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Healthy, Wealthy, and Wise?
Cardiovascular Health and Disease in the United States and Switzerland:
Implications for the World Health Organization Action Plan

Kathryn Marie Bass Haugen

Senior Honors Project

St. Catherine University

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Dr. Brian Fogarty

Dr. Lynda Szymanski

Dr. Amy Hilden

Dr. Gayle Gaskill

Dr. Julie Bass

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Abstract

Cardiovascular disease is one of the most significant public health problems of our time, as it accounts for more deaths worldwide than any other cause. This paper uses a comparison of the United States and Switzerland, as well as objectives outlined in the WHO “2008-2013 Action Plan for the Global Strategy for the Prevention and Control of Noncommunicable Diseases,” to understand opportunities and challenges of addressing cardiovascular health and disease on a national and global level. Comparisons of demographics, social determinants of health, risk factors, and governmental policies and programs for these two countries provided a context for exploring cardiovascular health and disease. There is evidence that the United States and Switzerland view health and disease differently. These perspectives in turn influence national priorities, policies, and programs. There are also differences in data collection and measurement tools used to document progress on cardiovascular health goals. The findings from the analyses of these two countries have implications for a global agenda to prevent and control cardiovascular disease.

Introduction

Are you ready? It is coming for you, or someone close to you. It will be devastating; after all, it is the number one killer worldwide. No, it's not a microorganism or a serial killer. It's cardiovascular disease. Cardiovascular disease (CVD) is responsible for more deaths worldwide than any other cause. In fact, one out of five Americans will die from cardiovascular disease. Living with cardiovascular disease also has profound effects on individuals, families, and communities.

Cardiovascular disease is a complex, multi-dimensional issue. Addressing this disease on a global scale requires consideration of multiple contributing factors. Some of the major contributing factors in trends of CVD include modifiable and non-modifiable risk factors, social structures, and governmental efforts. Many individual and social factors play a role in the prevalence of CVD, and, while these factors are well known, it is hard to account for the effects of possible combinations of risk factors. The complexity and variety of factors involved in this disease make it difficult to address, as seen by the existing high rates of cardiovascular disease on a national and global scale.

Cardiovascular disease is a national and global health issue due to its large implications for individuals, families, and countries. This disease has tremendous social costs in terms of the number of mortalities and years affected by disease or disability. It also has large economic costs and places a large burden on society and health care. In the United States alone, cardiovascular disease cost over 286.6 billion dollars in 2007 (Lloyd-Jones et al., 2010). In developed countries such as the United States and Switzerland, the social and economic costs are more noticeable due

to an aging population. As CVD has both social and individual risk factors, it must be tackled on both a population and individual level.

Cardiovascular disease is recognized as a health priority in a number of national and international entities, as evidenced by existing plans on heart disease. Various countries, such as the United States and Switzerland, as well as international entities, such as the World Health Organization, have worked on addressing cardiovascular disease. Because of all the economic and social impacts of cardiovascular health on both individuals and countries, it is important to assess the opportunities and challenges in reducing CVD. The primary purposes of this paper are to explore cardiovascular health and disease and its risk factors in two countries, United States and Switzerland, understand the opportunities and challenges of achieving objectives for cardiovascular disease, and analyze the WHO action plan as it relates to CVD goals and programs in the United States and Switzerland. The United States and Switzerland are compared because of their similarities as two high income, developed countries and my personal experience with each country. Cardiovascular health will be examined in terms of social determinants of health and health beliefs and priorities seen through lifestyles, policies, and programs.

Background

According to the World Health Organization, “cardiovascular diseases (CVDs) are a group of disorders of the heart and blood vessels” (WHO, 2011a). Many diseases are classified as cardiovascular disease, including ischemic, inflammatory, cerebrovascular, hypertensive, and rheumatic heart disease (WHF, 2011). Two main areas are hypertensive heart disease, which

relates to high blood pressure, and ischemic disease, which relates to narrowed arteries and decreased blood flow (WHF, 2011). Ischemic disease is the most common of all CVDs, and includes coronary heart disease, coronary artery disease, and heart attacks.

Cardiovascular disease causes more deaths worldwide than any other cause (WHO, 2011a). It affects both developing and developed countries at a high rate. In 2004, CVD accounted for 29% of all deaths, or 17.1 million people worldwide, and men and women were affected at a similar level. Over forty percent of these deaths were due to coronary heart disease, a form of ischemic heart disease. Mortality from CVD has only increased overtime, as it accounted for ten percent of all deaths in 1900 but 30% of deaths today (Fuster, Voute, Hunn, & Smith, 2007). The CVD mortality rate is only anticipated to increase by 2030 to 23.6 million people dying annually from cardiovascular disease (WHO, 2011a).

The developed countries of the United States and Switzerland follow the world cardiovascular trend, as CVD is the primary cause of death in both countries. In both the United States and Switzerland, over 35% of deaths were due to this disease in 2004 (WHO Global Infobase, 2011a). The estimated death rates due to total cardiovascular and ischemic heart diseases (per 100,000) were very similar for the United States and Switzerland (See Table 1 & Figure 1). However, the United States had higher mortality rates than Switzerland for ischemic disease and Switzerland had higher mortality rates than the United States for total cardiovascular disease (WHO Global Infobase, 2011b).

Cardiovascular morbidity rates were also high in these two countries. Disability Adjusted Life Years (DALYs), an indicator of mortality and morbidity, is defined by the WHO as “the sum of years of potential life lost due to premature mortality and the years of productive life lost due to disability” (WHO, 2011b). The United States had higher DALYs per 100,000 than

Switzerland for both CVD and ischemic heart disease, indicating a greater burden of disease in terms of disability in the United States (See Table 1 & Figure 1) (WHO, 2004). These data show that the rates of cardiovascular disease are similar in the United States and Switzerland, with some variations demonstrating differences in contributing factors. The similar levels of CVD allows for an informative comparison of lifestyles and governmental policies/programs between the two countries.

Figure 1: *Death and DALY Estimates for United States and Switzerland by Total Cardiovascular Disease and Ischemic Heart Disease (2004)*

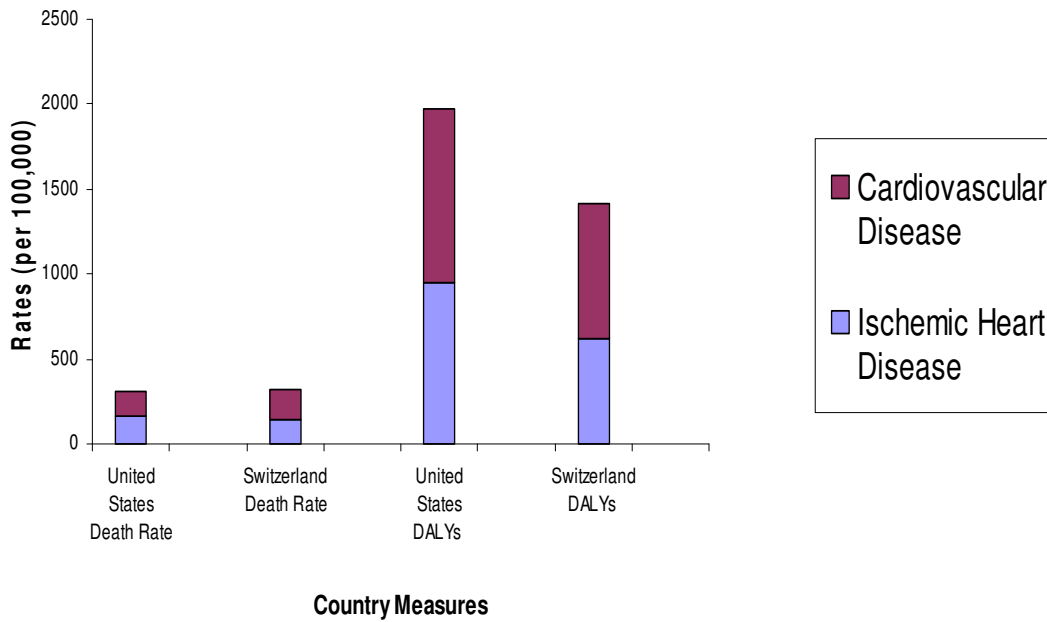


Table 1

Death and DALY Estimates for United States and Switzerland by Total Cardiovascular Disease and Ischemic Heart Disease (2004)

