

ATINER CONFERENCE PRESENTATION SERIES No: FIT2017-0032

ATINER's Conference Paper Proceedings Series

FIT2017-0032

Athens, 27 December 2017

**A Comparative Policy Analysis of the Health Care Systems in the
United States and Greece**

Janet Jones, Mildred Naquin, Wynn Gillan, Marie Zannis, Ifigenia Georgiadou,
Corinne Cormier and Jessica Friley

Athens Institute for Education and Research

8 Valaoritou Street, Kolonaki, 10683 Athens, Greece

ATINER's conference paper proceedings series are circulated to promote dialogue among academic scholars. All papers of this series have been blind reviewed and accepted for presentation at one of ATINER's annual conferences according to its acceptance policies (<http://www.atiner.gr/acceptance>).

© All rights reserved by authors.

ATINER's Conference Paper Proceedings Series

FIT2017-0032

Athens, 27 December 2017

ISSN: 2529-167X

Janet Jones, Assistant Professor, Department of Nursing, Southeastern
Louisiana University, Hammond, Louisiana, USA

Mildred Naquin, Professor, Department of Kinesiology, Southeastern
Louisiana University, Hammond, Louisiana, USA

Wynn Gillan, Assistant Professor, Department of Kinesiology, Southeastern
Louisiana University, Hammond, Louisiana, USA

Marie Zannis, Professor, Retired

Ifigenia Georgiadou, Director, Hellenic Culture Center, Megolochori,
Santorini, Greece

Corinne Cormier, Graduate Assistant, Department of Kinesiology,
Southeastern Louisiana University, Hammond, Louisiana, USA

Jessica Friley, Graduate Assistant, Department of Kinesiology, Southeastern
Louisiana University, Hammond, Louisiana, USA

**A Comparative Policy Analysis of the Health Care Systems in
the United States and Greece**

ABSTRACT

The purpose of this study was to compare the health care systems, funding, expenditures, professional availability, and other health care delivery issues between the United States of America (USA) and those of Greece. Methods of examination included observation, site visits, interviews, and a review of governmental statistics and documents. The USA is the only developed nation in the world that does not provide universal access to health care services for its citizens. Limited governmental funding has been available to the military, elderly, and those below poverty levels in the USA as to compared most Greek citizens who receive health care. Both countries have public and private health care sectors. The USA spent more on health care than any country in 2014 with 2,986 billion dollars or 17% of the gross domestic product (GDP). Greece spent 19 billion dollars or 8% GDP. Despite the exorbitant expenditures by the USA, the health status has not been superior to Greece. In 2014, USA infant mortality was 6 deaths per 1,000 births compared to 4 per 1,000 in Greece. The life expectancy was not significantly different between the countries with USA at 79.8 years and Greece at 80.5 years. Both countries have similar leading causes of death. The shortage of health care professionals has been a challenge for both countries. The USA has a shortage of physicians and nurses/midwives

with 25 and 98 per 10,000 people respectively. In contrast, Greece has an abundance of physicians at 62 per 10,000 population and a severe shortage of nurses/midwives with 2 per 10,000. Differences have existed related to educational opportunities, training, licensure, regulatory oversight, and salaries of health care professionals. Both countries have experienced issues related to access to health care services, refugee/immigrant health, and rising health care costs. These countries have identified health promotion, disease prevention, and primary care access as essential to decrease the soaring health care costs.

Keywords: health care systems, health care funding, health status, health care providers, policy analysis.

Introduction

The health care systems in the United States and Greece are very complex. In truth they are not true systems, because the components in either country are only loosely coordinated. However for simplicity of explanation the mechanisms of health care delivery are called systems with differing features, components, and services. A comparative policy analysis approach has been used to compare and contrast the countries' public health policies, political approaches, regulations, and actual health care delivery.

The purpose of this study was to compare the health care systems, funding, payment, effectiveness, expenditures, access, and emerging health issues between the United States of America (USA) and Greece. Methods of examination included observation, site visits, interviews, and a review of governmental statistics and documents. The USA is the only developed nation in the world that does not provide universal access to health care services for its citizens (Shi & Singh, 2017). Even though Greece has struggled to achieve universal health care this ultimate goal has been elusive (Economou, 2010).

Demographics

The general demographics of Greece and the United States of America (USA) provide the context for the health care system comparisons between the two countries. The USA is larger in population and land mass than Greece. Consequently the comparisons have been made primarily in terms of percents, population ratios and normalization of financial information. The Gross Domestic Product (GDP) is the total income of the country (Shi & Singh, 2017). Methods used to normalize income and expenditures include to either convert the currency into US dollars (US\$) or to look at the GDP in terms of purchase power parity (PPP). The PPP is a theory which states that exchange rates between currencies are in equilibrium when their purchasing power is the same. Consequently the currencies are adjusted to reflect the PPP. This method is often used by the Organization for Economic Cooperation and Development (OECD) and the World Health Organization (WHO) when making comparisons between countries. Per capita income is also used to reflect the average income per person in a given area. To determine per capita income, the country's total income is divided by the total population. Again the income can be converted to US\$ or PPP. These terms are used throughout this paper to make equitable comparisons.

