

Cross-Cultural Analysis of Nutrition Guidelines and the Effects on Health Statistics

Submitted by
Haley Marentette

Health Sciences

To
The Honors College
Oakland University

In partial fulfillment of the
requirement to graduate from
The Honors College

Mentor: Dr. Jennifer Lucarelli, Interdisciplinary Health Sciences
Department of Health Sciences
Oakland University

3/15/18

Contents

Abstract3

Dietary Guidelines4

Health Statistics Definition.....7

Health Statistics Per Country.....9

Actual Intake of Macro-Nutrients.....11

Cultural Lifestyles.....17

Who Did it Best?.....22

Conclusion: Where do we go now?.....26

References.....28

Abstract

This thesis will explore how countries around the world educate their citizens on proper nutrition. The United States of America uses the MyPlate theme, and other countries use various symbols to depict dietary guidelines. Nutrition guidelines vary from country to country; some countries focus on proteins, such as meats, while others focus on vegetables and other complex carbohydrates. This research will explore how guidelines are communicated and how these dietary guidelines effect health statistics such as body mass index (BMI). This research aims to find a relationship between following the nutrition guidelines and positive outcomes in health statistics. The likely results include a better understanding of worldwide nutrition, the impact of lifestyle choices and obesity, and ways to incorporate cross-cultural recommendations into the United States' nutrition guidelines.

Dietary Guidelines

Dietary guidelines have been developed by many different countries worldwide in order to inform citizens about healthy eating recommendations and to prevent obesity and chronic disease. In The United States, the first dietary guideline was developed in 1980 and has continued to be updated every five years since then (U.S. Department of Health, 2015). The main goal of the American dietary guidelines is to “eat healthy, be healthy and save” in order to reduce the amount of diet-related chronic diseases effecting the United States (U.S. Department of Health, 2015). While every guideline has the same end goal to end obesity and diet-related chronic diseases, each guideline represents a “healthy diet” in a different way. Due to these differences, the American (US), Japanese and Greek dietary guidelines along with chronic diseases statistics were explored.

United States

The US guideline uses “MyPlate” as a pictorial reference for the Dietary Guidelines for Americans. As seen in Figure 1, the plate indicates how portion sizes should be and is categorized per food group. Table 1 depicts each food group and the servings recommended on the MyPlate for ages 19 and older, however, the MyPlate model is designed to apply to Americans aged 2 and older with different recommendations for each age group based on their estimated calorie needs (MyPlate, 2017).



Figure 1. MyPlate (MyPlate, 2017)

| | Men (Age 19+) | Women (Age 19+) |
|-------------------|------------------------------|----------------------------|
| Fruit | 2 cups | 1.5 – 2 cups |
| Vegetables | 2.5 – 3.0 cups | 2-2.5 cups |
| Grains | 6-8 oz (3-4 oz whole grains) | 5-6 oz (3 oz whole grains) |
| Protein | 5.5 oz – 6.5 oz | 5.0 – 5.5 oz |
| Dairy | 3 cups | 3 cups |
| Oils | 6 – 7 teaspoons | 5 – 6 teaspoons |

Table 1. MyPlate Recommendations (MyPlate, 2017)

Japan

Japan uses a “spinning top” pictorial model to represent the Japanese Dietary Guidelines. This top-down model depicts the food groups with the largest daily recommended foods at the top and the smallest recommended foods at the bottom. As can be seen in Figure 2, a person is

running around the top to represent physical activity. The goal of using this “spinning top” model is to represent proper diet and physical activity in order to keep the top spinning. Therefore, if one were to stray from the recommendations, the top would fall (see Figure 2 & Table 2). This guideline is intended for the general healthy public which includes school-aged children and older (Japan Guidelines, n.d.).



| Food Groups | Servings |
|---------------------------------|----------|
| Grains | 5 – 7 |
| Vegetable Dishes | 5 – 6 |
| Fish and Meat Dishes | 3 – 5 |
| Milk (And other dairy products) | 2 |
| Fruits | 2 |

Figure 2. Spinning Top (Japan Guidelines, n.d.)

Table 2. Japan Guidelines (Japan Guidelines, n.d.)

Greece

Greece uses a pyramid to represent the Greek Dietary Guidelines. Similar to Japan, Greek uses a top-down model as its' pictorial representation. However, this depiction does have its differences. Seen in Figure 3, this guidelines categorizes foods into groups that should be eaten monthly, weekly and daily. The top of the pyramid represents the foods that are to be eaten monthly and the bottom represents the daily recommended foods (see Figure 3 & Table 3). The Greek guidelines are aimed to influence the adult population (Greece Guideline, n.d.).

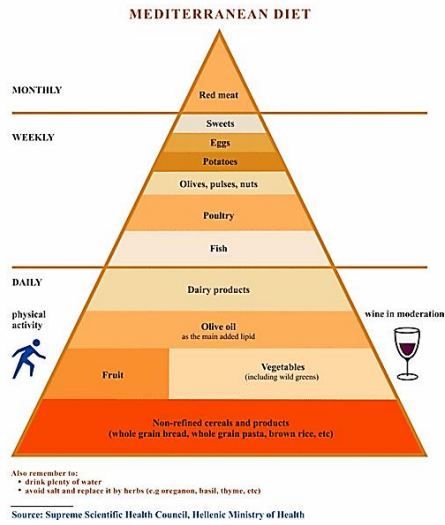


Figure 3. Greek Pyramid (Greece Guideline, n.d.)

| Food Groups | Servings |
|----------------------------------|---------------------|
| Red Meat | 4 (Monthly) |
| Sweets | 3 (Weekly) |
| Eggs | 3 (Weekly) |
| Potatoes | 3 (Weekly) |
| Olives, Pulses, Nuts | 3-4 (Weekly) |
| Poultry | 4 (Weekly) |
| Seafood | 5-6 (Weekly) |
| Dairy | 2 (Daily) |
| Olive Oil | As main added lipid |
| Fruit | 3 (Daily) |
| Vegetables | 6 (Daily) |
| Non-refined Cereals and Products | 8 (Daily) |

Table 3. Greek Recommendations (Greece Guideline, n.d.)

Health Statistics Definitions

Health statistics are numbers that quantify an aspect of health (Health Statistics, n.d.). These statistics were examined in order to find a relationship between following a country’s dietary guidelines and chronic illnesses that are caused by poor diet. Body Mass Index (BMI), heart disease and type II diabetes statistics were obtained for each country. Life expectancy for each country was also researched.

BMI is a measurement of weight in kilograms (kg) per height in meters squared (m²). The World Health Organization (WHO) uses this to define overweight and obese individuals. These individuals are noted to have abnormal or excessive fat that could cause health impairments (Obesity and Overweight, 2017.). WHO defines adult individuals that are overweight as having a BMI greater than or equal to 25 kg/m². Obese adult individuals are defined as having BMI

greater than or equal to 30 kg/m^2 . According to WHO, in 2016 more than 1.9 billion adults worldwide were overweight and of these individuals, 650 million adults were obese (Obesity and Overweight, 2017).