	<u>United States</u>		<u>Switzerland</u>	
	Total Cardiovascular Disease	Ischemic Heart Disease	Total Cardiovascular Disease	Ischemic Heart Disease
Estimated Total Deaths (In 1000s)	906.6	489.5	23.7	10.6
Estimated Total DALYs (In 1000s)	5,853	2,819	105	46
Estimated Death Rates per 100,000	305.4	164.9	320.5	143.3
Estimated DALYs per 100,000	1,972	950	1,416	617
Age Standardized Death Rates per 100,000	178.8	97.6	140.0	63.6
Age Standardized DALYs per 100,000	1,525	715	866	368

Note. World Health Organization (2004). DALYs (Disability Adjusted Life Years) are defined by the World Health Organization as the “sum of years of potential life lost due to premature mortality and the years of productive life lost due to disability.”(WHO, 2004).

Risk factors for ischemic and other forms of cardiovascular disease are well known. Risk factors may be divided into two categories, non-modifiable and modifiable risk factors. Non-modifiable risk factors can not be controlled; they include genetics, age, gender, and ethnicity (WHF, 2011b). Modifiable risk factors may be divided into primary and secondary risk factors, and include characteristics that may be altered and to some extent reflect individual choice. Primary risk factors for CVD include tobacco usage and exposure, unhealthy diets, overweight/obesity, physical inactivity, alcohol abuse, poverty, certain medications, chronic stress, depression, and anxiety. Primary risk factors are known contributors to the secondary risk

factors of hypertension, diabetes, and high levels of total cholesterol (or high levels LDL and low levels HDL). Having more than one risk factor greatly increases the risk of developing cardiovascular disease (WHF, 2011b).

Many studies have shown differences in levels of modifiable risk factors between populations. Guthold, Cowan, Autenrieth, Kann, and Riley found variations in levels of physical activity across schoolchildren in 34 countries, with children receiving sufficient levels of activity ranging from eight to thirty-eight percent (2010). Another study focused on physical activity in college students across four countries, with variations in physical activity linked to smoking and fruit and vegetable consumption within cultures (Seo, Torabi, Jiang, Fernandez-Rojas, & Park, 2009). Similarly, a study investigating alcohol and tobacco use among adolescents within 68 countries found large variations, with countries with higher alcohol use in adults having higher levels of alcohol and tobacco use in adolescents (Fuhr & Gmel, 2011). An additional study discussed predictors of obesity between two countries, and found that social and cultural factors were the biggest predictors of obesity, but education and eating habits also played a role (Font, Fabbri, & Gil, 2009). These studies demonstrate that differences in risk factors exist between countries, and are linked to population and lifestyle characteristics, which may influence efforts to combat cardiovascular disease.

There are many ways to address cardiovascular disease at a national level. Usually efforts fall into the categories of prevention or treatment and control. Governments may choose to focus on a specific area of cardiovascular health, such as primary or secondary risk factors or the disease itself. Governments may also choose to focus their efforts on at-risk groups or the population as a whole. To prevent cardiovascular disease, governments create policies and programs and engage in education and research. Non-governmental organizations are also very

active in preventing this disease. Many of their activities focus on research and education, such as establishing guidelines to help people understand healthy choices and behaviors.

Cardiovascular diseases, and other chronic diseases, have historically not been included in large, international health-related plans, such as the Millennium Development Goals. These are eight major goals that members of the United Nations have agreed to work towards by 2015. The goals focused on the health issues of communicable diseases, but goals for chronic diseases are noticeably absent, leading them to be often overlooked by organizations and policy makers (Fuster, Voute, Hunn, & Smith, 2007, and WHO, 2011c).

The World Health Organization (WHO) is a main contributor to combating cardiovascular disease on a national level. Their publication, the “2008-2013 Action Plan for the Global Strategy for the Prevention and Control of Noncommunicable Diseases,” is a landmark document in the fight against CVD (WHO, 2008). For purposes of this paper, this publication will be referred to as the WHO Action Plan. This plan was developed in response to the lack of WHO literature on chronic diseases. The WHO Action Plan fills a gap left in the Millennium Development Goals by providing objectives for preventing and controlling chronic diseases, including CVD, and the main primary risk factors of harmful alcohol use, unhealthy diets, tobacco use, and physical inactivity (WHO, 2008). This plan of action was created for WHO, its member states, and international organizations for the years 2008-2013. The six major objectives outlined in the WHO Action Plan are as follows:

1. “To raise the priority accorded to noncommunicable disease in development work at global and national levels, and to integrate prevention and control of such disease into policies across all government departments.
2. To establish and strengthen national policies and plans for the prevention and control of noncommunicable diseases.
3. To promote interventions to reduce the main shared modifiable risk factors for noncommunicable diseases: tobacco use, unhealthy diets, physical inactivity and harmful use of alcohol.

4. To promote research for the prevention and control of noncommunicable diseases.
5. To promote partnerships for the prevention and control of noncommunicable diseases.
6. To monitor noncommunicable disease and their determinants and evaluate progress at the national, regional, and global levels.” (WHO, 2008).

This action plan provides a framework for combating CVD on a global scale, and provides us with a comprehensive approach for analyzing countries’ risk factors and heart disease policies and practices.

Comparisons of the United States and Switzerland

Demographics

At first glance, the United States and Switzerland may seem to be very similar countries, as they are both post-industrialized, high income, developed countries with a Judeo-Christian background. However, when one examines demographic characteristics, some differences between the countries are important to note (See Table 2). The population of the United States is a substantially larger than Switzerland (CIA The World Factbook, 2011). In addition to differences in population size, the United States and Switzerland record ethnicity differently. In the United States, the majority of the population is identified as white/Caucasian as compared to Switzerland, which is identified specifically as of German descent. Minority groups in the United States include black/African American, Asian, American Indian/Alaska Native, Native Hawaiian/Pacific Islander, and mixed ethnicity, while French, Italian, and Romanash are the documented minority groups in Switzerland. These statistics indicate a more diverse ethnic population in the United States as compared to Switzerland. The poverty levels for these two countries also vary, with around 5% more Americans than Swiss citizens living below the

poverty line. These demographic characteristics are related to cardiovascular disease and its risk factors, and influence national plans and policies (CIA The World Factbook, 2011).

Table 2

Demographic Characteristics of the United States and Switzerland

	United States	Switzerland
Population (July 2010 est.) ¹	310,232,863	7,623,438
Life Expectancy at Birth (2010 est.) ¹	78.24 years	80.97 years
Median Age (2010 est.) ¹	36.8 years	41.3 years
Ethnic Groups ¹ (U.S. July 2007 estimate)	White 79.96%, Black 12.85%, Asian 4.43%, American Indian / Alaska Native 0.97%, Native Hawaiian / Pacific Islander 0.18%, two or more races 1.61%	German 65%, French 18%, Italian 10%, Romansch 1%, Other 6%
Population below poverty line ¹	12% (2004 est.)	7.4% (2009)
Unemployment rate (2010 est.) ¹	9.6%	3.9%
Health Expenditure per Capita (U.S. \$) ²	7,536	6,973

Note. The United States does not have a separate listing for Hispanic because the US Census Bureau considers Hispanic to mean Spanish/Hispanic/Latino people who may be of any race or ethnic group; about 15.1% is estimated to be Hispanic. ¹ CIA World Factbook (CIA The World Factbook, 2011). ² World Health Organization Global Health Observatory (WHO GHO, 2011d).

