

**“The Effect of Diet and Exercise Patterns of Costa Rican Women on their  
Cardiovascular Health”**

Allison Ordemann  
ao232771@muhlenberg.edu  
EST 350-Environmental and Cultural Conservation in Latin America  
June 6, 2006

## **ABSTRACT**

El objetivo de mi proyecto es estudiar las practicas la dieta y del ejercicio de las mujeres de Las Juntas y hacer correlaciones con su salud cardiovascular. La investigación incluyó entrevistas, encuestas y observación estudiar el efecto de la dieta y ejercicio en la salud de cardiovascular de las mujeres de Costa Rica. He aprendido que la mayoría de la gente entiende los riesgos de malnutrición y la falta de ejercicio pero escoge no cambiar sus conductas hasta que ellos tengan un problema de la salud. También, yo encontré que los problemas más comunes son hypertension y diabetes, se encuentra estos problemas también en los Estados Unidos.

## **INTRODUCTION**

Cardiovascular diseases include arteriosclerosis, heart valve disease, coronary artery disease, arrhythmia, heart failure, hypertension, shock, orthostatic hypotension, endocarditis, congenital heart disease, and any disease of the aorta, its branches or the peripheral vascular system (Cardiovascular Disease). In 1998, cardiovascular disease was the leading cause of death for both sexes in Costa Rica (Pan American Health Organization 2006). Cardiovascular disease has also been a leading cause of death and a major health concern in the United States the past few decades. In the United States many studies have been performed by groups such as the American Heart Association to determine the causes and risk factors that contribute to CVD (cardiovascular disease). They have found that obesity, sedentary lifestyle and poor nutrition are among the major risk factors for CHD (coronary heart disease), a contributor to CVD (Mosca and others 1997). Many studies conducted by the American Heart Association have also shown that active women have a 50% risk reduction over those that lead sedentary lifestyles and that 60% of all women have no regular physical activity. Furthermore, currently one-third of the women in the United States are obese (Mosca and others 1997).

Physical activity constitutes any bodily movement expending energy, and exercise is a structured physical activity. It is recommended to exercise or take part in any kind of physical activity for at least thirty minutes a day to decrease your risk of cardiovascular disease. Both regular physical activity and a nutritious diet will help reduce high blood pressure and obesity, major contributors to CVD. Walking, climbing stairs and biking are all examples of regular physical activity(Physical Activity and CVD).

Diet affects blood cholesterol levels, blood pressure, blood glucose levels and body weight. It has also been proven to have a direct affect on the development of atherosclerosis, lesions that clog arteries and suggested that less than 30% of your daily calorie intake should be contributed to fat calories. Obesity and being overweight affects all ethnic groups at all ages and gender, by increasing blood pressure. The American Heart Association has provided evidence that eating a diet rich in fruits and vegetables and low in total and saturated fat can effectively lower your blood pressure, thus helping your cardiovascular health. It is recommended that you get at least five servings of fruits and vegetables per day and increase your use of foods high in fiber and nutrients (Diet and CVD). The diet in Costa Rica is far from balanced. Rice, beans, fried foods such as fried plantains and meats like chicken, beef and fish are part of the staple diet of Costa Ricans. Vegetables are not a large part of the diet occasionally being consumed in a lunch or dinner. However, fruits are consumed on a daily basis and are normally easily accessible to the people. Furthermore, Costa Rican cuisine is uses oil (palm, vegetable, corn) heavily in cooking ( Food and Drink in Costa Rica). Also, in a study conducted by Kabagambe and his group, they researched the association of the type of cooking oil with myocardial infarction and data suggested that by that replacing palm oil with a polyunsaturated non-hydrogenated vegetable oil, you could reduce myocardial infarctions, a contributor to cardiovascular disease. Palm oil is one of the most widely used

cooking oils in the world and is the major oil used in cooking in Costa Rica (Kabagambe and others 2005).

