

INEQUALITIES IN GLOBAL HEALTH:
A WORLD-SYSTEM ANALYSIS, 1945-PRESENT

by

ANNA L. COLLINS

B.S.N., Ft. Hays State University, 1994
M.S.N., Ft. Hays State University, 2001

AN ABSTRACT OF A DISSERTATION

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Abstract

World-system theorist Immanuel Wallerstein made two theoretical assertions in *Historical Capitalism* that (a) significant inequalities in the “margin of safety against...endemic dangers and erratic violence” for people in different zones of the world economy persisted over long periods of time and (b) that the “margin of safety” for people in the periphery has actually deteriorated. This study set out to test this theory by examining mortality data for countries in different zones of the world-economy. It identified a set of health-related proxies for “endemic dangers and erratic violence”, infectious diseases (malaria, polio, tuberculosis, and influenza), chronic diseases (cancer, diabetes, and cardiovascular), erratic violence (homicide, suicide, and motor vehicle accidents), and also infant mortality and life expectancy for women and men. It gathered data from the United Nations Statistical Division’s *Demographic Yearbook* for a select sample of countries in different zones of the world-economy (core, semiperiphery, and periphery) from 1950 to 2010, and examined how mortality from these dangers changed during this period.

This study found that mortality data for infectious diseases did not provide much support for Wallerstein’s theoretical assertions. But the mortality data for chronic disease and erratic violence provided strong support for Wallerstein’s assertions. The data on life span provided some support for Wallerstein’s first assertion, but not for his second. Overall, the findings generally support Wallerstein’s theories and suggest ways that health-related inequalities might be addressed.

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Approved by:

Major Professor
Dr. Robert Schaeffer

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DEDICATION

This work is dedicated to my family. It is through their love and support that I accomplished what I never dreamed that I would. I want to give special thanks to my husband, who encouraged each step I took and stood by my side through it all. A thank you must be extended to my mom, who tirelessly took over many tasks, so I might have the time to complete this work. I can't forget my dad, who gave me the confidence to set my aim high and the courage to try to reach my goal. Most of all, I would like to dedicate this to my three children, Shane, Becki, and Brett. You are my inspiration for all I do in life. Also, for my grandchildren, never forget that if you set your mind to it, you can accomplish all that your heart desires. I love you all.

CHAPTER 1 - Introduction

In 2010, it was estimated that 9.2 million children under the age of five died due to preventable causes related to inequalities in health care delivery. This equates to 26,000 per day or 18 deaths per minute (Global Health Council, 2010). Although we have seen an overall increase in the global life expectancy rate and a decline in the number of deaths due to communicable diseases such as polio and malaria, disparities still exist between affluent core countries and poor, peripheral countries that do not possess the complex infrastructural systems necessary to support health initiatives. Health care inequalities result in needless suffering and are a result of unequal and unfair social conditions. Social conditions are the result of policies in a world-system that today pulls money, power, and resources from peripheral countries and directs them to core countries. Delayed development and unsustainable initiatives are the consequences of a global system that is driven by unrestrained capitalism and results in dramatic differences in mortality statistics between core, semiperipheral, and peripheral countries.

Statement of the Question

In *Historical Capitalism with Capitalist Civilization*, Immanuel Wallerstein argued that the capitalist world system, which first emerged during the long sixteenth century (1450-1650), created a global division of labor that provided vast economic benefits to people living in "core" states, some benefits to people living in "semiperipheral" countries, and few, if any benefits to the vast majority of people living in "peripheral" countries (Wallerstein, 1995; Wallerstein, 1974). Although capitalism subsequently expanded and developed during the next 500 years, this global structure of economic inequality remained intact, and the gap between core and periphery was not eliminated. As a result, Wallerstein (1995) called into question the

assumption that capitalism "represented progress over the various previous systems that it destroyed or transformed" (p. 98), and noted that many of the economic indicators used to measure progress were "one-sided." While the proponents of progress have argued that capitalism "has brought a massive increase in the margin of safety against hurt and death from endemic dangers (the Four Horsemen of the Apocalypse) and against erratic violence" (Wallerstein, 1995, p.100), Wallerstein (1995) challenged this assertion and asked, "Has this really been true...?" (p. 100).

This thesis sets out to test Wallerstein's (1995) two assertions that (a) significant inequalities in the "margin of safety against...endemic dangers and against erratic violence" (p. 100) for people in different zones of the world have persisted, despite the availability of technologies/treatments/practices that might provide greater margins of safety and (b) the conditions of people in the periphery have not improved, relative to the core, but gotten worse than the "margin of safety" for people in the periphery and has deteriorated.

To do this, I first identified a set of indicators that might serve as a proxy for "endemic dangers" (i.e., the Four Horsemen of the Apocalypse). This study examined infectious diseases (malaria, polio, tuberculosis, and influenza), chronic diseases (cancer, diabetes, and cardiovascular), erratic violence (homicide, suicide, and motor vehicle accidents), and also infant mortality and life expectancy as proxies for the Four Horsemen.

Second, so that inequalities between different zones might be examined, I identified a group of countries representing the core, the periphery, and the semiperiphery which were drawn from a study by world-system scholars who studied global economic stratification and inequality (Arrighi & Drangel, 1986).

Third, I identified a World Health Organization data set that provided mortality data for all of these countries from 1950 to 2010, to see what changes might have occurred. The idea was to examine mortality data for different diseases in different countries over a long period of time, to determine whether the margin of safety had changed for people living in different regions, and to see whether Wallerstein's theoretical assertions were true. If capitalism had developed technologies and treatments that increased the margin of safety, and the market effectively delivered these goods to people around the world, one might expect that the gap between core and periphery would close and disappear after a 60-year period. If it did, modernizationists might plausibly claim that capitalist development had increased the "margin of safety" and promoted "progress" (as defined by Wallerstein [Wallerstein, 1995].) But if significant inequalities remained, or if the margin of safety had fallen for people in the periphery, then Wallerstein's assertions that capitalist development had not increased the margins of safety for all, but only for some, and that it likely reduced margins of safety for others, might be validated.

There are several reasons why this study adopted this strategy. First, although Wallerstein urged scholars to examine health-related measures of "progress," world-system scholars have not yet done so. Given my training in the medical profession and my interest in public health and issues of inequality, I decided to answer his challenge and test his assertions as best as I could. Second, the availability of detailed and reliable mortality data for many diseases in many countries around the world, in all three zones of the world-economy and during the post-war period, made it possible to conduct the kind of comparative, longitudinal historical analysis that might answer these questions.

Purpose of the Study

The purpose of this study was to compare mortality rates and lifespan data between countries to determine whether differences exist between core, semiperipheral, and peripheral countries. As stated by Wallerstein (1983), there is evidence at the micro level of the presence of the apocalyptic Four Horsemen—war, famine, pestilence, and death—but not at the macro level. This study identified the presence of the Four Horsemen at the macro level. Also, the findings among countries will determine that there is evidence of inequalities in mortality and lifespan data. Additionally, the study will provide a description of what the inequalities look like and support Wallerstein's world-system theory.

This study examined how the global unequal distribution of money, power, and resources around the world affects health outcomes in peripheral, semiperipheral, and core countries. Additionally, this study was a longitudinal analysis, World War II to the present, of mortality and lifespan data of selected core, semiperipheral, and peripheral countries. The findings will provide evidence about disease, injury, and lifespan in different countries and regions. In the past, scholars have analyzed changing economic relations such as Gross Domestic Product (GDP) between core, semiperipheral, and peripheral states, but not mortality and lifespan data. New information was provided on the relationship between core, semiperipheral, and peripheral countries on mortality and lifespan data. This study also provided support for Wallerstein's world-system theory.

Theoretical Framework

Immanuel Wallerstein's world-system theory provided the guiding framework for this study. World-system theory uses a historical approach to current global issues. According to Wallerstein (1983), the historical aspect of the relationship between core and peripheral countries

affects the present and future distribution and use of resources. Wallerstein's world-system theory approach is based on the premise that the core obtains money, power, and resources from the periphery. Over time, economic development benefits the core and adversely affects the periphery. World-system analysts describe core countries as those with well-developed, industrialized, and complex commercial systems while the periphery consists of countries that typically produce raw materials and export their products to core countries. Arrighi and Drangel (1986) concurred, and asserted that the core controls a larger share of the surplus produced along the commodity chain than the periphery which has little control over wealth generated by commodity production. The core and periphery are not separate entities, but are joined in a global division of labor, which assigns dominant roles to producers in core areas and subordinate roles to producers in the periphery and are relational in nature (Wallerstein, 2005). According to Wallerstein (2005), the world system is defined as a single economic unit, with a single division of labor, but a system with multiple political units or "states."

This study included analysis from World War II to the present. After World War II, many scholars and funding sources argued that poor, post-colonial states could "develop" if they adopted the policies and practices of rich, developed countries such as the United States and other Western countries (Wallerstein, 2005). But Wallerstein (1983) argued that this idea was mistaken. Although he agreed that historical capitalism brought a massive increase in the margin of human safety against hurt, death, and erratic violence, he maintained that the gap between core and peripheral countries has grown over time and he called into question the deeply held belief in progress. Wallerstein (1983) states, "It is simply not true that capitalism as a historical system has represented progress over the various previous historical systems that it destroyed or transformed" (p. 98). Additionally, Wallerstein (1983) contended that a superficial glance or

examination at the micro level may give the appearance that capitalism has brought universal improvements to the standard of living; however, this may not be the reality for all. Wallerstein (1983) has argued that people in peripheral countries have fared much worse than those in core countries and the gap has grown between core and periphery in terms of health outcomes.

Limitations and Delimitations of the Study

Limitations of the study are the periodic gaps in the data for peripheral countries. However, the fact that the data was absent for peripheral countries and obtainable for core countries is indicative of inequalities that exist between zones. Core countries have the money, power, and resources to provide an organized infrastructure that is capable of collecting accurate data. Economic, political, and social stability provide a community setting where data can be gathered, stored, and analyzed. Peripheral countries that do not have the money to train and pay skilled workers to gather, store, and analyze the data will have limited information available. During times of political and social unrest, power from within the country may be diverted for other interests. Resources of personnel and equipment may also be used for purposes other than collecting, storing, and analyzing data. The reliability and accuracy of the data depends upon the country and their data-gathering methods.

It is for this reason that this study used data from the United Nations Statistics Division. The United Nations Statistics Division (UNSD) provides data from member countries on a yearly basis. This information is found in their Demographic Yearbook, which is more reliable and consistent than data from other sources. The use of mortality data on "cause of death" from the UNSD Demographic Yearbook along with Lifespan from Birth was used as the source. Data was collected from the UNSD Demographic Yearbook in five-year increments from 1950 through 2010. Although, some countries do not gather data yearly, the most recent count was

recorded in the UNSD Demographic Yearbook as representative of the country's count for that year. The data covers a span of 60 years and provides sufficient information for comparison and determination of whether inequalities exist. The macro nature and the use of multiple years provided reliability to the study. Additionally, mortality data from the Demographic Yearbook does not include a breakdown by race, class, or gender. Lifespan data by gender was the exception and included because of the availability of the data.

Delimitations of the study were the use of data from 1950 to the present. Wallerstein's world-system theory spans a period of 500 years. For the purposes of this study, however, it would not be feasible to study the whole period. Moreover, dramatic shifts have occurred due to changes in technology, communications, politics, and society since World War II. It is for this reason the data is limited to the period from World War II to the present.

Summary

Many people in the world share an unfair burden of disease and injury which results in loss of life at an early age. This is due to inequalities in a global economic system. The two questions for this study were: (a) whether or not inequalities exist in mortality and lifespan data between core and peripheral countries and (b) if conditions for the periphery have deteriorated as predicted by Wallerstein (1995).

Based on world-system theory, inequalities exist because affluent core countries pull money and resources from peripheral countries, which have limited power. Because of their economic position in the world system, peripheral countries do not have the ability to adequately address the social determinants of health in order to prevent disease and injury and prolong life. If world-system theory is true, then inequalities in mortality and lifespan data will exist, and conditions in peripheral countries will continue to get worse.

CHAPTER 2 - Review of Literature

The purpose of this study was to determine if inequalities exist between core, semiperipheral, and peripheral countries in mortality and lifespan data as argued by Immanuel Wallerstein's world-system theory. It was also to determine if conditions in peripheral countries are deteriorating and disparities widening between core and periphery. The literature review for this study provided background information in three areas of interest: world-system theory, globalization, and inequalities. The first area of interest was determined because of the need to have more information about the theoretical framework for this study. Information on the second area of interest, globalization, was necessary because the scope of this study included analysis of the relationship among countries around the world. Also, because the concept of globalization has been defined in many ways, it became necessary for clarity to provide a working definition for this study. Anthony Giddens's (1991) definition of globalization was used. Giddens defines globalization as an intensification of relations at a worldwide level. Due to the intense nature of the relations, local events are shaped and changed due to events occurring over long distances. It is important to understand how the world has changed and to gain an understanding how relationships between countries affect local outcomes for a country. World-system theory states that there is a relationship between countries. Gaining information on globalization will assist in understanding world-system theory. The third area of interest, inequalities, was included to gain an overview from other disciplines and authors of inequalities among countries. There was a need to determine what types of inequalities have been studied and published in the past. Each of the three areas of interest is necessary to provide a framework and to provide the necessary background information for this study.

Theoretical Framework

Immanuel Wallerstein's world-system theory was developed out of dependency theory which states that core countries are enriched by their relationship to semiperipheral and peripheral countries (Wallerstein, 2005, World-System Analysis). Dependency theory developed in reaction to earlier modernization theory (Wallerstein, 2005). Modernization theory stated that all countries develop in the same manner. In other words, given the same conditions, all countries develop along a path towards an increase in industrialization and complexity, and acquire a lifestyle comparable to that of developed countries such as the United States or those in Europe. Soon it became apparent that development on a global scale produced distinct differences between core and peripheral countries. New insights led to the development of dependency theory (Wallerstein, 2005). Noted dependency theorists Raul Prebisch (Wallerstein, 2005) and Hans Singer rejected the thinking of modernization theorists and maintained that peripheral countries are not earlier versions of core countries; rather they are unique and distinct in their political, geographical, historical, and other key components comprising a country's characteristics. Within the globalized world, each country holds a key position in its relationship to core countries. Peripheral countries provide resources, cheap labor, and economic gain for core countries in order for the core country to maintain its standard of living. Dependency theorists also argue that wealthy countries perpetuate a state of dependency through economic, political, legislative, and other means of control. Economists would argue that peripheral countries are not full participants in the global market. However, dependency theorists counter that they are full members and that it is their type of relationship in the global market that is the hindrance. It is also noted that peripheral countries have little power or control over their own economic activities and have markets that lack complexity. In contrast, core countries maintain

control over their own economy and have impact on the global market through trade, tariffs, and banking. This puts peripheral and semiperipheral countries at a disadvantage for future growth. Wallerstein's world-system theory is a refinement of dependency theory and states that countries interact within one global system (Wallerstein, 2005). It is the interaction and relationship between countries that determines their global position.

The argument can be made that a country's global position, whether it be core, semiperipheral, or peripheral, determines its level of social determinants of health. In turn, the level of social determinants of health predicts the country's ability to prevent and treat disease and injury and prolong life. If a country does not have the internal infrastructure to prevent and treat disease and injury in order to prolong life, mortality rates will be high and life spans shortened. A country with a high rate of disease resulting in shortened life spans will not be able to have sufficient numbers of healthy workers within the workforce. Without a healthy workforce, a country's economy will suffer and this may result in a country's inability to improve its position within the world-system. This compromises the ability of a country to develop and move into a position where their accumulation of power, money, and resources is increased and development can occur.

Shawn Kneipp and Denise Drevdahl (2003) argue that, although there has been a strong link between economic status and health, there is no clear indication why this occurs. World-system theory provides an explanation. When money, power, and resources are pulled towards the core, peripheral countries are locked in their dependent relationship to core countries. The pull of money, power, and resources results in internal turmoil and poverty for peripheral countries, which in turn affects the social determinants of health. The social determinants of health, such as housing, politics, pollution, nutrition, etc. affect mortality and lifespan data. In the literature, the

use of dependency theory and then world-system theory as an explanation for health-related inequalities is very limited. However, a few related studies were found.

A study by Dale Wimberley (1990) used dependency theory to explain the effect powerful core countries have on peripheral countries. The intrusion into the peripheral country's industry and control over their economic system is detrimental from a health perspective. The intrusion of the core countries into the peripheral country resulted in an increase in the infant mortality rate for the peripheral country. Wimberley states that increased industrialization has resulted in an increase in the pull of money, power, and resources to the core. Because of this pull, there is greater inequality between the core and the periphery. The infant mortality rate increased because greater industrialization did not result in a better lifestyle for the peripheral country, but instead resulted in greater environmental degradation, a breakdown of social structure, and decreased local control over the lives of the people in the peripheral country. Wimberley's findings support the theory that environmental degradation, decreased societal connectedness, and decreased control over one's own life affects the infant mortality rate. Wimberley continued his argument by stating that the greater the involvement of the capitalist world-economy into non-core areas, the greater the detrimental effect.

Another resource to provide information and add clarity was Giovanni Arrighi and Jessica Drangel's (1986) article. The study discussed in the article assisted in identifying which countries belonged to the core, periphery, and semiperiphery. Their study determined the placement of countries based on multiple factors beyond a country's gross national product. Kneipp and Drevdahl (2003) found there was a link to socioeconomic status. However, Arrighi and Drangel (1986) argued that more than a country's gross national product was involved in the determination of whether a country was core, semiperipheral, or peripheral. Arrighi and Drangel

found in their study that an analysis of a country's gross national product does not take into account the country's trade relations and control over its own economic future. They also stated that the gap between core and periphery was widening and challenged those who argued that the terms *industrialization* and *development* could be used interchangeably (Arrighi & Drangel, 1986). They argued that new methods of analysis, not just the level of industrialization or gross national product, but other determining factors should be used to measure whether a country is core or peripheral. Growing industrialization in peripheral countries has not resulted in growing control over global commodity chains. It is through control and power in the decision-making process that core countries maintain their position over peripheral countries (Arrighi & Drangel, 1986). Despite growing industrialization in peripheral countries, they maintain little control over these processes (Arrighi & Drangel, 1986). Arrighi and Drangel provided a method for determination of whether a country is in the core, semiperipheral, or peripheral zone within the world-system.

Globalization

Globalization is defined as an intensification of the relations between countries that has grown over time and results in a change of events locally and globally (Giddens, 1991). Intensification of the relations between countries will change the social determinants of health within a country (Giddens, 1991). According to a report by the World Health Organization (WHO), the social determinants of health include the political, economic, environmental, and living conditions of a country (WHO, Social Determinants of Health, n.d.). Increasingly, the WHO and others see the social determinants of health as the best predictors for health-related outcomes for a country. Globally, peripheral countries have seen dramatic change in their level of industrialization since 1950. Core countries with more complex organized infrastructures

have increasingly been able to access the raw resources and labor of peripheral countries and thereby outsource many industries. This has resulted in greater industrialization and urbanization for peripheral countries. But the economic shift from agrarian to industrial and rural to urban has not benefited poor peripheral countries as might be expected. Instead, the change has had a detrimental effect especially in the area of the social determinants of health. Globalization of money, power, and resources on the world market has had a stark effect on the social determinants of health. It is within the social determinants of health that globalization has resulted in greater inequalities (WHO, Social Determinants of Health, n.d.). A country's level of social determinants of health is a clear reflection of its global position within the economic world-system theory.

Further discussion on the topic of globalization and its impact on health can be found in Solomon Benatar's (1998) article, in which he states that the current level of health in the world will not change as long as health care is commodified on the world market and commercial gain is emphasized over human rights. Growing capitalism and commodification of health leads to greater polarization between countries according to Benatar. If polarization continues to expand, the result will be an increase in war, disease, and other destructive forces putting all of humanity at risk from growing poverty, unrest, and ecological degradation. World-system theory states that polarization exists and is evidenced by inequalities between core, semiperipheral, and peripheral countries. Benatar stresses that there is a need to expand knowledge about growing inequalities.

Many authors such as Solomon Benatar, Stephen Gill, and Isabella Bakker (2009) describe the impact of growing globalization and widening inequalities. According to Benatar et al., a country's placement within the world-system allows the country more or less access to the

technology and knowledge needed to provide the infrastructure and resources for optimal health. Benatar et al. argue that only 20% of the world's population have benefited from the technological advancements that promote longer life spans. Eighty percent of the world's population reside in the poorest countries and share the largest burden of disease. Benatar et al. contend that there are widening inequalities related to wealth and health on a global level. Therefore, Benatar et al. propose three steps in order to shift the way trade, economic governance, and global trajectories will progress: (a) Greater analysis of the global relationship between economic systems and inequalities must be gathered; (b) Greater emphasis on basic human needs over economic gains must come into focus in order provide sustainable, humane health initiatives; and (c) New attitudes on a global scale must be formulated to promote population health; in other words, extensive discourse must occur on human rights. In order for progress to result from the three steps, imagination and democratic political leadership should occur (Benatar et al., 1990). Also, global initiatives and alliances in public and private spheres will be required (Benatar et al., 1990). Long-term global development and improvement in mortality and lifespan data for all populations will require further analysis of the social determinants of health and the impact on all population groups. This study will provide additional information and will be useful to stimulate discourse on the role of globalization and health.

Spencer Moore, Ana Teixeira, and Alan Shiell (2006) concur, and argue that inequalities in population health cannot be understood by discussing the country's gross national product or level of social cohesion. A country's level of health must be reflected using global parameters. Using a world-system approach, Moore et al. analyzed global trade and population health for selected countries. Data on capital-intensive commodities within six world-system blocks were

analyzed for trends. They found that an association existed between a country's level of trade and infant mortality. Peripheral countries with lower trade rates and little power over their trade have a higher infant mortality rate.

Another author, Anne-Emanuelle Birn (2011), agreed and argued that the current state of global capitalism is a tug-and-pull process with imposition from above and resistance from below which allows opportunists in the global health care market to thrive. Birn continued to discuss how globalized health care has been detrimental to many of the world's countries. If all countries held equal power and status in the world market then there would be equal opportunity for all countries to be profitable. However, according to world-system theory, peripheral countries do not have equal access to money, power, or the resources to control their markets and surplus accumulation. Without the surplus accumulation, they cannot reinvest in their own market, something which creates even greater inequality. Countries that do not reinvest in their own market will not grow and the gap between them and the core will widen.

Birn (2011) continues his discussion by drawing a distinction between global and international health. He praises Latin American countries, those members of the Pan American Health Organization (PAHO) who have worked toward international health as opposed to global health. International health is defined by Birn as country-to-country cooperation and sharing of policies and practices. When member countries of the PAHO were able to share new ideas and practices relevant to their unique needs within the social determinants of health, improvement was seen in mortality and lifespan data. Birn sees this as the path to independent development in the area of health for other developing countries. Birn adds that it is through international health as opposed to global health that Pan American countries can thrive. Birn's interesting discourse gives insight in to the detrimental effects of globalization.

By the year 2000, it was evident that there was a need to address the impact of globalization on peripheral countries. *Understanding the Global Dimensions of Health* (Gunn, Mansourian, Davies, Piel, & Sayers, 2005) provided a collection of articles discussing the growing complexity of health in a globalizing world. The authors offered a discussion on the fundamentals, systems, and controversies surrounding global health. Their views offered insights into this complex issue. Although many of the views differed about why inequalities exist, all agreed that new paradigms for working to improve global health must be developed in order to prolong life in an ever changing global world (Gunn et al., 2005).

Hayne Dyches and Beth Rushing (1996) concurred. They supported the need for greater knowledge of the impact of global positioning, growing capitalism, and growing inequality. In their study, Dyches and Rushing found evidence that the level of health for women was affected by a country's world-system position. The study did not address issues related to sexism, violence on women, literacy rates, or income differences; but rather, it illustrated the impact of the social determinants of health, brought about by positioning, within the world-system on women's health.

Other authors on the subject of globalization have agreed that globalization is detrimental, especially for those population groups who are most vulnerable. Sylvia Walby (2001) examined the impact of globalization on gender relations and work. Walby found that an increase in industrialization led to greater numbers of women moving out of the home and into the workplace, which has resulted in societal confusion on what is considered the work of women. Traditionally, women, especially in poor countries, have provided the bulk of the healthcare delivery (Walby, 2001). According to Walby, the impact of this societal shift is still unknown. In more affluent countries, services exist for home care, daycare, hospice, and other services for

vulnerable individuals. In peripheral countries, these services are limited or do not exist. The question is: If women in peripheral countries work outside of the home, who provides care for the most vulnerable individuals in a population? Who is caring for the young, elderly, disabled, or mentally infirm in peripheral countries?

In his article "After Developmentalism and Globalization, What?", Immanuel Wallerstein (2005) discussed the history of the concepts of developmentalism and globalization. He then discussed his world-system and how the future is uncertain. Wallerstein emphasized that, in order to understand the current world-system, there must be a historical perspective. If we understand where we have been, we will have a better understanding of today's dilemmas and open our minds to alternatives in the future. Wallerstein also contends this will provide a practical approach that will serve as a basis to meet immediate and long-run needs for the world's people.

As stated by Wallerstein (2005), it is important that a historical perspective be included in a study in order to give greater insight into the effects of globalization and the current state of the relationships among countries in the world-system. This supports the inclusion of longitudinal data from post-World War II to the present in the current study. Analysis of the data over time will provide greater accuracy of trends and change over time in mortality and lifespan data. With the inclusion of data over time, insight into the present state of the world-system and the need for future initiatives can be gained.

Inequality

According to authors accessed for this literature review, inequalities exist between core, semiperiphery, and periphery. World-system theory provides an explanation of why the inequalities exist. World-system theory states that inequalities exist due to the relationships

among countries, and that these unequal relationships affect the social determinants of health. A country's position in the capitalist world-system determines their level of the social determinants of health, which is evidenced in inequalities in mortality and lifespan data. Findings in the study by Kath Moser, Vladimir Shkolnikov, and David Leon (2005) on world mortality data from 1950-2000 concur, and found a growing gap in mortality data between core and peripheral countries.

Discussions regarding the relationship between health, social determinants of health, and the global economic positioning of a country grew throughout the 1980s and 90s. Dependency theory was used to explain why some countries failed to develop and achieve standards of health as expected. An early study by Hans Baer (1982) on the political economy of health found a relationship between health and class and argued that this disparity was due to a country's position within the world-system. Baer described the political economy of health as being concerned with the production, distribution, and consumption of health care. He argued that it was within the class relations that the level of health was determined. Baer supported the need for a more holistic approach to the study of health, illness, and disease. Another early discussion on inequalities in health was Lynn Morgan's (1987) article on the relationship between dependency theory and the political economy of health. Morgan argued that the relationship between health and the modes of production, social class relations, history, and the impact of capitalism must be included when analyzing underdevelopment issues within countries. Morgan argued that dependency theory, however, did not fully give an accurate picture of the status of health in underdeveloped countries. Morgan stressed the need for ongoing dialogue to determine the relationship between core and peripheral countries and the inclusion of the impact on global positioning and health and vice versa. In other words, a

country's global position in the periphery hindered the country's ability to gain the money, power, or resources necessary to determine its own needs to prevent disease and injury and prolong life. Likewise, a country's inability to prevent disease, injury, and limited lifespans will decrease years of productivity in the workplace. Decreased productivity in peripheral countries has a negative effect on the development of the country's economic, social, and political stature within the world-system.

By the late 1990s, inequalities in health came into greater focus. Additional authors, for example, Jan Black (1999), stated that inequality existed in the world as a result of globalization. Black's book *Inequality in the Global Village: Recycled Rhetoric and Disposable People* stated that, to reverse the growing trend of inequality, we needed a U-turn in the social mindset. We needed to concentrate less on the technological and economic aspects and instead develop the political will to distribute the wealth. We have enough technology, essential goods, and human resources, yet poverty and declining human conditions exist. It is not more technology that we need, but better use of existing technology. Black called for greater collective action and volunteerism along with increased discussion on rights as human beings. Black also emphasized the need for discussion on who has the rights to what resources and what the rights to the resources look like. Black recognized that inequalities exist and there is a need to change the current relationship between core and peripheral countries. Change would include the redistribution of money, power, and resources. Black stated that we have enough technology, goods, and human resources; however, new means to distribute them must be implemented.

Many of the authors writing on the topic of inequality and global health concur that poor countries do not fare well in comparison to more affluent countries. Authors also concur that the gap is widening. Benatar (2001) supports the idea that economic trends in the past 50 years have

resulted in the widening of gaps between rich and poor. Benatar discussed how disparities in health care expenditures and research led to a lack of access for millions of the world's population. He used cancer, addressed in the current study, as a model to illustrate his point of view. Clearly Benatar emphasized the need for action to be taken to prevent a catastrophe in international health due to the widening disparities. He suggested sustainable healthcare initiatives and greater respect for human life in an increasingly interdependent world.

In *Dying for Growth: Global Inequality and the Health of the Poor*, Jim Kim, Joyce Millen, Alec Irwin, and John Gershman (2000) described the large-scale economic forces affecting the health of the poor. Kim et al. assert that while there has been an overall increase in life spans, the prospect for health in poor countries has not risen as rapidly as it has in more affluent countries. Through the use of case studies, the authors argued that economic growth did not lead to improvements in mortality and lifespan data in poor countries.

Craig Murphy (2001) concurs, explaining how new shifting global political patterns have resulted in growing income inequality, growing social conflict, and the politicization of public health initiatives. Murphy states that, although democracy is flourishing, state power is diminishing and income inequality has risen. This is especially true in the new democracies that are now struggling to provide the opportunities they promised when they came to power. Murphy, however, is more optimistic than other authors and, despite growing inequality, argued that, "new global public health politics" (Murphy, 2001, p. 352) of global agencies such as the World Health Organization will promote health-related initiatives leveraged through trade agreements. Other authors argue that continued interference by global powers in peripheral countries heightens inequalities. The loss of local power will result in the continued pull of money, power, and resources from the periphery to the core.

As the 2000s continued, discussions and studies on the topic of global health and inequalities continued and authors addressed particular aspects and rationales for the persistence of the inequalities. In *Under the Banyan Tree*, Sheldon Segal (2003) argued that the gap between rich and poor was widening and that the more affluent countries needed to provide educational and economic opportunities that will improve a population's health. The more affluent countries needed to reduce environmental degradation, increase methods to boost crops and food production, and increase economic stability and equality (Segal, 2003). Affluent countries should develop partnerships to promote global health, Segal argued. Policy makers should pay more attention to the health of women and children who have been victims of poor-to-nonexistent healthcare, and include them in future endeavors in order to realign the current state of unequal healthcare access (Segal, 2003). Robert Beaglehole (2003) agreed with Segal and in *Global Public Health: A New Era*, he examined the social determinants of health in core and peripheral countries. Beaglehole stated that new partnerships need to be developed to provide greater equality in healthcare access and improve outcomes for a greater number of people.

Additionally, Meredith Fort, Mary Anne Mercer, and Oscar Gish (2004) published a collection of essays that examined how the global market created inequalities for many of the world's most vulnerable people, especially in peripheral countries. Fort et al. described how current economic conditions contributed to growing poverty, inequalities, and declining human conditions. Additionally, Fort et al. described how international corporations and financial institutions maintained the cycle of poverty between countries in the Northern Hemisphere and Southern Hemisphere, arguing that inequality led to an increase in disease in the world. Fort et al. argued that the inequitable distribution of wealth and power contributed to rising levels of tuberculosis, AIDS, and infant and maternal mortality. The book focused on the North-South

hemispheric divide. Fort et al. argued that globalization made the world safer for corporations but not for humans. Although this book was informative, it did not adequately discuss the links between globalization, inequalities, and global corporations.

During the 2000s, scholars examined a country's economic relationship in the global market to illustrate the inequalities within a country. Etienne Krug, James Mercy, Linda Dahlberg, and Anthony Zwi (2002) found a relationship between violence (which includes suicide and homicide) and a country's economic status. They examined how violence against others and self is higher for people who are economically disadvantaged. Economic instability in countries destabilizes governments, health services, and businesses, which results in reduced productivity, an increase in social tensions, and an increase in violence (Krug et al., 2003). Homicide rates, in particular, show a relationship to income in the form of war, domestic violence, and random acts of violence.

Likewise, Laurie Wermuth (2000) in *Global Inequality and Human Needs* argued that as social and economic inequality has increased, there is greater disparity and inequality in health and mortality. Wermuth argued that there are three reasons to study health and mortality in relation to political economy. First, the relationship between the health of a population group and their position in the global economy determines their standard of living and life chances. This concurs with world-system theory and the argument that a country's global position determines the country's social determinants of health. Second, hunger, malnutrition, and lack of clean drinking water result in higher infant/child mortality and lower immunity for all age groups in poor peripheral countries. Third, countries located in the periphery of the economic world are exploited for their labor and natural resources. Wermuth further explains that this exploitation leaves countries vulnerable to environmental degradation and increases their incidence of

disease; furthermore, the exploitation of labor results in populations in peripheral countries not having labor laws protecting the workforce. Without regulation to protect the workforce, argues Wermuth, there is greater mortality due to disease and injury. Mounting debt for workers and the country will result in cuts in nutritional programs, education, health improvements, or infrastructure that provide for the everyday well-being of workers (Wermuth, 2003).

Paul Farmer (2003) provided insight into his experiences in *Pathologies of Power: Health, Human Rights, and the New War on the Poor*. Farmer argued the existence of growing disparities in health and well-being in the world today, and described the impact of a market-based system of healthcare that has not responded to the needs of the world's poorest population groups in peripheral regions. Farmer uses Wallerstein's world-system theory to support his argument that growing inequalities in the level of health is due to the relationship between core and periphery countries. Farmer's findings on widening disparity support Wallerstein's world-system theory.

Summary

There is ample literary support of a connection between health and Wallerstein's world-system theory. However, there is limited information in the literature on the use of world-system theory as an explanation for inequalities in mortality and lifespan data. There is a need for additional information on mortality and lifespan data regarding the relationship between core, semiperipheral, and peripheral countries. Past and present studies support the existence of economic inequalities between countries. This study contributes to an understanding of health-related inequalities.

Immanuel Wallerstein's world-system theory provided a plausible account of global economic inequalities. This study used world-system theory to determine if world-system theory

is supported by the data on mortality and lifespan. This current study used country-specific data from around the world and covering the time period of World War II to 2010. Scholars in the literature argue that inequalities exist, but this study will add to the knowledge with a look at inequalities for mortality and lifespan data.

In summary, there is a growing interest among scholars for information about the relationship between core, semiperipheral, and peripheral countries. The literature supports the view that growing inequality adversely affects poor peripheral countries greater than affluent core countries. This puts peripheral countries at a disadvantage. This disadvantage is reflected in the social determinants of health which impact the rate of disease, mortality rates, and the population lifespan data for a country. Additionally, there is a need to add to the body of knowledge, from a public health perspective, on global inequalities in health and if the health conditions in peripheral countries is increasing. The literature review provides information in support of Wallerstein's argument that inequalities do exist and that conditions in peripheral countries are deteriorating. This study provides information on whether or not this is true. Information from this study will add to the body of knowledge and be useful for future research, discussions, and interventions to prevent disease, injury, and prolong life.

CHAPTER 3 - Methodology

This study asked two research questions: (1) Do inequalities exist in mortality data among core, semiperipheral, and peripheral countries? and (2) If inequalities exist, have they increased during the past 60 years? Immanuel Wallerstein's (1974) world-system theory, which states that the core pulls money, resources, and power from the periphery, argues that inequalities exist between core and periphery and will grow over time. Therefore, the expectation would be that there is a higher mortality rate for selected diseases and injuries for people in the periphery when compared to the core, and that the gap between the mortality rates will grow over time.

In order to answer the research questions for this study, a longitudinal comparative analysis of the mortality data of core, semiperipheral, and peripheral countries was obtained from the United Nations Statistics Division (UNSD) Demographic Yearbooks. Data obtained covered a span from World War II to 2010. This method allowed analysis of longitudinal trends in mortality data among countries. An analysis of the trend lines provided information about core, semiperipheral, and peripheral countries and their ability to reduce infectious and chronic diseases, violence, injury, and infant mortality. The trend lines also provided information on life expectancies within and among countries.

The data provided information about the relationships among core, semiperipheral, and peripheral countries and whether quality of life and life expectancies increased for all countries or just for some. Based on the literature review, a country's level of health is a reflection of their economic, political, and social place within the world-economy. This information is of importance for future global health discussions and programs aimed at reducing mortality data.

Selection of Data

Countries were selected based upon both their designation as core, peripheral, or semiperipheral countries, and on whether they represented different zones of the world economy. To identify countries as core, semiperipheral, or peripheral, scholars would need to map out all of the commodity chains that linked countries together, a difficult and impractical task for purposes of this study (Arrighi & Drangel, 1986). Instead, this study relies on the model developed by Arrighi and Drangel (1986), which identified countries in the core, semiperiphery, or periphery. Although previous world-system scholars used Gross National Product (GNP) to determine which countries were in different zones, Arrighi and Drangel argued that the use of GNP as the determining factor to define a country's membership in the core, semiperiphery, and periphery did not take in to account the complex global nature of the relationship between states. Arrighi and Drangel argued that the activities of the core countries resulted in greater control over the aggregate rewards associated with the world division of labor, while the activities of peripheral countries resulted in limited control over the rewards. They also argued that this difference in control should be measured more accurately by using not only the GNP but also the log of the GNP per capita. By taking the log of the GNP per capita, Arrighi and Drangel gave a more comprehensive description of a country's level of control in the world's economy. By determining a country's level of control in the world-economy, Arrighi and Drangel argued that a true definition of core and periphery had been found.