Social Determinants of Health

A WHO Commission on Social Determinants of Health stated that “Social injustice is killing people on a grand scale” (WHO Commission on Social Determinants of Health, 2008, p. 36). Although it is understood that social inequalities play a large role in determining a person’s or community’s health, they are still largely ignored when implementing national or international plans. Some of the many social determinants of health include socioeconomic status, education level, employment, health care, stress levels, and discrimination, (Unnatural Causes, 2008). It is necessary to examine social inequalities, as they impact not only rates of cardiovascular disease but also rates of major risk factors. Switzerland and the United States demonstrate differences in social factors, both between and within counties.

Income. Many studies have found a strong correlation between income level and health, with higher levels of income associated with higher levels of health, regardless of educational level or race/ethnicity (Unnatural Causes, 2008). Chronic disease prevalence is also strongly associated with income level. In the United States, those in the lowest income bracket are three times more likely to be diagnosed with a cardiovascular disease than those in the highest income bracket (RWJF Commission to Build a Healthier America, 2011). In general, the higher a community’s or country’s income, the better the health and life expectancy of its population. The relationships between income and health are disturbing, as the income gap between the richest and the poorest keeps increasing. Differences in income are evident between the United States and Switzerland, and may play a role in the prevalence of risk factors and methods of addressing them.

The United States demonstrates noticeable differences in income levels, regardless of other social factors such as race and education. The gini index, which indicates the level of

equality for income distribution within a country (higher = less equality), was 45 in the United States in 2007, on a scale from 0 to 100 (CIA The World Factbook, 2011). This is reflected in poverty statistics, with 13.5% of all Americans living below the poverty level. Poverty is even more noticeable for children, with 18.6% of people under the age of 18 living in poverty. Race also plays a role, with over a fourth of African Americans and Native Americans living below the poverty level (U.S. Census, 2011).

Switzerland also has disparities in income levels. In 2008, just under 4% of Swiss residents aged 20-59 were classified as “working-poor.” This percentage became much higher when looking at households, especially in single-parent households (9.4%) and households with over 2 children (11.3%) (Swiss Federal Statistical Office, 2011). In 2009, 7.4% of the Swiss population lived below the poverty line. Switzerland had a gini index of 33.7 in 2008, indicating a lower level of inequality income when compared to the United States (CIA The World Factbook, 2011). However, more inequality is evident when the income earned by Swiss men and women are examined separately, with more men falling in the highest income bracket than the lowest, and more women falling in the lowest income bracket and not the highest (Swiss Federal Statistical Office, 2011). These data indicate disparities in income in both the United States and Switzerland, but the income inequalities are much larger in the United States.

Employment. A person’s type and level of employment is another major social determinant of health. Health is affected by numerous work-related factors, including intensity/stress level, amount of control, workplace hazards, and levels of pay, health, and vacation benefits. It is also influenced by the inability to work due to unemployment (RWJF Commission to Build a Healthier America, 2011). The WHO Commission on Social

Determinants of Health has named it one of the nine main contributing social factors for health worldwide (WHO Commission on Social Determinants of Health, 2008).

Wages, benefits, and unemployment rates vary greatly from country to country. The United States and Switzerland differ greatly in current unemployment, with the US unemployment rate at 9.6% and the Switzerland unemployment rate at 3.9% in 2010 (CIA The World Factbook, 2011). Job benefits also differ greatly between Switzerland and the United States. For example, Swiss workers have a federally mandated 20 days of paid vacation time annually in addition to 9 unpaid holidays. Workers in the United States receive 10 unpaid holidays but no federally mandated vacation time, which leaves companies to decide how long people will have for vacation time and what they will be paid during it (CNBC, 2009). The United States federal minimum wage is set to \$7.25 per hour, however Switzerland has no federal minimum wage. Through bargaining, Swiss usually receive just under \$15.00 minimum wage, which ends up being comparable to the United States' minimum wage through taxes (U.S. Dept of Labor, n.d.). Some of these differences may be due to the large variation in the size of the labor force, as there are 153.9 million possible workers currently in the United States, but only 4.13 million in Switzerland (CIA The World Factbook, 2011).

Education. Major links have been shown between education level and status of health. Higher levels of education are associated with a greater health status and life expectancy (RWJF Commission to Build a Healthier America, 2011). In the United States, people with a college degree are expected to live five years longer than those without a high school diploma. Entire families are affected, as the children of college graduates are expected to live an additional six years than the children of high school dropouts, and are half as likely to die before their first birthday. The relationship between education and health may be observed regardless of race or

ethnicity. Educational level also is related to the prevalence of risk factors for chronic diseases. High school dropouts are four times as likely to be physically inactive, and three times as likely to smoke as college graduates. The WHO Commission on Social Determinants of Health does not list education as a social determinant, but recognizes it as a contributor to many other social determinants of health (WHO Commission on Social Determinants of Health, 2008).

Large gaps in education exist in both the United States and Switzerland. In some aspects, Switzerland and the United States are fairly similar. In both countries, 99% of the population was literate in 2003. Both governments spend around 5% of their gross national product (GDP), 5.5% of the United States' GDP and 5.3% of Switzerland's GDP in 2007 (CIA The World Factbook, 2011). In other aspects of education, such as the organization of the educational systems, there are large differences between the United States and Switzerland.

The United States and Switzerland organize their education systems differently. In the United States, compulsory education varies from state to state and is based on age rather than school year, with ages ranging from five to eight years old for starting school and 16 to 18 years for ending school. After completing their compulsory schooling, students have the option to attend a vocational school or two or four year college/university, and then go on for additional degrees if desired. In the United States, 15.5% of adults 25 or older have not graduated from high school, 29.3% have received a high school diploma, 20.3% have taken some tertiary education but have not received a degree, and 34.9% have received some type of higher education degree (associate, bachelors, graduate, professional) (U.S. Census, 2011).

The education system in Switzerland has a different structure than that of the United States. In Switzerland, kindergarten is viewed more like preschool in the states and the first nine years of school after that are compulsory. After completing those first nine years, students have

the option to go to a vocational school or high school similar to the upper levels of an American high school. Further education may include studies at a University. Switzerland has far fewer universities than the United States, and thus universities are much more competitive (Educa,ch, 2009). Out of Swiss residents ages 25-64, 13.1% have only completed compulsory education, 43.9% have completed a vocational high school, 8.0% have completed a general educational high school program, and 35.0% have completed some form of advanced university degree (Swiss Federal Statistical Office, 2011). The standard level of educational attainment is important for tailoring of health information campaigns, so citizens understand the message.

Health Care. Inequality in access and quality of health care are major factors that contribute to health disparities (U.S. Dept of Health and Human Services, 2003). Those with very limited or no health insurance receive very little care besides emergency situations, and even then care is limited. Therefore, people without health insurance are less likely to receive necessary preventative medicine like vaccines and more likely to be diagnosed with serious diseases in a late stage. When they do receive care, it is likely to be of lower quality and at hospitals and clinics that are understaffed and overcrowded. Those receiving health insurance from publicly-funded programs such as Medicare/Medicaid are also more likely to receive a lower level of access and quality for health care than those with private insurance. In countries where insurance is required, there are still problems with access to health care, especially for non-citizen residents and undocumented migrants (U.S. Dept of Health and Human Services, 2003). Discrepancies in health care are related to the availability of care and funding by insurance, and may lead to inequalities in social determinants of health (Gardner, 2009).

The United States' and Switzerland's health care systems display noticeable differences. Both governments spend just under 20% of their total budget on health care (KFF, 2011b).

