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Comparison of Cardiovascular Disease Risk In Japanese Natives and Japanese Americans

Mayumi Takeda
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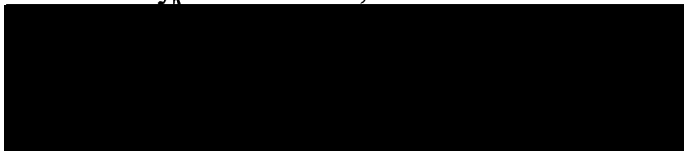
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The abstract and thesis of Mayumi Takeda for the Master of Science in Health Education were presented June 30, 1997, and accepted by the thesis committee and the department.

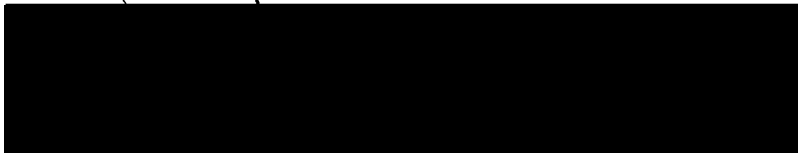
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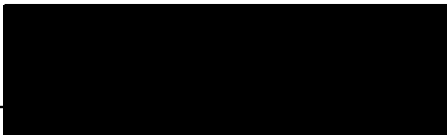
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ABSTRACT

An abstract of the thesis of Mayumi Takeda for the Master of Science in Health Education presented June 30, 1997.

Title: Comparison of Cardiovascular Disease Risk in Japanese Natives and Japanese Americans.

This research examined potential differences in cardiovascular disease risk (CVR) in two groups: Japanese Natives living in Saga, Japan and Japanese Americans living in or near Portland, Oregon. It explored data gathered in an effort to build a theoretical framework for future studies. Environmental, nutritional, and lifestyle differences were also examined to compare the health status of Japanese residents in the two countries. The history of Japan from World War II to present, and the history of Japanese Americans both first and second generation, are discussed in the literature review.

Accelerated plethysmography (APG) is a technique which presumably allows the early detection of circulatory insufficiency. It is designed to measure the pattern of blood flow in the index finger. This method is used to evaluate the peripheral circulation by classifying the APG waveforms into seven major patterns. Based on this classification, the APG might evaluate health status regarding cardiovascular disease risk (CVR). This investigation also compared the data gathered by the technique of the APG with cardiovascular disease risk questionnaires in order to examine the efficacy of using the APG to evaluate cardiovascular disease risk.

The comparison of health status in the two groups revealed several differences: Japanese American males are heavier than Japanese Native males and both Japanese American males and females take more prescription medications, and have better exercise habits than Japanese Natives. These differences could account for the higher APG-index in Japanese Americans. However, this research found that despite these differences, there was no correlation between the APG-indices and CVR factors. Further research is needed to determine whether the APG-index can be useful in the study of cardiovascular disease risk.

**COMPARISON OF CARDIOVASCULAR DISEASE RISK
IN
JAPANESE NATIVES
AND
JAPANESE AMERICANS**

by

MAYUMI TAKEDA

**A thesis submitted in partial fulfillment of the
requirements for the degree of**

**MASTER OF SCIENCE
in
HEALTH EDUCATION**

**Portland State University
1997**

DEDICATION

To my former thesis committee member, Milan Svoboda, Ph.D., who passed away in March, 1997, from pancreatic cancer for his love and teaching.

To my father, Taisuke Takeda, who passed away in December, 1994, from colon cancer for his love and memory.

To my American little brother, Stephen D. Wagner, who passed away in September, 1991, by a tragic accident for his love and faith.

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CHAPTER I

INTRODUCTION

Japan is a small country which is surrounded by seas. More than one hundred twenty five million people share the land (See Table II, p.18). The population density per square mile is 860.5 in Japan, while it is 32.1 in Oregon (See Table II, p.18).

Urbanization in Japan has been changing not only the natural environment, but also the patterns of human life. Presently, the Japanese are surrounded by contaminated air, water, and soil, which must ultimately influence their health (Swinbanks, 1995).

A Japanese word “karoshi” refers to the phenomenon of sudden death from prolonged, intensive overwork. The cause of death from “karoshi” is usually diagnosed medically as a stroke (Hamajima, 1992). Adults in their thirties and forties (middle-aged workers) are the most common victims because they work long, unrelenting hours (Uehata, 1991). Japan’s post-war economic success is largely attributable to the ethic of workaholism (Hayashi, Kobayshi, Yamaoka, & Yano, 1991).

On the other hand, workers in the U.S. have more living space with more regular work hours including more days off.

“On average, American houses are 1.6 times the size of Japan’s. On a per capita basis they are 1.8 times larger and also average annual working hours has been declining in Japan, but is still about 10% higher than that of the U.S. Japan has an average of ten fewer paid vacation days than the U.S.” (JETRO, 1991).

Most American elderly people do not live with their children. After a spouse’s death, it is common for a person to live alone or in a retirement home.

“The percentage of senior citizens living alone in Japan is 4.0%, while it is in the U.S. is 9.5% and also, the ratio of the number of people aged 65 and over to the number of beds in nursing homes for the aged is higher in Japan than in the U.S. The ratio is 57.9 in Japan and 17.1 in the U.S.” (JETRO, 1991).

This independent lifestyle in the U.S. might make them more active and healthy.

However, increased fatty food availability has made people more prone to obesity in the U.S. According to a nutrition text book, “one group of scientists studied 155

obese men who were eating a typical American diet - about 15 percent of total calories from protein, 38 percent from carbohydrate, 41 percent from fat, and 6 percent from alcohol. Their total average food-energy intakes (2,570 calories per day) fell short of current recommendations (2,900 calories per day). The researcher found that the more fat a man ate, the fatter was his body and, conversely, that the more carbohydrate a man took in, the lower his body fat” (Hamilton, Whitney, & Sizer, 1991, p.360).

Since the early 1900's, the number one killer in the United states has been cardiovascular disease in every year but one (1918) (1997 Heart and Stroke, American Heart Association). Deaths do not tell the whole story, but the problem of the obesity in the U.S. seems to be similar to the phenomenon of Japanese environmental pollution because both present increased risk and are very difficult to ameliorate.

This research is focused on assessing the living conditions and the quality of life of Japanese Americans living in or near Portland, Oregon and Natives living in Saga, Japan, over forty years of age, and examining cardiovascular disease risk (CVR). CVR may be evaluated directly through hypertension, diabetes, cholesterol, smoking, inactivity, and heredity. Also, there are other indirect factors, such as population

density, pollution problems, food availability, eating habits, working time or social pressure, and whether the person smokes or is exposed to passive smoke.

STATEMENT OF THE PROBLEM

Surprisingly, many elderly Japanese Americans still maintain the traditional Japanese lifestyle and customs. This includes diet, way of life, collecting Japanese furniture, dishes and utensils, clothing, and maintaining familiar traditions. Japanese Americans serve their guests green tea in a Japanese cup. At dinner, traditional Japanese food, such as plain rice, miso soup, fish and vegetables is served in a Japanese rice bowl with chopsticks. Also, all family members sit at a traditional low table, called a "kotatsu," and enjoy watching television during the winter season. The majority of people in this age group have no property and few relatives left in Japan and they feel they cannot go back. Therefore, their image of Japan is amazingly different from that of modern young Japanese students. Elderly Japanese Americans recollect their childhood, parents, and hometowns.

Forty years ago, when they arrived in the U.S., they could not openly adhere to Japanese cultural traditions because Americans did not appreciate the Japanese. In fact, Japanese Americans often experienced hostility from other Americans. They dared not speak Japanese or teach Japanese to their children. They desperately tried to be assimilated into the dominant American culture. Now it has been more than fifty years since the end of World War II, and they can speak up and be proud of their Japanese heritage because Japan has become an economic world leader.

In recent years, a sense of cultural pride has emerged and the Japanese Americans practice the customs of their youth and congregate in Japanese churches and other organizations to speak their language and socialize with other Japanese Americans. In Portland, for example, elderly Japanese Americans especially enjoy the connections they make with younger people who were raised in Japan with a knowledge of Japanese traditions. Although they have lost their own connections to Japan, they feel they have regained them through such associations and companionship.

In spite of Japanese Americans' sentimentality about their country, if they were to go back, they would be very surprised and perhaps disappointed. Things in Japan have changed dramatically. They would probably agree that their living conditions in the U.S. are much better than those in Japan. The extremely fast-paced life style in Japan would likely make many Japanese Americans very unhappy. They would notice and experience immediately that there is serious air and noise pollution. Prices are extremely high and space must be shared by many people. Since many insensitive smokers exist in public places, such as restaurants, lounges, and offices, second hand smoke in close quarters is very common.