Lifestyle and diet changes have been associated with globalization and have had a major impact on the health of those countries currently undergoing a nutritional transition, such as Costa Rica. As an industrializing country, Costa Rica has been faced with an increase of chronic diseases such as coronary heart disease. A recent study has found that the increase in heart disease may be due to an increased intake of saturated fat most likely contributed to by their extreme consumption of their traditional fried foods and cooking in palm oil (Himmelgreen 2004). However, not only industrializing countries are faced with the increasing problem of cardiovascular disease, CVD remains the leading killer of women in America and most other developed countries and has become a particularly increasing problem among minority women for reasons unknown. Although an overall reduction in mortality rates due to CVD in the U.S have declined in the past few decades, the rate of decline for women is less than for men, especially among those of African-American descent (Mosca and others 1997).

Based on all of the above information, the objective of this project was to gain an understanding of diet and exercise practices among middle-aged Costa Rican women, to gather information regarding health education in schools, to gather statistical health data regarding the prevalence of cardiovascular disease from health clinics and to draw inferences from all the data and information gathered to understand the relationship between a person's knowledge of, practices and attitudes toward their physical health and their physical health through surveying, interviewing and observation. Previous research in the United States shows that diet and exercise have strong correlations to cardiovascular disease. Research has also shown that women are more prone to CVD than men and that many women in Costa

Rica, as in the United States, are overweight and obese with unhealthy lifestyles, making the women the subject of study in this project. Furthermore, the daily diet of foods most accessible and most common in Costa Rica contain a lot of oil and are mostly fried and contain fewer nutrients than recommended. Very little is known about the cardiovascular health in Costa Rican women except that there are health problems and it's the leading cause of disease among older people, both men and women in Costa Rica (Pan American Health Organization 2006). As mentioned previously, understanding the women's knowledge of and attitude towards cardiovascular disease and the effect of diet and exercise on CVD were vital to understanding the root cause of the CVD problem in Costa Rica. Several hypotheses were made. One was that the lack in health education available to children may increase the prevalence of cardiovascular disease because of unknown proper diet and recommended exercise to prevent cardiovascular disease. Another was that the dietary practices and amount of physical activity the women get on a daily basis directly correlates to cardiovascular problems. Also, that eating a diet poor in vegetables and fruits and high in fried foods and meats and such as well as getting less than the recommended thirty minutes of exercise a day will increase the probability of a woman having cardiovascular health problems. Lastly, that the availability and use of vegetables would be slim.

## **MATERIALS AND METHODS**

A ten question survey assessing the participants' exercise and dietary daily habits, education background, knowledge of cardiovascular disease and its causes as well as their own health, attitude towards physical health and the availability of nutritious foods to them was constructed and prepared to hand out prior to departing for Costa Rica. Fifteen of these surveys were distributed randomly to women around the town of Las Juntas, Guanacaste and

filled out in Spanish. No prerequisites were necessary to participate and the surveys were aimed at evaluating women between the ages of 20-50. Later, the surveys were translated to English with the help of a Spanish/English dictionary to study and analyze the general data received.

Four interviews were conducted. The first with an orthodontist, Dr. Urpí, (Appendix B) at the local hospital to obtain statistical data and information about cardiovascular health from a doctor's point of view. Second, an influential woman of the community, Elliot Gramboa, was interviewed (Appendix A) to gain a deeper understanding of daily lifestyle and diet and exercise habits in Las Juntas and a history of the town and its major health concerns from a citizen's point of view. Two mini interviews were conducted with a nutritionist, Emily, (Appendix D) and with a school cook, Maria Alcazar, (Appendix C) to further assess the nutritional aspect of the project. For all of the interviews, only pen and paper were required and a human translator was used. Also, some observations were made around town when appropriate to help with matters of the research such as menus, grocery store stock, and physical activity around town.