However, the health expenditure per capita is over \$7000 in the United States as compared to just over \$4000 in Switzerland. Both the social security and out-of-pocket expenditures are much lower in the United States (25%) than in Switzerland (75%). The United States has a lower rate of doctors, nurses, and hospital beds per capita than, with about 10 fewer physicians and nurses and 25 fewer hospital beds per 10,000 people than the United States (KFF, 2011b).

Health insurance in the United States and Switzerland is also considerably different. In the United States, health care is privatized, with people buying health insurance individually or receiving it through their workplace. Many people cannot afford health insurance, and must pay out-of-pocket for health care; in 2009, over 50 million Americans were uninsured (Galewitz and Villegas, 2010). However, in 2010, the “Patient Protection and Affordable Care Act” was signed into law, with the intent to increase the number of people receiving health insurance and the services covered by health insurance (Stolberg & Pear, 2010). In Switzerland, everyone who is legally a resident must purchase health insurance (Rovner, 2008). Everyone pays the same for basic coverage, which insurance companies are not allowed to profit from, and it is subsidized for those making less than a certain amount. People may purchase additional insurance for other services not covered. People pay large deductibles, however, and costs keep rising at an alarming rate, making it difficult to afford health care even when it is mandatory (Rovner, 2008).

Lifestyles and Risk Factors-

In the fall of 2010, I studied abroad in Switzerland. While there, I noticed many differences in lifestyles of Swiss and Americans. Many of these lifestyle differences are related to the primary risk factors for cardiovascular disease. While these lifestyle differences are only

based on my experiences with my host family, their circle of extended family and friends, and people in public places, many of observations are supported by national statistics and policies.

Some of the main differences I observed regarded the risk factors of alcohol and tobacco use (See Table 3). In the United States, it often seems that alcohol is used as a way to get intoxicated. Many students in particular talk about their wild parties where they downed kegs of beer or bottles of hard liquor, but adults also drink heavily on occasion. These episodes of heavy drinking are episodic instead of a daily habit for the majority of Americans. Although the media glorifies heavy drinking and makes it seem normal, it is actually a small subset of the population, with 5.0% of all American adults classified as heavy drinkers (WHO Global Infobase, 2011). In fact, 22% of Americans abstain from alcohol entirely (WHO Global Infobase, 2011). Overall, American adults consume 8.5 liters/person/year (WHO GHO, 2011).

In Switzerland, drinking alcohol seems to be part of a social meal, rather than a way to party. In my host family, wine was an important aspect of nearly every dinner. It was viewed as a complement for all dishes, and the type of wine is decided according to the meal. Fifteen percent of all Swiss citizens drink alcohol on a daily basis (WHO Global Infobase, 2011). While on occasion much wine may be consumed, it is usually over the course of a long dinner and not everyday. As everywhere, there are people, especially students, who use alcohol to party and get drunk. However, this does not appear to be as ingrained into the Swiss society as it is in the United States. Because of the tradition of drinking wine daily, not as many Swiss people abstain from alcohol as Americans, with only 16% of adults abstaining (WHO Global Infobase, 2011). Annually, the Swiss adults consume more alcohol at 9.1 liters/person/year, then Americans at 8.5 liters/person/year (WHO GHO, 2011). Differences in amounts of alcohol intake may be related

to the drinking age, which is 21 years in the United States and 16 years for wine/beer and 18 years for hard liquor in Switzerland

Differences in tobacco use between the United States and Switzerland also appeared very noticeable (See Table 3). Smoking and tobacco use seem to be falling out of favor in the United States, as just under 20% of American adults currently smoke, while around 40% of Americans smoked 50 years ago (WHO Global Infobase, 2011). While many people smoke in the United States, people seem to be aware of other non-smokers around them. People usually do not smoke while waiting for buses or walking in-between buildings. Instead, people seem to be more likely to smoke on their own property or take short breaks from work to smoke in public outside of building entrances (WHO Global Infobase, 2011).

Swiss people seem to smoke much more than Americans, and seemed less aware of smoking around others. While my host family did not smoke, it appeared to be present in many other areas. People smoked all of the time while walking and waiting for trains and buses. People smoked in public areas so much it was difficult to get away from it while outside. Nearly 30% of all Swiss adults currently smoke tobacco (WHO Global Infobase, 2011). Smoking is banned in public transportation and enclosed public areas, but this seems to have little effect on the prevalence of smokers.

Table 3

Alcohol and Tobacco Consumption in the United States and Switzerland

	United States	Switzerland
Alcohol consumption among adults (≥ 15 years) (liters of pure alcohol per year) ⁵	8.5	9.1
Abstainer ¹	22.1	16.2
Males	14.8	9.9
Females	28.8	22.1
Daily drinker ²	N/A	15.4
Males	N/A	21.4
Females	N/A	9.8
Heavy drinker ³	5.0	N/A
Males	5.8	N/A
Females	4.1	N/A
Current smokers ⁴	19.8	29.0
Males	22.3	33.0
Females	17.4	24.0

Note. Source: WHO Global Infobase (WHO Global Infobase, 2011). ¹ Abstainer data are based on age 18+ years in the U.S (2002) and 20+ years in Switzerland (2007). ² Daily drinker data are available only for Switzerland and are based on age 20+ years (2007). ³ Heavy drinker data are available only for U.S. and are based on age 18+ years (2003). ⁴ Data are based on age 18+ years in the United States (2007) and ages 14-65 in Switzerland (2007). ⁵ Source: WHO Global Health Observatory (WHO GHO, 2011).

I also observed major differences in the way that exercise is integrated into Swiss and American society (See Table 4). In the United States, exercise is often an individualistic activity. Many of those who are motivated to exercise go running on their own or get memberships to

fitness centers, where they work out on machines while listening to music or watching television. Students engage in sports and physical activity in schools, but often do not exercise outside out these venues. During leisure time, the majority of American adults choose activities that do not involve activity, with 67% of adults inactive during their leisure hours (WHO Global Infobase, 2011). Physical activity does not appear to be ingrained into American society, with over half of Americans not exercising a sufficient amount (CDC, 2008).

Physical activity is ingrained into Swiss society. Exercise in Switzerland is not focused around fitness centers or school sports. In fact, there are very few fitness centers, and those that do exist are very expensive. Schools do not have sport teams. Instead, the Swiss seem to engage in much more outdoor and recreational team activities. Schools have designated vacations for ski trips. Hiking trails run from village to village, and are kept up, clearly marked, and well used. Students actively participate in competitive sports through venues outside of school. Adults become involved in sports too with many competitive recreational leagues. For example, in my host family, all three children were involved in sports, and the parents were part of a volleyball league that competed with teams up to an hour away. My host family and I would often go hiking in the mountains for a family activity, and daily they would be working outside in a garden or the woods. Everyone seems to enjoy and seek out physical activity. Only 36.8% of Swiss adults do not regularly engage in physical activity during their leisure time (WHO Global Infobase, 2011). This is significantly different from the 67% of Americans inactive during leisure time. As physical inactivity is broken down into age groups, these differences are even more noticeable, with a greater percentage of Americans aged 18-24 (57.5%) inactive during their leisure time than Swiss citizens aged 65-74 (47.2%) (WHO Global Infobase, 2011).

Table 4

Physical Activity in the United States and Switzerland

	United States ¹	Switzerland ²
Youth inactivity during leisure time ³	57.5	17.2
Males	51.6	13.5
Females	63.3	21.0
Adults inactivity during leisure time ⁴	67	36.8
Males	N/A	32.2
Females	N/A	41
Older adults inactivity during leisure time (age 65-74)	71.6	47.2
Males	67.8	38.6
Females	74.6	53.3
Oldest adults inactivity during leisure time (age 75+)	82.2	68.9
Males	77.0	58.8
Females	85.7	74.4

Note. Source: WHO Global Infobase (WHO Global Infobase, 2011). Data measures the percentages of people who did not engage in regular physical activity during their leisure time ¹ United States data are from 2003. ² Switzerland data are from 2002. ³ Youth data are based on age 18-24 years for United States and age 15-24 for Switzerland. ⁴ Adult data are based on age 18+ years for United States and age 15+ for Switzerland.

