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CARDIOVASCULAR DISEASE WITHIN NATIVE AMERICAN POPULATIONS

by

Leslie J. Harris
Bachelor of Science in Physical Therapy
University of North Dakota, 1998

An Independent Study

Submitted to the Graduate Faculty of the

Department of Physical Therapy

School of Medicine

University of North Dakota

In partial fulfillment of the requirement

for the degree of

Master of Physical Therapy

Grand Forks, North Dakota

May
2000




This Independent Study, submitted by Leslie Harris in partial fulfillment of the requirements for the Degree of Master of Physical Therapy from the University of North Dakota, has been read by the Faculty Preceptor, Advisor, and Chairperson of Physical Therapy under whom the work has been done and is hereby approved.



(Faculty Preceptor)



(Graduate School Advisor)



(Chairperson, Physical Therapy)

PERMISSION

Title Cardiovascular Disease within Native American Populations
Department Physical Therapy
Degree Master of Physical Therapy

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ABSTRACT

Native American populations have been experiencing a rise in chronic illnesses and social pathologies. The Indian Health Service (IHS) is the primary provider of health care to a majority of Native Americans. Cardiovascular Disease is the leading cause of death among Native American men and women in a majority of tribes. Despite efforts by the IHS this once uncommon disease rapidly increasing in native American groups. Many believe that the acculturation of western lifestyles and changes in diet are contributing factors to the increase in heart disease. They contend that the cause lies in the prevalence of associated risk factors that have increased in native groups through circumstances of habit or necessity. Inadequate congressional funding and other barriers to service have limited the type and extent of services on reservations and in urban settings. The purpose of this independent study was to review and summarize the current available literature on cardiac disease and its associated risk factors, within Native American populations, and methods of intervention were discussed.

CHAPTER 1

INTRODUCTION

For a majority of Native Americans cardiovascular disease is the number one cause of death. Despite efforts by the Indian Health Service, this once uncommon disease is rapidly increasing amongst Native American groups. Many researchers contend that the acculturation of western lifestyles and diet are contributing factors to the increase in heart disease.¹ They believe that the cause lies in the combination of risk factors associated with the westernization of Indian people that have been accepted by native groups through either habit and or necessity. The problem has been further compounded by congressional funding that has been historically inadequate, as well as federal initiatives that were well intentioned but piecemeal in nature.²

In response to the health care crisis of Indian people, efforts are now being made to focus on not only traditional primary care services but on wellness and prevention programs supported by IHS and through tribal initiatives.³ Many believe that these efforts should focus on the modification of risk factors that contribute to the host of diseases found within Indian populations.⁴

The purpose of this paper was to review and summarize the current literature on the epidemiology and characteristics of cardiovascular disease and its associated risk factors, within Native American populations and methods of intervention were discussed.

CHAPTER 2

OVERVIEW OF NATIVE AMERICAN HEALTH AND THE INDIAN HEALTH SERVICE

American Indians of today face many different and ever changing issues. Placed in a unique position of a nation within a nation, tribes find themselves wading through vague federal laws that bear weight on current issues but yet often stem from events occurring over a hundred years earlier.⁵

Treaty making between tribal nations and the United States created the unique situation of tribal sovereignty that is tied to federal control. In exchange for land the Federal government offered several provisions to tribal people, one of which is health care.⁶ Although treaties are one of the foundations on which Indian health care was based, today's government involvement is viewed more as a moral obligation than a treaty right.² Throughout the decade, congressional endeavors have brought changes in tribal policy and health care. Despite federal efforts tribal health continues to be a concern of both the federal government and Indian people.

In response to the ever increasing need for comprehensive health services the Federal government created the Indian Health Service (IHS), an agency within the Department of Health and Human Services.⁷ Charged with the

responsibility of delivering comprehensive health services to over 557 federally recognized tribes and Alaskan Natives, IHS provides a vast array of services through contracts with private sector agencies, tribal programs and directly from IHS facilities.³ For a majority of Native Americans the IHS is the primary and often the sole provider of health care. It is also important to note that although IHS services are essentially free to eligible members of recognized tribes, the Indian Health Service is not an entitlement program. Funding is limited and appropriated annually by congress.⁸ (see Appendix, Table 1). The IHS consists of 12 geographical service areas located nationwide that serve American Indians and Alaskan Natives on or near reservations or in urban settings. Under the supervision of the 12 area offices are 150 administrative units, or service units, of which 84 are tribally operated.⁷ (see Appendix, Tables 2, 3).

According to the IHS, approximately 60% of American Indians and Alaskan Natives in the U.S. reside within an IHS service area.⁷ For example, during 1998 1.46 million Indians resided in an IHS service area in comparison to 2.41 million in the entire U.S.(see Appendix, Table 4). These figures indicate that although a large number of native people live on or in close proximity to a service area, a majority number may live outside a designated area or within an urban setting. According to a 1990 census,⁸ 62.4 % of American Indians and Alaskan Natives resided off reservation yet the total urban Indian health budget accounted for only 1% of the total budget for IHS. Instead funding has been directed towards federally recognized tribes that are located in predominately non-urban settings.