TABLE I
LEADING CAUSES OF DEATH IN DIFFERENT AGE GROUPS IN JAPAN '95

Age	# 1	# 2	# 3	# 4	# 5
40-44	Cancer (7,845)	Heart disease (2,472)	Cerebrovascular disease (2,313)	Accidents (2,071)	Suicide (1,558)
45-49	Cancer (17,003)	Cerebrovascular disease (4,864)	Heart disease (4,856)	Accidents (3,027)	Suicide (2,227)
50-54	Cancer (25,013)	Cerebrovascular disease (6,895)	Heart disease (6,417)	Accidents (3,558)	Suicide (2,539)
55-59	Cancer (36,074)	Heart disease (9,657)	Cerebrovascular disease (9,328)	Accidents (3,970)	Suicide (2,228)
60-64	Cancer (57,755)	Heart disease (15,336)	Cerebrovascular disease (14,649)	Accidents (4,763)	Liver disease (2,582)
65-69	Cancer (73,084)	Heart disease (21,583)	Cerebrovascular disease (20,854)	Accidents (4,949)	Pneumonia/bronchitis (4,699)
70-74	Cancer (70,697)	Cerebrovascular disease (28,704)	Heart disease (28,117)	Pneumonia/bronchitis (7,907)	Accidents (5,493)
75-79	Cancer (67,459)	Cerebrovascular disease (41,906)	Heart disease (38,559)	Pneumonia/bronchitis (13,701)	Accidents (5,828)
79-84	Cancer (62,962)	Cerebrovascular disease (60,758)	Heart disease (52,811)	Pneumonia/bronchitis (21,842)	Accidents (5,975)
85-89	Cerebrovascular disease (54,851)	Heart disease (46,890)	Cancer (37,526)	Pneumonia/bronchitis (21,864)	Senility (6,234)
90-	Cerebrovascular disease (36,345)	Heart disease (33,011)	Pneumonia/bronchitis (16,835)	Cancer (15,339)	Senility (10,986)
Total death in 1995. (922,139)	Cancer (263,022)	Cerebrovascular disease (146,552)	Heart disease (139,206)	Pneumonia/bronchitis (79,629)	Accidents (45,323)

Department of Welfare. (1996). The Movement of National Health. Tokyo, Japan: Health and Welfare Statistics Association. 43 (9), 30-33.

Generally speaking, the Japanese live in high population density areas with a great deal of social pressure. Living expenses, including food and housing, are much higher than in the U.S. They have less vacation time, and usually work even after retiring by finding a new job or continuing the same job (Hinrichs, Roche, & Sirianni, 1991; Bosch, Dawkings, & Michon, 1994). They live close together in small living spaces, so air, water, noise, and soil pollution are high. Pollution from cigarettes, cigarette ashes, and cigarette stubs are one of the causes of air, water, and soil pollution. Recently, the problems of environmental pollution have been recognized as being more diverse and complex than was previously thought. Among them are increasing air contamination by nitrogen oxide, industrial waste and its disposal, groundwater contamination and soil pollution by agricultural chemicals and other chemical substances.

“In fiscal year 1991, the total budget for environmental conservation was 1,451 billion yen (about \$14 billion U.S. dollars), or 8.3% more than in the previous fiscal year. Of the total budget, expenditure for measures against pollution constituted 88.6%, and expenditure for measures to conserve natural environment 11.4%” (Statistics Bureau, 1993).

Japan is struggling to deal with these pollution problems, and efforts are being made to substitute cleaner energy sources for petroleum and to install and improve pollution control facilities.

Furthermore, since land prices are very high, people in Japan rarely own their houses.

“Land prices, especially those in residential areas, are considerably higher in Japan than in the U.S. Prices in rural areas in Japan are even more expensive

than preferred residential areas in Los Angeles. Also, the percentage of single-family detached dwellings in the total number of houses has been declining due to high land prices and the high costs of the houses themselves” (JETRO, 1991).

Consequently, most people live in high-rise apartments. Since most people cannot buy a house, they settle for a new car instead. All these cars contribute to the pollution, space, and traffic problems. People living every day under these conditions experience an inordinate amount of stress. Due to the competitive and high stress nature of the Japanese society, smoking and drinking are very common.

“Japanese spend large amounts on books and package tours, while Americans spend more on radios, television sets, musical instruments, leisure vehicles (including boats and private aircraft), and sports equipment” (JETRO, 1991).

In addition, the Japanese rely heavily on taking ergogenic remedies to “boost their vitality” and help relieve stress, and they spend a lot of money buying them. For example, ordinary people buy an ergogenic drink (per drink \$2 - \$50) as easily as American purchase a cup of coffee. Moreover, Japanese are very interested in trying natural medicines made of herbs and animals for their chronic diseases. Japanese Natives should realize now that effective tools for decreasing stress and the consequent attainment of longevity are actually acquired by the manipulation of diet, an increase in physical activity, management of stress, and a decrease in smoking and drinking. The environmental choices might be even more carefully considered by the Japanese. Like many Japanese emigrants who left to seek their fortunes in the new world, current teenagers in Japan may choose to live outside of Japan in the future.

“Many Japanese workers feel more loyal to their companies than American workers. Working oneself to death and suicide is not uncommon. Unlike their elders, many young Japanese workers want to spend less time working and more pursuing leisure activities” (Brown, Lubove, & Kwalwasser, 1994).

Modern elderly Japanese Natives do not have a choice regarding their living place, but they have good dietary habits. They prefer low cholesterol foods such as tofu, sashimi (a piece of very fresh raw fish), and plain rice, but environmentally, there are many negative factors related to cardiovascular disease in Japan. Even though they drink whole milk (if they drink milk at all), dairy products are expensive, so they do not consume nearly as much as elderly Japanese Americans.

“Almost all kinds of food are more expensive in Japan than in the U.S. Especially, Japan produces and consumes far less beef than the U.S. Imports account for 40% of the beef consumed in Japan. Therefore, the per capita daily intake of nutrients in Japan is considerably lower than of the U.S.” (JETRO, 1991).

Fortunately, this prevents elderly Japanese Natives from developing high cholesterol. In addition, elderly Japanese Natives do not consume much processed food. Their food is usually prepared from fresh vegetables and fish, so they spend a lot of time cooking. This limits exposure to harmful preservatives, which is another positive factor for elderly Japanese Natives.

On the other hand, there are plentiful meats, dairy products, fruits and vegetables, and beans and grains in the U.S., so elderly Japanese Americans can get these foods at cheaper prices. The average American diet is relatively high in fat when compared with the diet of the average Japanese Natives. However, most elderly Japanese Americans continue to cook with the Japanese cooking style. In addition to such a

low cholesterol diet, they are surrounded by plenty of fresh air, green grass, parks, and spacious living quarters. Furthermore, elderly Japanese Americans have more days off and retire early and definitely so that they can get away from social pressures sooner (Mirkin, 1987; Hinrichs, Roche, & Sirianni, 1991). Larger living spaces per person with easy access to fresh air and green open space seems to be the preferred choice.

The typically lower-fat, fresh food diet of the Japanese combined with such working conditions as an eight-hour-day, adequate days off, and early retirement as well as adequate personal space are conducive to a lower cardiovascular disease risk. Likewise, a poor diet, high in fat, and high-stress living (e.g. overwork and inadequate personal space) are conducive to a higher CVR. These factors lead to the hypothesis that there may be a difference in cardiovascular disease risk between Japanese Natives and Japanese Americans.

HYPOTHESIS

Since this was an exploratory descriptive study, the hypothesis tested were non-directional (i.e., two-tailed). The null and alternate hypotheses were as follows:

$$H_0: CVR_{JN} = CVR_{JA}$$

$$H_1: CVR_{JN} \neq CVR_{JA}$$

where CVR_{JN} denotes mean cardiovascular risk of Japanese Natives and CVR_{JA} denotes mean cardiovascular risk of Japanese Americans. Statistical significance was determined using an alpha level of 0.05. Since there is no extant research on Japanese

American cardiovascular risk, the hypothesis was focused on finding differences between these two populations. The research hypothesis was that there exists a statistically significant difference between the Japanese Native and Japanese American populations in terms of cardiovascular risk.

PURPOSE

The purpose of this study was to compare the cardiovascular disease risk for Japanese individuals living in the United States with those living in Japan, and to determine whether a significant difference exists. This investigation also compared the data gathered by the technique of APG with cardiovascular disease risk questionnaires in order to examine the efficacy of using the APG to evaluate cardiovascular disease risk.

SIGNIFICANCE OF THE STUDY

If differences in cardiovascular disease risk could be identified, what does it mean for the future? As stated earlier, this research was intended to provide exploratory data that may be useful in formulating hypotheses and research questions for the future. Any differences in cardiovascular disease risk between Japanese Natives and Japanese Americans may lead to research that will address the underlying mechanisms involved. It was expected that differences in cardiovascular disease risk would be found, but the extent to which any differences may be explained is limited by the design of the study. However, comparing the lifestyle and environment data gathered from the questionnaire may give some ideas as to why high cardiovascular disease risk

is present. Also, this could guide future research projects. If the null hypothesis is rejected, this research should be continued to the next step: why does a difference in cardiovascular disease risk exist between the Japanese Native population and the Japanese American population?