The World Health Organization (WHO) has classified both Greece and the USA as high income countries within their regions (WHO 2017b; WHO 2017d). These two countries have similar health profiles in terms of chronic diseases and cause of death. However the USA spends much more on health care with a focus on acute high-technology care, primarily within hospital settings (Shi & Singh, 2017). Both countries have public and private health care sectors. In Greece the public sector is more prominent; whereas in the

USA the private sector dominates. However in the USA the government subsidizes a large percent (48%) of health care expenditures, therefore it has been characterized as a quasi-national health system (WHO, 2017f; Shi & Singh, 2017). See Table 1.

Table 1. *Demographics of Greece and USA*

Statistics	Greece	USA
Total Population (2015)	10,955,000*	321,774,000**
Per Capita Income in US\$	21,561***	54,855****
Spent on Health Care 2014 in US\$	19 billion***	2,986 billion****
Total Expenditure on Health per Capita	2,098*	9,403**
Total Expenditure on Health as % GDP (2014)	8.1%*	17.1**
Domestic Health Care Funding	100%***	100%****
Health Care System	National health system	Quasi-national health system

*Data from WHO 2017a, ** Data from WHO 2017c, *** Data from WHO 2017b, ****Data from WHO 2017d

Historical Background

The United States is composed of a federal government, 50 state governments, and governments of several territories. The responsibilities and regulations vary between the federal, state, and local governments. The health care policy in the United States has gone through tremendous changes over time. Throughout the years, health care models were developed, and bills and policies were enacted (Shi & Singh, 2017).

For instance, the first model of state law for regulating health insurance was created in 1912. Moreover, a pre-paid hospital insurance plan for teachers presented by Baylor Hospital in 1929 served as a precursor for nonprofit plans offered by Blue Cross, a major insurance company in the United States. In 1935, Congress passed the Social Security Act which included services for maternal and child health and child welfare. Four years later, doctors began to develop the first Blue Shield plans to cover physician care costs. The Hill-Burton Act was passed in 1946 which allowed the funding to construct hospitals and prohibited discrimination in regards to hospital services. A

decade later, a military health care program was enacted providing health care for those in service and their dependents (The Henry J. Kaiser Family Foundation, n.d.).

During the late 1950s and early 1960s, the foundation and structure for Medicare and Medicaid began to take place (The Henry J. Kaiser Family Foundation, n.d.). Medicare is a government health insurance program for elderly and disabled (Medicare.gov, n.d.). Medicaid is a health insurance program funded by both the federal and state governments to provide services for low-income people such as children, pregnant women, seniors, and disabled individuals (Social Security Administration, n.d.). By 1965 both Medicare and Medicaid were signed into law (The Henry J. Kaiser Family Foundation, n.d.).

Over the next several decades, various changes were made to the health care policy in the USA. In 2010 America's health care was transformed by the Affordable Care Act (ACA). The Affordable Care Act was enacted under President Obama and called for dramatic changes such as coverage, Medicaid expansion, and reimbursement methods (The Henry J. Kaiser Family Foundation, n.d.).

Greece has an extensive history related to health care, dating back to Hippocrates, the father of modern medicine. Similar to the United States, Greece's health care has experienced changes over time. Until the end of the 19th century, no more than 10% of the Greek population had coverage for health care by any statute (Economou, 2010).

The Ministry of Hygiene and Social Welfare was created in 1917 (Economou, 2010). Municipalities and communities controlled existing hospitals. Gradually, large hospital institutions and some private hospitals were controlled at the national level. In 1934 coverage was increased for the population by establishing the Social Insurance Organization (IKA) (Economou, 2010). Approximately one third of the population subsequently received insurance coverage. The framework for the organization and operation of public hospitals and health services began in 1937. The 1950s - 1960s saw continued growth and expansion of the social insurance sector. Insurance funds were developed to cover public employees, the self-employed, agricultural workers, mariners, and other groups.

Rural medication stations were developed in 1961 (Economou, 2010). These stations were staffed with a recently-graduated physician doing one year of obligatory service, a nurse, and a midwife, similar to rural health centers today. Contracts with private hospitals and physicians increased, as well as the private sector. Solo private physician practices dominated. The number of small private hospitals rose. Only a few public hospitals existed in large cities.

From 1967 - 1974 during the dictatorship, the patterns for health care services were consolidated (Economou, 2010). The public sector expanded. Initiatives began to geographically redistribute services to decrease regional inequalities. The public sector enacted full-time status for physician employment with a restriction of working in private settings.

When the socialist party (PASOK) came to power in 1981, The Association of Hospital Doctors of Athens and Pireaus (EINAP) demanded a comprehensive national health care system (Economou, 2010). Consequently,

in 1983 landmark legislation was implemented that created the national health system (ESY). These reforms impacted the organizational structure, health services financing, universal coverage, and equal access. The national level was responsible for the provision of health services. From 1983-1992 new private hospitals were prohibited. The ESY absorbed existing private hospitals. Since 1985 private diagnostic centers grew extensively. In 1992, the restrictions were removed.

