

Lindenwood University

Digital Commons@Lindenwood University

Theses

Theses & Dissertations

1998

Health Aspects of Native American Indians and Alaskan Natives

Beverly V. Bennett-Maine

Follow this and additional works at: <https://digitalcommons.lindenwood.edu/theses>



Part of the [Medicine and Health Sciences Commons](#)

112310
B439h
1998

HEALTH ASPECTS OF
NATIVE AMERICAN INDIANS
AND ALASKAN NATIVES

Beverly V. Bennett-Maine, B.A.



An Abstract Presented to the Faculty of the Graduate
School of Lindenwood University in Partial
Fulfillment of the Requirements for the
Degree of Master of Health Management

ABSTRACT

This thesis will focus on the decline in health of Native Americans and Alaskan Natives in regards to chronic diseases due to changes in their food habits, customs, traditions, and culture.

The purpose of this study is to explore why Native Americans and Alaskans health has deteriorated in relation to diabetes, obesity, heart disease, and alcoholism.

Limitation in access to health care facilities includes geographic location, cultural, and linguistic barriers.

The studies to be discussed include: the Inter-Tribal Heart Project (ITHP) for cardiovascular disease; the Behavioral Risk Factor Surveillance System (BRFSS) for self-reported risk factors; and the Navajo Health and Nutrition Survey (NHNS) for chronic diseases associated with nutritional findings.

Results of the analysis of these surveys produced considerable evidence to suggest that the hypothesis be accepted and conclude that, the movement away from traditional lifestyles, customs, and eating patterns has exacerbated a decline in their health.

HEALTH ASPECTS OF
NATIVE AMERICAN INDIANS
AND ALASKAN NATIVES

Beverly V. Bennett-Maine, B.A.

A Culminating Project Presented to the Faculty of the
Graduate School of Lindenwood University in Partial
Fulfillment of the Requirements for the
Degree of Master of Health Management

1998

COMMITTEE IN CHARGE OF CANDIDACY:

Associate Professor Betty Lemasters,
Advisor

Adjunct Assistant Professor Peter Carich

Adjunct Assistant Professor Lynnette Gerschefske

Table of Contents

List of Tables	iv
List of Figures	v
I. Introduction	1
Purpose	1
Bureau of Indian Affairs	4
Native American Tribes	5
Diseases	11
II. Literature Review	15
Population	17
Indian Health Service Mission	20
American Dietetic Association Survey	33
Elderly Native Americans	44
III. Research Methodology	50
Race and Ethnicity	51
National Health Interview Survey	54
Behavioral Risk Factor Surveillance System ..	56
Inter-Tribal Heart Project	58
Navajo Health and Nutrition Survey	65
IV. Results	70
Age Distribution	71
Chronic Diseases	75
Summary	93

V. Discussion	94
Summary	94
Limitations	98
Suggestions for Future Research	100
Appendix A	102
Works Cited	104
Vita Auctores	108

List of Tables

Table 1	Rank Order of Age-Specific Crude Mortality Rates for Major Chronic Diseases Underlying Cause of Death for American Indians and Alaskan Native Women	75
Table 2	Rank Order of Age-Specific Crude Mortality Rates for Major Chronic Diseases Underlying Cause of Death for American Indians and Alaskan Native Men	76
Table 3	Demographic Characteristics of Participants	80
Table 4	Percent of Participants Who Recognize Selected Conditions as Risk Factors for Heart Disease	82
Table 5	Percent of Participants with Diabetes Mellitus	84
Table 6	Characteristics of Households included in the Navajo Health and Nutrition Survey, 1991 - 92	87
Table 7	Food Sources of Macronutrients Among Participants in the Navajo Health and Nutrition Survey, 1991 - 92	91

List of Figures

Figure 1	American Indian Population	17
Figure 2	Geographic Areas and Administrative Offices of the Bureau of Indian Affairs	18
Figure 3	Geographic Service Areas of the Bureau of Indian Affairs	19
Figure 4	Indian Health Service/Tribal Facilities ..	22
Figure 5	Percentage of American Indians and Alaskan Natives in U.S. Counties, 1990	70
Figure 6	Age Distribution of American Indians/ Alaskan Natives and Non-Hispanic White Populations, United States 1990	72
Figure 7	Age Distribution of American Indians/ Alaskan Natives and Non-Hispanic White Populations (Males/Females), United States 1990	73

Chapter I
INTRODUCTION

Native Americans and Alaskan Natives are suffering from a lack of access to primary health care facilities because of geographic location and cultural barriers, which is contributing to their declining health. These are underserved and vulnerable populations in the United States today. Rural populations, regardless of income or ethnicity, need access to the same diversity of health services and programs as urban and suburban populations.

The purpose of this study is to explore why Native Americans and Alaskan Natives health has deteriorated because of changes in their customs, food habits, traditions, and culture.

According to Krout and Dwyer the number of people living in rural America has increased steadily over the last forty years from fifty-four million in 1950 to sixty-two million in 1990 (10). In the U.S., most definitions of rural are reached by establishing a quantitative or numerical figure. Rural is defined differently by the Bureau of the Census, the Office of Management and Budget (OMB), and the United States Department of Agriculture (USDA) Economic Research

Service (ERS). The Census Bureau's definition distinguishes a metro/urban area versus a metro/urban area by its population density; the number of people per square mile, exceeding 1,000. An urbanized area (UA) includes a central city and a territory that has a population of 50,000 or more (United States Rural Development 26-30).

By exclusion, any urbanized area that has less than 50,000 people is considered a metro/urban or rural area. The Office of Management and Budget (OMB) specifies a metropolitan statistical area (MSA) must contain a central city and additional contiguous counties. By this method any county not included in a (MSA) is considered non-metro or rural. The USDA's Economic Research Service (ERS) differs greatly from the previous definitions. The ERS classifies rural as an urban population of 20,000 in close proximity to a metropolitan area, and completely rural having a population of less than 25,000 and not near a metro area. These three definitions of rural, within the U.S. Government, vary greatly in their perceptions of what the government constitutes as a rural or non-metro area. Depending on whose definition is used determines what benefits and services will be allocated for rural populations through the various government agencies (United States Rural Development 26-30).

Forty three million people in the United States today are served by the Bureau of Primary Health Care (BPHC). The BPHC is a division of the Health Resources and Services Administration (HRSA) under the Department of Health and Human Services. The BPHC's mission is to aid the undeserved and vulnerable populations who experience financial, geographic, or cultural barriers to care by increasing their access to comprehensive primary and preventive health care, thereby improving their health status. Populations living in rural and frontier areas are some of the vulnerable populations helped by the BPHC (United States Strategic Priorities 1-3).

Krout and Dwyer maintain that many ethnic backgrounds comprise the United States rural population: Caucasian, Native American Indians, African-Americans, Caribbeans of African descent and Black Africans, Eskimos, Aleuts, Asian and Pacific Islanders, and Hispanics (11).

President Bush's passing of the one point seven billion dollar, four-year reauthorization of the 1965 Older Americans Act on September 30, 1992 included the reauthorization of the Native Americans Act. This reauthorization gives new financial assistance to Native American Organizations (Congressional Quarterly 468).

Native Americans also receive aid through the Bureau of Indian Affairs (BIA) under the Department of the Interior. This bureau prepares and teaches American Indians and Alaska Natives how to manage their own affairs under trust relationships with the federal government. This trust encompasses responsibilities for 50 million acres of Indian Reservations (Wright 115). The BIA has one national office, twelve geographic area offices, and within those divisions, there are 109 agency offices (Utter 175).

The basic mission of the Bureau of Indian Affairs (BIA) is to carry out the government-to-government relationship that exists between the United States and the federally-recognized Indian tribes (Utter 173). The BIA is an agency run by Native American Indians. Native Americans and Alaskan Native are given employment preference for job positions within the reservation system and the Bureau of Indian Affairs. The United States Census reports that there are two million natives but the BIA estimates its "service population" is only around 950,000. Not all Native Americans use the Bureau of Indian Affairs. Some have moved out of the reservation area and have no need for or do not seek health services or benefits that are available to them through the BIA (Utter 173).

Certain criteria must be met in order to qualify

as a Native American. An Alaskan Native or Native American must be a member or a descendant of a member of a federally recognized tribe and have at least 1/4 native blood. In addition, they must live on or near a reservation (Utter 174).

Thomas, Miller, White, Nabokov, and Deloria assert in their book The Native Americans: An Illustrated History that in 1589, a Jesuit missionary, Jose de Acosta, hypothesized that Native Americans followed hunting trails and crossed the Bering Strait during the last Ice Age from Asia to the Americas. Twenty thousand years ago ice covered one-third of the earth and one unglaciated tract called the Bering Land Bridge connected Siberia to Alaska. Because of climatic changes, the sun warmed up parts of the glacial area and exposed land that stretched from the Yukon to Montana. Jose de Acosta believed that this was the way the first Native Americans and Alaskan Natives made their way onto the Great Plains (30-32).

According to the Time Life Series books on Native Americans certain traits are passed down from their Asiatic heritage which include a short to medium build, straight black hair, light brown skin, and prominent cheekbones ("The First Americans" 8).

- The Alaskan major tribes or nations are comprised of some 85,698 people. The Alaskan Native

tribes include the Aleut, Eskimo, Athapascan, Haida, Tlingit and Tsimpshian. Aleuts and Eskimos's are racially and linguistically related, but Athapascans are related to the Navajo and Apache Native Americans (Wright 550).

- Oklahoma is the largest population of Native Americans, numbering 252,420. These Native Americans include the Cherokee, Creek, Choctaw, Chickasaw, Osage, Cheyenne, Arapahoe, Kiowa, and Comanche (Wright 550).

- The third largest tribe are the California Native Americans with a population of 242,164. These Native Americans are the Hoopa, Paiute, Yurok, Karok, and Cherokee (Wright 550).

- The fourth largest tribe are the Native American's from Arizona, whose population is 203,527. They constitute the people's of the Navajo, Apache, Papago, Hopi, Yavapai, and Pima tribes (Wright 550).

- The fifth largest tribe are the Apache, Navajo, and Pueblo who live in New Mexico, with a population of 134,355. These are the five largest tribes from Alaska, Oklahoma, California, Arizona, and New Mexico. These bands, villages, groups and pueblos, including the Eskimo and Aleut villages are tribes or bands whose statistics are taken from The Universal Almanac 1997 (Wright 550).

Donald E. Worcester indicates that two of the largest tribes in Arizona and New Mexico included the nomadic Apaches, who roamed the mountains, which was their preferred dwelling, and the deserts, whose climate was harsher and survival more difficult. The land the Apache's lived on was called Apacheria. They were known as a warrior people and were raised for combat from early childhood. They subsisted on hunting and gathering wild seeds and roots. They ate lizard, but by choice would not eat the meat of bears, fish, or turkeys. They lived in tribal organizations, lead by a chieftain. They spoke Athapascan and a Zuni translation of their name is "enemy". Apache's lived in several groups or families called go-tahs. The family was a political unit where young married men left their mothers home and went to live with the family of his wife, and that became his domicile or territory to protect (3-16).

As Vicki Rozema explains, the largest tribes were the Cherokee situated in the states of California and Oklahoma. They called themselves Ani-Yun-Wiya or the "Principal People". They spoke the Iroquois language and the Cherokees later called themselves Tsalagi or "Cherokee". The Cherokee were hunters and trappers, who mainly pursued white-tailed deer because of their abundance, and bear in the fall, when they were at

their fattest. They were also fishermen who used traps and nets; and developed a dam system to trap fish. By using the dam system they first trapped the fish and then proceeded to poison them with ground-up buckeyes. The buckeyes were not harmful to humans who later consumed the fish, but the buckeyes were deadly to the fish. The Cherokee were also gatherers and cultivated crops. Corn and beans were the dominant crops but they also cultivated squash and tobacco. While females were able to voice their opinions at council meetings, the Cherokee village was basically male-dominated. The anaskayi, or council house was ruled by two chiefs, a White Chief and a Red Chief. The Red Chief ran the village in the winter and oversaw the hunting and plans for protecting the village. The White Chief was a summer chief, who took care of village domestic problems and oversaw planting. Cherokee culture was ruled by the clan system consisted of seven clans: Deer, Wolf, Paint, Bird, Holly, Blind Savannah, and Long Hair. Council houses had eight sides, one was for the entrance and the other seven sides honored the seven clans. Clan's were matrilineal: men remained in their mother's clan after marriage and punishments for violations of clan regulations were dealt with by female members of the clan. These punishments were administered by female members and usually consisted of

beatings (Rozema 4-9).

Most of the time the Alaskan Native Northerners are surrounded by snow and ice for nine months of the year. The Inupiat Eskimos live in the oldest settlement in Alaska called Tigara or "Index finger" (People of the Ice 27). Subsistence hunting and fishing is the largest source of economic livelihood because the cold weather does not allow for plant harvesting ("The Inupiat and Arctic Alaska 2). The Eskimo's hunt the animals as each species comes into its season. They use a special hunting tool called a toggle-headed harpoon or spear which can be altered to suit the killing of the animal they are hunting. They hunt seal, walrus, beluga whale, polar bear, crab, fox, wolf and many other species. The bowhead whale which can weigh sixty tons is the most prized for what it can provide for materials as well as for use in ceremonial traditions. The hunt is considered the most important activity in life. The basic social unit is a man, his wife, and their children. There is no chieftain, but the man who is most prized in the village is the man who is the best hunter. The prehunt ritual is considered to be one of the most important ceremonial traditions of the Eskimo's. A ceremonial center called a karigi allowed hunters to tell their stories to inexperienced young hunters and enabled the more

experienced hunters to pass on their skills. The Eskimo language has branched into two tongues, Inupiaq and Yupik. Most Alaskans call themselves Inuit meaning "persons". Adding the suffix -miut meaning "people of" to a specific geographic location (Barrow off the Northern Coast of the Arctic Circle it would be Barrowmiut, or the people of Barrow). Eskimo is a term used by the Algonquian Indians of eastern Canada meaning "eater of raw meat" ("People of the Ice" 27).

The Eskimo's are split into three cultural groups: the Aleuts, the Yupik, and the Inuit. The Aleut's as would be expected are from the Aleutian Islands. The Yupik are comprised of the St. Lawrence Island Eskimo, the Nunivak Eskimo of Nunivak Island, the Bering Strait Eskimo from the Bering Strait, the Mainland Southwest Alaska Eskimo from Alaska, and Pacific Eskimo from Kodiak Island. The Inuit are comprised of Eskimo tribes from the Arctic Circle along Canada, Newfoundland, and Greenland ("People of the Ice" 19-27).

The greatest threat to Native Americans and Alaskan Natives are chronic diseases brought about by leaving traditional ways of hunting, harvesting crops, and the preparation of the foods they consume. These departures from their traditional lifestyle are

exacerbating their decline in health ("Inter-Tribal Heart Project" 1).

The European expansion into the Americas brought infectious diseases which Native Americans and Alaskan Natives had no resistance to. Some of these diseases consisted of smallpox, tuberculosis, syphilis, and rubella. The transition from the infectious diseases of the 18th century to the chronic diseases of the 20th century included cardiovascular disease, diabetes - Type 1 and 2, heart disease, heart failure, alcoholism, alcoholic cardiomyopathy, fetal alcohol syndrome (FAS), and stroke ("Inter-Tribal Heart Project" 1).