## **RESULTS**

Data about exercise habits of the people of Las Juntas was gathered from observation, surveys and interviews. One observation was that several games of soccer were carried on daily by school age children at the town soccer field after school and the games normally continued for 2-4 hours. Also, there was a gymnasium in town also that the schools used to host their gym classes where children are required to participate in volleyball, basketball and soccer activities once a week for two hours (Appendix A). The only activity observed aside from this was two men on separate occasions jogging in the morning around town. Elliot also

divulged that there is a women's group for women older than 65 years of age that exercises twice weekly for 45min at a time that is run by the social security provided organization Ageco (Appendix A). Of the 15 participants that took the survey, 73% exercise daily, 67% exercise daily for more than 30 minutes a day, and 100% believe it is important to exercise and eat well for your health (Table 1). When broken down in to age group categories, it is seen that the participants in the 40-50 years category were the leaders in exercise, 100%, and also all of them exercised more than 30min a day (Table 1). The most common forms of exercise were also assessed from the survey information and found that the major form of exercise is walking with 57% of the participants naming it as their main way of exercising. Swimming, Biking, Dancing and Running each accounted for 6% as well and 19% of the participants do not exercise at all (Figure 2).

The typical food of Costa Rica includes rice, beans, meat, fruits, vegetables, chicken, fish, corn, pasta, and salad. Most or all of these foods are consumed in a day. Also, all of the participants of the survey said they eat three solid meals a day and that is the extent of the food they consume in one day, most of the time. Also, 100% of the participants eat fruits and vegetables every day and 93% believe that they are easily accessible to them (Table 1). On the survey they also listed the most common types of fruits and vegetables they eat on a daily basis which included: apples, bananas, oranges, mangos, pineapples, watermelon, grapes, apricots, avocados, platanos, chayote, papaya, remolacho, lemon, potatoes, tomatoes, carrots, cucumbers , lettuce, broccoli, guayabas, green beans and red cabbage. Also, the menu at Los Mangos, a local restaurant, shows common lunch and dinner meals eaten by the Ticos (Figure 1). Casados is a typical food dish which comes with rice, beans, salad, platanos and your choice of a meat. Also seen on the menu are hamburgers, pasta, chicken, steak and fish dishes. Maria, a cook at a school, said that the students are served typical food for lunch and

a piece of fruit, slice of ham and lettuce for a morning snack at school. Most students remain at school although others go home if it is close for a meal. Students are also allowed to bring food in to the school. The government funds the food for the students (Appendix C). The nutritionist, Emily, at the nutrition clinic in town, divulged that the clinic offers classes on proper nutrition twice daily as well as education about nutrition and basic hygiene to children. Also, they provide beans, rice, oil and milk to lower income families and feed their children if necessary. She also mentioned that these opportunities are available at some schools but only for school children (Appendix D).

Dr. Urpí, the orthodontist, provided several statistics regarding general health, annual consult visit rates, and abundance of hypertension and diabetes in Las Juntas. 14% of the population above 20 years old has hypertension. 6% of the population above 20 years old has diabetes (Appendix B). Furthermore, hypertension was the second most common cause for a consult overall in 2004, and separately for women and men. It was the primary cause for consult in 2004 for older adults, ties with respiratory illness which was the most common cause for consult in 2004 for everyone but women, and diabetes was a consistent third most common cause for consultation for everyone (Table 2). Costa Rica has the second longest life expectancy in the Americas for women which 80 years (Appendix B). Also, only 27% of the participants from the survey have health problems which included: colon problems, diabetes and asthma (Table 1).

Other statistics obtained vital to the project due with education, knowledge of cardiovascular disease and smoking history. Only 1 participant out of the 15 smokes, 7% (Table 1). Furthermore, 80% of the participants have a basic knowledge of cardiovascular disease and what it is and 67% understand the causes and risk factors for developing a cardiovascular disease (Table 1). All of the participants finished schooling through secondary

school available in Las Juntas and one participant (7%) has received a bachelor’s degree

(Table 1).

