twentieth century, however, as conditions such as starvation and infectious disease were treated and diminished, new health problems began to occur more frequently. These include obesity, heart disease, cancer, and diabetes mellitus.

Diabetes in particular has caused consternation among Native peoples and health care facilities attempting to combat the epidemic. There is an exponentially higher rate of diabetes mellitus in certain Native American groups than in the overall population of the United States, a dramatic reversal of the relative rarity of these conditions just 70 years ago.

First, I explain what diabetes mellitus is, who it affects, and why it is considered an epidemic among many Native American communities. I then discuss several theories that have been proposed regarding why indigenous peoples have been hit so hard by this condition. Finally, I tie these elements back to the Akimel O’odham.

Diabetes Mellitus

Diabetes mellitus is a metabolic disorder, which means that food is not processed correctly. Usually the pancreas produces insulin, a hormone, when glucose has been introduced into the
blood stream. Glucose is released through the breaking down of most foods, and it is essential that the body be able to absorb this sugar and use it as fuel. Insulin helps the absorption process. Diabetes is manifested through a hampered ability to produce insulin, especially in the amount that a certain level of glucose in the blood would cause to be produced in a healthy body. In addition, something called insulin resistance keeps cells from responding to insulin and absorbing glucose properly. When this happens the body cannot use the glucose, and it leaves the body through urine (National Diabetes Information Clearinghouse [NDIC] 2006a).

Diabetes mellitus has several forms. Non-insulin-dependent diabetes mellitus, known as type II diabetes, accounts for 90% of the diabetics in the United States and for almost all cases of diabetes in Native Americans (Gohdes and Acton 2000: 221). For people with type II diabetes, the insulin resistance develops gradually, and the lowered production of insulin follows (NDIC 2006a). The risk of developing type II diabetes increases for people the older they become, but the age of onset of the disease has been getting lower over the past couple decades. Most people who get type II diabetes are obese, so obesity and diabetes are strongly linked, but the disease can strike people of normal weight as well (Gohdes and Acton 2000).

Something called gestational diabetes mellitus (GDM) has been discovered over the thirty years that diabetes has been vigorously researched. It is a form of diabetes that occurs while a woman is pregnant and often disappears once the child is born. However, having gestational diabetes, even if it seems symptomless and temporary, is correlated with increased chances of developing type II diabetes later in life. Health workers are concerned about gestational diabetes because of the possible effects on both mother and child. Children whose mothers had gestational diabetes may have a higher birth weight and a higher risk of
developing diabetes (NDIC 2006a, Smith-Morris 2006). If children whose mothers had GDM become mothers themselves, they are more likely to develop GDM during pregnancy, repeating the cycle through generations (Gohdes and Acton 2000, National Institute of Diabetes and Digestive and Kidney Diseases 2002).

Complications

Symptoms felt by diabetics include fatigue, frequent urination, increased hunger or thirst, weight loss, blurred vision, and an impaired ability to heal wounds (NDIC 2006a). Diabetes is linked to several other health conditions, however. Mortality from heart disease has risen in areas where diabetes rates have also risen, though this correlation does not indicate why the trend is happening – from a common source or as a causal relationship from one factor to another (Gohdes and Acton 2000). About 65% of deaths of people with diabetes are attributed on death certificates to stroke or heart failure (NDIC 2006a). Longstanding diabetes can lead to renal (kidney) disease, eventually leading to the need for dialysis. Blindness can also occur in people with diabetes due to the deterioration of blood vessels, including those in the eyes. Slowness in healing wounds or ulcers and hardening of blood vessels can cause severe problems in the extremities, especially the feet or lower legs, which can often only be addressed through amputation. Infections, in the gums and in general, also pose problems for people with diabetes (Gohdes and Acton 2000). Children of women who experience GDM and are not able to control their blood sugar are three times more likely to have birth defects and are also more likely to be born premature, which leads to risks of psychical and mental underdevelopment. Their mothers are more likely to
experience toxemia, a condition involving abnormally high blood pressure and elevated protein levels which threatens the lives of both mother and child (NIDDK 2002).

Not all people who have diabetes feel symptoms at all, and many who do may never develop complications, especially if they manage the disease well. However, diabetes does cause a significant number of deaths, and last-ditch efforts such as dialysis and amputations lead many people to become physically disabled. There are emotional and psychological considerations to be made, as well. For people who live in communities or families with high rates of diabetes, the disease may feel inevitable (Smith-Morris 2006). Seeing family members develop the disease and later complications or being diagnosed themselves may cause some people a great deal of psychological and emotional suffering, as well as shame or a general unwillingness to talk about the issue, and health care professionals who work in areas where diabetes is prevalent need to be sensitive to these dimensions as well as the physical effects of diabetes.

**The Epidemic**

In the United States, diabetes is higher in racial or ethnic minorities than in Whites, and it is highest in Native Americans than any other group. Rising rates of gestational diabetes mellitus are contributing to the growing rates of the disease. Among Native Americans, type II diabetes has grown to epidemic proportions, in some areas happening at up to three times the rate of Caucasians living in the United States. 30-50 percent of Akimel O’odham adults who live in the Gila River Indian Community have diabetes, making it an enormously significant problem in the community (NIDDK 2002). Children of diabetic parents are more likely to develop the condition, and people are developing diabetes earlier
in life than before, around 36 years of age rather than 60 for the Akimel O’odham. For adolescents, rates of type II diabetes are higher than for any other ethnic group (NDIC 2008). Younger ages of onset leave people more vulnerable to complications, merely by the strength of having the condition for longer (NIDDK 2002).

These trends have a significant impact on communities with high rates of diabetes and on the health centers that provide care for them. More people become physically disabled by complications or have relatives who need extra care, and more resources are required to fund preventative education programs, test people for diabetes, and care for those who have been diagnosed or who have complications. These problems are why diabetes is such an important aspect of Native American health and why non-Native and Native health professionals alike are trying to understand, prevent, and treat the disease and lower rates in Native communities. Not every Native community suffers from diabetes at epidemic levels, however. Alaska Natives have rates closer to six percent, which is lower than the national average (NDIC 2008).

Type II diabetes is linked strongly to obesity, though one does not necessitate the development of the other and both can happen in people who otherwise seem healthy. About half of the efforts to prevent or manage type II diabetes involve managing weight and combating obesity (Story et al. 2000). Obesity may rise in a population before diabetes sets in, as happened in some Eskimo villages (Schraer 1994). Therefore, some of the discussions about type II diabetes, particularly those about why rates are so high among Native peoples and those proposing solutions, need to involve obesity, as well. Diabetes and obesity are both rooted in genetic as well as environmental, dietary, and lifestyle factors, and both are
common in Native American communities. Trying to understand and manage one often leads to an understanding and management of the other.

A “Disease of Civilization” – Potential Causes

Many scholars and health workers, as well as indigenous peoples outside of these fields, connect the rise in diabetes and obesity directly to colonization and assimilation. Most non-White groups in the United States have higher rates of obesity and diabetes than Whites. This trend among people who have had to accept certain features of western culture has led many researchers to call diabetes and related health problems “the ‘price’ of civilization” (Joe and Young 1994: 1). Opinions differ on the weight that genetics and lifestyle have in the issue, but it is more or less agreed that both have worsened Native Americans’ health regarding diabetes and obesity and that moving from ‘traditional’ to ‘Western’ diets and lifeways was the main mechanism for this change. Deloria and Lytle (1984) present this apparent paradox in their political history of interactions between Native Americans and the United States government: “The old Indians were in considerably better health than the Indians of today, yet they had no modern medical facilities available” (Deloria and Lytle 1984: 251). This generalization is clearly applicable to infectious diseases, evidence of which is scarce and relatively low before contact with Europeans, but colonization’s effects on dietary health – its hand in increasing the incidence of obesity, diabetes, cardiovascular disease, and other ‘diseases of civilization’ – is a bit more subtle, tangled as it is with environment, culture, and genetics.
The Faults of the Western Diet

The diets that people have relied on for hundreds of years have ranged from mostly meat and fish to mostly dairy and greens to the well-known hunter-gatherer model of nuts, berries, roots, and greens with some meat (Pollan 2008). During imperialism and colonialism, and even now with increasing globalization and with Western efforts to fight hunger, these widely-varied diets have been replaced with what Michael Pollan (2008) calls the Western diet. In his book In Defense of Food, Pollan describes the Western diet as “lots of processed foods and meat, lots of added fat and sugar, lots of everything – except vegetables, fruits, and whole grains” (Pollan 2008: 10). In addition, food has been decreasing in nutritional value over time. Pollan points to the application of industrial processes developed during World War II to agriculture and food production as one of the factors that has caused this trend (Pollan 2008).