This research provides data important in the evaluation of accelerated plethysmography (APG) as a tool for cardiovascular disease risk assessment. It is possible that the APG may demonstrate clinical utility as a risk assessment instrument, alone or in combination with other commonly used instruments.

LIMITATIONS AND ASSUMPTIONS

The design of this study is quasi-experimental since it resembles a nonequivalent-comparison group design, and therefore will be limited to the extent that inferences may be made. However, the exploratory nature of this research is intended to provide research questions for future investigations rather than conclusions for making inferences. The sampling procedures used limits the scope and generalizability of the results. It is assumed that instruments used to gather data (e.g., questionnaires and risk profiles) were valid and reliable when used with both samples, and that all subjects were truthful in answering questions about their health behaviors/status. It is also important to remember that the APG-index and other measures of health status are estimations of health status.

CHAPTER II

REVIEW OF LITERATURE

No previous research on Japanese American cardiovascular diseases has been found. Therefore, this study may provide the foundation for future research of cardiovascular disease risk in the Japanese American population and the Japanese Native population. Such research could have beneficial implications for other population subsets as well.

“More than 2,600 Americans die each day from cardiovascular diseases; an average of a death every 33 seconds. That’s more than 954,000 deaths annually; nearly 42 percent of all deaths every year. Extensive clinical and statistical studies have identified several factors that increase the risk of cardiovascular disease. These risk factors can be grouped into two classifications: 1) major risk factors and 2) contributing risk factors. Major risk factors for cardiovascular disease that cannot be changed are heredity, male sex and increasing age. Heredity: Children of parents with cardiovascular disease are more likely to develop it themselves. Race is a consideration, too. African-Americans have moderate high blood pressure twice as often as whites and severe hypertension three times as often. Consequently, their risk of heart disease is greater. Being male: Men have a greater risk of heart attack than women earlier in life. After menopause, women’s death rate from heart disease increase. Increasing age: The vast majority of people who die of heart attack are age 65 or older. Contributing risk factors are those associated with increased risk of cardiovascular disease, and can be changed or are modifiable by lifestyle. Cigarette/Tobacco smoke: Smokers’ risk of heart attack is more than twice that of nonsmokers. Smokers who have a heart attack are more likely to die and die suddenly (within an hour) than nonsmokers. High blood cholesterol: Based on large population studies, blood cholesterol levels below 200 mg/dL in middle-aged adults seem to indicate a relatively low risk of cardiovascular disease. A level of 240 mg/dL and over approximately doubles the risk. High blood pressure: increases the heart’s workload, causing the heart to enlarge and weaken over time. Physical inactivity: Regular aerobic exercise plays a significant role in preventing heart and blood vessel disease. Management of stress: Life would be dull without stress, but excessive amounts of stress over a long time may create health problems. For example, people under stress may start smoking

or smoke more than they otherwise would” (1997 Heart and Stroke, American Heart Association).

On the other hand, because of the increase in the number of older people in Japan, the frequency of disease and injury has increased. Especially, deaths due to such geriatric diseases as cancer, cerebrovascular disease, and heart disease have accounted for 60% of all deaths (see Table 1, p. 11). Of the three, heart disease is gradually decreasing, while cancer is on the rise as a cause of death: In 1993, deaths due to cancer were 235,707, heart disease were 180,297, and cerebrovascular disease were 118,794, while in 1996, cancer were 263,022, cerebrovascular disease were 146,552, and heart disease were 139,206 (Department of Welfare in Japan, 1997).

Comparison of Population Densities

Table II lists the population densities of several counties in Oregon, New York City, Tokyo, and Saga, Japan. The data show more clearly how many people share per one mile square in each place. Individuals living in Oregon experience the most open space. Saga, Japan, a small, rural city, has a population density four times greater than Portland. In addition, Tokyo, Japan has the highest population density in the world (Famighetti, 1996). Tokyo’s population density is 1.8 times the population density of New York City and 31.2 times that of Portland.

TABLE II

COMPARISON OF POPULATION DENSITY

36 COUNTIES	OREGON	3,086,188	96,002	32.1
COUNTY	COURT HOUSE	POPULATION	LAND (MI) ²	DENSITY per (MI) ²
MULTNOMAH	PORTLAND	611,729	465	1,315.5
CLACKAMAS	OREGON CITY	310,156	679	456.8
BENTON	CORVALLIS	74,492	679	109.7
LANE	EUGENE	298,994	4620	64.7
MARION	SALEM	250,133	1194	209.5
TILLAMOOK	TILLAMOOK	23,315	1125	20.7
WASHINGTON	HILLSBORO	359,018	727	493.8
LINCOLN	NEWPORT	43,259	992	43.6
48 PREFECTURES	JAPAN	125,506,492	145,850	860.5
SAGA PREFECTURE	JAPAN	880,310	939.47	937.0
SAGA CITY	JAPAN	204,926	40.03	5,119.2
TOKYO	JAPAN	8,163,000	198.8	41,052.6
NEW YORK CITY	NEW YORK	7,263,000	318.1	22,834.5

THE WORLD ALMANAC AND BOOK OF FACTS (1996). P.786

NOTE 1: THE DATA FOR SAGA JAPAN OBTAINED FROM THE BUREAU OF THE CENSUS 1994 IN SAGA JAPAN. NOTE 2: THE DATA FOR TOKYO AND NEW YORK CITY OBTAINED FROM JAPAN 1995: AN INTERNATIONAL COMPARISON. (1994). P. 109

Studying population density is very useful because it gives us the origin and the history of current settlers. Historically, the first immigrants were called "Issei," the second generations were "Nisei," and now most Japanese Americans are "Sansei." The first language of "Nisei" and "Sansei" was English, but most of "Nisei" can speak and write Japanese and are familiar with Japanese culture because most attended Japanese school in the U.S. However, almost all "Sansei" cannot speak or write Japanese. In general, "Sansei" do not perceive this lack of heritage as a loss.

JAPANESE AMERICANS

It was a little more than one hundred years ago when the first Japanese arrived in Oregon.

"In 1880 there were only three Japanese people in the entire region. Then, it was between 1910 and 1920 that large numbers of Japanese women arrived in Oregon. Under the system of immigration which permitted the bringing of "picture brides," during these ten years the number of women between the ages of 20 and 44 increased from 201 to 769. In 1924, the Immigration Exclusion Act virtually ended immigration until after World War II" (Stearns, 1974).

With increasing Japanese immigration ("Issei"), there was considerable agitation directed toward the Japanese. In a report to the governor on the Japanese situation in Oregon, the Japanese population of Portland in 1920 was estimated at about 1,800 (Stearns, 1974). They earned their living as merchants, lodging house keepers, hotel and eating house owners, tailors, shoemakers, dyers, cleaners, factory workers, and farm hands.

“In Portland, about 90 per cent of the small hotels and lodging houses were reported to be in the hands of the Japanese, who were gradually extending their operations into various new branches of trade. The Japanese population continued to increase; a survey in 1935 recorded that there were 2,000 first-generation Japanese “Issei” and 2,376 second generation Japanese “Nisei” in Oregon, with 273 of the latter over age twenty-one” (Stearns, 1974).

During the early post-World War II years, a small number of Japanese women entered the country as brides of American servicemen who had served in the occupation force (O’Brien & Fujita, 1991). Immigrations to the U.S. have been increasing every year, and “there were 8,580 Japanese in Oregon in 1980, which were

the largest group immigrants in the total of 2,639,915 Oregonians. In more detail, there were 740 Japanese in Clackamas County in a total of 243,000 residents, 301 Japanese in Clark County in a total of 192,227 residents, 2,921 Japanese in Multnomah County in a total of 562,300 residents, and 1,094 Japanese in Washington County in a total of 247,800 residents. The highest concentration of the Japanese was in Multnomah County, which includes Portland. The Japanese population was very dispersed, and they did not live in a high degree of concentration. The Japanese tended to be found less conspicuously in a core area of northeast or southeast Portland and, at the same time, they were distributed more prominently in outlying areas. The exclusive and more affluent neighborhoods of southwest Portland, (e.g., the inner West Hills) contained a greater population of Japanese in comparison to other East Asians, such as Chinese and Korean. Vancouver did not have a concentration of people of Japanese descent” (Stearns, 1974).

Unlike the majority of the Chinese and Koreans, the Japanese basically do not want to live in groups. They tend to want to live independently and diligently. In Stearns’ report (1974), “The history of the Japanese people in Oregon,” he wrote that the Japanese were interested in the purchase of land.