Ambitious reforms were introduced from 2000 through 2004 to address regionalization of the system, new management structures, prospective reimbursement, new physician employment arrangements, modernization of public health services, and reorganization of primary care (Economou, 2010). These measures did not move forward after the elections of 2004. A new strategy began in 2005 to secure financial viability in the short-term and sustainability in the long-term for the national health system. Some controversial measures were the centralization of administrative public procurement system, development of public and private partnerships, reform of pharmaceutical care, and abolition of professional hospital management with replacement of political appointments. Party dominance has greatly influenced the ESY since this time.

Health Care System Structures

As noted in Greece, the United States' health care system has been heavily influenced by political parties (Johnson, Stoskopf, & Shi, 2017). Two parties dominate in the USA, the Democrats and Republicans. The Democrats have focused on more social programs and increased government control. The Republicans have emphasized less national government control.

Health care is the largest industry in the United States (Johnson, Stoskopf, & Shi, 2017). The USA has a highly developed infrastructure. The nation has ultramodern facilities, medical schools with university-based curricula, research organizations, a large pharmaceutical industry, manufacturers of medical devices/equipment, and providers of long-term and rehabilitative services (Shi & Singh, 2017). The private sector owns most of the infrastructure. However, the government is a major financier of health research and medical education.

The umbrella for health services in the USA is the United States Department of Health and Human Services (DHHS, n.d.). DHHS is a cabinet level department of the United States federal government. The Secretary of DHHS is appointed by the President, with advice and approval from the USA senate. The Department's goals are to protect the health of all Americans and provide essential human services. The Department has 11 operating divisions with eight agencies including the Public Health Services. Some major areas of interest are the Agency for Health Care Research and Quality (AHRQ), Centers for Disease Control (CDC), Federal Drug and Food Administration (FDA), National Institutes of Health (NIH), Centers for Medicare and Medicaid

Services (CMS), Indian Health Services (IHS), and the Office of Inspector General (OIG).

The AHRQ conducts research on health care delivery systems with an emphasis on safety and quality (AHRQ, 2016). This agency produces materials to teach and train health care professionals and systems on incorporating evidence-based practice. Also, AHRQ generates and evaluates data used by providers and policymakers.

The CDC's mission is to protect the USA from health, safety, and security threats, both foreign and domestic (CDC, n.d.). This agency addresses chronic or acute diseases, preventable and curable conditions with a community focus. These goals are addressed through science, advanced technology, and health information. The CDC responds to new and emerging health threats.

The FDA is charged with ensuring the safety, efficacy, and security of human and veterinary drugs, biological products, and medical devices (FDA, n.d.). The FDA also oversees the safety of the nation's food supplies, cosmetics, and products which emit radiation. Additionally, the FDA regulates the manufacturing, marketing, and distribution of tobacco products. The agency plays a major role in counter-terrorism efforts through the security of the nation's food and develops medicinal products to respond to potential threats.

Originally founded in the 1870s, the NIH became the primary agency of the federal government responsible for biomedical and public health research. NIH has 27 separate institutes focusing on different aspects of health-related research.

CMS has been primarily known for its role in overseeing Medicare, Medicaid, and the Children's Health Insurance Program (CHIP), as well as oversight of compliance to the Health Insurance Portability Act (HIPAA) enacted in 1996. HIPAA governs the privacy and confidentiality of patient information and security of health care information technology (CMS, 2017b). However, the enactment of the Affordable Care Act (ACA) expanded the agency's strategic objectives (CMS, 2017). The ACA took steps to expand health care coverage, improving access while also enhancing quality and affordability for moderate and low-income Americans. CMS has been focused on changing payment methods for Medicare and Medicaid. Now the emphasis is on value-based purchasing, coordinating care, and reducing hospital readmissions. ACA required CMS to coordinate with states to set up Health Insurance Marketplaces, expand Medicaid, and regulate private health insurance plans. CMS has also taken a major role in the adoption and use of health information technology throughout the nation's health care system, also known as "meaningful use".

The federal government funds Indian Health Services (IHS) for American Indians and Alaskan Indians, the indigenous populations of the USA (Johnson, Stoskopf, & Shi, 2017). The American Indians and Alaskan Indians are the only ethnic groups for which the US federal government has assumed responsibility for health care. The IHS is the principal provider and health advocate for these groups. This federal agency provides services to 2.2 million

people who belong to the 566 federally recognized tribes in 35 states. The IHS operates 46 hospitals and over 600 health centers and clinics.

The Office of Inspector General (OIG) has been the investigative arm of DHHS for over 40 years (OIG, 2016). The OIG for DHHS is the largest such office in the federal government with over 1,660 employees in 70 offices nationwide. The OIG is charged with detecting fraud, abuse, and waste throughout DHHS divisions. In the first half of 2016, the OIG reported expected recoveries of more than \$2.77 billion US dollars with 428 criminal actions and 383 civil actions against individuals or entities engaged in crimes against DHHS programs. The majority of claims are in relation to the Medicare and Medicaid programs.