Researchers have noticed that non-Europeans who have for one reason or another ended up replacing traditional diets with canned foods, tv dinners, white bread, junk food, and the rest of the Western diet have also developed diabetes, cardiovascular diseases, and cancer (Pollan 2008). Many Native Americans have certainly noticed this fact. Some Dakota will say bluntly that “‘white man’s food’ has made them sick,” specifically canned or processed foods or meat packaged to look fresh but lacking “the positive attributes of ‘freshly-killed game or beef butchered at home’” (Garro and Lang 1994: 313-314). It is not a coincidence that diabetes mellitus has become one of the most serious health problems among some Native American communities since the mid-twentieth century (Narayan 1996).
The rise in diabetes in recent decades indicates the Western diet may be unhealthy, especially for groups of people who have suddenly adopted it. Before the Western diet was adopted by most Native Americans, the prevalence of diabetes and obesity was very rare (Rhoades 2000; Trennert 1998). Instead, more obvious malnutrition problems such as anemia and nutrient deficiencies, as I have partially indicated in the previous chapter, as well as infectious diseases such as tuberculosis or influenza, took center stage in battles for health. Largely because of better health services, these problems receded in the second half of the twentieth century, replaced by “socially related medical issues” such as diabetes, obesity, heart diseases, and alcohol-related accidents or health problems (Trennert 1998: 220).

Foods full of refined sugar and carbohydrates have not done anyone much good, as diabetes and obesity are rising everywhere in the United States, but they have caused extra damage to ethnic and racial minority groups (American Diabetes Association 2007). Relying heavily on bleached flour or rice, processed sugar, and corn syrup, selecting food for quantity, size, of shelf life over nutritional integrity, and adding chemicals or foreign nutrients into food products have all undermined the value beyond pure calories that people can get out of their food (Pollan 2008). Now that nutritionists are learning more about what the body needs to resist diseases, whole foods and grains, organic foods, and foods packed with nutrients are being promoted once more, but they are often more easily accessible to people high up on the socioeconomic scale (Harper and Le Beau 2003). The impact of diabetes is hitting poorer groups who cannot afford healthier foods harder than groups that can easily spend the money required for steady access to organic whole foods. Native Americans are on the whole the most impoverished of the major ethnic and racial groups in the United States, so it may not be surprising that some communities have high rates of
diabetes due to the purchase of lower-cost, processed foods (Deloria and Lytle 1984: 251). However, the wide range of rates among regions – from six to over 30 percent – begs the question of what else is contributing to high rates of diabetes in certain areas.

**You Eat What We Eat**

If diabetes and related diseases are the ‘price’ of civilization, it is a price that was not negotiated, for a product that American Indians did not volunteer to buy. ‘Civilization’ is a loaded word that brings to mind contrasts between British officers playing cricket and ‘savages’ running around practically naked. The idea of civilization, especially when combined with evolutionary thought – the concept that certain cultures were below other cultures, and in essence the whiter and more like the British a group was the more potential for ‘progress’ it had – led to the popular slogan “Kill the Indian to save the man,” which drove many of the United States’ policies (see Deloria 2004; Denetdale 2007). Though many other ways of seeing and understanding Native Americans cropped up in the national imagination over time, the policies of termination and assimilation had a great import on foodways, for both tried fiercely to wipe out knowledge of indigenous plants, diets, and lifestyles. Termination and assimilation affected all Native American groups in different ways, but the damage was widespread. Though during much of this paper I discuss the Akimel O’odham and their ancestors the Hohokam, Diné or Navajo history gives a searing glimpse into part of these processes and how they interacted with diet.

Diet-related health did not simply swing from undernourishment to too much unhealthy food. According to Robert A. Trennert (1998), who wrote about historical interactions between the U.S. government, non-Native doctors, and Navajo peoples, the
health of Diné people increased for a bit before declining precipitously. Introduction to European foods and the adoption of animal husbandry enriched their diet and smoothed out some prehistoric health problems. However, at about the time of the Civil War the army destroyed the Navajo peoples’ land and possessions and force-marched them from their ancestral lands to a fort with bad water and soil. The Diné’s health declined rapidly to ghastly levels. Army rations of flour, bacon, and coffee proved detrimental, as the items were not part of their normal diet and they did not know how to cook them safely (Trennert 1998: 24-45). Malnutrition, then, became a large health problem, more so than during the majority of their prehistoric ancestors’ lives. Though this reservation ‘experiment’ lasted only four years, it was long enough for the Diné’s crops and orchards to go bad and their sheep to disappear, ending their ability to live with the land in the ways they had before, and most Navajo had to continue living off of government rations through the next year (Trennert 1998).

It would not be far-fetched, then, to summarize the current diabetes epidemic among Native Americans as a lag in adapting to a system of eating and living that was not designed by or for them. Doane (1992) pointed out that while Europeans may have been aware that, for example, pasta needs to be eaten with meat and dairy to avoid malnutrition, Native Americans did not have this cultural background. Given that nutritional science is very recent, I doubt that Europeans eaters calculated which foods combined to make the healthiest meals. More likely, even after being taught how to cook the foods given out by army outposts, Native Americans were not given the chance to eat in healthy, balanced ways.

Even after interactions between the U.S. government and Native Americans ceased to be chiefly military, Native Americans everywhere were encouraged to assimilate into
American culture, including the cash economy and trading posts, and with it a diet of processed, sugary, fatty foods. Especially for people who are below the poverty line, as many American Indians are, access to leafy vegetables and other healthy foods through monetary means is restricted, while knowledge of wild edibles has diminished over time (Rhoades 2000). Foods that were at one point calorie-rich feasting foods may be eaten more often because they are available more often, and traditional eating patterns based on cyclical availability of food may become unhealthy now that the kinds of foods being eaten have changed (Hall et al. 1994).

**The “Thrifty Gene” in a Land of Plenty**

Inability to adapt to the Western diet has indeed been pointed to as a main cause of the rise in diabetes and the like. Some people have taken an evolutionary or biological route in finding reasons for non-Europeans to have higher rates of type II diabetes. For them, genetics plays a significant role in how sensitive certain ethnic groups can be to an overabundance of sugars and fats in the bloodstream.

The first person to coin the term ‘thrifty gene’ for the biological trait linked to insulin resistance and risk of developing type II diabetes was James Neel, in 1962. He noted “a true increase in the frequency of the disease as more and more people have come to enjoy the blessings of civilization” and hypothesized a gene much like the gene responsible for sickle-cell anemia which provided a benefit to humans during prehistoric times but which with the removal of prehistoric hardships, in this case with an increase of available food, revealed itself to be harmful (Neel 1962: 357). He viewed this as a maladaptive trait in a purely
biological sense, going so far as to explore whether allowing diabetic people to keep living and reproducing would mar the natural evolution of mankind (Neel 1962).

Many people have explored the idea of a ‘thrifty gene’ since Neel’s time. The basic concept of a gene that would aid in energy storage during centuries of fluctuating food supplies is nearly always mentioned in articles or books about type II diabetes and Native Americans (Joe and Young 1994; Nabhan 2004; Rhoades 2000; Smith-Morris 2006; Trafzer and Weiner 2001). Research on the Akimel O’odham has turned up a recessive gene that is correlated with earlier onset of type II diabetes; other researchers have looked to mice for obesity or diabetes genes (Story et al. 1994: 203). Smith-Morris (2006), in her book about gestational diabetes, applied the thrifty gene theory not to hundreds of years of prehistoric living but to a specific, severe famine that may have caused “malnourished fetuses [to develop] slight defects in the way their bodies metabolize glucose – ‘defects’ that may have been adaptive changes in other circumstances” (Smith-Morris 2006: 25). In this scenario, later ‘feasts’ during these children’s lifetimes would have caused fat and glucose to be cautiously stored by their bodies, and this trait would then be passed on to their children (Smith-Morris 2006). Such a development might help those children live through another famine, but if the famine never comes, as it has not in many decades, diabetes and obesity ensue instead.

One voice that has been raised in criticism of Neel’s ‘thrifty gene’ theory as it was presented in 1962 is that of Gary Paul Nabhan, who has spent his career writing about ways people have lived close to the land, growing or collecting the food they eat themselves. He spent part of Why Some Like It Hot (2004) exploring why, in his perception, desert-dwellers in particular have been hit hard by diabetes. This includes aboriginal peoples of Australia
and Native American peoples in the southwestern United States. He hypothesizes that desert plants containing complex sugars that entered the blood slowly shielded indigenous peoples from their genetic predisposition to diabetes (Nabhan 2004). Nabhan argues, as many other researchers have likely realized, that Neel’s theory cannot apply simply to quantities of food, such as caloric intake, but rather depends on what kinds of food are being eaten, specifically whether the carbohydrates in those foods release quickly or slowly, and the lifestyles the people eating them lived (Nabhan 2004). He also questions the connection Neel made between hunter-gatherers and a feast-or-famine lifestyle, for historically agriculturalists were a lot more susceptible to famines than foragers. His conclusion is, once again, that Europeans had a diet full of fast-release carbohydrates for much longer than many of the groups they colonized and may have adapted to these diets over time, while other groups have not been exposed to such a diet for as long a period (Nabhan 2004). However, he still seems to agree with the basic idea proposed by Neel that some groups are genetically unprepared to process large amounts of glucose at once.

Native American groups in communities with high diabetes rates may not understand diabetes as ‘genetic,’ but rather as an ‘inheritance,’ running through families, that may also include social factors (Weiner 2001). Diabetes can be seen as ‘contagious’ in the sense that it might ‘spread’ to children (Garro and Lang 1994, Weiner 2001). Or Native peoples may interpret diabetes ‘inheritance’ as social in the sense that people inherit ways of cooking and eating from their parents, and if those foodways are unhealthy, the children will inherit diabetes (Weiner 2001). Most Native peoples, then, attribute some genetic traits to diabetes, but conflate them with culturally-learned behaviors, such as food choice, preparation, and meal settings. They connect this to colonization as well, believing that before European
contact there was no diabetes. This leads to the conceptual paradox of diabetes as a “white man’s sickness” that can be passed on through American Indian families (Garro and Lang 1994: 299).