Following Arrighi and Drangel's (1986) findings, this study treats the United States, Canada, Australia, and Sweden as core countries. Also following Arrighi and Drangel's findings, this study identified Bolivia, Egypt, Mexico, and the Philippines to represent the periphery. World-system theory scholars argue that while it is relatively easy to determine which countries are core

and peripheral, it is more difficult to identify which countries belong in the semiperiphery. Wallerstein does not clearly define which countries belong to the semiperiphery (Arrighi & Drangel, 1986). However, by the use of Arrighi and Drangel's method, semiperipheral countries can clearly be identified. Some semiperipheral countries may rise into the core or fall into the periphery for a short period of time, and then return to the semiperiphery. By looking at their location over a long period of time, however, it is possible to determine where they belong. Economists have long noted that there is a fluctuation of economic prosperity and disparity for countries in the semiperiphery.

Arrighi and Drangel (1986) identified the following countries as members of the semiperiphery: Argentina, Greece, South Africa, Japan, Finland, and Bulgaria. Some of these countries resembled core countries in many ways while others resembled peripheral countries. Japan is a good example. At the time of their study, Japan was listed by Arrighi and Drangel as a semiperipheral country. Japan's economy and trade capacity grew after World War II, but it remained dependent on core countries for trade. From the 1950s through the 1980s, Japan supplied core countries with inexpensive goods. With the opening of the marketplace to China, Japan was forced to move to electronics and automobiles for exports. Japan is vulnerable in the world market and is weak politically. Moreover, Japan has not returned to their World War II prominence in power. This places Japan in the semiperiphery, but close to the core, according to Arrighi and Drangel.

Arrighi and Drangel (1986) provide two criteria for a country to be listed in the core zone. A country must have some command in the economic and political world to be considered in the core zone. In the world-system semiperipheral countries have characteristics of both the core and periphery. Importantly, Arrighi and Drangel argue that a country's position is not based

solely on their gross national product. Their political power is also important. It must also be stated that within the world-system there is not a clear demarcation from one zone to the next. The system is fluid, and countries, especially semiperipheral countries, are always changing in their relationships and positions within the system.

The countries of Bulgaria and Argentina were also identified as being in the semiperiphery (Arrighi & Drangel, 1986). Unlike Japan, Bulgaria and Argentina have many characteristics that may make them look like a peripheral country. Although ranked as semiperipheral, they are near the periphery and may slip into the peripheral zone at any time, depending on the world market and their level of trade.

South Africa was initially chosen as a member of the semiperiphery, but this became problematic (Arrighi & Drangel, 1986). As I gathered data on South Africa, I became concerned that the data was inconsistent, with extreme variations from one five-year span of time to the next. The data from South Africa was included in the tables but was not included in the graphs to compare core, semiperipheral, and peripheral countries. I decided not to include South Africa because I was concerned about the accuracy of the data and thought the data might skew the graphs when comparing different zones. However, I continued to gather the data and include it in the Excel tables for mortality data from selected countries. The fact that the data on South Africa is so inconsistent is, in itself, significant. During the last 60 years, tremendous social, economic, and political change has occurred in South Africa. Change always brings with it inconsistencies and uncertainty. This is reflected in the data-gathering methods used in South Africa. Early data gathered for South Africa was divided by ethnic groups. Separate counts for White, Asian, and Colored were recorded. This cumbersome process increased the room for error. Additionally, it was difficult for the government to obtain accurate numbers for the Black

population because there were large migrations into South Africa from neighboring countries and a lack of trained personnel to gather data. South Africa's decision to separate the data by ethnicity continued until 1960, when data began to be documented with the inclusion of all races in one number. But, according to the records in the relevant Demographic Yearbooks (UNSD), the data for South Africa from 1985 onward was either not recorded or inconsistent. For example, in 1985 and 1990, no data was listed for cancer, tuberculosis, or cardiovascular disease. For suicide the South African data is not recorded for 1985, 1990, 1995, and 2005. According to the Demographic Yearbook (UNSD), there were no recorded suicides in South Africa in the year 2000. It is for this reason, South Africa data was included in the country comparison chart but not in the graphs for core, semiperipheral, and peripheral comparisons.

Other countries were not included in this study because they had little or no data. The data for Russia, China, and India are incomplete or not recorded. Russia, as part of the Soviet Union, did not collect or share mortality data with the United Nations. The same is true for China and India. Although the information would have been of interest for this study, it was unavailable.

The countries selected for this study also represent various geographic regions of the world. For the core, the United States and Canada represent North America, Sweden represents Europe, and Australia represents South Asia. Although the United States and Canada both represent North America, I chose them because they have very different health care systems. I chose peripheral countries in North America, Africa, Asia, and South America. Semiperipheral countries include representation from Asia, South America, Europe, Africa, North America, and the South Asia. All continents except Antarctica were represented in the final selection. Additionally, countries reflecting different political backgrounds were included. For example, the United States, Egypt, and Bulgaria have different histories and political structures. The

countries of Burma, Armenia, Turkey, Iran, Thailand, and Ethiopia were added for infant mortality and life expectancy because the data was available; the addition of these countries adds depth and breadth to the analysis because they represented variety in terms of world regions and political structures. The country data was available and allows for additional comparisons.

When choosing countries I considered differences in population size, race, and ethnicity. Countries included were large enough to provide robust data that could be reflected in a ratio of per 100,000 of total population. Data provided by the Demographic Yearbook (UNSD) is calculated at rates of per 1,000 of total population for infant mortality and life expectancy, and at rates of per 100,000 of total population for infectious disease, chronic disease, violence, and injury. Data on infant mortality and life expectancy at birth is reflected at a rate of per 1,000 of total population. If the data were shown at a rate of 100,000 of the total population, the numbers would be too small and would not provide information that would be comparable among countries.

The United Nations Statistics Division Demographic Yearbook was used as the primary data source. The UNSD has been publishing this yearbook since 1948. The Demographic Yearbook was created after World War II to obtain global and national perspectives on social issues and health. The UNSD surveys countries and compiles information on topics including marital status, death and birth records, education, and household characteristics. After World War II, as a global organization, the United Nations developed the organizational capacity to gather global data about these issues. From the data collected, data sets for each country have been compiled by the UNSD and made available for analysis. This data is accessible to the public in hard cover texts or online under the title of the Demographic Yearbook. For purposes of this study, data was selected to determine if mortality and lifespan trends show inequality among core,

semiperipheral, and peripheral countries. Wallerstein's (1974) world-system theory predicts that inequalities will increase and grow over time. Data on mortality rates and life expectancy were compiled in a Microsoft Excel document. I used the Excel program to generate tables and line graphs for disease, violence, infant mortality, and life expectancy by selected country and years.

The Demographic Yearbook was used due to the reliability and consistency of the data. Disease classifications and descriptors for cause of death are consistent due to the use of the International Classification of Diseases (ICD) developed by the World Health Organization. The ICD provides specific descriptions and classifications for diseases and injuries, so consistency in reporting the data was obtained. Because reporting countries used this classification system, mortality and lifespan data was standardized on a global level.

Years selected for inclusion in the study span a timeline of five-year intervals from 1950 through 2010. Data from the UNSD Demographic Yearbooks from 1945 through 1950 appeared to be incomplete, so I chose to begin gathering data in 1950. Tremendous changes occurred in technology, communication, and political power after World War II that changed the social determinants of health. It is for this reason that the timeframe for this study covers the years from 1950 to 2010. After World War II, many countries struggled to reorganize their political and economic infrastructures. Data collection of the type included in this study requires governmental organization and the personnel trained to collect the data. By 1950, many of the countries had organized the data collection process so they could provide data to the UNSD. I chose five-year increments of data because this provided sufficient information without becoming cumbersome. Five-year intervals are sufficient because many countries did not collect data on a yearly basis due to cost, time, and personnel needed. For the purpose of this study, five-year intervals provided enough information to show change over a 60-year period.

I decided to use mortality data related to the cause of death rather than morbidity data on the occurrence of a disease because it provided more consistent data. The reason for the use of mortality data as opposed to morbidity data on disease occurrence is that not all cases of a disease are reported. The recording and analysis of the cause of a death is more likely to be recorded and collected for analysis than a disease diagnosis. Therefore, mortality data offers greater consistency and reliability. Through the use of ICD codes and mortality data, greater reliability and consistency of the data was obtained.

Disease, injury, and lifespan data were selected with Wallerstein's (1983) reference to the Apocalyptic Four Horsemen in mind. The Four Horsemen of the Apocalypse represent pestilence, famine, war, and death (Wallerstein, 1983). Pestilence mortality data includes the infectious diseases of tuberculosis, influenza, malaria, and polio. I decided to use tuberculosis, influenza, malaria, and polio because relevant data has been consistently collected and recorded in the UNSD Demographic Yearbooks over the past 60 years. The change in the technological capabilities over the past 60 years to prevent and treat these diseases has been remarkable. Factors affecting health, such as economic, political, social, geographical, and technological change have all affected disease processes. New vaccines to prevent polio and drugs to treat malaria, influenza, and tuberculosis have resulted in longer lifespans for many of the world's inhabitants. These four diseases have been common worldwide, and when left untreated, many times have resulted in death.

Tuberculosis was chosen because of its historical significance and because it remains a leading disease of concern today. This disease has a long history of impact on many diverse population groups. The development of new treatments and of antibiotics specifically engineered for tuberculosis would lead to an expected decline in the number of tuberculosis

cases. However, with the advent of the Human Immunodeficiency Virus (HIV) and the infected person's inability to fight off infections, this has led to an increase in the number of global tuberculosis cases. Additionally, increased virility of the organism and growing urbanization has led to an increase in the number of cases of tuberculosis and the potential for tuberculosis to spread within crowded conditions has also led to an increase in the number of tuberculosis cases.

Influenza has also changed over the course of the last 60 years. Emerging forms of influenza along with ever-increasing numbers of global travelers has led to rapid exposure of multiple individuals. Malaria today is treatable due to new drugs and methods to combat the disease. However, despite the ability to eradicate malaria, environmental degradation, poverty, lack of supplies for treatment, and poor sanitation controls have allowed this disease to continue to be a major health concern in many areas of the world. Polio continues to plague the world despite the discovery of vaccine in the early 1950s. Today, outbreaks of polio still occur in twelve countries around the world and have a persistent presence in three of them.

As I gathered data, I discovered that, although data has been collected for the past 60 years and is of worldwide concern, the incidence of disease in some countries was too low to give a number for comparison. Although, I did not have the numbers that I thought I would find, the fact that these infectious diseases persist in peripheral countries and not in core countries is worth noting. If world-system theory is true, and these diseases are preventable and treatable, then the findings should show that the mortality rate for the infectious diseases is higher in peripheral countries than in core countries.

Chronic disease processes have also undergone change over the past 60 years. Therefore, chronic disease data of concern in the past and present was also analyzed. Cancer, diabetes, and cardiovascular disease data was accessed from the records of the UNSD Demographic

Yearbooks. The technology to prevent and treat these diseases has improved; however, many countries do not have the money, power, or resources available to decrease mortality for these diseases. Diabetes, as a chronic disease of concern, was included because it is a growing problem. Wallerstein (1983) stated that the apocalyptic horseman of famine does not always signify the lack of food. Rather, it may be the lack of nutritional food to properly support the body. Diabetes is a growing disease due to lack of exercise and modern-day, high-carbohydrate, fast-food diets. Both core and peripheral countries have seen this as a growing concern. Closely related to diabetes is cardiovascular disease. Complications of diabetes often result in an increase in the risk for cardiovascular disease. Increased obesity, stress, and longevity add to the growing presentation of cardiovascular disease in core and peripheral countries. Additionally, an increase in the level of toxins in the environment and food supplies due to global industrialization and urbanization has resulted in the potential for a rise in the number of cases of cancer. This is especially true in peripheral countries as industry grows and where there is little government control over environmental degradation. The diseases of diabetes, cardiovascular disease, and cancer are common in core and peripheral countries and have been included in the UNSD Demographic Yearbook data from 1950 to the present. Therefore, they are included as representative of chronic disease for this study.

I also wanted to examine data on mental health and violence. Violence in the form of the apocalyptic horseman of war was discussed by Wallerstein (1983). I chose homicide, suicide, and motor vehicle accidents as representative of violence and the apocalyptic horseman of war. Since World War II, global economic changes have resulted in shifts in technology, politics, and social conditions. Suicide and homicide, as selected concepts for this study, have long been linked to social factors. Émile Durkheim in 1897 wrote *Suicide: A Study in Sociology* (1951), in

which he described how suicide is not just an individual act but a reflection of social currents or social characteristics. The data on suicides and homicides provides information on the mental health status of people in the countries included in this study. Durkheim (1951) described how each society has, at each moment, an aptitude for suicide, and argues that a decrease in social organization and times of turmoil will result in an increase in the suicide rate. Decreased social integration is another factor that will lead to an increase in the rate of suicide. Therefore, suicide is relevant to this study due to the vast changes in technological advancement, urbanization, industrialization, and migration that have occurred in the last 60 years. Families have migrated from rural to urban settings and left behind their well-organized communities for complex urban settings where social integration may be limited. Increased stressors within societies due to a greater concentration of populations in urban settings reduce quality of life for many and increase stress. Industrialization with repetitive tasks, long hours, and environmental degradation leads to a reduction in mental and physical health which results in greater mental stress and a rise in suicide and homicide rates.

Motor vehicle death rates were included in this study because they are also a measure of accidental violence. Growing numbers of automobiles have been mass produced since WWII. Growing urbanization coupled with the ever-increasing numbers of motor vehicles in core and peripheral countries has resulted in the potential for an increase in the number motor vehicle accidents. In the case of a motor vehicle accident a well-organized emergency system is essential to prevent death due to auto accidents. Costly emergency services have improved in core countries; however, for peripheral countries, access to care has become increasingly limited. Homicide, suicide, and motor vehicle accidents were included in this study due to the global

nature of their concern. All countries have deaths by homicide, suicide, and motor vehicle accident that are associated with human causes.

In addition to mortality data on disease and violence, I collected crude mortality rates (stillbirths not included) for analysis. However, I found that this did not provide useful information. A crude mortality rate is the number of deaths per 100,000 of the population. This data did not provide an accurate description of mortality data needed for this study. The explanation for this is that the birth rate and the average age of the population can skew crude mortality figures. The crude mortality rate may be higher in a core country than in a peripheral country despite the fact that the overall life expectancy and health conditions are higher in the core country. The opposite is true for peripheral countries, where the crude mortality rate may be low, but people are dying at a very young age. This occurs due to differing age dispersions between core and peripheral countries. Greater numbers of elderly and a lower birth rate in core countries, when compared to peripheral countries, may give a higher mortality rate for the core nation. This can lead to inaccurate representation of the overall mortality rate within a country. Therefore, I decided not to use the crude mortality rate, but instead included rates for infant mortality and life expectancy by gender. Infant mortality data was included because many social determinant factors affect whether or not an infant survives the first year of life. Infant mortality data includes all deaths of an infant before one year of age. If living conditions are not optimal for the infant, then the probability of the baby's death increases. For example, if the housing, food, sanitation, or water supply are lacking there is greater probability of the infant acquiring an infection and not surviving. Also, if healthcare, medications, or trained personnel are not available there is greater potential for the infant to die. Environmental factors, as well, affect the infant mortality rate. Maternal exposure to chemicals during the pregnancy may result in injury

to the infant and result in death during the first year of life. Therefore, an analysis with age-specific mortality data provides greater insight into the health of a country.

Method

Data was accessed from the United Nations Statistical Division's Demographic Yearbook for each of the relevant years. Mortality data from selected countries was compiled into a Microsoft Excel file. Text and electronic versions of the data in the UNSD Demographic Yearbooks were used. Data from 1950 through 2010, as available for selected countries, was selected. Data was collected from the UNSD Demographic Yearbook for every five-year period starting with 1950. It is recognized that data from a selected year may not have reflected the current year's findings for all countries. Some countries did not gather data yearly but did so periodically. Therefore, the most recent data is recorded in the UNSD Demographic Yearbook. However, because this data covers a span of 60-plus years, this provided sufficient information for comparison and determination of trends for selected countries. Data selected was placed in an Excel file document. Each Excel document included the countries selected and the years of 1950 to the present. From the data, charts and line graphs were created by Excel software. The charts and line graphs were created to gain an understanding of a country's change over time in terms of their mortality or lifespan data. Also, the chart and line graphs would provide comparison among countries, as well as among core, semiperipheral, and peripheral countries over time. The charts were color coded by zones. Means were then calculated using the Excel program for each year within the zone. Additionally, graphs of each country's data and each zone were created.

Data Analysis

Analysis of the charts and graphs created from mortality and life expectancy data was performed to determine the relationships among core, semiperipheral, and peripheral countries

between the years from 1950 to 2010. Additionally, data among countries were analyzed to determine change over time. Each table was analyzed for trends, over time, for each country and zone, and then comparisons made. An analysis of the line graphs for each country followed. Each country was then analyzed in comparison to the other countries. Finally, I looked at the line graph for core, semiperipheral, and peripheral and looked for change over time and then in comparison to the other zones. Questions for this study were considered during the analysis. Similarities and inequalities among countries were noted as well as if there were inequalities among core, semiperipheral, and peripheral countries. Longitudinal trends were also analyzed for change over time.

Summary

Like the biblical Horseman of the Apocalypse, pestilence, famine, war, and death (Wallerstein, 1983) in the form of infectious diseases, chronic diseases, and violence continue to plague mankind. Selected disease, injury, and lifespan data from the United Nations Statistical Division's Demographic Yearbooks from 1950 to 2010 provided mortality and lifespan rates for selected countries. From those, I then selected countries from different regions, ethnic, cultural, and political backgrounds. Wallerstein argues that the world economy is divided into three zones: core, semiperiphery, and periphery. Wallerstein did not specify which countries were located in which zone, but Arrighi and Drangle (1986) provided a way to place countries into each zone. Although the list is not exhaustive, it provides representative selection. The data were placed in an Excel table from which line graphs were developed. Tables and graphs were then analyzed to see if inequalities exist and if conditions in peripheral countries are deteriorating as suggested by world-system theory.

CHAPTER 4 - Findings: Infectious Diseases

Overview

Immanuel Wallerstein (1983) states that unrestrained capitalism can be likened to the biblical Four Horsemen of the Apocalypse: pestilence, death, war, and famine. It is easy to see evidence of the Four Horsemen in today's world. Pestilence, in the form of new and more virulent forms of microbes, along with the rapid spread of other diseases such as severe acute respiratory syndrome (SARS), bird flu, and West Nile virus (Smith, Sax, Gaines, Guernier, & Guegan, 2007) has been facilitated by globalization. Infectious diseases are not impeded by national borders. Complicating the issue are new infectious diseases and growing resistance to antimicrobial drugs by older disease-causing microbes. Therefore, death due to an infectious disease has potentially increased over the past 60 years.

There is a growing need for increased surveillance and action to diagnose and treat infectious diseases. Money, power, and resources are needed to prevent the spread of disease. Core countries are pulling money, resources, and power to the core and away from the periphery. This has been evidenced by the persistence of infectious diseases that could, in fact, be eradicated. I chose to examine malaria, tuberculosis, polio, and influenza as representative of infectious diseases that are global in nature and have been responsible for many deaths over the years. The selected diseases have been present in rich and poor countries. The technology to diagnose and treat these diseases exists, though a country must have the money, power, and resources to combat the disease. Without the money, power, or resources the disease will persist within the country and be evidenced in mortality data.

For infectious diseases, adequate money within a country's budget to fight the disease is imperative. Also, an infrastructure that can purchase, store, transport, and dispense the

medication is necessary. A country must also have the power to organize at the local and national level. Without the power to organize and educate local and national health care providers, the spread of disease is inevitable. A workforce that is trained to prevent, track, and treat is needed to reduce infection and mortality. When educated workers from peripheral countries migrate to semiperipheral or core countries, the peripheral country becomes more vulnerable to infectious disease outbreaks (Hooper, 2008).

This study analyzed malaria, tuberculosis, polio, and influenza mortality data over the past 60 years. Preventative measures and technological advances over the past 60 years have made it possible to eradicate malaria, tuberculosis, and polio. Preventative measures along with new drugs and treatments for influenza have made it possible to reduce the rate of deaths due to influenza. If world-system theory is accurate, then inequalities between different countries and zones should be observed in the mortality data and these inequalities should grow over time.

Findings

Malaria

Introduction

Malaria is a mosquito-borne disease that can spread rapidly from person to person in areas with high mosquito infestations. Standing, stagnant water where mosquitoes rapidly multiply allows for greater disease spread. Symptoms include fever, chills, lethargy, and body aches. If left untreated, malaria may result in death. The most vulnerable populations are women with reduced immunity due to pregnancy and young children who have yet to develop a fully functioning immune system. The World Health Organization's (WHO) *World Malaria Report 2011* (2011) stated there were approximately 655,000 deaths due to malaria worldwide. Most of these deaths, 596,000, occurred in Africa. Although, globally there has been a reduction in the

number of deaths due to malaria, it is still a leading cause of death in many semiperipheral and peripheral countries. Methods to control and eradicate the disease are possible, but semiperipheral and peripheral countries may not have the money, power, and resources needed to control or eradicate the disease. In 2010, 91% of the global deaths due to malaria were in the African region (Centers for Disease Control and Prevention [CDC], Malaria Worldwide, n.d.). The Southeast Asian region had a rate of 6% and the Eastern Mediterranean region had a rate of 3% (CDC, n.d.). Of the deaths globally, 86% were in children (CDC, n.d.). Cases of malaria reported in core countries have been due to travelers who were infected while in countries where the disease is active. According to the CDC, because there is the potential for disease spread to countries who have not reported recent outbreaks, malaria remains of global concern. Programs to control malaria are multifaceted. Programs include the drainage of standing water and prompt identification and treatment of people diagnosed with malaria. Also, the public should be educated on how to prevent malaria and provided with mosquito netting to prevent bites and spread of the disease. The CDC indicates that countries that have had the means to provide the money, power, and resources to do this have been effective in the control of malaria.

Malaria Mortality Table

Table 4.1 provides malaria mortality data for the countries selected for this study. According to selected countries for this study, core, and semiperipheral countries (except Argentina) reported rates of 0.1 cases per 100,000 in 1950, and now have zero or numbers too small to be reported at the 100,000 rate. The marked rise in the number of malaria cases in Argentina in 2005 was noted and researched to find a possible cause. Maria Juri, Mario Zaidenberg, Guillermo Claps, Mirta Santana, and Walter Almiron (2009) argued that environmental factors are the probable causative factor. From 1950 on, the Argentinean government implemented

measures to prevent outbreaks of malaria. Measures included increased surveillance and treatment of the disease along with measures to control the mosquito population (Juri et al., 2009). Programs were successful and by the late 1990s Argentina reported zero cases of malaria (Juri et al., 2009). Juri et al. argued that in the years 2000 through 2005, increased annual rainfall and unseasonably warm temperatures allowed the mosquito population to increase. The result is shown with the number of deaths due to malaria increasing to 4.1 in 2005. However, Argentina stepped up programs to address the growing number of cases and deaths due to malaria; this has since allowed the numbers to begin to come down (Juri et al., 2009). Likewise, Mexico brought the number of deaths due to malaria down from 85 in 1955 to 0 in 2005, due to an increase in programs to address malaria outbreaks (Bleakley, 2010). The Philippines has seen a decrease, but malaria persists as a health concern. The Philippines reported 2.2 deaths per 100,000 as late as 1995. This is possibly due to its position within the world-system and the tropical climate. Although, it could be argued that other countries in the region with similar climates have been able to control outbreaks of malaria. That would leave only the argument that malaria persists, due to the Philippines' position in the world-system.

Table 4.1

Malaria Mortality Data for Selected Countries

Country	1950	1955	1960	1965	1970	1975	1980	1985	1990	1995	2000	2005
US	0.1	0	0	0	0	0	0	0	0	0	0	0
Australia	0.1	0	0	0	0	0	0	0	0	0	0	0
Sweden	0	0	0	0	0	0		0		0		0
Canada	0.1	0	0	0	0	0	0	0	0	0	0	0
Core	0.1	0	0	0	0	0	0	0	0	0	0	0
Finland	0.1	0	0	0	0	0	0	0	0	0	0	0
Argentina		0	0	0.1	0	0	0	0	0	0		4.1
Bulgaria			0	0	0	0	0	0	0	0		0
Greece			0	0	0	0	0	0	0	0		0
Japan	0.1	0	0	0	0	0	0	0	0	0		
South Africa	0.8	0.6	0.1	0.2	0.2	0.2	0.4	0		0.3		
Semiperiphery	0.3	0.15	0	0.05	0.05	0.05	0.1	0	0	0.05	0	1
Bolivia					1.3	1.3			0			
Egypt		0.1		2.1	0	0.4	0	0	0	0		
India				0	0	0						
Turkey				0	0	0	0					
Burma			38.2	32.6								
Mexico		85	53	0.1	0.1	0	0		0.1	0		0
Philippines		22.7	8	3.3	2.7	2.3	2.3		2.2	2.2		
Periphery		36	33	6.4	0.7	0.7	0.6	0	0.6	0.7		0

Note. Core countries are color coded with red shading, semiperipheral countries are color coded in blue, and peripheral countries are color coded in green. Means were calculated for each year within the zone and are given in the last row of the zone.

Table 4.1 shows the number of cases of malaria per 100,000 by country and year. Line graphs for countries were not included because they did not provide new or additional information. The data had a lot of zeros or no data available and therefore a chart of the countries was not informative. Missing data for listed peripheral countries is a concern. However, if world-system theory is accurate, this would be an expected outcome. Missing data

suggests that the government does not have the money and the resources to collect, store, and report the data which would be the characteristic of a peripheral country. However, a chart of the zones provides some insight and so was included.

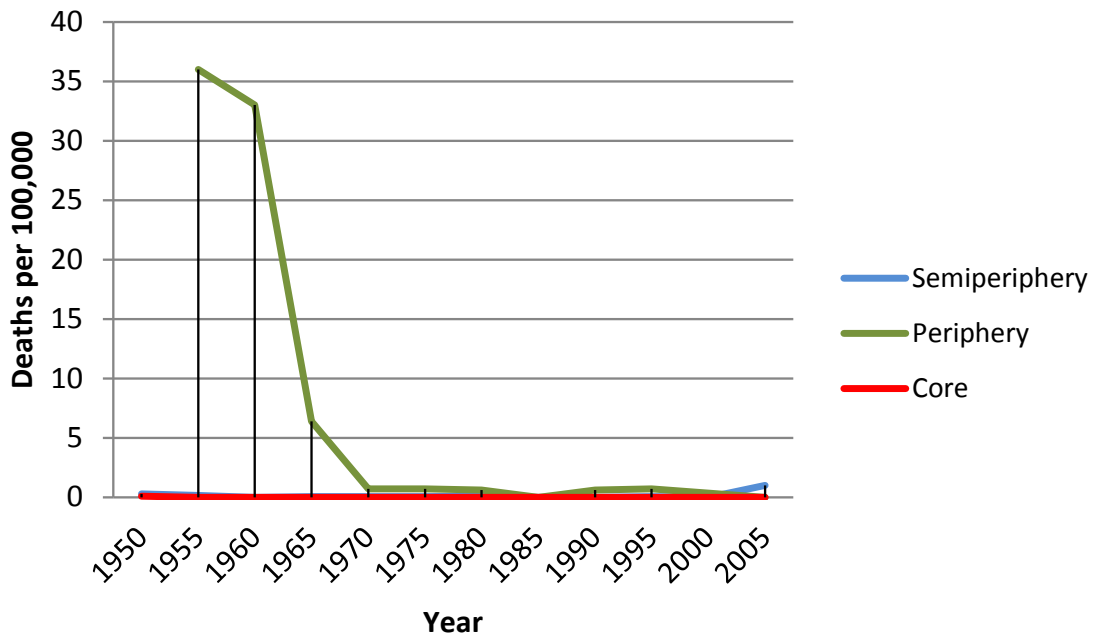


Figure 4.1. Malaria Line Graph of Zones shows the mean number of deaths due to malaria by zone from 1950 to 2005.

Summary

It is possible to control outbreaks of malaria and possibly even to eradicate the disease. From 1950 to 2010, there has been a global reduction in the number of deaths due to malaria.

However, the death rate for malaria in semiperipheral and peripheral countries is not equal to that of core countries. The rate of deaths due to malaria since 2000 fell by 13% in Africa, 12% in the Eastern Mediterranean, 17% in Southeast Asia (CDC, Malaria Worldwide, n.d.). During the same time period, the number of deaths for malaria fell by 48% in the Americas and 100% in Europe (CDC, n.d.), which is a much larger decline. While countries in the periphery and

semiperiphery have seen a reduction in deaths for malaria, the decline was not as significant as it was for core countries. Though the gap between core and periphery for mortality data on malaria has narrowed, inequality in the data suggests partial support for world-system theory.

Malaria is still a significant health issue in semiperipheral and peripheral countries. Randall Packard (1984) argued that there is an association between malaria outbreaks, industrialization, and urbanization. Packard's study found that increased industrialization and the resulting urbanization increased the risk for malaria and subsequently an increase in the number of deaths due to malaria. Industrialization disrupts the natural ecology of the landscape. If rainfall, groundwater, and wastewater are not carefully drained, the resulting standing water can be a source of mosquito infestation. Additionally, crowded conditions of urban environments make for an increased risk of exposure to infected individuals and mosquitoes. Peripheral and semiperipheral countries may not have the money and resources needed to fight this disease effectively. Money is needed for data gathering, storage, and reporting. Money is also needed for water drainage and treatment of sites where mosquitoes might grow. Netting to prevent mosquitoes from biting and treatment for the disease must be available in order to prevent deaths due to malaria. The power to enact legislation within a country to control standing water and address the health issue of malaria is also imperative. Trained medical personnel to address this medical issue in a timely manner are also essential. Peripheral and semiperipheral countries must be given the technology, expertise, and work force to gather accurate data and disseminate the data in order to provide ongoing surveillance of outbreaks of disease and to prevent deaths. Education on how to prevent the disease is also necessary and less expensive than more costly treatment of the disease. Education on draining standing water and the use of mosquito netting

provides preventative options that may provide cost effective methods that can be adopted by peripheral countries and control the spread of malaria.

Polio

Introduction

Polio is a viral infection that cripples, sometimes within hours of the onset of symptoms, and many times results in death. It is estimated that 1 in 200 cases will result in total paralysis and 5% to 10% result in death (WHO Media Centre, Poliomyelitis, n.d.). Children under five years of age are particularly vulnerable. Polio has no cure and the best method of treatment is prevention. With the advent of the Salk vaccine in the early 1950s, eradication of the disease became possible. Core countries have eradicated the disease through preventative vaccine programs. Peripheral countries with persistent cases of polio are Pakistan, Afghanistan, and Nigeria (CDC, Polio, n.d.).

Occasionally, outbreaks occur in other countries due to spread of the disease. In 2010, the WHO officials reported that 23 countries which had been polio free for many years found new cases of polio (WHO Media Centre, Poliomyelitis, n.d.). All of the countries reporting were in Africa, the Middle East or China (WHO Media Centre, Poliomyelitis, n.d.). As stated by the WHO, global eradication of polio will only be successful when financial support is implemented for steps to be taken to interrupt the transmission of the disease, strengthen health systems in order to provide routine immunizations, and systemic surveillance of the disease is maintained. Before a country can be certified as polio free, a country must

- be three years without a report of a polio case;
- meet international standards for surveillance efforts; and
- be able to detect, report, and respond to an imported case of polio (WHO Media Centre, Poliomyelitis, n.d.).

Angola, Chad, and Democratic Republic of the Congo had more than 12 months polio free, but then the disease reoccurred. Usually, this occurs because the disease was imported from another country. This may be due to refugees or travelers who had not been immunized, who were exposed in a country where the disease persists, and then who traveled to another country where they spread disease. Immigration, travel, and movement of refugees across national boundaries have made it more difficult to isolate, treat, and control this disease. According to the WHO, as long as one person remains infected, the virus has the potential to spread to people in other countries (WHO Media Centre, Poliomyelitis, n.d.). All of the countries listed are considered peripheral countries by Arrighi and Drangel (1986). Failure of a country to eradicate the disease may provide a clue to their global position within the world-system.

Polio Mortality Table

Table 4.2 shows the number of polio deaths per 100,000 for the selected countries. By the year 2005, the selected countries in the core and semiperipheral area show zero for the rate of polio mortality data. It is problematic that the United Nations Statistics Division Demographic Yearbook does not give data for the some peripheral countries. However, this is possibly indicative of these countries' position within the world-system. A country must have the money, power, and resources to gather, store, and report data in order to have ongoing surveillance of the disease. Effective immunization campaigns in the countries of the United States, Canada, Australia, and Sweden where the money, power, and resources exist to reduce the number of deaths to zero is apparent in the table. The semiperipheral countries of Finland, Bulgaria, Greece, and South Africa also reduced their number of deaths due to malaria to zero by 2005.

From 1985 through 1995 there was a rise in the number of mortality cases related to polio. Polio had been on the decline and then began to rise again in the 1980s. Whether the rise was

due to growing urbanization and crowded conditions cannot be determined. It could be argued that caregivers for children began to neglect vaccinations for children because of the misconception that polio was eradicated and no longer a concern. With the rise in the number of deaths due to polio, the CDC, the WHO, and other global health leaders began a campaign to increase the number of immunizations given worldwide and decrease the incidence of polio (CDC Morbidity and Mortality Weekly Report [MMWR], 1995). This campaign dramatically reduced the number of cases of polio and subsequently reduced the number of deaths. Between the years of 1985 to 1990, globally, vaccinations increased from 47% to 80% (CDC MMWR, 1995). Between 1985 and 1994, the number of polio cases decreased by 84% (CDC MMWR, 1995).

The WHO (WHO Media Centre, Poliomyelitis, n.d.) stated that the most effective method used to reduce the number of polio cases was the conducting of National Immunization Days. Also, the implementation of increased surveillance was found to be a critical element to eradicate polio. Disease eradication requires a surveillance system that can detect a single case and prevent spread of the disease. Preventing spread of the disease enables intensive and localized vaccinations and continued surveillance. Actions by the CDC, WHO, and other agencies during 1985-1995 brought positive results as evidenced by zero deaths in the year 2005. With public health campaigns designed to raise immunization rates, an increase in the education of parents, and intervening rapidly when new cases are identified, mortality rates are lowered.

Table 4.2

Polio Mortality Data for Selected Countries

Country	1955	1960	1965	1970	1975	1980	1985	1990	1995	2000	2005
US	0.9	0.3	0	0	0	0	2.3	3.2	3.7		0
Australia	1.3	0	0	0	0	0	0	2	2.4		0
Sweden	3	0.2	0	0	0		0		4.8		0
Canada	1	1	0	0	0	0	1.6	1.8	1.9		0
Core	1.55	0.4	0	0	0	0	1	2.3	3.2		0
Finland	0.6	0.4	0	0	0	0	0	1.4	1.4		0
Bulgaria		0.3	0	0	0	0	1.5	1.4	1.4		0
Argentina		3.1	3.1	0.1	0.1	0	5.5	5.1	3.9		
Greece		0.3	0.1	0.1	0	0	2.3	0.5	0.8		0
South Africa	0.3		0.1		0.1	0.1			2.4		0
Semiperiphery	0.5	1	0.7	0.1	0.04	0	2.3	2.1	2		0
Bolivia				0.6	0.6			0.6			
Egypt		0.4	0.5	0.3	0.3	0.3	6.5	5.4	5.4		
China			2.7								
India			0.9	0.9	0.9						
Turkey		0.1	0.2	0.13	0						
Burma		0.6	0.2								
Mexico			0.5								
Philippines			0.6	0.6							0
Periphery		0.4	0.8	0.5	0.5	0.3	6.5	3	5.4		0

Note. Core countries are color coded with red shading, semiperipheral countries are color coded in blue, and peripheral countries are color coded in green. Means were calculated for each year within the zone and are given in the last row of the zone.

Line Graph of Zones

As with malaria, there is limited data to create line graphs for countries and zones. Although, missing data for listed peripheral countries is concerning, however, if world-system theory is accurate this would be an expected outcome. Money and resources to collect, store, and report the data is essential in order for peripheral countries to be able add to the Demographic Yearbook database.

The spike in the number of reported polio cases in all three zones can be seen in Figure 4.2, Line Graph of Zones. Figure 4.2 also shows the reduction in the number of mortality cases due to polio by the year 2005. What cannot be seen in Figure 4.2 is the persistence of polio in peripheral countries. This information was obtained from literature review.

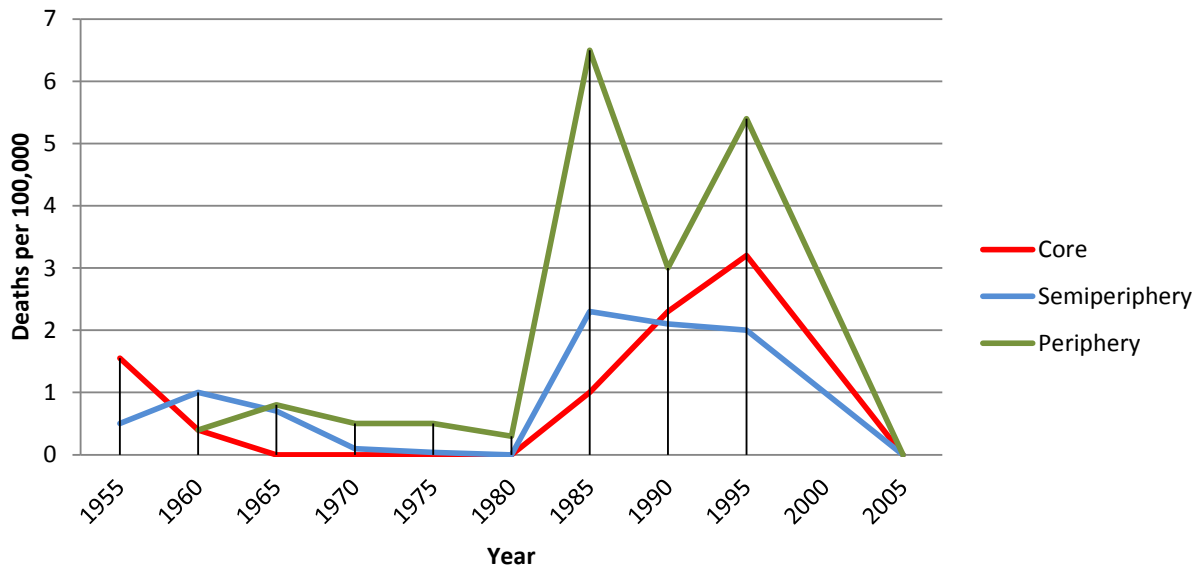


Figure 4.2. Polio Line Graph of Zones shows the mean number of deaths due to polio by zone from 1955 to 2005.