Heart disease or cardiovascular diseases (CVDs) are classified as disorders of the heart and blood vessels. These included coronary heart disease, cerebrovascular disease, peripheral arterial disease, etc. According to WHO, CVDs are the number one cause of deaths globally with an estimated 17.7 million people dying from CVDs yearly. Risk factors for CVD include unhealthy diet, lack of physical activity and use of tobacco and alcohol products. It has been shown that reduction of salt and an increase in consumption of fruits and vegetables with regular physical activity reduces the risk of CVDs (Obesity and Overweight, 2017).

Type 2 diabetes is an insulin resistant disease that is caused by pancreatic beta cell exhaustion (Maedler & Donath, 2004). Unlike Type 1 diabetes which is currently understood as being unpreventable, Type 2 diabetes is largely caused by excess body weight and improper amounts of physical activity. According to WHO, the global prevalence of diabetes among adults was 8.5% in 2014. It can be noted that healthy diet, regular amounts of physical activity and maintaining a healthy body weight (BMI of $18.5\text{-}24.9 \text{ kg/m}^2$) are ways to prevent or delay the onset of Type 2 diabetes (Diabetes, 2017).

Life expectancy at birth is the measure that reflects the overall mortality levels of a certain population. It is defined as “the average number of years that a newborn is expected to live if current mortality rates continue to apply,” (World Health Report, 2006).

Health Statistics per Country

United States

BMI, heart disease, type 2 diabetes, and life expectancy statistics were found for each country. The United States conducts a study called the National Health and Nutrition Examination Study (NHANES) that collects data to assess the health of American adults and children (United States, 2017). The study has found that the average American man has a BMI of 26.6 kg/m² and the average American woman has a BMI of 26.5 kg/m² both of which are considered overweight. It also has found that 28% of men and 34% of American women are obese (United States, 2017).

As stated by the Centers for Disease Control and Prevention (CDC), heart disease is the leading cause of death for both men and women in the US. It is estimated that 610,000 people die from heart disease each year in the United States (Heart Disease, 2017).

According to the CDC, more than 30 million or 1 in 10 Americans have a form of diabetes. Unfortunately, 90- 95% of the 30 million cases of diabetes are type 2 diabetes (Type 2 Diabetes, 2017).

In 2014, the CDC recorded that the life expectancy in the US was 78.8 years of age. It was found that the leading causes of death in 2014 were heart disease, malignant neoplasms and chronic lower respiratory diseases with the seventh leading cause being diabetes mellitus (Kochanek, Murphy, Xu, & Tejada-Vera, 2014).

Japan

According to a study conducted by Htun, Suga, Imai, Shimizu, and Takimoto; the average BMI of Japanese men is 23.7 kg/m² and the average BMI of Japanese women is 22.7 kg/m² (2017). In addition, WHO found that 5.5% of the male population were obese and 3.5% of the female population were obese in 2015 (Impact of Chronic Disease, 2002).

In Japan, men have a higher risk for developing CVD. According to Htun, Suga, Imai, Shimizu, and Takimoto: 41 per 100,000 men will develop CVD and of those 100,000, with around 4,600 men being at risk. 8 per 100,000 women will develop CVD with around 4,800 women being at risk for CVD (2017). In 2014, WHO found that 8.5% of all deaths in Japan (102,500) were caused by cardiovascular disease (WHO: Japan, 2012).

In a study conducted by A. Goto, M. Goto, Noda, and Tsugane; it was found that 9 in every 1,000 Japanese people are type 2 diabetic. This was based on a literary search of laboratory data and self-reported surveys and was found to be highly validated in comparison to other countries such as the U.S. and China (2013).

The average life expectancy in Japan is 83.7 years according to WHO. This is the highest life expectancy in the world as of 2017 (World Health Statistics, 2017). It was also found that lower respiratory infections, stroke, and ischemic heart disease were the leading causes of death in 2002 (Impact of Chronic Disease).

Greece

In 2014, WHO estimated that the average BMI for men was 28.7 kg/m² and for women was 28.5 kg/m² in Greece. In addition, 66% of the male population and 55% of the female population were found to be overweight and 22% of men and 24% of women were found to be obese (Greece Health Profile, 2011).

In 2014, WHO recorded that 48% of all deaths in Greece were caused by cardiovascular diseases. This accounted for around 54,000 deaths and was the largest cause of death in 2014 (Noncommunicable Diseases: Greece, 2014).

According to a study conducted by Pistavos, Miliadis, Panagiotakos, Xenaki, Panagopoulos, and Stefanadis: 6.2% of all males and 5.7% of all females had been diagnosed with type 2 diabetes (2006).

In 2011, WHO recorded that the life expectancy at birth for men was 78.6 years of age. For women, the life expectancy was 83.2 years of age. The total life expectancy of the population is 80.4 years of age. Deaths from cardiovascular disease, cancers and external causes of injuries (accidents, homicides, and suicides) and poisoning were the main causes of deaths (Greece Profile of Health).

Actual Intake of Macro-Nutrients

For the purpose of this study, actual intake of each country was researched. The purpose was to discover whether or not the actual intake of each country matches the recommended intake of each food group from the country's dietary guidelines.

United States

According to the 2015-2020 Dietary Guidelines, the current eating patterns in the United States do not align with the recommendations. Unfortunately, about three-fourths of the population eats less than the recommended fruits, vegetables, dairy, and oils. Over half the population is meeting or exceeds the total grain and protein foods recommended and most Americans exceed the recommendations for sugars, saturated fats and sodium (U.S. Department of Health, 2015). Furthermore, the eating habits of most Americans consists of a calorie intake

that is higher than the recommended intake. Figure 9 from the 2015-2020 guidelines depicts the population's eating patterns and whether or not it is above or below the recommended.



Figure 4. Actual Intake: United States (U.S. Department of Health, 2015)

Japan

Japan's nutrition guideline uses pictures of food in the guideline that suggest the correct serving sizes for each food group. Women are to consume 50 grams a day while men are to consume 60 grams per day (Overview of Dietary References Intake, 2015) According to the Ministry of Health, Labour and Welfare fats and carbohydrates are recommended to be 20-30% and 50-65% of a diet respectively (Overview of Dietary References Intake, 2015). In order to

find how many kcals and grams that is in one's diet the following equations were used (Calories Count, 2005):

Carbohydrates

50-65% of 2,300 kcal diet for men = 1,150 – 1495 kcal per day

There are 4 calories per gram of carbohydrate

$1150 - 1495 \text{ kcal} / 4 \text{ calories} = 287.5 - 373.75 \text{ g}$

Fats

20-30% of 2,300 kcal diet for men = 460 – 690 kcal per day

There are 9 calories per gram of fat

$460 - 690 \text{ kcal} / 9 \text{ calories} = 51.1 - 76.7 \text{ g}$

With the above calculations, the following figures were constructed to show the difference between the recommended intake and the actual intake. Both men and women are under the recommended value of calories, dietary fiber, and carbohydrates. While both men and women are over the recommended value of protein and fats, it is not a significant difference.