Placed under the domain of congressional appropriations, IHS funding has been historically limited and unevenly distributed. Until recently, what resources were available were distributed based on historical patterns rather than need.⁸ Since 1992, the IHS has experienced a decline in per capita funding, resulting in 20% less spending power. Moreover, overall Indian health care expenditures are estimated to be forty-percent of the per capita expenditures for health care nationally.⁴ For example, 1997 data indicates that \$1,362.00 dollars was spent per Native American, less than half the \$ 3,261.00 dollars spent per person nationally.

As funding levels dropped and inflation increased, non-urgent primary care services decreased. This was further compounded by a service population that was increasing at a faster rate than the growth in funding.⁸ Subsequently, the type and extent of services that can be offered to Indian people depends largely on annual congressional appropriations.

Inadequate congressional funding to tribes and health centers, in addition to the lack of transportation and qualified health professionals are several factors that have been identified in hindering service delivery.⁸ Generational poverty, poor sanitation systems and deplorable housing conditions exacerbate the problem of health care.² In the United States Native Americans represent a disproportionate percentage of the poor.⁷ According to 1990 census data, 47.3% of Indian family incomes fall below the poverty line, a significant number of which have incomes of less than \$ 5,000 dollars annually.² Housing is limited and is often in poor condition, many families can wait years for housing units to become

available. Some homes remain without indoor plumbing or potable drinking water, making sanitation conditions a problem.

Reservations are often isolated and few have public transportation.³ Many residents find that getting to a health facility may take over two hours.² In Alaska, where less than 20 % of the native communities are linked by a road system, basic medical care may be as far as a thousand miles away and may often consist of airlifting the patient to the nearest medical facility.⁴

The lack of health professionals is considered another hindrance to health care delivery.⁸ In fact, the need has been considered so great that programs have been implemented by the IHS and other federal agencies to educate and recruit Indian health professionals.³ Area recruiters must overcome the obstacles of non-competitive salaries and the isolation of reservation areas to employ health professionals. Although many positions go unfilled, efforts have been made to offer incentives to prospective employees.⁸ Currently IHS has a total of 14,425 employees nationwide, of which 48 physical therapists are employed. In 1996, the addition of five graduating physical therapists improved the number of Native American PT positions to sixteen.⁹

Indian health is a complicated issue. Chronic diseases, such as cardiovascular disease and diabetes are increasing and appear to have a number of related risk factors contributing to the poor health of Native Americans.¹

CHAPTER 3

CARDIOVASCULAR DISEASE AND ASSOCIATED RISK FACTORS

Although Native Americans have experienced great improvements in their overall health since the 1800's, native health continues to fall below levels experienced by the general U.S. population.¹⁰ The prevalence of health problems such as diabetes, cirrhosis, hypertension, alcoholism, heart disease and cancer continue to persist and in some cases have increased in native populations.^{2,10}

Cardiovascular disease is the leading cause of adult deaths in the U.S.¹¹ It also is one the major causes of mortality among Native Americans (see Appendix, Table 6).¹² The American Heart Association estimates that over \$151.3 billion dollars is spent annually in the United States for the treatment of heart disease.¹³ Heart disease continues to be a major cause of death and disability in the U.S., accounting for over 650,000 deaths or 38 % of all deaths in 1980.¹

Heart disease in Native American populations has been present prior to European contact. However, this once uncommon disease has become more common in a number of Native American groups.¹ Alpert et al find the increased frequency of heart disease disturbing, since a general decline in mortality has been observed in the general white population (see Appendix, Table 7). They

add that the rate of cardiovascular disease among Native American groups is not greater and in some cases is less than the general population. Native Americans, it seems, have not been sharing in the general decline of mortality or in the decreased frequency of risk factors seen in the last decade.¹ However, Native Americans under the age of thirty-five appear to be an exception. Heart disease death rates for those under thirty-five is two times greater than for all other ethnic groups.¹³ Around age forty-four the rate compares to the general population.¹⁴

Long term studies have established that risk factors, hypertension, increased serum cholesterol, sedentary lifestyle, diabetes, and obesity, especially in combination tend to increase the risk for heart disease.¹³ Just as cardiovascular disease rates for morbidity and mortality differ amongst regions and countries, they differ among tribal groups. For instance, there is a low prevalence of coronary heart disease (CHD) among southwestern tribes despite high rates of obesity, diabetes, hypertension, and low socioeconomic status.¹⁴ These tribal members appear to be at less risk of atherosclerosis (ASHD) mortality than whites in the surrounding area. In contrast, tribes in Canada report the same risk of cardiovascular disease mortality as whites in the general Canadian population.¹

Diabetes

Diabetes is a well-known risk factor for cardiovascular disease. Over 12 million Americans have diagnosed diabetes and another 7 million go undiagnosed.¹² For a disease that, up until the 1940's, was either rare or

undiagnosed in Native American populations, diabetes has become the second most common diagnosis for Native American admissions to the hospital.^{11, 15} In fact, Native Americans, as well as, black and Hispanic populations are three times more likely to develop the disease.^{12, 4} For all American Indians 65 years of age and over, 20.3 % are diabetic.¹⁶

Diabetes and its contributors, rank high as a cause of morbidity and mortality in Native American populations.¹⁷ Diabetes mortality rates among American Indian groups exceeds all races in the U.S., with the age adjusted rate of 4.3 times that of whites and two times that for black Americans.¹⁶ The increase in the number of diagnosed type II diabetes mellitus is linked to obesity in American Indian and other adolescents.¹⁸

A major cause of blindness, kidney disease, lower extremity amputation and cardiovascular disease, diabetes has disproportionately affected Native Americans since the 1960's.⁴ Many believe that the deviation from traditional ways is a chief source Native American susceptibility to diseases.¹⁷ The prevalence of diabetes was usually connected to poor diet and varied by tribal group.