“In the eastern part of Multnomah County the Japanese had established themselves in the farming industry. Beginning in 1906 the Japanese began near Russellville the culture of strawberries. In 1911 almost one-half of the farming lands around Russellville were under their control, their efforts having

been extended to the raising of all kinds of fruits and vegetables. They had to pay a good price for the rental of the land, usually \$15 an acre, but they took the best lands so that every acre would be productive. The dairy, hay, grain, and potato industries at this time were not attempted by the Japanese, who found the vegetable and small fruit production so much more profitable on land for which high rentals must be paid. In the Gresham community, where the soil is so well adapted to berry culture and truck gardening, the Japanese had a strong foothold. Fifty percent of the acreage of raspberries, 90 percent of the strawberries, 30 to 40 per cent of the loganberries, and 60 percent of the vegetable gardening were handled by the Japanese, with some inroads being made into the potato and dairying business. The Japanese held the land under lease of three to six years, usually picking the very best land. The majority of those who rent to them are city owners. Some resident farmers rent to them, but many refuse to deal with them feeling that the Japanese crop the ground intensively and rob it of its fertility by the time his lease expires” (Stearns, 1974).

JAPANESE NATIVES

There are many elderly Japanese Natives who have worked hard for a long time for Japan. World War II was extremely destructive to Japan, ending on 15 August in 1945 with Japan's defeat. Like any other defeated people, the Japanese were miserable at that time. All of Japan was in disorder. However, the Japanese who survived from World War II desperately worked very hard in order to reconstruct Japan. Because of this generation, in spite of losing many brothers and sisters, enormous amounts of properties, and many old conventions, Japan was reborn, and the Japanese adopted a new Western lifestyle. However, whether it can be shown how the new Western lifestyle has affected Japanese Natives' wellness is still unclear and forms the subject of this research.

DIET

For hundreds--perhaps thousands--of years, rice, fish, soybean products, and green vegetables made up the traditional Japanese diet. However, after World War II, Western habits penetrated Japanese life to an enormous extent, bringing important and dramatic changes in dietary and eating practices. In particular, consumption of rice as a staple food declined sharply. By contrast, intake of animal foods, such as meat, eggs, milk, and dairy products, has markedly increased. As a result, although diseases associated with undernutrition, such as tuberculosis and other communicable infectious diseases declined after 1947, degenerative diseases of aging are now the leading causes of death (Fujita, 1992).

New Japanese-type eating habits have been established. This new pattern consists of small servings of boiled rice, with the addition of meat, fish, vegetables, and milk. This eating revolution after World War II (which has included providing school lunches) has been supported by economic growth and may have contributed to the rapid rise in Japanese longevity. In fact, most Japanese before World War II ate only grains and vegetables, and died young.

“In Japan before World War II, while it was not the custom to eat much meat, the custom of taking 3 g of animal protein per person per day and eating large amounts of rice resulted in a high salt intake” (Matsuzaki, 1992).

Matsuzaki (1992) emphasized that with meat added to the previous Japanese diet, Japanese can expect to live longer, and cautioned that eating fatty meats is a factor in the development of hypercholesterolemia, which leads to ischemic heart disease or myocardial infarction. It has also been reported that Americans eat an average of 320 g of meat per person per day whereas Japanese eat an average of 100 g of meat per person per day (Matsuzaki, 1992). Daily meat intake in Japan may represent the ideal quantity to reduce cardiovascular disease. As a result, Matsuzaki (1992) recommended that due to low serum cholesterol levels among Japanese Natives, they should continue the present meat intake. Matsuzaki feels that if Japanese further reduce meat intake, they may increase the risk for cardiovascular disease or weaken bodily resistance against infectious diseases. Therefore, modern Japanese Americans are much more likely to have Matsuzaki's recommended diet, such as a balanced ratio of animal and fish to vegetable protein, retaining rice as the main dish.

CHAPTER III

METHODS

The purpose of this study was to compare the cardiovascular disease risk for Japanese individuals living in the United States with those living in Japan, and to determine whether a significant difference exists. The following methods were used to evaluate cardiovascular disease risk in Japanese Natives and Japanese Americans.

Subjects

The sample of subjects for this research included 134 Japanese Americans and Japanese Natives, forty years of age or older. Japanese American subjects were living in or near Portland, Oregon for at least ten years and Japanese Native subjects were living in or near Saga, Japan. Many of the Japanese Americans were recruited from the Japanese International Baptist Church (JIBC) and “Ikoi-no-kai,” one of the Japanese organizations in Portland, Oregon. Methods for recruiting Japanese Natives were similar for each group, and included targeting drug store employees, neighbors, friends, and their relatives. Because of their age, subjects in both samples were surveyed about their current status of health. A questionnaire was used to collect data concerning current medication use, past surgery, diet, exercise, drinking and smoking habits, and family history.

Equipment

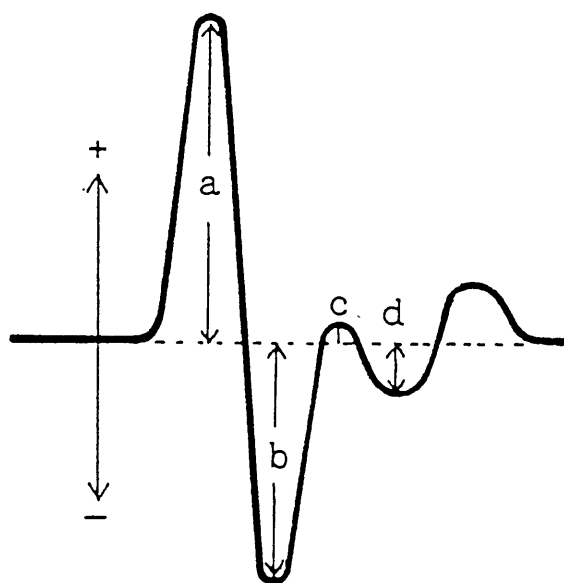
The cardiovascular disease risk of both samples was estimated using the APG-index, the measurement of blood pressure & resting heart rate, and RISK-O. The

RISK-O questionnaire assesses the risk of heart disease from the answers to questions in five categories: weight, systolic blood pressure, estimated blood cholesterol level, cigarette smoking, and estrogen use (female only).

The APG is a relatively new device which has been developed in Japan by the Misawa Company (Precaregraph, APG-100; Misawa, Japan). Resembling a laptop computer, it has a keyboard, a monitor, a printer, and a photo-optic sensor located inside a small receptacle into which the tip of a person's index finger is inserted. The photo-optic sensor detects changes in capillary blood flow in the fingertip, and presumably provides information allowing early detection of circulatory insufficiency by measuring blood flow characteristics in the tip of the index finger. An APG-index has been developed which has been hypothesized to indicate a person's cardiovascular disease risk. It is obtained by first calculating the second derivative of the pulse waveform, and identifying "turning points" labelled "a," "b," "c," and "d" (see Figure 1, p. 25).

The APG-index is calculated as follows: $(-b+c+d)/a \times 100$. It is designed to evaluate the peripheral pulse wave of the index finger. A higher APG-index presumably indicates better peripheral circulation while a lower APG-index indicates poorer peripheral circulation. The waveforms obtained can also be classified into seven major patterns (A-G), with "A" indicating good circulation and "B-G" indicating progressively worse circulation (see Figure 2, p. 25). Based on this classification, the APG-index is thought to provide an assessment of health status.

For example, young, healthy, and active people should expect type “A” or “B” waveforms with a relatively high APG-index. On the other hand, individuals suffering from cerebrovascular diseases or ischemic heart disease, may expect type “D” through “G” waveforms with a lower APG-index. The validity of the APG-index was examined by correlating the APG-index with RISK-O (American Heart Association) scores. Also, blood pressure and resting heart rate were measured with an automatic sphygmomanometer (CITIZEN, Digital Sphygmomanometer / TM-732).



$$\text{APG index} = (-b + c + d) / a$$

Figure 1. Components (a-e) of accelerated plethysmogram (APG).

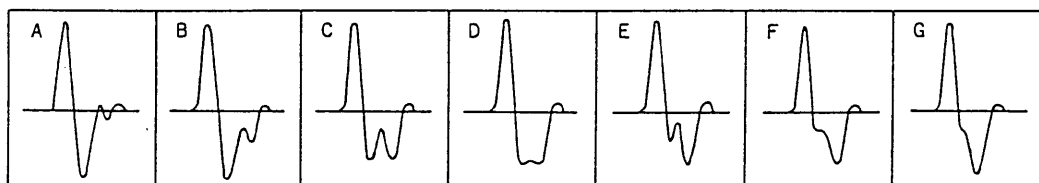


Figure 2. Typical patterns (A-G) of accelerated plethysmogram (APG).

Procedures

All subjects signed an informed consent form after receiving an explanation of all procedures. Height and weight were then measured, after which the subject sat in a comfortable chair to complete a health-related questionnaire (Appendix A). Most subjects' body weights were measured with a balance scale with the subjects in light clothing and without shoes. However, several female subjects who exceeded normal weight range or were underweight refused to take the measurement. They stated verbally their weight. However, there were fewer than five individuals in both populations who refused weight measurement. Also, the height measurement was taken with a tape measure.