The federal government also operates the military and veterans' systems through the Department of Defense making medical care available free of charge to active military members and their families (Shi & Singh, 2017). Routine ambulatory care is provided at a dispensary, sick bay, first-aid station or medical station close to the military personnel's workplace. Complicated services are provided by regional military hospitals. The dependents and survivors of military personnel receive care through the insurance program known as TriCare. These services are provided by military entities as well as private partners. War veterans receive a wide range of medical and long-term services from the Veterans' Administration (VA). The VA system is a large program including surgical, medical, and rehabilitative care. This system operates 155 medical centers with at least one in each state, Puerto Rico and the District of Columbia.

Public health services are typically delivered by local health departments, with services varying greatly by locality (Johnson, Stoskopf, & Shi, 2017). The programs are limited in scope. These services include family planning, well-baby care, nutrition, venereal disease clinics, screening and treatment of tuberculosis, and outpatient mental health care. As noted, the infrastructure for the USA is enormous with overlapping responsibilities. The strategic objectives of these agencies are often based on the platforms of the dominant political party.

Unlike the USA, health in the Greek constitution is considered a social right (Economou, 2010). This entitlement is based on citizenship in the case of outpatient services. Inpatient care at EYS hospitals and private providers are contracted by different insurance funds. The poor are entitled to services and free access to ESY health centers and hospitals.

As noted previously, in Greece the EYS System was created in 1983 and co-exists with the social health insurance model. The Ministry of Health and Social Solidarity is responsible for the planning and regulation of the EYS to ensure free and equitable access to quality health services for every citizen (Economou, 2010). The Ministry sets health-related priorities at the national level, outlines funding, allocates resources, proposes legislation, and implements laws. In addition, the Ministry is responsible for health care professionals. Until 2001 the Ministry was responsible for planning and

regulation at the central, regional, and local levels. Afterwards, some responsibilities were transferred to the Health Region Administration (DYPEs).

However, social health insurance is under the authority of the Ministry of Employment and Social Protection, formerly the Ministry of Labour and Social Protection (Economou, 2010). This national institution, subject to legislation, oversees contribution rates, coverage benefits, conditions for granting benefits, inequities in access and financing. The private profit-making hospitals, diagnostic centers, and independent practices contract with various insurance funds and practice independently.

The Ministry of Health and Social Solidarity is led by the Minister with two Deputy Ministers and three General Secretaries, all of whom are directly appointed by the Prime Minister. Within the Ministry there are five General Directorates: 1) Health Services including primary care, health care units, mental health, and ESY personnel, 2) Health which addresses health promotion and health protection of civil servants, 3) Administrative Support and Technological Infrastructure for education, research, quality, informatics, finance, procurement, and international relations, 4) Public Health including public health, environmental health, medicines, pharmacies, and coordination of regional and local services, and 5) Social Solidarity including family protection, vulnerable groups, the disabled, and welfare services personnel (Economou, 2010). Other entities participate in the governance and regulation of the public health care system such as Central Health Council (KESY), National Public Health Council (ESYDY), Central Council of Health Regions (KESYYPE), Health Sector Coordination Body (SOTY), and the Body of Inspectors for Health and Welfare Services. The KESY plays an advisory role to the Ministry on health-related issues. The ESYDY is an independent authority responsible for the coordination of public health organizations. The KESYYPE coordinates the DYPEs and their relationship to the Ministry. The SOTY coordinates institutions responsible for responding to emergency situations and disasters. The SEYYP conducts performance audits on public and private health and welfare services to improve quality and effectiveness.

The Ministry also oversees a number of organizations and institutions such as the Centre for Control and Prevention of Diseases (KEELPNO), which is similar to the USA's CDC (Economou, 2010). The National Drug Organization (EOF) is responsible for the evaluation and market authorization of pharmaceuticals, as does the FDA in the USA. The Institute of Medicinal Research and Technology (IFET) is responsible for the statistical analysis of the pharmaceutical market and distribution. In the USA the FDA tracks pharmaceutical marketing and approved usages (FDA, n.d.). In contrast to Greece, there is no central distribution or procurement of pharmaceuticals in the USA. The majority of the pharmaceutical industry is within the private sector (Shi & Singh, 2017). The Research Centre for Biological Materials (EKEVYL) is responsible for the certification, quality control, and research on medical devices (Economou, 2010). In the USA, the FDA performs these functions in coordination with the NIH. The FDA governs research on the development, safety and efficacy of medical devices, whereas the NIH assists

with funding of related research in addition to private industry. The Organization Against Drugs (OKANA) plans and implements policies on drug addictions in Greece. In the USA under DHHS a department entitled Substance Abuse and Mental Health Administration addresses some concerns related to substance abuse (DHHS, n.d.). However, in the USA there is no one agency addressing substance abuse. The National Transplant Organization (EOM) in Greece is responsible for managing transplant utilization (Economou, 2010). Again within the USA transplants are not governed by one agency. DHHS regulates the criteria for transplant centers and organ distribution, whereas NIH oversees federally supported research efforts (DHHS, n.d.).

The Ministry of National Education and Religious Affairs is responsible for undergraduate training of health care professionals and the awarding of graduate degrees such as Masters and PhD in Greece. The National School of Public Health (ESDY) is responsible for postgraduate training of health professionals in Greece (Economou, 2010). In the USA most health care professionals attend post secondary education to obtain their training, obtaining a certificate, diploma, or degree. Respective professional and regulatory organizations determine the core curriculum to produce a safe beginning practitioner. Each program has their own admission requirements, pathways, and degrees (United States Department of Labor, 2016).