**Table 1- Percentage (%) of Attributes Found in Sample of Costa Rican Women**

	Age Categories*				Total (All)
	20-30	30-40	40-50	50+	
Smokers	20	0	0	0	7
Exercise daily	80	75	100	0	73
Exercise more than 30 min a day	60	75	100	0	67
Eat fruits and vegetables daily	100	100	100	100	100
Believe fruits and vegetables are easily accessible	100	75	100	100	93
Health problems**	20	0	25	100	27
Knowledge of cardiovascular disease	100	50	75	100	80
Knowledge of causes of cardiovascular disease	80	50	50	100	67
Believe exercising and eating well is important for your health	100	100	100	100	100
Finished secondary school	100	100	100	100	100
Higher level of education	0	25	0	0	7

Notes: \* sample size of 15 that were surveyed is unevenly distributed among the four age categories (5; 4; 4; 2), (percent of each attribute was calculated according to the sample size of each age category)

\*\*health problems include asthma, diabetes and complications of the colon

**Table 2- Percent (%) and Ranking for Type of Consults in Las Juntas in 2004**

	Disease		
	Hypertension	Diabetes	Respiratory Illness
Consults in 2004	17.19 (2)*	7.54 (3)	20.9 (1)
Women Consults in 2004	21.25 (2)	11.58 (3)	-
Men Consults in 2004	21.17 (2)	9.79 (3)	33.56 (1)
Older Adult Consults in 2004	26.26 (1)	9.39 (3)	26.26 (1)

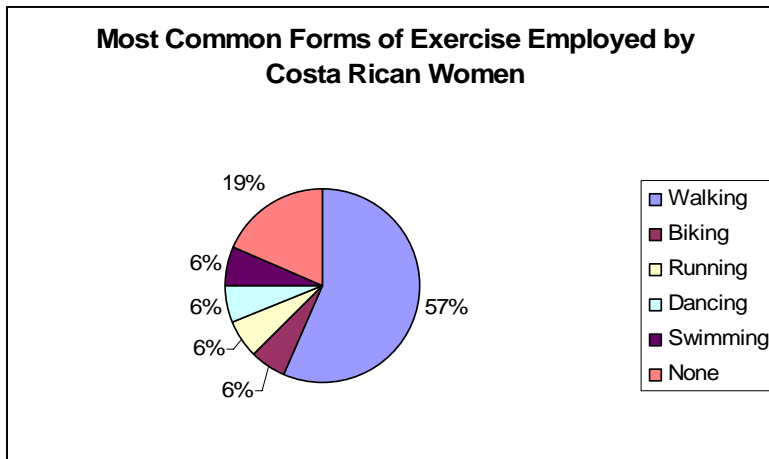
Notes: \* The ranking (referring to the commonness of the type of consult in that year) is the number in the bracket.

For example (2) in the hypertension column in the first row means hypertension was the 2nd most common type of consult in 2004

**Figure 1- Menu at Los Mangos**

- \*Cordon Blue  
con pollo y puré y vegetales
- \*Cordon Blue  
con cerdo con puré y vegetales
- \*Fricase de pollo  
pollo en salsa blanca, papas y ensalada
- \*Bistek de cerdo  
con papas y ensalada
- \*Filete de corvina al ajillo  
con puré y ensalada
- \*Filete al milanesa  
con papas y ensalada
- \*Casados (Typical Food)  
Arroz, Frijoles, Ensalada, Platano Maduro con:
  - Pollo                      Pescado
  - Cerdo                     Vegetariano
  - Res
- \*Arroz
  - Camarones              Pollo
  - Cantones                Mariscos
  - Chorizo Chino        Cerdo
  - De la casa (Pollo, camarón, y tocineta)
- \*Hamburguesas
  - Especial
  - Especial con papas
- \*Pastas
  - Bolonessa
  - Con Pollo
  - Con Vegetales