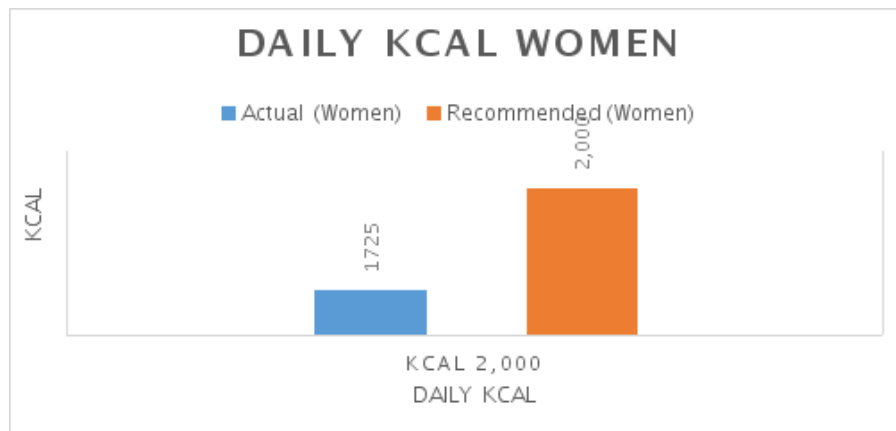


Figure 5. Calorie Intake: Women (Japan)

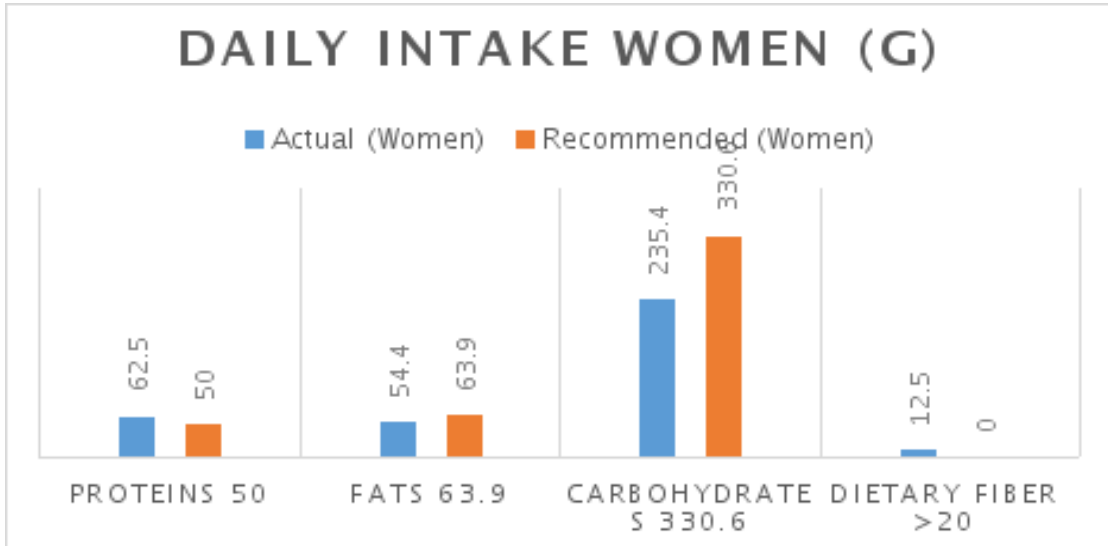


Figure 6. Daily Intake: Women (Japan)

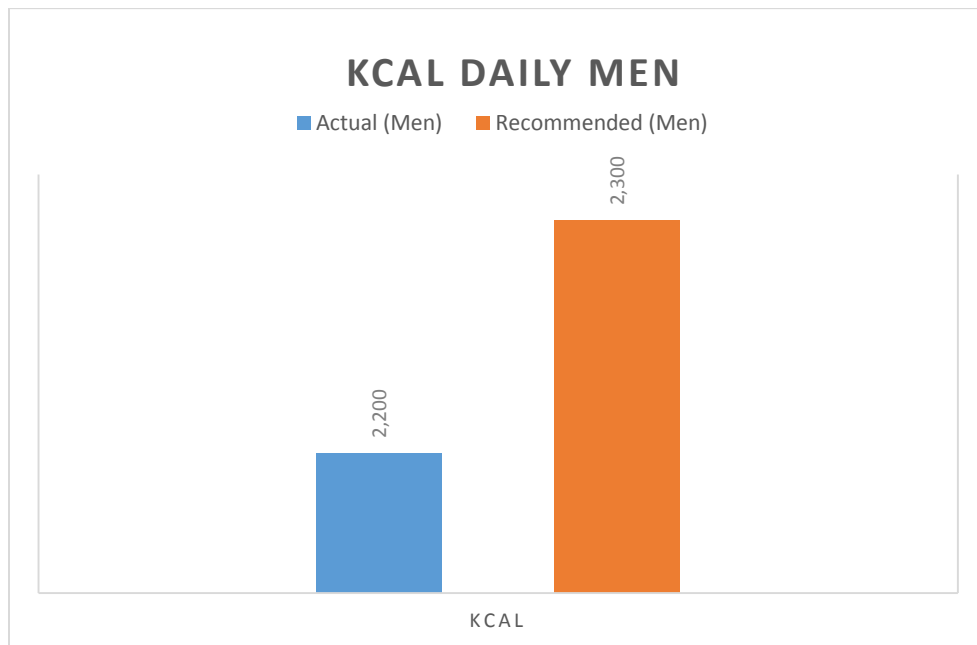


Figure 7. Calorie Intake: Men (Japan)