The Public Company for Hospital Buildings (DEPANOM) addresses the Greek health care infrastructure issues (Economou, 2010). In the USA, there is no central coordination of infrastructure such as planning hospitals, clinics, diagnostic centers or public health units (American Hospital Association (AHA, 2017). Most infrastructure planning is handled at a state or local level with the exception of military and veterans' facilities.

The Hellenic Centre for Mental Health and Research (EKEPSYE) is responsible for the research, prevention, and provision of mental health care. Hellenic Pasteur Institute is responsible for the study of infectious, autoimmune and neurogenerative diseases including the development of new therapies (Economou, 2010). The Institute of Child Health (IYP) is responsible for Greek research, educational and preventive activities relating to children (Economou, 2010). The National Centre for Diabetes Mellitus (EKEDI) is responsible for the monitoring and coordination of research, prevention and treatment of diabetes mellitus (Economou, 2010). In the USA, DHHS offers a variety of services for children including those with special needs, health insurance, screenings, and immunization. In addition, DHHS also addresses various aspects of mental health and substance abuse with emphasis on suicide prevention, eating disorders, and veterans' issues (DHHS, n.d.). The CDC focuses on infectious diseases, chronic diseases, health promotion, and prevention (CDC, n.d.). NIH has several institutes and centers that also coordinate research related to infectious diseases, chronic diseases, children, mental health, and substance abuse (NIH, n.d.). In contrast to Greece, the USA has numerous consumer organizations such as the American Diabetes Association that assist with research and public education efforts.

The Ministry of Employment and Social Protection is the “second pillar” of the Greek health care system (Economou, 2010, pg. 29). This Ministry is responsible for the majority of the insurance funds and their associated health branches. The health insurance fund groups are dependent on the national government to cover their deficits. Their governors are typically appointed by the national government. Insurance funds are the main purchasers of ESY services and the major “customer” for the private sector in Greece (Economou, 2010, pg. 29). There are over 30 different insurance funds. The range of services and policies regarding coverage are outside the jurisdiction of the Ministry of Health and Social Solidarity.

The Greek Department of National Defense owns and operates 14 military hospitals consisting of 1,912 beds (Economou, 2010). Ten of these hospitals have less than 100 beds. These hospitals and personnel operate outside the ESY. The Department of Defense in the USA provides similar services to its military personnel (Shi & Singh, 2017).

The Ministry of Development is responsible for pricing medicinal products (Economou, 2010). This Ministry coordinates the requests and procurement for DYPEs and public hospitals. There is no USA counterpart to this Greek Ministry, since the procurement of medicinal supplies is not handled in the USA on a national level. Individual private and public organizations negotiate contracts with suppliers (Shi & Singh, 2017).

The Ministry of Finance and Economics prepares and controls the national budget and allocates money for the health care system (Economou, 2010). In addition this Ministry must cover any deficits in the health insurance funds. In the USA, the Congress approves and monitors the federal budget in relation to health care and insurance benefits of federal employees (Shi & Singh, 2017).

The Greek Orthodox Church owns a significant number of nursing homes, orphanages, hostels, and blood donation programs (Economou, 2010). This network of welfare services has no connection with the Ministry of Health and Social Solidarity. These services are supported by donations from members and income from the Church’s assets. Historically religious organizations within the USA also funded and provided health care services within the USA. Various religious groups operate large and complex health care systems, which may include hospitals, community clinics, outreach programs, education and research (AHA, 2017).

Resources

Facilities. In 2015 Greece reported a total of 283 hospitals with 52,511 beds compared to 5,627 hospitals with 902,202 beds in the USA (OECD, 2017a). The hospital employees to bed ratio was 2.1 in Greece compared to 6.88 in the USA. The employment ratio in Greece has been stable since 2005, whereas the USA has gradually increased staffing to address regulatory and quality requirements. The nurse to hospital bed ratio in Greece was 0.82 in 2014 compared to 2.62 in the USA.

ESY hospitals are accountable to the Ministry of Health and Social Solidarity, who reports to the president (Economou, 2010). The public hospitals are managed by an executive board at the local level. However, the director and the majority of board members are appointed by the Ministry using political criteria. Other board representatives are from the medical, nursing, and hospital staff. The boards have no decision-making impact on capital investments, or staffing. These decisions must be approved by the DYPE and the Ministry. The hospitals have no authority to negotiate with social insurance funds. The rural health centers have no management or financial autonomy, nor can they develop their own policies or operational priorities. Most rural health centers function as units of a hospital.

In the USA, hospitals may stand alone or be part of a larger network. These hospitals may be organized at a national, state, or local level, and may be public or private. Typically, the hospitals are governed by a local administrative staff and governing board (AHA, 2017). In the USA, hospitals have some independent input into negotiations and procurement. However, networks or larger organizations have centralized decision-making bodies based on their structure.