Pima Indians have reported the highest known diabetic rates in the world. One in two Pima Indians over the age of thirty-five has diabetes compared with one in twenty five in the general U.S. population.¹⁵ The high frequency of diabetes in the pima population has been attributed to marked obesity.¹ It has also been noted that seven out of every ten Tohono O'Oddham tribal adults have diabetes. In addition, approximately thirty-three percents of Cherokees, Zunis

and Senecas and twenty-five percent of Apaches, Pawnees and Paiutes tribal members develop diabetes by age 35.¹⁵

The IHS has emphasized the aggressive identification and treatment of diabetes. Weekly foot care clinics, dietary management and education of the patient and family are key components of care.³

Nutrition and Obesity

Obesity has become a significant health problem within Native American populations. The current epidemic of child and adult obesity and its relation to chronic diseases has implications for the immediate and long-term health of American Indian children.¹⁸

Over the last thirty years the nutritional health status of Native American children has changed. Surveys^{11,18} conducted in the 1920's and 1930's, identified malnutrition as a major health problem for Indian children and families. They reported that both the quantity and quality of the food was lacking in native diets. Many Indian families, they added, didn't have enough to eat and childhood malnutrition was fairly common.

By the mid 1970's malnutrition had been greatly reduced by a concentrated public effort. However, this reduction was accompanied by a rapid increase in child and adult obesity in American Indian populations.¹¹ The problem of obesity is not unique to Native American populations but can be seen in all populations within the United States.¹⁸

Many of today's chronic health problems such as type II diabetes mellitus and hypertension are related to obesity.¹¹ Type II diabetes, which was rarely

diagnosed among Native American populations until the 1930's, is now found increasingly in the population and is largely attributed to the increased prevalence of obesity.¹⁵

Studies¹⁸ indicate that American Indian youth have a higher incidence of being overweight than do children in all ethnic groups, in both sexes, and at all ages in the general U.S. population. These studies also point to the increased rate of obesity occurring in early childhood for American Indian preschoolers. Childhood obesity is known to persist into adulthood and is a recognized risk factor for many chronic diseases, such as type II diabetes. Knowing these facts, it is understandable that health professionals are concerned with the increase in type II diabetes found in native children and adults. Of additional concern is the increased centralization of upper body fat in Indian children and adults, which shows a positive relationship with high blood pressure.

Obesity is prevalent in southwestern tribes, where body weight exceeding 25% or more of the ideal body weight, was noted in 39% of males and 65% of females.¹¹ In a 1981 study of Pima Indians,¹⁵ nearly 60 % of members aged 20-34 years of age had a body mass index (BMI) that exceeded the 90 th percentile, compared with 10 % for the U.S. population. A survey of Navajo members¹¹ found that 63% of those surveyed had weights greater than 120 % of their ideal body weight.

Nutritional factors have been found to contribute to at least four leading causes of Native American deaths, heart disease, cancer, cirrhosis and diabetes and to the prevalence of obesity and hypertension.¹¹ The nutritional adequacy of

Indian diet varies from tribe to tribe and can be attributed to different socioeconomic and cultural factors, in addition to food availability and preference.¹⁸

Deviations from traditional diet and habits have had a great impact on native health. A complex set of changes in social, economic, cultural and environmental circumstances has replaced traditional foods, dietary practices, and physical lifestyles with processed foods and sedentary activity.¹⁵ The introduction of high fat and high salt government commodity programs to Indian culture coupled with the explosion of fast food restaurants and convenience stores on or near reservations has encouraged diets high in fat, salt, and sugar.^{11,18} Researchers also theorize of a possible genetic predisposition of Native Americans to obesity. They contend that a thrifty gene encourages maximum fat storage from centuries of conditions caused by periods of gormandizing and starvation.¹⁸

CHAPTER 4

CONCLUSION

In general, the therapeutic and diagnostic approaches utilized in white populations do not differ and are similarly employed in Native American populations. Current innovations in medical therapies, with its vast array of medications and surgical approaches, offer Native American and white populations, as well as other minority groups, choices in health care. However, there are other factors which may limit the quality and type of health care provided to Native American and minority groups.

Although health care to many Native Americans is free, it hasn't guaranteed a healthy population. This is especially true for Native American populations whose health care services are limited by IHS and Native American Program lack of funding, lower socioeconomic conditions and cultural barriers.

When necessary health care is not available locally, the IHS may contract with outside providers to offer care. Over the years, the IHS has found it necessary to contract for services since 76% of IHS hospitals are not equipped to handle surgical or delivery services.² For a majority of Indian people who reside in remote areas, access to health care may be limited to these small hospitals, where there are limited facilities for coronary care. More often those patients

requiring emergency services are stabilized and are then quickly transported to a facility better equipped to handle the crisis.