Transportation systems and infrastructure play a large role in the amount of exercise people obtain. Switzerland and the United States have different levels and types of infrastructure for transportation. In the United States, the amount of public transportation available differs greatly depending on the area. In city centers, there are many buses that come on a regular basis, but the farther one goes out, the fewer the routes and the more infrequent the stops. In the Twin

Cities metropolitan area, most people feel that it is necessary to have a car to get around in a reasonable time frame, so the majority of people who can afford a car have one rather than use public transportation. There are a few environmentally-conscious middle-upper class people that choose to take the bus, but most of the regular public transportation users are people without current means for a car. Not many students use public transportation on a regular basis, as school buses run separate, and buses are generally not viewed as entirely safe for children alone. However, for those that do use the bus system, it is relatively inexpensive. For example, in my city, bus fares range from \$1.75 to \$3.00 depending on the route and time of day.

Public transportation is very extensive and well-used in Switzerland. In Switzerland, there are trains that go nearly everywhere. For the small villages that are not on the rail lines, there are buses that provide connections to other villages and rail lines. Cities have many buses and trams to get around, and they run on a regular basis. Most students, even kindergarteners, ride the public transportation daily to school and home, as there are no separate school buses. Even with all of this public transportation available, many families own cars. This may be due in part to the high prices of public transportation outside of city centers. For example, to take the bus from my host family's village to the nearest town, a ticket would cost around \$4.50. Nevertheless, public transportation is well used, with buses and trains full during rush hours. People from all areas of society ride the public transportation, from businessmen to students to new Swiss residents.

Eating habits were also noticeably different between the Swiss and the Americans. Americans are known for eating their food fast. We eat in the car, in front of televisions, and in fast food joints. We are known around the world not for the quality of our food, but for the quantity of it. Huge industries revolve around meals that are quick and easy to make. In the

United States, the presence of fat in our food seems to have increased greatly over the past 20 years. In 1997, Americans consumed on average 138 grams of fat per day, but in 2007, Americans consumed 161 grams of fat per day (See Table 5) (FAO, 2010). This may be related to the high levels of overweight and obesity in Americans, at 67% and 33% respectively (See Table 6) (WHO Global Infobase, 2011). While my family eats together at home the majority of the time, it is often hurried as we prepare to go do homework or other evening activities. My family eats fairly healthy, compared to many American families, but also looks for meals that are quick and easy. We, like many other American families, enjoy eating together, but go ahead and eat if one person is going to be late or if we have things to do.

Eating habits in Switzerland seem almost opposite those in the United States. While my host family seemed to lead very busy lives and often didn't get home until after six, they always made an elaborate meal with fresh vegetables from their garden that usually took an hour to prepare. Even if someone cannot be home until late, everyone waits to eat until they get home. Meals were social times. They were usually unhurried, with everyone remaining at the dinner table for an hour. My host family would never think to eat on the run, in front of the television, or at a fast food place. While there is McDonalds in Switzerland, they are not very popular, and many of the menu items are healthier than in the United States.

Although fast food is not a big part of Swiss society, not all of Swiss meals are healthy. Many of their traditional meals include rich foods such as fondue and raclette, which are either bread or potatoes covered with a rich cheese. The Swiss consumption of fat has remained fairly constant over the past 20 years, at 148 grams per day in 1997 and 154 grams per day in 2007 (See Table 5) (FAO, 2010). When the Swiss eat rich, unhealthy foods, they appear to prefer fancier meals, while Americans seem to prefer hamburgers and fast food. With only 8% of Swiss

people obese and 37% overweight, it appears the Swiss diet and level of exercise is probably healthier than the American (See Table 6) (WHO Global Infobase, 2011).

Table 5

Nutrition in the United States and Switzerland

	United States	Switzerland
Dietary Fat Consumption (g/person/day) ²		
1990-1992	140	152
1995-1997	138	148
2000-2002	155	151
2005-2007	161	154
Children who eat at least one fruit a day, aged 15 ¹	N/A	N/A
Males	53.0	44.0
Females	58.0	59.0

Note. Source: ¹ WHO Global Infobase (WHO Global Infobase, 2011). United States and Switzerland data are from 1998. ² FOA. (FOA, 2010).

Table 6

Overweight/Obesity in the United States and Switzerland

	United States	Switzerland
People who are obese (BMI \geq 30) ¹	33.4	8.2
Males	32.4	8.7
Females	34.3	7.8
people who are overweight (BMI \geq 25) ¹	66.7	37.3
Males	72.1	46.3
Females	61.3	28.6

Note. Source: WHO Global Infobase (WHO Global Infobase, 2011). ¹ Data are based on age 20+ years for United States (2006) and age 15+ for Switzerland (2007).

Family time is given different levels of importance in the United States and Switzerland. While Americans value family time, I think it is often brushed aside due to busy, fast-paced lives with work, school, extracurricular activities, homework, and social activities. When people have time, they seem to choose hanging out with friends over family. Social interactions, in general, appear to revolve around technology much of the time. Many families, however, make an effort to eat together often, attend school or sport events of the children, and fit in short periods of family time into their busy lives.

Family time appears to be sacred in Switzerland. This is evident in the time spent together in outdoor activities and mealtimes. In my host family, every Sunday was set aside as a family day. Except for rare exceptions, they would get together with friends on Friday or Saturday, but all understood that Sunday was a day for spending time together. Everyone ate

dinner together, and those who had a longer lunch break, including children, came home for lunch. For activities, my host family would go on hikes and trips together, work together, and watch movies together. While my interactions with other Swiss families were limited, they also appeared to value family time. While technology doesn't appear to be as essential to the general Swiss population as the general American population, it is a huge aspect of the social interactions for the younger generation. There is concern among the older Swiss people that in the future their culture will move more towards technological interactions and away from the emphasis on family time.

Alcohol and tobacco use, low exercise levels, and unhealthy eating habits all are primary risk factors for cardiovascular disease that are identified in the WHO Action Plan. Transportation systems and family time also give insight for the major risk factors of physical inactivity and stress levels. The U.S. has less influence of smoking as a risk factor, but is challenged by a lifestyle that is in some ways is stressful and fast-paced and in other ways is too sedentary. Heavy drinking by some Americans also poses a risk for heart disease. On the other hand, Switzerland seems to have a healthier overall lifestyle with more exercise, a better pace, and healthier eating habits. However, heavy smoking is one of their major risk factors, and drinking levels are high even though it is more a part of meals. Levels of risk factors allow us to see cardiovascular trends in societies, and gain cultural competency essential for success in efforts to prevent cardiovascular disease in a population. Differences in lifestyles trends also emphasize that risk factors are not just an individual's choice, but a societal problem that needs to be addressed on a population level.

Governmental Policies and Programs

Governmental policies and programs are essential for understanding the health beliefs and priorities of a country, as they both influence and are influenced by national priorities. This is especially true when it comes to cardiovascular disease, because the risk factors for cardiovascular disease are well known but there are many different approaches to combating it. By examining a nation's policies/programs, it is possible to see which objectives of the WHO Action Plan are also priorities within a nation.

Both Switzerland and the United States federal governments have many policies and programs aimed at combating cardiovascular disease and its major risk factors. While both Switzerland and the United States federal governments have been working to prevent cardiovascular diseases, they have worked to end it in different ways. Under the United States Centers for Disease Control and Prevention, there are two separate sections, one related to diseases and conditions and another related to healthy living (CDC, 2011). Under the diseases and conditions, there is a lot of information about heart disease, but there are very few programs. The few programs that are listed are targeted for very specific populations. While primary risk factors are listed, the emphasis is placed on secondary risk factors of high cholesterol, blood pressure, and blood sugar (CDC, 2011).