In order to assess the density of technology the OECD reported the utilization of computed tomography (CT) machines. In 2013 Greece had 385 CT machines in contrast to 13,745 in the USA (OECD, 2017a). The number of CT machines per one million population was 35.11 in Greece and 43.47 in the USA. The majority of these CT scanners were concentrated in hospitals in both countries with 187 or 17.05 per 1 million in Greece and 8,520 with 26.94 per one million in the USA. The USA utilizes technology more frequently than does Greece.

In 2015 the USA reported 17.1 long-term care facilities per 1,000 population (OECD, 2017a). Greece did not report. In 2000 Greece reported 2,000 long-term care (LTC) beds with 1.3 per 1,000 population over 65 years. The USA stated 529,182 LTC beds in 2000 with 43.6 per 1,000. The USA number of LTC beds in 2015 could possibly accommodate 11.5% of the over 65 year population. The Greek Orthodox Church supports a substantial number of nursing homes. The Greeks are also known for extended families and incorporates the elderly into family and community life more so than in the USA. Consequently, Greece may not have the same need for long-term facilities.

Human Resources. The shortage of health care professionals has been a dilemma for both countries. In the USA, there are 25 physicians per 10,000 population compared to 62 in Greece (OECD, 2017a). However, both countries have an oversupply of some medical specialties and a shortage in others. A shortage of generalist physicians exists in both countries. In 2014, Greece reported 0.41 generalists per 1,000 population as compared to the United States with 0.31 (OECD, 2017a). The majority of physicians are seeking specialization rather than pursuing primary care, because specialization offers higher salaries. Consequently, there is underemployment and unemployment in some specialties in Greece, which has been reported up to 25% (Economou, 2010).

There are seven public university medical schools in Greece (Economou, 2010). Access is limited to people with extremely high entry grades in national competitive exams. The standard curriculum consists of a core program with basic science followed by clinical practice and specialization. The specialization training ranges in years based on the specialty. For example, general practice requires four years; whereas vascular and neurological surgery require seven years. Specialization practice is conducted in public or university affiliated hospitals. Before pursuing specialization, each physician must provide one year of obligatory rural service. This service is typically in rural health centers. The goal is for physicians to practice close to their chosen location. However, this goal is seldom realized.

In Greece, physicians must apply to the prefecture for licensure to practice (Economou, 2010). They must apply to their health department of residence and enroll in the relevant medical association. These associations are very active politically. Once the diploma has been obtained and licensure granted, no further regulation exists regarding health care professional practice. Exams are not required for licensure; the diploma is sufficient to establish competency. No governmental or professional entities oversee mandatory certifications or continuing education for health care professionals. Maintenance of education and competency is an individual responsibility in Greece.

Physicians in the USA attend four years at the university obtaining at least three years of “pre-med” education or a bachelor’s degree (United States Department of Labor, 2016). These students must take a national entrance exam. Entry into medical school is highly competitive. The successful candidate finishes two years of didactic medical school training followed by two years of clinical training to qualify for a Doctor of Medicine degree or less often a Doctor of Osteopathic Medicine degree. A national exam is required for licensure. During the last year medical students apply for a post-graduate residency. The standard for general medicine is one year of residency. Specialty education may range from three to seven years of post-graduate training followed by a specialty board certification exam. The specialty medical associations control the content of specialty training and certification. The average salary for a physician is 208,000 US dollars per year compared to approximately 24,000 US dollars in Greece (ELSTAT, 2016; United States Department of Labor, 2017).

The allocation of physicians varies across geographic regions in the United States and Greece (Economou, 2010, US source). In Greece physicians are heavily concentrated in Athens (Attica). The largest scarcities are in Central Greece, Western Macedonia, and the southern Aegean Islands. Within the USA physicians are more concentrated in the urban areas. Rural, inner cities, and low-income areas are considered underserved. Special programs exist in these areas to encourage physician practice, such as federal student loan forgiveness (US Department of Labor, 2016).

There is a critical shortage of nurses in Greece and the United States with two per 10,000 population and 98 per 10,000 population respectively (OECD,

2017a). In 2014 there were 15,000 open nursing positions in Greek public hospitals not filled (ELSTAT, 2017). Consequently, patients often hire private nurses or non-qualified nurses, especially for the night shifts. These circumstances promote informal payments as part of the black economy.

An assistant nurse is the lowest level within Greece (Economou, 2010). These assistants have no nursing degree. Instead they have obtained one to two years of hospital training. In the USA, Licensed Vocational Nurses (LVN) or Licensed Practical Nurses (LPN) receive 18 to 24 months of training from a technical school after completing their secondary education (United States Department of Labor, 2016). These nurses function under the supervision of a registered nurse (RN) or physician. Their practice is restricted to primarily technical procedures and varies from state to state.

Registered nurses (RN) graduate from either an ATEI or a university in Greece (Economou, 2010). In 2010 there were seven ATEI departments and two university departments offering four years of training. Once nurses have obtained their diploma they may apply to the prefecture for their license to practice. In the USA, registered nurses complete post-secondary education and receive either a two-year associate degree or a four-year bachelor's degree (United States Department of Labor, 2016). RNs provide and coordinate care, educate patients and public regarding health conditions, and provide emotional support. Their scope of practice varies from state to state.