Summary

Challenges remain related to the global eradication of polio. Globally, deaths due to polio are reduced. Total eradication of polio is possible. Although the technology exists to eradicate this disease, polio persists as a major health concern. As long as one case exists in the world, the potential for future outbreaks exists. It is for this reason that polio has become a major focus for the WHO and other agencies that seek to eradicate polio (CDC MMWR, 1995). Currently, the number of deaths due to polio is down, but a difference in the number of cases between core, semiperipheral, and peripheral countries exists.

Medically, vaccine is the best preventative measure against the disease. We need to increase actions to eradicate polio in countries with persistent cases. An increase in surveillance, especially in countries where polio persists, will add to the effectiveness in preventing future outbreaks. This will allow for prompt treatment and vaccination in the local community.

Money, power, and resources to provide ongoing surveillance, vaccines, and education may not be available in peripheral countries. Money, power, and resources that are pulled from periphery to the core will increase the number of polio cases and be reflected in the polio mortality data. Disruption in the acquisition and distribution of vaccines allows the polio virus to continue to spread. If the vaccine is not stored and distributed appropriately then polio outbreaks will persist. Organized efforts must be implemented on the local, national, and global level to prevent this global threat (CDC MMWR, 1995).

Tuberculosis

Introduction

Tuberculosis is caused by a bacterium that primarily infects lung tissue. The tuberculosis bacterium can also infect the kidneys, spine, and brain (CDC, Tuberculosis, n.d.). Symptoms include cough, pain in the chest, coughing up blood, fatigue, weight loss, fever, and night sweats. When left untreated, tuberculosis can be fatal. Tuberculosis is an airborne illness that is spread through close encounters with exposure to droplets of sputum or saliva. Coughing, sneezing, speaking, or singing can spread the disease from one person to another. Not everyone who is exposed and contracts the tuberculosis bacterium will become ill. Those who are exposed may develop a latent tuberculosis infection, where they carry the organism but are not ill and cannot spread the infection. If their immune system is compromised, however, they may convert to the

active form of the disease and can spread the disease to others. Individuals infected with the Human Immunodeficiency Virus (HIV) are at increased risk of acquiring active tuberculosis.

In today's world, tuberculosis is the second most deadly infectious disease. It is second only to HIV (WHO Media Centre, Tuberculosis, n.d.). According to the WHO Media Centre, in 2011, tuberculosis killed 1.4 million people around the world and left 10 million children orphaned. Out of the number who died from tuberculosis, 95% live in peripheral countries (WHO Media Centre, Tuberculosis, n.d.).

Tuberculosis Mortality Table

Table 4.3, Tuberculosis Mortality Data for Selected Countries, indicates that, globally, deaths due to tuberculosis are on the decline. New methods to diagnose and treat tuberculosis have improved outcomes for many infected with tuberculosis. In 1950, tuberculosis killed approximately 20 people per 100,000 in the United States, Australia, Sweden, and Canada. By the year 2005, the number of deaths had dropped to below one per 100,000. At this same time, peripheral countries are all well above this number. In the 60-year span listed in the table, peripheral countries never recorded a value below 2.6. All countries show a steady downward trend, except for Egypt, which had values that increased between 1950 and 1960. There was a dip in 1965, and then the value increased in 1970. This up-and-down trend can likely be attributed to Egypt's unstable political climate and the influx of refugees from neighboring countries with political unrest. A stable political and social environment increases the likelihood of accurate data being collected, analyzed, and used to track disease outbreaks. Also, the capacity of a country to effectively respond to disease outbreak is related to the infrastructure in place and trained personnel with the knowledge to respond in a timely manner.

Instability in the political climates of neighboring countries also affected the data in South Africa. Depending on political stability of neighboring countries, South Africa had refugees flee into their country and may have been counted in the South African data. The arrival of refugees did not add to the reliability of the data for South Africa. It could be argued that the influx of refugees added to the potential exposure of native South Africans, however, this cannot be confirmed. Due to the potential of inaccuracy in the data for South Africa, South African mortality statistics for tuberculosis were not included in the averaging of numbers for the semiperipheral countries.

Japan started at 168 deaths per 100,000 in 1950. Although Japan is in the semiperiphery, it was able to bring the number down to 2.1 in the year 2000. After World War II, Japan received economic and political support and was able to restore social order and recover from the devastation of war. Social stability was restored, and money, power, and resources were put in place to implement actions necessary to bring down the number of deaths due to tuberculosis. This is evidenced by a tuberculosis mortality rate of 168 in 1950 that dropped to a rate of 2.1 in the year 2000.

It is unclear why Mexico had a rise in the number of mortality-related deaths due to tuberculosis in 1955, but it may have been linked to their rising rate of diabetes. The literature reveals that diabetic patients are at greater risk of acquiring tuberculosis (Restrepo, Camerlin, Rahbar, Wang, Restrepo, Zarate, Moar-GuzAin, Crespo-Solis, Briggs, McCormick, & Fisher-Hoch, 2011). Diabetics are more susceptible to a tuberculosis infection due to a compromised immune system.

Table 4.3

Tuberculosis Mortality Data for Selected Countries

Country	1950	1955	1960	1965	1970	1975	1980	1985	1990	1995	2000	2005
US	15	12.4	13.2	8.6	3.2	1.6	1.3	0.8	0.8	0.6	0.5	0.3
Australia	14.1	11.2	5.6	3.7	1.8	1		0.8	0.3	0.2	0.2	0.2
Sweden	25.8	14.4	15.8	5.8	9.2	4.5	3.1	1.9		0.5	1.2	0.2
Canada	21.7	10.4	11	3.6	5	1.8	1.8	0.5	0	0.4	0.5	0.3
Core	19.2	11.4	11.4	5.4	4.8	2.2	2.1	1	0.4	0.4	0.6	0.3
Finland	20.1	44.6	28.6	14.8	9.8	6	5.8	3.4	2	1.5	2.2	0.5
Bulgaria			20.6	14.2	11.2	6.5	5.4	3.8	2.6	3.8	3.7	3.4
Japan	168	33.4	35.6	23.6	8.4	5.3	7.2	4.1	2.9	2.5	2.1	
Argentina		36.8	39.4	39.8	15	15.7	7.4	6.6	4.4	3.7	2.9	1.9
Greece			18	14	9.6	7	5.3	2.9	1.9	1	0.7	0.7
South Africa	15.6	20.4	52	39.4	56.2	22.2	57.3			18.9	32.3	
Semiperiphery	94.1	38.3	28.4	21.9	10.8	8.1	6.2	4.2	2.8	2.5	2.3	1.6
Bolivia					32	32						
Egypt		36	43.4	18	20.8	15	5.6	4.6	2.6	2.6		
Turkey			47.6	28.8	17.6	13						
India				82.6	82.6	82.6						
Burma			94	94								
Mexico		37.2	60.4	50.2	18.8	15.8	13.1	8.5	8.3	5.4	4.4	2.9
Philippines		107.2	90	79.2	77.8	75.2	72.4		55.2	55.2	38.1	
Armenia										3.1	4.1	4.8
Periphery		60.1	67.1	58.8	41.6	38.9	30.4		22	16.6	15.5	3.9

Note. Core countries are color coded with red shading, semiperipheral countries are color coded in blue, and peripheral countries are color coded in green. Means were calculated for each year within the zone and are given in the last row of the zone.

Line Graph of Countries

Figure 4.3 represents the tuberculosis line graph for countries. It can be seen that there is a downward trend for all countries selected. The peripheral country of the Philippines has consistently had the highest rate; however, the rate has shown a consistent downhill trend. South

Africa's rate can be seen to be inconsistent and, as discussed, this may be due to variations in data gathering and the influx of refugees from neighboring countries. Mexico had a rise in 1955 but appears to have declined to near the level of core countries.

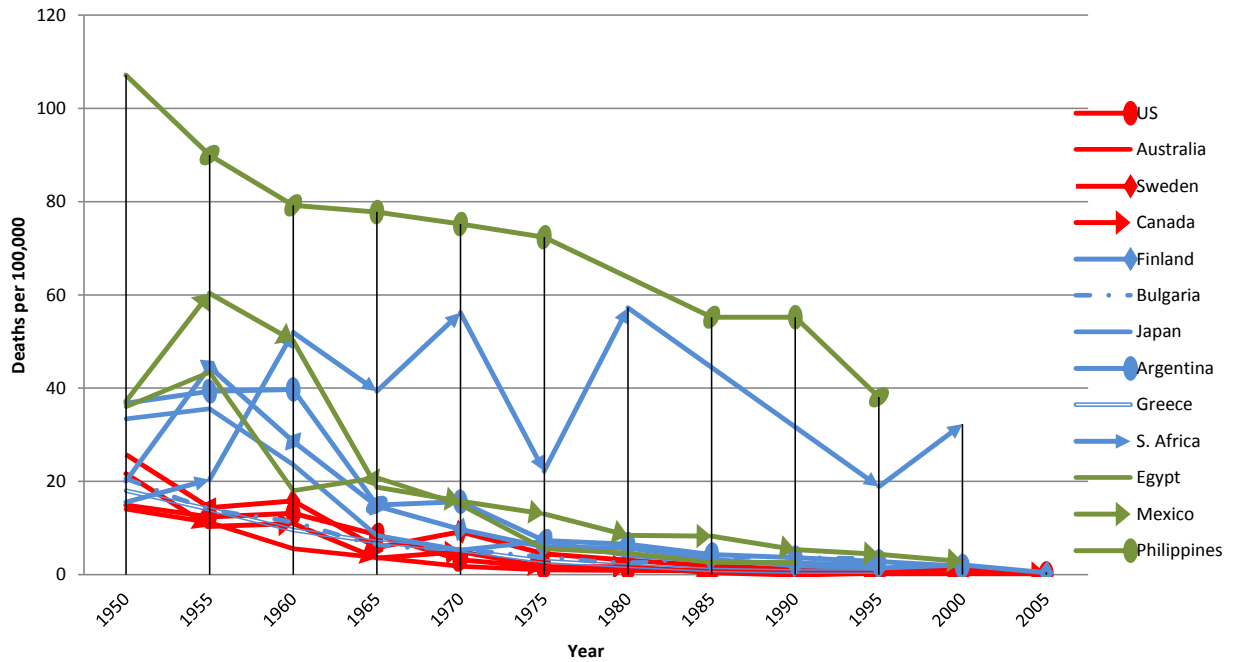


Figure 4.3. Tuberculosis Line Graph for Countries indicates the mortality rate from tuberculosis for selected countries from 1950 to 2005.

Line Graph of Zones

As shown in Figure 4.4, Tuberculosis Line Graph for Zones, mortality data for tuberculosis narrowed between 1950 and the present. However, mortality data for peripheral countries remains stubbornly high and about the level that the core achieved in 1950. In the core, tuberculosis deaths have steadily declined, and the rate is low and flat. The semiperiphery is also declining and is near the level of the core. Peripheral countries remain the highest and are indicative of their status within the world-system.

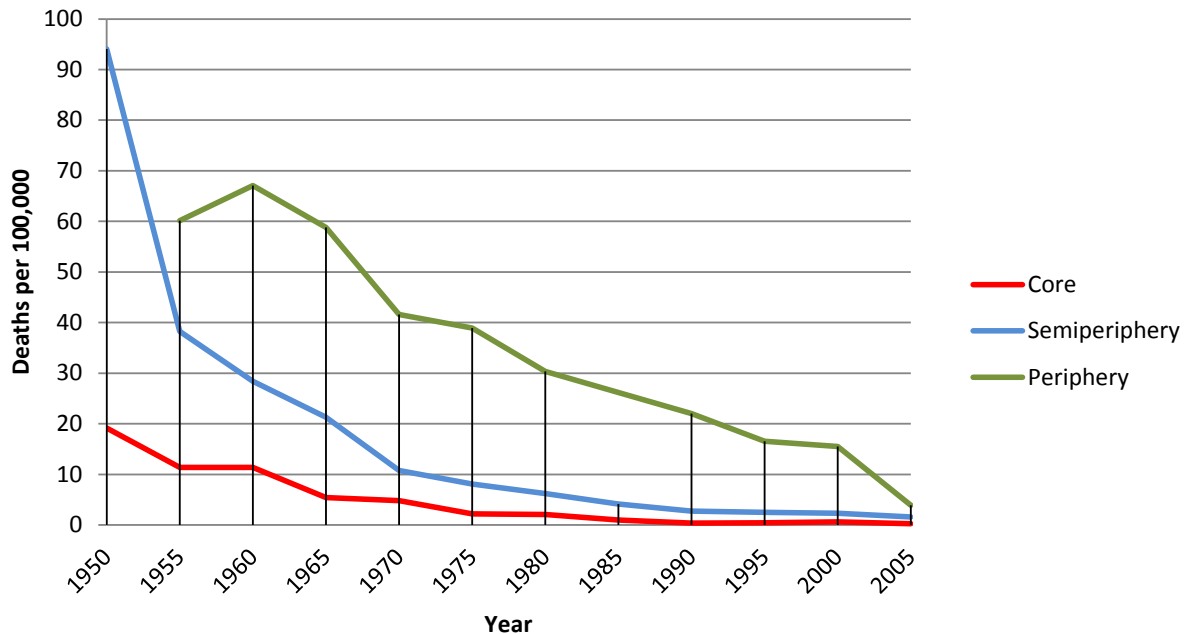


Figure 4.4. Tuberculosis Line Graph of Zones shows the mean number of deaths due to tuberculosis by zone from 1950 to 2005.

Summary

As with malaria and polio, it is possible to eradicate tuberculosis. Having the money, power, and resources to accomplish the eradication of tuberculosis is complex and difficult.

Globalization spreads tuberculosis and HIV due to the ability of infected individuals to travel more than in the past and spread the disease. Urbanization with resultant crowding of individuals together in inner cities aids the spread of diseases such as tuberculosis. Additionally, antibiotic-resistant strains of the tuberculosis bacillus have emerged and made the eradication of tuberculosis more difficult. According to the WHO, the formation of antibiotic-resistant forms of tuberculosis occurs when there is inappropriate treatment, incorrect use of anti-tuberculosis drugs, or use of poor quality drugs (WHO Media Centre, Tuberculosis, n.d.). More virulent forms of the disease are most likely to form in peripheral and semiperipheral countries where drugs used to treat tuberculosis are not stored and dispensed properly. This may occur for

multiple reasons including lack of trained personnel, lack of medication, and/or non-existent equipment to store and maintain the quality of the medication.

It may prove difficult to eradicate tuberculosis given the rise of HIV. HIV and tuberculosis will often occur in the same individual. HIV lowers the ability of the immune system to fight off infections and leaves HIV-positive individuals susceptible to acquiring a secondary tuberculosis infection. It is estimated that one third of those living with HIV are also infected with tuberculosis (WHO Media Centre, Tuberculosis, n.d.). Health care providers in many peripheral countries lack the ability and funding to provide close surveillance, support, and treatment of people with HIV and tuberculosis. This greatly reduces the ability of peripheral countries to lower the incidence of tuberculosis and eradicate this disease. This suggests that while the gap between core and peripheral countries has narrowed, they are unlikely to close, which means that significant inequalities will remain.

Urbanization increases the likelihood of spread of the tuberculosis bacillus. Tuberculosis is spread through the air. In the cramped living quarters common to urban areas, the disease can rapidly spread. Those with compromised immune systems, such as individuals with HIV, diabetes, malnutrition, or people who use tobacco are at greater risk (WHO Media Centre, Tuberculosis, n.d.). Early symptoms of tuberculosis include a cough, night sweats, fever, and weight loss. Early treatment may be delayed due to lack of access to care which can result in transmission of the disease to others living and working in close proximity. Without treatment, two thirds of people who are infected will die. Peripheral countries account for 95% of tuberculosis-related deaths (WHO Media Centre, Tuberculosis, n.d.).

Because tuberculosis is a disease that has been around for many years, drugs to treat tuberculosis have also been used for decades. Over the decades, the tuberculosis bacillus has

developed a resistance to many of these drugs. Multidrug-resistant tuberculosis (MDR-TB) results in greater risk of ineffective treatment and greater spread of the disease. Treatment for MDR-TB may require up to two years of treatment and incurs greater cost. In the past, Asia has had the greatest number of cases of tuberculosis. Sub-Saharan Africa now has the greatest proportion of new cases per capita. According to Dermot Maher, Anthony Harries, and Haileyesus Getahun (2005), sub-Saharan Africa shares the largest burden of disease in the world for HIV and also for tuberculosis. The link between HIV and tuberculosis could make it very difficult to eradicate tuberculosis in this region.

Many peripheral countries still rely on the long-used sputum smear to detect the tuberculosis bacillus. New but expensive equipment is available to detect multidrug-resistant forms of the tuberculosis bacillus in its earliest stages. Treatment involves use of equipment to detect the tuberculosis bacillus, a six-month course of drugs, ongoing support, supervision, and surveillance by trained personnel to insure treatment compliance and disease control. Trained lab technicians, familiar with newer methods to detect the tuberculosis bacillus, must be present in the peripheral countries in order to detect the disease in the earliest stages. Without the money, power, and resources to provide the equipment, drugs, and trained personnel, control of tuberculosis in peripheral countries will not occur, and the gap between core and periphery will likely not close.

Influenza

Introduction

Influenza is a viral infection that primarily affects the respiratory system (CDC, Influenza n.d.). Most cases will result in mild-to-severe illness, though some cases result in death. Those most vulnerable to death due to influenza are the elderly, the very young, and those with

compromised immune systems. Prevention of the disease is accomplished with yearly flu vaccine, hygiene, and staying away from those with active cases. The virus is spread through the air by coughing, sneezing, and talking. Spread of the disease can also occur by touching articles that have been in contact with someone with an active case of influenza. Influenza is highly contagious and may be spread even when a person is symptom-free. Outbreaks of the disease occur most often during winter months when people are in close contact due to the cold weather. Treatment includes symptom relief and in severe cases antiviral drugs may be used. Antiviral drugs are costly and may not be affordable or available to many people in the world.

Influenza Mortality Table

Table 4.4, Influenza Mortality Data for Selected Countries, does not indicate marked differences between countries or zones. Lack of data in the peripheral countries was troubling. This could be indicative of a lack of resources to collect, store, and analyze the data. Deaths due to influenza may also have had other causes of death. This occurs when the body is weakened due to flu and a secondary infection occurs, resulting in death. The death may then be attributed to the secondary infection, especially pneumonia. Occasional outbreaks of influenza, such as in Greece in 1965, can be seen, but their rates are lower by 1975. Overall, deaths due to influenza appear to be lower than in the past for the countries selected and in all zones.

In the case of influenza, the data suggest that the gap between core and peripheral countries has narrowed and closed. This does not support world-system theory. In fact, core countries have a higher mortality rate than peripheral countries. This is possibly due to the ability of people in the core traveling and being exposed to a greater degree. Also, because most people will survive when infected with influenza, and inexpensive antibiotics for secondary infections are used, more people are surviving. Possibly, greater education about hygiene and hand

washing to prevent the spread of influenza has been of benefit. Certainly, education is inexpensive and something that poor peripheral countries can use to decrease the number of influenza cases.

Table 4.4

Influenza Mortality Data for Selected Countries

Country	1950	1955	1960	1965	1970	1975	1980	1985	1990	1995	2000	2005
US	3.5	6	1.6	0.9	3.5	1	1.9	0.3	0.8	0.4		0.3
Australia	4.9	2.1	6.9	2.7	1.7	1.1		0.7	1	0.7		0.3
Sweden	4.6	4.8	4	4.2	3.7	2.3		0.8		6.5		2.2
Canada	8.8	3.4	7.3	1.6	3.5	2.6	2.2	0.8	0.7	0.8		0.7
Core	5.45	4.08	4.95	2.35	3.1	1.75	2.05	0.65	0.83	2.1		0.86
Finland	2.6	29.4	4.7	1.9	4.9	6	3.8	2.4	1.5	2		0.1
Argentina		1.7	0.8	0.8	2	3	0.5	0.2	0.1	0		0.1
Greece			13.3	21.9	9.7	2.9	2.8	1.5	0	0		0
Japan	0.6	3.1	1.1	0.6	2	1.1	0.6	0.2	0.1	0.1		
South Africa	3.5	3.7	3.5	3.9	2.5	2.3	5.7			0.3		
Semiperiphery	1.6	11.4	4.98	6.3	4.65	3.25	1.93	1.08	0.43	0.53		0.07
Burma			0.2	0.3								
Bulgaria			73.9	2.5	23.7	2.8	2.7	4.2	0.4	0.5		0.1
Bolivia					9.2	9.2						
Egypt		0.6	0.2	0.1	0	0.12	0.5	0.2	0	0		
India				0.6	0.6	0.6						
Turkey			0.8	0.2	0.15	0.7						
Mexico		11.7	27.4	20.4	13.2	12.8	8.9	2.6	0.9	0.3		0
Philippines		19.5	23.4	5.4	5.8	7.1	6.4		3	3		
Periphery		10.6	25.14	4.87	7.52	4.76	4.63	2.33	1.08	0.95		0.05

Note. Core countries are color coded with red shading, semiperipheral countries are color coded in blue, and peripheral countries are color coded in green. Means were calculated for each year within the zone and are given in the last row of the zone.

Line Graph of Countries

Figure 4.5 represents the influenza line graph for countries. Analysis of the line graphs for countries show that mortality deaths due to influenza are down within all countries. In 1955, it

appears that an influenza outbreak occurred in the peripheral and semiperipheral countries of Mexico, the Philippines, and Greece. Australia and Canada had an outbreak in 1960, but with fewer deaths. Sweden, likewise, had an outbreak in 1995. It is noted the greatest number of deaths occurred within peripheral and semiperipheral countries in the early 1950s. However, deaths overall have decreased over the past 60 years. Egypt has continuously had a low rate. Possible reasons for this are unclear and bear further investigation.

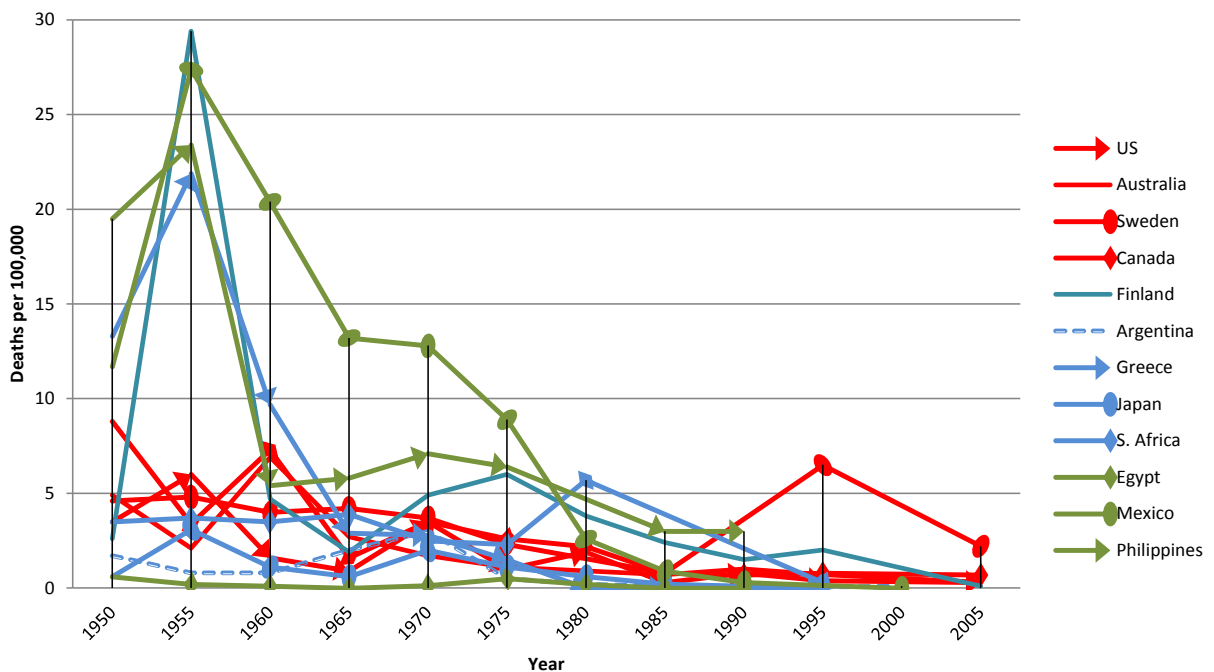


Figure 4.5. Influenza Line Graph for Countries indicates the mortality rate from influenza for selected countries from 1950 to 2005.

Line Graph of Zones

In core, semiperipheral, and peripheral countries alike, influenza trends since 1950 show deaths due to influenza have diminished. In 1950, peripheral countries had the highest number of deaths and the core had the lowest. Peripheral countries were higher than core and

semiperipheral countries until the mid-1980s when the numbers began to drop. Currently, peripheral countries have the fewest number of deaths and the core has the highest number. Increased travel and the advent of super viruses due to overuse of antibiotics on the part of the core may provide a rational explanation for the higher rate.

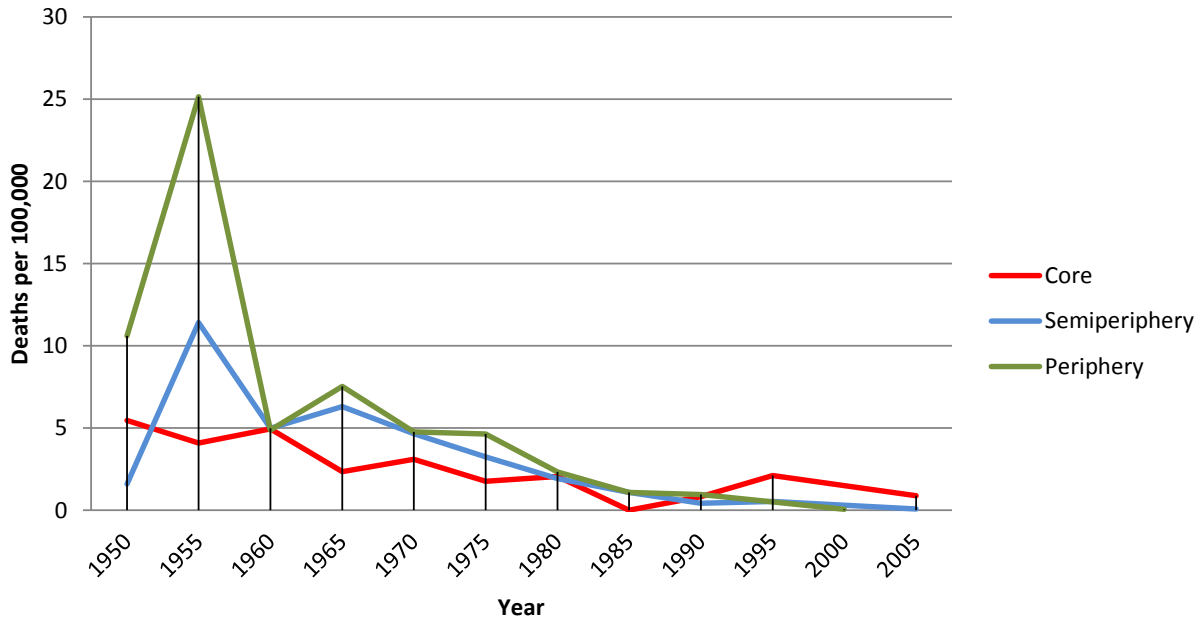


Figure 4.6. Influenza Line Graph of Zones shows the mean number of deaths due to influenza by zone from 1950 to 2005.

Summary

Based on available data it appears that mortality data for influenza has closed for core, semiperipheral, and peripheral countries. Although overall mortality data is low for all countries, virologists warn of the potential for the emergence of a "super influenza bug" that will rapidly spread globally and result in deaths worldwide. One reason given for the rapid spread of influenza is the availability of travel that allows for an infected person to travel to numerous countries within hours. An example of this is the outbreak in the early 1990s of SARS which

was spread globally by airline travelers. A rational reason for the mortality data to be higher in core and lower in peripheral countries could be due to travel. International travel and changing land use have increased the spread of viruses (Smith et al., 2007). Education regarding practices to prevent the spread of the disease must be shared by all in order to prevent the spread of the disease in an ever-globalizing world where travel between countries is common. Still, peripheral countries would be very vulnerable to an influenza outbreak because they would lack the economics, resources, and the power needed to address a superbug infection.

Summary

Like the biblical horseman of the apocalypse, pestilence, in the form of infectious diseases, continues to plague mankind. According to the study by Smith et al. (2007), changing land use and alterations in agriculture increase the risk for zoonotic spread of disease such as malaria. Smith et al. (2007) continue by arguing that malaria will increase and spread due to global warming and growing industrialization.

Findings from selected infectious disease mortality data reveal that the rate for infectious diseases is drawing downward across the world. The gaps among infectious disease rates in the core, semiperipheral, and peripheral countries have narrowed, but gaps remain nonetheless. Findings on influenza presented a different picture than polio, malaria, or tuberculosis. Mortality rates for polio, malaria, and tuberculosis in the periphery fell, but they still remained higher than in the core. In the case of influenza, the core was higher than the periphery. This could be due to the greater amount of travel by the core and the rapid spread of influenza through travel. Although the gaps between the core and the periphery have narrowed, they have not closed; nor are they likely to do so.

The complete eradication of polio, tuberculosis, and malaria has not been accomplished in the periphery and semiperiphery, despite the existence of drugs and the knowledge to eradicate these diseases. Peripheral and semiperipheral countries have been unable to eradicate these diseases, and without the money needed to fund programs to provide data gathering, storing, and analysis, and to provide timely, economical, and sustainable prevention and treatment of disease, they will be unable to eradicate them. Many of these diseases are developing more virulent strains and have a greater resistance to drugs. When drugs, vaccines, and antibiotics are not stored, distributed, and dispensed properly this adds to the development of more virulent strains. Power must be given to peripheral countries to enact legislation and programs that fit within their cultural and economic framework if programs are to be effective and sustainable. Also, environmental degradation, which is prevalent in many industrializing countries and urban settings, perpetuates unclean conditions that lead to unhealthy living conditions and increases the risk for disease. Peripheral countries need the power, autonomy, and freedom from adverse consequences in order to enact legislation that prevents environmental degradation and in turn prevents the spread of disease. Additionally, trained personnel must be supported in order to stay within the peripheral country and provide services. By whatever means, trained personnel are the most valuable resource that must be present in order for eradication of these diseases to occur. Prevention is cheaper than treatment of the disease. Prevention is the key for preventing rising mortality data for infectious diseases. Education as a preventative measure is often cheaper and easier to implement over the use of newer technological interventions.

In order to track the findings from this study, I will score the mortality data on whether the findings support world-system theory. Table 4.5 represents the scorecard that will be used. If the findings support world-system theory I will give the findings a "+" (plus). If they do not

support world-system theory, a score of "-" (minus) will be given. The first column will show whether or not the data finds inequalities between core and peripheral countries. The second column will show whether or not the data finds deteriorating conditions in the periphery.

From the findings, I have determined that there is little or no support for Wallerstein's world-system theory with the criteria of infectious diseases. Mortality rates are going down for all of the infectious diseases that were identified for this study. A weak gap exists between core and periphery for malaria, polio, and tuberculosis. The core has a higher mortality rate for influenza and certainly does not support world-system theory. I chose to give both columns a minus for the criteria of malaria, polio, and influenza because these infectious processes are persistent in all countries. I did not feel that they support world-system theory. I gave the criteria of polio a plus because polio has been eradicated in all but three countries. The three countries are all peripheral countries. The support is weak, but, since it is possible to eradicate polio and three peripheral countries have not done so I felt there was weak support for world-system theory.

Table 4.5
Score Card for Infectious Diseases

Endemic Danger		Inequalities Between Core and Periphery	Deteriorating Conditions for Periphery
Infectious Disease	Malaria	-	-
	Polio	+	+
	Tuberculosis	-	-
	Influenza	-	-
Total		1 to 3	1 to 3

Note. Column 3: + Inequalities persist between core and peripheral countries.
 - Inequalities do not persist between core and peripheral countries.
 Column 4: + Conditions in peripheral countries are deteriorating.
 - Conditions in peripheral countries are not deteriorating.

CHAPTER 5 - Findings: Chronic Disease

Overview

Chronic disease mortality rates are increasing in peripheral countries. Peripheral countries suffer the greatest negative impact from chronic disease and, therefore, this issue demands greater attention (Magnusson, 2007). Although death rates for most infectious diseases are down in the periphery, mortality rates for chronic diseases are on the rise. In this study, I examined the following chronic diseases: diabetes, cardiovascular disease, and cancer. Since World War II, chronic disease mortality data has changed. Technology to diagnose and treat chronic disease has improved. This has created the expectation that early diagnoses, education, and treatment of the chronic disease will occur and lead to a decrease in the mortality data. However, this has not always been true.

Technological development has led to many advantages. However, along with the benefits must come the risks. According to Ulrich Beck (2004), risk is inherent in our current society for poor and affluent alike. Greater industrialization and urbanization in peripheral countries, in an attempt to promote development, leads to greater soil, water, and air degradation and increases the risk for cancer. This risk is heightened in peripheral countries due to their inability to legislate protection of the environment and safety in the manufacturing process. Polluted air, lead-painted toys, and contaminated water used in manufacturing are just a few of the examples. The floods in Hungary in October of 2010 provide an example where toxic waste spilled into waterways, spread, and increased health risks for all. Although core, semiperipheral, and peripheral are all affected by the pollutants, it is the peripheral countries who have found it difficult to meet the health care demands of a growing population of individuals who are

diagnosed and will eventually die from the effects of environmental contamination and related cancers (Fort, Mercer, and Gish, 2004). Additionally, globalization and the resulting industrialization and urbanization have resulted in a decrease in green space and subsistence gardens (Fort, etal, 2004). This has stimulated a change in dietary habits in many countries where fast food and over-processed foods have become the norm. These foods are fat- and sugar-laden, and may lead to obesity and in turn chronic disease such as diabetes and cardiovascular disease (Fort, etal, 2004).

Findings

Cancer

Introduction

Cancer results when there is rapid and uncontrolled growth of abnormal cells. Cancer can develop in any part of the body and spread into neighboring tissue or throughout the body. Risk factors include a genetic predisposition and exposure to external agents that alter a cell's growth pattern. A person may be exposed to the external agent through their lifestyle, such as with smoking, or in their home or work environment. Early detection and treatment are the primary measures to prevent death. Treatment includes surgery, radiation, or chemotherapy to remove or kill the cancerous cells.

Worldwide cancer is a leading cause of death; 7.6 million deaths occurred from cancer in 2008 (World Health Organization [WHO], Cancer, n.d.). It is for that reason that it was chosen for this study. Seventy percent of all cancer deaths in 2008 were in semiperipheral and peripheral countries (WHO, Cancer, n.d.). Cancer deaths are predicted to rise worldwide with an estimated number of deaths of 13.1 million in the year 2030. As stated by the WHO, deaths due to cancer can be greatly reduced by systematically using the extensive knowledge and

technological interventions that are currently available (WHO, Cancer, n.d.). Education on how to avoid exposure to cancer-causing agents that are known to cause cancer is the first step. Secondly, cancer deaths are reduced through early detection by trained personnel with resulting treatment. The prevention of environmental degradation is also essential for lowering the potential for exposure to cancer-causing agents. In order for preventative and treatment initiatives to occur the WHO initiated its Noncommunicable Diseases Action Plan (WHO, Cancer, n.d.) which includes the following criteria:

- Increase political commitment for cancer prevention and control;
- Coordinate and conduct research on the causes of human cancers;
- Develop scientific strategies for cancer prevention and control;
- Generate new knowledge, and disseminate existing knowledge to facilitate the delivery of approaches to cancer control;
- Develop standards and tools to guide the planning and implementation of interventions for prevention, early detection, treatment, and care;
- Facilitate broad networks of cancer control partners and experts at global, regional, and national levels;
- Strengthen health systems at national and local levels to deliver care for cancer; and
- Provide technical assistance for rapid, effective transfer of best practice interventions to developing countries.

Cancer Mortality Table

According to the WHO (Cancer, n.d.), cancer will continue to be on the rise in the years to come. This is due to a variety of reasons. People are living longer; therefore, the potential for exposure to a cancer-causing agent increases. Also, as we age, the body begins to lose the ability to defend itself from outside agents and to do the necessary repairs after exposure. The consequence of the body's inability to be as efficient with repair work may be cancer.

Additionally, growing industrialization and urbanization resulting in environmental degradation adds to toxic buildup in the air we breathe, the land used for agriculture, and the water we use for drinking and bathing. It would be expected that greater exposure to cancer-promoting toxins would result in growing numbers in the mortality data over the past 60 years. Therefore, it is not surprising that the findings from this study concur with the WHO's predictions. The findings for this study show that cancer mortality rates have risen globally over the past 60 years. Although global mortality rates have risen, cancer mortality rates are lower in peripheral countries than in core countries. Numbers for semiperipheral countries are between the numbers for core and periphery, which would be expected. This is possibly due to the greater amount of industrialization and urbanization in core countries. If this is true, it would explain the increase in core countries and why the rates in peripheral countries increase as they become more industrialized.