Cardiovascular disease (CVD) is the number one killer of Alaskan Natives and American Indians ("Inter-Tribal" 1). Cardiovascular disease is a disorder that affects the heart muscle or the blood vessels of the heart. The vascular or blood vessel problem is caused by a blockage which results in poor blood circulation. Congestive heart failure (CHF) is another disorder where the heart loses its ability to pump blood efficiently. Alcoholic cardiomyopathy results from excessive alcohol use and the heart muscle is weakened and damaged and this affects the lungs, and liver. The risk factors for these three heart related disorders are smoking, obesity, excessive alcohol consumption and diets high in fats and salt (Long 1-2).

Another heart related disease that affects Native Americans and Alaskan Natives is stroke or cerebral vascular accident. This occurs when there is a blockage or a rupture of one of the blood vessels that supplies blood to the brain. Factors affecting the decrease of incidence of stroke are controlling high blood pressure, obesity, cessation of smoking, keeping blood cholesterol and triglycerides levels below two hundred, and reducing fat and salt intake ("Stroke").

The second type of disease affecting Native Americans and Alaskan Natives is Type 1 & 2 Diabetes. Type 1 Diabetes is also called immune-mediated diabetes. It was formerly called insulin-dependent diabetes mellitus (IDDM). The body does not produce insulin, the hormone which allows glucose to enter the cells of the body for fuel. Type 1 diabetics must monitor their blood sugar levels and adjust their daily insulin dosages in relation to their blood sugar levels ("Type 1 Diabetes"). Type 2 Diabetes has a genetic factor which runs in families. Type 2 diabetics have a metabolic disorder in which the body does not make enough insulin or properly use the insulin the body makes. The body cannot move blood sugar into the cells and the cells starve and die off. Type 2 Diabetes is also called non-insulin-dependent diabetes mellitus (NIDDM). Type 2 is inherited, but it can also be

brought on by obesity. Another factor is a sedentary lifestyle, not enough exercise. This type of diabetes can be controlled through diet and exercise, but in some cases people need to take pharmacological measures such as oral or injection medications on a daily basis ("Type 2 Diabetes").

Another disease which affects a disproportionate number of Native Americans and Alaskan Natives is alcoholism. Alcoholism is a toxin which causes metabolic damage to the cells and depresses the immune system. Alcohol is broken down in the liver and can cause severe damage to those cells leading to liver damage or cirrhosis of the liver. The body does not absorb nutrients well when the body is intoxicated and this can also result in malnutrition.

Another alcohol related disease that affects these minority groups is Fetal Alcohol Syndrome (FAS) which is one of the leading causes of birth defects and mental retardation in Native American children. Fetal Alcohol Syndrome (FAS) affects the fetus or unborn child of a woman who consumes alcohol. A woman needs to abstain from alcohol while pregnant. FAS children suffer with learning difficulties, growth retardation, speech/language delay, and facial abnormalities. The highest risk factor for Fetal Alcohol Syndrome is mothers who drink when they are pregnant. FAS is

preventable through women's abstinence of alcohol during pregnancy which alleviates the threat of this disease ("Preventing Fetal").

Chapter II
LITERATURE REVIEW

A disease which was possibly smallpox or plague wiped out tribes from Maine to Connecticut with a death rate as high as 90%. This disease was transmitted from European seafarers to the American Northeast in the year 1620. In the 1600's the Massachusett, an Algonquin-speaking people numbered 24,000; after 1620 as few as 1,000 Massachusett were left ("The Reservations" 15).

A new community or camp was started in 1646 which was voted in by the legislators of the Massachusetts Bay Colonies. These camps were set aside to protect those Native Americans not infected by the white colonists. In the years between 1620 and 1640 the Massachusett tribe had decreased to 500 men, women, and children due to a second epidemic of smallpox. In order to preserve these people the colonists started camps which would segregate the Native Americans from the colonists diseases. These reservations were referred to as enclaves to preserve the people. A Puritan missionary named John Eliot was the spiritual architect of a new kind of community called a prayer

town. Eliot believed that if the Massachusetts Indians lived like the Englishmen and worshiped like the Puritans, then the Indians would be "reduced to civility" ("The Reservations 16).

Believing that the Native American's had descended from the lost tribes of Israel, John Eliot initiated church camps or reservations to convert the Massachusetts to Christianity. In order for the different tribes to live in church camps, praying towns, or reservations, they had to comply with the Massachusetts Bay Colony's legal code which forbade Indians to worship false gods, the devil, and give up gambling, pre-marital sex, and polygamy. Anglicanizing their names, dressing as the English, and having their hair cut were seen as bridling, civilizing, or assimilating the Native Americans to the British customs and traditions ("The Reservations" 16-18).

Fourteen praying towns existed with 2,200 Indian inhabitants in the Bay colonies, the population was between 1,800 and 2,600, on the islands of Nantucket and Martha's Vineyard. These praying towns were safe until 1675 when the Wampanoag sachem Metacomet led an uprising against King Phillip. Ten of the praying towns were destroyed and those Indians left were either killed or sold into slavery and interred into the four remaining praying towns, now called internment camps.

Two centuries later the United States Government would establish a system of reservations that originally had started as praying towns. From this point on Native Americans would be transferred to different camps, relocated to other parts of the country, and be detained in particular tracts of land, deemed by the U.S. Government as reservations ("The Reservations" 19).

The tribes with the most total acreage (19,775,959 - Arizona) are the Navajo, Apache, Papago, Hopi, Yavapai, and Pima. The Arizona tribes are also the third largest groups of Native Americans in the U.S. with a population of 203,009 according to the statistics published in Figure 1 - American Indian Population compiled by John Wright (550).

Figure 1
American Indian Population

American Indian Population

Source: Bureau of the Census, U.S. Dept. of Commerce, 1990 Census

The Bureau of the Census figures reflect personal self-identification and are not based on any designation by a federal or state government.

State	Total	State	Total	State	Total	State	Total	State	Total	State	Total
AL..	16,312	FL..	35,461	LA..	18,361	NE..	12,344	OK..	252,089	VT..	1,650
AK..	31,245	GA..	12,926	ME..	5,945	NV..	19,377	OR..	37,443	VA..	14,893
AZ..	203,009	HI..	4,738	MD..	12,601	NH..	2,075	PA..	14,210	WA..	77,627
AR..	12,641	ID..	13,594	MA..	11,857	NJ..	14,500	RI..	3,987	WV..	2,365
CA..	236,078	IL..	20,970	MI..	56,131	NM..	134,097	SC..	8,049	WI..	38,986
CO..	27,271	IN..	12,453	MN..	49,392	NY..	60,855	SD..	50,501	WY..	9,426
CT..	6,472	IA..	7,217	MS..	8,435	NC..	79,825	TN..	9,859		
DE..	1,982	KS..	21,767	MO..	19,508	ND..	25,870	TX..	64,349	Total	
DC..	1,432	KY..	5,614	MT..	47,524	OH..	19,859	UT..	24,093	U.S.	1,878,285

SOURCE: John Wright. The Universal Almanac 1997.
Extracted from the American Indian Population separated
by state according to the Bureau of the Census. U.S.
Dept. of Commerce. 1990.

The BIA has one national office, twelve geographic area offices, and within those divisions, there are 109 agency offices (Utter 175). Figure 2 lists the geographic areas and administrative offices of the BIA (Utter 176).

Figure 2

Geographic Areas and Administrative Offices
of the Bureau of Indian Affairs



SOURCE: Jack Utter. AMERICAN INDIANS: Answers to Today's Questions. (1993).

Reporting to the Deputy Commissioner are the Area Director's of the twelve Main Geographic Service Area addresses under the Bureau of Indian Affairs.

Figure 3

Geographic Service Areas of the
Bureau of Indian Affairs

Deputy Commissioner Bureau of Indian Affairs 1849 C Street, N.W. Washington, DC 20240	
Aberdeen Area Director 115 4th Ave. S.E. Aberdeen, SD 57401 (605) 226-7343	Minneapolis Area Director 331 S. Second Ave. Minneapolis, MN 55401 (612) 373-1000
Albuquerque Area Director P.O. Box 26567 Albuquerque, NM 87125 (505) 766-3171	Muskogee Area Director Old Federal Building Muskogee, OK 74401 (918) 687-2296
Andarko Area Director WCD Office Complex P. O. Box 368 Andarko, OK 73005 (405) 247-6673	Sacramento Area Director Federal Building 2800 Cottage Way Sacramento, CA 95825 (916) 978-4691
Billings Area Director 316 North 26th Street Billings, MT 59101 (406) 657-6315	Navajo Area Director P.O. Box 1060 Gallup, NM 87305 (505) 863-8200
Juneau Area Director P.O. Box 3-8000 Juneau, AK 99802 (907) 586-7177	Portland Area Director 911 N.E. 11th Avenue Portland, OR 97232-4169 (503) 231-6700
Eastern Area Director 3701 N. Fairfax Drive Suite 260 Arlington, VA 22203 (703) 235-2571	Phoenix Area Director P.O. Box 10 Phoenix, AZ 85001-0010 (602) 379-6600

SOURCE: Jack Utter. AMERICAN INDIANS: Answers to Today's Questions. 1993.

The Indian Health Service (IHS) is the primary federal health resource for Native Americans. The Indian Health Care Improvement Act of 1976 empowered Native Americans to have access to the highest quality of comprehensive health services. It also enabled them to be connected to services for health care needs outside the reservations through Federal, State, and local programs. The IHS also assists tribes in developing operational authority with Native American staffing and program management development for health care. The IHS covers 34 states in 12 geographic areas and subdivides these service units into 136 locations. Each service unit includes a small hospital or health center with two or more clinics, in or around, an Indian reservation (Utter 181-182).

The Indian Health Service's mission is to maintain: "Individual patient care and community health" (Utter 181-182). Projected use of IHS service population for the 1990's is one point two million people; for the year 2000 an increase is expected of one point four million. Some of the services available to the Indian population through the IHS are: preventive care, emergency services, rehabilitation, mental health programs, and environmental (safe drinking water and sanitation) (Utter 183).

Since 1955 the most notable service, to date, is

the increase in ambulatory medical service care and an extensive program of constructing sanitation facilities and the development of a community-oriented care program (Trujillo 5). Health services can be obtained directly from the Indian Health Service or through Indian Health Service tribal centers and through contract services. Health assistance not available through IHS facilities or IHS tribal centers are contract services which are purchased through local hospitals and private practitioners. Seventy percent of the cost of health care services is covered by the IHS and 30% is covered by additional sources, such as private insurance and state aid (Utter 184).

The IHS agency provides health care services only for those people considered eligible. This list includes "Indians" or Native Americans, and Alaskan Natives, who are federally recognized tribes, bands, nations, or villages. They must live near a designated reservation or IHS health care center. Children who have one parent who is a Native American are eligible. Non-Indian women who are pregnant with a recognized eligible Indian father are also eligible for services, but only for the time they are pregnant and for six weeks after childbirth. People who are near reservations and need emergency medical treatment may use the IHS health centers or clinics on a fee-for-

service basis (Utter 185).

Today the IHS has 50 hospitals and 450 outpatient clinics. Figure 4 displays the Indian Health Service (IHS) facilities and the health centers and clinics operated by the different tribes (Utter 185).

Figure 4

Indian Health Service/Tribal Facilities

Type of Facility	IHS	Tribal
Hospital	43	7
Outpatient		
Health Centers	66	89
School Health Centers	4	3
Health Stations	51	64
Alaska Village Clinics	-	173

SOURCE: Jack Utter. AMERICAN INDIANS: Answers to Today's Questions. Extracted from the Indian Health Service and Tribal analysis of Hospital and Outpatient Clinics accessible to eligible Indians and Alaskan Natives in the United States. 1993.

Native Americans have had longstanding relationships with their physical environment (Lewis 424). Individual wellness is considered as harmony and balance among mind, body, spirit, and the environment. The "Circle of Life" symbolizes Indian life. It is the continuing circle which includes birth, adolescence, adulthood, elder years, passing-on, and rebirth. Indian philosophy on life is to take from the earth, but to be thankful and replace that which was taken (Trujillo 3). Native Americans mostly live in close

knit, small family units cognizant of the land they hunt and live on. They believe in spirits, sacred grounds, ceremonies, rituals, and oral traditions (Lewis 425).

Howard L. Harrod discusses the Plains Indian religion and morality in his book Renewing the World which includes the Blackfeet, Crow, Cheyenne, and Arapaho tribes. These tribes have kept their traditions and cultures alive through social changes in their societies, reinterpretation of their histories, and creative adaptation to the lands to which they were forced to relocate. The Northwest Plains includes land from the western Dakotas in the states of Wyoming and Montana, 150 miles into Northern Canada, eastward into Nebraska, North Dakota, South Dakota, Kansas and southward into the states of Texas, Oklahoma, New Mexico, and Colorado (1-8).

Historically the animal which dominated these four Native American tribes in earlier times was the buffalo. Buffalos provided clothing, coverings for conical tipi's, while the skins were used for rawhide bags and household articles. Tools were also made from the bones of the animal. Buffalos were also a major source of food (Harrod 7).

The rhythm of the tribal life was in synchronization with the herding of the buffalo across

the Plains during the summer months, and in the winter the disbanding of the herds to creek banks and valleys to seek shelter from the harsh winter winds and snows. Tribes were mobile units following the herds; domesticated dogs were also an important part of tribal life. The dogs were used in a carrying capacity to haul the possessions of the camp from one site to another (Harrod 9).

Horses changed the hunting patterns of the Plains tribes in the seventeenth and eighteenth centuries. Instead of corralling animals the tribes were now hunting animals on horseback with guns which made hunting more efficient. Trading of horses also changed the subsistence patterns in their social structure. No longer did they depend on hunting; they were able to catch and sell horses for money or exchange horses for weapons. Also the introduction of horses meant the Plains Indians were able to go further into other territories and territorial conflicts with other tribes escalated (Harrod 8-10).

Experiencing the Sacred from the Plains tribes perspective is their notion of visions: the dream-vision and the waking-vision. Dream-vision consisted of fasting from four to seven days and praying in isolation on a hill or summit. Deprivation of food or fasting developed these dream states which enhanced

their abilities to communicate with objects such as rocks or animal forms. Two other forms of visions are the transfer of power and the inheritance of power. Special helpers and guardian spirits helped the Plains Indians to transcend into these spiritual vision states. Cultural expectations that these visions would occur sustained the traditions of the Plains Indians (Harrod 32-37).

An understanding of religious and moral traditions was experienced through the use of symbols and rituals. Some of the symbols included medicine bundles which medicine men or women were allowed to use for ceremonial rituals. Blackfoot tribes used pipe bundles which were used ceremoniously with the advent of spring and weather conditions. Crow tribes used their bundles for war purposes in ceremonial use (Harrod 66-84).

As mentioned previously tribes transcended religious and moral experiences through their rituals. The bundles associated with rituals are: solar/lunar and astral motifs which are identified with transcendent powers of animal motifs, and these are mediators to humans in the characteristics of speed, vision and cunning, and plant motifs which symbolize the sacredness of the earth. A Native American uses these bundle objects to transcend into visions which takes their thinking to a higher plain, again used

ceremoniously in rituals. An example of a ritual would be the Sweet Medicine Tradition which is a renewal of the people and their world. The Cheyenne Sun Dance invokes barren earth renewal and is associated with rebirth. The ritual of the Sacred Arrow alerts tribes, bands, family members and individuals to meet at a predetermined destination to perform the ceremony where courage and life would be renewed. Religious and moral attitudes were preserved with the use of these visions, ceremonies, and rituals (Harrod 93-105).