Understanding that limits on federal funding also limits the type and quality of services offered in IHS facilities, it stands to reason that expansion of rural facilities to acute coronary care units is unfeasible. Therefore, the focus of IHS facilities, unable to provide an acute or phase I cardiac rehabilitation program, should then be on the development of phase II and phase III rehabilitation programs at the local level. The establishment of an area wide (12 geographical areas) comprehensive cardiac rehabilitation program that incorporates prevention and wellness ideas, along with a more coordinated multi-disciplinary approach to care, community involvement and cultural considerations is more feasible given monetary constraints

IHS initiatives, such as the Southwest Native American Cardiology Program at the University of Arizona Medical Center and Tucson Veterans Administration Medical Center³ was developed to address limitations in service. Developed in 1993, the program offers a comprehensive and coordinated approach to cardiovascular care, which was lacking in the previous system. Primary and secondary cardiac care is provided in the Navajo and Phoenix areas, with the Tucson area also providing tertiary care services. The program utilizes an on-site cardiology team at the two medical centers and provides support services to reservation and urban clinics across Arizona, Nevada and Utah. The program also offers IHS physicians educational experience in dealing

with cardiac care management. The IHS notes that the benefits of the program include, but are not limited to providing continuity of care to Indian patients as well as a reduction of contract health expenditures. The proven success of this type of program within the realm of IHS, may support its use as a possible prototype for cardiac care that may be readily applied to other IHS areas.

The focus of an outpatient cardiac rehabilitation program is the promotion of healthy lifestyle changes by combining health education and medical management, with an exercise program tailored to the individual.¹⁹ A failure of IHS to aggressively address the issue of heart disease nationally, makes the implementation of a cardiac rehabilitation program a critical issue as well as a necessary component to the overall health of Indian people. Surprisingly, some of the programs needed for collaboration and to establish a program are currently in place on many reservations. Nationally established programs addressing known risk factors of heart disease such as, diabetes and nutrition have been in operation for some time. Delivered in a separate and distinct manner, these programs would lack the connection needed to address their interrelatedness over the long term. For instance, a diabetic individual participating in weekly foot care clinic may indeed obtain good information and foot care management, but may receive a one time nutritional consult address necessary dietary changes. The failure to recognize and promote the interrelatedness of these programs when addressing even the most identified and targeted of health problems would appear to inhibit realization of IHS goals.

The development of a cardiovascular program within the existing array of programs is a logical step given the interrelatedness of these programs. It is important that any reorganization of current health programming include coordination not only among healthcare personnel, but include tribal people as well, when planning and promoting prevention efforts. Gaining the acceptance and participation of the community for healthcare initiatives is vital for a successful program. IHS personnel must recognize the existence of cultural differences amongst various tribes as well as the differences that exist between white culture and Indian people.

A failure to identify multi-disciplinary teams as an integral part of patient care management would undermine the potential for collaboration amongst professionals in offering the best possible care. Multi-disciplinary teams are a standard in patient care that are recognized by healthcare professionals as a core component in providing good patient care. It would be recommended that any changes include multi-disciplinary teams in patient care management.

Funding, which will undeniably remain a problem for IHS also needs to be addressed during program development. Alternative sources of funding should be sought out in both the public and private sectors. Taking a lead role, the Centers for Disease Control and Prevention (CDC),²⁰ has developed a national cardiovascular program at the state level. The initiative includes every state in a comprehensive, integrated program targeting heart disease and its associated risk factors. In collaboration with the American Heart Association, the National Healthcare and Blood Institute and state health departments, the CDC has

outlined core requirements of a state-based plan of action that includes strategies for targeting the underserved.

The review of the literature just presented has established that Native Americans are underserved in many areas, one of which is healthcare. Efforts by the federal government to allow the IHS to collect third-party payments, such as Medicare, Medicaid and private insurance, will be beneficial to IHS facilities only if congressional appropriation levels are not decreased in compensation.

The Indian Health Service has made many strides in improving healthcare to Indian people. Unlike other communities, an Indian reservation's reliance on the IHS for more than basic healthcare needs is evident in the vast and far reaching role IHS plays within Indian communities.