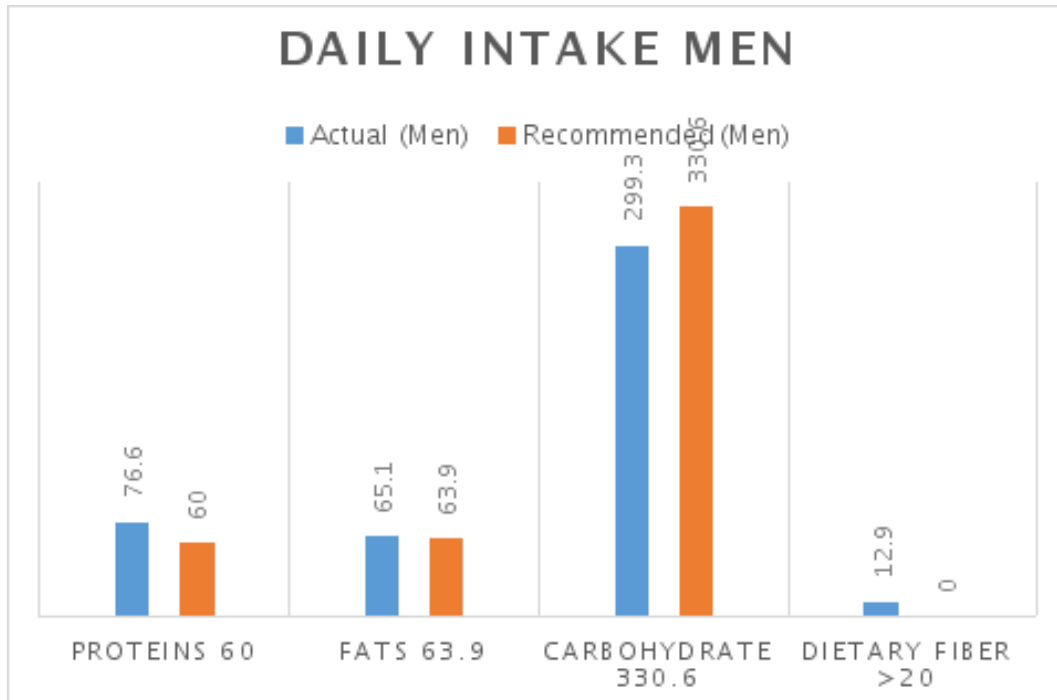


Figure 8. Daily Intake: Men (Japan)

Greece

Greece recommends different serving sizes for each food group that is then broken down into subcategories by month, week and then day. The serving sizes are "one-half of the portions as defined in the Greek market regulations," (Greece Guideline, n.d.). Example serving sizes include one slice of bread (25 g) or half a cup (i.e. 50-60 g) of cooked rice or pasta (Food Based Dietary Guidelines, 2003). Trichopoulou, Bamia, and Trichopoulos conducted a study that gathered information about actual intake of the recommended food groups among the Greek population (2009). The following figures show this comparison.

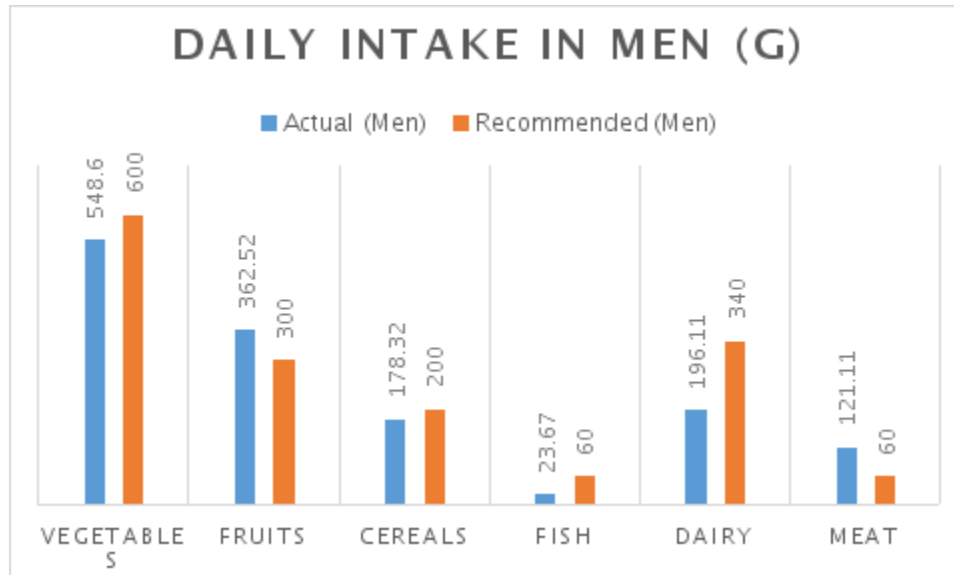


Figure 9. Daily Intake: Men (Greece)*

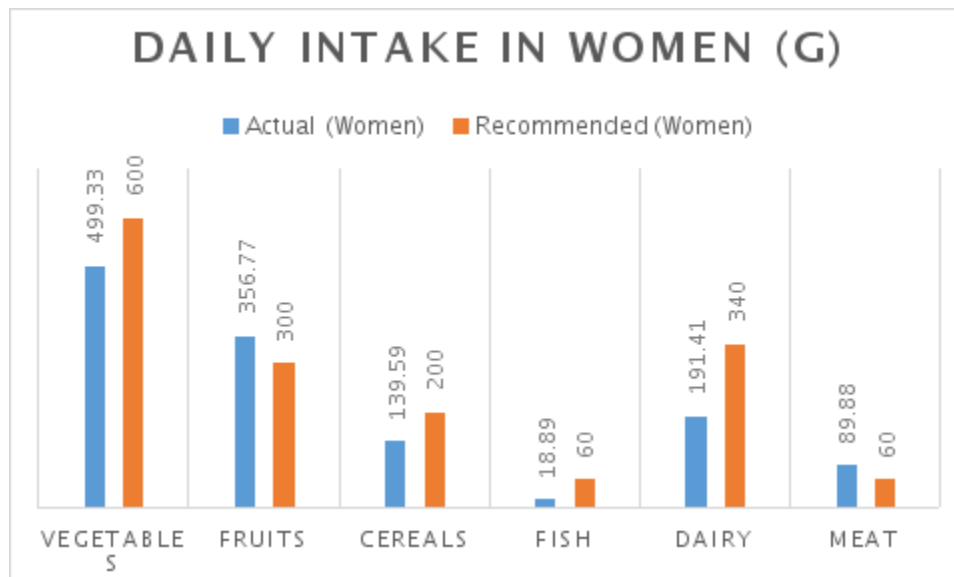


Figure 10. Daily Intake: Women (Greece)*

*The recommended amounts of each food group was derived from the Food-Based Dietary Guidelines (2003). This was done by using the Greek restaurant serving size for one serving and multiplying this number by the number of servings recommended on the dietary guideline.

As can be seen in figures 9 and 10 both men and women meet or exceed the daily recommended fruits and meat. However, both men and women do not meet the recommended intake of dairy, vegetables, fish, and cereals.

Cultural Lifestyles

Cultural lifestyles for each country were also examined. As seen in the previous section, many of the recommended food groups were either not met by actual daily intake or they were exceeded, both of which can lead to health detriments. Examining cultural lifestyles helped to bring in to perspective the reasons why those certain food groups were not met or overindulged.

United States

The American or “Westernized” diet is one that receives a multitude of backlash from nutritionists worldwide. The western diet is associated with low consumption of fruits and vegetables and overconsumption of processed meats and grains, sugars, calories, alcohol, and fats. In addition, the westernized lifestyle is associated with low levels of physical activity (Dietary Guidelines, 2015). While the western diet has been perceived to be negative, a study conducted by Levine and associates suggest otherwise.

A study conducted by Levine and associates suggests that the American need for independence pushes for a healthier diet, instead of the negative norm of the western diet. Furthermore, this study suggests that Americans view healthy eating as the “right” way to behave, thus they are more likely to eat a healthier diet. In addition, when independence is promoted, people tend to make a healthier choice. For example, a child who is a “picky eater” will choose a healthier option autonomously if parents expose that child to the independence and multiple healthy options. This would suggest that most Americans would choose a healthier diet over the “predicted” western diet (2016).