**Figure 2- Most Common Forms of Exercise Employed by Costa Rican Women**



## DISCUSSION

Based on the results found from the research done, most of the hypotheses must be rejected and modified at this time. One of the hypotheses was that a lack in health education available to children may increase the prevalence of cardiovascular disease because of unknown proper diet and recommended exercise to prevent cardiovascular disease. Although this may be true, a lack of education does not hold true for the reason for cause of CVD in this community. Elliot, Dr. Urpí and Emily all agreed that the entire community has plenty of knowledge on the subjects of nutrition, exercise and cardiovascular health and that the reason for an increase in health problems was a behavioral problem (Appendix A, B, D). Inferences can be made as to why this is. The United States is plagued with a similar lazy attitude/behavior. As Elliot said it is not that they don't know or don't care they just don't do anything about the problem until there is a problem, and at the point it may be too late (Appendix A). Also in her interview, Elliot mentioned all of the ways the town has been modernized over the past few years and how things have changed for better or worse. She attributed part of the poor nutrition and prevalence of sweets and fatty foods to Americanization, in which are products are largely influencing the world. Large coke bottles, pizza and hamburgers are all relatively new to the community, and all relatively American (Appendix A). So it is seen that American culture is influencing the diet of many Costa Ricans which may in part be affecting their health, especially their cardiovascular health. So then it is suggested that Costa Rica and America share similar health issues, and they seemingly do.

America has been plagued by obesity since the nineties with all the fast food restaurants and obsessions with the super sized meal. Costa Rica does not appear to have any

too dramatic obesity problems, or not any that data could back up. However, cardiovascular diseases account for 63 deaths, the most of any, in Las Juntas in 2002 (Appendix B). Dr. Urpí attributed part of the reason for so many deaths of CVD is simply because people are living longer, and the heart tends to be one of the first organs to go (Appendix B). Also hypertension and diabetes were the 2<sup>nd</sup> and 3<sup>rd</sup>, respectively, most common causes for consultation in 2004 which also verifies that CVD is definitely a problem in Las Juntas (Table 2). And for older adults hypertension was tied for the most common cause for consultation which verifies that it is an even bigger problem for the elderly. Part of this may be due to a lack of exercise.

As stated in the results section as an observation, exercise is seen to be primarily done by children and men. Very few women are seen exercising, there is even a reduced amount of girls exercising compared with the boys. With the exception of the group Ageco for older women, there are no exercise programs available to the community (Appendix A). It is suggested that this lack of exercise output done by women is a contributing factor to their health problems. Along the same lines as diet, people know what is good for them and that they should, but they just do not do it regardless. Most women from the survey stated that they were too busy to exercise when asked why they do not exercise on a daily basis or for at least thirty minutes a day. This is probably why the most common form of exercise, walking, which was surveyed at 57% (Figure 2) of the exercise done is because it fits best into daily activity. Instead of riding in cars, many women walk places or run errands. Also, it was seen that 100% of the women in the 40-50 year old category exercise daily for more than 30 minutes (Table 1). This was greater than any other category. It can be inferred that at this age, women are starting to retire and have more time to them selves but are not too old or unhealthy to not exercise. This is a possible explanation for this observation.

The hypothesis that the dietary practices and amount of physical activity that women get on a daily basis directly correlates to cardiovascular problems can be suggested as true, but since there is no exact way of measuring this, it remains an open correlation. Based on the knowledge that is available on the subject of diet and exercise as it affects CVD, the hypothesis that eating a diet poor in vegetables and fruits and high in fried foods and meats and such as well as getting less than the recommended thirty minutes of exercise a day will increase the probability of a woman having cardiovascular health problems can be speculated as true as well. However, the hypothesis that the availability and use of vegetables would be slim must be rejected. A farmer's market comes to town once a week and sells fresh fruits and vegetables for cheap that is available to all. Also, the supermarket carries a fair and fresh variety of fruits and vegetables on a daily basis. Finally, 100% of the survey participants eat fruits and vegetables daily and 93% believe that they are easily accessible to them (Table 1).