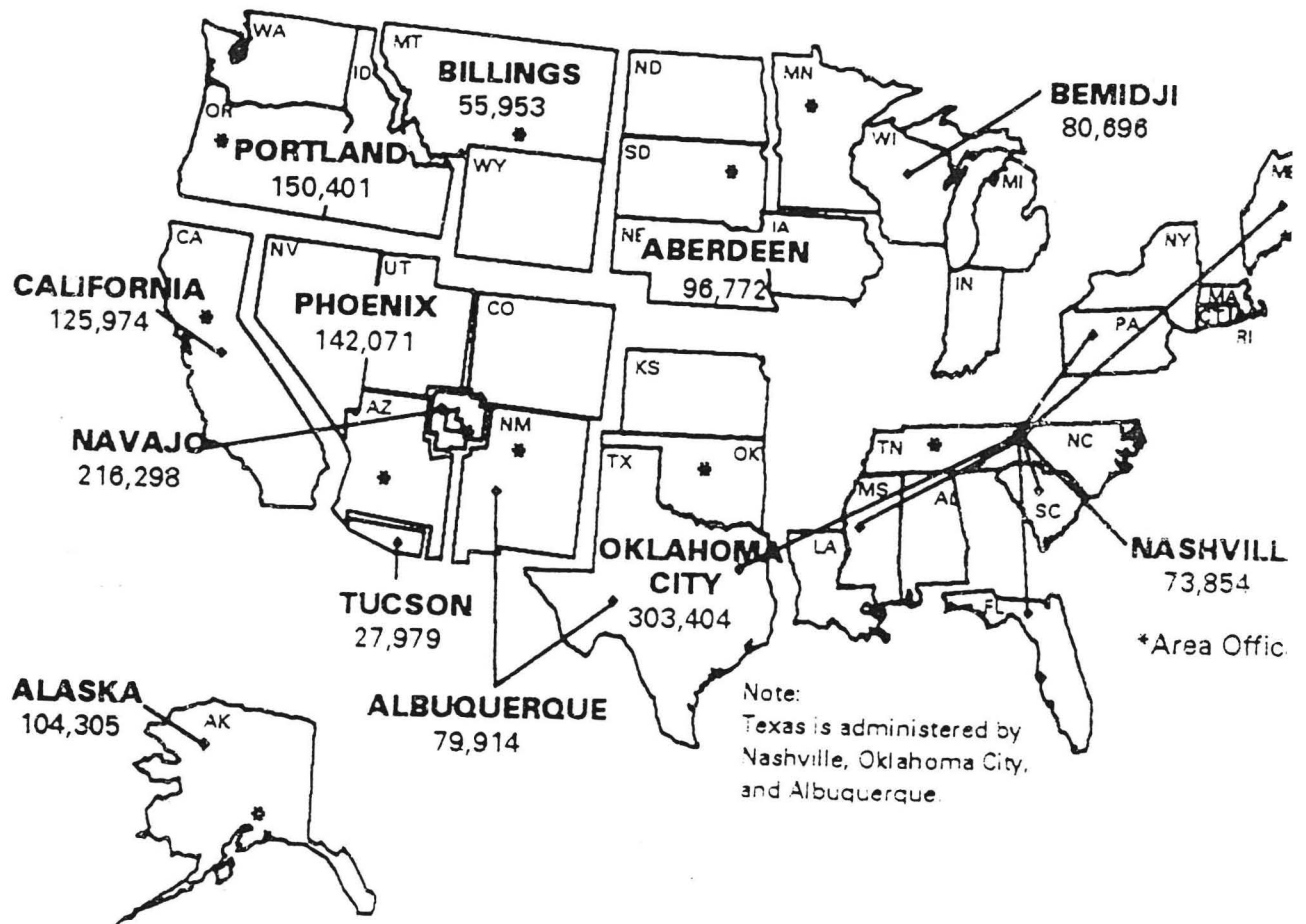
APPENDIX

Table 1. Indian Health Service Budget ⁷

IHS Budget Table (in thousands)	FY 94 Approved Budget	FY 95 Approved Budget	FY 96 Approved Budget	FY 97 Approved Budget
Total for Health Care Services	\$1,646,088	\$1,709,780	\$1,747,842	\$1,806,269
Total for Facilities	\$298,982	\$253,282	\$238,958	\$247,731
Total Budget Authority	\$1,943,570	\$1,963,062	\$1,986,800	\$2,054,000