To coincide with Levine and associates’ study, the American government has worked to aid the public on proper nutrition education. One example of this is former First Lady, Michelle

Obama's "Let's Move!" campaign. This campaign was launched with the goal that childhood obesity would decrease through an education in nutrition and physical activity. A second goal was that this campaign would push parents, government officials, schools, healthcare professionals and community-based organizations to play a role in reducing childhood obesity (Learn the Facts, 2010).

A second attempt in guiding American's in a healthier eating direction is the 2015-2020 Dietary Guidelines for Americans. These guidelines not only put forth a suggested healthy eating pattern, but it also suggests ways to reform current, poor eating habits and other challenges. One challenge the Dietary Guidelines address are the circumstances that limit healthy eating, such as food access, household food insecurity, and acculturation (Dietary Guidelines, 2015). The guidelines describe food access as the ability to access healthy and affordable food options in order to develop a healthy eating pattern. Household food insecurity, the unavailability of adequate and safe foods, affects about 48 million individuals. The guidelines mention acculturation as individuals and families from other countries immigrate to The United States and they may adopt behaviors and habits of their new country that could be detrimental to their health.

While the United States dietary guidelines provide a seemingly perfect outline for healthy eating, it, unfortunately, does not reach as far into the population as one would hope. The U.S. Food and Drug Administration (FDA) conducts a Health and Diet Survey yearly. The 2014 survey found that

77% of U.S. adults reported using the Nutrition Facts label always, most of the time, or sometimes when buying a food product. Half of those who had reported rarely or never use the label said they did not feel they need to use the label, most likely

because they bought products they or their family liked or they were satisfied with their diet or health.

In addition, the study found that lack of interest in nutrition was the primary reason for not using these labels at all (Lin et al., 2014).

Another survey, Functional Foods Consumer Survey, suggests a more positive outlook on the nutrition knowledge of Americans. It found that 89% of consumers can name one functional food (grains, dairy, etc.) and the health benefits associated with it. The survey also found that 86% of Americans are interested in learning more about foods beyond the knowledge of basic nutrition. While most Americans understand that nutrition plays a major role in health outcomes, 10% of Americans still are unsure if they are meeting the recommended daily amounts of food groups based on lack of knowledge of these recommendations (2013).

Japan

The cultural difference between Japan and United States is, in Japan, interdependence, instead of independence, is the way of thinking and acting. In Japan, people strive to adjust behaviors in order to accommodate others. This idea of interdependence is what shapes healthy eating in Japan. According to Levine and associates, the Japanese guidelines suggest people who cherish a closer family atmosphere during meal preparation and mealtime, will lead a healthier life (2016).

This aspect of Japanese culture is one that, of recent time, has become less involved in the population's lifestyle. In the "Health Japan 21" there was a growing concern for the loss of traditional food culture and inappropriate dietary habits. Due to this growing concern, the "Basic Law on Shokuiku" was enacted in 2005. Shokuiku means "diet education" and is further defined

as “the acquisition of knowledge about food and nutrition and ability to make appropriate food choices through various experiences related to food, in order to develop people with the ability to practice a healthy diet,” (Miyoshi, Tsuboyama-Kasaoka, & Nishi, 2012). The implementation of Shokuiku has affected the school lunches in Japan.

In Japanese schools, dietitians or nutrition teachers are responsible for the creation of the school menus that satisfy recommended dietary intakes, student tastes, and that incorporate food traditions and cultures. The schools emphasize how important it is to eat healthy, fresh foods by having students visit the farms where the fresh produce comes from. Furthermore, parents are encouraged to post-school lunch menus in the home so that its' nutritional importance may be discussed by the family and it may serve as an example for healthy meals at different mealtimes (Kaneda & Yamamoto, 2015).

While the lunchtime education has been immensely successful in combating rising obesity concerns and other diet-related ailments (Kaneda & Yamamoto, 2015), there is still a nutritional gap in the Japanese diet. This gap has been shown to come from the fast-paced Japanese lifestyle of long work hours and lack of family structure/life rhythm. It has been shown that cultural Japanese dishes are harder to achieve in contemporary Japan, leading to unhealthy diet choices. Thus any nutrition gap seen is not from lack of knowledge of nutrition recommendations or the importance of health but from lifestyle constraints (Melby, & Takeda 2014).

Greece

The Greek or “Mediterranean” diet is one that has gained popularity over the years as research has shown that the diet was associated with a reduced risk of cardiovascular mortality as

well as overall mortality (Mediterranean Diet, 2017). The guidelines suggest that together with healthy eating and moderation that a lifestyle that preserves cultural elements leads to an overall healthy lifestyle (Bach-Faig et.al, 2011).

While this diet has been promoted in other countries to replace current eating habits, the Greek population, specifically the younger population, have slowly been abandoning the traditional Mediterranean diet and adopting a more westernized diet. This shift can be credited to the economic crisis that affected Greece in 2009 and continues today. This economic crisis has caused public health spending to be cut drastically and the unemployment and poverty rates to skyrocket (Kentikelenis et., al 2014). This recession caused food insecurity to increase as well as an increased intake of unhealthy, cheap food. Fortunately, in more recent years there have been programs implemented to aid in an increase in healthy diets following the economic crisis.

“The Healthy Children, Healthy Planet” program has been implemented into the Greek population by the World Wildlife Fund (WWF). The initiative is for people to learn about sustainable nutrition through educational activities for children and lectures for parents and teachers to aid in the promotion of healthy eating patterns. The goal is to lessen the growing rate of obesity in children and to shift back towards the traditional Mediterranean diet while also leaving a small environmental footprint (Diet and Environment, 2017).

Another initiative to prevent rising health concerns following the economic crisis is the implementation of the DIATROFI program. This program provides daily free healthy meals to students in participating schools. In addition, the program provides educational support on proper nutrition to both the children and the families. Current results after the implementation of the

program include lower food insecurity, decreasing numbers of underweight and overweight children and improved eating habits (Food Aid and Promotion, 2013).

Who did it best?

Each guideline, while slightly different, was created with the same intention: to create a healthier country by preventing obesity and diet-related chronic diseases. While each country had the same objective: who did it best?

Each country recommends food groups and different serving sizes for each food group. In The United States, the servings of fruits, vegetables, and dairy are based on cups. For proteins and grains ounces (oz) are used and tablespoons are used to measure oils (MyPlate, 2017). In Japan, the daily servings are based on servings that are given as examples of different dishes such as one serving of grains being one piece of bread (Japan Guidelines, n.d.). Finally, in Greece, the servings are based on the recommended servings that are served in the Greek restaurants. Example servings include half a cup of cooked rice as one serving of grains (Greece Guideline, n.d.).

Due to the difference in the depiction of serving sizes, each recommendation was converted into grams (g) and compared in Figure 11.