Table 5.1 depicts cancer mortality data for selected countries. Core countries show the greatest variance in their rates. In the United States, until 2000 there was a steady rise in the rate to 233 per 100,000. From 2000 to 2005, the rate decreased to 193. Despite a steady increase in Australia's rate to 215 in 1995, Australia's rate dropped to 92 in 2000, and then rose sharply to 188 in 2005. This drop from 215 to 92 could be due to a fluke in the data. Therefore, it is important to look at the overall trend, which is increasing. Likewise, Canada and Sweden's rates fell in 2000 then moved slightly upward in 2005. New technological advances to diagnose and treat cancer may be the reason for the fall and rise of the cancer mortality rate throughout the years for core countries. Core countries would have the greatest access to the research, diagnosis, and treatment needed for decreasing the mortality rate for cancer. It is also noted that

the mortality data for cancer for peripheral countries has yet to reach the level of core countries in the 1950s.

Table 5.1

Cancer Mortality Data for Selected Countries

Country	1950	1955	1960	1965	1970	1975	1980	1985	1990	1995	2000	2005
US	134.9	144.7	147.1	151.3	159.4	170.5	181.9	213.3	225.5	233	200.2	193
Australia	125.4	130.5	131.6	136.2	141.1	147.7		152.4	204	215	92.5	188.4
Canada	124.3	129.8	127.5	133	140.5	149.5	158.4	204.5	223.7	223.2	195.8	207.5
Sweden	140.9	163.6	174.5	191	195.3	228.5		231.9		263	238	238.9
Core	131.4	142.2	145.2	122.9	159.1	174.4	170.2	147.2	217.7	233.6	181.6	207
Finland	119.6	148.7	151.5	159.1	164.4	172.2	179.8	194.4	176.9	174.1	197.2	254.7
Bulgaria			103.7	132.8	134.5	139.6	142.7	176.5	173.9	214.8	193.7	207.9
Japan	71.5	82.6	98.1	107.5	114.2	122.7	131.6	160	181.3	204.5	114.8	
Argentina		115.7	120.4	121.9	147.9	160.1	150.1	134.5	123.6	171.9	145.7	145
Greece			95.4	114.3	128.2	151.1	168.8	196.6	175.8	227.4	213.3	230
South Africa	107.8	124.8	50.8	83.4	86	105.2	234			44.8	58.7	
Semiperiphery	95.55	115.7	113.8	127.1	137.8	143.4	154.6	172.4	166.3	198.5	172.9	209.4
Bolivia					11.4	11.4			37.1			
Egypt		21.6	25.5	31.1	22.1	20	18.7	17	20.1	20.1		
Turkey			19.4	18.7	21.2	20.7						
Burma			30.1	23.9								
Philippines		7.9	15.3	20.5	23.1	30	30.4		31.5	31.5	41.8	
Mexico		28	35.1	36.8	35	35.8	36.3	33.7	38.3	41.5	54.4	57.4
Periphery		19.2	25	26.2	18.3	23.6	28.5	25.4	31.8	31	48	57.4

Note. Core countries are color coded with red shading, semiperipheral countries are color coded in blue, and peripheral countries are color coded in green. Means were calculated for each year within the zone and are given in the last row of the zone.

Line Graph of Countries

Figure 5.1 depicts the cancer line graph for the selected countries. Sweden and the United States have the highest cancer mortality rates. Canada and Australia are not far behind. All of the core countries show a similar pattern with the rates increasing until 1995 and then dropping.

This is of interest and could be due to preventative measures and improved technology to diagnose and treat cancer in the core countries. Findings also indicate an increase in the data for 2005. Growing economic austerity in the 2000s, impacting healthcare delivery, may be responsible for this increase.

Greece has the highest cancer mortality rate of the semiperipheral countries. Greece, Japan, and Bulgaria all show similar patterns of increase in mortality rates with a decrease in the 1990s. Like the core countries, this may be due to increased use of technology to detect and treat cancer in the 1990s. Japan is interesting because there is a rapid rise in the cancer mortality rate until the 1990s when, like Australia, there is a precipitous drop in the rate. Like the other core and semiperipheral countries, however, there is a rise in the data by 2005. Cancer mortality data for peripheral countries is markedly lower than for countries in the core and semiperiphery. The cancer rate overall is low but when individual countries are examined it is noted that Egypt had a low number for mortality data that remained flat over the years. Possibly, this may be due to the low level of industrialization in Egypt or the lack of trained personnel to accurately diagnose and then record and report data on cancer-related deaths. Mexico and the Philippines are on upward trends. In contrast to Egypt, this may be due to greater globalization resulting in industrialization and urbanization with resulting environmental degradation. This increases the risk for exposure to cancer-causing toxins which increase the risk for cancer-related deaths.

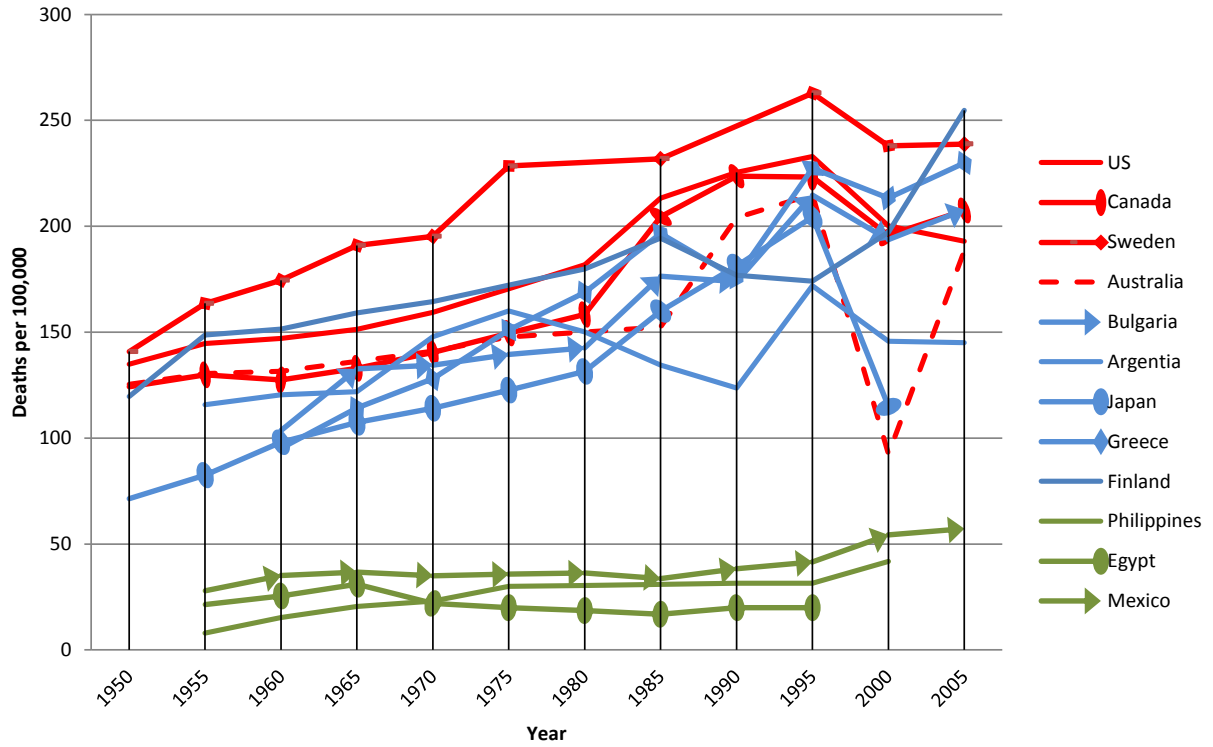


Figure 5.1 Cancer Line Graph for Countries indicates the mortality rate for cancer for selected countries from 1950 to 2005. South Africa was not included due to inconsistency in data. Bolivia, Turkey, and Burma were also not included due to limited data.

Line Graph of Zones

Line graphs of cancer mortality data reveal that core and semiperipheral countries have a higher rate of mortality due to cancer than peripheral. Core countries have an irregular rate of ups and downs and the highest level of cancer death rates when compared to the other zones.

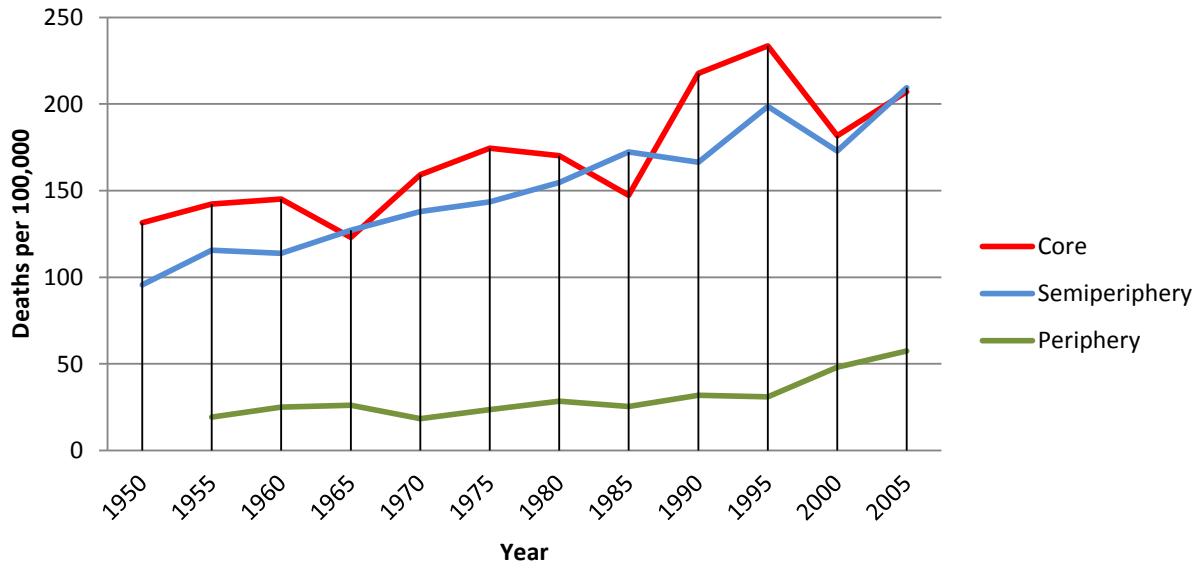


Figure 5.2. Cancer Line Graph of Zones shows the mean number of deaths due to cancer by zone from 1950 to 2005.

Overall, the core rate is increasing. Semiperipheral countries also have an irregular rate of up and down and now are essentially the same as the core. Like the core, semiperipheral countries have shown a marked upward trend from 1950 on. Peripheral countries have the lowest death rate due to cancer. However, as in the core and semiperipheral countries, in peripheral countries it is found that the rates are increasing. The upward trend for peripheral countries climbs at a faster rate from 1995 on. The question then becomes if this increase is related to greater exposure to cancer-causing toxins from industrialization.

Summary

Cancer mortality rates are rising globally and, based on the literature, they are expected to continue to rise. Core countries have had a higher cancer mortality rate than semiperipheral and peripheral countries. However, rates in semiperipheral countries are near those of the core and, since 2000, appear to be about equal. The periphery has had a much lower rate than that of the

core or semiperipheral countries. But, the findings show that since about 1995, the peripheral rate has climbed at an accelerated rate.

Many factors may be attributed to the fact that the rate for peripheral countries may be climbing. If Wallerstein's world-system theory is true, this could be the result of greater globalization, with the industrialization and urbanization that follows. Growing industrialization without the legislation to protect workers and the environment will result in greater exposure to cancer-causing toxins. An example is the expansion of the tobacco industry into countries such as Mexico, Pakistan, Indonesia, and the Dominican Republic. It is here that large companies can find protection from legal and public relations problems, access low-wage workers, and maximize profit (WHO, Global Tobacco Epidemic, 2008). Little legislation to protect workers and the environment may result in exposure to cancer-causing toxins for the worker, the community, and the country as a whole.

Cancer does not have to be a death sentence if diagnosed early and treated promptly and appropriately. New technologies make it possible to diagnose and treat cancer in a more effective manner, but, the rate is still increasing. It is imperative that research, legislation, and funding be available to look for causative factors in order to slow the number of deaths due to cancer. Core countries must take this initiative due to the greater complexity of their research and health care industry. Peripheral countries do not have the money, the power, or the resources to provide this service.

Diabetes

Introduction

Diabetes is a chronic disease which occurs when the pancreas does not produce enough insulin or when the body cannot effectively use the insulin it produces. This leads to an increased

concentration of glucose in the blood. Over time, this may result in damage to the cardiovascular system, eyes, kidneys, and nerves. If left untreated, diabetes increases the risk for stroke, heart disease, blindness, and kidney failure. Individuals with diabetes are also more susceptible to infectious diseases (Restrepo, B. et al., 2011).

Diabetes is treatable. But, according to the WHO, the number of cases of diabetes will rise by two thirds between 2008 and 2030 (WHO, Diabetes, n.d.). It is estimated that 347 million people worldwide now have diabetes (WHO, Diabetes, n.d.). It is estimated that, in 2004, 3.4 million people died from complications related to diabetes and, of those deaths, it is estimated that 80% were in semiperipheral and peripheral countries (WHO, Diabetes, n.d.).

Diabetes is a global, chronic disease that is of concern because of the increasing number of people with diabetes and the potential to decrease lifespan. Like the biblical, apocalyptic horseman of famine, mortality data for diabetes is influenced by dietary habits within a country. A healthy diet, regular physical activity, and maintaining a normal body weight may prevent or delay the onset of diabetes. Wallerstein (1983) states that today's workforce does not fare as well as our ancestors did 500 years ago. Fast food that is high in calories and low in nutritional value has become the norm for many of today's workers. Today's diet is not as balanced and we do not eat as well as people did 500 years ago, when diets consisted of more whole grains, fresh fruits, and vegetables.

Diabetes Mortality Table

Findings in Table 5.2, Diabetes Mortality Data for Selected Countries, show mortality due to diabetes has been increasing over the past 60 years. This is especially true after 1990. Canada and the United States had similar rates in 2005, even though Canada was lower than the United States during the previous 60 years. This is possibly indicative of greater consumption of fast

food or other lifestyle changes that lead to obesity and an increase in diabetes. Economic levels and standards of living are similar in the two countries, but Canada maintained a lower rate than the United States until 2005.

Within the semiperiphery, there are a wide range of values. Japan had the lowest rate, at 5.1 in the year 2000. This may be due to a diet where vegetables and fish are largely consumed, but it is still noteworthy that the rate in Japan is increasing just as it is in other countries. Finland also has a diet where fish is a staple of the diet and is widely consumed. The rate of diabetes for Finland in the year 2000 was 10.6. Other factors than diet may play a part in the mortality data for Finland. Both countries have access to health care and a standard of living that is comparable, but differences do exist. Greece also has a very low rate at 6.4 for 2000. Greece may have a lower rate due to their "Mediterranean diet" that is high in vegetables and fruits. In 2000, Argentina and Bulgaria had the highest rates for the semiperipheral countries at 19.1 and 24, respectively. Both Argentina and Bulgaria have diets high in animal protein and carbohydrates (Rao, 1988). Vijayendra Rao (1988) argued that national diets high in animal protein and carbohydrates may increase the risk for diabetes and shorten life expectancies.

Peripheral data is not complete for all countries. It would have been helpful to have more data to complete the table, but the peripheral countries selected may not have the money, power, or resources to collect and analyze the data. Mexico's data is the most complete and shows a rapid rise in the mortality data rate for diabetes. This could be attributed to a diet that has been high in carbohydrates and animal fats. Also, Mexico has multiple other factors that could be related to an increase in the rate. Along with their global position within world-system theory, they have had rapid industrialization and urbanization in the past 60 years. Political and social unrest resulting in a poor infrastructure to address healthcare has resulted in poor control of

diabetes for their citizens. If world-system theory is true, then Mexico is a classic example of diabetes in the future for other peripheral countries. We also see the growing trend for diabetes in Egypt but not at the rapid rate that we see in Mexico. The data also shows that the Philippines had a rapid jump between 1995 and 2000 when they went from 3.4 to 10.7.

Table 5.2

Diabetes Mortality Data for Selected Countries

Country	1950	1955	1960	1965	1970	1975	1980	1985	1990	1995	2000	2005
US	26.5	16.3	16	16.9	19.2	17.7	15.5	14.9	16.5	20.9	23.9	25.4
Australia	18.8	12.5	11.1	13.2	14.3	13.6		12.1	12.1	15.4	7.8	17.2
Canada	19.8	10.6	11.4	12.9	13.6	14.8	12.4	13.3	14.8	17.7		25.1
Sweden	8.6											21.4
Core	18.43	13.13	12.83	14.33	15.7	15.37	13.95	13.43	14.47	18	15.85	22.28
Finland	26.2	6.2	11.2	12.1	13.2	14.5	15.3	10.5	11	10.5	10.6	28.6
Bulgaria			4.8	7.1	8.1	8.2	11	14.7	18.7	21.6	24	24.8
Argentina		5.9	7	7.1	17.4	21.4	18.5	16.8	15.3	18.2	19.1	24.1
Japan	2.3	2.4	3	4.8	6.3	8.2	8.5	7.9	7.5	8.7	5.1	
Greece			6.6	13.2	20.2	26.4	31.6	34.8	8.9	7.2	6.4	9.2
South Africa	10.8	10.4	8.4	9.2	14.9	8.4	19.5			14.2	20.4	
Semiperiphery	14.25	4.833	6.52	8.86	13.04	15.74	16.98	16.94	12.28	13.24	13.04	21.68
Thailand			2.1	2.1								
Bolivia					0.9	0.9			11			
Egypt		7.3	5.2	10	5.4	6.6	5.9	7.1	8.9	8.9		
Mexico		4.3	6.7	9	13.3	13.8	18.8	21.7	29.1	32.4	38.2	56.7
Philippines		0.3	0.9	1.7	2	2.7	3		3.4	3.4	10.7	
Turkey			1.4	1.4	2	2.1						
Burma												
Periphery		3.967	4.267	6.9	6.9	7.7	9.233	14.4	13.8	14.9	24.45	56.7

Note. Core countries are color coded with red shading, semiperipheral countries are color coded in blue, and peripheral countries are color coded in green. Means were calculated for each year within the zone and are given in the last row of the zone.

Line Graph of Countries

When looking at chart and graph data of Figure 5.3, Diabetes Line Graph for Countries, it appears deaths due to diabetes in core and semiperipheral countries declined in the years between 1950 and 1955. This trend appeared to continue into the late 1950s and early 1960s. Possibly, this was due to the advent and increased availability of synthetic insulin. It is noted that the United States also showed this decline in the early 1950s and the 1960s. But, by 1965, there was a rising trend with a fall in the 1980s. By 1990, it is obvious that the trend was upward, and by 2005, it reached all-time high at 25.4 per 100,000. Canada's rate closely mirrors that of the United States, though, it is lower. Likewise, Australia's trend is similar to Canada's until 1985 when rates flatten out and then rise slightly over time.

Bulgaria has shown a steady rise and is now equal to the core. Likewise, Argentina is now at the level of core countries. Argentina started with a rather slow rise and then sharply rose until 1975, when there was a slow decline until 1990 when it rose again. As with the core countries, Finland's mortality rates fell in the 1950s, but then rose until 1985. Since then, the rate remained relatively flat until 2005, when it rose sharply. Japan has often been touted as having a healthy diet of fish and vegetables. However, despite a history of healthy eating and a low incidence of diabetes, there has been a continual increase in the number of deaths due to diabetes until 1975. Japan's trend line then remains flat until 1995 and then drops to a rate similar to their 1965 rate. Greece as well has been known for their healthy Mediterranean diet that includes a lot of fruits and vegetables. However, Greece showed a steep increase in deaths due to diabetes until 1985, when a dramatic drop-off resulted in a rate well below that of core countries. However, between 2000 and 2005 there was a slight upward trend.

Peripheral countries that have fewer resources to manage diabetes have shown increasing mortality rates. Egypt started relatively low when compared to core and semiperipheral countries. There was a peak in 1965, then a decline back down to their rate of the early 1950s. There was slight variation until 1980, when the trend moved upward, as it continues to do. The Philippines was found to have a rate that was the lowest of all of the selected countries. But, the Philippines have seen a continuous rise in the number of deaths due to diabetes, with a rapid increase between 1995 and 2000. Mexico has shown a continuous and rapid upward trend throughout the past 60 years. Mexico started lower than many other countries, but, has far surpassed the rates of all the other countries used for this study. Many factors may be related to this, such as diet, genetics, and their relationships within the world-system.

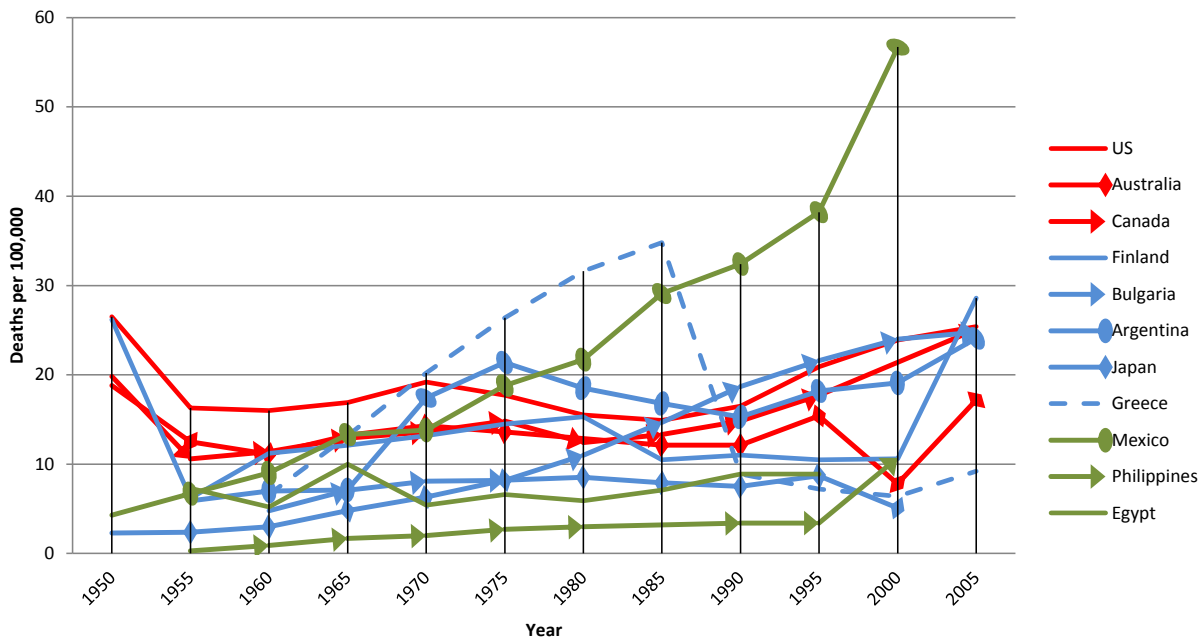


Figure 5.3. The Diabetes Line Graph for Countries indicates the mortality rate for diabetes for selected countries from 1950 to 2005. South Africa was not included due to inconsistency in the data. Sweden, Thailand, Bolivia, Turkey, and Burma were also not included due to lack of data.

Line Graph of Zones

When looking at the graph in Figure 5.4, Diabetes Line Graph for Zones, for comparison of core, semiperipheral, and peripheral countries, it is apparent that all three increased after 1995. The core shows an increase from 1990 on, with a slight dip in 2000 and a sharp rise in 2005. The semiperiphery started lower than the core, but, by the year 2000, it closely paralleled the core and showed the same increase in 2005. Peripheral countries started lower than core or semiperipheral countries, but, have been on a slow steady rise towards the rates of core and semiperipheral countries. In 1995, there was a sharp upward turn in the peripheral line, but this was probably due to Mexico having a huge leap in the data for this time frame. According to the available data in the charts, other peripheral countries have trended upward, but none as markedly as Mexico.

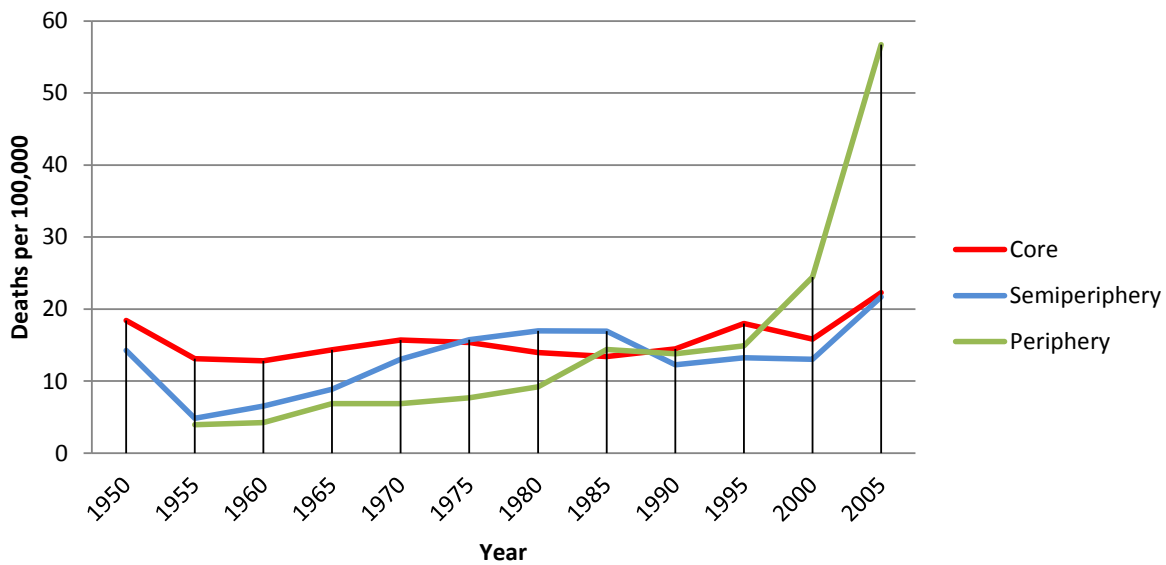


Figure 5.4. The Diabetes Line Graph of Zones shows the mean number of deaths due to diabetes by zone from 1950 to 2005.

Summary

Findings for diabetes show that mortality due to diabetes is on the rise. This is supported by the literature, which also predicts a rise in mortality for diabetes. Core and semiperipheral countries started high and over the years show an overall upward trend. In the early 50s, there was a downward dip when the use of injectable insulin came into use. Core and semiperipheral mortality data for diabetes is now above the mortality level of the early 50s. Findings from this study show that peripheral countries now exceed the core and semiperipheral countries.

Treatment for diabetes includes an inexpensive blood test to determine if blood sugars are within normal range. If the blood sugars are consistently high, medication and education on diet, exercise, and weight management will be prescribed. If the diabetes plan of care is effective, blood sugar levels will return to normal and further damage to the cardiovascular system, kidneys, eyes, and neurological system can be avoided. In order for this to occur, however, a country must have the money for the purchasing of life saving oral medications or insulin. Also, the country must have the power to distribute the medications and provide ongoing surveillance of diabetes trends within the country. As with other disease processes, the infrastructure within the country, such as roads and railways, capable of transporting medications and supplies, must be in place for consistent treatment to occur.

Cardiovascular

Introduction

Cardiovascular disease includes disorders of the heart and blood vessels, and may occur as a result of congenital abnormalities, infectious disease, aging, or lifestyle. Globally, cardiovascular disease is on the rise (WHO, Cardiovascular, n.d.) and ranks as the number one killer annually. In 2008, 7.3 million people died from cardiovascular disease (WHO,

Cardiovascular, n.d.). This represents 30% of all global deaths. Semiperipheral and peripheral countries are disproportionately affected with 80% of their deaths attributed to cardiovascular disease (WHO, Cardiovascular, n.d.). According to the WHO (Cardiovascular, n.d.), people in semiperipheral and peripheral countries are exposed to tobacco and other diseases that precipitate cardiovascular disease at a greater rate than in the core. Additionally, semiperipheral and peripheral countries do not have the levels of prevention and treatment programs compared to core countries. It is for this reason that people in semiperipheral and peripheral countries die younger from cardiovascular disease, many times in their most productive years. At the local level, cardiovascular disease perpetuates poverty due to loss of productivity for the individual and his or her family. At the country level, economies may be strained due to loss of productivity and can reduce the Gross Domestic Product by 6.77% (WHO, Cardiovascular, n.d.). The WHO predicts that, by the year 2030, 25 million people will die annually from cardiovascular disease (WHO, Cardiovascular, n.d.). Additionally, in 2008, diabetes, a risk factor for cardiovascular disease, contributed to 1.3 million of those deaths (WHO, Cardiovascular, n.d.). Risk factors for cardiovascular disease include lack of physical inactivity, the use of tobacco, an unhealthy diet, diabetes, and overuse of alcohol. According to the WHO (Cardiovascular, n.d.), additional social forces that impact cardiovascular disease include globalization, urbanization, poverty, and stress. Death from cardiovascular disease occurs at a younger age in peripheral countries and reduces the country's working population. Also, for those living with cardiovascular disease, limitations in their productivity and quality of life may occur (Leeder, Ramond, Greenburg, Liu, & Esson, 2004).

Core countries have the resources to potentially offer the medical interventions that will improve cardiovascular mortality data. By comparison, peripheral countries do not have the

health care infrastructure or resources needed to provide services for cardiovascular disease at the same level. In addition to inequality in resources to treat cardiovascular disease, peripheral countries are exposed to greater risk factors that predispose them to cardiovascular disease. These risk factors include growing numbers of diabetics from poor nutrition, lack of access to health care services, and lack of access to new technologies to diagnose and treat cardiovascular disease.

Cardiovascular Mortality Table

Data for core and semiperipheral countries is relatively complete, as indicated in Table 5.3, Cardiovascular Mortality Data for Selected Countries. However, the data for some peripheral countries is incomplete. Once again, this may be due to lack of money, power, or resources to properly collect, record, and analyze the data. Overall, cardiovascular mortality rates have improved in the core countries of the United States, Canada and Australia. In Sweden the rate has increased. For the United States, Canada and Australia the peak rate was in the 1960s. The data for Sweden has increased since the 1950s. Possibly, improvements in the management of cardiovascular disease and new technologies can account for the decrease in cardiovascular deaths in the United States, Canada, and Australia. Additional research in to why Sweden's rate has continued to climb would be of interest in future studies.

The semiperipheral countries of Finland, Bulgaria, and Greece had rates that were similar to those of the core countries. However, in the 2000s, Greece and Bulgaria began to exceed the core countries. Japan had the lowest rate in the selected semiperipheral countries, at 243.5 per 100,000. Bulgaria and Greece had rates lower than core countries, but from the 1980s onward the rate began to skyrocket. Possibly, this is due to greater affluence and an increase in the use tobacco products. It has long been known of the association between tobacco use and

cardiovascular disease (WHO, Global Tobacco Epidemic, 2008). In 2011, the WHO (2008) gathered data for analysis on trends for smoking. The findings show that the use of tobacco in Greece is at a rate of 49%, compared to Bulgaria at 32%, and Japan at 25% (WHO, Global Tobacco Epidemic, 2008). Although Bulgaria's cardiovascular rate is twice that of Greece, Greece has a higher rate of tobacco use. Japan has the lowest cardiovascular mortality rate and the lowest rate for tobacco use. Although tobacco use may explain an increase in cardiovascular mortality rates it does not provide an explanation in all cases. An increase in diabetes is also a risk factor for an increase in cardiovascular mortality rates. Cardiovascular disease occurs for many reasons. Smoking, diet, exercise, and genetics are all of concern in the prevention of mortality due to cardiovascular disease. Possibly, addressing diabetes in Bulgaria and smoking in Greece might be the best way to reduce cardiovascular disease within these two countries.

The peripheral country of Egypt has rates coming close to that of a semiperipheral country. Egypt's rate is above that of the other peripheral countries. Mexico and the Philippines have the next most complete data, but their rates are still well below that of core and semiperipheral countries.

Table 5.3

Cardiovascular Mortality Data for Selected Countries

Country	1950	1955	1960	1965	1970	1975	1980	1985	1990	1995	2000	2005
US	346.2	347.9	355.4	357.4	362.9	346.2	331.3	335	320.5	294.2	349.3	320.6
Australia	341.4	291.1	299	329.4	317.7	296.7	279.3	263.6	248.7	198.6	135.2	244.6
Canada	276.1	261.9	268.3	266	254.7	253	242.6		234.5	139.6	265	237.9
Sweden	368.6	285.5	303.3	346.7	373.8	401.8	429.3	423.9	472.9	427.6	508.1	474.9
Core	333.1	296.6	306.5	324.9	327.3	324.4	320.6	340.8	319.2	265	314.4	319.5
Finland	243.5	259	268.9	320.1	341.1	335.3	339.4	336.3	370.5	326.4	416.2	377.9
Argentina		149.2	164.9	167	159	173.9	245.2	275.9	267.7	246.9	297.3	250.8
Japan	71.2	62.5	66.9	75	93.2	105.1	102	118.5	132.4	133.7	122.2	243.5
Greece			110.2	127.4	147	166	197	225.8	292	289	501.8	462.4
Bulgaria			89.1	139.7	199	258		384.3	447.3	507.6	887.8	951.8
South Africa	219	204.2	137.6	144.5	177.5	194.1	215.1			50	103	
Semiperiphery		156.9	140	165.8	187.9	207.7	220.9	268.2	302	301	445.1	457.3
Egypt		43.9	46	87	87.3		111.4	145.6	269.8	270		
India				76.9								
Turkey			69									
Burma			94.2	126.4								
Mexico		71.7	70	36	60.3	73.7	74.5	70.9	60.7	65.6	108	103.2
Philippines		19.2	14.8	20.6	28.1	67.9	70.3		81.3	81.3	132.7	
Bolivia					25.7	25.7						
Periphery		44.93	43.6	47.87	58.57	70.8	85.4	108.3	137.3	139		

Note. Core countries are color coded with red shading, semiperipheral countries are color coded in blue, and peripheral countries are color coded in green. Means were calculated for each year within the zone and are given in the last row of the zone.

Line Graph of Countries

Figure 5.5, Line Graph for Countries, provides a visual aid for the rates of the selected countries on cardiovascular mortality data. Core countries started higher than semiperipheral and peripheral countries. However, semiperipheral countries have rates that are now similar to that of the core. Peripheral countries are still lower but approaching that of the semiperiphery,

especially Egypt. Rates for all countries are increasing. Bulgaria's rate draws attention due to the rapid rise and level far above that of the other countries.

The core countries of the United States, Australia, and Canada all show an overall trend line that is relatively flat with occasional peaks and downward drops. Rates for Canada and the United States increased in 1995 with a decline again in 2000. Australia showed the same upward movement and then downward five years later in 2000 and 2005. The overall trend for the core countries of the United States, Canada, and Australia may be due to access to resources that provide education, trained staff, latest medications, and surgical procedures to limit the number of cardiovascular deaths. The one core nation with a significant rise in cardiovascular deaths is Sweden.

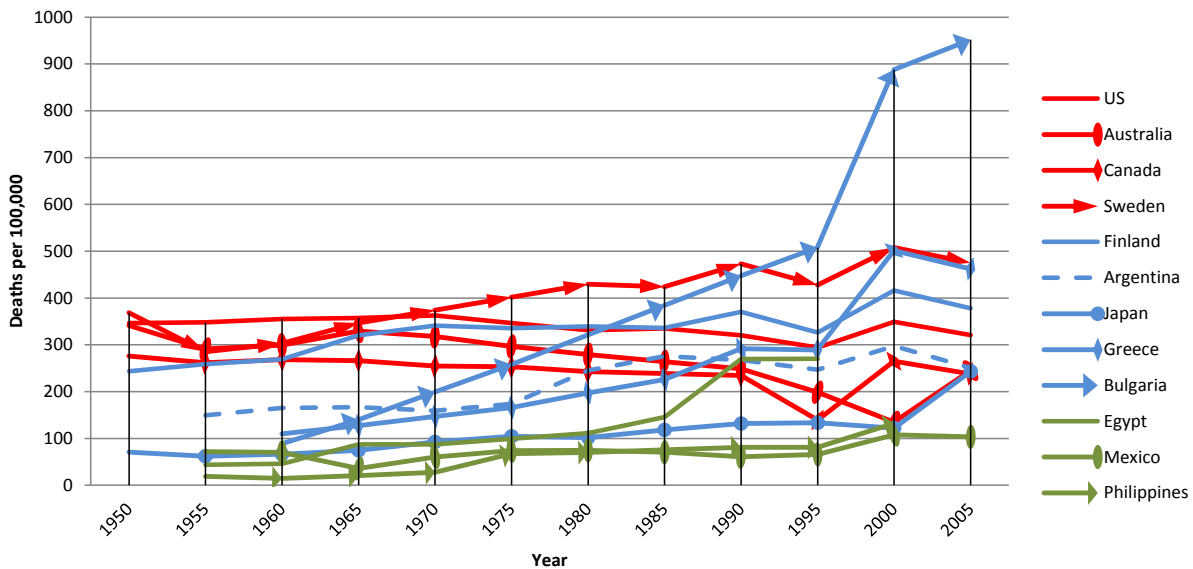


Figure 5.5. The Cardiovascular Line Graph for Countries indicates the mortality rate for cardiovascular disease for selected countries from 1950 to 2005.

Line Graph of Zones

Figure 5.6 represents the cardiovascular line graph for zones. In 2001, cardiovascular disease was the leading cause of disease in core and peripheral countries. Deaths due to cardiovascular disease in core countries accounted for 27% of the total number of deaths and 21% of the total number of deaths in peripheral countries (Lopez, Mathers, Ezzati, Jamison, & Murray 2006). The cardiovascular line graph of zones provides evidence that there is an overall difference in the mortality rates for those in peripheral countries. According to the chart for cardiovascular mortality rates, core countries remained relatively flat despite rising incidences of the disease. Although incidence of the disease increased, the ability of core countries to research new modalities for treating cardiovascular disease and prolonging life may be reflected in the data. Semiperipheral countries have seen their rates for deaths to cardiovascular disease climb significantly, from 150 to 450, which is a threefold increase. Peripheral countries have also seen a rise, but not at the rate of the semiperipheral countries.