This unfortunate blending of genetic with external influences is also reflected in scholarly literature. Smith-Morris (2006) commits only a few pages to discussing genetic vulnerability and spends most of her book discussing cultural reasons why health care may not be as effective as desired in preventing and managing gestational diabetes. Indeed, most authors add more emphasis on external factors such as culture or environment to the genetic explanation, especially in looking for ways to stem the growing rates. Brosseau (1994) summarizes the problem nicely: “No one has come forth with a better theory [than Neel’s]. Yet it is clearly the environmental influences – the changes in lifestyle – which have precipitated the epidemic” (Brosseau 1994: 47). The number of genes linked to obesity and diabetes is growing, and one day a perfect explanation for glucose-processing differences may arise, but for most people involved in the issue, curbing the epidemic is more important than just-so stories.

Genes cannot be changed, so other methods of treatment and prevention are necessary. Medications have been used to some effect to control the hypertension and other problems caused by diabetes, but lifestyle changes are a clear and accessible route through which marked improvements can be made. Nevertheless, genetic factors are recognized as having a significant role in who has diabetes, in particular within family lineages.
Stranded: Life on Reservations

The social, economic, environmental, and cultural factors in the high rates of diabetes among Native American communities are linked to sedentism, which in turn stems from the United States’ history of colonization and oppression. Overall in the past hundred years, Native lifestyles went from mobile to sedentary and their diets from a variety of foods to a fairly limited selection. This shift to sedentism was not in all cases a shift from hunting and gathering to farming, which often ties people to a particular piece of land, because many Native communities were already growing crops. The change was far more severe. Groups in the eastern part of the continent were scattered or driven forcibly to ‘Indian Territory,’ which would become part of Oklahoma (Pickering 2004). Cultures west of that area were also force-marched or confined on reservations. On early reservations any mobility at all, whether to trade, communicate with other tribes or villages, contact surrounding communities, or follow game or herds, was barred. Native peoples were also often removed from their ancestral lands. New lands with new weather patterns, flora, and fauna, combined with limited freedom to explore the environment or work fully with the land and thus learn how to live off of it, caused a shift in Native communities from independence to dependence on the U.S. army and government, which was exactly the goal of U.S. policy at the time.

An example of this process can be seen in the description of the first reservation experiment upon the Navajo and Apache communities, as described earlier in this project. The Diné’s presence, resistance, and way of life were found threatening to the U.S.’s hold on the Southwest. The army targeted them though their food, destroying crops, livestock, and stored food supplies. It then moved them to a new place and tried to make them into sedentary farmers, but in the meantime the Navajo peoples were forced to rely on army
rations that were nothing like what they were used to eating. In the end the project’s goals were never met, and the Navajo were resettled closer to their traditional grazing lands, still dependent on the army for food (Trennert 1998).

The government viewed Native cultures – such as the Pueblo cultures in the Southwest or the Cherokee in the Southeast – that farmed rather than foraged or herded, as more ‘civilized.’ However, the U.S. government still dealt out similar fates to these groups, moving them onto reservations or certain plots of land and trying to force European styles of farming upon them. The Dawes Act, for example, meant to break up what land the tribes that moved to Oklahoma had been given to make way for White settlers and to encourage individual ownership of land rather than communal use of it (Sturm 2002). Ultimately, the reservation system and Dawes-era individual land allotments were used to uproot Native communities all over the continent from their cultural lands and practices and replace them with new lands and cultural practices, making reservations “assimilation centers” for the newly-dependent Native communities. This particularly focused on instilling “the industrial capitalist work ethic, a sedentary agricultural lifestyle on dispersed family farms, and individualized wealth” and discouraging Native foodways, religion, land use, family structures, and ways of communicating (Pickering 2004: 114). Reservations were often placed on land deemed unsuitable for any other purpose and in isolated spots. In the 1930s and 1940s, many tribes lost federal recognition, which removed from them the rights to have a land base at all.

Over the second half of the twentieth century, especially after the Indian Self-Determination Act of 1975, reservations have become land bases for politically sovereign tribes able to make their own decisions about what to do and who to contract out to do it
instead of mere pieces of land that the Bureau of Indian Affairs used supposedly in tribes’
best interests. Reservations have moved away from the U.S.’s former agricultural projects,
and tribal governments are one of the largest employers of Native peoples living on
reservations (Pickering 2004). However, in many places employment is still low, due to lack
of steady wage labor jobs in or surrounding reservations or cultural resistance to
EuroAmerican economic systems. Many households pool various income sources in order to
get by, from the sale of craft items for tourists to earned wages to Social Security benefits
(Pickering 2004). A handful of tribes have grown very successful through opening and
running casinos, and these have been able to buy land in ancestral homelands, start cultural
revival programs, and create jobs for tribal members (Pickering 2004). However, tribes that
have chosen not to open casinos or who have been unable to use such measures to become
prosperous are still quite dependent on the U.S. government for assistance, including
maintenance of many of their health care facilities.

Many Native Americans do not live on reservations. Due to U.S. government
assimilation policies, many Native Americans were relocated to urban centers. Others may
have chosen to leave reservations in order to get jobs. In the case of urban populations,
socioeconomic status remains important. Native Americans who are unemployed or lack
financial resources share economic barriers to healthy food with those on reservations with
similar circumstances.

*Flowing Together*

Clearly, colonization, imposed lifestyles and diet, and genetics have all contributed to
the growing diabetes epidemic. Native Americans in many areas are more susceptible to
developing type II diabetes than Whites. However, genetic predisposition alone cannot explain the growing trend. Shifts from mobile and self-sufficient to sedentary and largely impoverished greatly affected what kinds of foods many Native Americans had access to in a relatively short period of time. Decades of unemployment and underemployment on many reservations have left many with not much to do and nowhere to go, which contributes to inactivity. Processed foods from local trading posts, grocery stores, or drugstores have largely replaced traditional, often healthier foods, and reservations may be far from traditional food sources. However, in the past 50 years, tribes have been gaining more control over their lands and their social services, including health services. They have been able to have more input regarding medical research as well as cultural revival, in which traditional diet may play a part. Paths out of the diabetes epidemic are later in this project. Next, I present some aspects of the Akimel O’odham tribe’s relationship with diabetes and diabetes research.

**Case Study: Akimel O’odham**

Known as the Pima by some researchers, the Akimel O’odham community has had the highest diabetes rates among Native American groups for decades and thus has been the subject of diabetes studies since 1965 (NIDDK 2002). Data from research in their community have been usefully applied to diabetes assessment and treatment all over the country, but rates in their community have only gotten higher. Their long-documented case, then, may show why diabetes has such a strong foothold in the community and how Native groups may begin to strategize ways to overcome it.
River People

The Akimel O’odham community is historically the most sedentary of the O’odham peoples. Living by the Gila, Salt, and Santa Cruz rivers allowed them to have year-round agriculture and permanent villages (Griffin-Pierce 2000). They grew corn, cotton, squash, beans, tobacco, and gourds “exactly like the archaeological evidence at the Huhukam[sic] village sites” and supplemented their fare with wild plants and some meat and fish (Allen 2001: 92, Griffin-Pierce 2000). They traded with the Tohono O’odham, who lived in a “two-village” mode, seasonally planting or foraging (Griffin-Pierce 2000). Some scholars lump these groups together, calling them the Pima and Papago, and they are still often discussed together regarding the traditional use of desert plants or type II diabetes.

The Spanish were the first Europeans to meet the Akimel O’odham, and they introduced some new foods, such as wheat, and tools to the indigenous peoples. The growing prosperity of the Akimel O’odham made them a target of Apache raids, but overall the Gila River villagers were healthy and well-fed until white settlers and miners diverted the river water away from their land in the late 1800s, creating a famine that forced hundreds to move to the Salt River area and become dependent on whites in the area for food and income (Smith, et al. 1994).
Now the Akimel O’odham have two reservation communities: the Gila River Indian Community, south of Phoenix along the Gila River, and the Salt River Pima-Maricopa Indian Community, in the metropolitan Phoenix area. The Akimel O’odham share both spaces with the Xalychidom Piipaash “People who live toward the water,” who have been called Maricopa in the past (Salt River Pima-Maricopa Community 2008). The reservations as a whole attract income through casinos, the tourist industry, and agriculture, among other efforts, but a large portion of those living on the reservations are below the poverty line.