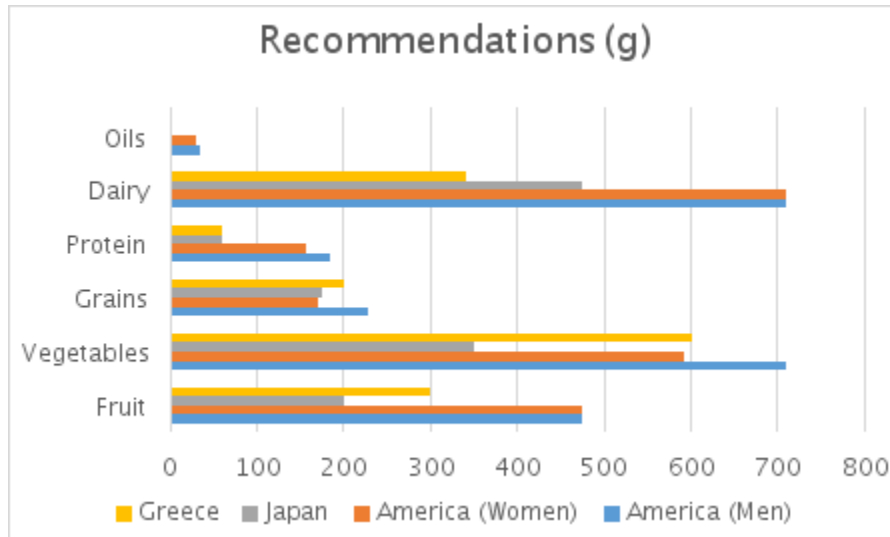


Figure 11. Recommendations

As can be seen in Figure 11, each recommendation varies significantly per country. In every recommendation, The United States has the greatest amount recommended per serving. Greece and Japan are generally close in recommendations aside from Greece having a greater recommendation size in vegetables and Japan for dairy. It should be noted that Japan does not have a recommendation on oils and Greece does not put a limit on oil intake unless BMI is greater the 25 kg/m² (Dietary guidelines, 1999).

In Figures 12-15, the diet-related health statistics and life expectancy are compared for each country.