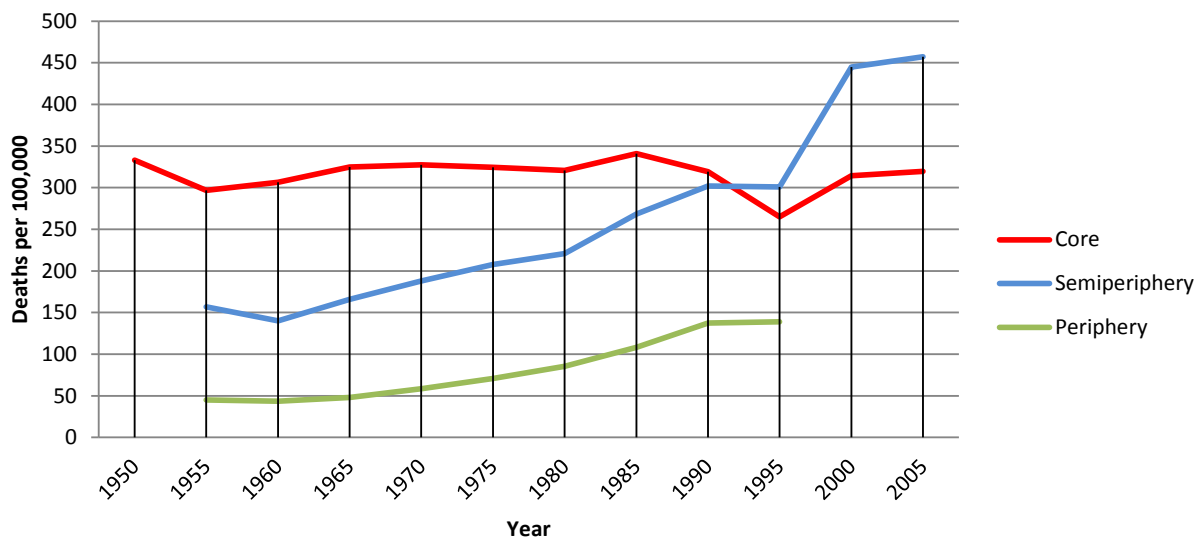


Figure 5.6. The Cardiovascular Line Graph of Zones shows the mean number of deaths due to cardiovascular disease by zone from 1950 to 2005.

Summary

Cost-effective interventions can be implemented to address cardiovascular disease. Healthy diet, exercise, and avoiding tobacco can affect the overall mortality data for cardiovascular disease. Incorporating fruits and vegetables in diets and avoiding processed foods high in fat, sugar, and salt will reduce body weight and maintain a healthy cardiovascular system. In order for effective preventative programs to be implemented, trained healthcare workers must have a comprehensive program to support reducing the use of tobacco, improving diets, encouraging exercise, and educating the public.

Summary

With increasing disposable incomes, individuals in core countries may purchase many labor-saving devices, thereby producing a more sedentary lifestyle. An abundance of fast food along with the sedentary lifestyle may lead to a greater risk for obesity leading to type II diabetes and cardiovascular disease. Heart disease, stroke, and diabetes are estimated to reduce the Gross Domestic Product for low- and middle-income countries between 1% and 5% due to premature death (WHO, Cardiovascular, n.d.). Deaths due to cancer, diabetes, and cardiovascular disease are all on the rise around the world. However, in the core countries, early detection and treatment prevent many deaths. Semiperipheral countries may or may not have available the resources or monetary ability to provide health care services to provide prevention and treatment. Peripheral countries are increasingly under pressure to adopt lifestyles similar to core countries. This lifestyle includes growing industrialization, urbanization, and lifestyles rich with processed fast foods. Our data shows a growing or leveling of all three diseases within peripheral countries. An improvement in outcomes for these diseases is possible for the selected diseases in

peripheral countries but growing commodification and relationships within the world-system restrict overall health outcomes.

Magnusson (2007) argues that, as life expectancy has risen, chronic disease has risen as the leading cause of death. The question then is, as the level of chronic disease rises, in time, will life expectancy data begin to reflect this and life expectancy begin to decline? Also, will the chronic disease mortality data of peripheral countries begin to look more like that of core countries, and possibly even surpass that of core countries? Magnusson (2007) continues by stating that global partnerships, economic incentives, and international legal action could more effectively respond to chronic disease than what is currently being used. Global partnerships that share the wealth of knowledge on new technology and treatments to combat chronic disease should be implemented. Economic incentives that will fund education and treatment initiatives are vital as well. Also, international legal action to regulate and control industry will prevent environmental degradation that adds to the chronic disease mortality data.

The findings on chronic disease support world-system theory. Core and semiperipheral countries were found to be higher, but rates in peripheral countries are increasing, which is bad for the periphery. According to the literature and the findings in this study, the rate of chronic disease is expected to continue to increase for peripheral countries. Core and, at times, semiperipheral countries have greater access to early diagnosis and treatment of chronic disease and so we see the rate slowing down. For peripheral countries we see the rate rapidly climbing. Although many factors affect the rate of mortality due to chronic disease, the effect of globalization with industrialization and urbanization within a country increases the risk for chronic disease. As peripheral countries become more industrialized and urbanized, the risk of chronic disease goes up. Unlike core countries, peripheral countries do not have the money,

power, or resources to address the causative factors of chronic disease or provide treatment when a disease occurs.

As with infectious disease, I have scored the findings for chronic disease in Table 5.4, Score Card for Chronic Diseases. The findings for the selected chronic diseases support world-system theory. Inequalities were found between core and periphery. Even though the rates may be narrowing between core and periphery, this is not a positive trend. In an ideal world rates would be going down for all. In the periphery we see the rates increasing, and they may not have the infrastructure to address chronic diseases with expensive technology and medications. People in core countries have the possibility of access to new technological advances. Therefore, I gave the chronic diseases of diabetes, cancer, and cardiovascular pluses in the first column. If chronic disease mortality data increased within the periphery, then world-system theory is correct. Conditions in the periphery have declined, and that is why I gave pluses in the second column.

Table 5.4

Score Card for Chronic Diseases

Endemic Danger		Inequalities Between Core and Periphery	Deteriorating Conditions for Periphery
Chronic Disease	Diabetes	+	+
	Cancer	+	+
	Cardiovascular	+	+
Total		3 to 0	3 to 0

Note. Column 3: + Inequalities persist between core and peripheral countries.
 - Inequalities do not persist between core and peripheral countries.
 Column 4: + Conditions in peripheral countries are deteriorating.

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CHAPTER 6 - Findings: Violence and Injury

Overview

Homicide, suicide, and motor vehicle accidents reflect political and social conditions that may affect a country's mortality data. Significant social changes have occurred over the past 60 years. Growing globalization, industrialization, and urbanization has resulted in economic gain for many, but not all have benefited. Today's rapidly changing world, according to Wallerstein (1983), is one in which growing anomie, alienation, and psychic maladies cause great stress and a decline in quality of life despite economic gains. Change over the past 60 years has included new social constructs and demands that have increased the level of stress within individuals, communities, and countries. This ever-increasing stress may lead to greater conflict both from within and without for the individual or group. Wallerstein (1983) used the analogy of the apocalyptic Four Horsemen to describe this increase in stress and the decrease in the margin of safety for people in today's world. An increase in the level of stress and margin of safety will be evident in an increase in violence and injury. Violence and injury equate to Wallerstein's apocalyptic horseman of war. It is for this reason that I selected the indicators of homicide, suicide, and motor vehicle accidents for this study.

Homicide and suicide were selected because they give information on the social conditions of a country and the response of the country to stress within the world-system. Since World War II, significant change has occurred among countries, global economic relations, and political structures. Additionally, the use of motor vehicles has changed. In many core countries, automobile ownership became the norm after World War II. To protect their citizens, core countries mobilized political and social forces to develop laws, provide adequate roadways, and

improve automobile safety requirements. This has not held true for semiperipheral or peripheral countries. Goats, cows, motorcycles, pedestrians, and autos may all share a common, poorly surfaced roadway. Additionally, peripheral countries lack the money, power, or resources necessary to mobilize in order to put in place initiatives that will save lives.

Findings

Homicide

Introduction

Homicide includes acts of violence of one individual on another resulting in death. Many of those killed are in the prime of their life and are contributing members of their families, communities, and country. Many of the deaths are preventable. However, the problem is complex and multifaceted. Homicide can be the result of abuse within a family, such as a case of child or spouse abuse. It can also be in the form of aggression of one group within a community or one country on another. It is estimated that over 1.7 million people die every year due to homicide (World Health Organization [WHO], 2001). It is a leading cause of death for those 15-44 years of age, and on any given day approximately 1,500 people die due to homicide (WHO, Youth Violence, 2004).

Homicide Mortality Table

Table 6.1 represents the homicide mortality rates for the countries selected for this study. Homicide rates for core countries are relatively low, except for the United States. In 2005, Australia, Canada, and Sweden all had rates between 1.1 and 1.5. The United States had a homicide mortality rate of 6.1. Between the years of 1950 and 1980, Canada, Sweden, and Australia show their homicide rates increasing. After the early 1980s, the rates in all three countries decreased. The United States also saw a decrease but not to the level of the other core

countries. It is difficult to determine the reason the United States has such a high rate, though the widespread availability of firearms in the United States may play a role. According to the WHO (WHO, Youth Violence, 2004), the United States stands apart from other similar core countries. The rate for the United States is similar to that of a developing country or countries experiencing rapid social or economic change which may contribute to homicide rates (WHO, Youth Violence, 2004). Homicide rates are multifaceted and unique for each country. The level of gangs, drugs, and guns within a society appear to increase the rate, apart from acts of war (WHO, Youth Violence, 2004).

Findings for semiperipheral countries show a similar trend as that for the core countries: rising rates until the 1980s and then a decrease in the numbers. South Africa showed a steep rise in the numbers for homicide, but data is not available after 1980. The mounting number of homicides could have been due to the growing internal strife in South Africa after the abolishment of apartheid. Even after apartheid was abolished, South Africa faced internal realignment politically and socially in order to implement reform. This has had an impact on South Africa's ability to gather, store, and analyze data on homicide rates.

Argentina, a semiperipheral country, has a rate more closely resembling those of peripheral countries. The rate for Bulgaria showed a peak of 3.4 in 1980 and another peak in 1995 of 5.1. Currently, Bulgaria's rate is at 2.9. Japan's rate was very steady throughout the 1950s, 1960s, and 1970s. In 1980, the rate dropped to 0.9 and then continued to drop to a rate of 0.3 in 2000. In the periphery, Mexico has the highest number of homicides of any of the selected countries. The all-time high for Mexico was in 1970 with 45.6 per 100,000. Mexico's rate, although high, dropped to 31 but rose again in 1980 to 44.7. Mexico's rate once again dropped to 17.7 in 1985, rose slightly in 1990 to 19.9, and then dropped once again. After 1980, Mexico's rate began to

decrease until in 2005, when it was at 9.6. This is still the highest rate of the selected countries. The rate for the Philippines is also decreasing. The rate climbed to a high of 19.5 in 1990 and 1995. Data for homicide rates in the Philippines is not available after 1995. An explanation for the high rates in Mexico and the Philippines might be found in the explanation for the high rate in the United States. When gangs, drugs, and guns are present in high numbers, homicide rates, especially for young males, will rise (WHO, Youth Violence, 2004). Also, according to the WHO (Youth Violence, 2004), low levels of social cohesion, the quality of a country's governance, income inequality, rapid demographic change, and urbanization all lead to greater violence (WHO, Youth Violence, 2004).

Egypt's rate started at 4.9 in 1955, increased to 9.6 in 1960, and dropped to 4.1 in 1965. In 1980, the rate rose to 26.6 and fell back to 0.9 in 1985. It is interesting data and may show that, during this timeframe, volatile and unstable political and social conditions were present in Egypt. In 1977, the leader of Egypt, Anwar Sadat, made a historic trip to Israel. This trip was followed by a peace treaty with Israel in 1979. Not everyone in the Arab world approved of Egypt's diplomatic moves and this led to the expulsion of Egypt from the Arab League. In 1981, Anwar Sadat was assassinated and greater political and social turmoil within the country of Egypt ensued. After that, it appears that data was not collected. Therefore, an accurate analysis of the level of homicide in Egypt cannot be made.

The country of Armenia was included in the table in order to provide a perspective on the impact of war on homicide rates. The Nagorno-Karabakh war between Armenia and Azerbaijan began in 1988 over disputed territory claimed by both countries. The war ended in 1994. The Armenian death toll stood at 4,592 at the end of the war and increased the mortality data to 25.3. After the war ended, the rate promptly returned to 2.3 in 2000 and 1.9 in 2005. These rates are

very similar to those of core countries. This is an example of how a peripheral country may have a low rate and appear to be very core-like, but due to their vulnerability to conflict, both internal and external, mortality data may be altered dramatically during times of war or civil unrest.

Table 6.1

Homicide Mortality Data for Selected Countries

Country	1950	1955	1960	1965	1970	1975	1980	1985	1990	1995	2000	2005
US	5.8	4.8	4.7	5.1	9.5	12.6	11.3	9.5	8.9	9.9	6.6	6.1
Australia	1.1	1.4	1.6	1.6	3.4	3.4		2.7	2.4	1.8	0.8	1.3
Canada	1.2	1.2	1	1.3	2.5	3.9	6.2	2.3	2.1	1.7	1.4	1.5
Sweden	0.5	0.7	0.7	0.8	0.7	7.5		8.1		1.3	1.1	1.1
Core	2.15	2.025	2	2.2	4.025	6.85	8.75	5.65	4.47	3.675	2.475	2.5
Finland	4.6	3.3	1.8	2.2	2.1	5.3	6.3	6.7	2.8	3.2	2.8	2.5
Bulgaria			2.1	2.1	3	2.8	3.4	2.9	2.5	5.1	2.9	2.9
Japan	2.1	2	2	1.5	2.3	2.4	2.5	0.9	0.6	0.6	0.3	
Argentina					15.2	6.9	15.5	3.8	5.6	4.3	4.6	7.3
South Africa	3.3	3	8.2	7.1	12	14.7	37.8					
Semiperiphery	3.35	2.65	1.967	1.933	5.65	4.35	6.925	3.575	2.88	3.3	2.65	4.2333
Bolivia					11.2	11.2			0.4			
Egypt		4.9	9.6	4.1			26.6	0.9	0	0		
Burma			10.8	16.7								
South Africa	3.3	3	8.2	7.1	12	14.7	37.8					
Mexico			33.2	22	45.6	31	44.7	17.7	19.9	14.4	15.6	9.6
Phillipines		3		2.3	2.1	15.6	15.3		19.5	19.5		
Turkey			1.9	1.6	2.4	1.5						
Armenia										25.3	2.3	1.9
Periphery	3.3	3.633	12.74	8.967	14.66	14.8	31.1	9.3	9.95	14.8	8.95	5.75

Note. Core countries are color coded with red shading, semiperipheral countries are color coded in blue, and peripheral countries are color coded in green. Means were calculated for each year within the zone and are given in the last row of the zone.

Line Graph of Countries

Figure 6.1 depicts the homicide line graph for the selected countries. All countries appeared to have relatively low homicide rates from 1950 to 1955. But, in 1960, when Mexico and Burma were included in the peripheral data, the chart shows Mexico and Burma with rates far above any of the other countries. Egypt's rate also moved upward at this time. Burma and Mexico continued to have higher rates than other countries in 1965. After 1965, the data for Burma was absent; however, for Mexico the rate doubled. In 2005, Mexico was still higher than all of the other selected countries. The Philippines also shows a high rate for mortality due to homicide.

Of the core countries, the United States had the highest rate, with a sharp rise after 1965. The rate continued to rise in 1975 and then started a slow descent into 2005. Australia had an upward trend from the 1950s until 1975, when the rate began to fall to its current level. Finland's rate declined in the 1950s with a slight movement upward in 70s through the 1985. Argentina's rate also showed an upward trend with the peak period between 1970 and 1980. Argentina has the highest rate for the core and semiperipheral countries selected. Greece has a low rate and is comparable to the core nation of Sweden.

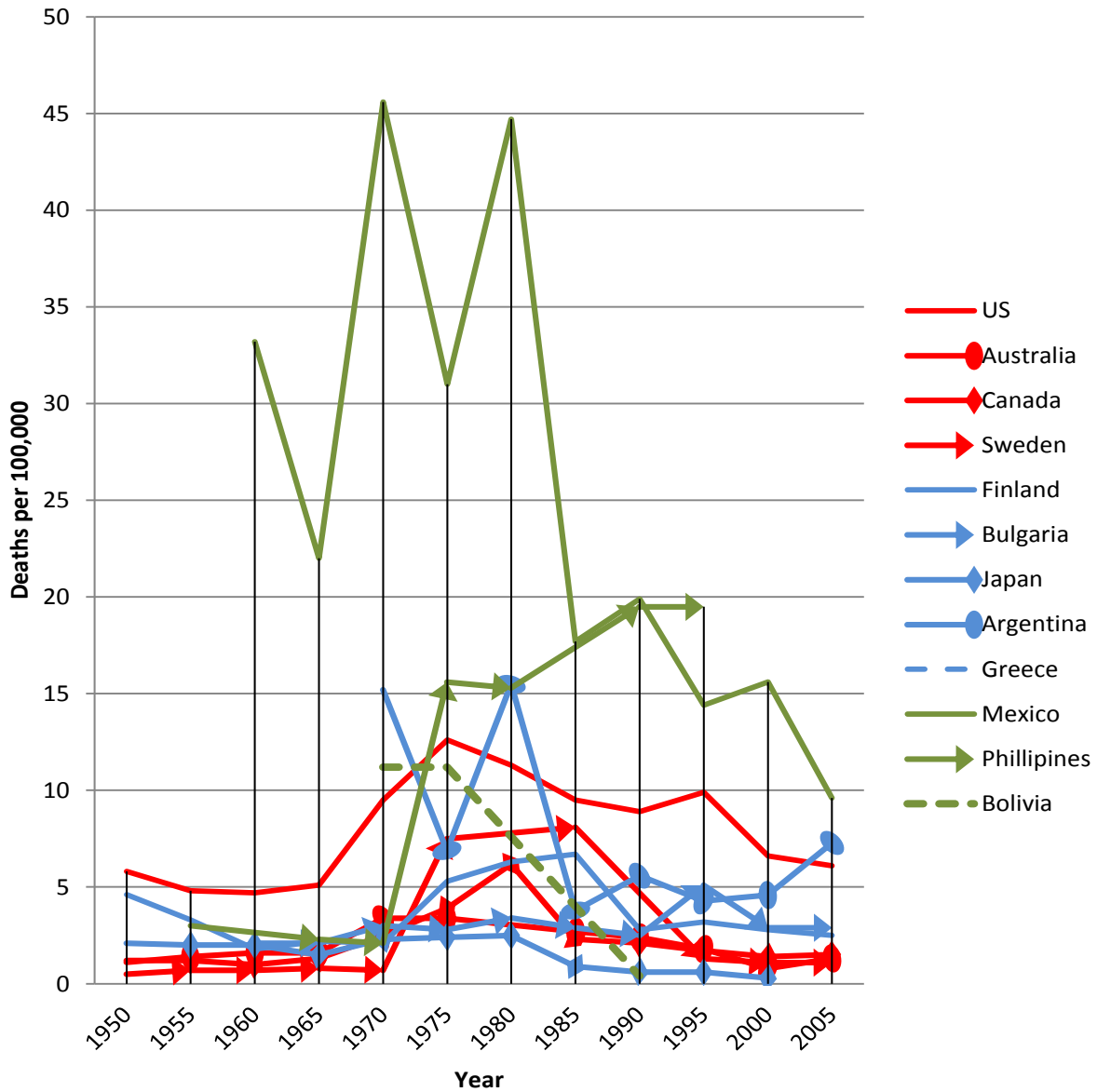


Figure 6.1. Homicide Line Graph indicates the mortality rate from homicide for selected countries from 1950 to 2005.

Line Graph of Zones

Based on the charts for core, semiperipheral, and peripheral, there is a marked difference between peripheral countries, core, and semiperipheral countries. According to Figure 6.2, Homicide Line Graph for Zones, peripheral countries have a higher homicide mortality rate than

do core and peripheral countries. Although this may be true, it must be mentioned that Mexico's extremely high rate may skew the data for all peripheral countries. Core, semiperipheral, and peripheral lines are similar with all three peaking in the mid-1980s and then decreasing to near 1950 levels. Semiperipheral mortality data shows an upward trend from 2000 on.

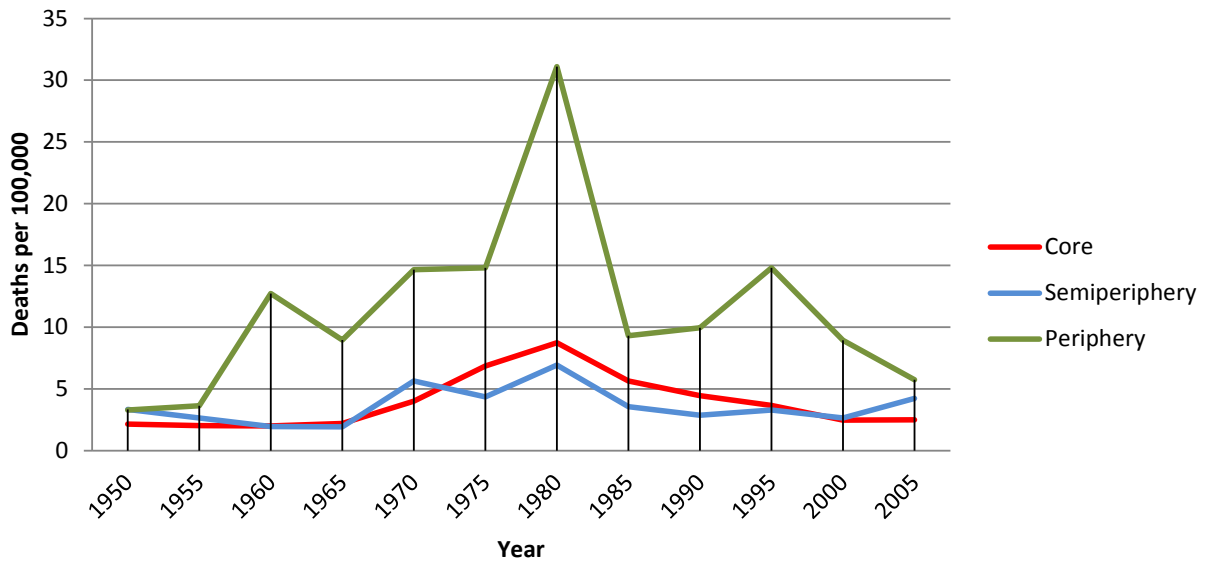


Figure 6.2. Homicide Line Graph of Zones shows the mean number of deaths due to homicide by zone from 1950 to 2005.

Summary

Homicide mortality rates are unique to each country. Homicide mortality rates are dependent on the country's unique historical, political, and societal background. Preventative measures must address each of the areas of history, politics, and society in order to lower the homicide mortality rate. Guns, gangs, and drugs may play a part in higher mortality data for homicides in some countries. However, this may not fully explain the homicide rate in another country. It can be stated that countries with rapid social and economic change are the most vulnerable to high homicide mortality data (WHO, Youth Violence, 2004). Additional reasons for high rates

include the presence of low levels of social cohesion, income inequality, rapid demographic change, rapid urbanization, and governments that do not have the laws and the enforcement power to protect citizens. This supports world-system theory, which states that peripheral countries do not have the money, power, or resources to fully provide for their citizenry. Education, trained personnel, and legislation to provide protection are needed if a program to prevent homicide is to be successful and sustainable. Literature and the findings suggest that homicide deaths are higher per capita in peripheral countries. The exception to this is the United States where the numbers are comparable to some semiperipheral or peripheral countries.

Although there seems to be some support for world-system theory based on the homicide mortality data for the selected countries in this study, it is not definitive. More data on peripheral countries and analysis of additional indicators for homicide would provide more information. This would give greater support to or rejection of Wallerstein's world-system theory.

Suicide

Introduction

Suicide is the act of taking one's own life. Globally, it is estimated that every year, one million people die from suicide. This is roughly equal to 16 per 100,000, or someone dying every 40 seconds from a self-inflicted act (WHO, Suicide Prevention, n.d.). Suicides have increased by 60% over the last 45 years (WHO, Suicide Prevention, n.d.). The WHO reports it is the second leading cause of death for the age group of 10-24 and the third leading cause for the age group from 15-44. This in itself gives support to world-system theory. Wallerstein (1995) argued that "the margin of safety against...endemic dangers and against erratic violence" persists and is getting worse and is evidenced by the above information.

According to WHO (Suicide Prevention, n.d.), in the past, elderly males were most likely to commit suicide. However, in recent years, WHO reports that young people, male and female, are most likely to commit suicide. Mental disorders and depression are listed as the most common reason for suicide in Europe and North America (WHO, Suicide Prevention, n.d.). In Asia, the most common reason is listed as impulsiveness. The cause is complex, and culture, religion, social setting, biology, and environmental factors have all been linked to suicide (WHO, Suicide Prevention, n.d.).

Suicide Mortality Table

Table 6.2 represents suicide mortality data for the selected countries. Core countries have not seen a tremendous change in suicide rates from 1950 to the present. The greatest change was seen in Canada, which in 1950 had a rate of 7.5 and in 2005 a rate of 11.6. Sweden had the highest rate in 1950 at 14.8 and maintained the highest rate in 2005 at 13.2. Finland, another Scandinavian country, has the highest rate for semiperipheral countries at 20.3. It is interesting that both Scandinavian countries have high rates and it would be of interest for future studies to determine if this may be due to high use of alcohol, abuse, depression or other factors. Japan, historically known for a high rate of suicides, has a rate higher than core countries. Between 1955 and 1960, the rate increased from 20.5 and 22.4. The rate fell to 14.4 in 1970, but increased again to 20.3 in 1985. Japan's rate in 2000 fell to 12.4. South Africa's rate jumped in 1975 from 10.1 to 21.8 in 1980. After 1980, there is no data recorded. Possibly, this is due to the internal political and social conflict within South Africa over Apartheid.

Table 6.2

Suicide Mortality Data for Selected Countries

Country	1950	1955	1960	1965	1970	1975	1980	1985	1990	1995	2000	2005
US	11.2	10.1	10.4	10.8	10.7	12.2	12.5	12.2	12.4	12	11.3	11
Australia	9.6	10.9	11.1	14.5	12.2	11.6		11.1	13.3	12.8	6.6	10.8
Canada	7.5	7.3	7.4	8.2	10.9	12.5	14.8	13.7	13.3	12.8	12.3	11.6
Sweden	14.8	18.6	17.3	18.5	21.5	20.8		19.5		15.7	13.9	13.2
Core	10.78	11.7	11.55	13	13.83	14.28	13.65	14.13	13	13.3	11.03	11.65
Finland	16.1	17.4	20	19.8	21.6	23.5	25.8	24.4	28.3	27.3	23.4	20.3
Bulgaria			7.5	8.7	11.3	12.7	13.6	13.4	16.2	17.3	15.9	13
Japan	17.3	20.5	22.4	14.9	14.4	17.5	17.7	20.3	17.2	16.7	12.4	
Argentina					15.2	10.4	7.8	7.7	7.5	5.9	6.4	8.7
Greece			4.4	3.2	3.5	3.4	2.9	3.7	4	3.4	1.4	3.2
South Africa	3.3	10.1	7.9	10	9.1	10.1	21.8				0	
Semiperiphery	16.7	19	13.58	11.7	13.2	11.65	13.3	13.9	14.64	14.1	11.9	11.3
Bolivia					1.4	1.4			3			
Egypt		0.3	0.1	0.1			0.3	0	0	0		
Mexico		0.9	1.6	1.8	0.7	0.7	1.7	1.7	2.2	3.6	3.3	3.9
Phillipines		0.5		0.6	0.4	1.1	0.8		0.5	0.5		
Turkey			0.5	0.5	0.6	0.5						
Armenia										2.3	1.6	1.8
Burma			9.4	2.9								
Periphery		0.57	2.9	1.18	0.775	0.925	0.933	0.85	1.425	1.6	2.45	2.85

Note. Core countries are color coded with red shading, semiperipheral countries are color coded in blue, and peripheral countries are color coded in green. Means were calculated for each year within the zone and are given in the last row of the zone.

Line Graph of Countries

As shown in Figure 6.3, Suicide Line Graph for Countries, the United States, Canada, and Australia have similar trends from 1950 to 2005. Australia had a dip in the rate in 2000, but quickly returned to their previous trajectory. Among the core countries, Sweden's rate is noticeably higher than the other countries. However, Sweden's rate has declined since 1970, and

is nearing the rates of the other core countries. In all of the core countries, there was a rise in the number of suicides until around 1970, and then the rate began to drop and is nearing the 1950s level.

Finland, like the Scandinavian country of Sweden, also has a remarkably high suicide rate. In the early 1950s, Japan had a suicide rate higher than any other selected countries for this study. This rate stayed higher than other countries until between 1960 and 1965, when the rate fell to below that of Finland and Sweden. In 1970, the rate again climbed until 1985, when the rate began to fall. It is now similar in rate to that of core countries. Bulgaria's rate began to be recorded in 1960 and has steadily risen until 1995. In 1995, the rate fell slightly and is now almost down to the rate for the selected core countries. In 1970, Argentina's data began and the rate for suicide was near that of Japan's at that time. The rate continued to fall and was below that of core countries and near the rate for peripheral countries until 1995. In 1995, the rate began to rise slightly. Greece has the lowest of the selected semiperipheral countries. The rate has remained very steady with slight variations. The high points are in 1960, when data began to be collected, and again in 1990. After 1990, the data once again fell slightly and then began to rise in 2000. Greece joined the European Union in 1981 and adopted the Euro as the form of currency in 2001. Inclusion in the European Union meant economic prosperity they had not seen before. However, in 2001, with the adoption of the Euro came economic reform. Possibly, requirements of this reform on Greek industry and thereby the citizenry was the precursor to the rise in the suicide rate between 2000 and 2005. Currently, the economic crisis within Europe and Greece has been blamed for a 22% increase in the suicide rate in Greece (Ekathimerini, 2012). Greece now has the highest suicide rate in Europe. Experts contend that this is due to the ever-increasing pressure of economic insecurity and uncertainty in the future (Ekathimerini, 2012).

The peripheral countries of Mexico and the Philippines show the lowest rates of all countries, until 1995, when Mexico's rate exceeded the rate in Greece. Mexico's rate rose slowly after 1970. With the rise in suicide in Greece between 2000 and 2005 the rates between Mexico and Greece became similar. The rate for the Philippines has remained low and has been relatively flat.

Although Great Britain was not a country selected for this study, a recent NBC News Wire Service (2012) study conducted by Cambridge University found current job losses have resulted in a rise in suicides in Great Britain. This finding reflects similar findings in other countries in Europe according to the article (NBC News Wire Service, 2012). The Cambridge University study found that there were 846 more suicides for men and 155 more for women between 2008 and 2010 than what would have been expected (NBC News Wire Service, 2012). Between 2000 and 2010, an annual increase of 10% in the unemployment rate increased the suicide rate by 1.4% (NBC News Wire Service, 2012). Although a direct causal link cannot be made, a strong association was made between suicide and a declining economy.

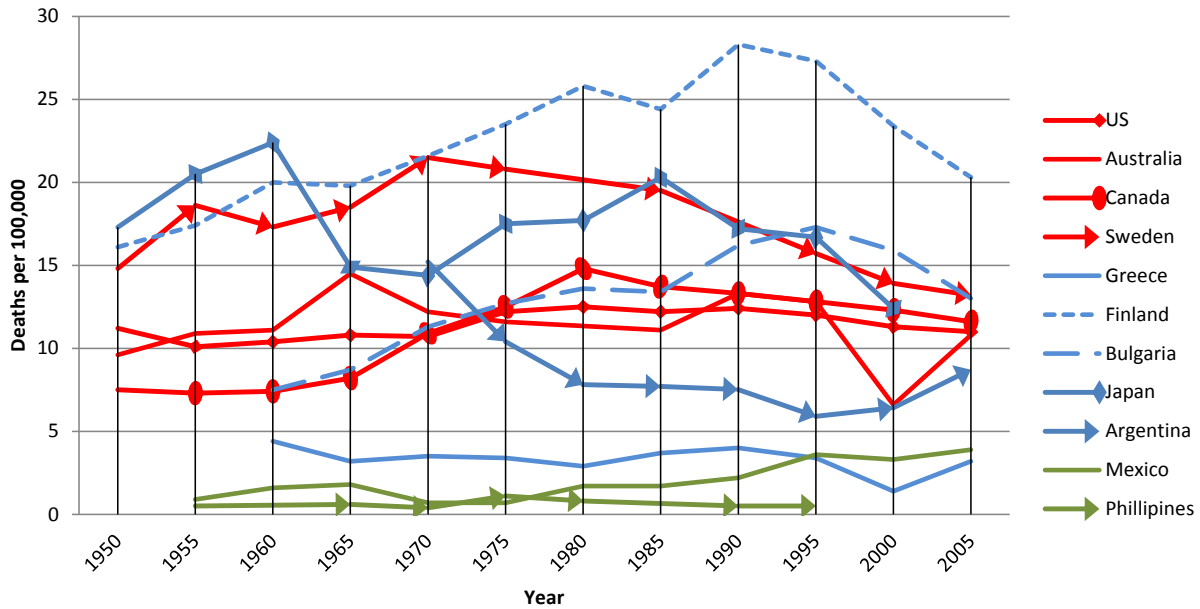


Figure 6.3. Suicide Line Graph of Countries indicates the mortality rate from suicide for selected countries from 1950 to 2005.

Line Graph of Zones

Figure 6.4 depicts the suicide line graph for zones. According to the data for this study, in 1950, suicide rates in semiperipheral countries were higher than in core countries. Since 1965, however, they have had similar rates. In core and semiperipheral countries, suicide rates appear to be falling. Suicide rates for peripheral are less notable than for core and semiperipheral countries, with a peak in 1955. In 1960, rates returned to 1950 levels. This may reflect an aberration in the data or some other unknown reason for the sharp rise in the 1955 data. But, after 1980, suicide rates slowly increased. Why might this be? A global world with growing inequalities leads to a growing sense of disenfranchisement. Alienation and loss of power to effect change personally and as a group leads to ever increasing frustration and stress, which may be manifested as a rise in the suicide rate (Durkheim, 1951).

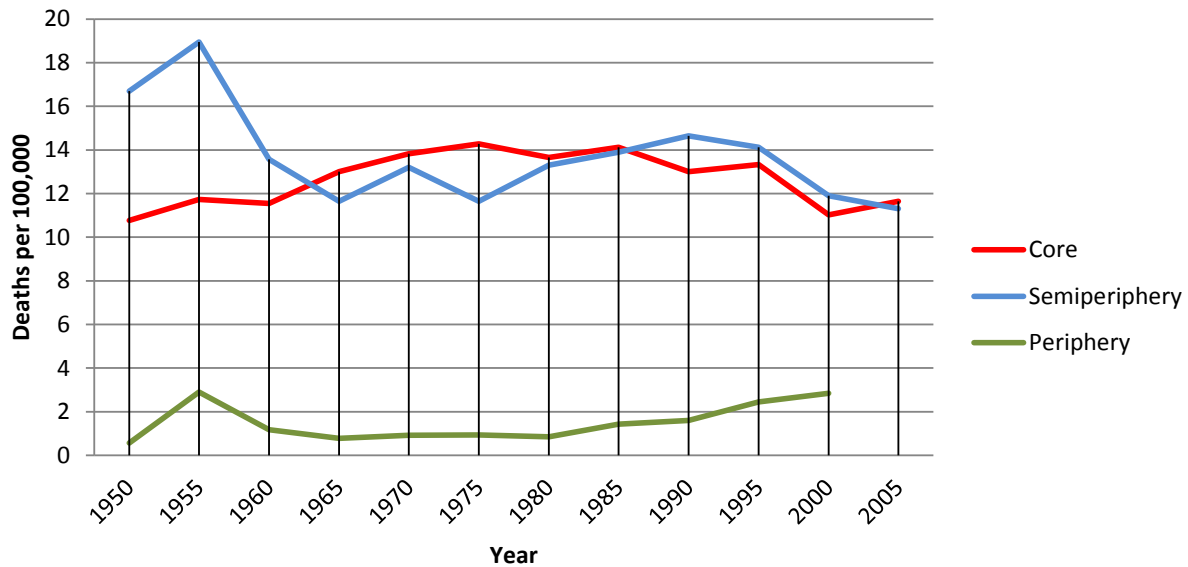


Figure 6.4. Suicide Line Graph of Zones shows the mean number of deaths due to suicide from 1950 to 2005.

Summary

Suicide rates for semiperipheral countries have decreased since the 1950s. Core and semiperipheral rates appear to be very similar and lower than they were in 1970s and 1980s. The periphery has a rate that is considerably lower than core and semiperipheral countries. However, suicide mortality rates have been increasing since 1980. The data shows some support for world-system theory, but suicide rates in the periphery are getting worse over time, which is what world-system theory predicts. If world-system theory is correct, then suicide rates will continue to increase as anomie and isolation increase due to growing industrialization and urbanization. If the rate for the periphery continues to increase, this increase will support Durkheim's (1951) theory that suicide is a societal issue. According to Durkheim (1951), suicide results from decreased connectedness and feelings of isolation within society. Industrialization brought with it labor where there is little interaction between employees. Additionally, movement from rural communities, where strong interconnected relationships exist, to urban

living, precipitated a sense of isolation for many. As described by Durkheim (1951), anomie and alienation grow when there is little interconnectedness and a sense of isolation. If suicides rates increase in peripheral countries, then the data suggests Durkheim's theory is supported as well.