**Subjects of Study**

The Akimel O’odham are one of the first peoples who come to mind when academics and researchers are asked about diabetes in Native Americans. This is likely because the government has sponsored and published long-standing diabetes research on “the Pima.” The National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK), a part of the

*Figure Two: Reservations in Southern Arizona, Including Salt River and Gila River Communities*

*Map Created by the Arizona Geographic Alliance*

*Source: alliance.la.asu.edu/maps/AZ-RES3.PDF*
National Institutes of Health (NIH), has been researching diabetes and obesity in the Gila River Indian Community for over 40 years. NIH’s interest in the matter seems to stem from both the high rates of diabetes in the community and in the fact that families have stayed on the reservation for generations, making it easier to research genetic traits and family history (NIDDK 2002). I would also venture to guess that researchers selected that community rather than the Salt River community in part because it is more remote, larger, has a more homogenous population, and is possibly more in touch with ‘traditional’ ways of life than the more suburban reservation. The results of the Gila River research are usually reported as applying to all Akimel O’odham who live in Arizona; furthermore, the rates of diabetes among Maricopa tribe members, who are not thought of as genetically related to the O’odham but live in the same areas, are not usually mentioned, though they too have hypoglycemic tendencies (Justice 1994). Research has also shown that the Tohono O’odham have rates of obesity, diabetes, and their complications similar to those of the Akimel O’odham, but they have not been the focus of diabetes research either (Justice 1994).

Regardless of the reasons for selecting the Gila River Indian Community as a foundation for diabetes research among Native Americans, much of what the medical field knows about diabetes in general comes from the research performed there, and the research has sparked attention about the problem throughout the nation. The basic workings of type II diabetes – the fact that there is a genetic component to susceptibility, the physiological processes that prevent diabetics from using glucose effectively, and the warning signs such as high blood pressure that bode future complications – have risen from this work (NIDDK 2002). The NIH has been especially concerned with finding genetic markers that indicate not only likelihood of developing diabetes, but also increased chances of developing kidney
diseases in patients suffering from diabetes for long periods of time (NIDDK 2002). The rate of kidney disease in the Akimel O’odham community was 14 times that of the main U.S. population as of 1992, so this complication has been particularly salient (Savage and Bennett 1992: 102).

Along with genetic and physiological research, the Gila River Indian Community research has worked to increase diabetes management education and diabetes prevention programs. Part of the impetus for this research are studies showing that communities in northern Mexico with common ancestors to the Akimel O’odham have much lower rates of diabetes and obesity. The people who conducted these studies claim that the reason for the disparity is that Piman speakers in Mexico live more ‘traditional’ lifestyles with higher activity rates and different diets, demonstrating that genetics alone are not responsible for the O’odham’s propensity to develop the disease (Schulz, et al. 2006). The term ‘traditional’ is a tricky term, as discussed in the next chapter, but advice to eat more healthily and get more exercise has yielded favorable results for many people at risk for diabetes, and lifestyle changes are the crux of the prevention models (NDIC 2006A, NIDDK 2002).

**Indigenous Interpretations of Care**

The long-term nature of the research among the Akimel O’odham has proven to be an exercise in cross-cultural interactions and mutually beneficial projects, though visible improvement in the Gila River community’s rates of diabetes has been far less than desired (Nabhan 2004, NIDDK 2002). For example, the need for dialysis skyrocketed from 1977 to 1989, leaving the Gila River Indian Community paying $1.6 million per year for dialysis treatment (Garcia-Smith 1994: 473). More women are being diagnosed with gestational
diabetes and warned about the increased likelihood that they and their children will develop “outright” diabetes (Smith-Morris 2006). These worsening conditions could have the effect of making the community want to have more control over the research and feel more invested in its results. However, it is just as likely to fill people with despair at seeing rates rise despite decades of work.

Many living on the Gila River reservation, where rates of diabetes in adults can be as much as 50%, feel that diabetes is inevitable for them. Knowing that the disease is linked to genetics only makes this feeling more certain. For those who live under the constant threat of developing the disease, the simple act of going to the doctor and being diagnosed may be seen as a trigger that causes the disease to appear (Smith-Morris 2006). Western medicine demands that people organize their lives around appointments, medicines, and machines in ways they may not be comfortable with. Treatment, then, can be just as much of a problem as the disease itself (Garcia-Smith 1994). The history of colonialism also affect how willing indigenous peoples may be to obey “government doctors” (Jacob 2008). Native American identity, for members who do not have jobs and have lost most of their traditional culture, is often tied to food and kinship. As one researcher found, “being a good diabetic or even a healthy eater might be at odds with being a good Indian or a good host/ess” (Jacob 2008). The fact that people can die even if they do everything ‘right’ is not encouraging to those asked to view doctors as figures of authority, either (Smith-Morris 2006).

There is great potential for under-communication or even miscommunication between doctors and patients. Some may not heed doctors’ advice on prevention or medication because for them the idea of an outside person knowing more about how their body works than they do does not make sense (Garcia-Smith 1994, Smith-Morris 2006). They interpret
the doctors’ words as suggestions to adapt as needed instead of words that should be followed exactly. Women especially are not likely to feel empowered or compelled to tell health providers whether they plan to follow, modify, or disregard “doctor’s orders,” and this leaves many health providers feeling that the patients are fully to blame for their conditions (Smith-Morris 2006).

Reservation life, especially in the desert, does not often motivate people to increase their exercise or eat different foods. The desert is very hot, and few houses in the Gila River reservation have air conditioning. Transportation to stores that have healthy food is not always easy to come by. Many, especially female heads of households, do not have steady employment and thus don’t have much to do or resources with which to buy healthier food. Waits for the doctor are extremely long, and when women’s schedules and doctors’ hours conflict many women simply don’t go to appointments. Carlolyn Smith-Morris (2006) recorded these and other obstacles to care for pregnant Akimel O’odham women at risk for gestational diabetes. They may seem to be unacceptable excuses to health providers working hard to help the Akimel O’odham manage or prevent type II diabetes. Overall, a conflict in viewpoints and cultures may result in mutual frustrations and lack of progress.

Not everything found about the biological and social processes surrounding diabetes in the Gila River Indian Community should be applied to other Native American groups. However, much of the broader messages and specific medical practices learned from National Institute of Health’s work have contributed to the general pool of knowledge about type II diabetes. In many other Native American communities similar themes of gene-environment-culture interaction have been explored, both to look for culturally specific
dimensions to diabetes and for causes and solutions that might help all Native American peoples cope with and prevent the disease.

**Solutions?**

Indigenous peoples and medical professionals cannot alter genetic predisposition to type II diabetes, but social, cultural, dietary, and environmental factors are fluid. Research has been done to better find causes, treatments, and prevention methods for American Indian people at risk for diabetes. Whatever the strategy ultimately decided by any community is, it will be executed by the health providers – in this case the Indian Health Service (IHS) – and community members themselves. The next chapters outlines first, how the IHS operates and addresses the diabetes epidemic, and second, the potential that incorporating traditional diet and lifestyle patterns as a supplementary measure hold in curbing the rate of diabetes mellitus for these communities.
Native Americans have not been facing type II diabetes in a vacuum. The Indian Health Service (IHS), run through the U.S. Department of Health and Human Services (HHS), provides health care to roughly 1.9 million American Indians and Alaska Natives living on or near reservations, and provides some services potentially accessible to the roughly 600,000 who live in or near certain urban areas (Indian Health Service [IHS] 2009). It is network of hospitals, physicians, dentists, mental health professionals, and other specialists whose goal is to provide the best possible care to members of the 562 federally recognized Native American tribes. The United States government funds the IHS as part of its responsibilities toward Native American peoples. Many tribes are increasingly taking control of their own health care, running or contracting out a majority of IHS facilities. Care for patients with diabetes and preventative educational programs often take place at or through IHS medical centers.

This system is different in form from health care delivery for most United States citizens, and its health care goals are often broader than those of other organizations. However, there are some significant problems with the IHS, particularly insufficient funding and resources, which demand changes in the way the IHS operates or supplementation of IHS services with alternate, possibly more indigenous, forms of health care.
History

The Indian Health Service is unique among most health services in the United States. A member of any federally recognized Native American tribe could go to an IHS center and receive free or inexpensive health care. Eligible patients pay no premiums, deductibles, or copayments for IHS coverage regardless of income level (Cunningham 1996). In addition, placement of IHS facilities is on or near reservations, which are usually in locations private physicians might choose not to practice (Cunningham 1996).

The basis for the provision of health care by the United States government to tribal members, at such low cost, is that health care is one of many promised services included in treaties between Native American groups and the U.S. government. In these treaties, which can be thought of as “contracts between federal and tribal governments…[in which] valuable considerations were exchanged,” Native American tribes gave up their land in return for money and services from the United States (Johnson and Rhoades 2000: 75). Giving up their ancestral land, sacred sites, and with them a key part of their way of life is still a painful event in the tribal memory of many Native American communities. Still more treaties confined tribes to reservations, which was just as devastating for Native peoples; in these treaties the government continued to promise social services such as health care (National Indian Health Board [NIHB] and American Indian Technical Services 1988). In this sense Indian health care is prepaid, a constantly maintained responsibility of the federal government. Executive orders and legislative acts have reinforced this relationship while continually changing its nuances.
Early Health Care for Native Americans

The amount and type of health care afforded to Native Americans have changed dramatically through the United States’ history. In the early 1800s, the main health measure provided to American Indians was smallpox vaccination through military doctors. The chief impetus for this was the desire to prevent smallpox overall, for the protection of the general public and presumably of the armed forces encountering Native Americans in military confrontations (NIHB and American Indian Technical Services 1988). During the second half of the nineteenth century and the turn of the twentieth century, the United States government gradually increased the amount of health care it provided to American Indians, though sometimes only through assimilation centers such as boarding schools (Johnson and Rhoades 2000). Despite the fact that improving health for American Indians and Alaska Natives was a federal duty, the Bureau of Indian Affairs (BIA) had trouble getting enough funding and the goal was not met.