Furthermore the knowledge of cardiovascular disease and its causes was higher than expected, 80% and 67% respectively (Table 1). Also, the fact that all had the knowledge of healthy nutrition and exercise and 100% of those surveyed agreed that they believed both were vital to maintaining good health, yet 19% of them do not exercise at all (Table 1) was mildly shocking. Yet again, this behavior is very similar to that of the United States. We have the knowledge and resources to better ourselves but yet most of us do not. Why that is can only be speculated as laziness, business or putting off till tomorrow what one can not do today. The behavior regarding exercise and diet in regards to health can be speculated as one of the major problems in Las Juntas, as in the United States. The correct knowledge and attitude are there already.

For future experiments stemming off of this project, it is suggested to use the information and data found in this project and focus on the causes and reasons for

hypertension and diabetes being so prevalent in their society. Also, make further comparisons between the cardiovascular problems of women in the United States versus Costa Rica and its implications. Also, a shorter, more general survey is suggested to collect general data with a larger sample size regarding this or similar information. In this research it was found that respiratory illness was the leading cause for consultation in 2004 (Table 2) yet only 1 out of the 15 participants in the survey smokes (Table 1), investigating why there may be so much respiratory illness may be another possibility. Finally, it is suggested to focus primarily on some aspect of health and gather information from the clinics there rather than focusing on exercising and nutrition, because little information was found.

## **Appendix A- Interview with Elliot Montayer Gramboa**

(Oral History)

Elliot Montayer Gramboa has lived in Las Juntas her entire life. She currently works as a professor at the high school level at the Institute of San Jorge, a private school. Growing up with a teacher for a mother and having the profound, famous teacher Edma Camboya (who appears on the 10,000 colones bill) for an aunt made her decision to become a teacher and carry on the family tradition an easy one. In addition to teaching at the school three times per week, she works in her home for her and her husbands business, Mina Tours. Other daily responsibilities include caring for her elderly mother and assisting her teenage son, Fadrique with his homework. On Sundays, their family attends church and occasionally they go on weekend trips. In the recent past, she used to work for a non-government organization that helped run the Ecomuseo.

Having lived in Las Juntas her whole life, she has seen social and technological changes occur. Socially, children are forced to leave Las Juntas to go study at a college or a university or to find work once they finish school because there is a lack of jobs in Las Juntas. Most of the time the children do not return which leaves segmented families in Las Juntas. Modernization of the town has also taken place. Bicycles and cars have replaced the once unpaved streets that used to be covered with horses and carts. New buildings have replaced old cultural buildings. Small businesses have been on the rise and farmers seldom come to sell fresh goods, with the exception of the weekly farmers market on Thursdays. However, improved health care and education has come with the rising number of health clinics and schools, but with this good comes the bad, drugs. Drug addiction, prostitution and alcoholism are all new problems plaguing the community. Elliot is concerned for the safety of her son and other impressionable youth and hopes that these new problems can be eliminated from the community in the future. Also, she feels that further developing the community is

unnecessary. Although development and globalization has helped their health care and education systems, she feels any more development will eliminate the quiet, authentic feel of the community and further corruption. However, she feels that ecotourism, conservation and community service are all things that should be continued to help the community. Elliot is doing her part by teaching, help reforestation through Mina Tours, and writing a book about the history of the Abangares.

When asked the major cause of death in Las Juntas, she responded heart disease and cancer. She believes heart disease is so prevalent because of the poor dietary habits of the people. The combination of excessive amounts of oil, unhealthy foods, and little to no exercise makes for a bad combination. She, herself, has recently been diagnosed with hypertension. Hypertension and diabetes have been the most common heart conditions found in Las Juntas and the number of cases increases each year. She commented that everyone in Las Juntas has been educated about the risks of eating unhealthily and the impact of poor diet and exercise habits on one's cardiovascular health. However, using herself as an example, she pointed out that no one does any thing about their habits until a diagnosis comes or it is too late. She also pointed out that there is a nutrition clinic paid for by the social security for all ages that offers meals to those unable to afford them and can act as a resource for education about nutrition. She blames globalization for part of the malnutrition problem. Pizza, super sized cola drinks and hamburgers were all things people did not know about in previous years and now they are all sold in the cafeterias at school even. Before they served tortillas and papas at school. Also, palm oil is still used which is one of the worst cooking oils but some people have replaced it with healthier alternatives such as soy bean oil or corn oil, but these oils are more expensive. Many of the less expensive foods such as pasta, rice, and beans are also the less nutritious ones, which is also part of the problem.