In addition to its focus on disease, the United States also focuses on healthy living. Under the healthy living area, there is a great deal of information regarding the main risk factors of overweight/obesity, poor nutrition, physical inactivity, tobacco use, and alcohol abuse. However, cardiovascular disease is only briefly referred to in this section, emphasizing separateness between addressing diseases and addressing lifestyle issues. There is a plethora of programs and publications included in this area relating to nutrition, overweight/obesity, physical activity, and

tobacco use, such as BAM! Body and Mind and girlshealth.gov, with the majority directed at children and adolescents. These programs, however, are primarily just web-based programs using publications and interactive web sites to provide information, rather than programs using other forms of media and interacting directly with citizens in places like schools (CDC, 2011).

Switzerland has focused its programs on the risk factors of nutrition, physical activity, alcohol, and tobacco (Swiss FOPH, 2011). It has national plans and programs and a lot of information published on its Federal Office of Public Health website in all of these areas. However, it does not have any federal programs, mandates, or strategies on any illnesses or diseases, including cardiovascular disease (Pfisterer, Junker, & Bacchtold, 2008). They are in the process of expanding a federal law on prevention to make it more directed to the prevention of non-communicable diseases, but that still is a long way from being finished. However, in the areas of preventing overweight/obesity, poor nutrition, physical inactivity, tobacco use, and alcohol abuse, Switzerland has a large public health infrastructure. Switzerland has put into place many programs for many different segments of society. Many of them focus primarily on children and adolescents, but some are also directed at adults. The programs are located in schools, recreational facilities, and companies, as well as through advertising, media, and online resources. These programs focus on making it easier for people to live healthy lives by providing greater access to healthy products and activities, decreasing the accessibility to unhealthy products, and helping people engaged in unhealthy behaviors become healthy. An example of a program is Bike2School, which organizes groups of students to bike to school together and provides routes and rewards for the students that choose to bike (Swiss FOPH, 2011).

Implications

Health Beliefs: Individual Choices and Culture

There is evidence of differences in risk factor rates, disease rates, and lifestyle between the United States and Switzerland. Rates of risk factors and disease in both countries mirror their lifestyles and cultures.

The lifestyle of the US appears to be very different from that of Switzerland. Americans in general live more sedentary, stressful, and fast-paced lifestyles. Physical activity is not ingrained into our society. People usually hurry from one activity to the next, which decreases their ability to spend time with families or engage in healthy behaviors like exercising or making healthy meals. A small subset of people engage in heavy or binge drinking as a way to escape from stress, but this is offset by a fairly large number who don't drink at all. Although Americans have a fast-paced stressful lifestyle, smoking and tobacco use do not seem to be a popular activity. Overall, healthy living does not seem to be embedded into American life.

The Swiss lifestyle does not seem to follow the trends in the American lifestyle. Although Swiss people seem just as busy as Americans, their lives do not appear to be as fast-paced or stressful. More people drink alcohol, and more alcohol is consumed annually, but it is consumed on a more gradual basis than in the United States. Swiss residents engage in an active lifestyle, with an emphasis in eating healthily and spending time together. A major exception to this is found in tobacco use. Smoking is more used and acceptable in Swiss society than it is in the United States.

While people in the United States or Switzerland have made individual lifestyle choices, those choices are greatly influenced by supports in their culture and environment. One source of

support for lifestyle is the infrastructure. For example, the availability of public transportation influences the likelihood of people using public transit. When people take public transit, they often walk farther to their bus stop or train station than they would to their car. Thus, a strong public transportation infrastructure supports people engaging in exercise.

Social norms also have an influence on lifestyles. If an activity is not socially acceptable, members of that culture are less likely to participate in that activity. For example, in a society where smoking is frowned upon, less people are likely to start smoking and more people will be interested in quitting. Thus, the social norm of not smoking provides support for people making the lifestyle choice to not smoke.

National policies also support people's lifestyle choices. If a national health-related policy prohibits an activity in certain areas or times, that activity is likely less socially acceptable under prohibited conditions, and not engaging in that prohibited activity is supported. Going back to the example of tobacco use, many countries have created policies limiting the age of tobacco users and the places it may be used (such as schools and public areas). When smoking is restricted in certain locations, people do not have as many opportunities to smoke as it is an inconvenience to travel elsewhere where smoking is allowed. Thus people are supported by governmental policy when they choose not to smoke.

Infrastructure, social norms, and policies all influence people's individual lifestyle choices. This has large implications concerning efforts to have populations make different health-related choices. To successfully support individuals in making lifestyle changes, the infrastructure, social norms, and policies must support the desired lifestyle change.

National Priorities: Similarities and Differences between the United States and Switzerland

The national priorities of a country may be indicated by its policies, programs, and educational/informative resources for the general public. Based on their governmental plan, the United States and Switzerland have very different priorities when it comes to cardiovascular health.

The United States has two “separate but equal” educational focuses in cardiovascular health. One focus is cardiovascular disease, while another is living healthily. This may be evidenced by the division of educational resources and programs into healthy living and diseases and conditions sections. Healthy living includes behaviors and trends such as overweight/obesity and physical activity that may be classified as primary risk factors. The disease and conditions section includes information on diseases and their causes, which are listed principally as the secondary risk factors. Although there is some overlap in the sections these are not emphasized. Based on the organization, size, and detail of these two sections, it appears that the United States views health behaviors and diseases as equally important to address, but as separate entities. As they are viewed as separate entities, not much focus is prevention programs for the primary risk factors as a way to prevent disease. This may be due to healthy living behaviors being viewed as individual choices that the government should not interfere in (Van Dam & Willett, 2009).

Provision of information, and education of the public on health issues are health priorities for the United States. A great deal of information is provided about cardiovascular-related issues through websites and publications. The sheer amount of CVD information emphasizes the U.S. priority of education. Governmental policies and programs also provide evidence for the priority of education on health issues. The majority of the United States’ programs are internet-based rather than part of society. This means that most of them focus on educating the intended

audience rather than having them actively participate in healthy behaviors. Many policies also center on education. For example, the policy requiring nutrition labels on foods results in the general public gaining knowledge about what they eat.

Issues related to cardiovascular disease are health priorities in Switzerland as they are in the United States, but have different forms. Switzerland's health priorities are healthy behaviors and primary risk factors rather than cardiovascular disease. Like the United States, this is evident in the governmental policies, programs, and educational resources. On the Swiss health website, there is little mention of cardiovascular disease itself, but a large amount of information pertaining to the primary risk factors of cardiovascular disease. Similarly, nearly all programs deal with health behaviors rather than disease.

While the United States focuses on informing and educating the public, Switzerland focuses on community engagement of Swiss residents. Switzerland's programs are located in schools, recreational facilities, and workplaces. As these locations are frequented by many members of society, many people have opportunities to become involved in programs that promote healthy behaviors like exercising and eating balanced meals. As programs also utilize advertising and media, they reach out and attract the attention of Swiss residents, thus engaging the Swiss population in information rather than waiting until they find it themselves through websites. Switzerland's governmental approach to addressing heart disease might be described as community engagement. Although education is a component of this approach, there is more emphasis on developing specific community strategies that result in healthy behaviors and lifestyles.

The differences in health priorities between the United States and Switzerland have huge implications in attempting to decrease the rates of cardiovascular disease. Plans that involve the

spread of information with an emphasis on both health behaviors and disease will fit more easily into the United States health system, while plans for engaging populations in health behaviors as compared to informing them will mesh more easily in Switzerland's health system. The effectiveness of concentrating on these health priorities rather than others has yet to be determined. The effectiveness of these different health priorities, risk factors and disease vs. risk factors and education vs. engagement, may influence future rates of cardiovascular disease in the United States and Switzerland.