Motor Vehicle Accidents

Introduction

Motor vehicle accidents include death or injuries that occur while in a car, riding a motorcycle, riding a bicycle, or if hit by a moving vehicle. The number of motor vehicles on the road today has grown exponentially since WWII. Along with the growth in the number of motor vehicles worldwide, the number of fatalities related to motor vehicle accidents has grown as well. This is a growing public health issue. Young adults are most likely to be the victims of a motor vehicle accident (WHO, Road Traffic Injury Prevention, 2004). Those between the ages of 15-44 years of age make up over half of those who die in motor vehicle accidents (WHO, Road Traffic Injury Prevention, 2004). Most of the people killed are in the prime of their life, when they contributing to their families, communities, and country in the home, workplace, and community (WHO, Road Traffic Injury Prevention, 2004). Families, communities, and countries may be driven deeper into debt with loss of breadwinners or large numbers of their young adult population. For semiperipheral and peripheral countries the loss of this vital resource can result in a decline of 1% to 2% of their Gross National Product (WHO, Road Traffic Injury Prevention, 2004). WHO (Road Traffic Injury Prevention, 2004) projects that, by the year 2020, motor vehicle accidents will be the third leading cause of death in the world.

For those in core industrialized countries, the ability to own and operate a motor vehicle became the norm. Motor vehicles quickly replaced other means of transportation such as by an animal, train, or boat. Although the number of motor vehicles increased, a societal response to

provide prompt state of the art emergency services emerged. Also, societal and political resources were organized to pass legislation and enact laws to protect citizens from a fatality related to a motor vehicle accident. Laws include seat belt safety and most recently laws that disallow texting while driving.

Motor vehicle accidents are preventable. High-income countries have the money, resources, and power to invest in programs to prevent motor vehicle accidents. Legislation to enforce the use of seatbelts, speed control, and safer design of cars and roads has helped lower the mortality rate. In the 1960s and 1970s many core countries passed legislation based on sound scientific evidence of road hazards (WHO, Road Traffic Injury Prevention, 2004). Led by safety scientists such as Ralph Nader in the United States and others, the number of motor vehicle accidents and fatalities began to decline (WHO, Road Traffic Injury Prevention, 2004).

In comparison, semiperipheral and peripheral countries lack the infrastructure to systematically collect data and determine what initiatives would best work within their country. Information on safety measures developed in core countries may not be applicable in semiperipheral or peripheral countries. Traffic types also vary between core countries and peripheral countries. Core countries have high speed, well-maintained super highways that segregate pedestrians from autos. Peripheral countries have cars, bikes, animals, and people all using a narrow roadway and at varying speeds. The intermingling of pedestrians and motorized vehicles can be very dangerous to pedestrians. The percentages of cars, motorcycles, pedestrians, and bicycles on a road at any given time may be quite different between a core and a peripheral country. For that reason, each country must determine its own set of standards that will effectively lower the mortality data for motor vehicle accidents. Additionally, rapid and unplanned urbanization without thought to traffic patterns and control have made motor travel

hazardous in many peripheral countries. Narrow streets with cars, motorcycles, animals, pedestrians, and bikes all crowded together results in a higher likelihood of a motor vehicle accident, injury, and death.

It is estimated that worldwide 1.2 million people are killed in motor vehicle accidents each year, with peripheral and semiperipheral countries making up about 85% of the total number of deaths (WHO, Road Traffic Injury Prevention, 2004). It is predicted that these figures will increase by 65% over the next 20 years (WHO, Road Traffic Injury Prevention, 2004).

Motor Vehicle Accidents Mortality Table

When we look at individual countries in Table 6.3, Motor Vehicle Accidents Mortality Data for Selected Countries, the data shows that amongst core countries, the United States started with the highest fatality rate in 1950. However, by 1960 the United States rate had dropped from 24 to 20 per 100,000. This was lower than the rates of Canada and Australia where fatalities increased to rates of 21 and 24 respectively. The United States' rate then climbed until 1970, when it reached a rate of 27.5 per 100,000. After 1970, the rate declined to a rate of 16.6 in 2005. Australia's rate climbed to 30 in 1970; however, the rate has dramatically gone down to a rate of 4.8 in 2000 with a bump upwards to 8.9 in 2005. Canada is similar and climbed from 1950 on until 1975 at 29.5. After 1975, the rate declined to a rate of 10 in 2005. Sweden's data was similar but never reached the level of the other core countries. Currently, Sweden's rate is the lowest of the selected core countries at 6.4.

The selected semiperipheral countries of Finland and Argentina have data reflecting similar trend lines as core countries. Finland reached a peak rate in 1975 at 23.5 and then began to decline. In 2005, Argentina's rate was 9.9 and Finland's was 9.5, which was a steady decrease. Bulgaria's rate was up and down. Overall, there has been little change in the fatality rate for

Bulgaria since 1970. Greece does not show as much irregularity. The rate increased from 5.7 in 1960 up to 21 in 1985. From there the rate fluctuated slightly and was noted at 17.9 in 2005. Little change has occurred since 1980 in the fatality rate for motor vehicle accidents in Greece.

Although motor vehicle accident data is not as complete for peripheral countries, inferences can be made from selected data for this study. Egypt's data was determined to be 10.4 in 1955; however, a significant drop to .1 was noted in 1960. Poor data collection methods may be reflected in the data. However, by using longitudinal data, increased reliability can be obtained. Egypt's data for 1965 increased to 1.6 and then stayed relatively the same until 1985 when the rate increased to 6.3. The rate stayed at this level through 1995 when the rate increased to 6.6. Mexico has the most complete data for peripheral nations. Mexico's rate began at a low of 3 and steadily grew to 24.5 in 1985. From there the rate began a downward movement to 14.6 in 2005. The Philippines have shown an overall low rate. The Philippines started with the lowest rate for all of the selected countries at .5 and has remained low. However, we have seen a steady increase to a rate of 4.1 in 1995 with no downward turn.

Table 6.3

Motor Vehicle Accidents Mortality Data for Selected Countries

Country	1950	1955	1960	1965	1970	1975	1980	1985	1990	1995	2000	2005
US	22.1	24	20	24.5	27.5	22	24	19.2	19.6	15.8	15.6	16.6
Australia	17.2	22.1	24	26.6	30	29.1		26.7	18.6	10.8	4.8	8.9
Canada	14.9	18.9	21.1	25.2	27	29.5	22	15.8	16.1	10.4	9.6	10
Sweden	7.2	12.9	13.4	16.7	17.2	15.3		10		6.8	5.4	6.4
Core	15.4	19.48	19.63	23.25	25.4	23.98	23	17.9	18.1	11	8.85	10.5
Finland		8.7	14.1	22.1	21.7	23.8	14.8	12.5	12.7	8.9	9.1	9.2
Bulgaria				6.5	12.8	11.5	14.1	11.1	13	13.6	10.9	12.6
Argentina					15.2	16.7	14.9	13.1	10	9.4	10.5	9.9
Greece			5.7	10.7	11.3	14.5	20.9	21	18.6	21.3	22.1	17.9
South Africa	15.2	15.5	22.5	22.8	36.4	45.1	104					
Semiperipheral				13.1	15.3	16.63	16.18	14.4	13.58	13.3	13.2	12.4
Bolivia					2.5	2.5						
Egypt		10.4	0.1	1.6	0.1	1.5	1.7	6.3	6.6	6.6		
India				1.1	1.1	1.1						
Burma			2.8	6.7								
Mexico		3	2.8	6	6.4	8.4	18.3	24.5	15.4	15.7	15.5	14.6
Philippines		0.5		2.1	2.9	3.2	4.1		4.1	4.1		
Armenia										12.7	5.3	6.2
Turkey			2.5	3.9	4.8	4.4						
Peripheral		4.633	2.05	3.567	2.97	3.517	8.033	15.4	8.7	9.79	10.4	10.4

Note. Core countries are color coded with red shading, semiperipheral countries are color coded in blue, and peripheral countries are color coded in green. Means were calculated for each year within the zone and are given in the last row of the zone.

Line Graph of Countries

From the line graph of countries on mortality data for motor vehicle accidents in Figure 6.5 it can be seen that core countries had the highest rates until the 1970s when the rates began to come down. This is probably due to the core countries enacting legislation to improve safety on the

roads and improvement of highways and interstates. Currently, the core countries of Australia, Sweden, and Canada are lower than the semiperipheral countries. The United States has dropped to the level of the semiperipheral countries.

Semiperipheral countries also showed an increase in the mortality rates for motor vehicle accidents until about the 1970s. The rates never reached the high numbers of the core countries but did increase during this time. It can be seen that there is more of an up-and-down movement of the trend lines and no dramatic drop in the lines as seen for core countries. Greece is the one semiperipheral country that had the highest increase in rate up to about 1975 and then fell until 1990. In 1995, the rate increased until 2000 and dipped again in 2005. The dips may be indicative of a semiperipheral country's ability to muster the money, power, and resources to put in place reforms and safety measures, but the effects are not as significant and sustainable as in core countries.

Peripheral countries were all lower than the core or semiperipheral countries in 1950. However, fatalities are shown as increasing for all of the peripheral countries. Mexico's rate increased dramatically from 1960 to 1985. After 1985, the trend line shows a decrease, but it is at the level of a core country. This is concerning and bears watching to see if Mexico has the money, power, and resources to continue to bring the high rate of motor vehicle accident mortality data down.

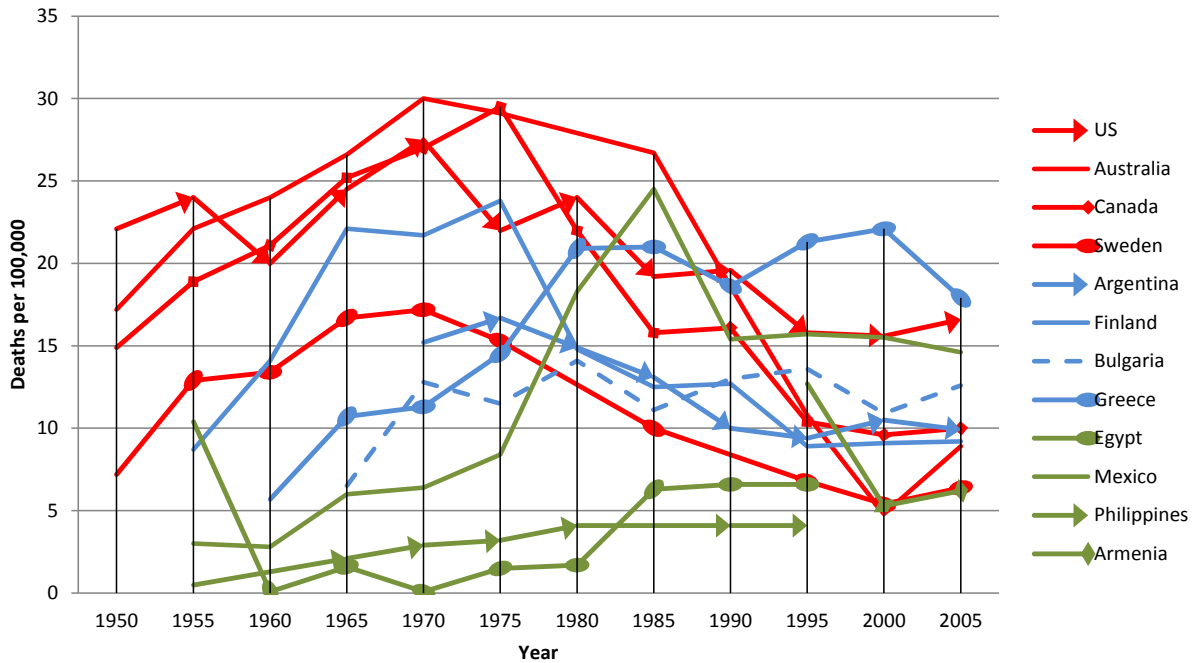


Figure 6.5. Motor Vehicle Accidents Line Graph of Countries indicates the mortality rate from motor vehicle accidents for selected countries from 1950 to 2005.

Line Graph of Zones

As shown in Figure 6.6, data from selected countries for this study show that from 1950 through 1995, the number of fatalities related to motor vehicles was higher in core countries than in semiperipheral and peripheral countries. For core countries the number of fatalities continued to rise until 1970 and then turned down. By 2000, the number of fatalities had dropped below that of semiperipheral peripheral countries. In 2005, the number of fatalities rose slightly to meet the number of fatalities recorded by the peripheral countries.

For semiperipheral countries, fatalities rose between 1965 and 1975. In 1975, fatalities began a slow downward slide. However, the downward movement in the rate was not as dramatic of a drop as that of core countries and, by 1995, semiperipheral countries had the highest number of motor vehicle accident fatalities.

Fatalities for peripheral countries have increased. This may be due to the complexity of transportation in peripheral countries. Peripheral countries, due to poverty, poor transportation laws, high tax rates on vehicles, etc. have a myriad of vehicles on the road. Automobiles, buses, mopeds, donkeys, bikes, and camels, may all share a common roadway. Congested and poorly maintained roads add to the risk factors. If injured, poor emergency services put those in peripheral countries at greater risk for loss of life in a motor vehicle accident.

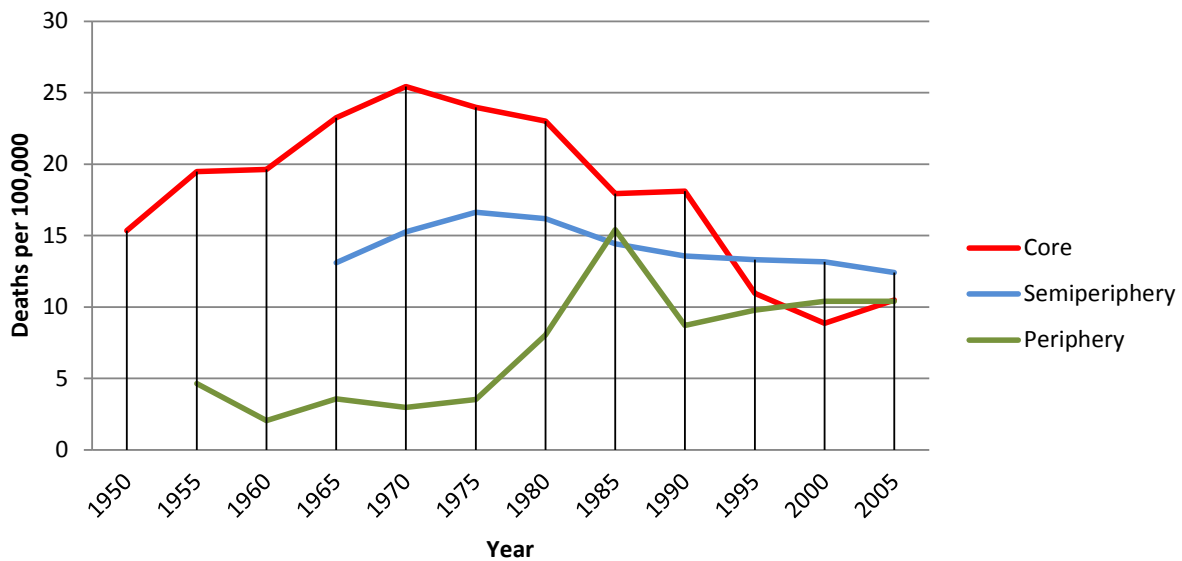


Figure 6.6. Motor Vehicle Accidents Line Graph of Zones shows the mean number of deaths due to motor vehicle accident by zone from 1950 to 2005.

Summary

Motor vehicle accidents and mortality data increased for peripheral and semiperipheral counties from 1950 to the 1980s. In the 1970s and 80s the motor vehicle mortality data for core and semiperipheral countries began to decrease. This was due to an increase in safety measures, legislation, improved roadways, and education. Peripheral countries have not shown the same

trend. Peripheral countries were the lowest in the 1950s; however, motor vehicle mortality data is increasing.

Support for world-system theory based on the findings for motor vehicle mortality data is weak. Analysis of the trend lines for peripheral countries in the years to come will provide the information necessary to better provide support for world-system theory.

Summary

Violence and injury were selected for analysis in this study due to their global impact on mortality and their analogous link to the apocalyptic horseman of death. Homicide rates are the highest in peripheral countries. Rates remain about the same for core and semiperipheral countries. Suicide rates were the lowest in semiperipheral countries but increased at a time when they decreased in core countries. Semiperipheral countries remain about the same for suicide. Motor vehicle mortality fatalities in peripheral countries have increased over the past 60 years, while fatalities in core and semiperipheral countries have decreased, which suggests the theory is correct.

If world-system theory is a good descriptor of the relationship between countries and the globalizing effects of this relationship, then findings in the mortality data should reflect this. Ideally, and because it is possible to put in place measures to prevent deaths due to violence and injury, the expectation would be that all countries would reduce their numbers for mortality data related to violence and injury. However, if world-system theory is true, the data would show an increase in the mortality data in the periphery and a decrease in the core. The findings support world-system theory.

In Table 6.4, Score Card for Violence, I scored pluses in the first column because inequalities were shown between core and peripheral countries for homicide, suicide, and motor vehicle accidents. I also gave pluses in the second column because there is evidence that conditions are deteriorating for peripheral countries. For homicide, peripheral countries were overall higher than core countries throughout the past 60 years. There is a greater gap in homicide rates between core and periphery, and the rate is higher in the periphery than it was in 1950. Although suicide rates were lower for the periphery, the gap between the core and periphery was narrowing. This is not a positive trend for peripheral countries. Motor vehicle mortality data has decreased in the core but risen in the periphery. The periphery is not as high as the core but the gap has narrowed. This is not a positive move. Conditions are deteriorating in the periphery and more deaths are occurring due to motor vehicle accidents. Conditions in the core are improving and fewer deaths are occurring. If the trend continues, there will soon be more motor vehicle deaths in the periphery than the core. There is support for world-system theory with the use of mortality data indices of homicide, suicide, and motor vehicle accidents.

Table 6.4

Score Card for Violence

Endemic Danger		Inequalities Between Core and Periphery	Deteriorating Conditions for Periphery
Violence	Homicide	+	+
	Suicide	+	+
	Motor Vehicle	+	+
Total		3 to 0	3 to 0

Note. Column 3: + Inequalities persist between core and peripheral countries.
 - Inequalities do not persist between core and peripheral countries.
 Column 4: + Conditions in peripheral countries are deteriorating.

- Condit

CHAPTER 7 - Findings: Mortality Data

Overview

Included in this study is data on infant mortality and life expectancy at birth. This information will provide insight into conditions within a country that may alter viability in the first year of life and increase the risk of death at an early age. Mortality data provides an indication of how the social determinants of health affect the potential life expectancy of people within a country. A country's level of nutrition, access to health care, environmental degradation, and preventative health services will determine the infant mortality and life expectancy outcomes. The social determinants of health are affected by a country's position within the world-system. The position of a country within the world-system will dictate the country's ability to use money, power, and resources to provide initiatives to decrease mortality data and prolong life.

Infant mortality is a good indicator of the health status of a nation because the effects of pollution, poor nutrition, lack of adequate housing, stress, and other negative health factors will affect the mother's pregnancy and newborn period of life. These factors affect a mother's ability to have a healthy baby and how the infant's life will be sustained during the first year after birth. Infants are among the most vulnerable in any population group. They will suffer the effects of inadequate living conditions to a greater degree than other members of the population. Therefore, the use of infant mortality data may be used as a reflection of the overall level of social determinants of health that affect the mortality data. Infant mortality data is a better indicator of a nation's overall health than mortality data for all ages. Mortality data for all ages may not represent a country's ability to improve the social determinants of health and prolong life. A country may appear to have a high mortality rate due to an aging population and a low

birth rate. A country with a low birth rate, but a high number of elderly, will have a high mortality rate due to the large numbers within the population dying due to their age. By comparison, a country with a high birth rate and few elderly may appear to have a lower mortality rate than other countries. An example would be comparing a core country with a proportionally high elderly population and a low birth rate to a peripheral country where there is proportionally a young population with a high birth rate. Such a comparison may give the perception that conditions to prolong life are better in the peripheral country. This does not give a true picture of the social determinants of health in the countries and the impact on mortality present in the selected country. Therefore, overall mortality rate was not used in this study.

Findings

Infant Mortality

Introduction

Infant mortality data was chosen for this study because this data best shows the effect of the social determinants of health on the viability of an infant in the first year of life. Mortality data for all ages was initially considered for this study, but it was found to not be a good indicator. Mortality data for all ages is skewed by birth rates and the number of elderly in the population. This may give the impression that the living conditions and interventions to prevent death are better in the country with the lower mortality data.

The social determinants of health are the conditions experienced by infants during the prenatal period and the first year of life. The mother's health and birth experience affect infant mortality. If a mother does not have adequate nutrition and medical care during the pregnancy and birth experience the infant is more likely to be born with low birth weight or to be injured during the birth experience. If the environment that the infant is born into is laden with toxins,

the infant is more likely to die during the first year of life. Additionally, the presence of disease and risk of exposure is increased when poor living conditions exist.

Infant Mortality Table

In Table 7.1, Infant Mortality Data for Selected Countries, I chose to include additional countries due to the convenience and the availability of infant mortality for the selected countries. I included countries from a variety of locations, political backgrounds, and cultural diversity. It must be noted that the numbers given are at a rate of per 1,000 births. It is found in the data for infant mortality that there is an overall downward trend from 1950 to 2010. Wide differences in the rate of reduction occurred, depending on the country. This may be due to a variety of reasons such as economic status, geography, and political climate. It is for this reason that Table 7.2 was also created, so as to allow comparison between countries and their rate of reduction in infant mortality over the past 60 years.

This data shows that there is an 84% reduction in infant mortality data for core countries, an 86% reduction for semiperipheral, and an 80% reduction for peripheral countries. From this it can be concluded that, although there was an overall reduction in the percentage rates for infant mortality, the least amount of change in the infant mortality data is found in the peripheral countries. If the trend continues, the gap between core and peripheral countries will continue to widen with devastating effects.

Table 7.1

Infant Mortality Data for Selected Countries

Country	1950	1955	1960	1965	1970	1975	1980	1985	1990	1995	2000	2005	2010
US	30	27	25	23	18	14	12	10	9	7	7	7	6
Canada	38	32	27	21	17	13	9	8	6	5	5	5	5
Australia	24	22	20	18	17	13	10	9	7	5	5	5	4
Sweden	20	17	16	12	10	8	7	6	5	4	3	3	3
Core	28	24.5	22	18.5	15.5	12	9.5	8.25	6.75	5.25	5	5	4.5
Bulgaria	92	65	37	31	26	22	18	14	15	15	13	10	9
Turkey	167	164	161	157	141	119	97	78	63	46	31	24	20
Finland	43.7	30.7	20.4	17.4	12.5	10.2	7.7	6	6	4	4	3	2
Japan	50	37	26	16	12	9	7	5	4	4	3	3	3
Argentina	66	60	60	57	48	39	32	27	24	22	15	13	12
Greece	60	56	50	42	34	25	15	11	8	7	5	5	4
South Africa	96	91	87	84	77	71	61	53	51	56	59	55	46
Iran	262	212	173	141	116	92	70	55	47	39	33	27	23
Semiperiphery	104.6	89.46	76.8	68.18	58.31	48.4	38.46	31.13	27.25	24.13	20.38	17.5	14.88
Philippines	97	87	77	68	59	52	45	40	35	30	26	23	21
Mexico	122	102	88	79	69	57	47	40	33	28	21	17	14
Armenia	83	78	73	68	63	58	53	48	44	38	30	26	24
Egypt	201	186	171	155	138	119	101	85	67	47	33	26	22
Ethiopia	199	181	160	148	140	135	140	127	115	101	87	72	63
Bolivia	176	170	164	157	151	131	109	90	75	67	56	46	41
Thailand	130	109	90	76	63	50	39	25	23	19	15	12	11
Burma	213	175	156	131	113	98	93	90	76	65	60	55	45
Periphery	152.6	136	122.4	110.3	99.5	87.5	78.38	68.13	58.5	49.38	41	34.63	30.13

Note. Core countries are color coded with red shading, semiperipheral countries are color coded in blue, and peripheral countries are color coded in green. Means were calculated for each year within the zone and are given in the last row of the zone.

Core countries follow the same trend for infant mortality rates. In 1950, the rate for Canada was 38, and for Sweden it was 20. By 2010 the rates for Canada and Sweden were five and three, respectively. The United States was at six and Australia at four by the year 2010. It is apparent the difference between core countries was minimal. Among the core countries, the lowest percent of change was in the United States and the highest was in Canada. This is of

interest because both countries are in North America and have similar socioeconomic backgrounds. However, there is a difference in health care systems and this could explain the difference in infant mortality outcomes. Canada had a higher rate of infant mortality than the United States; but since 1965, Canada has had a rate lower than the United States.

For semiperipheral countries, the percent of change varied, ranging between 94% for Japan and Finland and 52% in South Africa. As stated previously, South Africa's data has been very erratic. Instead of South Africa having a steady downward trend that is seen in other countries, the data has an up and down movement. From 1950 to 1990, the rate moves down from 96 to 51. In 1991, the rate moves up to 56 and then to 59 in 2000. In the years 2005 and 2010 the rate decreases to 55 and 46, respectively. This up and down movement accounts for South Africa having a very low percent of change at 52%. Argentina also had a low percent of change, but not as severe as South Africa's. Argentina's percent of change was 82% and considerably higher than South Africa's of 52%. Finland and Japan each had 94% of change. Their infant mortality rates are more similar to the rates of the core.

In contrast, peripheral countries have infant mortality rates that are considerably higher than those of semiperipheral and core countries. In 1950, the peripheral country with the highest mortality was Burma with 213 infant deaths per 1,000 births, and the core country with the lowest was Sweden with 20 infant deaths. By 2010, the span between infant mortality figures was Ethiopia with 63 infant deaths per 1,000 and Sweden with 3. It is found that peripheral countries had the smallest reduction in infant mortality during the past 60 years. The country with the highest percent of change in infant mortality data was Thailand at 92%. The rate in Thailand declined from 130 to 11 infant deaths per 1,000. Countries with a lower percent of change were Ethiopia with a 68% decline and Armenia with a 71% decline. All peripheral

countries had a consistent downward trend except for Ethiopia. In 1950, the infant mortality rate for Ethiopia was 199 deaths per 1,000. By 1975, the rate had dropped to just 135. In 1980, the rate once again climbed to 140, but then declined to 63 in 2010. This bump up in the rate may be a reflection of social and political unrest at the time after the end of the reign of Haile Selassie and conflict over succession. Persistent famine during the late 1970s and early 1980s added to the rate of mortality for infants in Ethiopia during this time. Likewise, Burma was on a steady downward slope until 1975. But then the rate flattened out until 1985, when it declined again. Mexico, Thailand, Armenia, and the Philippines all show trends quite similar to each other. Although Egypt and Bolivia started higher than many other peripheral countries, they have steadily decreased their infant mortality rates.

Table 7.2

Infant Mortality Data; Change from 1950 to 2010

Country	Change between 1950 and 2010	Percent of Change
US	24	80
Canada	33	87
Australia	20	83
Sweden	17	85
Core Countries Combined	23.5	84
Bulgaria	83	90
Turkey	147	88
Finland	41	94
Japan	47	94
Argentina	47	82
Greece	56	93
South Africa	50	52
Iran	239	91
Semiperipheral Countries Combined	90	86
Philippines	76	78
Mexico	108	89
Armenia	59	71
Egypt	179	89
Ethiopia	136	68
Bolivia	135	77
Thailand	119	92
Burma	168	79
Peripheral Countries Combined	122.9	80

Note. Core countries are color coded with red shading, semiperipheral countries are color coded in blue, and peripheral countries are color coded in green.

Line Graph of Countries

The greatest variability in the data is shown in the semiperipheral countries. A large outlier in the data for the semiperipheral countries is Iran. Iran's infant mortality rate was the highest of the selected countries in this study. However, by 1985 the rate decreased and is now similar to that of other semiperipheral countries. Turkey, like Iran, started very high, more like a peripheral nation, but then dropped dramatically between 1965 and 2010. The rate is now closer to other semiperipheral and core countries. South Africa started higher than many semiperipheral countries, but declined until 1995 when infant mortality rose. This rise continued until 2005 and then declined. Currently, their rate is the highest of the semiperipheral countries selected for this study. Argentina's downward trend started in 1965. Prior to that, the numbers were very stagnant. Greece, a semiperipheral country, had an infant mortality rate higher than that of core countries, but then reduced their infant mortality rate, similar to the rate of core countries. Although Bulgaria started high, comparable to a peripheral nation, their rate is now near that of core countries. In the late 1980s and into the 1990s there was a slight upward movement in the rate; however, the numbers have since come down. Japan and Finland, although they started higher than core countries in this study, are now within the core nation range.

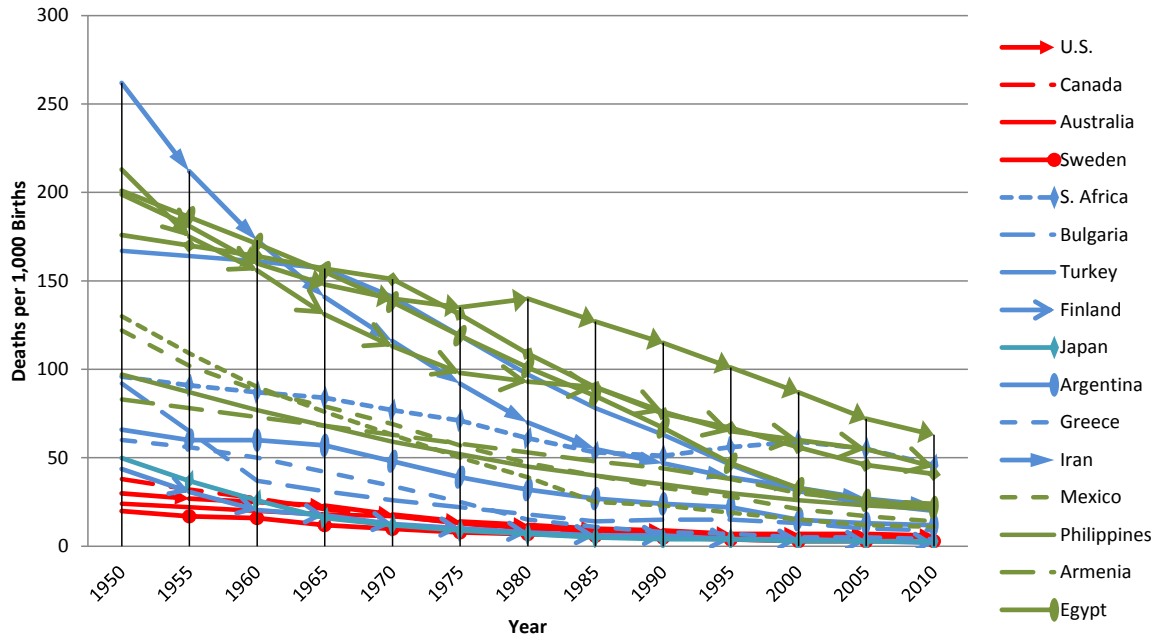


Figure 7.1. Infant Mortality Line Graph of Countries indicates the mortality rate for infants for selected countries from 1950 to 2010.

Line Graph of Zones

From Figure 7.2 it can be determined that countries in the periphery have had the highest infant mortality rates over the past 60 years. Semiperipheral countries have rates between core and peripheral countries. Core countries started at the lowest level when compared to semiperipheral and peripheral countries. Core countries remained the lowest throughout the 60 years of comparison. The overall trend for all three zones showed a decline in the rates for infant mortality; but, peripheral countries still lag behind semiperipheral and peripheral countries. The gaps between the zones appear to have narrowed, but based on the information on the percent of change, this assumption may be questionable.

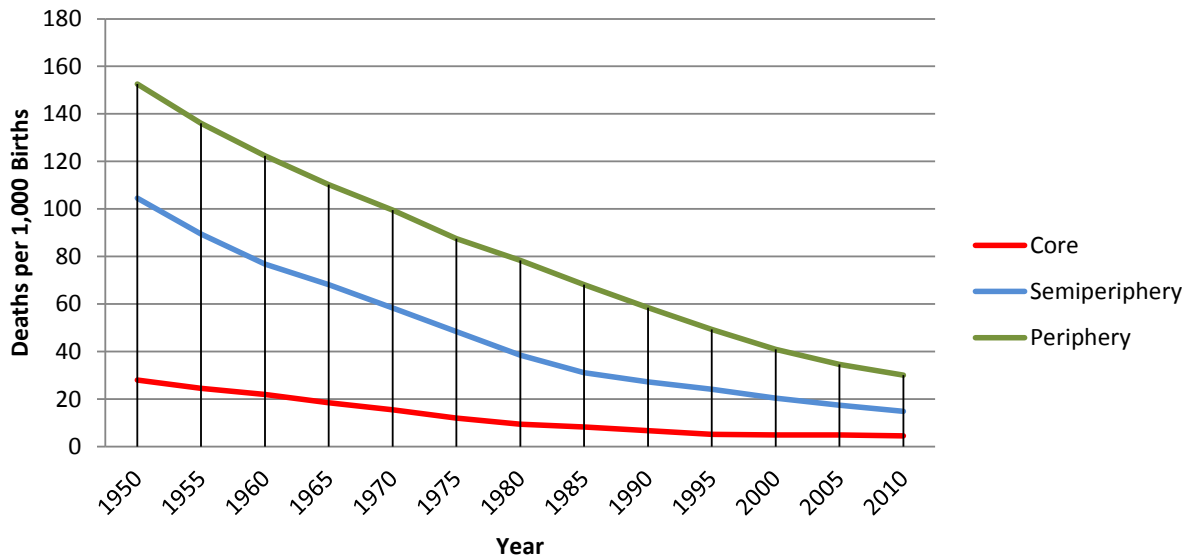


Figure 7.2. Infant Mortality Line Graph of Zones shows for the mean number of infant deaths by zone from 1950 to 2010.

Summary

Previous studies have found a link between a country's economic level and the rate of infant mortality. Two studies that found the link were by Ursula Casabonne and Charles Kenny (2011) and John Gerring and Strom Thacker (2009). Casabonne and Kenny (2011) found in their study that there is weak link between infant mortality rates and a country's Gross Domestic Product. Gerring and Thacker (2009) concurred, and found an association between market-oriented economic policies and infant mortality rates. Likewise, this study supports world-system theory when using data on infant mortality. A country's ability to provide the money, power, and resources to promote healthy pregnancies, births, and life in the first year is vital and will impact the country's infant mortality data. Infants in core countries are more likely to survive than those in peripheral countries. Clean water, nutritious food, and an environment free of pollutants are necessary to promote healthy fetal development and sustain the infant's life once born. Safe medical care by trained personnel is necessary in order to support pregnancies and births that

result in healthy infants. Likewise, technological resources to diagnose developing problems in pregnancies and births add to lowering the infant mortality rate for a country.

Life Expectancy at Birth for Females

Introduction

Life expectancy for females and males was included in this study to provide information on variations in the impact of mortality for all causes. Additionally, by using separate data for females and males, comparisons between the genders can be made for each country. Also, comparisons between females from different countries can be made. It is useful to look at the data by country and gender because a woman's position within the community, may be affected by the country's culture, religious beliefs, and social determinants of health. In core countries, where women are educated and have greater access to health care, there is a higher life expectancy. For peripheral countries, where women have limited access to education and health care, the life expectancy is lower.

Female Life Expectancy Table

Analysis of Table 7.3 shows core countries with an average life expectancy for females of 82.3 years, semiperipheral with 81.6, and peripheral with 69.2. For the United States, life expectancy is three years lower than for other core countries. This may be due to differences in health systems, life style, or genetics. However, this is not a focus of this study but may be considered in future research. South Africa has the lowest life expectancy in the semiperipheral countries at 57 years with Japan at 86 years. The average life expectancy for semiperipheral countries is very comparable to the average in core countries, which is 81.6 years. This is in contrast to the peripheral countries where the average life expectancy for females is 69.2.

Table 7.3

Life Expectancy at Birth for Females Data for Selected Countries

Country	1960	1965	1970	1975	1980	1985	1990	1995	2000	2005	2010
US	72	73	74	75	77	78	78	78	78	80	80
Australia	72	72	74	74	77	79	79	80	81	83	83
Canada	72	74	75	76	77	78	79	79		82	83
Sweden	74	75	76	77	78	79	81	81	81	75	83
Core	72.5	73.5	74.8	75.5	77.3	78.5	79.5	79.5	80	80	82.3
Finland	69	71	72	74	77	78	78	80	80	82	83
Bulgaria	46	71	72	73	73	73	74	74	74	76	77
Japan	69	72	74	76	78	80	81	82	83	85	86
Argentina	61	68	70	71	71	72	72	73		77	80
Greece			70	70	73	73	76	79	80	81	82
South Africa			49	53	61	55	63	66		52	57
Semiperiphery	61.3	70.5	71.6	72.8	74.4	75.2	76.2	77.6	79.25	80.2	81.6
Bolivia		49	49	47	53	53	60	61	63	63	63
Egypt			53	53	53	53	55	61	67	67	67
India	31	40	40	40	44	44	52	58	62	63	64
Thailand	51	51	58	58	58	63	65	68	72		
Mexico	39	57	63	63	68	66	66	66	75	77	77
Philippines			53	60	62	63	66	66	70	65	
Burma		43	47	51	60	59	63	63	58		68
Armenia								75	78	76	76
Periphery	40.3	48	51.9	53.1	56.9	57.29	61	64.8	68.13	68.5	69.2

Note. Core countries are color coded with red shading, semiperipheral countries are color coded in blue, and peripheral countries are color coded in green. Means were calculated for each year within the zone and are given in the last row of the zone.