After that, APG measurements were made, and then blood pressure and resting heart rate were measured with an automatic sphygmomanometer. The subject placed the right index finger into the pulse wave detector, and rested in this position for three minutes. The APG measurements were sometimes repeated for older subjects because of difficulty in obtaining measurable waveforms in some subjects. The average of several pulse waves (3-5) was automatically generated by the accelerated plethysmogram (APG) and used to establish the APG-index. When all of the measurements were completed, the investigator answered any additional questions asked by the subject.

Data collection was begun in October, 1996 and was completed in February, 1997.

Data Analysis

Data were analyzed using simple descriptive statistics and correlation according to StatView Student computer program (Feldman & Gagnon, 1991). Also, contingency tables were used to examine the data with respect to questions about smoking, medication, alcohol consumption, and exercise habits.

The comparison of Japanese Native and Japanese American cardiovascular disease risk was evaluated with t-tests, using a Bonferroni adjustment to protect against an increased Type I error rate (Huck & Cormier, 1996). An experiment-wise error rate of $p \leq 0.05$ was used.

CHAPTER IV

RESULTS

The following chapter presents the results of the comparison between the cardiovascular disease risk of Japanese Natives living in Saga, Japan and Japanese Americans living in or near Portland. It was hypothesized that differences between Japanese Americans and Japanese Natives would be significant because of cultural differences.

Descriptive Characteristics

The general characteristics of the Japanese Natives and the Japanese Americans are summarized in Table III.

In Saga, Japan, 67 Japanese Natives were selected in December 1996, while the 67 Japanese American subjects were selected to match the Japanese Natives with respect to age and gender.

Since age and gender were matched in both countries, similar subject characteristics were observed. The exception was that Japanese American males consistently had a higher Body Mass Index (BMI). The recruitment was completed by February 1997.

TABLE III
SUBJECT CHARACTERISTICS

	Japanese Americans			Japanese Natives		
	Male	Female	Total	Male	Female	Total
n	19	48	67	19	48	67
Age (yrs)	62.4±10.7 (44-82)	62.4±10.7 (43-82)	62.4±10.6 (43-82)	62.7±10.6 (46-86)	62.4±10.7 (43-82)	62.4±10.9 (40-86)
Height (m)	1.66±0.05 (1.55-1.78)	1.52±0.05 (1.42-1.60)	1.56±0.08 (1.42-1.78)	1.65±0.07 (1.51-1.76)	1.52±0.05 (1.42-1.60)	1.56±0.08 (1.43-1.76)
Weight (kg)	71.2±9.0** (56.7-90.7)	54.2±5.9 (44.5-68.0)	59.0±10.3* (44.5-90.7)	62.3±9.1 (51.0-78.0)	54.2±5.9 (44.5-68.0)	55.2±9.1 (35.0-78.0)
BMI (kg/m ²)	25.8±3.2** (21.0-32.1)	23.4±2.7 (18.8-30.3)	24.1±3.1* (18.8-32.1)	22.8±2.2 (19.5-26.6)	23.4±2.7 (18.8-30.3)	22.7±3.0 (17.1-32.0)

*Significantly different (JA vs. JN)

**Significantly different (JA_{male} vs. JN_{male})

Cardiovascular Disease Risk

According to the Department of Statistics in the Saga prefecture Health Division (Health and Welfare Statistics Association in Japan, 1996), the causes of death in the Saga prefecture in 1995 were cancer (29%), cerebrovascular disease (15%), and cardiovascular disease (14%). Also, the average life span was 76.1 years for males and 83.0 years for females in 1995. In addition, the Saga prefecture population in 1995 consisted of 419,492 males and 466,020 females, totalling 885,512.

On the other hand, according to the Oregon State Health Division in Portland (Hall and Johnson, 1997), the causes of death for Chinese and Japanese Americans in Oregon were cancer (28%), cardiovascular disease (27%), and cerebrovascular disease (8.5%). Also, Chinese and Japanese Americans' life spans in Oregon were 73 years for males and 75 years for females.

Comparing the causes of death in the both populations, the incidence of cardiovascular disease in Japanese Americans was nearly twice that of Japanese Natives. Since the incidence of cardiovascular disease is much higher in Japanese Americans, it was hypothesized this would be reflected in differences related to risk factors. As indicated in Table III and Table IV, there were significant differences in the APG-index, BMI, and weight of the two populations.

TABLE IV

CARDIOVASCULAR DISEASE RISK VARIABLES

	<u>Japanese Americans</u>			<u>Japanese Natives</u>		
	Male	Female	Total	Male	Female	Total
Systolic BP	135.4±19.8 (100-172)	133.9±20.8 (99-184)	134.3±20.4 (99-184)	139.8±20.4 (111-188)	134.0±27.3 (93-209)	135.7±25.5 (93-209)
Diastolic BP	81.5±12.3 (61-108)	79.5±9.7 (59-101)	80.1±10.4 (59-108)	85.5±11.8 (64-104)	75.9±11.9 (53-106)	78.6±12.6 (53-106)
RISK-O	6.8±3.5 (2-14)	8.25±3.8 (0-18)	7.9±3.8 (0-18)	6.2±3.3 (1-15)	7.0±3.9 (0-15)	6.8±3.7 (0-15)
APG-index	-3.7±31.6** (-75 - +42)	-24.1±32.6** (-118 - +65)	-18.4±33.4* (-118 - +65)	-33.7±40.4 (-123 - +26)	-44.0±38.6 (-120 - +48)	-41.1±39.1 (-123 - +48)

*Significantly different (JA vs. JN)

**Significantly different (JA_{male} vs. JN_{male}) JA_{female} vs. JN_{female})

Table V presents the intercorrelation matrix for variables hypothesized to relate to cardiovascular disease risk in Japanese Americans, and Table VI presents a similar matrix for Japanese Natives. The correlation matrixes were evaluated the significance by the table of critical value of correlation coefficient in the level of significance for two-tailed test at $p = .05$. The p-value means the smallest significance level at which the null hypothesis can be rejected (Mann, 1992, p. 442). According to the Statistical Tables for Biological, Agricultural and Medical Research, the critical values of correlation coefficients of the degree of freedom (df); 67 subjects in each population, was .25 (Fisher & Yates, 1963, p. 452).

Table V, Japanese American data, presents each variable hypothesized to relate to cardiovascular disease risk. Age positively correlated with systolic blood pressure, and negatively correlated with resting heart rate, and APG-index. Systolic blood pressure positively correlated with age, diastolic blood pressure, RISK-0, and BMI, and negatively correlated with APG-index. Diastolic blood pressure positively correlated with diastolic blood pressure, resting heart rate, and RISK-O. Resting heart rate positively correlated with diastolic blood pressure, and negatively correlated with age. APG-index negatively correlated with age and systolic blood pressure. RISK-O positively correlated with BMI, systolic blood pressure and diastolic blood pressure. Weight positively correlated with BMI.

Table VI, Japanese Native data, presents each variable hypothesized to relate to cardiovascular disease risk. Age positively correlated with systolic blood pressure,

and negatively correlated with APG-index and weight. Systolic blood pressure positively correlated with age, diastolic blood pressure, and RISK-O. Diastolic blood pressure positively correlated with RISK-O, weight, BMI, and systolic blood pressure. Resting heart rate positively correlated with APG-index. RISK-O positively correlated with BMI, systolic blood pressure, and diastolic blood pressure. Weight positively correlated with BMI and diastolic blood pressure, and negatively correlated with age. BMI positively correlated with diastolic blood pressure, RISK-O, and weight.

TABLE V
CORRELATION MATRIX (JA) MALE & FEMALE

	Age	Systolic	Diastolic	RHR	APG	RISK-O	Weight	BMI
Systolic	.362	1						
Diastolic	-.175	.471	1					
RHR	-.401	.143	.337	1				
APG	-.401	-.239	-.162	-.063	1			
RISK-O	.164	.692	.299	.126	-.149	1		
Weight	.064	.166	.218	.096	-.196	.159	1	
BMI	.012	.349	.192	-.01	-.164	.417	.791	1

Note. The critical values of correlation coefficients of the degree of freedom (df); 67 subjects in each population, was .25 (Fisher & Yates, 1963, p. 452).

TABLE VI
CORRELATION MATRIX (IN) MALE & FEMALE

	Age	Systolic	Diastolic	RHR	APG	RISK-O	Weight	BMI
Systolic	.248	1						
Diastolic	-.009	.735	1					
RHR	-.146	-.008	.039	1				
APG	-.395	-.032	.128	.312	1			
RISK-O	.119	.792	.52	-.025	.118	1		
Weight	-.309	.118	.351	-.108	.194	.161	1	
BMI	-.148	.209	.25	-.118	.08	.325	.74	1

Note. The critical values of correlation coefficients of the degree of freedom (df), 67 subjects in each population, was .25 (Fisher & Yates, 1963, p. 452).

TABLE VII

OBESITY CLASSIFICATION BASED ON BMI

	Men	Women
Normal	24 - 27	23 - 26
Moderately obese	28 - 31	27 - 32
Severely obese	> 31	> 32

Note. Data from *The Surgeon General's Report on Nutrition and Health (1988, p.284)*.