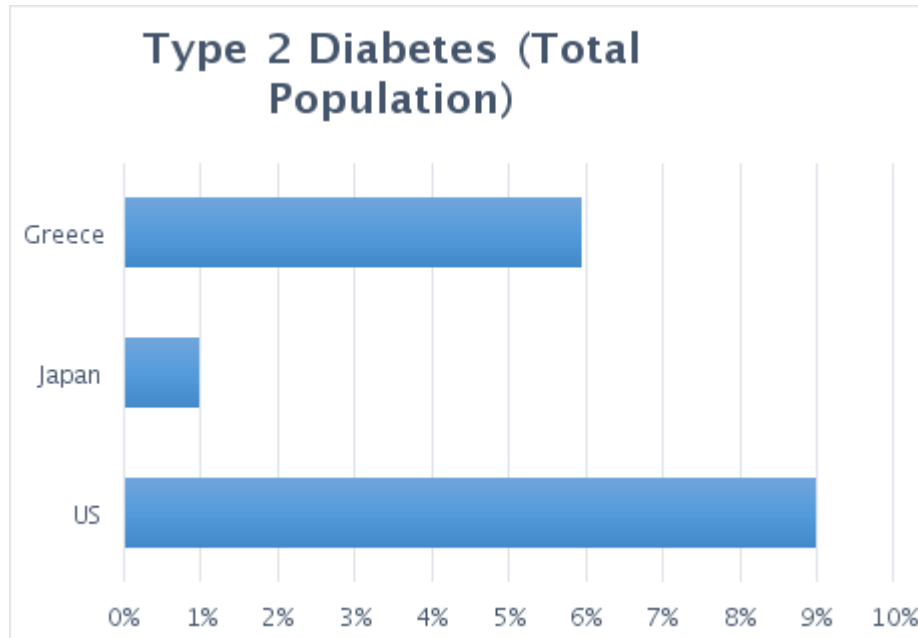


Figure 12. Type 2 Diabetes Comparison

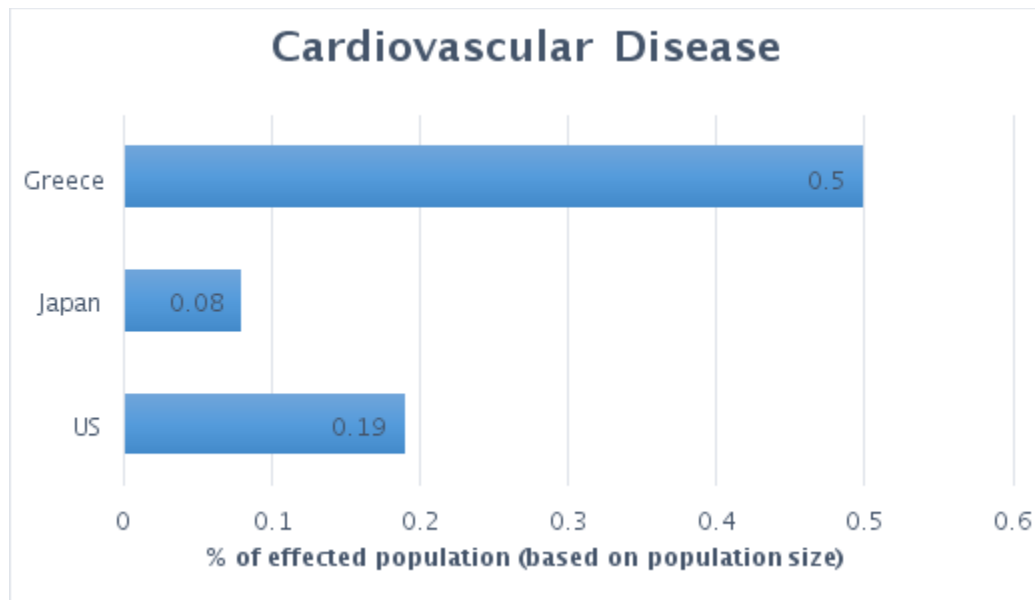


Figure 13. Cardiovascular Disease Comparison

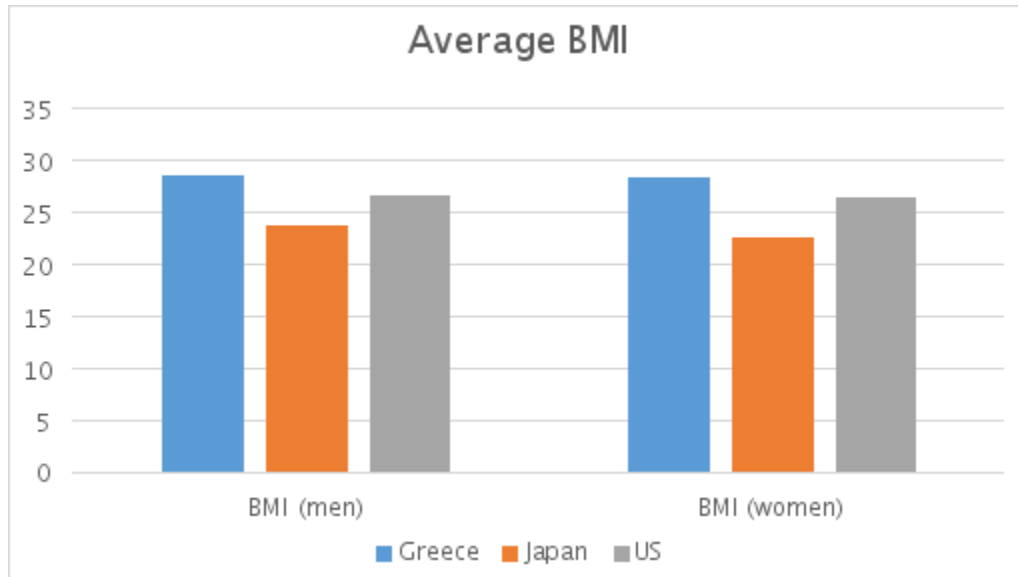


Figure 14. Average BMI per Country

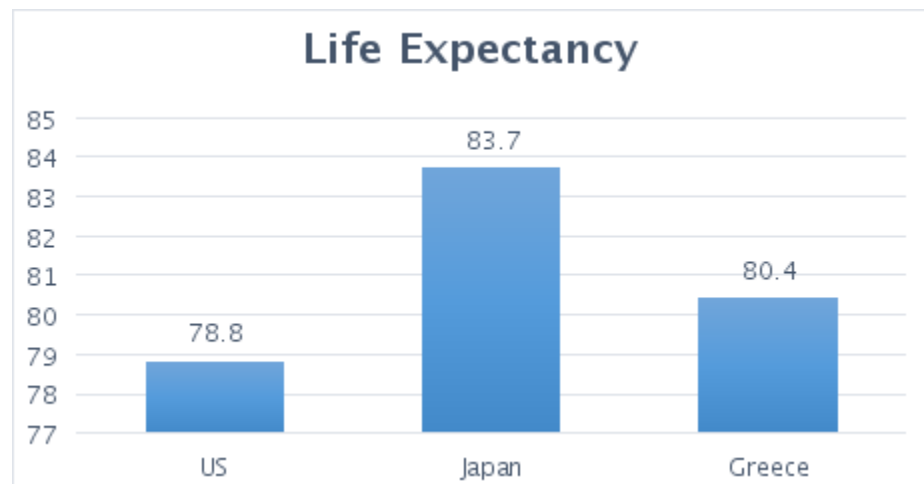


Figure 15. Life Expectancy

Figures 12 – 15 are visual representations of the differences of health statistics per country. Greece has the highest BMI. Japan has the highest life expectancy. The United States has the highest prevalence of cardiovascular disease and type 2 diabetes. With these results, Japan is the healthiest overall with the lowest rates of cardiovascular disease, type 2 diabetes, and the lowest BMI.

When comparing Figures 12 – 15 with the average daily intake for each country, there are some relationships that are undeniable. One such example is the average intake for Americans compared to the health statistics found. The 2015 Dietary Guidelines for Americans noted that a decreased consumption of fruits and vegetables is related to an increase in BMI leading to obesity (U.S. Department of Health, 2015). According to Figure 4, nearly 100% of Americans are below the recommended amount of vegetables and nearly 85% are below for fruits. This under consumption of fruits and vegetables could lead to the average BMI for Americans to be greater than 25 kg/m².

Furthermore, Japan has the smallest recommended portion sizes of all three countries according to Figure 11. This could be the reason for the lowest average BMI and lowest amounts of cardiovascular disease and type 2 diabetes. It could also account for the greatest life expectancy compared to Greece and The United States.

Finally, when comparing cultural lifestyles to the actual intakes and health statistics of each country Japan has the greatest cultural influence on cultivating a healthier diet than both Greece and The United States. Through the implementation of Shokuiku, the Japanese population are more knowledgeable about nutrition and therefore may be more health conscious, leading to better health statistics.

While it cannot be determined through this research whether or not these modifiable diseases and risks are directly related to the dietary guidelines; it can be seen that Japan and its guideline provides a better platform for healthier results.

Conclusion: Where Do We Go Now?

Nutrition and dietary guidelines provide information on a better way to live a healthier life. Yet, even with the guidelines, there still are diet-related health disparities. Unfortunately, the goal of the research; finding one guideline that could be implemented in every country in order to combat the diet-related health disparities, could not be found. This is caused by the need to research statistics on things such as imports/exports, agriculture and socio-economic status, and cultural influences on dietary intake. Instead, this research found recommendations that could be taken into consideration in order to better each guideline.

Key Recommendations:

- Greater ease of access to guidelines and other helpful nutritional information as socioeconomic status can limit this access.
- More education for all age groups, not just schoolchildren, on the effects of a healthy diet.
- Guidelines that better represent the actual intake of the population and foods that are readily available so the population feels more apt to follow the guidelines.

These recommendations open the door to a larger possibility of a healthier people and world.

References

- Bach-Faig, A., Berry, E. M., Lairon, D., Reguant, J., Trichopoulou, A., Dernini, S., . . . Serra-Majem, L. (2011). Mediterranean diet pyramid today. Science and cultural updates. *Public Health Nutrition, 14*(12A), 2274-2284. doi:10.1017/s1368980011002515
- Calories Count. (2005). [eBook] University of California. Available at:
http://www.dining.ucla.edu/housing_site/dining/SNAC_pdf/CaloriesCount.pdf
- Diabetes. (2017, November). Retrieved November 12, 2017, from
<http://www.who.int/mediacentre/factsheets/fs312/en/>
- Diet and Environment. (2017). Retrieved January 12, 2018, from <http://food.wwf.gr/roadtrip>
- Dietary guidelines for adults in Greece. (1999). *Archives of Hellenic Medicine, 16*(5), 516-524.
Retrieved from <http://www.mednet.gr/archives/1999-5/pdf/516.pdf>

U.S. Department of Health and Human Services and U.S. Department of Agriculture. (2015).

2015–2020 *Dietary Guidelines for Americans*. 8th Edition. Available at:

<http://health.gov/dietaryguidelines/2015/guidelines/>.