In the 1930s, groundbreaking laws and initiative under Commissioner of Indian Affairs John Collier focused on putting a stop to allotments of Indian land and on improving reservation life, including health conditions (NIHB and American Indian Technical Services 1988). In the next decade, government policies made an about-face, wanting to terminate Federal-Tribal relationships and move much of the responsibility for Native American health care to the states. Several tribes and communities lost federal recognition, which decreased the number of people eligible for social services through the federal and state governments (NIHB and American Indian Technical Services 1988). In 1954, after decades of stagnation under the BIA, responsibility for healthcare was moved to the Public Health Service and
called the Division of Indian Health, later renamed the Indian Health Service (Johnson and Rhoades 2000).

**Steady Improvements**

The IHS’s first objectives were to provide quality care for Native Americans, who in 1955 were plagued by infectious diseases and had inadequate health facilities. It heavily recruited physicians and specialists, built and renovated health facilities, and appropriated funds to compensate non-IHS hospitals when patients needed care beyond what could be provided by Indian health facilities (Johnson and Rhoades 2000). It also worked to prevent infectious diseases through vaccinations, provide prenatal care, and control tuberculosis, which was still disproportionately common among Native Americans. In 1959 the Indian Health Service even gained the ability to provide water treatment and safe waste disposal through the Indian Sanitation Facilities Construction Act (Johnson and Rhoades 2000). Steadily, rates of preventable or curable infectious diseases and infant mortality went down, though as the case of diabetes makes clear this did not spell an end to major health problems among Native Americans.

By the early 1960s, the IHS had made enough gains in basic health services that it could begin to measure, assess, and improve its performance. It began several programs to train managers, health workers, and specialists. This included some training for tribal leaders and community health representatives. It also set up offices to examine how the organization could become more efficient and cost-effective. Over time, the number of Native Americans employed by the IHS both as health workers and managers grew.
Self-Determination

Under President Nixon’s administration, Native American social services took a new turn. The Indian Self-Determination and Education Assistance Act, made law in 1975, enabled tribes to take control over the services provided by the Indian Health Service or the Bureau of Indian Affairs. This allowed tribes to contract health services out using federal funds and take on the operation of these health services. The government annually publishes statistics about the health of Native Americans, which have shown an upward trend in the number of health facilities run by tribal governments compared to those run by the IHS. For example, in 1992, tribes operated 8 hospitals and 332 outpatient facilities, while the IHS operated 42 hospitals and 123 outpatient facilities (IHS 1993). By 1996, tribes operated 12 hospitals and 379 outpatient facilities (Johnson and Rhoades 2000: 79). Currently, tribes run an overwhelming majority of IHS facilities; hospitals are an exception, with 14 run by tribes and 31 run by IHS directly (IHS 2009). In addition to sharing these services with IHS, Alaskan tribes manage its Alaska Village Clinics.

Self-determination was also aided by the passage in 1976 of the Indian Health Care Improvement Act, which established standards for inpatient and outpatient care, dental services, preventative services, mental health programs, and alcohol treatment programs. It also provided means by which tribal members could gain post-secondary education in health fields, authorized limited support for Native Americans living in urban areas rather than reservations, and allowed the IHS to interact with Medicare and Medicaid when applicable (Johnson and Rhoades 2000). Thus the national goals for Native American health are now to provide the highest quality possible of health to Native Americans – eliminating any
disparity in health between them and the main U.S. population – and to encourage maximum participation of tribal members in their health programs (Johnson and Rhoades 2000).

**Structure**

The IHS headquarters in Rockville, Maryland, oversee the entire organization. There are three main branches within the IHS – facilities and programs contracted out by tribes, direct IHS facilities and programs, and urban services (Johnson and Rhoades 2000, IHS 2009). Facilities are distributed among twelve Service Areas covering 35 states: Aberdeen, Alaska, Albuquerque, Bemidji, Billings, California, Nashville, Navajo, Oklahoma, Phoenix, Portland, and Tucson (IHS 1993, 1994).

*Figure 3: IHS Service Areas*

*From Johnson and Rhoades 2000: 85*
There is great variation in the number of people each Service Area is responsible for, from roughly 30,000 in Tucson to over 300,000 in Oklahoma (Johnson and Rhoades 2000: 85). These service areas, which are located “on or near” reservations, are broken down into several service units, or local administrative units (IHS 1994: 12). Service units can include hospitals, health stations – primary care physician services – or health centers, which contain an array of outpatient services (IHS 1994). All area directors are Native American, as are 70% of IHS employees (Johnson and Rhoades 2000, IHS 2009).

There are certain criteria that patients must meet in order to qualify for IHS health care. For direct IHS services, Native American descent is key. Even non-Native spouses of Native peoples are not usually eligible for IHS care. Descent is usually proven by tribal membership or a certificate provided by the BIA. To be eligible for services that have been contracted out, an individual must also live in a county on or near the IHS Service Area, which puts most IHS resources to use in reservation spaces (Johnson and Rhoades 2000). Urban health facilities are a relatively new development, even though roughly 60% of people of Native American descent live in urban areas and urban health has been shown to be just as bad or worse than health on or near reservations (IHS 2008b). By 2008, there were 34 community based urban health programs at 41 sites, which reach about one fourth of urban Native Americans (IHS 2008b). They are often not as developed or extensive as IHS facilities and programs near reservations.

**Combating Diabetes**

The Indian Health Service has been confronting a rise in diabetes rates in many areas for decades, and particularly at the Gila River location, research has been performed to develop
better diagnosis, treatment, and prevention methods (NIDDK 2002). Early diagnosis and conveying the importance of constantly managing blood sugar levels is a familiar struggle for many health care workers because the symptomless nature of diabetes when it begins does not make the benefits of treatment obvious to patients. For women who have been diagnosed to be at risk for gestational diabetes, this has resulted in incorporation of diagnostic tests within prenatal check-ups. These women must also attend a series of educational sessions about diabetes that they are asked to attend (Smith-Morris 2006).

The main program currently in place to address diabetes is the Special Diabetes Program for Indians [SDIP], which began at the direction of Congress in 1997. Roughly $150 million are set aside each year for the SDPI, which then funds grants for diabetes treatment and prevention at IHS locations. It focuses on proven treatment and prevention practices and community-driven initiatives. The IHS Division of Diabetes Treatment and Prevention [DDTP] administers the program, and the Tribal Leaders Diabetes Committee [TLDC] provides input. Area Diabetes Consultants [ADCs] act as the go-betweens for each IHS Service Area, passing information between local and federal levels and training health professionals in good diabetes practices.

The program has three main parts – community-driven programs designed to begin or strengthen local treatment and prevention programs, demonstration projects meant to design and implement prevention curricula for individuals at risk for diabetes or diabetics are risk for cardiovascular disease, and a strengthening of diabetes surveillance within the IHS (Indian Health Service Division of Diabetes Treatment and Prevention [DDTP] 2008). It publishes an online newsletter three or four times a year about its progress in these fields and featuring certain people or grant projects. The SDIP has made tremendous gains in bringing
health care providers and communities closer together to work toward the common goal of combating type II diabetes.

**Criticisms**

The affordability of IHS care places Native Americans in a unique position. They are on the whole more impoverished than other demographically under-represented groups within the United States, but if tribal members are able to reach an IHS location, they can receive free or low-cost health care, while non-Native peoples of low socio-economic status, who face exorbitant insurance or health care rates, may not be able to afford the care they need to survive (Rhoades 2000: xiv). However, the IHS has many shortcomings that keep many Native Americans from receiving adequate health care.

**Eligibility**

A significant concern for some is that not all Native Americans are covered by IHS services. During Congress’s last bout of termination policies in the 1940s, many tribes lost federal recognition, a status that grants access to the social services promised in treaties. Members of those tribes cannot use the Indian Health Service. In fact, the policies that drove Congress to exclude tribes from federal recognition intentionally trimmed the population that the IHS and other services had to reach as part of an overall effort to cut spending disguised as a move to place more power – and financial responsibility – in state and tribal hands (NIHB and American Indian Technical Services 1988). The genuine attempts to empower tribes and tribal members brought on by Self-Determination look much different from those policies and certainly do not include cutting down the list of tribes with which the
government must maintain relationships. However, the IHS has noted a rise in the populations of tribes still eligible for its services with some concern, chiefly because of the aforementioned lag in construction and questions about funding. Its policies have thus become more specific in recent decades about who within these tribes can benefit from IHS care. Moreover, the IHS is not likely to grow more lenient in its policies.