Challenges and Opportunities of the WHO Action Plan

There are many challenges that stem from the WHO Action Plan. The WHO Action Plan is designed for all countries, regardless of size, demographics, social factors, health beliefs, or governmental priorities. These factors may make it difficult to reach the objectives laid out in the WHO Action Plan. While countries may find some objectives easy to attain, they may discover difficulties in reaching other objectives due to health beliefs and priorities. For example, Switzerland already seems to be promoting interventions that reduce risk factors (Objective Three) through their engaging programs. As the United States has a health priority of education, rather than engagement, they may find it difficult to create programs that actively engage people outside of websites. On the other hand, the United States has existing plans for CVD (Objective Two), which reflects their health priorities of both disease and healthy behaviors. As Switzerland's health priority is only on risk factors, they may have difficulty in creating a national plan for cardiovascular disease.

Although there are many challenges, there are also many opportunities that stem from the WHO Action Plan. This plan provides an outline for combating cardiovascular disease on a large

scale, helping countries understand what they should be doing for CVD prevention and control. By laying out clear objectives and a plan for achieving those objectives, the WHO Action Plan allows countries an opportunity to self-examine their efforts and make changes as needed. The collection of data relating to cardiovascular disease and its risk factors may be improved at both national and global levels due to the need to evaluate progress towards the plan's objectives. This WHO Action Plan also helps countries examine other countries' plans and learn from their efforts.

The challenges and opportunities stemming from the WHO Action Plan have implications on how cardiovascular disease is addressed in the United States and Switzerland. Based on demographics and social determinants of health, it appears that more variation exists in the United States as compared to Switzerland. This may make it more difficult in the United States than Switzerland to achieve results from the implementation of the WHO Action Plan. As there are challenges in applying one plan to different countries with varying health beliefs and priorities, there are also challenges in implementing one set of policies, programs, and interventions to a country's population when much variety is present. Also, if behaviors are firmly entrenched into a society, it also will be difficult to achieve results from the implementation of the WHO Action Plan. As the health behaviors of Swiss citizens seem to be found in so many areas of their lives, they are likely strongly embedded into their culture. This may make it difficult to find interventions and plans that are effective in changing unhealthy behaviors, such as smoking. Country efforts on this disease must be tailored to meet the country's unique social factors and health beliefs.

While the WHO Action Plan might appear to be over-reaching in its health objectives for chronic diseases across diverse nations, it is important to remember that health-related behaviors

have successfully been maintained or changed within diverse nations. A decrease in tobacco use over the past half century in the United States is an example of how health-related behaviors can be changed in a diverse population. In the 1950's and 1960's, the prevalence of smokers was about double what it is now. This was accomplished through governmental laws, programs, and policies, and a shift in the acceptableness of smoking. Anti-smoking advocacy in schools, hospitals, communities, and families was responsible for the cultural shift in smoking acceptance and reduction of tobacco use (Gardner, 2009). Societies may decrease the prevalence of other risk factors by examining aspects responsible for the reduction of smoking in the United States overtime.

An example of the maintenance of a healthy behavior is seen in exercise and physical activity in Switzerland. In Switzerland, the average amount of physical activity in the population has remained relatively unchanged over the past several decades. This is notable, as increases in technologies have led to dramatic increases of inactivity in many societies. While many Swiss people still do not get enough physical activity and there is still much room for improvement, the Swiss society has managed to prevent a decrease in physical activity as seen in the United States. The maintaining of levels of physical activity is due to multiple factors. Through all of these factors, physical activity seems ingrained in the Swiss culture. If countries can get a healthy behavior embedded as part of their culture through integrating it into multiple areas, they will have greater success in maintaining that healthy behavior overtime (Van Dam & Willett, 2009).

The unique factors of countries raise an important question: Does it matter if countries use different strategies to achieve the larger objectives of the WHO Action Plan? I would argue that it does not, as long as the larger objectives of the plan are met and the strategies used by a country are effective. Standardized statistics and an overall plan like the WHO Action Plan are

essential for determining the effectiveness of country strategies, however. The objectives of the WHO Action Plan are reasonable as they remain broad, although specific ways to achieve these objectives are laid out. The more specific a plan is, the less relevant it will be with social factors and health beliefs of a population, decreasing the plan's value in application. The WHO Action Plan is valuable for addressing cardiovascular disease because the causes of cardiovascular disease are well known. When countries agree on the main causes of a disease, it is possible to create objectives and a plan that countries can work towards.

Cardiovascular Health: A National and Global Imperative

So, again, why does this matter? Cardiovascular disease and prevention and control efforts have large implications for individuals, families, and countries in terms of the population demographics, costs and stressors on services, relationships to other health problems, anticipated increases of problems worldwide, and the inability to measure progress.

Cardiovascular disease levels may be expected to increase in the United States and Switzerland, regardless of health behaviors, because of their aging populations. CVD affects people more as they grow older because age is a non-modifiable risk factor and CVD is a natural cause of death for an elderly person. The United States and Switzerland have aging populations, meaning the population is shifting to a larger number of older people than children or younger adults. In the U.S., a large baby boomer population (people born between 1946 and 1964) exists, and the first members of this population will be reaching retirement age this year. The next 15 years should see a large influx of retirees, indicating a larger number of people with cardiovascular disease and other health problems. In addition to an aging population, people are developing the risk factors for cardiovascular diseases at younger ages, indicating an increase of

cardiovascular diseases at younger ages. Switzerland faces similar problems, as they already have a higher median age of the population and longer life expectancy than in the United States. These changes in the demographics and CVD levels of the United States and Switzerland are placing a huge amount are straining the resources of health systems.

Increases in cardiovascular disease increase the costs of health care and decrease the family savings and the amount of money available for social security, services, and programs. In the U.S., CVD may wipe out an entire family's savings or put them in debt in years if they do not have adequate health insurance. When families are not able to pay for emergency services, hospitals have to take the costs on themselves, leading to increases in costs for other services. Insurance companies have to keep raising rates to keep up with the rising costs of health care, in large part from cardiovascular disease. These large increases in health care costs lead to people using less preventative health services like yearly checkups, which means that diseases are caught later and at higher costs. In Switzerland, health insurance is mandatory, but the costs of health care keep rising due to increasing rates of cardiovascular and other diseases. Health insurance costs keep rising, impacting both families and the government, as health insurance is subsidized for low income residents. Even with mandatory health insurance, people may still not receive preventative care, as they cannot afford the rising deductible costs in addition to the rising costs of insurance. As cardiovascular diseases disproportionally affect those living in poverty, the budgets for social services such as social security and governmental health subsidizes are stretched thinner as CVD increases.

Cardiovascular disease and its risk factors cost a lot of money to address. In 2007, cardiovascular disease was estimated to cost 286.6 billion dollars in the United States alone in terms of direct medical costs and lost workplace productivity from early death, more than any

other disease group including all cancers (Lloyd-Jones et al., 2010). This accounted for 15% of total health care spending in 2007, and did not include the medical costs of its primary and secondary risk factors or other diseases with the same risk factors. To put this in perspective, 286.6 billion dollars could eliminate the deficit in all 50 states twice. It also could pay for the entire yearly budget of the federal departments of veteran affairs (52.5 billion), transportation (72.5 billion), education (46.7 billion), homeland security (42.7 billion), and energy (26.3 billion). If we could save the 286.6 billion dollars that is lost due to cardiovascular disease, we could pay more than 11 years of all Pell grants for higher education at the existing rate (23 billion per year), or increase the yearly funding for Pell grants by over ten-fold. Some may say this is not realistic, as cardiovascular disease is natural cause of death for the elderly. However, out of the cost of 286.6 billion dollars, only 109 billion dollars was due to CVD in those 65 or older. This means that if we could just eliminate the costs related to cardiovascular disease in those less than 65 years, we would still save enough money to eliminate the state deficit and pay two years of Pell grants (Lloyd-Jones et al., 2010).