As far as exercise, school children are required to participate in volleyball, soccer or basketball once a week for two hours. Also, there is an exercise program Ageco ( Association Gerontologica) also run by social security that is available to older women. The members gather twice a week to exercise as a group. There are no places where other community members can go to exercise like a gym. Elliot hopes that some sort of physical place such as a gym will become available to the community in the future.

### **Appendix B- Interview with Fernando Cruz Urpí**

Fernando Cruz Urpí is a practicing orthodontist in Las Juntas. He provided many facts about the healthcare system of Costa Rica and how health care has changed as well as specifics about cardiovascular disease and its prevalence in Las Juntas. Around the 1970's health began to be looked at differently. They stopped looking at just illness and began preventative health care. The end of World War II brought about antibiotics and vaccines which helped people live longer, better lives. Now, because people are living longer, cardiovascular disease and diabetes are the most common health problems. Now more than ever , old people are more dominate part of the community and require a lot more attention and service.

Costa Rica has the second longest life expectancy for women, 80 years, of any country of the Americas, with the same health markers as the United States (ranked 3<sup>rd</sup>) yet is considered an underdeveloped country. Since 1940 Costa Rica has viewed healthcare as a public problem not an individual problem, as the United States does, and this is the reason for their success. Also, the United States spends the more money on healthcare than any other country. All the hospitals in the country are under one universal system, everyone is treated equally. Healthcare is insured for all by the government taking part of your salary. There are private hospitals available for those that want them, but they are no different then the public

care hospitals except they offer a little more privacy and a much bigger bill. Costa Rican healthcare also included referrals and home visits. Fernando said, “Here the patients run and own the hospital.” The system includes required visits for minors of all ages, with different requirements depending on how old you are.

Diabetes tests, self-esteem tests, blood pressure readings and weight recordings are the main components of adult healthcare screening. And ironically, they all have something to do with cardiovascular disease. Hypertension and Diabetes are the most common diseases of adults in Las Juntas and Costa Rica. Fernando believes that cardiovascular disease is a cultural problem and that the women more than the men take better care of themselves. 14% of the population above 20 years old has hypertension. 6% of the population above 20 years old has diabetes, which affects CVD (cardiovascular disease) because it affects circulation. Also, cardiovascular disease and other heart related problems accounted for 63 deaths in Las Juntas in 2002 (the number one cause of death). Fernando thinks part of the reason CVD seems to be a bigger problem in women than men, is because more women come in and get diagnosed and thus live longer than men. Many people used to cheat on their diabetes tests and would not eat at all before coming and they would seem fine, but were only lying to themselves. Since then, a different way of testing has been discovered.

As far as education about health and diet goes, Fernando said that the government supplies everyone with enough knowledge and that everyone in Las Juntas is educated about the risks and know how to properly eat and exercise, they just do not. This stems down to what he called Knowledge, Attitude, and Behavior. They have the knowledge, they want to change, and they just do not. Their behavior is the hardest challenge, and for most it is a self-esteem problem.