Line Graph of Countries

The data in Figure 7.3, Life Expectancy at Birth for Females Line Graph for Countries, indicates that all core countries have similar trend lines where the life expectancy for females has increased to reach an age of 83 in all core countries except for the United States which is at 80.

Since 1990, the United States has had a lower life expectancy for females than the other

identified core countries. There was a downward trend in the data for Sweden in 2005, but the rate rose back to the prior level in 2010, which may be an aberration in the data. For semiperipheral countries, there was a wide variation in female life expectancy. For 2010, life expectancies ranged from 57 in South Africa to 83 years of age in Finland. Japan has had an ongoing, and improving, high female life expectancy. In 2010, the female life expectancy in Japan was the highest of the countries selected at 86 years. Following Japan is Greece, with a life expectancy of 82 years. Greece and Finland have life expectancies similar to core countries at 82 and 83 years, respectively. Close behind is Argentina at 80 years of life expectancy for females. Argentina quickly improved their life expectancy for females from 1960 through 1970. Their life expectancy then leveled off and did not improve until the 2000s. Bulgaria made vast improvements in their female life expectancy from 1960 to 1965, from 46 to 71 years of age. Between 1965 and 2010, Bulgaria made modest improvements with a six-year gain to age 77. For South Africa, life expectancies for females were 49 in 1970 but climbed to 61 in 1980. Life expectancy for females in South Africa then fell in the 1985 data to 55 and increased to 66 in 1995. In 2005 South Africa's data once again fell to 52 but began an upward movement to age 57 in 2010. South Africa has had irregularity in all of their data for health parameters selected for this study. This is possibly due to political unrest, social change within the country, and difficulties in the data-collection process.

Peripheral countries show great diversity in the data. Core countries have data that is tightly bunched and similar. As stated previously, the data for core countries show a straight trajectory, whereas peripheral countries show trajectories that are more irregular. This is possibly a reflection of their economic, political, and social states of flux affecting the social determinants of health and in turn life expectancy. Despite the fact that Mexico started very low, with a

female life expectancy of only 39, they are now near the age expectation for females in core countries. In 2010, the age expectancy for females in Mexico was 77. Thailand shows similar data of raising their life expectancy from 51 in 1960 to 72 in 2000. The Philippines showed improvement from 1970 to 2000, and then the age dropped from 70 years of age to 65 in 2005. No data is recorded for the year 2010. For Burma, female life expectancy was 43 in 1965. It climbed to 60 in 1980, dropped one year in 1985, and then reached 63 before dropping again in 2000. However, in 2010, the data shows life expectancy as 68 years of age. Egypt's data starts in 1970 and remains unchanged at 53 years of age until 1990 when the female life expectancy increased to 67 in 2000. The life expectancy for females has remained the same through the 2010 data. Bolivia has a similar trend line with periods of no change and then at other times a small increase in the life span. Data begins in 1965 with the female life expectancy in Bolivia at 49. The life expectancy stays the same through 1970 and then drops to 47 years in 1975. After 1975 there is a slow rise to 63 years of age in 2000 and then it remains the same through the 2010 data. India is the only country that had a lower female than male life expectancy in 1960, when the life expectancy for a female was only 31 years of age while for males it was 32. In 1990, the Indian female life expectancy was equal to the male life expectancy, and surpassed it in 1995 with the female life expectancy at 58 and the male at 57. But, in 2010, the life expectancy had increased to 64 years of age for females and 62 for males.

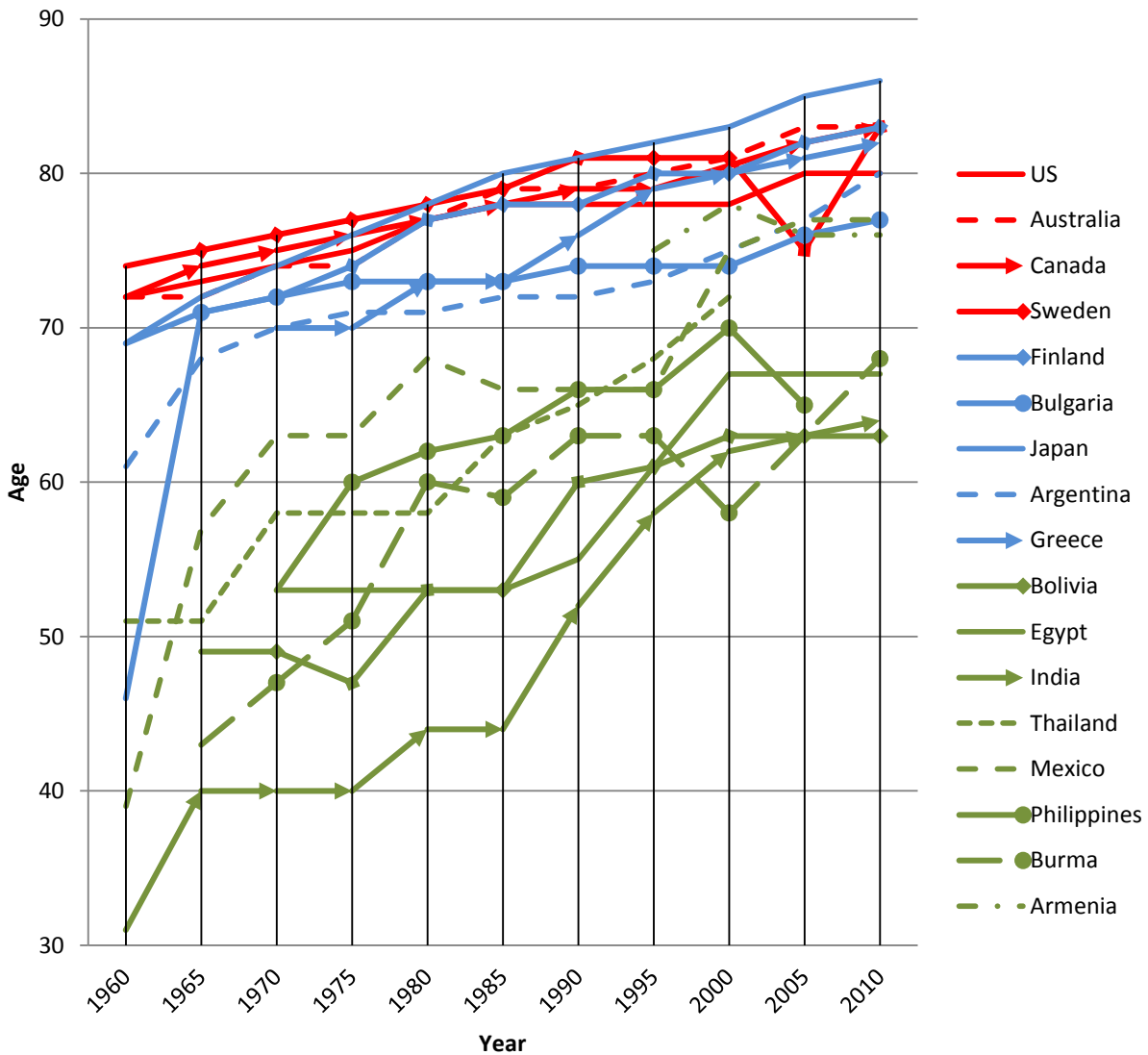


Figure 7.3. Life Expectancy at Birth for Females Line Graph for Countries indicates female life expectancy data for selected countries from 1960 to 2010.

Line Graph of Zones

Overall, the data for the life expectancy for females show support that differences exist between core, semiperipheral, and peripheral countries. Core and semiperipheral countries are very close. In 1960, there was a 10-year difference in age. From the year 2000 onward, the female life expectancy for semiperipheral countries was similar to that of core countries.

Peripheral countries had a rate of life expectancy for females that started dramatically lower than

that of core or semiperipheral countries, and despite improvements, remains lower. The female life expectancy rate is lower in all peripheral countries than in the lowest of the semiperipheral countries, excluding South Africa. Convergence between core and peripheral countries appears to be occurring, but there presently exists a wide divide between the two groups.

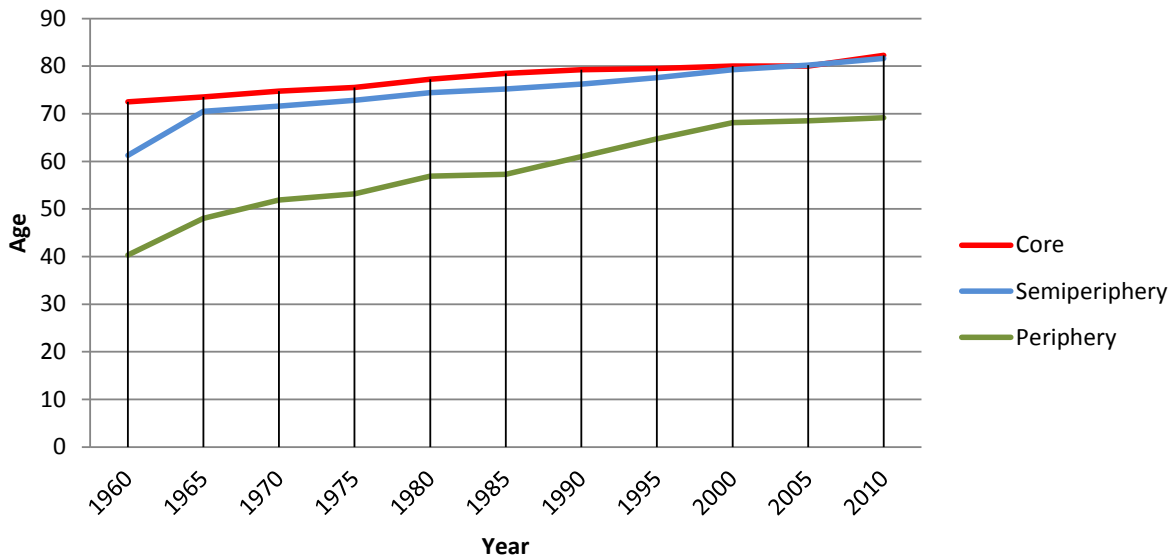


Figure 7.4. Life Expectancy at Birth for Females Line Graph of Zones shows mean life expectancy for females by zone from 1960 to 2010.

Summary

It is impossible to gain a full understanding of the impact of the social determinants of health on life expectancy at birth without the inclusion of the gender perspective. Historically, females in most countries live longer than males. However, when comparing the data solely among females, it shows that females in peripheral countries do not fare as well as females in core countries. Multiple social, physiological, and environmental factors may affect the course of health over the years and determine the life expectancy for females. Females will have a shorter life expectancy in countries where they may share the greater burden of poverty that puts them at

greater risk for poor nutrition, greater exposure to disease, and decreased access to healthcare. Additionally, increased risk associated with the childbearing experience escalates the risk factor for females who have limited access to the money and resources necessary to prolong their lives. It is also necessary for females to have the power to socially and legally demand their right to adequate health services for themselves and their children. In countries where limited money, power, and resources exist, and women are not held as equal participants in the healthcare system, the adverse effects will be evident in a shortened life expectancy.

Life Expectancy at Birth for Males

Introduction

It is evident that gender must be considered in an analysis of life expectancy. Physiological and sociological differences exist for males and females. The differences determine the social determinants of health and affect the life expectancies for both genders. In most countries, males historically do not live as long as females for reasons that are not clearly understood. Whether this is due to lifestyle or genetics has not been determined by science. However, when comparing the data solely for males, in this study there is clearly a difference in life expectancy for males between core, semiperipheral, and peripheral countries.

Male Life Expectancy Table

From the data in Table 7.4, Life Expectancy at Birth for Males Data for Selected Countries, it is evident that males in core countries live between 75 and 79 years with an average life expectancy of 77.75 years. Australia, Canada, and Sweden have a life expectancy for males of 78 or 79 years while the United States has an average of 75 years. This is comparable to females in the four selected core countries where females live to 83 years in Canada, Australia, and

Sweden, and 80 years in the United States. It is of interest that both males and females in the United States live about three years less than in their counterparts in the other core countries.

The range in differences in the data on life expectancy for males in semiperipheral countries is wider than that of core countries. Life expectancy in semiperheral countries ranges from 53 years in South Africa to 79 years in Japan. If South Africa were not included, the range for life expectancy would be from 69 years for Bulgaria to 79 for Japan.

For peripheral countries, male life expectancies range from 62 years for India to 72 years for Mexico. When compared to core and semiperipheral countries, males in the periphery have shorter lives. Most countries show a steady increase in the life expectancy years for males, except for Bulgaria, South Africa, Bolivia, and Burma. Bulgaria's dip in the life expectancy in 1995 and 2000 may be due to internal conflict and the fall of the Soviet Union. Internal social and political conflict will lead to a greater number of deaths due to violence. Also, with the fall of the Soviet Union, the infrastructure supporting health care became limited, resulting in a decrease in health services. Similar reasons may be true in Bolivia, where the life expectancy rate dropped to 45 in 1975. However, based on a literature review, I have not found a specific event that corresponds to the decrease in the life expectancy for males in Bolivia. It is noted that countries showing a decrease in the life expectancy for males are in the periphery or semiperiphery.

When aggregate data for each zone is compared, it is found that males in core countries live the longest, 77.75 years, compared to males in the semiperiphery, at 74.6 years, and the periphery, at 67.2 years. It is also noted that peripheral countries have had the greatest increase in life expectancy for males. In 1950, the average life expectancy for a male born in India was 32 years and in Mexico it was 37 years. India and Mexico have both increased their life

expectancy for males by approximately 30 years. In the semiperiphery, the number of years for a male born in Bulgaria has increased by 24, while other semiperipheral countries increased approximately 10 to 15 years. The life expectancy in core countries has increased by approximately ten years.

Also of interest, in Egypt, men live longer than women. Women in Egypt had a life expectancy of 67 years in 2010, compared to the life expectancy of men at 68 years. In 1950, men in India lived to an average of 32 and women to 31 years of age. In India, the trend of men living longer than women changed in 1990 when the life expectancy for men and women both stood at 52 years of age. After 1990, women began to outlive men by approximately two years. This could possibly be due to improvements in care for women during their childbearing experiences.

Table 7.4

Life Expectancy at Birth for Males Data for Selected Countries

Country	1960	1965	1970	1975	1980	1985	1990	1995	2000	2005	2010
US	66	66	66	68	69	71	71	72	72	74	75
Australia	67	67	67	67	70	72	73	75	76	78	79
Canada	67	68	68	69	70	71	73	73		77	78
Sweden	70	71	71	72	72	73	76	76	77	77	79
Core	67.5	68	68	69	70.3	71.8	73.3	74	75	76.5	77.75
Finland	63	64	65	66	68	70	70	72	73	75	76
Bulgaria	45	67	68	68	68	68	68	67	67	69	69
Japan	65	67	69	71	73	74	75	76	77	78	79
Argentina	66.6	63	64	65	65	65	65	68		70	72
Greece			67	67	70	70	72	74	75	76	77
South Africa			49	49	58	51	57	60		49	53
Semiperiphery	59.9	65.25	66.6	67.4	68.8	69.4	70	71.4	73	73.6	74.6
Bolivia		49	49	45	48	48	50	57	59		
Egypt			51	51	51	51	57	62	65	67	68
India	32	41	41	41	46	46	52	57	61	62	62
Thailand	48	48	53	53	53	57	62	63	66		
Mexico	37	55	61	61	62	62	62	62	69	71	72
Philippines			48	56	59	60	62	63	66	64	
Burma		40	47	48	56	55	58	57	53		64
Armenia								68	70	70	70
Periphery	39	46.6	50	50.7	53.6	54.1	57.6	61.1	63.6	66.8	67.2

Note. Core countries are color coded with red shading, semiperipheral countries are color coded in blue, and peripheral countries are color coded in green. Means were calculated for each year within the zone and are given in the last row of the zone.

Line Graph of Countries

As indicated by the data in Figure 7.5, Life Expectancy at Birth for Males Line Graph for Countries, all countries selected for this study have shown an increase in the life expectancy of males since 1960. The United States has the lowest life expectancy for core countries at 75 years of age and the highest is Australia, at 78 years of age. Semiperipheral countries vary

considerably. In 1960, Bulgaria was at 45 years of age, but in 2010 it had increased to 69. For Argentina, life expectancy for males ranged from 63 to 68 years of age until 2005. In 2005, males in Argentina had a life expectancy of 70, and by 2010, it was at 72. South Africa, as with other tables and graphs, shows great variability in the data; for that reason, South Africa is not included on the line graph. Data begins in 1970, with a life expectancy of 49 years of age, and increases to 58 years in 1980. The life expectancy data then drops in 1985 to 51 years, and then goes back up in 1995 to 60 years. In 2005, the life expectancy data for South Africa decreases to 49 years and then increases to 53 years in 2010.

Semiperipheral countries that do not show fluctuations and demonstrate steady upward trends are Finland, Japan, and Greece. According to Arrighi and Drangel (1986), Finland, Japan, and Greece are on the lower end of the core-peripheral spectrum. All of the life expectancy data for males for Finland, Japan, and Greece are within the core range. The lowest is Finland at 76 years, followed by Greece at 77 years, and the highest is Japan at 79 years. Japan ties the core nation of Sweden for the greatest longevity of males among the selected countries for this study.

The peripheral countries of Bolivia and Burma show fluctuations in the life expectancy data, whereas the other peripheral countries show a steady rise. Bolivia's data reveals that, in 1965 and 1970, 49 years was the life expectancy for males. However, in 1975 the life expectancy dropped to 45 years. It rebounded to 48 years in 1980 and continued upward to 59 years in 2000. In 1985, Burma's male life expectancy rate dropped from 56 years to 55 years. It recovered to 58 years in 1990, but dropped again in 1995 to 57 years of age. It fell to 53 years in the year 2000 but increased to 64 years in 2010. India and Mexico show the lowest life expectancy for males in 1960 at 32 years for India and 37 years for Mexico. Both countries increased, though Mexico had a better rate than India, improving to 72 years and India to 62 years for 2010. Egypt's data

begins in 1970 and shows a life expectancy of 51 years of age through 1985. The rate then begins to rise until 2010 when the life expectancies for males in Egypt reached 68 years. Thailand also began very low at 48 years of age for males in 1960, but has shown steady progress in improving their life expectancy for males. The last data recorded for Thailand is in 2000, when life expectancy was at 66 years of age. The Philippines begin their recorded data in 1970, showing life expectancy for males at 48 years and steadily improving to 66 years in 2000. In 2005, the life expectancy for males in the Philippines dropped to 64 years.

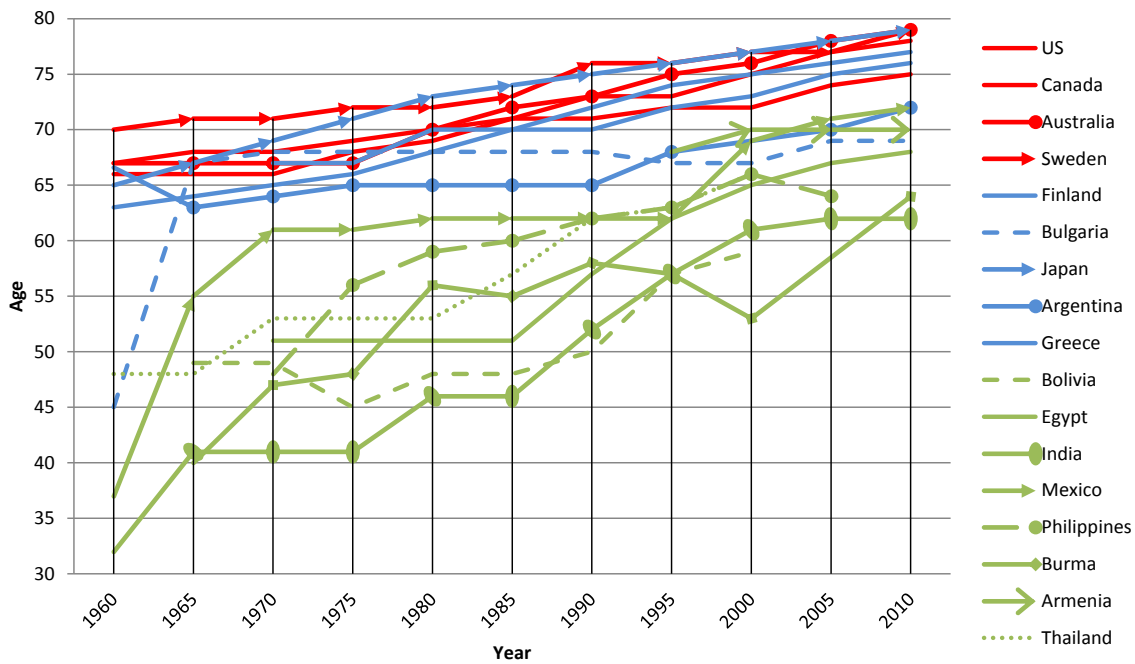


Figure 7.5. Life Expectancy at Birth for Males Line Graph for Countries indicates male life expectancy data for selected countries from 1960 to 2010.

Line Graph of Zones

An analysis of Figure 7.6, Life Expectancy at Birth for Males Line Graph for Zones, indicates that peripheral countries have made the greatest strides and gained the most years when compared to core or semiperipheral countries. Between 1960 and 1965, however, semiperipheral

countries also gained and have a trajectory just below and similar to that of core countries. Peripheral countries started with much lower life expectancy rates than semiperipheral and core countries. Between 1960 and 1970, there were significant improvements in the life expectancy for males in peripheral countries. The steady increase in life expectancy continued until 2005. Between 2005 and 2010 there is a flattening of the life expectancy rates for peripheral countries. Core countries show steady upward movement in life expectancy rates for males over the 60-year period of this study.

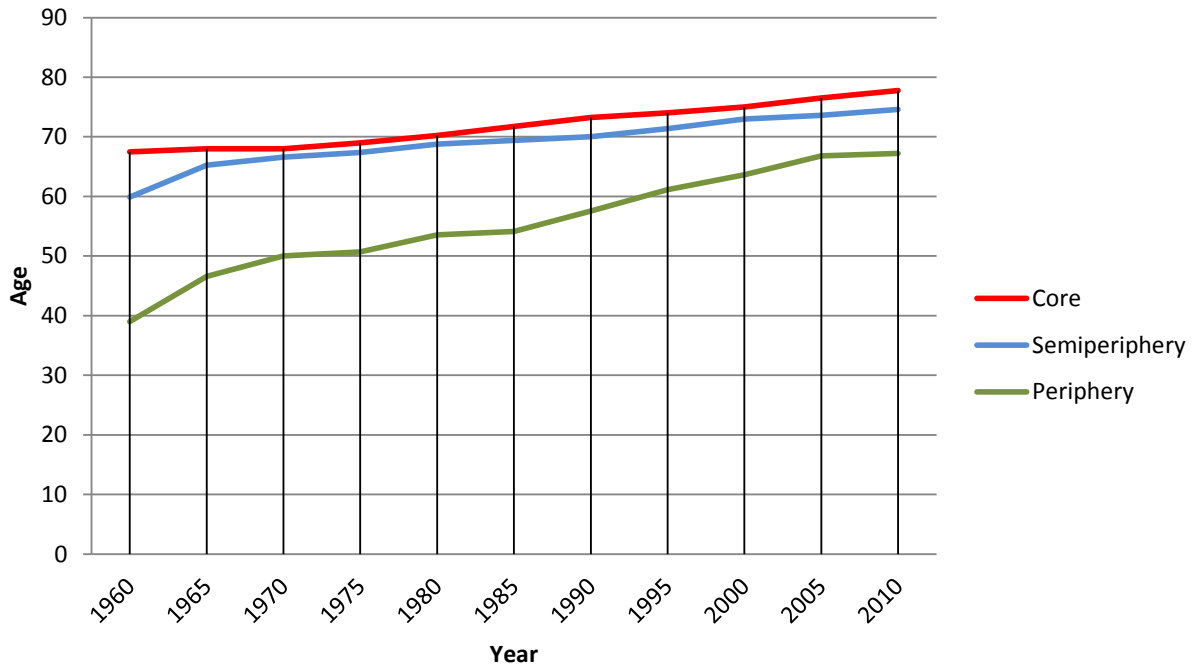


Figure 7.6. Life Expectancy at Birth for Males Line Graph of Zones shows mean life expectancy for males by zone from 1960 to 2010.

Summary

As evidenced by the findings of this study, overall, women live longer than men. Whether this difference in life expectancy is due to genetics or lifestyle is a debatable topic, one that is

beyond the scope of this study. From the findings of this study, it is noted, however, that women in the peripheral countries of India and Egypt were not living as long as men but this trend has reversed and women now live longer than men. This may be due to greater interest on the part of the World Health Organization and other groups to increase globally health care access for women. This increase in health care access for women has resulted in a decrease in maternal mortality rates in Egypt and India from 1950 onward. It is also noted that life expectancy for men was greater in the core than in the periphery.

Summary

Overall, since 1950 infant mortality rates have declined and life expectancies have improved. This is true for core, semiperipheral, and peripheral countries. This is a positive trend and is worth noting. But, while peripheral countries have shown improvement, they did not reduce infant mortality rates or raise life expectancy rates to levels reached by core countries. The persistence of the disparities in the rates of infant mortality and life expectancy is of concern. Evidence of the disparities in the data between core countries and peripheral countries can be found in the data for this study. In Sweden in 2010, out of 1,000 births, 3 children died before their first birthday. In Ethiopia in 2010, 63 children out of 1,000 died. Life Expectancy data shows the same gap between core, semiperipheral, and peripheral countries. For a male in Sweden, life expectancy in 2010 was 79 years, while in India the life expectancy was 62 years of age, a difference of 17 years. For most of the selected core countries, the life expectancy for females is 83 years of age, while for Bulgaria, a semiperipheral country it is 63 years, and for India, a peripheral country, it is 64 years of age. Therefore, efforts to address the disparities and inequalities must occur before stagnation or reversals of previous positive trends occur. These findings provide support for world-system theory. The expected findings would be that the

infant mortality and life expectancy rate would show disparities among core, semiperipheral, and peripheral countries. Core countries pull money, power, and resources from the periphery to the core, thereby, negatively affecting the social determinants of health in the peripheral countries. When the social determinants of health are affected in a negative manner, infant mortality rates and life expectancy data will show a difference between core countries and peripheral countries. It is for this reason that I scored the first column with pluses. I scored the second column with minuses, because, there was no evidence in the findings that conditions in the periphery has deteriorated. Future studies and time will tell if the conditions plateau or deteriorate in the periphery due to growing industrialization and urbanization.

Table 7.5

Score Card for Mortality

Endemic Danger		Inequalities Between Core and Periphery	Deteriorating Conditions for Periphery
Life Span	Infant Mortality	+	-
	Female Life Expectancy	+	-
	Male Life Expectancy	+	-
	Total	3 to 0	0 to 3

Note. Column 3: + Inequalities persist between core and peripheral countries.
 - Inequalities do not persist between core and peripheral countries.
 Column 4: + Conditions in peripheral countries are deteriorating.

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CHAPTER 8 - Summary and Conclusions

Introduction

After World War II, many people in government and industry thought that new vaccines and disease treatments would benefit everyone equally. But this was not always the case. Although technology exists to improve lives, it has not been made widely available. This thesis set out to test two of Immanuel Wallerstein's (1995, p. 100) theoretical assertions: 1. Significant inequalities in the "margin of safety against...endemic dangers and erratic violence" for people in different zones of the world-economy persist over long periods of time despite the availability of technologies/treatments/practices that could provide greater margins of safety, and 2. The "margin of safety" for people in the periphery has actually deteriorated.

To test these assertions, I identified a set of proxies for "endemic dangers and erratic violence" (Wallerstein, 1995, p. 100): infectious diseases (malaria, polio, tuberculosis, and influenza), chronic diseases (cancer, diabetes, and cardiovascular), erratic violence (homicide, suicide, and motor vehicle accidents), and also infant mortality and life expectancy for women and men. I then examined how mortality from these dangers, comparing them to the Four Horsemen of the Apocalypse, changed in countries located in different zones around the world over the last 60 years.

Just as the apocalyptic four horsemen of pestilence, famine, war, and death describe the last days of humanity, the indicators of chronic and infectious disease, violence, and lifespan data describe some conditions in the world today. Although an improvement in some mortality has occurred, persistent inequalities exist when individual countries or zones are analyzed. The apocalyptic four horsemen—pestilence, famine, war, and death— as argued by Wallerstein

(1995) can be seen on a daily basis in the form of a decline in human safety. Wallerstein (1995) continues by stating that hurt, death, and erratic violence is the result of unrestrained capitalism.

Capitalism has not closed the gap between core, semiperipheral, and peripheral countries, though the gap has narrowed in some cases and increased in others. According, to Solomon Benatar, Stephen Gill, and Isabella Bakker (2009), a new paradigm on how to achieve more equitable global health is needed. This new paradigm would include new visions of human development, human security, and human rights. The ability to achieve this exists. The knowledge needed to improve longevity exists. But without an improvement in the forces of social justice and economic redistribution, this change will not occur. Over the past 60 years, disparities have widened for many people in the world. The growing economic recession will likely make matters worse for people in the periphery. Benatar, Gill, and Bakker (2009) state that only 20% of the world's population has benefited from a market-driven health care system. In the 1990s, 89% of the world's annual expenditure on health was spent on 16% of the world's population (Benatar, Gill, & Bakker, 2009). Between 51%-60% of the world's population live below the "ethical poverty line" and this equates to 3.2-3.8 million people (Benatar, Gill, & Bakker 2009). For many, living conditions will decline as a result of environmental degradation, global warming, increasing industrialization, emerging infectious diseases, increasing chronic disease, and accidental deaths.

Score Card and Graphs of Zones

Findings from the data were scored and placed in a table which provided additional comparison and clarity. The score card listed the four proxies for "endemic dangers": infectious disease, chronic disease, violence, and lifespan. Scores were given using a *plus* for data that supported Wallerstein's assertions and a *minus* when the data did not support. The first

assertion, that there is a gap between core and periphery, is indicated in the third column. The fourth column assessed if conditions are growing worse for people in the periphery.

Table 8.1 Combined Score Card for Endemic Dangers

Endemic Danger		Inequalities Between Core and Periphery	Deteriorating Conditions for Periphery
Infectious Disease	Malaria	-	-
	Polio	+	+
	Tuberculosis	-	-
	Influenza	-	-
Total		1 to 3	1 to 3
Chronic Disease	Diabetes	+	+
	Cancer	+	+
	Cardiovascular	+	+
Total		3 to 0	3 to 0
Violence	Homicide	+	+
	Suicide	+	+
	Motor Vehicle	+	+
Total		3 to 0	3 to 0
Life Span	Infant Mortality	+	-
	Female Life Expectancy	+	-
	Male Life Expectancy	+	-
Total		3 to 0	0 to 3

Note. Column 3: + Inequalities persist between core and peripheral countries.
 - Inequalities do not persist between core and peripheral countries.
 Column 4: + Conditions in peripheral countries are deteriorating.
 - Conditions in peripheral countries are not deteriorating.

At this point I have also added graphs of the zones for additional reference.

Infectious Disease

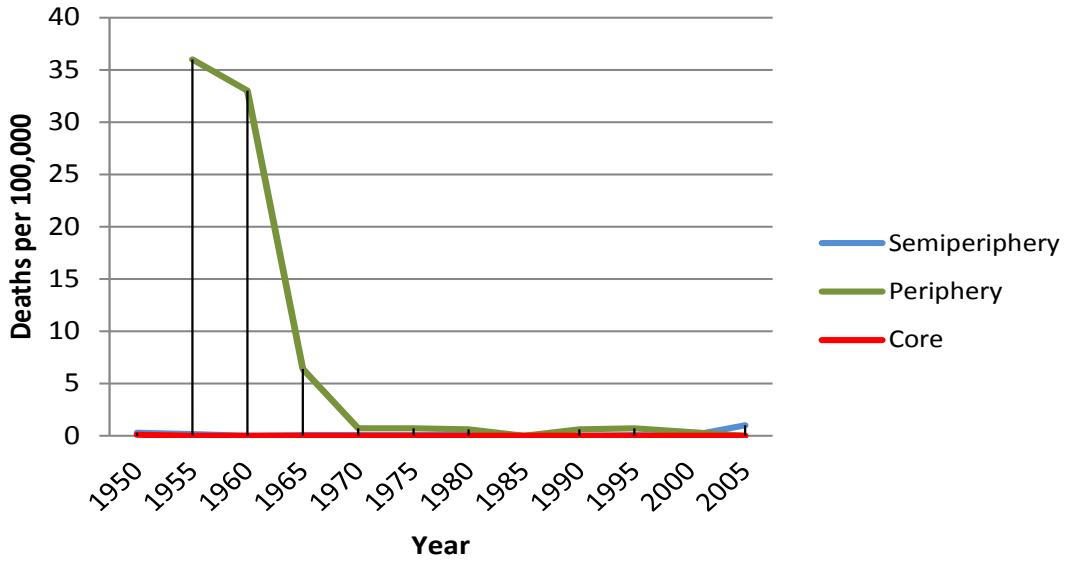


Figure 8.1. Malaria Line Graph of Zones shows the mean number of deaths due to malaria by zone from 1950 to 2005.

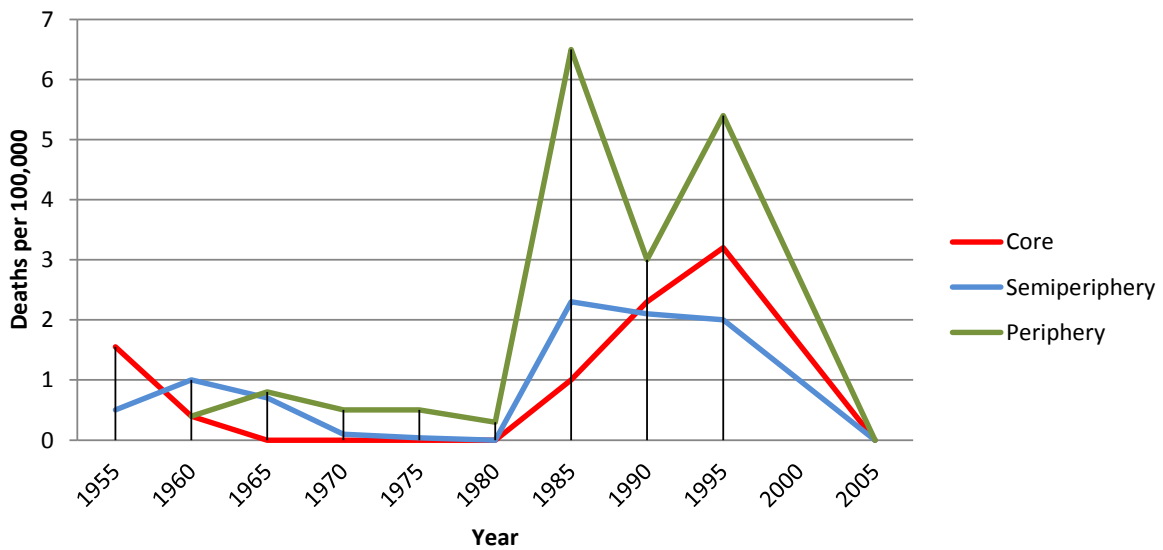


Figure 8.2. Polio Line Graph of Zones shows the mean number of deaths due to polio by zone from 1955 to 2005.

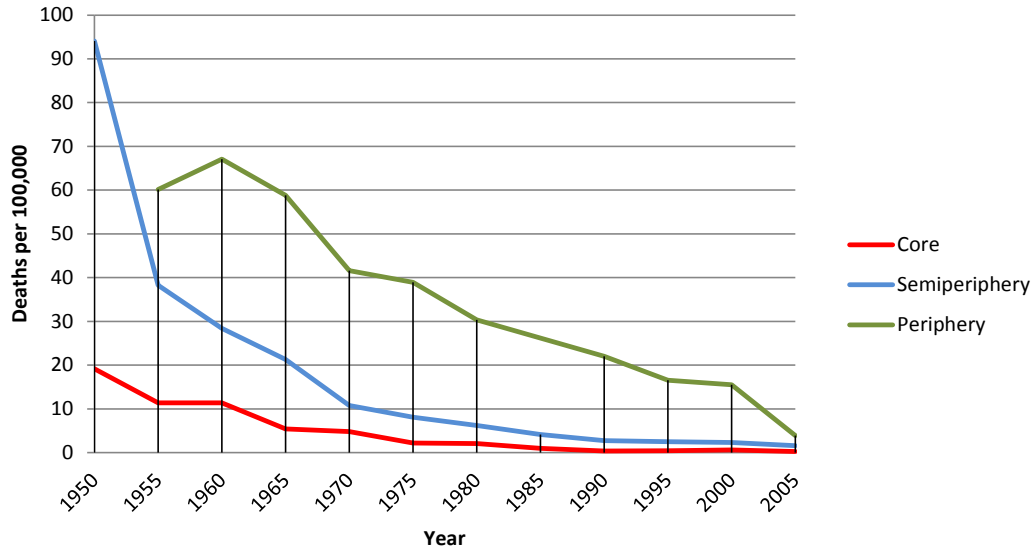


Figure 8.3. Tuberculosis Line Graph of Zones shows the mean number of deaths due to tuberculosis by zone from 1950 to 2005.