Western medicine and traditional Indian healers use a dual health care system approach that exists in most medical communities in and around reservations and in the Indian Health Service (IHS) system. Indian identity is inherited through beliefs, traditions, and customs handed down through time, from elders to children, in the form of ceremonies and storytelling. Medical professionals need to understand the Indians unique cultural and traditional way of life in order to provide quality health care to Indian people (Trujillo 4).

It is estimated that before Europeans arrived there were at least 10 million American Indians and Alaska Natives living in the United States (Trujillo 5). Native Americans changed culturally and environmentally when Europeans first came to the New

World as these Europeans caused epidemic diseases throughout the Indian nations. The white man brought domesticated animals and livestock which ruined the landscape because of the animals feeding patterns. Many native animal species had to compete for food and eventually the native species died out and were replaced by the domesticated animals. Bison and wild horses are two examples of native animals that have dwindled in numbers because of ecological disturbances on the reservations. The Indian character trait of being in tune with nature is to allow the animals free range on the open plains. If drought comes along, then it is nature's way of decreasing the size of the herd and man should not interfere with nature. White men believe that to decrease the size of the herd you kill off the excess; Indians believe nature decides what animals live or die, and under what conditions they are killed. Native American's introduction to the European way of life also influenced their dietary habits (Lewis 423-428).

During the last 50 years diabetes has emerged as one of the leading causes of sickness and death among Native Americans and Alaskan Natives. Diabetes is not only a killer, but complications from the disease also place Indians at greater risk. Some of the complications from the disease are: blindness, leg,

foot and toe amputations, kidney, heart, and neurological disorders. The ratio for diabetes in Indians is 1 to 3 in Arizona and 1 to 25 in Alaskan Natives. Not following traditional dietary patterns has led to a higher incidence in diabetes. Diets heavy in fast food and pre-packaged goods have replaced maize, wild rice, buffalo meat, and vegetables. Type 2 diabetes or adult-onset diabetes has increased with the added fat intake. This type of diabetes does not readily convert sugar from food into energy. Type 2 diabetes also makes cells resistant to insulin in the body. This form of diabetes can be controlled through an exercise regime and carefully restricted dietary intake of fats (LaMountain 54).

Today the U.S. Department of Agriculture gives out food in the Pine Ridge Reservation of Arizona to the Pima Indians. Most of the food handed out through local government programs contains an excessive amount of carbohydrates, fats, and white sugars. Canned meats which are high in fats and have high levels of sodium, and canned peaches packed in heavy syrup are examples of food that is passed out on the reservations for food subsistence programs. To the Pima Indians this food is considered poison according to Lorelei DeCora, a registered nurse, member of the Winnebago Tribe in Nebraska, and founder of the Porcupine Clinic on Pine

Ridge Reservation in Arizona. Indians at one time hunted and killed their own food and dried it in the sun for consumption at a later date. Today food is packaged and most food preparation is accomplished with frying without regard to the oils and fats used. In addition most reservations are not centrally located to area shopping centers so fruits and vegetables are hard to obtain. DeCora recommends more green vegetables and fresh fruits and she is trying to revive the traditional tribal ways of preparing foods. Also she has started a communal gardening project where corn, squash, and beans (the three sisters) will be grown for tribal consumption (Sandrick 42). Karen Sandrick relates a story from a tribal elder to DeCora about his philosophies on diabetes:

this approach to diabetes isn't just about food. When you bring back the knowledge and skills about preparing food, you bring back the ceremonies that go with them. Maybe this is a message from the Creator that we have to hang on to those traditions to survive in the next century. (42)

Increased tribal elder participation in teaching the younger generations in the preparation of traditional foods is one way to keep the customs and the culture alive in the 90's (Sandrick 42).

The states of Arizona and New Mexico are the indigenous territories of the Southwestern Indians.

The tribes that inhabit these lands are the Western Apache, Hopi, Havasupai, Yuma, Yavapi, Navajo, Pima, Papago, Chiricahua Apache, Zuni, and Mescalero Apache. These indigenous tribes use their knowledge of the plant world to survive in their habitat. Cactus fruit is harvested and eaten but does not need replanting because the fruit's seed dispersal from birds replenishes the plant. Hopi Indians utilize the local flora for food, medicine, and tools, while the Navajo who were not relocated to the area until centuries after the Hopi only use some of the wild plants that grow in area. Since the Navajos came later they are still learning to adapt to their new homeland. The pueblo people also called the Zuni considered plants sacred because they felt the Star people had dropped them to the earth. The Apache were a nomadic tribe and hunting consisted of 75% of their food consumption while agricultural products, such as corn, beans, and squash comprised only 25% of their food consumption. The arid lands of New Mexico and Arizona produced vast quantities of seeds and these were harvested by the Indian tribes because they could be ground and made into bread or mush (Niethammer xx-xxii).

Women were the primary gatherers in these tribes while the men were off hunting. While gathering the berries and wild foods it also gave the women a chance

to talk and deepened their culture which unified their village life. Communal preparation including grinding of wheat on a metate or grinding stone and kneading of bread allowed the women more time for discussion and solidified relationships (Niethammer xxvii-xxx).

After the 1930's Indian tribes were becoming more Americanized and not using their indigenous meats, berries or seeds. Today there are many books that have recaptured those recipes that were used by Indian tribes in that time period. Some books are Wild Edible Plants of the Western United States by Donald Kirk, Common Edible and Useful Plants of the West by Muriel Sweet, and Arizona Flora by Thomas Kearney, and Robert H. Peebles (Niethammer xxix).

Because of the arid climate there was not an abundance of food sources in the agricultural area. Mush was a dominant staple and berries or seeds were added for variation. Domestic meat, chili spice, salt, sugar, and onions were added to the staples of corn or bean mush. The Papago diet consisted mainly of cereals, dehydrated vegetables, and sun-dried meats (Niethammer xxviii).

Some of the cactus and cactus-like plant provided food, fiber, and medicine which were supplied by the agave or century plant which was used by the Indian tribes of the Southwest. Navajo Indians found the

prickly pear also called tuna and Indian fig to be plentiful in the desert area throughout the West. Pima, Yumans, and Apaches believe that if you eat too many prickly pear fruits you will get chills and the purple fruit was believed to be poisonous. The harvesting of the saguaro or giant cactus signaled the new calendar year for the Pima and Papago Indians (Niethammer 2-22).

Nuts and seeds used by the southwestern Indian groups included acorns. These were used as a thickener for stews once they were ground into a meal base. Pinyon pine or pignolia is a very high caloric nut. One pound of pignolia nuts contains 3000 calories. It is the custom of Apache women who are pregnant not to eat too many pignolia nuts because the high caloric content would make the baby too large and delivery would be difficult. The Black Walnut or American Walnut was found on the Arizona - Mexican border in the town of Nogales and nogal is the Spanish name for walnut. Seventy-five percent of the nut is oil and it is very rich in fat (Niethammer 58-82).

Grapes, berries, and cherries were also used in great quantity by the southwestern tribes. The Elderberry bush or Blackbead elder is considered a medicinal plant. This particular berry is used in tonics and poultices. Some people become nauseous when

it is made into a juice and consumed. The Wolf Berry plant is eaten by the Navajos, Papagos, Yumas, and Zunis because the berries can be picked off the bush, sun-dried, and eaten like raisins (Niethammer 58-82).

Many other agricultural products are used by southwestern tribes today such as beans (pinto and tepary), chili, corn, melon, pumpkin, squash (summer and winter), and wheat. Many of these products are abundant in the Southwestern United States (Niethammer 128-155).

The Indians of the Southwest Plains are moving towards americanizing their diets and leaving their traditional agricultural ways according to Niethammer (128). Murphy states that Alaskan Natives are also increasing their fat intake which leads to a higher incidence of diabetes (Murphy et al. 680).

A study done by the American Dietetic Association from January 1987 to February 1988 along the Yukon and Kuskokwim rivers in Alaska has shown the most dramatic increase in non-insulin-dependent diabetes mellitus (NIDDM) in Alaskan Natives and Aleutians (Murphy et al. 676). Alaskan Native is a term used to describe people of the Athabaskan, Tsimpsian, Tlingit, Haida, Eskimo, and Aleut descent (Trujillo 5). Before Western civilization impacted the Alaska Indians their traditional food consisted of fish, moose, caribou, and

marine animals. By 1978 the foods were higher in carbohydrates and sugars and soft drink consumption among younger Alaska Natives was three to four times greater than that in the general U.S. population. Overall consumption of carbohydrates and a sedentary lifestyle have led to obesity which was nonexistent before the year 1957 in the Eskimo tribes. The study included 1,124 village adults, 20 years or older, with 492 men and 632 women. The Eskimo population was 895 and the 229 remaining subjects were Athabascan Indians. The information was obtained from village-based health fairs and village clinics. A self-administered, twenty minute, food frequency questionnaire was obtained. People participating gave demographic information and all participants signed informed consent documents. Random blood samples for oral glucose tolerance tests (OGTT) were taken from those in this study group who had a history of glucose intolerance or who were already registered with the Alaskan Area Diabetes Registry. Indigenous protein foods consisted of moose, caribou, seal, walrus, salmon, fish, wild birds, and beaver. Non-indigenous protein foods were beef, pork, chicken, eggs, milk, cheese, chili, and spaghetti. Some of the food results were enlightening. Eskimos ate more salmon and fish than the Athabascan Indians. The Eskimo Indians ate more indigenous proteins in the

form of moose and caribou. This could be related to what was plentiful in that population area at that time in the winter months. The Athabascan Indians ate more non-indigenous proteins, such as chicken and eggs. Both groups consumed large amounts of Tang, Hi-C, sugary soft drinks, butter, and margarine. This study revealed that the intake frequency for salmon, fish and seal oil is associated with the lower rate of NIDDM seen in Eskimo Indians. The generation of Eskimos aged 60 and older showed less propensity to diabetes because they had stayed with the traditional preparation of indigenous foods, such as seal oil, salmon, and fish. The Athabascan Indians who introduced more non-indigenous foods such as snack cakes, doughnuts, sweetened soda pop, white bread, shortening, and deep fried foods were at a higher risk for NIDDM. Both groups are still high risk groups for NIDDM, but the Athabascan Indians particularly are at greater risk according to this study. The recommendation from the Dietetic Association for these two population groups is to preserve traditional customs of food preparation and the consumption of more salmon and fish. Education should be targeted to both groups of Alaskan Indians regarding discarding visible fat from pre-packaged meats, less frying of foods with vegetable oils, and perhaps substituting game animals which are lower in

saturated fats (Murphy et al. 680).

The Alaskan Natives philosophy on life is luck based. Richard Dallam, an architect for the state of Washington, spent six weeks touring native Alaskan villages so he could assimilate his findings of their culture and incorporate this into the building of a hospital complex in Alaska. He discovered that luck is an important concept to Alaskans and he states, "Alaskans believe you accrue luck or lose it depending on how you treat the world" (32). During his visits to the villages he learned that Native Alaskans live in elder-based societies. In various dealings with Alaskan Natives he found, through trial and error, that eye contact with elders is to be avoided, meetings with elders are accomplished by sitting on the floor, and when talking with an elder it is done one elder at a time. This shows a form of respect for the aged in Alaskan society (Dallam 33).

Chronic diseases plague the Native Americans and Alaskan Natives. Individual behavior is cited as the culprit for these conditions. The use of tobacco and alcohol consumption are both rampant. In 1987 a behavioral risk factor surveillance survey (BRFSS) was conducted by the Washington State Health Department. Both a telephone survey and a face-to-face interview method were used. The survey encompassed four tribes

living in the surrounding counties of Washington state, on reservations, and in rural county areas. When the face-to-face interviews were used, only interviewers conducted interviews with respondents of his or her own sex. This method of interviewing leaves less chance for bias; because a female is more open to speak with another female and a male more open to discuss subjects with other males. Some of the topics covered were tobacco use, alcohol consumption, weight and diet, physical activity, injury prevention, and diabetes. Results indicate that 35% of men and 39% of women older than 18 years had not completed high school. Reported household annual income was less than \$15,000 a year and both men and women in this income level received some other kind of financial assistance in the form of welfare, food stamps, or Bureau of Indian Affairs (BIA) benefits. Women smoked more than men in the age range from 25 to 49 years, and smokeless tobacco was used by the younger male generation (Kimball et al. 264-272).

Alcohol was introduced to the Native Americans in the 16th century. The colonists wanted the furs, slaves, and skins that the Indians were able to provide and in order to obtain these products or commodities they wanted to trade with the Indians for these things. In order to draw the Indians into becoming consumers the colonists introduced the Native Americans to rum

distilled from West Indies sugar. It was more profitable for the colonists to trade for furs than to use cash to buy the skins and furs from the Native Americans. Those Native Americans living in or near the colonial settlements were easier to sell the alcohol to than Indians living farther away and near the rivers. The colonists moved farther into Indian territories by loading their canoes with kegs of rum and paddling through the riverways to do more trading. This escalated the use of alcohol by Native Americans. By the eighteenth century once the Native Americans had traded skins and furs for all the guns and blankets they could possibly use, the skin traders began selling more alcohol to the Indians. The next step colonists took was to offer Native Americans gifts of alcohol at social gatherings. This gift giving spread the alcohol to more Indian communities and reached as far as the Western part of the United States (Mancall 29-49).

Today alcohol consumption of Native Americans living on reservations is very high according to the Indian Health Survey. Both men and women reported that when they drank they consumed enough to get drunk or pass out. This is called "binge drinking". It is an all-encompassing problem on Indian reservations associated with unemployment, depression, or feelings of hopelessness or helplessness. Both males and

females also reported driving an automobile under the influence of alcohol. Indian reservation statistics also report a large number of deaths by automobile accidents. This includes the driver of the vehicle, passengers, and any other cars or bystanders that get hit by the person driving the automobile under the influence of alcohol. More than one person is affected when a person drives drunk (Kimball et al. 264-272).

According to Philip Long in his work on "Alcohol Dependence: An American Description", he states alcoholism is the dependence on alcohol for both physiological and psychological reasons. Alcohol can cause metabolic damage to every cell and it also depresses the immune system. Withdrawal symptoms include insomnia, hallucinations, convulsions, hand tremors, anxiety, physical agitation, and profuse sweating (Long 1).

Fetal Alcohol Syndrome (FAS) is a medical diagnosis for a type of birth defect caused by women who are pregnant and who drink alcohol heavily. Children born to mothers who drink excessively have a higher incidence of their children being born with growth deficiencies, malformations, and central nervous system abnormalities. Some children born with some characteristics of FAS, but not all characteristics are diagnosed as having Fetal Alcohol Effects (FAE). Other

risks associated with women who drink heavily are: spontaneous abortions and stillbirths, decreased birth weights, and central nervous system disorders including tremors, delayed development and attentional problems (Streissguth, LaDue, and Randels 1-4).

Identifying features of malformations include craniofacial anomalies: short palpebral fissures, epicanthal folds, flat midface, thin upper lip, low nasal bridge, minor ear abnormalities, short nose, micrognathia and microcephaly (Streissguth, LaDue, and Randels 7).

In the developmental stages a child born with FAS often loses weight after birth, is irritable, appears scrawny, has a weak sucking reflex, and is usually readmitted to the hospital during the first few months due to a failure to thrive, with complications from pneumonia, heart conditions, and hip dysplasia (Streissguth, LaDue, and Randels 10).

Due to the stress of feeding difficulties and erratic sleep/wake cycles this is often the time a child born with FAS is often neglected, abandoned or abused by their biological mother who has not stopped drinking. The development of a child born with FAS is slower than a child not born with FAS. Slow motor skills, slow vocalization of words and strings of words, and adjustments from bottle feeding to solid

feeding usually leads to digestive problems, poor appetites and disinterest in food (Streissguth, LaDue, and Randels 10).