Food Aid and Promotion of Healthy Nutrition Program. (2013, September 23). Available at:

<http://www.prolepsis.gr/new/en/Projects/41/The-Food-Aid-and-Promotion-of-Healthy-Nutrition-Program.html>

Food Based Dietary Guidelines: in the WHO European Region. (2003). [eBook] Copenhagen:

World Health Organization, pp. 10-26. Available at:

http://www.euro.who.int/_data/assets/pdf_file/0017/150083/E79832.pdf

Functional Foods Consumer Survey. (2013). [eBook] Washington DC: International Food

Information Council, pp. 1-7. Available at:

<http://www.foodinsight.org/Content/3840/FINAL%20FF%20Executive%20Summary%2009-30-13.pdf>

Goto A, Goto M, Noda M, Tsugane S (2013) Incidence of Type 2 Diabetes in Japan: A

Systematic Review and Meta-Analysis. PLoS ONE 8(9): e74699.

doi:10.1371/journal.pone.0074699

Greece Guideline. (n.d.). Available at: [http://www.fao.org/nutrition/education/food-based-](http://www.fao.org/nutrition/education/food-based-dietary-guidelines/regions/countries/greece/en/)

[dietary-guidelines/regions/countries/greece/en/](http://www.fao.org/nutrition/education/food-based-dietary-guidelines/regions/countries/greece/en/)

Greece Profile of Health and Well-Being. (2011). *World Health Organization*. Available at:

http://www.euro.who.int/_data/assets/pdf_file/0010/308836/Profile-Health-Well-being-Greece.pdf

Health Statistics: MedlinePlus. (n.d.). Retrieved October 16, 2017, Available at:

<https://medlineplus.gov/healthstatistics.html>

Heart Disease. (2017, November 28). Retrieved December 18, 2017, Available at:

<https://www.cdc.gov/heartdisease/facts.htm>

Htun, N. C., Suga, H., Imai, S., Shimizu, W., & Takimoto, H. (2017). Food intake patterns and cardiovascular risk factors in Japanese adults: analyses from the 2012 National Health and nutrition survey, Japan. *Nutrition Journal*, *16*, 61. <http://doi.org/10.1186/s12937-017-0284-z>

Japan Guidelines. (n.d.). Retrieved November 11, 2017, Available at:

<http://www.fao.org/nutrition/education/food-based-dietary-guidelines/regions/countries/japan/en/>

Kaneda, M., & Yamamoto, S. (2015). The Japanese School Lunch and Its Contribution to Health. *Nutrition Today*, *50*(6), 268-272. doi:10.1097/nt.0000000000000130

Kentikelenis, A., Karanikolos, M., Reeves, A., McKee, M., & Stuckler, D. (2014). Greece's health crisis: from austerity to denialism. *The Lancet*, *383*(9918), 748-753. doi:10.1016/S0140-6736(13)62291-6

Kochanek, K., Murphy, S., Xu, J., & Tejada-Vera, B. (2014). Deaths: Final Data for 2014. *National Vital Statistics Reports*, *65*(4), 1-122.

Learn the Facts. (2010). Retrieved December 20, 2017, Available at:

<https://letsmove.obamawhitehouse.archives.gov/learn-facts/epidemic-childhood-obesity>

- Levine, C. S., Miyamoto, Y., Markus, H. R., Rigotti, A., Boylan, J. M., Park, J., . . . Ryff, C. D. (2016). Culture and Healthy Eating. *Personality and Social Psychology Bulletin*, 42(10), 1335-1348. doi:10.1177/0146167216658645
- Lin, C., Zhang, Y., Carlton, E. and Lo, S. (2014). *2014 FDA Health and Diet Survey*. [eBook] Center for Food Safety and Applied Nutrition. Available at:
<https://www.fda.gov/downloads/Food/FoodScienceResearch/ConsumerBehaviorResearch/UCM497251.pdf>
- Maedler, K., & Donath, M. (2004). β -Cells in Type 2 Diabetes: A Loss of Function and Mass. *Hormone Research in Paediatrics*, 62(3), 67-73. doi:10.1159/000080503
- Mediterranean diet: A heart-healthy eating plan. (2017, November 03). Retrieved January 12, 2018, Available at: <https://www.mayoclinic.org/healthy-lifestyle/nutrition-and-healthy-eating/in-depth/mediterranean-diet/art-20047801>
- Melby, M. K., & Takeda, W. (2014). Lifestyle constraints, not inadequate nutrition education, cause gap between breakfast ideals and realities among Japanese in Tokyo. *Appetite*, 72, 37-49. doi:10.1016/j.appet.2013.09.013
- Miyoshi, M., Tsuboyama-Kasaoka, N., & Nishi, N. (2012). School-based “Shokuiku” program in Japan: application to nutrition education in Asian countries. *Asian Pacific Journal of Clinic Nutrition*, 21(1), 159-162. Available at:
<https://www.ncbi.nlm.nih.gov/pubmed/22374574>.
- MyPlate. (2017, April 19). Retrieved January 10, 2018, Available at:
<https://www.choosemyplate.gov/MyPlate>

National Center for Health Statistics. (2015). *National Health and Nutrition Examination Survey*.

Available at: <https://www.cdc.gov/nchs/nhanes/index.htm>

Noncommunicable Diseases: Greece. (2014). [eBook] World Health Organization. Available at:

http://www.who.int/nmh/countries/grc_en.pdf?ua=1 [Accessed 9 Dec. 2017].

Obesity and overweight. (2017, October). Retrieved December 20, 2017, Available at:

<http://www.who.int/mediacentre/factsheets/fs311/en/>

Overview of Dietary Reference Intakes for Japanese (2015). (2015). [eBook] Ministry of Health,

Labour and Welfare. Available at: [http://www.mhlw.go.jp/file/06-Seisakujouhou-](http://www.mhlw.go.jp/file/06-Seisakujouhou-10900000-Kenkoukyoku/Overview.pdf)

[10900000-Kenkoukyoku/Overview.pdf](http://www.mhlw.go.jp/file/06-Seisakujouhou-10900000-Kenkoukyoku/Overview.pdf)

Pitsavos, C., Miliatis, G. A., Panagiotakos, D. B., Xenaki, D., Panagopoulos, G., & Stefanadis, C.

(2006). Prevalence of self-reported hypertension and its relation to dietary habits, in adults; a nutrition & health survey in Greece. *BMC Public Health*,6(1).

doi:10.1186/1471-2458-6-206

The Impact of Chronic Disease in Japan. (2002). *Facing the Facts: World Health Organization*.

Available at: http://www.who.int/chp/chronic_disease_report/japan.pdf?ua=1

The World Health Report 2006: working together for health. Geneva, World Health

Organization, 2006. Available at: <http://www.who.int/whr/2006/en/>

Trichopoulou, A., Bamia, C., & Trichopoulos, D. (2009). Anatomy of health effects of

Mediterranean diet: Greek EPIC prospective cohort study. *Bmj*,338, 1-8.

doi:10.1136/bmj.b2337

Type 2 Diabetes. (2017, July 25). Retrieved November 5, 2017, Available at:

<https://www.cdc.gov/diabetes/basics/type2.html>

United States, CDC. (2017). *National Health and Nutrition Examination Survey*. Available at:

https://www.cdc.gov/nchs/nhanes/about_nhanes.htm

World Health Organization. (2012). *Japan: WHO statistical profile* [Fact Sheet]. Available at:

<http://www.who.int/gho/en/>

World health statistics 2017: monitoring health for the SDGs, Sustainable Development Goals.

(2017) Geneva: World Health Organization; Licence: CC BY-NC-SA 3.0 IGO.