Midwives graduate from higher technical training institutes (ATEIs). Greece reported 0.24 midwives per 1,000 population in 2014 (OECD, 2017a). In 2016, 11,475 certified nurse midwives (CNM) were practicing in the USA (American College of Nurse Midwives [ACNM], n.d.). In 2010 there were three departments with four-year courses for midwives in Greece (Economou, 2010). In the USA nurse midwives attend two years graduate education after their bachelor's degree (ACNM, n.d.). The practice of midwifery in the USA is relatively low with attendance at 8.3% births in 2016. Gynecologists dominate the field of obstetrics with the midwife as an assistant. However, the trend is moving toward increasing the number and utilization of midwives in the USA.

In an effort to address the physician shortage in the USA, advanced practice nurse roles have been expanded including certified registered nurse anesthetist (CRNA), nurse practitioner (NP), certified nurse midwife (CNM) and clinical nurse specialist (CNS) (United States Department of Labor, 2016). These nurses specialize with at least two years of graduate training receiving either a masters or doctorate degree. The current movement is to require a doctorate degree for these advanced nurses. After graduation, they must take a specialty certification exam in order to be licensed within their state. Each state regulates the extent of practice including physician supervision, collaboration, and prescriptive authority. At this time, Greece is not utilizing this role.

In the USA graduates from LPN, RN, midwifery, and advanced practice training must take national exams in order to practice (United States Department of Labor, 2016). Each state governs licensure of physicians and nurses. Currently some states have formed coalitions to allow these professionals to practice within several designated states with one license. Physicians and nurses must maintain

licensure by practicing a certain number of hours per year, as well as obtaining an established number of continuing education hours. Each state sets standards for licensure and regulates practice, including performance. In Greece, the training of physicians and nurses are according to EU standards (Economou, 2010). Consequently, these professionals are mutually recognized throughout the EU. However very few foreign physicians practice in Greece (0.87%) (OECD, 2017a).

Funding

Health care financing in the USA is different from Greece. Private insurance is dominant in the USA (Shi & Singh, 2017). Three types of cost sharing are commonly used in both countries including premium cost sharing, deductibles, and copayments. In employer-sponsored health insurance in the USA, the employer and the employee share in the cost of the premium. On average the worker shares 18% of the premium cost for individual plans and 29% of the cost for family plans. The deductible is the amount the insured must pay before the benefits of the plan are payable. Most plans require a deductible on an annual basis. In 2014, the average annual deductible for an individual plan in the USA was 1,217 US dollars. A plan may also have different deductibles for different services or providers. In both countries a co-payment is an amount paid by the insured out of pocket each time the service is received either after the deductible is paid or separate from the deductible (Economou, 2010; Shi & Singh, 2017). Copayment is in the form of a dollar amount contracted between the insurance company and the insured. Coinsurance is cost sharing in the form of a percent amount between the insurance company and the insured. A common plan is 80% covered by the insurance company and 20% by the insured after the deductible is met. Most US plans have a maximum amount that must be paid out of pocket Shi & Singh, 2017).

Private insurance in the USA includes many types of health plan providers such as commercial companies (Aetna, Cigna, Prudential, Blue Cross/Blue Shield), self-insured employers, and managed care organizations (MCOs) (Shi & Singh, 2017). Private insurance is available in the form of individual or family plans. A family plan typically covers the insured, spouses, and children. Government plans such as Medicare and Medicaid only offer individual plans. Initially health insurance was meant to cover the high costs of major medical care such as a severe illness or injury. Since the 1970s, health insurance plans have consisted of comprehensive plans with major medical coverage and routine care such as physician visits, diagnostics, and medications. Five main types of private insurance are available: group insurance, self-insurance, individual private insurance, managed care plans, and high deductible plans.

Group insurance can be obtained through an employer, union, or professional association (Shi & Singh, 2017). In 2014 before the enactment of ACA, 55% of all employers offered insurance to employees. In 2014, 98% of large employers (greater than 200 employees) offered insurance. Small

employers often did not offer insurance because of cost. ACA required that employers with more than 50 employees must offer insurance. The premiums of these group plans are based on the risk characteristics of the employees, the number to be covered, cost sharing amounts, and services to be covered. A large employer may be able to offer its own insurance in which the employer acts as the private insurer. This method of payment is known as self-insurance. Managed care plans are offered by health maintenance organizations (HMOs) and preferred provider organizations (PPOs). These companies provide insurance often at lower rates by contracting with a network of providers. HMOs also monitor utilization and focus on preventive care.

Public insurance in the USA is funded by the federal and state governments (Shi & Singh, 2017). However the services are contracted primarily through providers in the private sector. Medicare is intended for individuals over 65 years, the disabled, and those with permanent kidney failure. Medicare has a four part insurance program known as Parts A, B, C and D. Part A covers hospital insurance which has been funded through employer and employee payroll taxes. Part B is a voluntary supplementary program. Coverage includes physician services, ambulance, rehabilitation and preventive services. This program is funded partially by general taxes and beneficiary premiums. Part C is not a program that provides certain services. This program expanded the involvement of private managed care plans. Beneficiaries must be enrolled in Parts A and B. Then they have the choice to choose a HMO or PPO to provide Medicare benefits. Medicare pays these organizations a set amount to provide the services. Approximately 30% of Medicare recipients are enrolled in these services. Part D was implemented in 2006. Part D is voluntary and requires a monthly premium. This portion covers pharmaceutical costs based on a tiered system of out-of-pocket expenses.