**Accessibility**

Accessibility for people who are eligible for IHS care has also been criticized. On one hand, IHS facilities are purposefully placed in areas on or near reservations, where other providers may not choose to build. However, as mentioned earlier, Native Americans living in urban or suburban regions tend to be outside of IHS service range, as are people living in the 17 states not included by the twelve IHS Service Areas. Using Indian health care is often either not feasible for these groups, even if they are eligible, or limited to direct care because they do not live in a county considered a contract service delivery area. A recent government report states that many patients may have to travel between 60 and 90 miles to reach certain IHS facilities (United States Government Accountability Office [GAO] 2005). In other cases, patients would be referred by one location to another location over 50 miles away for primary care services. Thankfully for some, the IHS can contract care when patients live further away than 90 miles, as long as they reside in eligible counties. Some facilities used to provide this service for people who lived 60 or even 25 miles away, but constricted funds caused them to discontinue this practice or limit it to children and the elderly (GAO 2005).
Timing

Waiting periods between when appointments are made and when services are used can be quite long, making some primary care services virtually inaccessible. The Government Accountability Office [GAO] found that for women’s health care, general physicals, and dental health care and some IHS locations, appointments had to be scheduled two to six months in advance (GAO 2005). This is a much longer wait than, for example, veterans’ health care – also run by the U.S. government – requires, which is 30 days for nonurgent care (GAO 2005: 15). In addition, spots for appointments were often vastly insufficient to meet demand. Smith-Morris’s ethnographic study revealed similar problems. The hospital for members of the Gila River reservation only allowed people to schedule appointments on two specific days each month (Smith-Morris 2006). If women forgot or were unable to call on those days, or if spots were already full, they risked not receiving prenatal care or diabetes assessment in a timely fashion (Smith-Morris 2006).

Waiting for appointments, whether or not they have been scheduled in advance, can also prove draining, inconvenient, or difficult to accommodate with daily tasks. In Smith-Morris’ study, several women noted that their time spent in waiting rooms could be several hours. GAO’s report noted this problem as well, stating that some patients would wait until their condition grew serious enough to demand more immediate attention because they did not want to spend all day waiting to see a doctor (GAO 2005: 16).
Resource Availability

Resources are not always available to the Indian Health Service or its patients. Once Congress has obtained funds for the IHS each year, no additional funding is available until the next year (Cunningham 1996). Funding for the IHS has generally increased annually in recent years, but it has increased slightly less than the rate of inflation (U.S. Commission on Civil Rights [USCCR] 2004). Thus the IHS, even though the population it serves has been growing, has been continually underfunded. In fact, per capita funding of IHS in 2003 was calculated to be 52 percent of the level deemed appropriate for the average American citizen.

Figure 4: Per Capita Health Care Expenditures

See USCCR 2004: 98
When compared to per capita funding from other government health care systems like Medicare, Veteran’s Affairs, and even federal prisoners, the IHS falls far short (USCCR 2004: 98).

If demand oversteps the funding available, which it often does, patients are often prioritized by need, especially for contract care. Expensive diagnostic services or treatments that need to be contracted out may be denied (Cunningham 1996). Contract care must usually be paid at prevailing rates, and funding set aside for this service runs out quickly. Also, not all IHS Service Areas receive equal levels of support according to demand, as resource allocation to different areas is based on historical patterns of funding rather than need (Cunningham 1996). In addition, lag in resources to expand buildings or buy new equipment often results in overcrowded, aging facilities (IHS 2008a). Facilities may be understaffed as well. Despite recent efforts and gains in staff retention, it often remains difficult to entice physicians and other health workers to work for the IHS, especially in remote areas, because they may be paid less than they would receive elsewhere (GAO 2005, Smith-Morris 2006).

There are some ways to work around low resource availability, however. People who can afford to do so may choose to pay for non-IHS health care providers, either to obtain more reliable care or to leave the limited resources to those who do not have the means to use another provider (Rhoades 2000). The government may also set aside funds for separate preventative and educational programs designed to cut down future resource use. The Special Diabetes Program for Indians [SDIP], for example, focuses on diabetes prevention and management education as well as treatment in the hope that fewer people will develop
diabetes, that those who do will develop it later or manage it better, and that fewer people will need expensive treatments like dialysis or amputation in the future.

The IHS itself has access to income outside of its annual allotment through Medicare and Medicaid reimbursements (GAO 2008). The IHS is reimbursed for providing care and facilities for patients whose health care is paid for by these programs. Many tribal members who are elderly, disabled, or members of families with little money may qualify for these services; the federal government or tribal governments often pay the premiums for those who apply. The more tribal members eligible for Medicare and Medicaid who become aware that they can apply for these services, the greater the income from these reimbursements can be. This, in addition to the $3.2 billion parceled out by Congress in fiscal year 2007, the IHS reported $677 million in reimbursements from Medicare and Medicaid, which it could use without an offset reduction in future funding from Congress (GAO 2008)³.

**Approach**

An organization like the Indian Health Service needs to be culturally competent, aware of factors in patients’ lifestyles and culture such as religious beliefs that might influence the kind of care appropriate for them. Cultural competence has been heavily emphasized and expanded in the fields of social work, psychiatry, and health services in the past two decades. As a result, the meaning of cultural competence has shifted from a parallel to the applied linguistics concept of “communicative competence”⁴ to a way of thinking and

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³ The reimbursement amounts to facilities run by tribal governments are not included, as tribes are not required to report these figures (Frederickson and Frederickson 2006, GAO 2008).
⁴ See Canale and Swain (1980). “Communicative competence,” particularly useful in learning second languages, includes understanding of words and rules, sociolinguistic appropriateness, cohesion and coherence, and appropriate use of communication strategies.
acting that attempts to counter prejudices practitioners may have once held. The IHS, because it is funded by a predominantly White government and uses Western medical equipment and procedures but serves an ethnic group with various other healing traditions, necessarily works within cross-cultural environments. Staff members are using non-Native medical practices and settings and should understand whether patients may expect seemingly unusual things from their health care or interpret care differently than expected by doctors. Procedures and practices may need to be organized or explained differently than the way Western-trained doctors are accustomed so that all patients interpret and use them well. This understanding and accommodation on behalf of health workers and institutions is cultural competence.

There are several cultural barriers that health providers may need to surmount in order to communicate effectively, sensitively, and respectfully with their patients. For example, few Native American groups have a cultural framework for the concept of chronic disease (Hickey and Carter 1994). The slow effects of diabetes on sight or the healing of wounds, then, is not something that fits with many indigenous peoples’ concepts of serious ailments or illness and are often ignored until, for example, amputation is needed or blindness proves debilitating (Hickey and Carter 1994). Some Native Americans may have trouble trusting young, assertive, non-Native doctors because of cultural differences in behavior or their cultures’ deeper trust and respect for elders (Hickey and Carter 1994). Younger doctors may be mistaken for interns and taken less seriously or not trusted (Smith-Morris 2006). In addition, doctors have been criticized for not acknowledging the benefits of indigenous healing practices and are usually against the application or replacement of known
biomedical treatments with treatments that are unknown or unfamiliar to them (Hickey and Carter 1994, Trennert 1998). Understanding cultural difference and indigenous interpretations of diabetes is essential to treating and preventing it among Native American groups.

The IHS, increasingly managed and staffed by Native Americans, is more culturally competent than many other medical institutions in the United States. Facilities that provide contract care, but do not normally hire or care for indigenous peoples, are in much greater need of cultural competence training (USCCR 2004). However, the biomedical approach that the IHS and contract care providers are founded upon, sometimes thought of by indigenous peoples as Western or “White” medicine, is connected to a legacy of assimilation practices such as undermining traditional healers, forced sterilization of women, or non-Native stewardship of Indian health (USCCR 2004). The earliest hospitals for the Navajo, for example, were so unsuccessful at treating patients that many Navajos began to associate them with death instead of health (Trennert 1998). This history casts a shadow over current Native American health care, possibly necessitating extra effort on the behalf of the IHS to dispel the image of assimilation and oppression that modern medicine occupies in Native American histories. Though increasing numbers of Native Americans trust the health system enough to make and attend appointments and traditional healers are working more closely with the IHS, some experience discomfort when medical practices violate what is culturally appropriate to them. For instance, many Native Americans do not feel comfortable being asked questions, making direct eye contact, or being touched during examinations (Smith-Morris 2006).
Chapter Four: Community Action and Cultural Revival

This chapter is about alternative methods of controlling and preventing diabetes. Doctors, scholars, and indigenous peoples alike have proposed incorporating traditional diets and activities into Native American lifestyles rather than relying solely on modern medicine to manage diabetes. The suggestion is usually founded on two assumptions, that diets before European contact were healthier than modern diets, and that before the creation of reservations and the introduction of wage labor, most indigenous peoples led very active lives. Knowing that healthier foods and more exercise are two prevention methods that have achieved positive results in managing diabetes, proponents of this solution then recommend reclaiming old diets and activities.

Returning completely to a traditional lifestyle is acknowledged as infeasible, but many hope to restore some foods and activities. A key factor of prevention plans outside of official health care centers is that they are usually community-driven and tied to indigenous identity; this can be empowering and thus more effective. However, people need to be cautious about how they propose these dietary and lifestyle changes, and at least one group has encountered opposition to the ways it has tried to reclaim earlier cultural activities.

Bringing Back the “Old Ways”

Native American communities and health workers catering to Native Americans have often suggested integrating traditional activities and foods into diabetes prevention programs
(Schraer 1994). As I described earlier, diabetes is a relatively recent phenomena among Native American groups – the Akimel O’odham have been markedly affected since the mid-twentieth century, while Alaska Natives have only shown growing rates over the past 20 or 30 years. Factors that predispose Native Americans to diabetes include genetic susceptibility, sudden lifestyle changes during the historic period – usually from mobile to without transportation or freedom of movement – and dietary changes that increasingly incorporated processed sugar- and fat-rich foods. Some of these factors also contribute to the rise in diabetes in the entire population of the United States; however, for Native American groups there remains memory of previous ways of living and an incentive to put that memory into practice.