The Body Mass Index (BMI) of Japanese American males and females was within the normal range, while the BMI of Japanese Native males and females was below the normal (American standard) range (Table VII).

Exercise Habits

All subjects were asked to rate themselves with regard to their exercise habits. Results indicated that more than 90% Japanese Natives identified themselves as sedentary, while more than 60% of the Japanese Americans considered themselves exercisers (Table VIII).

TABLE VIII

EXERCISE HABITS

	Japanese Americans	Japanese Natives
Hard (0)	20 (29.85%)	2 (2.99%)
Moderate (1)	23 (34.33%)	4 (5.97%)
Sedentary (2)	24 (35.82%)	61 (91.04%)
Total	67 (100%)	67 (100%)

Note. p-value; p = .0001, was obtained by StatView Student computer program (Feldman & Gagnon, 1991, p. 148-149).

Exercise habits were measured according to the investigator's scale: 0 for frequent exerciser, 1 for moderate exerciser, and 2 for sedentary.

Hard (0) means that the exercise is equivalent to participate in golf, tennis, swimming, or bowling weekly, run, or weight-lifting regularly, or similar equivalent. Moderate (1) means that the exercise is equivalent to walk 20-60min., 3-5 days per week or similar equivalent. Sedentary (2) means that subjects don't do any kind of exercise. Since the p-value; $p = .0001$, was statistically significant, the null hypothesis was rejected for exercise habit. Japanese American had more exercise habit than Japanese Natives.

Medication

Subjects were also asked about prescription medications they were currently taking. The results indicated that Japanese Natives were using fewer prescription medications than Japanese Americans (Table IX). Medication habits were measured according to the scale: 0 for not currently taking medication, 1 for takes one kind of medication, 2 for takes two kinds of medications, 3 for takes three kinds of medications, 4 for takes four kinds of medications. Since the p-value; $p = .0229$, was statistically significant, the null hypothesis was rejected: Japanese Americans were taking more medication than Japanese Natives.

TABLE IX
MEDICATION

	Japanese Americans	Japanese Natives
No medication	30 (44.78%)	44 (65.67%)
1 kind of medication	25 (37.31%)	20 (29.85%)
2 kinds of medication	4 (5.97%)	3 (4.48%)
3 kinds of medication	6 (8.96%)	0 (0%)
4 kinds of medication	2 (2.99%)	0 (0%)
Total Subjects	67 (100%)	67 (100%)

Note. p-value; $p = .0229$, was obtained by StatView Student computer program (Feldman & Gagnon, 1991, p. 148-149)

Smoking & Drinking Habit

All subjects were asked about their current smoking and drinking habits (Table X and XI). Results indicated that the majority of individuals in both samples were non-smokers and non-drinkers at the time they were surveyed.

Smoking habits were measured according to the scale: -1 for non-smoking, 0 for former smoker, 1 for moderate smoker, 2 for heavy smoker. Non-smoker means never smoked, former smoker means currently not smoking, moderate smoker means less than half pack per day, and heavy smoker means more than one pack per day. Since the p-value, $p = .0595$, was not statistically significant, the null hypothesis was approved: the smoking habits showed similar pattern in the two populations.

Drinking habits were measured according to the scale: -1 for non-drinker, 0 for former drinker, 1 for moderate drinker, 2 for heavy drinker. Non-drinker means currently quit drinking, moderate-drinker means occasional moderate-social drinking, and heavy-drinker means everyday drinks three or more alcohol beverages. Since the p-value, $p = .0008$, was statistically significant, the null hypothesis was rejected: Japanese Natives have more heavy drinkers than Japanese Americans.

TABLE X
SMOKING HABITS

	Japanese Americans	Japanese Natives
Non-smoker	51 (76.12%)	56 (83.58%)
Former smoker	15 (22.39%)	6 (8.96%)
Light smoker	0 (0%)	3 (4.48%)
Heavy smoker	1 (1.49%)	2 (2.99%)
Total	67 (100%)	67 (100%)

Note. p-value; $p = .0595$, was obtained by StatView Student computer program (Feldman & Gagnon, 1991, p. 148-149).

TABLE XI

DRINKING HABITS

	Japanese Americans	Japanese Natives
No drinker	46 (68.66%)	50 (74.63%)
Former drinker	11 (16.42%)	0 (0%)
Moderate drinker	9 (13.43%)	9 (13.43%)
Heavy drinker	1 (1.49%)	8 (11.94%)
Total	67 (100%)	67 (100%)

Note. p-value; p = .0008, was obtained by StatView Student computer program (Feldman & Gagnon, 1991, p. 148-149).

CHAPTER V

DISCUSSION

The following chapter presents the discussion of the findings regarding cardiovascular disease risk variables and the APG-index.

Cardiovascular Disease Risk Variables

The purpose of this study was to examine cardiovascular disease risk (CVR) in Japanese Natives (≥ 40 yrs) living in Saga, Japan and Japanese Americans (≥ 40 yrs) living in or near Portland, Oregon. Accelerated plethysmography, a RISK-O, blood pressure, resting heart rate, and BMI were used to examine CVR. In addition, lifestyle information obtained from a personal history questionnaire was used to assess behaviors related to drinking, smoking, exercise, and medication use. There were statistically significant differences between the samples (e.g., body weight and BMI in males, the APG-index in males and females, the use of medication, and exercise habits), but the data did not provide a clear explanation for the difference in deaths due to cardiovascular disease.

There was a significant difference in the APG-index between Japanese Natives and Japanese Americans, but the APG-index did not correlate highly with any other variable thought to be related to CVR, such as RISK-O, blood pressure, or BMI. The lack of strong correlations between the APG-index and other risk factor variables limits our ability to suggest that the APG-index is somehow predictive of the differences in the major causes of death between Japanese Natives in Saga, Japan

(cancer, cerebrovascular disease, and heart disease) and Japanese Americans in or near Portland, Oregon (cancer, heart disease, and cerebrovascular disease). Although there was a difference between the mean APG-index of the two samples, the mechanisms underlying this difference remain to be elucidated.

APG-index

It has been demonstrated that endurance training increases the number of capillaries in trained skeletal muscle, thereby allowing a greater capacity for blood flow in the active muscle (Terjung, 1995). Since the APG-index theoretically provides information related to capillary blood flow, and is usually higher in aerobically trained individuals, it may be useful as an indicator of fitness status. Peripheral blood circulation (as measured by the APG-index) may be a factor that can distinguish sedentary from active subjects, because the low exercise levels were associated with a low mean APG-index in Japanese Natives and the high exercise level was associated with a high mean APG-index in Japanese Americans. It appears that elderly Japanese Americans are more active. This could explain, in part, the difference between death rates due to cardiovascular disease. It was also found that Japanese Americans used more prescription medications, and this may have played a role. The design of this study did not allow us to determine which factor (exercise habits or medication use) was more important in explaining differences between the APG-index of Japanese Americans and Japanese Natives.

Health Care System

Since medical expenses are very high in the U.S., and not everyone has medical insurance, getting medical treatment may be less convenient for Japanese Americans. On the other hand, Japanese Natives benefit from a national health care system. However, they may focus mostly on their careers so have difficulty finding time on their own to exercise, hoping to substitute a variety of over-the-counter remedies for exercise. Japanese Natives are somewhat reluctant to use prescription medications. Since there are many convenient pharmacies which provide easy access to health care products (many varieties of natural medicines and over-the-counter medications), and there is good medical care insurance for older people in Japan, Japanese Natives enjoy the luxury of many choices for maintaining their health. Especially, since doctors can be reimbursed for treating older people, many Japanese clinics and hospitals are remodeling their facilities to target the older population. According to the chief of medical staff of the Fukuoka Hospital in Saga, Japan, the development of a daycare system for the elderly is a relatively new venture for many Japanese doctors. For example, the hospital can pick up older people who live alone at home, bring them to the hospital, provide them with social interactions, exercise and recreational activities, and a nutritional lunch, and provide transportation home again. The purpose of this system is to decrease long-term medical expenditures in the health care system (Fukuoka, 1997).