During the preschool years FAS children are usually shorter in stature than peers their age. Hyperactivity, low attention spans, and an excessive need for bodily contact in the form of touching, patting and kissing is especially prevalent in the preschool years. Speech is delayed and articulation is not sharp. Kindergarten and first grade are usually accompanied by referrals for special education because of a lack of reading and writing skills. Poor peer relations and isolation occur at this time due to excessive bodily contact (Streissguth, LaDue, and Randels 11-12).

Middle school years find that a child who has FAS has better reading and writing skills than arithmetic skills. Completion of assignments, distractedness in the classroom, and poor school attendance add to the stress of a child with FAS. If a child is not tested at this period by a psychological evaluation then a child with FAS will not get the necessary guidance to be placed in an education/vocational program that suits his/her needs. If the student is not placed correctly then low adaptive living skills and poor intellectual development make is nearly impossible for the child

with FAS to survive, be employed, be independent and live on their own (Streissguth, LaDue, and Randels 12).

Tribal councils and community leaders are working on developing a program for prevention and intervention because the prevalence for FAS is so high in many Native American communities. Indian Health Service workers, Bureau of Indian Affairs workers, medical personnel, social workers, and alcoholism counselors need to be alert to the effects of Fetal Alcohol Syndrome and initiate an ongoing awareness of patients with FAS and provide in-service programs for those affected. Tribal policies and vocational/educational programs need to be started in the communities where FAS is prevalent. Alternative choices for careers need to be addressed for those afflicted with FAS because the skills needed to keep a full-time job such as higher math and reading skills are not attainable to children with FAS (Streissguth, LaDue, and Randels 43-45).

In 1991 the Center for Disease Control (CDC) signed an inter-agency agreement with the Indian Health Service and the state of Alaska to form joint programs to prevent FAS. The CDC funds projects to identify women at high risk of having a child born with FAS. The CDC performs screenings in prenatal clinics, identifying mothers who already have a child with FAS

and follow-up with case management and counseling in order to give support to those mothers identified and help them achieve abstinence. In 1992 cooperative agreements with three universities and five state health departments were funded through the CDC to design prevention strategies and to evaluate the effectiveness of those strategies. The Healthy People 2000 goals for children's health is a major concern to the CDC. To advance the cause to fight Fetal Alcohol Syndrome the CDC provides public information to anyone who wants accurate information about FAS. The address for more information is: Fetal Alcohol Syndrome Prevention Section, Division of Birth Defects and Developmental Disabilities, National Center for Disease Control and Prevention, 4770 Buford Highway Ne, Atlanta, GA 30341 ("What CDC" 1-6).

Of paramount concern to tribal agencies is the increased use of alcohol and all the diseases associated with this drug. Alcoholic Cardiomyopathy is a disorder resulting from excessive alcohol ingestion which weakens the heart muscle and the heart can no longer work efficiently. This also affects the lungs and liver. Heart failure is the result of damage to multiple tissues and organs in the human body. Some symptoms of alcoholic cardiomyopathy are palpitations, irregular pulse rate, overall body swelling of hands,

feet, and ankles, shortness of breath, oliguria - decreased urine output and nocturia - need to urinate at night. Symptoms usually appear in the advanced stages of this disease. Most cases are not discovered until the person has heart failure. Complications to the disease include congestive heart failure and cardiac arrhythmias ("Alcoholic Cardiomyopathy" 1-4).

Obesity is also a major risk factor for cardiovascular disease, diabetes, and hypertension. The major goal of the Washington State American Indian Study conducted in 1987 was to support tribal efforts to set objectives and design interventions for healthier reservations and communities associated with reservations. Suggested efforts included nutritional education and exercise programs to address obesity. This would help to control the type-II diabetes population and the chronic conditions that accompany this disease. Health promotion and disease prevention are both major objectives of the Indian Health Service and the Center for Disease Control. (Kimball et al. 264-272).

Elderly Native Americans are also a part of the rural population that are underserved. Talmadge D. Smith, author of "The Elderly Native American-- Forgotten Again" in Aging Magazine, asserts his opinion: "Elders are again the forgotten people when

it comes to overall health care that has been promised to our Native Americans" (50). Traditionally, the American Indians have taken care of their own when they became ill by keeping them in their homes and taking care of their needs. Today, because of economic factors, both husbands and wives must work, and their children must go outside the reservation to look for work. No one is home to take care of frail elders. There is a lack of nursing homes and long term care services (Smith 50). The Indian Health Service emphasizes children and family concerns more than those of elderly Indians (Mercer 186).

Only thirteen or fourteen American Indian-owned nursing homes exist in the United States, and only a few care for Native Americans only (Smith 50). Two Native American owned nursing homes are in Navajoland, Chinle (79 beds) and Toyei (64 beds). The Navajo nation is the third largest U.S. reservation-based tribe and the elderly growth projection is 3% per year. The Navajo tribe is also the poorest. Forty-seven percent live below the poverty level and large areas on the reservation have no piped water or indoor toilet facilities. There is a lack of electricity and lighting and most do not have telephones. Most Navajo's must drive 30 miles to the nearest IHS facility for health care (Mercer 186).

The Chinle Nursing Home in Arizona is operated by Navajolands Nursing Homes. It is a nonprofit organization run by an all Navajo board of directors. This is a 79 bed nursing home within walking distance of the IHS hospital. The Chinle facility provides intermediate care for reservation residents and the two wings are split, one for women and one for men. Navajo elders are called Grandparents. These elders are referred for admission to the nursing home by family members, IHS staff, tribal communities, public health workers or the elder themselves. Primary reasons for nursing home admissions are unsafe home for Grandparents because of unsanitary living conditions (no indoor bathroom or running water); homes were too isolated and transportation too unreliable during winter months; income too inadequate to sustain their quality of living; and Grandparents children work off the reservation and are not able to care for Grandparents during the day. Many reasons for putting Grandparents into the Nursing Home were alcohol related. There were several instances in this article where the money the Grandparents obtained through Social Security or SSI was taken by an alcoholic son or daughter. Sometimes the Grandparent was an alcoholic and could not care for himself/herself. In addition, some Grandparents have diabetes and are unable to care

for the chronic conditions that accompany the disease (Mercer 181).

Often there are communication problems because the elder Navajos do not speak fluent English. They speak their own language which often leads to confusion because some translations of English words are not necessarily what that particular word means in Navajo. Translators are used in non-reservation American nursing homes to help alleviate this miscommunication (Mercer 181).

The Navajos deep sense of family is the center of their social structure. In some Navajo homes there are 10 family members living under one roof. This is considered a blessing because a Navajo measures poverty by the lack of family members. Many families visit the Chinle Nursing Home often and travel great distances to do so (Mercer 185).

There are many traditions that are upheld in a Native American Nursing Home that are not done in the non-reservation American Nursing Home systems. Navajo's sleep on sheepskins stacked on the floor and this tradition is upheld in Chinle. Some other customs or traditions which are followed include sweat baths. A Navajo does not feel completely clean unless they have sweat both from the inside (spiritually) and from the outside. The Chinle Home has two separate sweat

baths; one is for the women and the other is for the men. Navajo hair washing is another convention the Nursing Home observes. Many Navajo wash their hair with yucca roots and do not feel clean if conventional shampoo's are used. Food is another tradition that is honored at Chinle. Grilled mutton, mutton stew, corn, and fried potatoes are served often. Family is also encouraged to bring in traditional foods for the Grandparents. Allowing these traditions and customs to be carried out in the Chinle Nursing Home allows the elder the dignity that is deserving to one who has reached an age when a Grandparent needs help with activities of daily living (Mercer 188).

Death is also not discussed among the Navajo. The Navajo believe to speak about death may bring death to you. Advance directives, living wills, and powers of attorney are not prepared because to speak of death is not discussed in those Native American families who practice the customs and traditions of the Navajo. Social workers do not press Grandparents for this paperwork and it is an accepted custom at Chinle not to ask for these directives. Nursing staff also point out that the Navajo consider it taboo to perform CPR on a person. If that person dies, he or she may take your breath to the grave. Navajos who are Christians are more likely to allow nursing staff and doctors to



perform CPR. When a Grandparent is ready to die they are moved to the IHS facility because it is not suitable for a Navajo to die in the Nursing Home. If it does happen then a Singer comes and performs a cleansing ceremony so the room can be used again. Ceremonies or cleansings are done often for the entire nursing facility to uphold the traditional Navajo ways (Mercer 189).

Chinle offers to its residents the customs and traditions of the culture they have lived with their whole life. Most Grandparents who live in off-reservation nursing homes are reported to have more depression, loneliness, and isolation. Most Grandparents who live at Chinle Nursing Home are said to be content, satisfied, and "at home" according to the article written by Susan Mercer (190).

More information about rural health care can be researched from the following organizations; National Rural Health Association, Kansas City, MO; Office of Rural Health Policy, Rockville, MD; Senate Rural Health Caucus, Washington, D.C.; and House Rural Health Care Coalition, Washington, D.C. (Coward and Dwyer 43).

Native American Organizations need additional financial assistance to enable the Indian Health Service to provide nursing homes on the reservations so that Native Americans, who are in need of long term

care, could live among their own culture and not with strangers. Relatives would not have to travel far distances to visit families in long term care facilities, and the food prepared in these facilities would be the traditional food these Native Americans have eaten their entire lives. People live longer and happier lives when their quality of life is not in constant turmoil (Smith 51).

As with other groups, the author contends that cultural mindedness is the key to working with Native Americans and Alaskan Natives. Physicians need to wear two medical hats when treating Native Americans. They need to use Western World medicine/technologies and combine that with cultural and traditional customs from the Indian heritages. Through the Indian Health Service more Native Americans are being educated about the consequences of obesity, diabetes, alcoholism, fetal alcohol syndrome, alcoholic cardiomyopathy, and the chronic illnesses that can be a result of overindulgence. Native Americans need to find a way to coexist with Western World philosophies and cultures, while maintaining a balance with their own cultures, heritages, and traditions if they are to survive into the next century in the Western world.

Chapter III

SELECTIVE REVIEW AND EVALUATION OF RESEARCH

The research studies that pertain to my hypothesis and central to my thesis on Native American Indians and Alaskan Natives come from the Center for Disease Control in cooperation with the U.S. Department of Health and Human Services, The Inter-Tribal Health Project, and The Journal of Nutrition, the official publication of the American Society for Nutritional Sciences.

According to Len J. Paulozzi, MD, and James M. Mendlein, PhD in their chapter on "American Indians and Alaska Natives" in the 1994 Chronic Disease in Minority Populations they state: "The Native Americans and Alaskan Natives are racially different in their cultural, genetic heritage, geographic location, sociodemographic characteristics, and lifestyles" (Paulozzi and Mendlein 3-1).

Trying to define tribal membership is a difficult task because the Bureau of Indian Affairs uses different criteria from the criteria used by individual tribal members. These standards are used by the Bureau of Indian Affairs to specify what entitlements Native Americans and Alaskan Natives have available to them

through different government agencies. The Bureau of the Census relies on self-identification for classifying an individual as an American Indian or an Alaskan Native (3-1).

Current standards for collecting and publishing federal statistics on race and ethnicity were established by legislation in 1976 under Directive 15 by the Office of Management and Budget (OMB). The racial and ethnic categories for federal statistics are interpreted as follows for American Indian or Alaskan Natives: "A person having origins in any of the original peoples of North America, and who maintains cultural identification through tribal affiliations or community recognition" (Paulozzi and Mendlein A-1).

Race and ethnicity for recordkeeping and reporting are treated separately. Race is considered American Indian or Alaskan Native, Asian or Pacific Islander, and Black or White. Ethnicity is categorized as Hispanic origin or Not of Hispanic origin (Paulozzi and Mendlein A-1).

One limitation on the race and ethnic standards for federal statistics and administrative reporting is that the use of race and ethnicity data in reporting often leaves out socioeconomic status and income level. This leaves out incidences, distributions, and control of a disease in a population variation between groups

to explain variations on data. Another limitation is a discrepancy in the measures used for data collection. Self-reported or observer-reported discrepancies lead to different conclusions. Census undercounts also need to be looked at as a limitation in reporting because they reflect errors in estimating a population (Paulozzi and Mendlein A-4).

According to the 1990 Bureau of the Census there were two million descendants of American Indian and Alaskan Native ancestry. This was approximately less than one percent of the U.S. population and makes this the smallest minority group in the United States. A limitation to the 1990 Bureau of the Census report is individuals who have changed their self-identification status from other races to American Indian or Alaskan Native. The Census reported that sixteen percent of American Indians were Cherokee, twelve percent Navajo, six percent Chippewa and Sioux, four percent Choctaw and the Pueblo, Apache, Iroquois Confederacy, Lumbee, and Creek tribes were numbered at less than 10,000 individual members. The Bureau of the Census considers the six tribes of Alaskan Natives to be Eskimos, Aleuts, Alaskan Athabaskan, Tlingit, Tsimshian, and Haida. Of the 86,000 Alaskan Natives counted in the census the Eskimos comprised half of the population, twelve percent were Aleuts and the remaining thirty

seven percent were American Indians (Paulozzi and Mendlein A-4).

The age distribution of American Indians and Alaskan Natives indicates that thirty percent are less than fifteen years old and six percent are 65 years or older. Males are more abundant up until age 29; females outnumber the males after the age of 29 (Paulozzi and Mendlein 3-1, 3-2, 3-3).

The states of Oklahoma, California, Arizona, New Mexico, Alaska, Washington, and North Carolina were home to most Native Americans and Alaskan Natives in the year 1990. While the majority of Native Americans and Alaskan Natives do not live on reservations, twenty-two percent of this population lives on 314 reservations and historic trust lands governed under the United States Congress (Paulozzi and Mendlein 3-4).

The Navajo reservation which consists of 14 million acres and is contiguous across the states of Arizona, New Mexico, and Utah is stated by the Bureau of the Census to have a population of 143,405. The second largest reservation is Pine Ridge which is located in South Dakota with a population of 11,182. The boundaries of the lands allotted to these populations were established by treaty, statute, and executive court orders. Fifteen percent of the American Indian population live on tribal or village

areas, twenty-two percent on reservations and sixty-three percent live on land other than reservations or tribal and village areas (Paulozzi and Mendlein 3-1, 3-2).

The Eskimo groups that inhabit Alaska are the Inupiat and the Yupik. The majority of Eskimos and Aleuts live in Alaska and some inhabit the United States along the Pacific coast states of Oregon, Washington, and California (Paulozzi and Mendlein 3-4).

The ten most prevalent chronic diseases that affect American Indians and Alaskan Natives are: ischemic heart disease (IHD), cirrhosis, diabetes, lung cancer, breast cancer, stroke, chronic obstructive pulmonary disease (COPD), colorectal cancer, cervical cancer in women, and prostate cancer among men (Paulozzi and Mendlein 3-9).

Morbidity information was collected from two sources. The first source was the National Health Interview Survey (NHIS) which included data in the form of crude and age-adjusted prevalence rates from 1986-1990. The second source was the 1987 Survey of American Indians and Alaskan Natives (SAIAN), a part of the national Medical Expenditure Survey performed by the Agency for Health Care Policy and Research under the Department of Health and Human Services. Paulozzi and Mendlein state that a limitation to this study was

misclassification on death certificates by listing the decedent as white. The mortality rates for American Indians and Alaskan Natives are based on death certificate identification of the decedent as a member of this minority. Consequently this reduces the mortality rates for persons classified as American Indians and Alaskan Natives (Paulozzi and Mendlein 3-9).