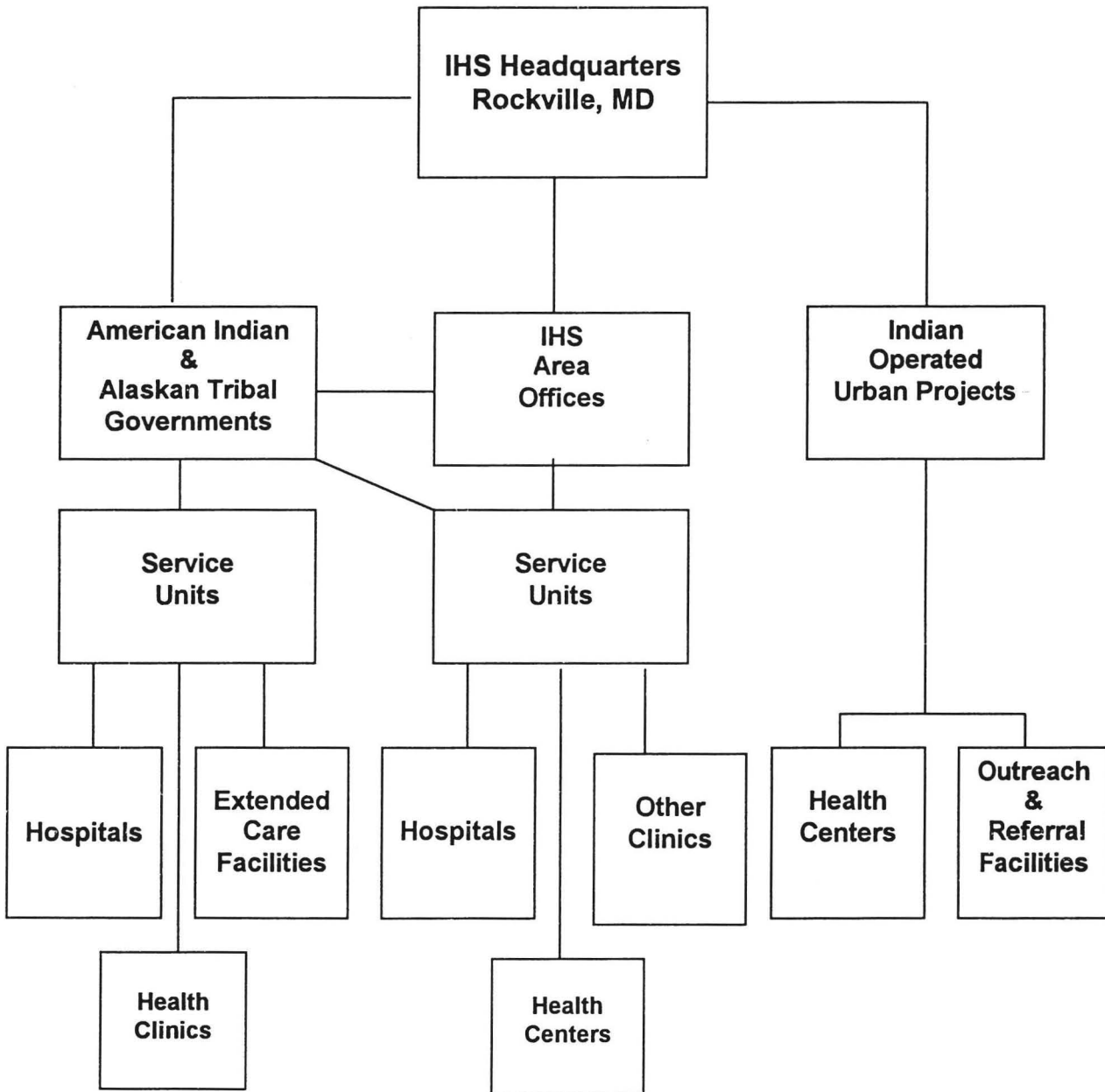
Source: 1997 Trends in Indian Health, U.S Department of Health and Human Services, Indian Health Service, Office of Public Health, Division of Community and Environmental Health.

Table 2. Indian Health Service Area Offices ⁷



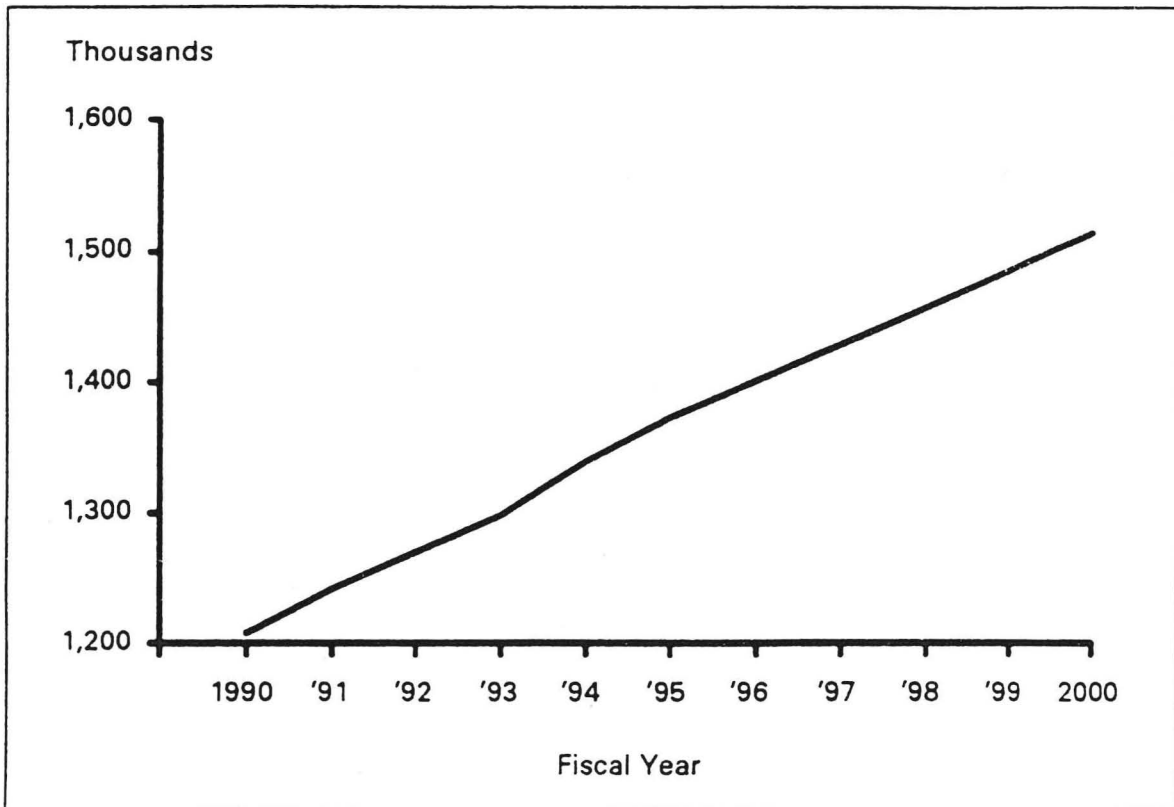
Source: 1997 Trends in Indian Health, U.S Department of Health and Human Services, Indian Health Service, Office of Public Health, Division of Community and Environmental Health.