## **Appendix C- Interview with Maria Gomez Alcazar**

Maria is a cook at one of the schools in Las Juntas. She gave insight on how the schools try to influence children to eat healthier foods. The schools try and serve balanced breakfasts and lunches. For breakfast, each student receives a piece of fruit and a slice of ham and cheese on lettuce. For lunch, typical food is served like rice, beans, salad, pasta, and potatoes. Some students go home to eat if they live close enough. And some mothers cook for the children at the schools or send food with their children. It is the same for both public and private schools. The government funds the meals and is trying to force more nutrition in to the schools. Soda has proved to be a problem but soda is allowed in school because Costa Rica is a free country and they can not ban anything but the school can choose not to serve soda or make other not nutritious foods unavailable to the students.

## **Appendix D- Interview with Emily (Nutritionist)**

Emily is a nutritionist at the one and only nutrition clinic in Las Juntas. The nutrition center helps undernourished and malnourished people of all ages as well as providing lower income families with rice, beans, oil and milk for cooking. There are also programs within the schools in the community, but they are only for school children. The clinic also offers education to people about nutrition offering both morning and afternoon sessions. They teach about all aspects of health, including dental hygiene. The government is the one that funds the clinic; therefore, clinics such as the one in Las Juntas are available to towns everywhere in Costa Rica.

The lower economic class as well as children and people older than forty have the most problems with their health. She believes diabetes and hypertension are the most common problems. She believes it stems from the economic problem Las Juntas has, with little

availability of work. Also, the primary method of cooking is frying and using lard or vegetable oil. Also, she said that malnutrition is a much bigger problem than undernourishment in Las Juntas.

## REFERENCES CITED

- 1) Alcazar, M.G. Personal interview. 23 May 2006.
- 2) “Cardiovascular disease”. *Cytokinetics Glossary*. 2006.  
<<http://www.cytokinetics.com/cyto/glossary>>
- 3) Diet and CVD. July 1997. West Virginia Department of Health and Human Resources. 16 March 2006.  
<<http://www.wvdhhr.org/bph/cvd/page7.htm>>
- 4) Emily. Personal Interview. 23 May 2006.
- 5) Food and Drink in Costa Rica. Infocostarica. 17 March 2006.  
<<http://www.infocostarica.com/culture/food.html>>
- 6) Goldhaber-Fiebert JD, Tristan ML, Goldhaber-Fiebert SN, Nathan DM. “Randomized controlled community based nutrition and exercise intervention improves glycemia and cardiovascular risk factors in type 2 diabetic patients in rural Costa Rica.” Diabetes Care 2003; 26.1: 24-9.
- 7) Gramboa, E.M. Personal Interview. 22 May 2006.
- 8) Himmelgreen D, Klempner CS. “Food Consumption Patterns and Obesity in the Monteverde Zone: An Exploratory Study on the Nutrition Transition and Health in Costa Rica.” Patel Center for Global Transitions. May 2004. University of South Florida. 17 March 2006.  
< [http://www.cas.usf.edu/globalresearch/research/nutrition\\_proj.php](http://www.cas.usf.edu/globalresearch/research/nutrition_proj.php)>
- 9) Kabagambe EK, Baylin A, Ascherio A, Campos H. “The Type of Oil Used for Cooking is Associated with the Risk of Nonfatal Acute Myocardial Infarction in Costa Rica.” Journal of Nutrition November 2005; 135.11: 2674-9.
- 10) Mosca L, MD, MPH, PhD, Manson JE, MD, PhD, Sutherland SE, PhD, Langer RD, MD, MPH, Manolio T, MD, Barrett-Conner E, MD. “Cardiovascular Disease in Women.” American Heart Association 1997; 96: 2468-82.
- 11) Pan American Health Organization. World Health Organization. 24 February 2006.  
< [http://www.paho.org/English/DD/AIS/cp\\_188.htm](http://www.paho.org/English/DD/AIS/cp_188.htm)>
- 12) Physical Inactivity and CVD. July 1997. West Virginia Department of Health and Human Resources. 16 March 2006.  
<<http://www.wvdhhr.org/bph/cvd/page4.htm>>
- 13) Urpí, F.C. Personal Interview. 22 May 2006.
- 14) Various Community members of Las Juntas. Análisis Situacional de Salud. 2004-2006.