Dietary Habit

In a comparison of both samples in this study, Japanese Natives ate a smaller amount of food, less meat, more fresh fish, vegetables, and fruits, more salt, less sugar, and less dairy products, while Japanese Americans ate a greater amount and variety of foods. In other words, Japanese Americans ate not only a larger quantity of foods but also a greater variety of foods. They appeared to select foods without cultural discrimination between Japanese food and American food. On a daily basis, Japanese Americans could get a proper amount of meat, fish, vegetables, and dairy products more cheaply than Japanese Natives. Therefore, Japanese Americans were able to eat more. For example, one lunch menu at "Ikoi-no-kai" consisted of chicken soup, rice, mashed potatoes, roast beef, boiled broccoli & carrots, bread, carrot cake or processed fruit. On the other hand, Japanese Natives ate mainly rice and noodles, vegetables and fruits, and less animal protein. As a protein source, fish and soy products are traditional. Historically, Japanese Natives prefer to eat plain rice and side dishes which are usually cooked with soysauce, such as fish and vegetables. The dietary preference for salty, grilled fish has continued for more than 100 years. During the past decade, the leading cause of death has changed dramatically: tuberculosis, cerebrovascular disease, and pneumonia, were once the leading cause of death in the early 1900's (Department of Welfare, 1996). However, since 1981, deaths from cancer rapidly overcame tuberculosis, cerebrovascular disease, and pneumonia, and became the number one cause of death in Japan (Department of

Welfare, 1996). Since then, the number of deaths from cancer has never declined is continuing increasing. Although, further study using more sophisticated dietary analysis procedures is needed, the rapid increase of cancer in Japan, may not necessarily to be related to dietary habits, but may be attributable to environmental pollution from industrial development (Koizumi, Aoki, Isukada, Naruse, & Saitoh, 1994).

Lifestyle

Traditionally, in Japan, older people stay home, and take care of family and run the household. Additionally, medical convenience and high awareness of hygiene have brought longevity for Japanese Natives, even though they eat less food, and expend less energy (i.e., are less active). Although such a lifestyle in Japan happened historically, as a result, Japanese Natives live longer than Japanese Americans. One study (Goto, 1992) mentioned that the once traditional Japanese diet was no longer so typical in Japan, and the incidence of cardiovascular diseases, particularly ischemic heart disease, has increased. However, in this research, people living in Saga prefecture still preferred a traditional diet of rice, salty fish and vegetables. However, it is true that lifestyle and diet in Japan are concurrently becoming Westernized. Therefore, the percentage of adult Japanese Natives who eat less and work out less might decrease in the future.

CHAPTER VI

SUMMARY, CONCLUSION, AND RECOMMENDATIONS

SUMMARY

One hundred thirty-four subjects from 40 to 80 years of age were involved in this research in Japan and in Oregon. The research hypothesis was that there is a difference in cardiovascular disease risk of Japanese Natives and Japanese Americans. RISK-O, blood pressure, resting heart rate, and BMI were compared with the APG-index in order to examine the efficacy of using the APG-index to evaluate CVR. Also, questions about medication, drinking, smoking, exercise habit, past surgery, and daily diet were asked using a self-administered questionnaire.

CONCLUSION

In this research, the mean APG-index was significantly higher in Japanese Americans than in Japanese Natives. However, the hypothesis that the APG-index could be used to evaluate health status regarding cardiovascular disease risk was not supported because of its low correlation with RISK-O and blood pressure. Two of the three primary risk factors in the development and progression of cardiovascular disease: high blood pressure, and smoking behavior were examined. Since many Japanese Native and Japanese American subjects were taking proper medication to control hypertension, there was not a significant difference in the systolic and diastolic blood pressures between the groups. Also, most subjects had quit smoking in both populations; therefore, there were not significant differences in smoking habits

between populations. If the APG-index had correlated with any one or all of the primary risk factors of cardiovascular disease, this study would have provided preliminary support for the hypothesis that the APG-index can be used to measure CVR. However, since the APG-index did not correlate highly with indicators of CVR, we cannot support the contention that the APG-index can be used to measure CVR. Even if the APG-index cannot be used for the assessment of CVR, the result of this investigation comparing and contrasting the two populations provides some direction for future research concerning the quality of life for both populations.

RECOMMENDATIONS

Generally speaking, Japan is becoming Westernized. As a group, the Japanese have been following many American ways of life. According to the Center for Population Research & Census at Portland State University (1997), the Japanese American population in Oregon included 5,309 males and 6,487 females in 1990. Since there was a total of 8,580 Japanese Americans in Oregon in 1980, Japanese immigrations to Oregon have been increasing dramatically in the past decade. The Westernized lifestyle, including early retirement, more food consumption and more exercise, and the increased use of many prescription drugs might improve quality of life, but seems not to lead to longevity. To clarify more details of the factors involved in longevity, a longitudinally designed study on aging may be needed. Lifestyle factors, especially dietary habits and social security for older people in Japan, may be major elements of longevity.

The causes of cardiovascular disease are complicated, and investigations into cultural differences in CVR may require more time, subjects, and not only quantitative research but also qualitative research methodologies.

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A PERSONAL FILE

APPENDIX A

A Personal File

Identification Number: _____

Examination Date: _____ Evaluation Date: _____

Name & Gender: _____ Female Male

Address & Phone #: _____ # _____

Birthdate: _____ Age: _____

Height: _____ Weight: _____

1. APG score: higher score is the best.

(Attach the record from a printer on this file.)

2. RISK-O score: Close to zero is the best. _____

3. Blood Pressure: _____

4. Resting Heart Rate: _____

5. Cholesterol: Total _____ HDL _____

(Examination Date: _____)

Overall comments:

QUESTIONNAIRE

APPENDIX B

QUESTIONNAIRE:

This study assesses quality of life in adult Japanese people who live in Portland OR and Saga Japan. It has been more than one hundred years since the first Japanese arrived in Oregon. After World War II in 1945, many Japanese people came to the U.S. Now, it's been more than a half century since then. Now, they are called "Japanese Americans." I would like to assess the living conditions and the quality of life of that generation: Japanese Americans and Japanese natives. Through this research, I want to listen to current health problems, suggest solutions, and encourage them to improve their quality of life.

Please read the questions and answer as completely as you can.

Name: _____

Today's date: _____

Gender: Please circle one. Male Female Birthdate: _____

Age: _____

Height: _____ Weight: _____

Resting Heart Rate: _____ Blood Pressure: _____

Address: _____

Phone #: _____

Q1. Since when have you been living in the U.S.? _____

Q2. What is your marital status? Please circle one.

Never married Married Separated Divorced Widowed

If "Married": What is your spouse's nationality? _____

How long have you been married? _____

Q3. Are you retired? _____

If "YES" : How old were you when you retired? _____

If "NO" : When are you going to retire? _____

Q4. Do you have a Job? _____

If "YES" : What is it? _____

If "NO" : What was your job before you retired? _____

Q5. How many days off you have per week? _____

Q6. How much vacation time do you have in a year?

Q7. In a typical week, how many hours do you work? _____

Q8. Do you currently exercise regularly? _____

If "YES" : How much do you exercise per week and what do you do? _____

If "NO" : Why don't you exercise? _____

Q9. What do you eat most? Please provide a sample menu for one day.

Breakfast: _____

Lunch: _____

Dinner: _____

Snacks: _____

Q10. Do you smoke? _____

If "YES" : How many cigarettes per day? _____

If "former smoker" : When did you quit and how many cigarettes did you used to smoke?

When: _____ How many: _____

Q11. Do you drink alcoholic beverages? _____

If "YES": How much do you drink per week? _____

If "former drinker": How much did you used to drink? _____

Q12. Are you currently taking medication? _____

If "YES": What kind of medication? _____

Q13. Do you take vitamin supplements and/or ergogenic remedies?

If "YES": What do you take and how often? _____

How much do you spend for these things per month? _____

Q14. Are you currently involved in a church or a buddhist temple or other religious group?

Please circle one. CHURCH BUDDHIST TEMPLE OTHER

Q15. Do you own your residence? Please circle one. YES NO

Q16. Do you live in a house or an apartment? Please circle one.

House Apartment

Q17. Do you know your cholesterol level? YES NO

If "YES": When did you get it? _____

If "NO": Do you want to know it? YES NO

If "YES": Would you be willing to get it checked? YES NO

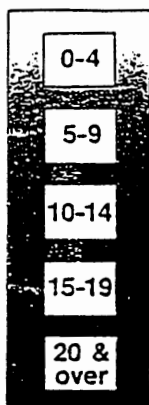
Q18. Have you ever taken any surgery? If "YES":

When _____ and What _____

Thank you very much for your participation.

RISK-O
APPENDIX C

WHAT YOUR SCORE MEANS



You have one of the lowest risks of Heart Disease for your age and sex.

You have a low to moderate risk of Heart Disease for your age and sex but there is some room for improvement.

You have a moderate to high risk of Heart Disease for your age and sex, with considerable room for improvement on some factors.

You have a high risk of developing Heart Disease for your age and sex with a great deal of room for improvement on all factors.

You have a very high risk of developing Heart Disease for your age and sex and should take immediate action on all risk factors.

WARNING

- * If you have diabetes, gout or a family history of heart disease, your actual risk will be greater than indicated by this appraisal.
- * If you do not know your current blood pressure or blood cholesterol level, you should visit your physician or health center to have them measured. Then figure your score again for a more accurate determination of your risk.
- * If you are overweight, have high blood pressure or high blood cholesterol, or smoke cigarettes, your long-term risk of heart disease is increased even if your risk in the next several years is low.