Table 3. Indian Health Service Structure ⁷



Source: 1997 Trends in Indian Health, U.S Department of Health and Human Services, Indian Health Service, Office of Public Health, Division of Community and Environmental Health.

Table 4. Indian Health Service Population ⁷



Source: 1997 Trends in Indian Health, U.S Department of Health and Human Services, Indian Health Service, Office of Public Health, Division of Community and Environmental Health.

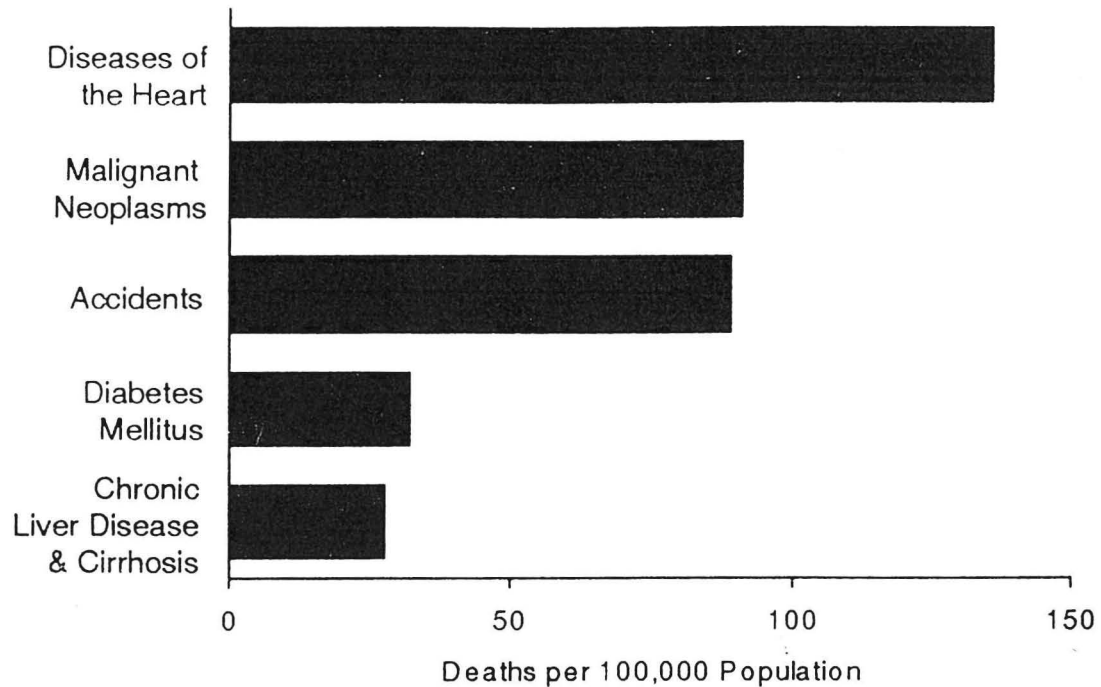
Table 5. IHS Health Spending Per Person ⁷

	1990	1991	1992	1993	1994	1995	1996
U. S Average	\$2150	\$2317	\$2505	\$2660	\$2771	\$2912	\$3046
IHS Average	\$ 899	\$1058	\$1040	\$1087	\$1120	\$1153	\$1200

Indian people served by IHS receive 40 % of health care dollars spent on the general U.S. population.

Source: 1997 Trends in Indian Health, U.S Department of Health and Human Services, Indian Health Service, Office of Public Health, Division of Community and Environmental Health.