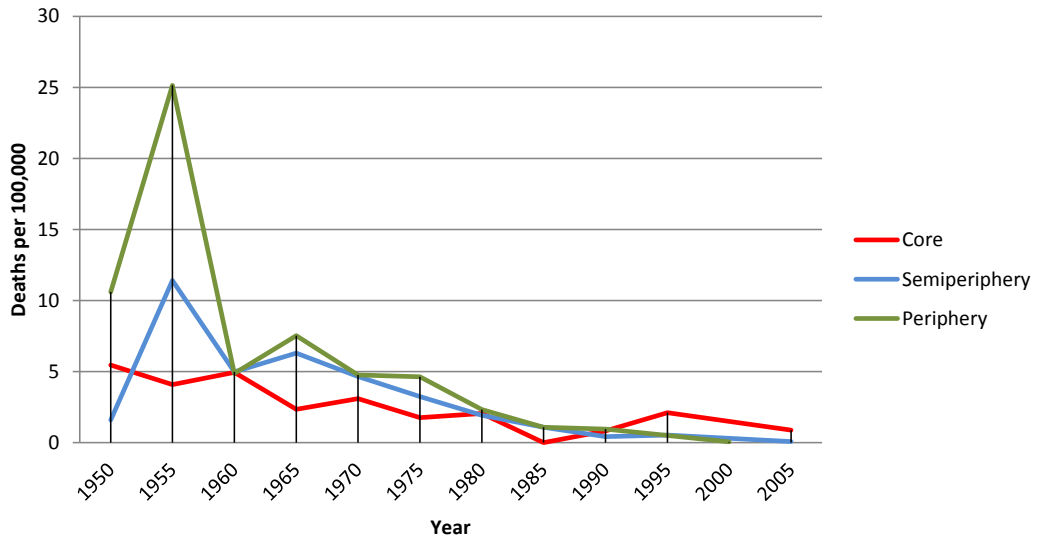


Figure 8.4. Influenza Line Graph of Zones shows the mean number of deaths due to influenza by zone from 1950 to 2005.

Chronic Disease

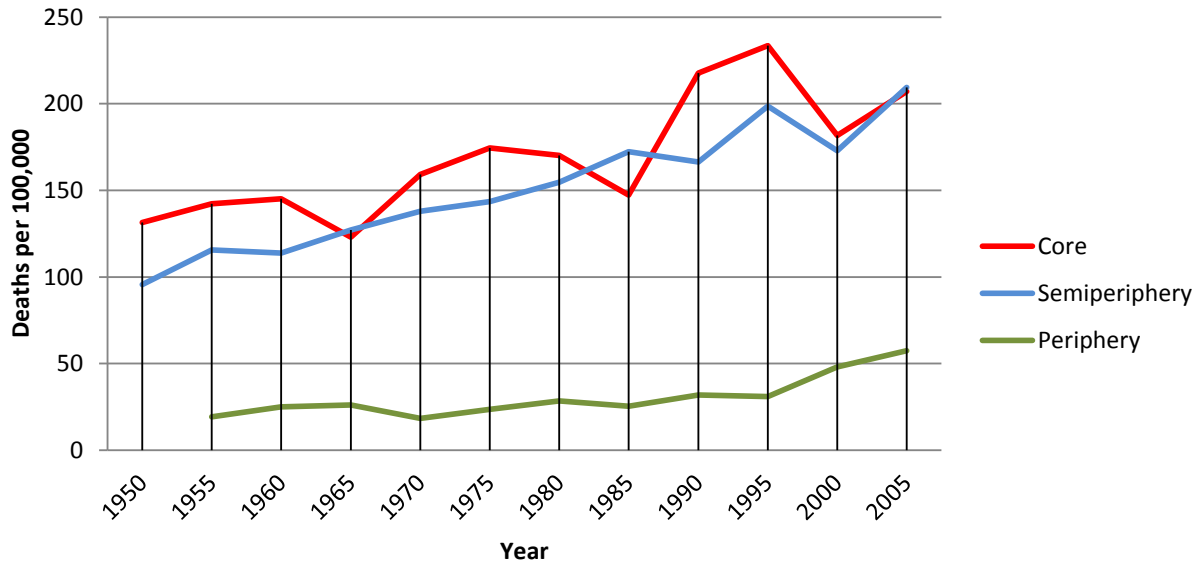


Figure 8.5. Cancer Line Graph of Zones shows the mean number of deaths due to cancer by zone from 1950 to 2005.

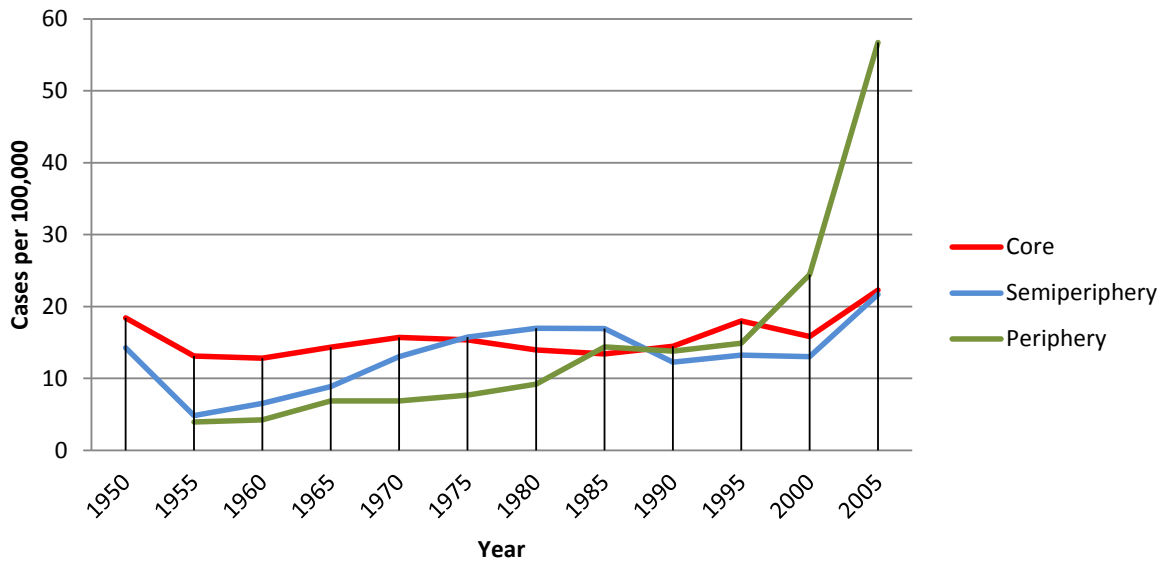


Figure 8.6. The Diabetes Line Graph of Zones shows the mean number of deaths due to diabetes by zone from 1950 to 2005.

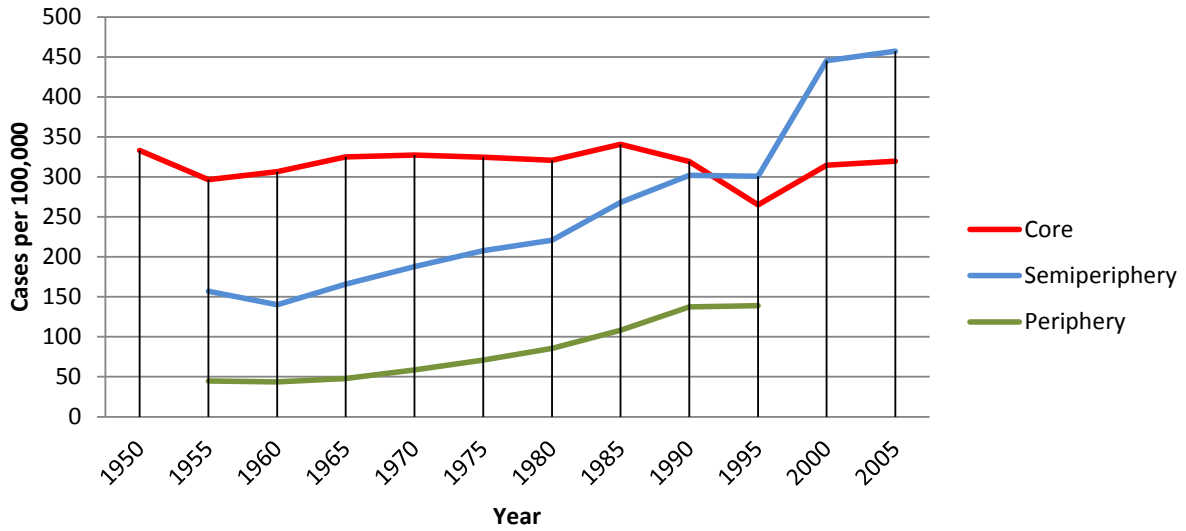


Figure 8.7. The Cardiovascular Line Graph of Zones shows the mean number of deaths due to cardiovascular disease by zone from 1950 to 2005.

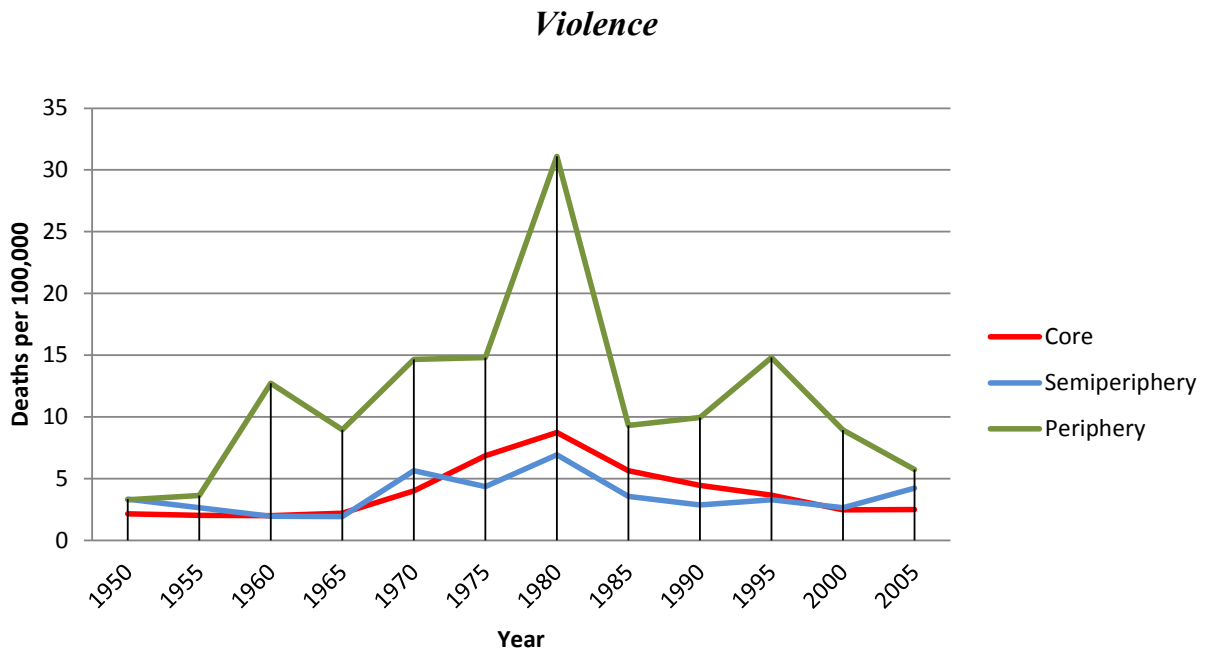


Figure 8.8. Homicide Line Graph of Zones shows the mean number of deaths due to homicide by zone from 1950 to 2005.

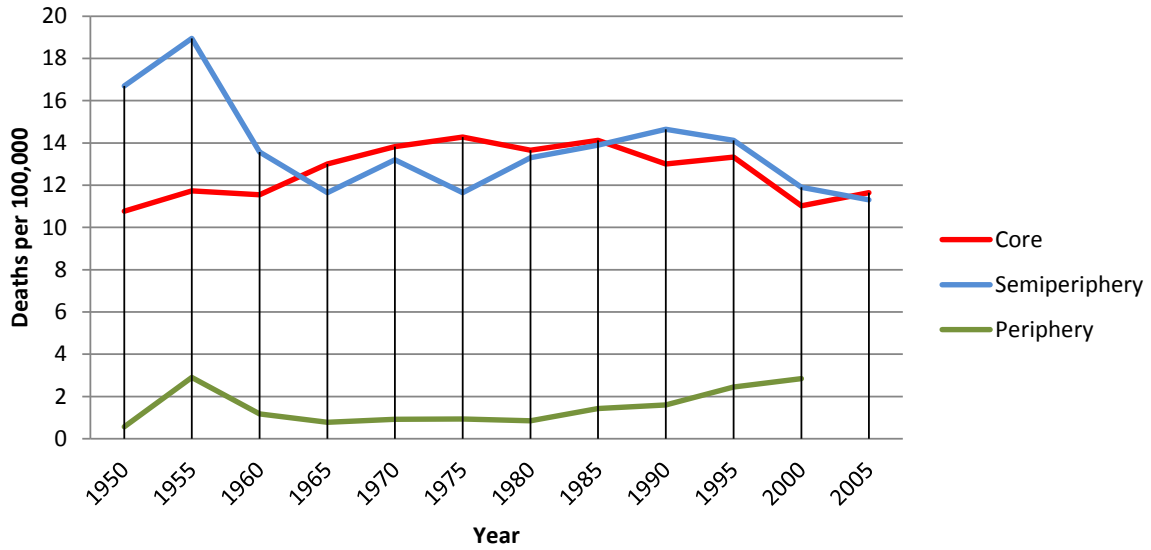


Figure 8.9. Suicide Line Graph of Zones shows the mean number of deaths due to suicide from 1950 to 2005.

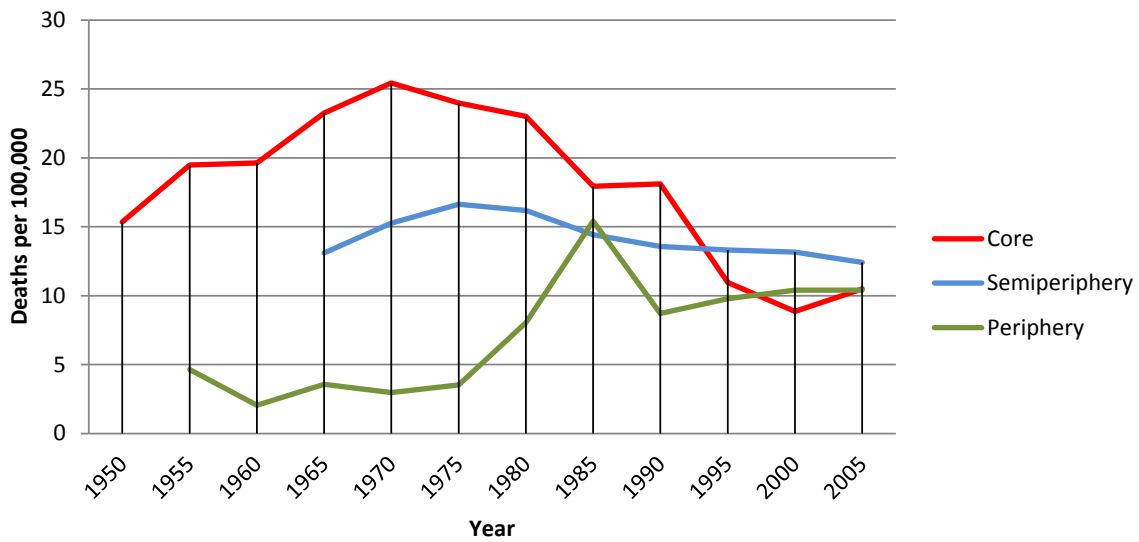


Figure 8.10. Motor Vehicle Accidents Line Graph of Zones shows the mean number of deaths due to motor vehicle accident by zone from 1950 to 2005.

Life Span

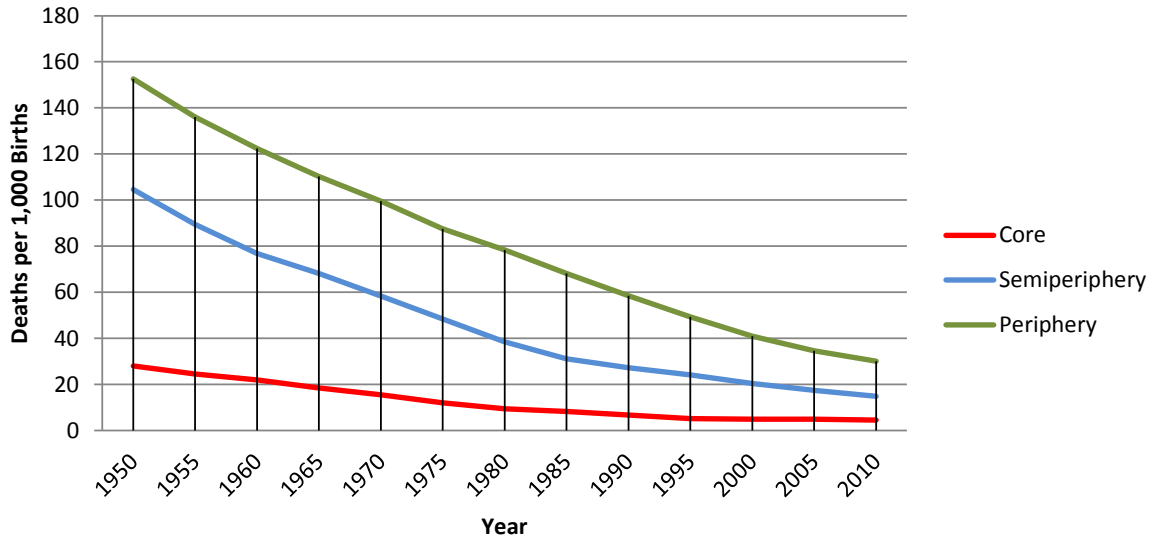


Figure 8.11. Infant Mortality Line Graph of Zones shows for the mean number of infant deaths by zone from 1950 to 2010.

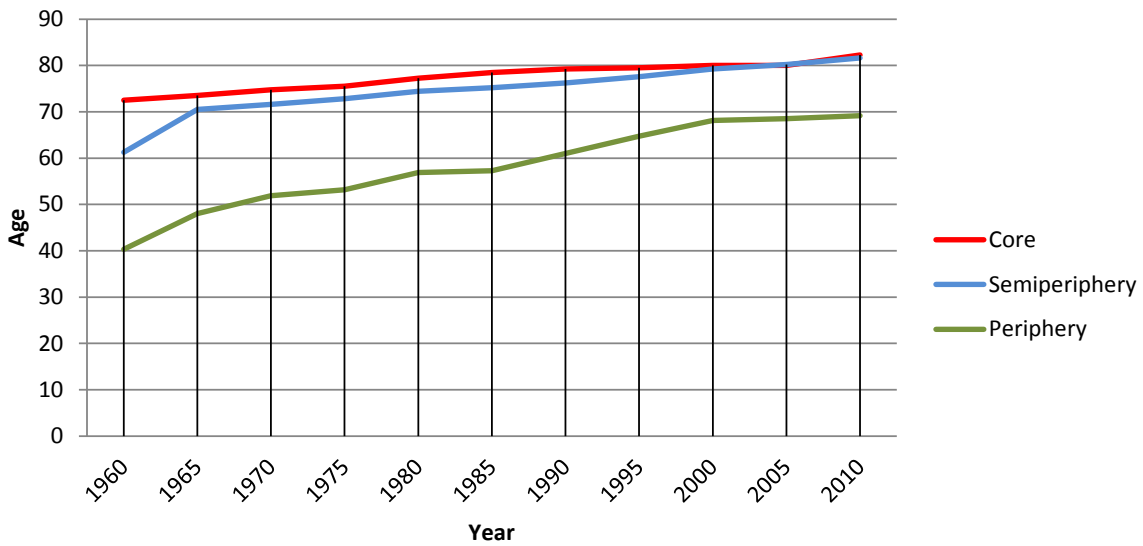


Figure 8.12. Life Expectancy at Birth for Females Line Graph of Zones shows mean life expectancy for females by zone from 1960 to 2010.

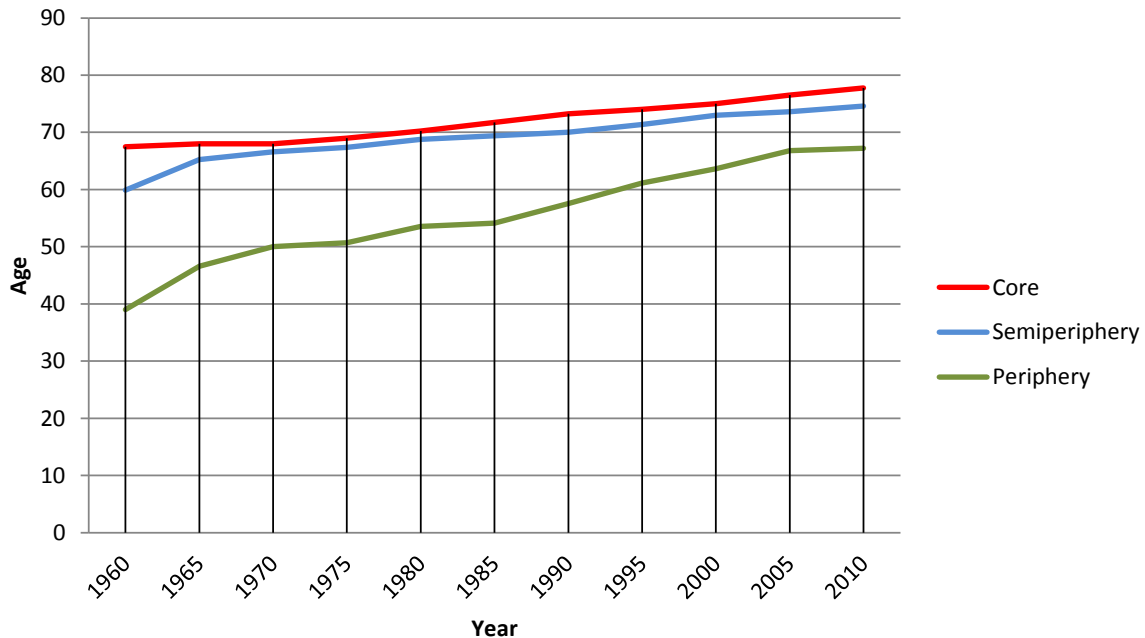


Figure 8.13. Life Expectancy at Birth for Males Line Graph of Zones shows mean life expectancy for males by zone from 1960 to 2010.

Discussion of Findings

Analysis of the data overall provides support for Wallerstein's assertions. But, different conclusions can be drawn from the distinct disease, violence and lifespan data. First, the mortality data for infectious diseases provide very little support for Wallerstein's assertions. The gap between core and peripheral countries narrowed and then disappeared for malaria, tuberculosis, and influenza. Polio was the exception. In general, the mortality data for these diseases did not support Wallerstein's assertion that the gap between core and periphery persists; nor did it support his assertion that the margin of safety in the periphery would worsen.

Nevertheless, several qualifications should be made. Malaria remains a problem in some areas of the periphery, though it is not as bad as it was at the beginning of the 60-year measurement period. This can be seen in the zone graph for malaria. What can be seen is a flat and similar rate for all three zones. Cost effective means to prevent and treat malaria is widely

available for most countries. Tuberculosis remains a problem in a few countries, the Philippines and South Africa, despite the fact that treatments are widely available. Again, this provides limited support for Wallerstein's first assertion but not the second. Moreover, if Acquired Immune Deficiency Syndrome (AIDS) had been included in the study, the mortality data would likely provide strong support for world-system theory. AIDS was not included in the study because it is a relatively recent disease. In fact, it appears that AIDS mortality has declined in the core but increased in the periphery, which would support Wallerstein's first and second assertions (Gunn, Mansourian, Davies, Piel, Sayers, 2005). Whether this trend continues over the long run is unclear. It will likely depend on whether AIDS drugs become cheaper and widely available to people in peripheral countries. Influenza has steadily declined in all countries and the number of cases reduced with subsequent decline in mortality with simple measures such as hand washing and isolation of infected individuals. In contrast, polio cases persist in a few countries, despite the fact that a vaccine to prevent and even eradicate the disease is widely available. Globally, polio has been eradicated in all countries except for three (WHO Media Centre, Poliomyelitis, n.d.). In nine other countries, occasional outbreaks occur, but it has been determined that the exposure occurred in one of the three countries where polio persists (WHO Media Centre, Poliomyelitis, n.d.).

All of the infectious diseases in this study have shown a steady decline, except for polio which spiked in 1995. Scores for the infectious diseases of malaria, tuberculosis, and influenza were negative for a persistent presence of disease and conditions worsening in peripheral countries. Polio, however, was given a positive score for continued presence of disease and for the potential of deteriorating conditions in peripheral countries. The prevention of influenza, tuberculosis, and malaria can be prevented with inexpensive measures. Education on hand

washing for influenza and draining of standing water for malaria will reduce the number of cases and subsequent mortality. Polio, on the other hand, persists because of complex social and political issues. The prevention of the use of vaccine and the death of health workers distributing the vaccine by the Taliban must be changed in order for significant numbers of individuals to be immunized against polio. By preventing the use of the polio vaccine in the three countries where polio persists, deaths due to polio will persist. It appears this problem will not be readily changed in the near future and may, if political and social conditions fail to improve, result in conditions to eradicate polio deteriorating in peripheral countries. Therefore, the rationale for negative scores for the diseases of malaria, influenza, and tuberculosis is due to the consistent decline in the diseases and the ease in preventing the diseases. Polio was scored as positive due to the persistence of the disease and the potential for deteriorating conditions in the periphery if complex social and political conditions remain unchanged.

By contrast, the mortality data for chronic diseases provide considerable support for Wallerstein's assertions. For chronic diseases the margin of safety is falling for people in the periphery; and, for many people, not only were they worse off in relative terms, in some cases they were worse off in absolute terms, which is what Wallerstein predicted. In 1950, people in the periphery had lower rates of mortality from diabetes, cancer, and cardiovascular disease than people in the core. But by 2010, the margin of safety for people in the periphery had deteriorated, becoming more like the core; in some cases their mortality rates from diabetes, cancer, and cardiovascular disease exceeded the mortality rates of people in the core.

Why might Wallerstein have been wrong about infectious diseases, but right about chronic diseases? It may be that the means to prevent and treat these particular infectious diseases, excluding AIDS, was relatively inexpensive. Prevention and treatment was cheap enough so that

even poor peripheral countries had the means and resources needed to reduce infection and treat the disease. By contrast, the cost of treating chronic diseases such as cancer, diabetes, and cardiovascular disease is much higher, which made it difficult, if not impossible, for peripheral countries to treat them effectively and reduce mortality. Moreover, neither profit-making capitalist institutions nor government aid projects have fully helped peripheral countries provide effective treatment. Given the lack of external or indigenous resources, it is unlikely that peripheral states will be able to reduce mortality and increase the margin of safety anytime soon, which is what Wallerstein predicted.

The data about erratic violence provided support for Wallerstein's assertions. In the case of homicide, the periphery experienced higher rates of homicide, and homicide rates are worse now than they were in 1950. This evidence, however, has been proven to be marginal but narrow. In 1950, suicide rate in peripheral countries was lower than in the core, but by 2005 the rate was still lower than the core but had increased. Motor vehicle accident rates started lower and they are catching up in the periphery. The gap is closing and for the periphery this is a sign that conditions are getting worse.

The life span data provides some support for Wallerstein's theory. There is a persistent gap in mortality data between the core and the periphery. This supports Wallerstein's first assertion that gaps would be present. But, infant mortality, female life expectancy, and male life expectancy have not become worse and do not support Wallerstein's second assertion.

For the most part, the data for the semiperipheral countries is almost identical to that of the core countries. Semiperipheral countries are more like the core than the periphery and, generally, provide very similar margins of safety. Nevertheless, the rates of mortality from malaria, cardiovascular disease, tuberculosis, homicide, motor vehicle deaths, and infant

mortality are higher in the semiperiphery than in the core. Why might that be? Perhaps because there is both less government regulation of industrial pollution, smoking, and auto safety, and poorer national health care systems in the semiperiphery than in the core. We know that semiperipheral countries industrialized during the 60-year period from World War II to 2010. Rapid industrialization without effective government regulation might contribute to higher rates of mortality in semiperipheral countries much as it did in Western Europe and America during the so-called "Industrial Revolution."

Policy Solutions

Based on the findings from this study, new public policies should be discussed and implemented in order to increase the margins of safety against endemic dangers. During the past sixty years, tremendous advances have been made in the development of medical technologies that can reduce, and even eradicate some infectious diseases. Malaria outbreaks have been reduced or eradicated in many countries around the world. However, peripheral countries still lead other countries in the number of malaria outbreaks and deaths, despite the existence of effective and inexpensive preventative measures and treatments. Through the use of mosquito netting, entire families, communities, and countries may be spared the higher cost of medicinal treatment and lives may be spared. The reality is that mosquito netting is inexpensive, while treatment of the disease is expensive. It makes sense for poor countries to develop their limited resources or foreign aid on preventative measures. Even with modest resources, the periphery might be able to reduce the number of malarial infections and reduce mortality, something which is possible, and should be a high priority, given the number of deaths.

Polio, like malaria, has known, effective, and inexpensive prevention treatments. Education on how polio spreads and the use of polio vaccine has eliminated polio in all core and

semiperipheral countries. Polio vaccine has been available since the early 1950s, yet persistent pockets of the disease persist in peripheral countries. Peripheral countries lack the ability to store the vaccine and inoculate people in a safe manner. Equipment and personnel must be protected in order for the vaccine to reach all populations. In 2012, 11 workers were attacked and killed in Pakistan while distributing polio vaccine (Khan, 2012). Pakistan is one country where polio persists due to lack of security for workers who have been targeted by the Taliban (Masood, 2013). The Taliban views polio workers as infiltrators who seek intelligence information (Masood, 2013). Greater security must be given to workers in countries with persistent outbreaks of polio.

Like other infectious diseases, tuberculosis has known, effective, and relatively inexpensive technologies to prevent the infection and spread of the disease. But, treating the disease once it has been acquired can be costly, especially for new drug-resistant forms of the disease. Crowded conditions and poor ventilation in newly urbanized countries increases the spread of the disease. Complicating the process is the link between AIDS and tuberculosis. Individuals with AIDS are at greater risk of acquiring tuberculosis than people in the general population (Gunn et al., 2005). Because peripheral countries have large numbers of individuals with AIDS, this population is at greater risk of tuberculosis infection than people in core and semiperipheral countries (Gunn et al., 2005). This means that bigger and more expensive treatments and aid programs will be needed to assist the peripheral countries where both AIDS and tuberculosis are present.

Influenza has effective and inexpensive preventative treatments, though ongoing monitoring is necessary to prevent the spread of the disease. Education on hygiene methods, such as basic hand washing, can be inexpensive and can be taught to nonprofessionals who could disseminate the information to the public. However, peripheral countries may not have the organization and

monetary resources to effectively manage a program of this type. Core countries must take a greater interest in spending money in the periphery to prevent the spread of influenza and other infectious diseases to the core. Pathogens spread rapidly across national borders and place everyone at risk. Money spent on surveillance of disease and education on methods to prevent its spread can save both money and lives.

Like infectious diseases, the prevention of chronic diseases is relatively cheap, but treatment is very expensive. Given the cost, it makes more sense for peripheral countries to spend what little money they have on prevention through education and early detection of the disease. Education on healthy diet, minimizing the exposure to toxins, and smoking would greatly reduce the number of deaths due to chronic diseases. Early diagnosis, rather than costly treatment at later stages of the disease, would prevent deaths and conserve valuable and scarce health care resources. Cancer, diabetes, and cardiovascular disease would all benefit from education and early detection. Once again, this can be accomplished with trained nonprofessionals who target specific concerns that are prevalent in their community. Medical personnel can then be used to gather data, assess needs, and provide direction for education and assessment activities. Peripheral countries may not have the power to organize, money to allocate training, or the medical personnel to develop programs for education and assessment. Core countries must understand that it is to their benefit to aid peripheral countries in promoting public health education and assessment programs.

For the next endemic danger category of violence and injury, it is difficult to suggest how public policy might reduce mortality. The reasons for violence and injury are complex and are different in each country. Political and social unrest increase the likelihood of war, murder, and suicide. Homicide has been linked to guns, drugs, and gangs, and efforts to address this issue

can be difficult and costly (WHO, Youth Violence, 2004). By contrast, suicide may be addressed through less expensive public policies. If Emile Durkheim (1951) is correct, then increasing the level of social connectedness within communities may help individuals to feel a greater sense of belonging, which might lower suicide rates. Public education and suicide prevention programs are relatively inexpensive in the core and periphery.

Rising levels of motor vehicle deaths in peripheral countries is also a problem. Greater safety measures, police surveillance, driver education, and traffic segregation may be needed in order to reduce mortality from motor vehicle accidents. Many safety measures, greater use of seat belts, and driver education are cheap. But, other interventions are more expensive or impractical. Increasing the police force, improving roadways, restricting the use of roadways to certain types of vehicles may be expensive and difficult to achieve in political terms. Therefore, assisting peripheral countries with inexpensive programs to promote seat belt use and educate on safe motor vehicle operation would be recommended.

Public health officials know how to reduce infant mortality. Though much can be done through inexpensive education programs designed to improve the status of women and girls, countries in the periphery need economic help. In terms of the mortality data utilized for this study, an analysis was performed on infant mortality and life expectancies for males and females. Although there were overall improvements, peripheral countries still lagged behind semiperipheral and core countries. If core countries helped peripheral countries initiate some of the inexpensive prevention programs described above, they would help increase life expectancies for infants, men, and women.

Preventative measures such as those described above are inexpensive, available, and sustainable. But, where treatments are expensive, inequalities will likely remain. Given the

limited resources available to governments in the periphery, they might focus on programs that provide the greatest benefit to the greatest number of people, rather than devote scarce resources to the few. Addressing infectious diseases may be the best place to start. Prevention of the spread of many common infectious diseases can be inexpensive, especially when compared to the cost of treating infectious diseases. Education disseminated by nonprofessional workers who are able to communicate the information with the local culture in mind can effectively promote prevention programs.

Future Initiatives

Comprehensive and integrated action by governments and non-governmental organizations (NGO) will be necessary in order to provide the most efficient and sustainable health initiatives in the world. This will include actions to continue to gather, store, analyze, and disseminate data in order to support practices that will provide the most comprehensive and cost-effective care. This will also allow for approaches that reduce risk and target populations who are most vulnerable. Additionally, peripheral and semiperipheral countries should provide locally controlled health promotion initiatives with the local culture in mind. For example, when people in peripheral countries are made aware of the detrimental effects of environmental degradation and unplanned urbanization they can fully participate in the planning and implementation of policies. With local input, local culture and ownership of the policies occur and implementation of the policy is enhanced.

In the past, healthcare in many countries was often delivered by women or a local medicine man. In other cases, local workers, trained by the government, were the ones who provided health services for the local community. Health care was personal and delivered in the home or in the village. But, as a result of globalization, the responsibility for providing health care has

been shifted to distant and centralized providers who often exclude local traditional providers. It is known, however, that many effective prevention programs depend on local health providers. If the local community is not involved, prevention programs may be less effective.

Future Research and Theory Development

The findings in this study support Wallerstein's world-system theory. Additional studies related to mortality data and world-systems theory would help explain disparities between countries. Core and semiperipheral countries should provide assistance and money to peripheral countries to aid in data gathering so that health care needs can be identified. Additionally, research on methods of how to best store, disseminate, and use the data by semiperipheral and peripheral countries must be undertaken. Without this information, inequalities in mortality data will continue and, in some cases, increase the level of disparity.

According to Shawn Kneipp and Denise Drevdahl (2003), social and economic factors determine health disparities; however, little is known on the operation of the factors on health. Greater knowledge is needed that will address why health disparities persist. We need to move beyond describing the existence of health disparities but rather why they persistently occur. "We need a new paradigm that recognizes societal factors as primary pathogenic forces...our research methods and designs must include the acquisition of economic resources and political power by the participants" (Flaskerud & Nyamathi, 2002, p. 139).

Summary

Findings from this study support Wallerstein's (1995) theory of a world-system where the core is pulling resources and money, and maintaining power in the global market place. This study, through the use of databases on health-related parameters demonstrates differences in the level of mortality data between core, semiperipheral, and peripheral countries. This is of

importance for social, political, economic, and humanitarian reasons. It is important because growing social unrest and a decline in the overall human condition will result if inequalities are not addressed globally by countries and organizations interested in the well-being of others. High levels of political commitment are required to make these investments. This commitment must include plans that are country specific and address the challenges unique to local areas. Wallerstein (2005) argues that we are at a crossroads and we must choose between one of two possibilities. The first is to keep doing what we have been, which will likely increase the polarization between core and peripheral countries. The second choice is to promote democracy and egalitarianism, and which will likely lead to a reduction in the polarities between and within countries.

With knowledge comes the power to effect change locally and globally. Resources are then more efficiently used, including the resource of health care workers to monitor disease and mortality. Assessment and monitoring the social determinants of health and the provision of care when disease or injuries occur will result. A shift in the global order is needed that will affect the economic and political power. Latin American countries have begun to do this. They have shed some of the old colonialism through the work of health activists who want to see a change in their health care with population-focused health that includes local citizens in the decision-making process. This new way of improving health is through international cooperation. States in the Southern Hemisphere mutually support one another, rather than the old style where support came from the old Euro-North dependency system (Birn, 2011). Benatar, Gill and Bakker (2009) state that achieving greater global health is not accomplished with greater technology or improved production lines and chains but with greater attention to social justice and enhanced democratization of the health care system, with input from all.

Information gathered from the study will be disseminated and shared with those with an interest in decreasing mortality due to inequality. Currently, there is little information in the literature about how the relationship between core, semiperipheral, and peripheral countries affect mortality data. Based on the literature review and analysis of data from the United Nation's Statistical Division's Demographic Yearbook, disparities exist between core and peripheral countries related to mortality data. Further research is needed to explain why inequalities exist and to identify ways to reduce the health disparities that exist. Education on best practices to improve health care access and disseminate knowledge will be enhanced by the findings. This study provided insight and promotes discussion on inequalities in mortality data. Continued discussion on this topic will bring added emphasis and a need placed on continued collaboration at the local, state, national, and global levels to coordinate services and to better meet the needs of many different people around the world. New guidelines for allocation of limited health care resources are needed. Health care needs should not be based on income, geographical location, politics, ethnicity, or gender.

"The test of our progress is not whether we add more to the abundance of those who have much; it is whether we provide enough for those who have too little."

Franklin Delano Roosevelt
1882-1945

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