HOW TO REDUCE YOUR RISK

- * Try to quit smoking permanently. There are many programs available.
- * Have your blood pressure checked regularly, preferably every twelve months after age 40. If your blood pressure is high, see your physician. Remember blood pressure medicine is only effective if taken regularly.
- * Consider your daily exercise (or lack of it). A half hour of brisk

walking, swimming or other enjoyable activity should not be difficult to fit into your day.

- * Give some serious thought to your diet. If you are overweight, or eat a lot of foods high in saturated fat or cholesterol (whole milk, cheese, eggs, butter, fatty foods, fried foods) then changes should be made in your diet. Look for the American Heart

Association Cookbook at your local bookstore.

- * Visit or write your local Heart Association for further information and copies of free pamphlets on many related subjects including:
 - Reducing your risk of heart attack.
 - Controlling high blood pressure.
 - Eating to keep your heart healthy.
 - How to stop smoking.
 - Exercising for good health.

SOME WORDS OF CAUTION

* If you have diabetes, gout, or a family history of heart disease, your real risk of developing heart disease will be greater than indicated by your RISK score. If your score is high and you have one or more of these additional problems, you should give particular attention to reducing your risk.

* If you are a woman under 45 years or a man under 35 years of age, your RISK score represents an upper

limit on your real risk of developing heart disease. In this case your real risk is probably lower than indicated by your score.

* If you are a woman whose use of estrogen has contributed to a high RISK score, you may want to consult your physician. Do not automatically discontinue your prescription.

* Using your weight category to estimate your systolic blood pressure or

your blood cholesterol level makes your RISK score less accurate.

- Your score will tend to overestimate your risk if your actual values on these two important factors are average for someone of your height and weight.
- Your score will underestimate your risk if your actual blood pressure or cholesterol level is above average for someone of your height or weight.

WOMEN

Find the column for your age group. Everyone starts with a score of 10 points. Work down the page adding points to your score or subtracting points from your score.

1. WEIGHT

Locate your weight category in the table below. If you are in . . .

- weight category A
- weight category B
- weight category C
- weight category D

2. SYSTOLIC BLOOD PRESSURE

Use the "first" or "higher" number from your most recent blood pressure measurement. If you do not know your blood pressure, estimate it by using the letter for your weight category. If your blood pressure is . . .

- 119 or less
- between 120 and 139
- between 140 and 159
- 160 or greater

3. BLOOD CHOLESTEROL LEVEL

Use the number from your most recent blood cholesterol test. If you do not know your blood cholesterol, estimate it by using the letter for your weight category. If your blood cholesterol is . . .

- 199 or less
- between 200 and 224
- between 225 and 249
- 250 or higher

4. CIGARETTE SMOKING

If you . . .

- do not smoke
- smoke less than a pack a day
- smoke a pack a day
- smoke more than a pack a day

5. ESTROGEN USE

Birth control pills and hormone drugs contain estrogen. A few examples are: *Premarin *Ogan *Menstranol *Provera *Evex *Menest *Estinyl *Meurium

- *Have you ever taken estrogen for five or more years in a row?
- *Are you age 35 years or older and are now taking estrogen?

- No to both questions
- Yes to one or both questions

	54 OR YOUNGER	55 OR OLDER
STARTING SCORE	10	10
SUBTRACT 2	1	1
SUBTRACT 1	1	1
ADD 1	1	0
ADD 2	1	1
EQUALS	1	1
SUBTRACT 2	1	3
SUBTRACT 1	1	0
ADD 0	1	3
ADD 1	1	6
EQUALS	1	1
SUBTRACT 1	1	3
ADD 0	1	1
ADD 1	1	3
EQUALS	1	1
SUBTRACT 1	1	2
ADD 0	1	1
ADD 1	1	4
EQUALS	1	1
ADD 0	1	0
ADD 1	1	3
FINAL SCORE	1	1
EQUALS	1	1

WEIGHT TABLE FOR WOMEN Look for your height (without shoes) in the far left column and then read across to find the category into which your weight (in indoor clothing) would fall.	WEIGHT CATEGORY (lbs.)			
	A	B	C	D
4 8	up to 101	102-122	123-143	144 plus
4 9	up to 103	104-125	126-146	147 plus
4 10	up to 106	107-128	129-150	151 plus
4 11	up to 109	110-132	133-154	155 plus
5 0	up to 112	113-136	137-158	159 plus
5 1	up to 115	116-139	140-162	163 plus
5 2	up to 119	120-144	145-168	169 plus
5 3	up to 122	123-148	149-172	173 plus
5 4	up to 127	128-154	155-179	180 plus
5 5	up to 131	132-158	159-185	186 plus
5 6	up to 135	136-163	164-190	191 plus
5 7	up to 139	140-168	169-196	197 plus
5 8	up to 143	144-173	174-202	203 plus
5 9	up to 147	148-178	179-207	208 plus
5 10	up to 151	152-182	183-213	214 plus
5 11	up to 155	156-187	188-218	219 plus
6 0	up to 159	160-191	192-224	225 plus
6 1	up to 163	164-196	197-229	230 plus
ESTIMATE OF SYSTOLIC BLOOD PRESSURE	119 or less	120 to 139	140 to 159	160 or more
ESTIMATE OF BLOOD CHOLESTEROL	199 or less	200 to 224	225 to 249	250 or more

Because both blood pressure and blood cholesterol are related to weight, an estimate of these risk factors for each weight category is printed at the bottom of the table.

MEN

Find the column for your age group. Everyone starts with a score of 10 points. Work down the page adding points to your score or subtracting points from your score.

1. WEIGHT

Locate your weight category in the table below. If you are in . . .

- weight category A
- weight category B
- weight category C
- weight category D

2. SYSTOLIC BLOOD PRESSURE

Use the "first" or "higher" number from your most recent blood pressure measurement. If you do not know your blood pressure, estimate it by using the letter for your weight category. If your blood pressure is . . .

- 119 or less
- between 120 and 139
- between 140 and 159
- 160 or greater

3. BLOOD CHOLESTEROL LEVEL

Use the number from your most recent blood cholesterol test. If you do not know your blood cholesterol, estimate it by using the letter for your weight category. If your blood cholesterol is . . .

- 199 or less
- between 200 and 224
- between 225 and 249
- 250 or higher

4. CIGARETTE SMOKING

If you . . .

(If you smoke a pipe, but not cigarettes, use the same score adjustment as those cigarette smokers who smoke less than a pack a day.)

- do not smoke
- smoke less than a pack a day
- smoke a pack a day
- smoke more than a pack a day

54 OR YOUNGER		55 OR OLDER	
STARTING SCORE	10	STARTING SCORE	10
SUBTRACT 2		SUBTRACT 2	
SUBTRACT 1		ADD 0	
ADD 1		ADD 1	
ADD 2		ADD 3	
EQUALS	□	EQUALS	□
SUBTRACT 1		SUBTRACT 5	
ADD 0		SUBTRACT 2	
ADD 0		ADD 1	
ADD 1		ADD 4	
EQUALS	□	EQUALS	□
SUBTRACT 2		SUBTRACT 1	
SUBTRACT 1		SUBTRACT 1	
ADD 0		ADD 0	
ADD 1		ADD 0	
EQUALS	□	EQUALS	□
SUBTRACT 1		SUBTRACT 2	
ADD 0		SUBTRACT 1	
ADD 1		ADD 0	
ADD 2		ADD 3	
FINAL SCORE	□	FINAL SCORE	□
EQUALS	□	EQUALS	□

WEIGHT TABLE FOR MEN	YOUR HEIGHT FT IN	WEIGHT CATEGORY (lbs.)			
		A	B	C	D
Look for your height (without shoes) in the far left column and then read across to find the category into which your weight (in indoor clothing) would fall.	5 1	up to 123	124-148	149-173	174 plus
	5 2	up to 126	127-152	153-178	179 plus
	5 3	up to 129	130-156	157-182	183 plus
	5 4	up to 132	133-160	161-186	187 plus
	5 5	up to 135	136-163	164-190	191 plus
	5 6	up to 139	140-168	169-196	197 plus
	5 7	up to 144	145-174	175-203	204 plus
	5 8	up to 148	149-179	180-209	210 plus
	5 9	up to 152	153-184	185-214	215 plus
	5 10	up to 157	158-190	191-221	222 plus
	5 11	up to 161	162-194	195-227	229 plus
	6 0	up to 165	166-199	200-232	233 plus
	6 1	up to 170	171-205	206-239	240 plus
	6 2	up to 175	176-211	212-246	247 plus
	6 3	up to 180	181-217	218-253	254 plus
	6 4	up to 185	186-223	224-260	261 plus
	6 5	up to 190	191-229	230-267	268 plus
	6 5	up to 195	196-235	236-274	275 plus
ESTIMATE OF SYSTOLIC BLOOD PRESSURE	119 or less	120 to 139	140 to 159	160 or more	
ESTIMATE OF BLOOD CHOLESTEROL	199 or less	200 to 224	225 to 249	250 or more	

Because both blood pressure and blood cholesterol are related to weight, an estimate of these risk factors for each weight category is printed at the bottom of the table.