The National Health Interview Survey (NHIS) is a multistage probability design. In the first stage of the sampling or target area, the United States is divided into 1,900 geographically defined primary sampling units (PSU's). A unit consists of a county, group of counties, or a metropolitan statistical area (MSA). Of the 1,900 PSU's only 198 PSU's are chosen for the sampling. In the second stage of the sampling, each PSU is divided into segments of 4-8 households each, and all occupied households are assigned to interviewers (Paulozzi and Mendlein D-1).

Interviewers from the Bureau of the Census conducted the interviews in-person and in the individuals home dwelling. The reference period for the survey is all information included within the last 12 months timeframe. The NHIS assigns condition categories and uses the International Classification of Disease (9th Revision) (ICD-9) codes which are assigned

to the chronic diseases (Paulozzi and Mendlein D-1).

Limitation to this study were participants who were interviewed and who did not recall or wish to divulge information of a personal nature to the interviewer. A chronic condition which exists may go unreported. Also an individual may be elderly and die during the reporting period of the survey; this would then reflect an inaccurate count in the data (Paulozzi and Mendlein D-2).

An aggregated, state-based, prevalence estimate of selected risk factors was derived from the Behavioral Risk Factor Surveillance System (BRFSS) from 1991-1992 and included 1,811 American Indians and Alaskan Natives out of a total population survey that numbered 180,255. (Paulozzi and Mendlein F-1, F-2).

The study included 822 women and 989 men of American Indian and Alaskan Native descent. The BRFSS survey contained White Americans, African-Americans, Asian/Pacific Islanders and, by ethnicity, each group as to whether they were Hispanic or Non-Hispanic (Paulozzi and Mendlein F-7).

State health departments used random-digit dialing telephone techniques to conduct statewide point-in-time behavioral risk factor surveys. Forty-nine states in the United States plus the District of Columbia, excluding the state of Wyoming (because the state did

not wish to participate in the survey), were the target population for the behavioral risk factor survey.

People chosen were greater than or equal to eighteen years of age or older who lived in households with one or more telephones. The sample size for the 1991 and 1992 sample of respondents was 184,059. Four thousand four hundred and fifteen respondents were excluded from the survey because they did not report their age and race on the initial survey (Paulozzi and Mendlein F-1, F-3).

Analysis was conducted on 180,255 observations from 46 states and the District of Columbia were analyzed. These respondents were tallied and recorded on the BRFSS sample size chart by age, race, and sex (Paulozzi and Mendlein F-2, F-7).

Data collected on the questionnaire provided information on demographics, and risk factors such as cigarette smoking, exercise, alcohol (chronic or binge) consumption, weight control, and high cholesterol. The preventive health practices tallied were questions on past screenings for cholesterol checks, blood pressure measurements, and screenings for breast and cervical cancer. Access to health care including access to preventive services and questions on Health Insurance was also addressed in the BRFSS (Paulozzi and Mendlein F-4, F-5).

Another chronic disease or western disease that affects American Indians and Alaskan Natives is cardiovascular disease (CVD). The Inter-Tribal Heart Project: Results from the Cardiovascular Health Survey states that the leading cause of death among American Indians and Alaskan Natives is CVD; this includes both heart disease and stroke (Inter-Tribal Heart Project 1).

The three communities that participated in the Inter-Tribal Heart Project were the Red Lake Chippewa Reservation, the White Earth Chippewa Reservation and the Menominee Reservation in Wisconsin. The Bemidji Service Area consists of 32 tribes in four states: Indiana, Michigan, Minnesota, and Wisconsin (Inter-Tribal Heart Project 5).

The largest tribes in these four states are the Chippewa, the Oneida, and the Menominee. The largest band is the Chippewa whose approximate size is 70% of the American Indian and Alaskan Native population. The Red Lake Band of Chippewa Indians is comprised of 8,677 members of which 5,500 live on the Red Lake Reservation in North Central Minnesota. This is one of the original tribes who live on their ancestral homeland. Average income is equal to \$7,000 per year and unemployment was calculated by the Bureau of Indian Affairs at 50.3% (Inter-Tribal Heart Project 5-6).

The White Earth Reservation located in northwestern Minnesota is 70 miles southwest of Bemidji, Minnesota. The total tribal enrollment of 20,496 makes them the largest tribe by population in the Bemidji Service Area but only 5,861 Chippewas live on or near the reservation. Average income is at \$7,737 with unemployment at 9.4% (Inter-Tribal Heart Project 6-7).

The Menominee Tribe resides in Wisconsin; there are 7,424 members and of those 4,750 live on the reservation. In 1990 the per capita income was \$5,674 with unemployment calculated by the Wisconsin Department of Industry, Labor and Human Relations at 18.3% in 1992 (Inter-Tribal Heart Project 8).

The target populations of the study were the members from the Red Lake Chippewa, Earth Chippewa, and Menominee tribes who were invited to apply for participation in a cardiovascular disease prevention project. The criteria established for participation in the project was specified by the Center for Disease Control (CDC), the Indian Health Service (IHS), and the Bemidji Area Office Tribal Advisory Board (5-9).

The study population was taken from an age-stratified random sample of adults ages 25 - 44 and ages 45 and older. The lists were taken from the Indian Health Service. People chosen were those

individuals who had used the local Indian Health Service or Tribal Health Care Facility at least once during the past three years. There were a total of 1,367 participants. Sixty-three percent of the participants were women, for a total of 866 women; thirty-seven percent were men for a total of 510 men. The majority of the participants were between the ages of 25 and 64 (Inter-Tribal Heart Project 5-7).

Each participant was asked to participate in an in-depth risk factor assessment. This included an interviewer-administered questionnaire and physical examination performed by a public health nurse who was trained in interviewer techniques and standardized procedures. Transportation was arranged and some home visits were performed. Respondents were reimbursed for their participation in the study (Inter-Tribal Heart Project 9-11).

Some limitations to the study were the fact that only American Indians or Alaskan Natives living on or near the reservations were asked to participate and in this particular project the age distribution was skewed towards younger people. The figures are not adjusted for differences in age distribution (Inter Tribal-Heart Project 14).

The risk factors addressed in this study were hypertension, diabetes, high cholesterol, tobacco use,

weight, physical activity, food habits, and psychosocial characteristics (Inter-Tribal Heart Project 25-65).

The statistical analysis was based on a response to a questionnaire on demographics, health care access and use, family and medical history, hypertension, diabetes, cholesterol, tobacco use, weight, physical activity, food habits, and psychosocial characteristics. The respondents were broken into age groups, education, household income, and employment status. The accuracy of this study for each risk factor was estimated to be at a 95% confidence interval with a plus or minus estimated percentage between the mean of the lower limit and the upper limit (Inter-Tribal Heart Project 73).

In contrast the last survey is on the Navajo population. The Navajo reservation consists of 26,109 square miles and covers portions of Arizona, New Mexico, and Utah. Largely rural with a population density of around 7 persons per square mile; the Navajo population exceeds 200,000 according to the 1990 Census. In 1991 the Navajo Health and Nutrition Survey (NHNS) was started by the Indian Health Service to help them fill in some of the gaps in their knowledge about risk factors for chronic diseases such as diabetes, cancer, cardiovascular disease, and hypertension

(White, et al. 2078S-2079S).

The population for the study was drawn from all Navajo people at least twelve years of age who lived within the main Navajo Reservation or in adjacent communities of a designated eight Navajo Area Indian Health Service unit. The eight service units were in Chinle, Fort Defiance, Winslow, Tuba City, and Kayenta in Arizona. The smaller service units were grouped together consisting of Crownpoint, Gallup, and Shiprock in New Mexico. Of those eligible, the direct enumeration was 130,200 Navajo (White et al. 2079S).

Eligible households were randomly selected using a three stage cluster design. The original design was developed from maps, aerial photographs, and population distributions from a radon survey that was conducted on the Navajo Reservation in 1989-1990 by the United States Government while they were looking for radioactive gas (White et al. 2079S).

The first stage of the three cluster design sampling consisted of selection of census enumeration districts within each service unit. Between five and seventeen enumeration districts were chosen per service unit (White et al. 2079S).

The second stage consisted of selecting one segment within each enumeration district. The Navajo Health and Nutrition Survey used the same segments

selected in the radon survey in 1989-1990. Reservation enumeration districts were partitioned into equal number of households, and from each enumeration district one segment was selected (White et al. 2079S).

The third stage consisted of selecting 10 household within selected segments. A household was defined as a group of individuals sharing income and eating together. Households were numbered on a map and randomly selected to be included in the sample. There were city dwellings and rural camp dwellings. The rural households consisted of a camp which included one or more dwellings that housed related individuals (White et al. 2080S).

Participants accepted to be interviewed numbered 985 out of a total target number of 1,690. Questions selected for the survey were modified so they could be easily translated into the Navajo language and cultural appropriateness was also taken into consideration. Information obtained included questions on education, socioeconomic status, cancer screening, diabetes screening, exercise, and eating habits, and heart disease including hypertension. Also included was tobacco use, alcohol, and drug use. Questionnaires were available to the participants in either English or the Navajo language (White et al. 2080S).

Interviewers were chosen from the local community;

they also had to be Navajo members of the communities involved in the study. Another stipulation for interviewers was the need to be bilingual which meant they had to speak English and Navajo; candidates also needed prior experience with venipuncture in order to be chosen as an interviewer. Those chosen had forty hours of training under the direction of the Center for Disease Control and the Indian Health Service staff. Interviewers then had to work six weeks until they were certified in collecting, processing, and storing blood samples (White et al. 2080S).

Once household members had been accepted to participate in the Navajo Health and Nutrition Survey they had to sign an informed consent form. This was approved by the Health and Social Services Committee of the Navajo Nation Council, members of the Navajo tribal judicial system, and the Navajo Area Institutional Review Board. Participants were reimbursed for their participation in the survey and each person or household member was paid \$10.00 (White et al. 2080S).

Interviewers visited the homes in pairs and gave an oral glucose tolerance test, measured blood pressure, and anthropometric dimensions. The standards for the anthropometric measurements included standard height with shoes; weight without shoes, mid-arm circumference; waist and hip measurements; triceps,

suprailiac, subscapular skinfolds measurements, and wrist and elbow thicknesses. The blood testing included a 28-item blood chemistry profile, a complete blood count, and an oral glucose test taken after an overnight fast from 17 - 24 hours and at one hour and two hour intervals after the participant drank 75 grams of glucose in water (White et al. 2080S).

Some limitations of the study included an undercount of male heads of household because the interviews were done during the day from Monday thorough Friday and male heads of households were not at home or working. The same limitation could also be applied to teenagers being at school while the interviews were being completed (White et al. 2082S).

Questions about household income were declined by many participants which could possibly skew the socioeconomic data. Also the body measurements may be underestimated because many participants were too modest or embarrassed to allow the interviewer to take the measurements. Questions regarding exercise and physical activity were too ambiguous for the participants to answer (White et al. 2082S)

The last item to be addressed from the Navajo Health and Nutrition Survey was the intake of nutrients and food sources of nutrients among the Navajo. Diet has been related to the etiology of diabetes,

cardiovascular disease, and cancer in Navajo and other American Indian tribes. One survey done in 1955 on 1,246 individuals found that the Navajo diet was good; there seemed to be no nutritional deficits, with the exception of an inadequate level of vitamin C intake. Food sources came from mutton as a dietary staple, with sugar, flour, coffee, and bacon being added to the diet intakes plus Navajo grown and gathered plant foods. Between the years 1961 and 1981, three more surveys were done and the deductions from these found evidence of nutritional inadequacy among children, pregnant, and lactating women. This included low vitamin A, folate, calcium, and iron (Ballew et al. 2085S).

In this nutritional survey there were 985 participants, 390 men and 556 women broken down by age group and sex. Thirty five pregnant women and four individuals were excluded from the survey because they were unable to respond to the dietary interview. This survey was also based on the three-stage cluster design. The interviews were given Monday through Friday and were done during the months from October 1991 through December 1992 (Ballew et al. 2086S).

Interviewers were members of the Navajo community and were fluent in both Navajo and English. The participants were administering a 24 hour diet recall interview. Some standardizations included portion size

controls, preparation techniques, brand name item recall, standardized recipes, and the utilization of nutritional supplements. This data was recorded on interview forms and later transferred for entry into the Food Intake Analysis System (FIAS version 2.3) software. Items added into the software for this particular study included six Navajo food ingredients: blue corn meal, juniper ash water, Mormon tea, and two Navajo teas (*Ephedra* sp. and *Thelasperma* spp.) plus North American pine nuts (Ballew et al. 2086S).

Some recipes that were modified in the FIAS software were fry bread, Navajo tortillas, blue corn mush (with and without ash), kneeldown bread, Navajo cake, sumac pudding, some soups, stews, and mixed dishes. Three people supervised the correctness of the interpretation into the FIAS software: a supervising nutritionist, a Navajo coder, and a coding and software consultant. From the information entered the median intake of nutrients to sex and age specific recommended daily allowances were compared to the Recommended Daily Allowances (RDA) by the National Research Council. Analysis was presented in a weighted means, with standard errors for energy and nutrients at the 15th, 50th, and 85th percentiles (Ballew et al. 2086S).

Foods were grouped into categories similar to those of the Food Guide Pyramid put out by the U.S.

Department of Agriculture (USDA). These categories also took into account Navajo food classifications and eating patterns (Ballew et al. 2086S)

Some limitations to this study were in the mixed dish recipes where an ingredient such as mutton had to be classified in the meat food group. Fruits and vegetables had to be categorized in the food group analysis but were not able to be broken down in the nutrient intake because of limitations in the FIAS software. Pizza was another item that could not be coded by the FIAS system and it was listed as one item instead of bread for the crust and calcium for the cheese. Cheeseburgers also had to be put under meat even though there was calcium in the cheese. In this survey calcium may be underestimated because of the FIAS software limitations. One more limitation was in the standardization of a serving size. Some Navajo recipes like a Navajo taco does not conform to the Food Guide Pyramid as a standard serving size, but the FIAS software tabulated a Navajo taco (which is much larger than a standard taco) as a single serving. Therefore a standard size serving does not consistently adapt to the Food Guide Pyramid's standard size serving even though the FIAS software counted the number of times the participants ate that specific food (Ballew et al. 2086S).

The food study was based on macronutrients and the percentages of consumption of foods broken down into energy, carbohydrate, protein, total fat, saturated fat, cholesterol, and fiber. This survey also broke down the percentage of vitamin A, vitamin C, folate, calcium and iron (Ballew et al. 2091S-2092S).

The surveys discussed in chapter three suggest how traditional dietary patterns along with increasing dependence on refined, processed, and nutrient-poor foods could be linked to the increasing decline in Native Americans and Alaskan Natives health. These newly developed dietary patterns are a departure from their culture, lifestyle, and heritage.