While there are many efforts to combat cardiovascular disease, discrepancies in data collection make it difficult to know whether progress is being made. The types of data collected, the method of collection, and how often it is collected is not standardized on a national or international scale. Varying definitions of CVDs and their risk factors makes accurate comparisons of data and overall trends difficult. For instance, “heart disease” is often used to mean cardiovascular disease, but may mean ischemic heart disease in other sources, greatly changing the statistics for the prevalence of heart disease. Often, there are no data available for areas we are trying to make progress on. These factors make accurately measuring progress in CVD prevention and the effectiveness of our programs and policies difficult. There is no reason

to continue pouring money into ineffective programs, but without standardization, we don't know whether our efforts have an impact in what they are trying to address.

Cardiovascular disease is an increasing problem because its rates are anticipated to increase in countries globally in high, middle, and low income countries. As levels of cardiovascular disease increase, lower income countries will not be able to focus on development in education, sanitation, housing, their economy, or other areas, forcing them to rely on outside aid in these major development areas. As lower income countries must depend more on outside assistance so they can deal with a growing prevalence of CVD, they are less able to contribute to and benefit from the global economy. Therefore, developing countries are left with less economic opportunities, and a greater necessity for countries like the United States to spend money on global assistance that they could be spending on our own CVD problems.

Although cardiovascular disease is acknowledged as a major problem and the risk factors for CVD are widely known, it remains a hidden epidemic. Communicable diseases, including HIV/AIDS, malaria, and influenza, get much more national and international attention than cardiovascular diseases, even though they only cause a fraction of the deaths. Again, people are quick to acknowledge that HIV/AIDS has reached epidemic proportions worldwide, but if you talked about the global epidemic of cardiovascular disease, many people would just say "huh?". Money is poured into addressing under-nutrition and lack of water, but people affected by these issues are also greatly affected by cardiovascular disease. Even in a high income country like the United States, it seems more common to hear about fundraising walks for cancers than cardiovascular disease, although cardiovascular disease affect more people than all cancers combined.

Cardiovascular disease may not receive the attention it deserves due to its perception in society and the media. Perhaps CVDs are not a popular issue because they are not “sexy,” and are viewed as the fault of an individual. Many people associate cardiovascular disease with overweight or elderly people. Movie stars, on the other hand, are diagnosed with cancer when they are seemingly in great physical shape and healthy. When someone is diagnosed with a cardiovascular disease, people often ask “What changes does your doctor recommend you make?” This innocent question identifies cardiovascular disease as the fault of the individual because of their lifestyle choices. If a disease is someone’s fault, rather than based on a number of socially-related factors, it doesn’t make sense to raise money for a cure or talk about it. While cancers affect more elderly than young people, there also seems to be a fair number of people who are diagnosed with cancer while they are physically healthy. This suggests that cancers are not the fault of an individual, and should be addressed and funded on a national level. Because cardiovascular is a hidden epidemic, it is not on the daily radar of even well-educated individuals as much as HIV/AIDS or cancers.

Summary

Cardiovascular disease is a complex issue with a wide variety of contributing factors, including modifiable and non-modifiable risk factors, social determinants of health, and health beliefs and priorities. Cardiovascular disease and these contributing factors vary from country to country, and thus countries view health and disease differently. A plan for addressing CVD must either account for all of these factors, or be broad enough that various factors may be addressed in implementation of the plan. The WHO Action Plan is valuable as an outline for combating

CVD and as a way for countries to examine their efforts. There are challenges in its application at the country level, as countries may place higher values on some of the objectives than others based on their health beliefs. Countries may also find it difficult to create a national plan on cardiovascular disease due to unique social factors and demographics. The WHO Action Plan also provides opportunities for an evaluation of country efforts, leading greater efforts in areas where a country is lacking. It may be helpful to view the objectives of the WHO Action Plan as an ideal that countries strive towards. The success of the WHO Action Plan at national levels depends on the ability of its related ideas to become ingrained into culture. Successes in areas such as tobacco reduction in the United States and exercise in Switzerland were dependent on a change or maintenance of country priorities. Lessons may be learned from these examples for the successful integration of the WHO Action Plan into countries with different situations, beliefs, and priorities.

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Appendix

Other Definitions for Cardiovascular Disease

Cerebrovascular disease relates to buildup or blockage of blood vessels in the brain, and it is sometimes classified as separate from other cardiovascular diseases. Rheumatic heart disease is associated with rheumatic fever, and involves scarring and weakening to the heart valves and muscle. Inflammatory heart disease is an inflammation of a specific section of the heart like the lining, sac, or muscle, and usually results from an infection..(WHF, Different Heart Diseases 2010).

Methods

A number of different types and sources of information were used for this research. Data on lifestyles came from two primary types of sources. Information about governmental policies and programs are based on information on governmental websites and documents. Statistics regarding cardiovascular disease, risk factors, demographics, and social determinants of health came from the World Health Organization website as well as governmental and non-governmental websites. Observations of Swiss lifestyle and culture were completed during a study abroad experience in Fall, 2010. These observations were based on experiences with my host family, their circle of extended family and friends, and people in public locations.

Measures

WHO Global Health Infobase. The WHO Global Health Infobase is a database of indicators related to chronic diseases and their risk factors as well as general health information

(WHO Global Infobase, 2011c). It contains data collected by the World Health Organization from all of the member states. It focuses on the risk factors of chronic diseases to allow predictions of future morbidity and mortality rates and interventions. As data measurements come from each individual country, the WHO Global Health Infobase ensures that all data can be linked to its original survey. There are varying ways to view the data, including noncommunicable disease indicators, international comparisons, mortalities, and country profiles. This site was used to obtain statistics regarding risk factors and cardiovascular disease in the United States, Switzerland, and the world (WHO Global Infobase, 2011c).

WHO Global Health Observatory. This database is the main source of statistics in the World Health Organization (WHO GHO, 2011d). Its data are organized into health priorities. These global health priorities or themes include trends and core indicators from publications, databases, and websites. The health priorities currently included in this database relate to risk factors (alcohol, tobacco control, child nutrition, road safety, and water and sanitation), health (child health, maternal and reproductive health, women and health, medicines), and diseases (cholera, HIV/AIDS, mortality and the global burden of disease). The data in WHO Global Health Observatory are from the WHO Indicator and Measurement Registry, the WHO central resource of all health-related data, including definitions and sources for data and procedures for estimations of future health situations. This insures that data and definitions are consistent and accessible. This data source was useful in obtaining information about alcohol and tobacco use, general characteristics, and mortality and morbidity rates (WHO GHO, 2011d).

CIA World Fact Book. The CIA World Factbook is a data base of information for all countries (CIA The World Factbook, 2011). Information found in country profiles and cross-country comparisons focuses on economy, communications, people, government, geography,

transportation, history, military, and transnational problems. This site is updated weekly. The economy and people sections were used in this paper for information regarding demographics and social determinants of health (CIA The World Factbook, 2011).

Kaiser Family Foundation. The Kaiser Family Foundation is a non-profit non-governmental health organization that focuses on policy, communication, and research in the United States, but also includes global information (KFF, 2011). Their statistical section holds national and international data and provides information about demographics, social determinants of health, and policy for all countries. Data comes from their own research in the United States as well as data from other sources such as the World Health Organization. This source was used for data on basic demographics, policy, and social structures for the United States, Switzerland, and the world (KFF, 2011).

Limitations

This study has several limitations. A major limitation of this study is that much of the Swiss information needed to be translated to English, and so may not be 100% accurate. The United States and Switzerland may also define measures differently, and thus the statistics given may not accurately represent the actual situation. Observations of Swiss and American culture are only based on one person's observations, in one area of the country, and may not be representative of the entire country.