_Cultural Revitalization_

Tribes have gained more autonomy over the past few decades due to U.S. governmental policies supporting self-determination and the passage of legislation acknowledging tribal sovereignty. With this autonomy, support, and in some cases increased incomes, tribes have begun projects and held events celebrating and reclaiming their cultures and histories. The Miami Tribe of Oklahoma, for example, has been working with Miami University and created a multifaceted language and culture revitalization project, trying to impart not only language to tribe members but also promoting a Miami worldview, culturally-specific ways of interacting, games, gendered activities such as gardening or dwelling-construction, and traditional foods (Osawa and Osawa 2009). Other tribes, such as the Seminole Tribe in Florida, are similarly exploring and promoting their culture (Cattelino 2008).
Parts of the cultural revitalization projects may include sports, games, ethnobotanical knowledge, or traditional cooking. For some groups, the inclusion of these aspects in particular are significant because they hold the possibility of providing culturally particular means of making diets and lifestyles healthier. In a similar sense, framing necessary dietary and lifestyle changes in culturally recognizable ways may make the management of diabetes easier for Native Americans, who like many diabetes patients often balk at the vast, long-term changes that blood sugar control requires (Schraer 1994).

*Pre-Colonial Diets*

The diets many Native American tribes used to rely upon were high in complex carbohydrates – slow-release sugars – moderate to low in fat, and moderate in protein (Jackson 1994). This is much different from Pollan’s description of the Western Diet, rich in fats and simple or fast-release carbohydrates. Even high-fat diets such as those traditional for Alaska Native peoples may be healthier than store-bought foods, because fish and sea mammal fats may even be protective against some heart conditions, while the kinds of fats in processed foods – especially trans fats – have proven to be dangerous (Pollan 2008, Shraer 1994). As a result of this contrast, it has been suggested that traditional foods be reincorporated into Native American diets so that health problems like diabetes may be alleviated.

At least one test of a pre-colonial diet has been carried out already under the direction of Kerin O’Dea, who studied a small group of Australian aborigines with diabetes who returned to a hunting and foraging diet for seven weeks and returned significantly healthier than they were when they began the study (Pollan 2008). However, not every group of
indigenous peoples has retained all of the cultural knowledge necessary to incorporate older methods of food procurement and processing into its members’ lifestyles. Nor is a complete shift feasible in light of the myriad ways Native American communities have changed over the past few hundred years (Wilson et al. 1994). The fact that many tribes no longer live near land they used to inhabit also makes a complete reestablishment of early patterns of eating unfeasible.

To reclaim traditional diets, several more pragmatic strategies have been pursued. Research through historical records or early anthropological accounts and studies may give indications of what indigenous peoples ate and how they produced their food. Native peoples may then adapt this knowledge however they deem appropriate – it can be incorporated into general cultural projects, applied for special events, or modified to meet available resources. Another source of information about previous cultural foods lies within elders, who may remember eating, collecting or making traditional foods or who continue these practices. Yet another place pre-colonial foods may be maintained is within religious ceremonies (Jacob 2008).

Some food traditions may be passed on through the generations, especially among women. Carolyn Niethammer (1999), an ethnobotanist, created a cookbook specific to the southwestern United States using recipes she collected from several indigenous peoples, specifically some Tohono O’odham women. Not only were traditional dishes and modern adaptations included, but basic identification and preparation techniques for wild Southwestern plants were, as well, making the volume much more useful and replete with culturally-significant knowledge than everyday cookbooks. Volumes like this show that much knowledge is available for those who look for it.
Traditional Activities

In addition to looking for ways to incorporate traditional foods into their diets, many groups are turning to culturally relevant sports and games for sources of exercise. For example, some Northwest-coast groups are promoting canoeing and the Zuni Tribe in New Mexico is encouraging long-distance running (Olson 2001). Concerns about losing culture and declining health manifest in observations that videogames and television are decreasing the amount of physical activity people experience daily and contributing to obesity and diabetes rates (Shraer 1994). Promoting active, primarily outdoor traditional games and sports thus provides a partial solution to both of these concerns. Though the Miami Tribe has not pointed to diabetes as a reason for its inclusion of traditional games and sports into its summer camps, the model provided by these camps may be a good place to start for communities worried about their children being too inactive or developing diabetes earlier than is normal (Osawa and Osawa 2009).

In some sense activities and food can intersect as part of an overall strategy to reclaim traditional culture and improve health. The Makah Tribe in Washington has fought to reestablish whaling as a cultural activity. It is important to them not only in reasserting their cultural identity, but in providing an organize activity for younger tribe members and in combating health problems attributed to processed foods (Makah Tribal Council and Makah Whaling Commission 2005). Hunting and fishing are in general, activities that can promote physical exercise, cultural renewal, and healthy diets. Intertribal competition can also reinforce fitness, community, and identity (Olsen 2001).
Community Action

An indigenous author, Michelle Jacob, writes, “Truly, our bodies are social. In reclaiming traditions surrounding our foods we will be able to heal the soul wound of diabetes” (Jacob 2008: 53). She also emphasizes that community efforts to promote exercise are part of the path to health, for example when her community opened up a walking path and began its own diabetes program. T-shirts with encouraging messages and tribal artwork have even been used by Jacob’s tribe to create an encouraging environment for people who want to get more exercise but feel nervous or depressed about diabetes (Jacob 2008). These tribal and community efforts are important supplements to formal health programs and facilities.

Community-sponsored health initiatives are often just as much about the community as they are about the health problems they address. The Seminole Tribe in Florida holds an annual event called the “Rez Rally” in which the six Seminole reservations compete in a three-mile race to raise awareness about diabetes. The most recent Rez Rally took place on January 17th of this year, with 1,434 participants (Buxton 2009). The event promoted lifestyle changes such as athletic exercise to alleviate diabetes, but more importantly it brought the Seminole community together, making visible a support network for tribal members who had or knew people who had diabetes. Participants came “from all walks of life,” ranging in age, health, clan, and residence (Buxton 2009). The event was also able to bring in a well-known Native American motivational speaker and comedian to address the participants after the race about his own struggle with making his lifestyle healthier.

Overall, the Rez Rally is a good example of a community-driven event that promotes lifestyle changes that could alleviate or prevent diabetes and provides support for people trying to make those changes or cope with this chronic illness. It is based on a model that has
become popular across the nation for cancer or AIDS awareness, but it focuses on the particular health problems of this Native American community. The competitive aspect both ties people closely to the communities they live in and reinforces the connections they share with the entire tribe. Jacob recounts how encouraging the early-morning “fitness walk” portion of a tribal diabetes conference was for her and others because it emphasized their community efforts to work toward improving their health together (Jacob 2008).

Community events are good ways to motivate people, but long-term fitness programs are needed to provide sustained health improvements. Reviving traditional games and activities may provide some with consistent, culturally-relevant exercise, but fitness on a smaller, daily scale is the goal many health workers set for people with diabetes. For that, Jacob believes that people brave enough to lead by example and share their own ways of connecting exercise with indigenous identity have the most potential for inspiring Native Americans to respect themselves and to believe in their ability to become healthy (Jacob 2008). Several tribes including the Akimel O’odham of the Gila River Indian Community have begun tribal exercise and nutrition programs designed to prevent diabetes (Wilson et al. 1994). Often the programs are geared toward one demographic, such as children or at-risk adults, but end up influencing and including entire families (Wilson et al. 1994). The programs are begun in community rather than IHS settings and are tribally run (Wilson et al. 1994). In other words, health begins when Native Americans help each other “win control” over their bodies, not just when people receive advice from doctors or dieticians (Jacob 2008: 55).
Barriers

In trying to return or retain past, healthy ways of eating, some Native American groups or health providers often face challenges. I discuss two major barriers here: one is the fact that “traditional diet” can mean several things, and the other is that protecting food resources for the purposes of consumption can lead to legal clashes with other groups or organizations.

*What is a Traditional Diet?*

One of the problems with calling for “traditional” foods to be reincorporated into the diets of Native American groups is that the foods seen as traditional by the community and those seen as such by health educators or anthropologists may not be the same. Traditional is not, as it is often interpreted, an indication of a static, innate quality determined solely by time or historic preservation. It is a category that changes constantly with communities’ perceptions and experiences (O’Brien 2008). In advocating a return to traditional diets, many people mean prehistoric or early historic diets, usually consisting of nuts, greens, fish, or wild game, depending on the region. Traditional food in this case is food that was cultivated, gathered, or caught by indigenous peoples before processed or EuroAmerican foods became pervasive, and traditional diets in this sense become synonymous with healthy food.

However, foods such fry bread, tortillas, lard, sweet rolls, beef stews, or fried potatoes have been part of several communities’ diets throughout much of the historic period and continue to be significant today (Garro and Lang 1994). These foods have for some Native Americans become traditional, symbolizing indigeneity and representing their cultures. This trend contradicts scholars’ belief that “traditional” foods are necessarily
prehistoric. Fry bread, tortillas, and mutton have become traditional foods in Navajo communities, while potatoes and eggs are also frequently consumed (Hall et al. 1994). For people who have been in contact with European and colonial societies for hundreds of years, it is understandable that foods that incorporate European animals or grains have become traditional foods. However, incorporation of green vegetables has not concurrently occurred; one Dakota woman for example stated that she did not like eating most of the vegetables suggested for her diabetic diet and that they were expensive compared to foods she was more comfortable with (Garro and Lang 1994: 315).