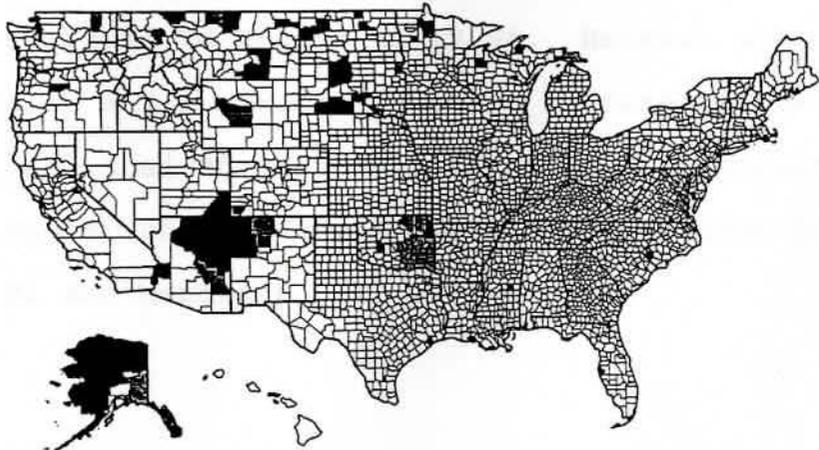
Chapter IV

RESULTS

The percentage of American Indians and Alaskan Natives living in United States counties according to the Bureau of the Census for 1990 is depicted by the United States map in Figure 5. The shaded areas represent percentage of population per county; 0% - 10% is represented by the white areas; while the shaded areas is represented by 11% - 24% of the population; and finally 25% to 100% is represented by the blackened area (Paulozzi and Mendlein 3-4, 3-5).

Figure 5

Percentage of American Indians and Alaskan Natives in U.S. Counties, 1990.



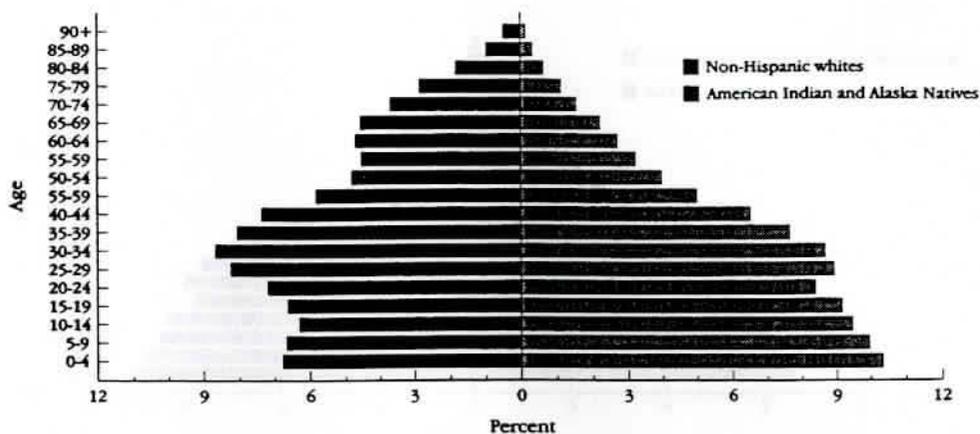
SOURCE: Bureau of the Census, 1990. Chronic Disease in Minority Populations. (1994)

Paulozzi and Mendlein state that less than one percent of the United States population is comprised of Native Americans and Alaskan Natives, and according to the Bureau of the Census for 1990, their population figure is around two million people. They are still considered the smallest minority group in the United States (3-1).

The age distribution of American Indians and Alaskan Natives shown in Figure 6 clearly indicates the age population of male/female 15 years or younger to be about 27.9%, as compared to those of the non-Hispanic whites, which is about 10% lower or 19.7%. Ages 15 - 44 for both populations are evenly distributed at around 47%. The ages between 45 - 64 show a slight decrease in the mortality rates for American Indians and Alaskan Natives to be around 5 percent lower or 14.9%, compared to Whites at 19.9%. Between ages 65 - 84 there is a 7.4 percentage point difference favoring Whites and those 85+ show Whites to be 0.9 percentage points higher than Native Americans and Alaskan Natives (Paulozzi and Mendlein 3-2, 3-3).

Figure 6

Age Distribution of American Indians/Alaskan Natives and Non-Hispanic White Populations, United States 1990

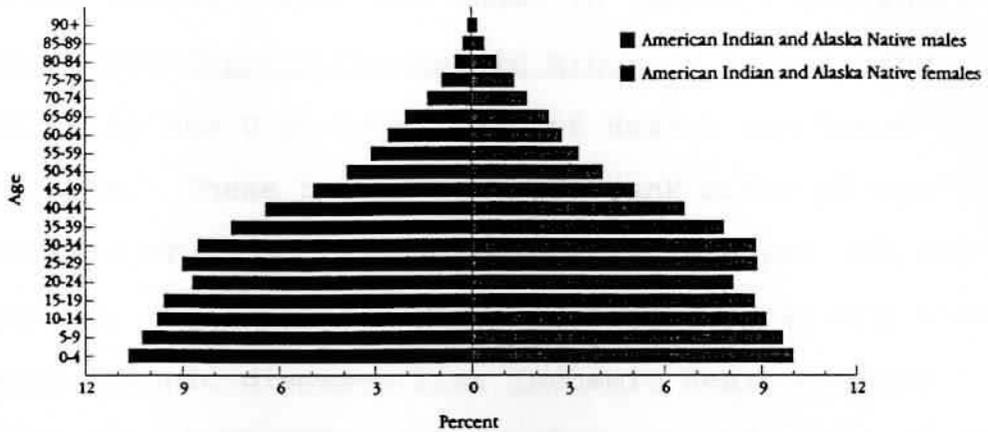


SOURCE: Bureau of the Census, 1990. Chronic Disease in Minority Populations. (1994)

Figure 7 shows the ratio of males to females in the American Indian/Alaskan Native populations. The largest population is from the years between 0 - 4, 5 - 9, 10 - 14, 15 - 19 for males, and after ages 29+ the population shifts to the female side of Native American/Alaskan Native Women (Paulozzi and Mendlein 3-2, 3-3).

Figure 7

Age Distribution of American Indians/Alaskan Natives and Non-Hispanic White Populations, United States 1990



SOURCE: Bureau of the Census, 1990. Chronic Disease in Minority Populations. (1994)

The percentage distribution of lands where American Indians and Alaskan Natives live according to Paulozzi and Mendlein for the year 1990 are listed from smallest to largest: Village Statistical Areas at 2.4%, Tribal Designated Statistical Areas at 2.7%, Tribal Jurisdiction Statistical Areas at 10.2% and, Reservations/Trust Lands at 22.3%. The map in Figure 5 shows a breakdown of the states in which the highest populations exist. As mentioned the blackened areas indicate areas of highest population. In 1990 the states of Oklahoma, California, Arizona, New Mexico, Alaska, Washington, and North Carolina housed more than half of the population of Native Americans and Alaskan

Natives. These states accommodate nearly 22.3% of the Indian population (Paulozzi and Mendlein 3-4, 3-5).

The chronic diseases that affect this population in the United States are shown in Tables 1 and Table 2, taken from Chronic Disease in Minority Populations (1994) by the U.S. Department of Health and Human Services. These tables list the rank order of age-specific crude mortality rates at a rate per 100,000 persons. Age-specific crude mortality rates for these major chronic diseases list Ischemic Heart Disease (IHD), for both males and females aged 45 - 64, as the number one underlying cause of death. The second highest underlying cause of death for males and females, aged 45 - 64 years, was Cirrhosis. The third ranked disease for females ages 45 - 64 was Diabetes, and for males it was Lung Cancer (Paulozzi and Mendlein 3-10, 3-11).

The International Classification of Diseases 9th Revision (ICD-9) codes used in calculating mortality rates used in Chronic Disease in Minority Populations (1994) were: Ischemic heart disease - 410-414; Stroke - 430-438; Lung cancer - 162; Colorectal cancer - 153-154; Breast Cancer - 174; Cervical Cancer - 180; Prostate Cancer - 185; Chronic Obstructive Lung Disease - 490-498; Diabetes - 250; and Cirrhosis - 571 (Paulozzi and Mendlein C-3).

Paulozzi and Mendlein also show in Table 1 and Table 2 the chronic diseases that affect the older population, those aged 65 years and older. For women the diseases that affect them later in life were Ischemic Heart Disease, Stroke, and Diabetes. For males the three highest chronic diseases affecting their mortality rates were Ischemic Heart Disease, Lung Cancer, and Stroke (3-10, 3-11).

Table 1

Rank Order of Age-Specific Crude Mortality Rates for Major Chronic Diseases Underlying Cause of Death for American Indians and Alaskan Native Women

Persons Aged 45-64 Years		Persons Aged 65 Years and Older	
American Indian/ Alaska Native	White	American Indian/ Alaska Native	White
Ischemic heart disease (69.1)	Ischemic heart disease (75.1)	Ischemic heart disease (517.2)	Ischemic heart disease (1179.0)
Cirrhosis (43.0)	Lung cancer (68.0)	Stroke (215.5)	Stroke (420.6)
Diabetes (42.4)	Breast cancer (60.3)	Diabetes (182.8)	Lung cancer (180.7)
Lung cancer (35.2)	COPD [†] (24.1)	COPD [†] (93.6)	COPD [†] (176.8)
Breast cancer (26.1)	Stroke (24.0)	Lung cancer (86.2)	Breast cancer (135.3)
Stroke (25.4)	Colorectal cancer (20.2)	Colorectal cancer (62.4)	Colorectal cancer (120.8)
COPD [†] (13.7)	Diabetes (16.4)	Breast cancer (49.0)	Diabetes (106.3)
Colorectal cancer (10.4)	Cirrhosis (12.6)	Cirrhosis (44.6)	Cirrhosis (24.8)
Cervical cancer (0.7)	Cervical cancer (2.5)	Cervical cancer (8.9)	Cervical cancer (12.1)

SOURCE: Center for Disease Control, National Center for Health Statistics, National Vital Statistics System, 1990.

Table 2

Rank Order of Age-Specific Crude Mortality Rates for Major Chronic Diseases Underlying Cause of Death for American Indians and Alaskan Native Men

Persons Aged 45-64		Persons Aged 65 Years and Older	
American Indian/ Alaska Native	White	American Indian/ Alaska Native	White
Ischemic heart disease (177.3)	Ischemic heart disease (237.1)	Ischemic heart disease (838.9)	Ischemic heart disease (1584)
Cirrhosis (60.8)	Lung cancer (127.1)	Lung cancer (251.7)	Lung cancer (473.6)
Lung Cancer (54.4)	Cirrhosis (31.5)	Stroke (231.2)	Stroke (363.9)
Diabetes (43.8)	COPD [†] (31.3)	COPD [†] (225.1)	COPD [†] (343.1)
Stroke (24.0)	Colorectal cancer (29.4)	Diabetes (157.5)	Prostate cancer (217.5)
COPD [†] (17.7)	Stroke (29.2)	Prostate cancer (104.3)	Colorectal cancer (164.9)
Colorectal cancer (10.6)	Diabetes (19.5)	Cirrhosis (67.5)	Diabetes (106.3)
Prostate cancer (5.7)	Prostate cancer (12.1)	Colorectal cancer (65.5)	Cirrhosis (47.6)

SOURCE: Center for Disease Control, National Center for Health Statistics, National Vital Statistics System, 1990.

Appendix A shows the sample size, by race, sex, and state for the Behavioral Risk Factor Surveillance System (BRFSS) survey from 1991 - 1992 for White Americans, African-Americans, Asian/Pacific Islanders, and American Indian/Alaskan Natives. The BRFSS study included 822 Native American men and 989 women. This study was significant because it included risk

prevalences for Native Americans and Alaskan Natives and information from the total United States population by state. The data analyzed included demographics, risk factors; smoking, exercise, alcohol consumption, obesity, weight control, high cholesterol, and preventive health practices; smoking cessation, blood pressure and cholesterol screenings, accessibility of preventive and health insurance. This survey, although nationwide, concentrated the results on the Indian population (Paulozzi and Mendlein 3-14).

Ischemic Heart Disease rates were high for both men and women. Stroke prevalences were higher for those populations living in the Northern Plains, but less so for Alaskan Natives in the Alaskan Service Areas. Hypertension also was higher in the Northern Plains, especially the Bemidji, Minnesota area for American Indians. Alaskan Natives showed a lower rate of diagnosed hypertension than other eligible Indian Health Service Areas. For Native American/Alaskan Native men and women the Behavioral Risk Factor Surveillance System estimates ranked Diabetes prevalence for women at 9.0 percent for women and 4.2 percent among men. Alcohol abuse findings in the study indicate the prevalence for diagnoses related to alcohol abuse was 2.5 times greater among American Indians and Alaskan Natives than the total U.S.

population in this study. American Indians Cancer rates are on average with the total U.S. population included in this study, but Alaskan Natives were found to have higher incidences of cancers of the oral cavity and pharynx, colon and rectum, uterine cervix, and kidney (Paulozzi and Mendlein 3-13, 3-14, 3-15).

The report of the Inter-Tribal Heart Project presents prevalence data on the current lifestyles related to Cardiovascular Disease that affect three specific Indian reservations in the Bemidji Service Area, specifically the Chippewa and Menominee tribes. These areas include Red Lake and White Earth Chippewa Reservations in Minnesota, and the Menominee Reservation in Wisconsin. The three reservations are classified as rural communities and as members of the same tribe, they share not only a cultural history, but they also have a common heritage in that they belong to the Algonquian linguistic family ("Inter-Tribal Heart Project" 2).

Some of the risk factors associated with this study are hypertension, diabetes, cholesterol, tobacco use, weight, physical activity, and food habits. Sixty-three percent of the participants were women, or a total of 866 females, and thirty-seven percent were men, for a total of 510 males ("Inter-Tribal Heart Project" 19 - 20).

It is perceived that a strong contributing factor to Coronary Heart Disease (CHD) is genetic characteristics or through environmental factors. If both parents die at a young age from CHD, then their children have a higher risk genetically of developing heart disease, and dying at a young age also. Adverse risk factors that contribute to CHD are hypertension, glucose intolerance, and obesity. The Inter-Tribal Heart Project (ITHP) gathered family histories to compile prevalence factors for associated risk factors ("Inter-Tribal Heart Project" 29 - 30).

Demographic characteristics of participants in the Inter-Tribal Heart Project from 1992 - 1994 were grouped into three age groups; 25 - 44, 45 - 64 and 65+ years and by sex whether male or female. The education criterion was < 12 years, high school graduate, technical school, and any college. Household income was less than \$15,000 and equal to or greater than \$15,000. The last demographic was whether the participant was currently employed or not. Tabulation of the data is shown in Table 3.

Table 3
Demographic Characteristics of Participants

	Women		Men		Total	
	Number	Percent	Number	Percent	Number	Percent
Age Group						
25-44	408	47	202	40	610	44
45-64	341	39	238	47	579	42
65+	117	14	69	14	186	14
Education						
<12 Years	244	28	164	32	408	30
High School Graduate	284	33	157	31	441	32
Technical School	145	17	88	17	233	17
Any College	183	21	95	19	278	20
Missing/Refused	10	1	6	1	16	1
Household Income						
<\$15,000	387	45	199	39	586	43
≥\$15,000	389	45	261	51	650	47
Missing/Refused	90	10	50	10	140	10
Currently Employed						
No	326	38	214	42	540	39
Yes	534	62	290	57	824	60
Missing/Refused	6	1	6	1	12	1
Total	866	100	510	100	1376	100

SOURCE: "Inter-Tribal Heart Project", 1992 - 1994.

Of the 866 females and 510 males who participated in the ITHP survey there was a high percentage of participants who knew or were aware of the conditions that affect the risk of developing heart disease. The risk factors recognized by participants were smoking,

worry or stress, high blood pressure, diabetes, overweight, high fat diet, family history of ischemic heart disease, and high cholesterol. Women in the study knew more about the risk factors associated with developing diseases in the areas of worry/stress, diabetes, high fat diet, and family history of ischemic heart disease. There was an eight percentage point difference in the awareness of these risk factors between the men and women. As indicated in Table 4 women were more knowledgeable in the study than the men in the areas of recognizing selected conditions as risk factors associated with heart disease ("Inter-Tribal Heart Project" 120).