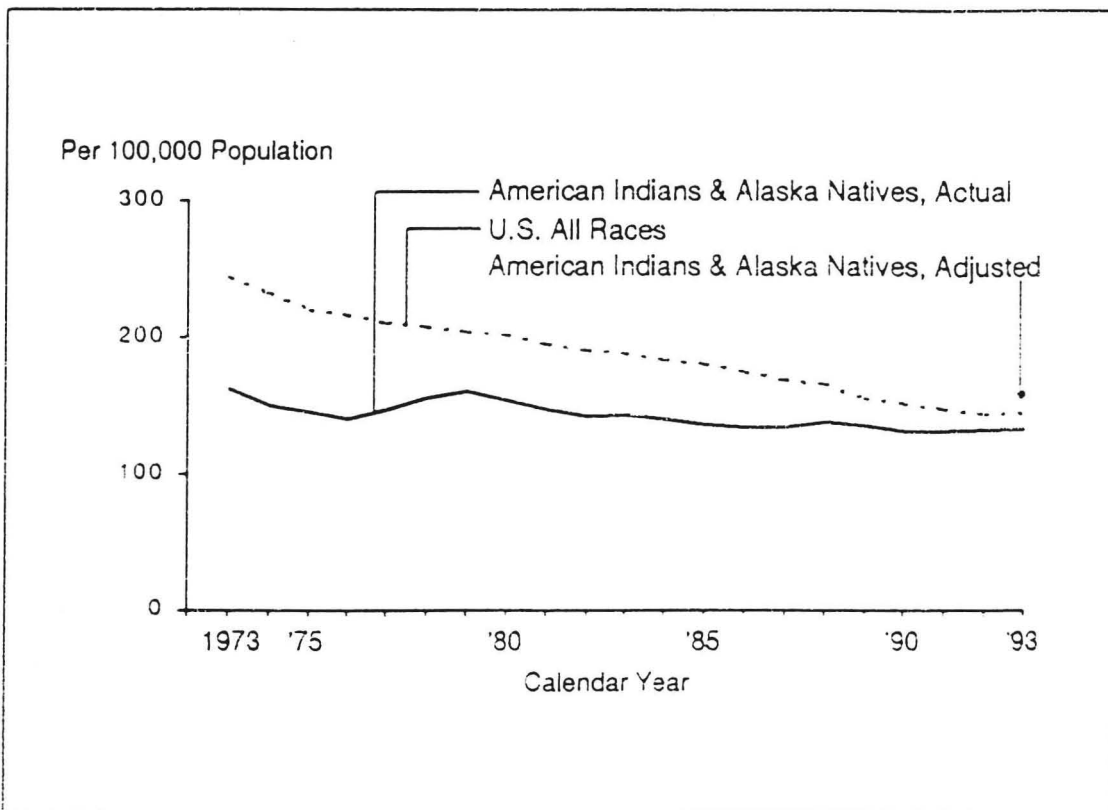
**Table 6. Leading Causes of Death American Indian and Alaska Natives ⁷
Both Sexes
(1992-1994)**



Diseases of the heart and Malignant Neoplasms were the two leading causes of death for both Native American (recent change) and White populations .

Source: 1997 Trends in Indian Health, U.S Department of Health and Human Services, Indian Health Service, Office of Public Health, Division of Community and Environmental Health.

Table 7. Age-Adjusted Heart Disease Death Rates



Source: 1997 Trends in Indian Health, U.S Department of Health and Human Services, Indian Health Service, Office of Public Health, Division of Community and Environmental Health.

REFERENCES

1. Alpert JS, Goldberg R, Ockene IS. Heart Disease in Native Americans. *Cardiology*. 1991; 78 (1): 3-12.
2. Joe JR. The Health of American Indian and Alaska Native Women. *J Am Med Women's Assoc*. 1996; 51(4): 41-5.
3. The Indian Health Service. Fact Sheet. Available at: <http://www.his.gov>. Accessed August 23, 1999.
4. Taggart MM. What Ails Indian Country?; Lifestyle Choices and Lack of Funding Impact Native Health. *American Indian Report*. 1999;13-15.
5. Klebe ER, Judge KM. *Health Services for American Indians and Alaska Natives*. Congressional Research Service, The Library of Congress; November 13, 1993. Publication EPW 93-975.
6. Schneider MJ. *North Dakota Indians: An Introduction*. Dubuque, IA: Kendall/Hunt Publishing Co; 1986: 17.
7. Indian Health Service. *Trends in Indian Health 1997*. Washington, DC: Department of Health and Human Services; 1997.
8. Noren J, Kindig D, Sprenger A. Challenges to Native American Health Care. *Public Health Reports*. 1998; 113 (1): 22-33.
9. Dininny P. Narrowing the Distance: Practicing Physical Therapy in an Uncommon Setting. *PT Mag Phys Ther*. 1996; 4(4): 42-51.
10. Kimball EH, Goldberg HI, Oberle MW. The Prevalence of Selected Risk Factors for Chronic Disease Among American Indians in Washington State. *Public Health Reports*. 1996;III: 264-271.
11. Jackson MY. Nutrition in American Indian Health: Past, Present and Future. *Journal Of The American Dietetic Association*. 1986; 86 (11): 1561-5.
12. Goodman CC, Bossonault WG. *Pathology: Implications for the Physical Therapist*. 1st ed. Philadelphia, PA: WB Saunders Company; 1998: 279.

13. Kernicki JG. A Multicultural Perspective of Cardiovascular Disease. *Journal of Cardiovascular Nursing*. 1997; 11 (4): 31-40.
14. Yu PN. Heart Disease in Asians and Pacific Islanders, Hispanics and Native Americans. *Circulation*. 1991; 83: 1475-7.
15. Brown AC, Brenton B. Dietary Survey of Hopi Native American Elementary Students. *Journal Of The American Dietetic Association*. 1994; 94: 517-22 .
16. Rousseau P. Native American Elders: Health Care Status. *Clinical Geriatric Medicine*. 1995; 11: 83-95.
17. Jacobson SF. Native American Health. *Annu Rev Nurs Res*. 1994:193-213.
18. Story M, Strauss KF, Zephier E, Broussard BA. Nutritional Concerns in American Indian and Alaska Native Children: Transitions and future Directions. *Journal Of The American Dietetic Association*. 1998; 98: 170-176.
19. Advanced Cardiac Specialists. Cardiac Rehabilitation. Available at: <http://advancedcardiac.com/cardiac-rehab.htm>. Accessed October 12, 1999.
20. Centers for Disease Control and Prevention. Disease Prevention. Available at: <http://cdc.gov/needphp/cdc/cvdaag.htm>. Accessed October 12, 1999.