The problem lies in that this set of European-influenced traditional foods is not, unless balanced with other foods, very useful in mitigating the effects of obesity and diabetes; however, telling people to stop eating them comes across as an attack on American Indian cultures or feels like a request to Native Americans not to take part in their culture (Olson 2001). Food and eating are significant parts of Native American community and family life, and not fully participating in these activities can be difficult for those with diabetes. In this sense holding onto their identity as Indians may be more important to them than their health, especially with a chronic and relatively invisible disease like diabetes. Pushing “traditional” foods that do not necessarily feel traditional to some Native Americans, while telling them to cut down on consumption of other foods they think of as traditional, sends a confusing message to Native Americans trying to cope with diabetes. Creating a dietary plan that includes both recent and older traditional foods may be the best strategy for dieticians to take when suggesting eating strategies to Native Americans with diabetes (Garro and Lang 1994).
Environmental Degradation and Environmental Lobbyists

Many Native peoples have been undermined in their quests to preserve, maintain, or revive traditional foods by pollution, development, and other forms of environmental degradation. This pits groups that try to protect migration grounds, fields, or other habitats where indigenous foods can be found against developers, the U.S. government, the U.S. agriculture industry, and other large organizations. At the same time, some Native American communities have found themselves in opposition to environmental protection groups in initiatives to reincorporate traditional foods into contemporary diets.

Groups such as the Anishinaabeg are trying to protect the wild rice, a sacred food that they call manoomin that grows in some of Minnesota’s lakes from the influence of bioengineered rice (LaDuke and Whipple 2006). Lobbying for wild rice has also pitted Native American tribes against dam building, which changes water systems and can prove detrimental to wild rice’s growing environment (The Circle 2004). Many tribes in the northern United States also lobby for protection of salmon resources. Wild rice and salmon are both healthy, traditional foods for many Native American groups, and their interests in protecting these resources usually clash with industrial agriculture or U.S. energy or water management plans.

Alaska Natives have suffered the effects of global climate change, oil and gas drilling and exploration, and toxic contamination in recent decades. All of these affect the health of wild game and change their migration patterns, which are essential to people hunting some of these animals for meat (McBeath and Shepro 2007). Every time Congress faces a bill that would allow increased oil production in Alaska, it holds the fate of Alaskan hunters, as well
as wildlife in its hands. Alaska Natives in this sense are on the same side as environmentalist groups wishing to preserve arctic and subarctic ecosystems.

At the same time, the Makah Tribe in Washington State has been involved in court cases against marine mammal conservation groups for the right to hunt and eat whales. The Makah want to return to whale hunting partially because they perceive whale and seal meat as healthier than the processed foods otherwise available and they want to preserve their culture (Makah Tribal Council and Makah Whaling Commission 2005). The tribe argues that as a sovereign nation it has the right to hunt whales. It has faced much criticism and legal action from groups worried about protecting whale populations from all forms of hunting, though Makah hunting would take away 5 or less animals annually. Additional criticism has been aimed at the tribe because it uses modern harpoons to kill the whales, which is a practice contrary to expectations that returning to hunting and traditional diets means returning to prehistoric hunting methods and tools as well. However, the Makah plan to use modern harpoons to stay within regulations which prescribe that killing be done in the most painless, quick way possible (Makah Tribal Council and Makah Whaling Commission 2005).

Clearly the position of Native American communities who want to keep or reincorporate some foods in their diet is tricky when it comes to environmental issues. They fall on the side of environmentalists for the most part because they want healthy and abundant resources, but the fact that some northern communities want to hunt animals pits them against animal protection groups. The Makah whaling debate in particular is hotly contested and bleeds into many other issues facing Native Americans today, such as sovereignty, cultural distinctiveness, and the conflation of environmentalism with indigenous peoples (Ames 2004). There is a difference of opinion between Native Americans and the
groups they find themselves in opposition to in various cases regarding whether consuming those resources is actually necessary to Native American peoples. Most outside groups dismiss cultural heritage and even health concerns, stating that because Native Americans technically have access to foods from grocery stores and the like, they do not need these other resources and have no ground in trying to utilize or protect them.

**Two-Front Attack**

The successes of community efforts to revive or retain cultural activities and foods or to create supportive environments for people with diabetes have not gone unnoticed by the Indian Health Service [IHS] and other health providers. As evidenced by the Special Diabetes Program for Indians [SDPI], the IHS increasingly promotes and incorporates community-based health programs. Although there is still tension between the usual approach of modern medicine, in which health problems reside in and must be managed by individual people, and the belief by many indigenous people that food and diabetes are social and are best managed communally, the IHS is more progressive than most private health facilities in considering the culture and beliefs of its patients.
Conclusion: Resiliency and Reclamation

The health of the Akimel O’odham has certainly shifted from that of their prehistoric ancestors. The Hohokam used a variety of subsistence strategies, collecting many desert plants and animals as well as growing maize, beans, and other crops. Where before quality of life was hampered by nutritional deficiencies, causing anemia and skeletal stress, now diabetes ranks as one of the most severe health problems in several Native American communities. Though it is linked to obesity, type II diabetes is not simply a result of eating too much. As demonstrated by the National Institute of Health’s research about the diabetes epidemic among the Akimel O’odham, the disease is severe because of the interactions between genetic disposition, culture, and socioeconomic factors such as limited access to healthy foods. Colonization in particular rapidly limited Native American mobility, attempted to stamp out traditional knowledge, replaced indigenous subsistence patterns with EuroAmerican processed foods, and in many cases uprooted tribes and moved them far from their homes. Though the Akimel O’odham were able to remain in the Southwest, they have been affected by these other processes.

Economic resources play a large part in the prevalence and potential for prevention of diabetes in a given community. Healthy food is expensive, as are diabetes treatments and prevention programs. However, Native Americans, though often at the greatest risk for type II diabetes, also have the greatest opportunities for change. They have increasing control over a health organization designed to specifically maintain and improve their health,
something members of other ethnic and racial groups in the United States lack. Their indigeneity also means that they are able to look back and explore the possibilities that previous diets and lifestyles hold, for they are on the same continent – if not usually the same region – where their ancestors lived. Native Americans can return to those places, buy land there, conduct archival or ethnobotanical research, and educate others on the importance of wild edibles and traditional subsistence practices.

Community efforts are already underway in many tribes to reclaim parts of their cultures. Food and eating practices that have been forgotten or dropped out of use are easily incorporated into these projects. It is important to remember, however, that Native Americans have economic disparities among themselves as well. Some tribes have profited from recent economic ventures and have the means to operate their own diabetes prevention and treatment programs, to organize and host events, to bring in public speakers, and research and reclaim their cultural heritage, including food. Other Native Americans are more dependent upon U.S. governmental support and the Indian Health Service, which though trying to adapt and assist can be quite limited in resources and scope.

It is clear that plants and fish, if prepared simply rather than heavily processed, salted, or sweetened, are healthier and less problematic for diabetics than processed cheap foods. However, programs that investigate prehistoric foods should be selective. One of the tenets of the return to traditional foods relies upon is that they were healthier, but as bioarchaeological studies show, not all aspects of traditional diets were not entirely healthy. Anemia, in particular, was a widespread and weakening disease, and in trying to move away from processed foods people should not make themselves vulnerable to it. In addition, it is not feasible for a complete return to prehistoric diets. There are simply not enough resources
or people with the right knowledge to do so, and modern lifestyles and land-ownership restrict the extent to which people can break away from their current diet and activities. Furthermore, the term “traditional” is debated, sometimes referring to fat- or sugar-rich feasting foods that connote Indian identity, and sometimes referring to older more plant- and game-oriented diets.

Women seem to have borne the brunt of both prehistoric and contemporary diet-related health problems. Pregnant and lactating women were most susceptible to anemia and other nutrient deficiencies and risked the same for their children. Now, the threat posed by gestational diabetes once again places the blame for lowering ages of diagnosis and growing rates on women, regardless of their control over their predisposition to the condition. Women also tend to have prominent roles in the production, preparation, and serving of food, so they may be saddled with blame for not buying or cooking healthy food or may be able to play a large role in altering meals to include “Indian” foods from the present and the past. Both women and men have the opportunity to work as doctors, as healers, or as educators.

There are a number of directions diabetes prevention programs can go toward lower rates among high-risk populations. But they also lead to reassertions of cultural identity, empowerment, reclamation of tribal histories and lifeways, and a break from colonial history and control. These are distinct dimensions of the indigenous struggle against type II diabetes. It is going to be a slightly different fight for other groups facing the same disorder, and even more so for people who feel as though they are facing the chronic problem alone. Even for non-indigenous peoples, there are many approaches people can take. They can grow gardens, create wild plant guides, compile cookbooks, hold cooking classes, or organize markets. The Internet offers even more opportunities to network, find support, and
organize events. With efforts modeled after Native American projects but grounded in their own histories and cultures, other groups may be able to fight for better health and diabetes education as well.
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