Table 4

Percent of Participants Who Recognize Selected
Conditions as Risk Factors for Heart Disease

	<i>Women (%)</i>	<i>Men (%)</i>	<i>Total (%)</i>
<i>Cigarettes</i>	96	92	94
<i>Worry/Stress</i>	91	84	88
<i>High Blood Pressure</i>	94	89	92
<i>Diabetes</i>	82	74	79
<i>Overweight</i>	96	89	93
<i>High Fat Diet</i>	92	84	89
<i>Family History of IHD</i>	90	82	87
<i>High Cholesterol</i>	92	87	90

SOURCE: "Inter-Tribal Heart Project", 1992 - 1994.

One of the major risk factors for Cardiovascular Disease (CVD) is hypertension. High blood pressure is associated with an increased risk of CHD. In the ITHP the mean prevalence for hypertension among those aged ≥ 25 years was stated to be 31%. Women were rated 11%

lower than males in this category compared to men at 38%. The National Health and Nutrition Examination Survey, 1988 - 1991 reports that the U.S. average is 7 percentage points lower across the total U.S. population averaging 24% for ages ≥ 18 years (qtd. in Burt et al. 305-313). Hypertension in this study was defined as systolic blood pressure (SBP) of ≥ 140 mmHg, and diastolic blood pressure (DBP) of ≥ 90 mmHg. Hypertension was more commonplace in participants with incomes of \$15,000 or less, those who were unemployed, and participants with less than 12 years of formal education ("Inter-Tribal Heart Project" 33 - 34).

Diabetes is another risk factor associated with heart disease. Diabetes was defined by the World Health Organization as fasting blood glucose level of ≥ 140 mg/dl, a 2-hour blood glucose level of ≥ 200 mg/dl. Impaired glucose tolerance (IGT) was defined as a fasting blood glucose level of < 140 mg/dl and a 2-hour blood glucose test of ≥ 140 mg/dl but < 200 mg/dl. The overall prevalence for diabetes in women as shown in Table 5 was slightly higher at 27% versus 25% for men. This overall prevalence included education, household income and whether or not the participant was employed. Diabetes was more prevalent with women aged 45 - 64 with a total of 40% versus a 32% percentage rate for men. Lower levels of education, lower

incomes, and unemployment markedly affected the rates for the risk factors for diabetes among both men and women.

Table 5
Percent of Participants with Diabetes Mellitus

	Women (%)	Men (%)	Total (%)
Age Group			
25-44	9	8	9
45-64	40	32	36
65+	50	49	50
Education			
<12 Years	38	30	35
High School Graduate	24	23	23
Technical School	20	16	18
Any College	21	20	21
Household Income			
<\$15,000	32	28	30
≥\$15,000	19	20	19
Currently Employed			
No	35	33	34
Yes	21	17	20
Total	27	25	26

SOURCE: "Inter-Tribal Heart Project", 1992 - 1994.

Food habits or diet influence the development of weight or obesity which also affects the risk for developing chronic diseases such as diabetes, hypertension and CHD ("Inter-Tribal Heart Project" 57).

Fruits, vegetables, and whole grains are an important part of a diet rich in sources of antioxidants. The study done by the ITHP included a food frequency questionnaire which tallied respondents' answers on estimation of serving size, and the number of times during a day, week, or month that the participant recalled consuming the particular food group. Breads, starches, oat foods, fruits, and vegetables were consumed by 18% of the women or 156 of the female participants and by 13% of the men or 66 of the male participants ("Inter-Tribal Heart Project" 57 - 60).

Exercise is another factor examined by the ITHP survey and included percentage of participants who exercise regularly to control their weight. The mean for both men and women ages 24 - 44 out of 1,376 participants was 35% or 481 people exercised regularly; for the age group 45 - 64 the mean was 37% or 510 participants; and for the 65+ group the mean was 38% or 523 participants. The men exercised more regularly than the women but there was only a 4 percentage point disparity between the males and females ("Inter-Tribal Heart Project" 108).

In contrast to the North Central Chippewa tribes which were studied in the Inter-Tribal Heart Project, another survey discussed was the Navajo Health and Nutrition Survey (NHNS). This survey included the

Navajo who live in the states of Arizona, New Mexico, and Utah. Participants were all Navajo at least twelve years of age and were selected from a three-stage cluster design sampling. The population for this survey numbered 985 participants (White et al. 2079S).

The first survey addressed characteristics of households which included language spoken, utilities used, heat sources used, percentage of children in a household, and household participation in Nutrition Support Programs. Of the 985 participants 459 households participated in this survey. Table 6 shows the results of the Navajo Health and Nutrition Survey conducted in 1991 - 92 (White et al. 2081S).

Table 6

Characteristics of Households included in the Navajo Health and Nutrition Survey, 1991 - 92

	All households 459	Age of head of household		
		<40	40-59	60+
		189	151	119
		%		
Speak Navajo only in home	43	21	42	80*
Electricity ¹	69	72	72	61
Running water	55	56	56	50
Telephone	16	14	18	17
Radio	94	97	94	91
Television ²	72	82	77	50*
VCR	52	65	54	29*
Refrigerator	53	56	53	46
Heat source ³				
Wood	80	71	85	88*
Coal	44	35	47	56*
Gas	30	31	21	21
Participation in Nutrition Support Programs				
FDPIR only ⁴	14	8	13	31*
Food Stamps only	19	18	22	17*
WIC only ⁵	8	10	8	5*
WIC and other ⁶	18	30	10	10*
	386 ⁷	178	133	75
		%		
Presence of				
Children <age 12 y	58	80	49	32*
Teens age 12-18 y	41	42	53	24*
Elders age 60+ y	30	5	12	100*

¹ Some participants included generator-supplied electricity in response while others did not.

² Percentage with TV exceeds percentage with electricity because some households use generators not reported as electricity.

³ Forty-nine percent of households used more than one heat source.

⁴ Food Distribution Program on Indian Reservations.

⁵ Special Supplemental Food Program for Women, Infants and Children.

⁶ WIC participants may also be eligible for FDPIR or Food Stamps.

⁷ Seventy-three heads of households did not provide complete data on household composition.

* Age strata significantly different by χ^2 . $P < 0.001$.

SOURCE: Navajo Health and Nutrition Survey, 1991 - 92.

The standard household composition was adults with children or teens. Teens age 12 - 18 years living

with an adult comprised the next largest population in a household at 41%. The elderly aged 60 years or older constituted the least population at 30%. Two hundred and sixty-seven households or 58% contained children aged twelve or less, and three hundred and forty of the households or 41% had teens between the ages of 12 to 18 years. Household composition was usually adults less than 40 but not older than 59 with children or teens in residence listed at 56% out of 340 households. Elders and adults aged 60 and older which included adults and/or teens and children residing in same household listed at 119 households or 40% (White et al. 2082S).

Forty three percent of households speak Navajo only with more than 80% of the elders or 95 households out of 119. Twenty one percent of those participants aged 40 or less speak Navajo only and between the ages of 40 to 59 only 42% speak Navajo. Most homes have electricity, running water, radio, televisions, and VCR's. Telephone usage was the lowest for the age group less than 40 years old but that age group also had the highest percentage use for televisions at 82%. Television was only used in 50% of the homes of those aged 60+ years. Radio's were used in 94% of all 459 households. Refrigerators were used less by the elderly at 46% or 55 households; and in all households

refrigerators were used in 243 of the homes. The three heat sources were wood, coal, and propane gas. Gas was used less often for heating than wood or coal. Of those participating in Nutrition Support Programs which included Food Distribution Programs on Indian Reservations (FDPIR), Food Stamps, Special Supplemental Food Program for Women, Infants and Children (WIC) there were 270 households that took advantage of these programs. The elderly aged 60+ took part in the FDPIR more often than those in younger households. Individuals 40 and under participated more in WIC and Food Stamps programs (White et al. 2082S).

The second survey from the Navajo Health and Nutrition Survey written by Carol Ballew, Linda L. White, Karen F. Strauss, Lois, J. Benson, Jams M, Mendlein, and Ali H. Mokdad was the "Intake of Nutrients and Food Sources of Nutrients among the Navajo." This survey was used to understand the current nutrient intake of the Navajo in specific food groups; analysis of vitamin supplement use; and calculations of macronutrients in specific food sources (Ballew et al. 2087S).

The age groups used for the men in the survey were 12 - 19 (n = 89), 20 - 39 (n = 157), 40 - 59 (n = 77), 60+ years (n = 67) for a total of 390 males. The age groups for the women were 12 - 19 (n = 73), 20 - 39

(n = 225), 40 - 59 (n = 163), 60+ years for a total of 556 females. Vitamins in this discussion include vitamin A, carotene, vitamin E, thiamin, riboflavin, niacin, vitamin B-6, folate, vitamin B-12, calcium, magnesium, phosphorous, iron, sodium, and zinc. For both men and women the intake of vitamin A, vitamin E, vitamin B-6, folate, calcium, and magnesium are below the recommended daily allowances (RDA) set by the U.S. Department of Agriculture 1995 for men and women age 20 and older. Older men and women, aged 60 and older, are below the RDA for thiamine. Iron intake was below the RDA for all women under age 60. Calcium intakes for both sexes were particularly low according to the recommended daily allowances required. According to the survey, vitamin C intake for both men and women decreased with age (Ballew et al. 2087S).

Three major contributors that affect the dietary choices of the Navajo are cost, availability, and shelf life. Half the homes in this survey had refrigerators so shelf life for food in these homes is longer than homes that do not own refrigerators. Navajos that do not have refrigerators have to consume their perishables quickly. Navajos live in rural communities and buy most of their consumer products from reservations where selection is limited. Canned fruits and vegetables are more accessible on reservations than

fresh fruit and produce which often need refrigeration and are more costly. Canned and powdered milk is used more often than fresh milk, again because of lack of refrigeration (Ballew et al. 2091S).

Selected food sources of macronutrients were broken down by their percentage contribution of energy, carbohydrates, proteins, total fats, saturated fats, cholesterol, and fiber in Table 7 (Ballew et al. 2091S).

Table 7

Food Sources of Macronutrients Among Participants in the Navajo Health and Nutrition Survey, 1991 - 92

	% Contribution						
	Energy	Carbohydrate	Protein	Total fat	Cholesterol	Saturated fat	Fiber
Navajo tortillas	8	13	7	1	0	0	7
Navajo fry bread	6	7	2	8	0	6	7
Fried potatoes	9	8	3	9	2	8	14
Soft drinks ¹	7	15	0	0	0	0	0
Coffee, tea and herb tea ²	2	1	0	0	0	0	0
Mutton ³	2	0	3	4	4	5	0
Mixed dishes with mutton	4	2	7	6	5	8	6
Processed meat ⁴	3	0	5	7	4	9	0
Subtotal	41	46	27	35	15	36	34
Other meat, poultry, and fish ³							
Beef, pork and venison ³	6	0	14	10	11	11	0
Mixed meat dishes	3	1	5	3	4	3	2
Chicken and turkey ³	4	0	8	6	5	5	0
Mixed poultry dishes	1	1	1	1	2	1	1
Fish and seafood	1	0	1	0	1	0	0
Subtotal	15	2	29	20	23	20	3
Other grains ⁵	15	17	15	7	2	7	16
Restaurant and fast-food entrees	8	6	10	11	6	13	6
Fruits and vegetables ⁶	6	13	4	2	0	0	25
Desserts and snacks ⁷	5	6	1	7	1	2	7
Dairy	4	3	5	5	4	12	0
Eggs	3	0	6	7	44	6	0
Legumes	2	2	3	2	1	2	9
Total	99†	95†	100	96†	96†	98†	100

SOURCE: Navajo Health and Nutrition Survey, 1991 - 92.

Foods calculated in this study were Navajo tortillas, Navajo fry bread, fried potatoes, mutton and mixed dishes with mutton, processed meat, soft drinks, coffee, tea and herb tea which provided 41% of the energy for this core food group. Navajo tortillas contained the most carbohydrates at 13%, low in fat and high in fiber content. Fried potatoes provided the next source of energy at 9% with 14% fiber. The least valuable source of energy were the mutton dishes, processed meat, coffee, and teas. Total fat from these foods was high with a total percent contribution of 17% (Ballew et al. 2091S).

Foods high in energy contribution were beef, pork, venison, chicken, and turkey ranging from 4% to 6%. Fish and seafood were low in energy contribution at 1% (Ballew et al. 2091S).

The other food groups were grains, fruits and vegetables, dairy, eggs, legumes, desserts and snacks, and restaurant/fast-food entrees. The foods in this group that provided the best macronutrients were the fruits and vegetables. Their total fat was listed at 2% contribution, and their fiber contribution was 25%. Eggs provided the most total cholesterol contribution at 44% (Ballew et al. 2091S).

The lowest nutritional food groups consumed by the Navajo are soft drinks, desserts and snacks, sugars and

candy, salad dressing and fats spread on bread. These only contribute 15% energy intake and 11% of total fat intake (Ballew et al. 2091S).

Ballew and his colleagues in this survey indicated the current diet of the Navajo exceeds the recommended fat content by 30% and saturated fat content by 10% total energy (2087S).

The Inter-Tribal Heart Project and the Navajo Health and Nutrition Survey indicates there are serious chronic diseases associated with behavioral risk factors that are affecting Native Americans. Local level intervention programs through the Indian Health Service and local tribes need to be initiated to reduce these chronic illnesses. Preventing unhealthy behaviors rather than attempting to correct them later in life should be the goal of educational and intervention programs.

Chapter V

DISCUSSION

Summary

A movement away from the traditional lifestyles of cultivating food crops, gathering the earth's produce, and hunting and fishing, along with the assimilation of Western lifestyles into their culture has decreased the health of the Native Americans and Alaskan Natives. Patterns of chronic diseases are a reflection of lifetime intermixing of traditional lifestyles with those of the European settlers of North America and their descendants (Paulozzi and Mendlein 3-26).

In fact population projections by the U.S. Bureau of the Census for the minority populations of Native Americans and Alaskan Natives are expected to increase by fifty percent in the year 2050. Survival of Indian tribes depends on their ability to adapt to changes in both their physical and cultural environment (Paulozzi and Mendlein 3-1, 3-6).

Before the introduction of the white man into the Red Lake and White Earth Reservation areas in Minnesota, the Chippewa hunted and fished along the lakes and the country abounded in produce such as

squash, pumpkin, corn, berries, and wild fruits. Wild rice was considered a staple food and sweetening was accomplished by mixing maple sugar with other food staples such as cereals, vegetables, and hot beverages. The Chippewa people subsisted on vegetables, fish, deer, and other hunting animals. Gardens were maintained and food was stored for use during the winter months. Before 1847 the Chippewa used no salt. The "Salt Treaty" introduced on August 21, 1847 to the Native Americans allotted each family five barrels of salt annually for five years. According to Frances Densmore in her book How Indians Use Wild Plants for Food, Medicine & Crafts she states that some of the older Native Americans have still not acquired a taste for salt. Herbs were also used extensively for the treatment of the sick. The Chippewa utilized the natural resources of their environment (318 - 321).

On the whole the Inter-Tribal Heart Project risk profiles which include cardiovascular disease, diabetes, hypertension, elevated cholesterol, and obesity far exceed the total for the U.S. population in those aged 25 and older for Native Americans living in the Red Lake and White Earth Reservations in Minnesota. Sedentary lifestyles accompanied with poor nutritional habits have exacerbated these chronic illnesses (Byers and Hubbard 2075S).

According to a study on the nutritional aspects of the Navajo Indian completed by W. Darby and his colleagues in 1956 he stated that: "The Navajo has abandoned his primitive diet--he no longer depends on the hunt, on Indian corn, on the gathered wild plants, berries, and fruits for his food" (Byers and Hubbard 2075S). Forty-one years later Tim Byers and John Hubbard reported their findings from "The Navajo Health and Nutrition Survey: Research That Can Make a Difference" and stated that much of the increase in chronic diseases is due to nutritional factors. The Spaniards introduced sheep and goat herding in the 17th century and mutton became a dietary staple of the Navajo but in the 17th century they also maintained gardens and physical labor was still required. The Navajo maintained an active lifestyle well into the end of the 19th century (Byers and Hubbard 2085S).

However reservation life today for Native Americans includes low education levels, high unemployment, high calorie pre-packaged foods, accompanied with sedentary lifestyles. All these factors help to increase the risk for chronic diseases such as alcoholism, obesity, diabetes and heart disease (Byers and Hubbard 2075S - 2077S).

Tim Byers and John Hubbard suggest several improvements to the health system for the Navajo in

order for programs to work efficiently in both the prevention and treatment of diseases. Addressing the younger Native Americans in the school system so that lifestyle education can be started early in life could help deal with obesity which entails diet and levels of physical activity. Curtailing obesity could prevent diabetes Type II from occurring because it can be averted by proper nutrition and exercise. Older Native Americans who are already overweight need to stabilize their weight and not gain more. Both patient and family education are required for preventive measures to be addressed in the Native American communities. Outreach services are also needed to provide chronic care and patient monitoring for those patients who live far from tribal clinical care centers (Byers and Hubbard 2076S).

In addition, tribal leaders and educators need to address their rural minorities who are geographically and linguistically separated from the Native American community. Health promotion, prevention, and treatment services for rural minorities who do not have access to clinics due to obstacles in language or transportation should be addressed. Surveillance systems need to be set up to track individuals in rural communities so risk factors can be targeted and preventive measures addressed (Paulozzi and Mendlein 3-26).

Ultimately public health agencies and tribal governments should unite to address the major interrelated problems of chronic diseases in this minority population.

The literature would suggest that the author's hypothesis is correct in that the reason Native Americans and Alaskan Natives health has deteriorated has been due to their assimilation into the Western tradition and culture thrust on them by relocation from their indigenous habitats. Their departure from their own customs, traditions, and culture has intensified a decline in their health in relation to the chronic diseases of diabetes, obesity, alcoholism, and heart disease.

I concur with the recommendations of Tim Byers and John Hubbard in the Navajo Health and Nutrition Survey that an active physical lifestyle accompanied by the consumption of an abundance of plant-based foods, complemented by lean meats, and the avoidance or abuse of tobacco and alcohol would precipitate a decline in chronic diseases in Native Americans and Alaskan Natives (2077S).

Limitations

Most surveys were taken from Native Americans and Alaskan Natives who used the tribal health centers and

clinics. The whole Native American and Alaskan Native population was not addressed in these studies. Those Native Americans and Alaskan Natives who live away from the reservations, who are better educated, who take better care of themselves nutritionally and physically would undoubtedly strengthen the viewpoint that it is your surroundings that make you a healthier person. These studies do not tell the whole story; only the Indians who live on or near a reservation and who used a tribal health clinic in the past year were a part of the statistics.

Another limitation is the way the surveys were conducted. The Behavioral Risk Factor Surveillance Survey (BRFSS) was a telephone survey; only those Indians who could afford a telephone participated in the survey. The poorest and probably the least healthy Indians were not allowed to participate because they could not afford a telephone. Therefore, the population on the whole of those Indians who live on or near a reservation is not a true representation of the whole population. However, the survey was effective as it set up a profile of people with self-admitted risk factors. Indeed, too many Native Americans and Alaskan Natives were missed due to the design limitations of the study.

In addition, high risk groups need to be better

defined both racially and ethnically. A distinction needs to be made to minorities of a particular income group who may have diseases related to their lifestyle which has nothing to do with the fact that they are Native Americans or Alaskan Natives.

Suggestions for Future Research

I think that the development of data collection instruments which are more linguistically and culturally appropriate to Native Americans and Alaskan Natives need to be developed. The FIAS (Food Intake Analysis System) software that was developed for the Navajo Health and Nutrition Survey was limited in its food categories. There needs to be a better way to address ethnic foods (Navajo tortillas) in a software program so that food is categorized correctly.

To summarize, the last item to be addressed is the necessity for more research to be done on the hereditary or genetic predisposition to chronic diseases for the Native Americans and Alaskan Natives under the age of nineteen. I feel trend data studies should be done on this age group because they are the highest minority population in the United States today. Tracking students from kindergarten through their senior year in high school would be a good sampling, but with the limitation that it would be students who

went to school on reservations; it would not be a whole population study. Some issues that could be addressed in the study might be tobacco use, alcohol use, nutrition, exercise, and family histories of chronic diseases.

A survey of school-age children from the ages of 5 to 18 could be a valuable risk factor indicator for future health promotion and prevention programs. Invaluable information from this tracking survey could lead to a more effective and efficient future health care delivery system for Native Americans and Alaskan Natives.

Appendix A

Behavioral Risk Factor Surveillance System

	Total	American		American		Islander		Alaska Native	
		Male	Female	Male	Female	Male	Female	Male	Female
State:	N	N	N	N	N	N	N	N	N
Alabama	4095	1332	1847	306	579	7	6	13	5
Alaska	3009	1142	1170	14	21	22	51	272	317
Arizona	3286	1251	1792	83	60	14	14	37	35
Arkansas	1313	483	679	53	86	2	1	6	3
California	6473	2494	3010	208	288	209	206	28	30
Colorado	3358	1331	1818	63	85	16	22	10	13
Connecticut	3474	1306	1903	88	130	17	9	7	14
Delaware	2990	1027	1490	153	282	7	21	6	4
District of Columbia	2882	449	500	646	1235	25	25	—	2
Florida	4897	1810	2519	163	341	17	24	13	10
Georgia	3733	1304	1553	319	536	8	9	3	1
Hawaii	3760	720	780	30	34	958	1232	3	3
Idaho	3499	1484	1933	11	10	8	19	18	16
Illinois	4010	1465	1943	174	348	37	39	3	1
Indiana	4458	1742	2327	122	232	4	17	5	9
Iowa	3206	1370	1774	15	28	8	9	1	1
Kansas	1419	611	746	24	19	4	4	5	6
Kentucky	4076	1482	2302	87	183	9	10	2	1
Louisiana	3282	1020	1426	269	540	10	11	4	2
Maine	2513	1075	1413	6	4	2	5	5	3
Maryland	3848	1208	1681	302	553	38	64	1	1
Massachusetts	2839	1171	1492	45	74	30	20	2	5
Michigan	4689	1739	2332	191	346	20	18	21	22

State:	White American		African-American		Asian/ Pacific Islander		American Indian/ Alaska Native		
	Total	Male	Female	Male	Female	Male	Female	Male	Female
	N	N	N	N	N	N	N	N	N
Minnesota	6794	2862	3677	47	88	32	32	24	32
Mississippi	3115	837	1355	302	610	3	3	5	—
Missouri	2996	1123	1598	86	160	15	8	1	5
Montana	2355	992	1295	3	2	4	5	22	32
Nebraska	2942	1197	1638	29	49	11	7	7	4
Nevada	1565	558	869	35	53	14	20	6	10
New Hampshire	2949	1323	1585	7	9	9	7	4	5
New Jersey	2883	979	1635	75	122	27	41	1	3
New Mexico	2336	946	1246	50	26	6	7	27	28
New York	4161	1505	1949	214	354	58	62	5	14
North Carolina	3990	1374	1802	286	485	7	6	13	17
North Dakota	3587	1557	1934	9	8	4	3	27	45
Ohio	2594	1037	1292	96	139	11	12	3	4
Oklahoma	2958	1054	1606	55	117	7	3	41	75
Oregon	6617	2741	3645	22	25	37	50	43	54
Pennsylvania	4796	1958	2462	117	213	15	18	5	8
Rhode Island	3544	1466	1914	43	76	15	15	9	6
South Carolina	3937	1273	1768	293	583	8	5	3	4
South Dakota	3560	1442	2004	7	6	5	8	39	49
Tennessee	5333	1918	2631	265	475	16	18	3	7
Texas	3576	1257	1834	154	277	19	23	6	6
Utah	3556	1479	1989	10	10	21	27	8	12
Vermont	3361	1434	1903	2	—	4	5	6	7
Virginia	3492	1288	1608	192	343	24	29	6	2
Washington	4573	1867	2416	58	47	58	61	30	36
West Virginia	4796	1742	2873	49	111	7	5	3	6
Wisconsin	2780	1219	1411	35	63	12	16	10	14
Totals	180255	67444	90369	5913	10465	1921	2332	822	989

Works Cited

- "Alcoholic Cardiomyopathy." Orbis Broadcast Group, Interactive Media. 1997. <<http://www.housecall.orbisnews.com/databases/ami/convert/00174.htm>> (28 Aug. 1998).
- Ballew, Carol, et al. "Intake of Nutrients and Food Sources of nutrients among the Navajo: Finds from the Navajo Health and Nutrition Survey." The Journal of Nutrition 127 (1997): 2085S-2093S.
- Burt VL, et al. Prevalence of Hypertension in the U.S. Adult Population: Results from the Third National Health Nutrition Examination Survey, 1988 - 1991. Hypertension 1995;25:305-313.
- Byers, Tim and John Hubbard. "The Navajo Health and Nutrition Survey: Research That Can Make a Difference." The Journal of Nutrition 127 (1997): 2075S-2077S.
- Congressional Quarterly Almanac. "Service Programs for the Rural Elderly." Volume XLVIII. Washington: GPO, 1993.
- Coward, Raymond T., Jeffrey W. Dwyer. Health Programs and Services for Elders in Rural America: A Review of the Life Circumstances and Formal Services that Affect the Health and Well-Being of Elders. Kansas City: National Resource Center for Rural Elderly, 1991.
- Dallam, Richard. "How the Other .0004% Live." Forbes Sep. 1997: 32-33.
- Densmore, Frances. How Indians Use Wild Plants for Food, Medicine & Crafts. New York: Dover Publications Inc., 1974.
- Harrod, Howard L., Renewing the World: Plains Indian Religion and Morality. Tuscon: University of Arizona Press, 1987.

- "Inter-Tribal Heart Project: Results from the Cardiovascular Health Survey." U.S. Department of Health and Human Services. Center for Disease Control and Prevention. Atlanta, Ga., 1996.
- Kimball, Ernest H. et al. "The Prevalence of Selected Risk Factors for Chronic Disease Among American Indians in Washington State." Public Health Reports May-June 1996" 264-272.
- Krout, John A., and Jeffrey W. Dwyer. "Profile of the Rural U.S." Aging 365 (1993): 10-11.
- LaMountain, Joe. "The Indian Health Service Diabetes Program - A Growing Need in Changing Times." Diabetes Forecast Mar. 1994: 54.
- Lewis, David R., "Native Americans and the Environment: A Survey of Twentieth-Century Issues." The American Indian Quarterly July 1995: 423-428.
- Long, Phillip. "Alcohol Dependence: An American Description." 1997. <<http://www.mentalhealth.com>> (28 Aug. 1998).
- . "Alcohol Dependence (Alcoholism)" 1996. <<http://www.mentalhealth.com>> (28 Aug. 1998).
- Mancall, Peter C. Deadly Medicine: Indians and Alcohol in Early America. Ithaca: Cornell University Press, 1995.
- Mercer, Susan O., "Navajo Elderly People in a Reservation Nursing Home: Admission Predictors and Culture Care Practices." Social Work Mar. 1996: 181-190.
- Murphy, Neil J., et al. "Dietary Change and Obesity Associated with Glucose Intolerance in Alaska Natives." Journal of the American Dietetic Association 95 (1995): 676-683.
- Niethammer, Carolyn. American Indian Food and Lore. New York: Macmillan Publishing Co., 1974.
- Paulozzi, Len J., and James M. Mendlein. Center for Disease Control and Prevention. Chronic Disease in Minority Populations. Atlanta: Centers for Disease Control and Prevention, 1992.

- "People of the Ice and Snow." The American Indians Time-Life Book Series II. Alexandria: The Time Inc. Book Company, 1992.
- "Preventing Fetal Alcohol Syndrome (FAS)." Center for Disease Control and Prevention (CDC). 1996. <<http://www.health.org/pubs/factsht/fetal.htm>> (10 Jul. 1998).
- Rozema, Vicki. Footsteps of the Cherokees: A Guide to the Eastern Homelands of the Cherokee Nation. North Carolina: R.R. Donnelley & Sons, 1995.
- Sandruck, Karen M., "The Wisdom of the Old Ways." Hospitals & Health Networks Feb. 1997: 42.
- Smith, Talmadge D. "Speaking Out: The Elderly Native American--"Forgotten Again." Aging 365 (1993): 50-51.
- Streissguth, Ann, Robin A. LaDue, and Sandra P. Randels. A Manual on Adolescents and Adults with Fetal Alcohol Syndrome with Special Reference to American Indians. Seattle: University of Washington, 1988.
- "Stroke" Stroke: Recognition and Guidelines for Care. 1996. <<http://www.yourhealth.com/ahi/1902.htm>> (10 Jul. 1998).
- "The First Americans." The American Indians Time-Life Book Series II. Alexandria: The Time Inc. Book Company, 1992.
- "The Reservations." The American Indians Time-Life Book Series II. Alexandria: The Time Inc. Book Company, 1992.
- Thomas, David H., Jay Miller, Richard White, Peter Nabokov, Philip J. Deloria. The Native Americans: An Illustrated History. Atlanta: Turner Publishing, 1993.
- Trujillo, Michael H., "IHS Profile Part 2." Infotrac Feb 14, 1997.
- "Type 1 Diabetes." Jefferson Health System, All About Diabetes. 1997. <<http://www.jeffersonhealth.org/diseases/diabetes/type1.htm>>.

- "Type 2 Diabetes." Jefferson Health System, All About Diabetes. 1997. <<http://www.jeffersonhealth.org/diseases/diabetes/type2.htm>>.
- Utter, Jack. AMERICAN INDIANS: Answers to Today's Questions. Grawn: National Woodlands Publishing Company, 1993.
- United States. General Accounting Office (GAO). Rural Development: Profile of Rural Areas. Washington: GPO, 1993.
- . Department of Health and Human Services (DHHS). Strategic Priorities. Washington: GPO, 1997.
- U.S. Bureau of the Census. Population projections of the United States, by age, sex, race, and Hispanic origin: 1992 to 2050. Current Population Reports, Series P25, No. 1092. Washington, DC: U.S. Government Printing Office, 1992.
- "What CDC is doing to Prevent Fetal Alcohol Syndrome and Other Alcohol-Related Developmental Disabilities." Center for Disease Control and Prevention (CDC). 1996. <<http://www.health.org/pubs/factsht/fetal.htm>> (28 Aug. 1998).
- White, Linda L., et al. "Rationale, Design and Methodology for the Navajo Health and Nutrition Survey." The Journal of Nutrition 127 (1997): 2078S-2084S.
- Worcester, Donald E., The APACHES Eagles of the Southwest. University of Oklahoma Press: Oklahoma, 1992.
- Wright, John W., The Universal Almanac 1997. Kansas City: Kansas UP, 1996.