Medicaid is the USA's public health insurance program for the indigent (Shi & Singh, 2017). Each state develops its criteria for eligibility according to income and assets. Federal law specifies coverage for low income elderly, the blind, and disabled. The Medicaid program is funded jointly by the federal and state governments. The federal government mandates services for Medicaid recipients, which include inpatient, outpatient, preventive, and long-term care (nursing home). With implementation of ACA, various states have chosen to expand eligibility requirements to increase citizens' access to health services.

The Children's Health Insurance Program (CHIP) was enacted in 1997 (Shi & Singh, 2017). When the program was created, one-fourth of low-income children were uninsured. States may operate CHIP as a separate program or in conjunction with Medicaid. Children up to 19 years of age can be enrolled. In some states, pregnant women, parents, and caregivers may also be covered.

In Greece, social insurance funds are critical for the coverage, financing and provision of health care services (Economou, 2010). There are approximately 30 social health insurance funds providing coverage to 97% of the Greek population. IKA is the largest fund, covering 50% of the population which consists of private sector employees and workers. The next largest fund is OGA which covers 20% of the population involved in agriculture. The

Social Insurance Organization for Self-employed Professionals (OAEE) provides funding for 13% of the population. The OPAD covers the public sector employees (12% of the population). These four funds cover 95% of the entire Greek population. Each social insurance fund has its own benefit packages (Economou, 2010). There are significant differences in the scope of insurance coverage. Differences exist in regards to choice of primary providers, private sector utilization, and access to specialists.

Private insurance in Greece plays a minor role with coverage for less than 12% of the population (Economou, 2010). Primarily private insurance is used as supplemental coverage for faster access, better quality of services, and increased consumer choice. The growth of private insurance has been constrained by the lack of disposable income, unemployment rates, the aging population, strong family structures, perception of health services as a public right, and availability of social insurance coverage. Most Greeks see payment to a third party for their health care as unnecessary.

Greek private insurance plans typically do not cover dental care, plastic surgery, alternative medicine, and vision (Economou, 2010). Pre-existing conditions and chronic illnesses like diabetes are often not covered. Insurers are not required to provide a standardized benefit package. Premiums are determined by individual risk rating. Most individuals are ineligible to purchase private insurance after the age of 65 years.

Payment/Reimbursement

In the USA and Greece, fee-for-service is based on the assumption that services are provided as a unit, such as a physician visit, lab test, x-ray, and the like (Shi & Singh, 2017). In the USA, fee-for-service charges are set by providers and insurers. Insurers may limit reimbursement for services to a customary and reasonable amount. Typically the fees for service are billed by the provider and paid after receiving the service, known as retrospective payment. Historically providers prefer fee-for-service payments. However other methods of reimbursement have been implemented because of the rapid escalation of health care costs.

Bundled payments or package pricing includes a number of related service for one price (Shi & Singh, 2017). This method of payment has been utilized by the public and private sector in the USA and Greece (Shi & Singh, 2017; Economou, 2010). Surgical services are frequently bundled. The price includes physician visits, related diagnostics, the surgical procedure, and after care.

Three distinct approaches of reimbursement are used by HMOs and PPOs in the USA, also known as managed care (Shi & Singh, 2017). A version of fee-for-service is used with a fee schedule that has been negotiated with the providers. HMOs may have providers on their payroll and own the facilities in which care is provided. Capitation may be used in which the provider is paid a monthly fee per enrollee regardless of whether the enrollee receives services or not. This method removes the incentive for provider induced demand, encouraging

only necessary services. In Greece, the public sector occasionally uses fee schedules and capitation in contractual arrangements with private entities (Economou, 2010).

As noted previously Medicare and Medicaid have historically provided reimbursement in a retrospective manner using fee-for-service (Shi & Singh, 2017). However, in 1983, four prospective reimbursement methods were implemented including diagnosis-related groups (DRGs) for inpatient services, ambulatory payment classifications (APCs) for outpatient diagnostic and surgical centers, resource utilization groups (RUGs) for skilled nursing facilities, and home health resource groups (HHRGs). These methods grouped payment based on the patient's diagnosis or procedures with a set payment amount determined prior to the service, making reimbursement prospective. The goal was to encourage a shorter length of hospital stay and utilization of essential services. Greece has implemented some forms of prospective reimbursement, especially for cardiovascular services (Economou, 2010).

Value-based payment to providers was introduced in the USA with the ACA (Shi & Singh, 2017). These payments were designed to incentivize providers to be accountable for cost and quality of care. In 2015 the Medicare Access and Child Health Insurance Program Reauthorization Act (MACRA) replaced the sustainable growth formula for reimbursing hospitals, physicians, and health networks with a value based payment system (Fagan, 2016). The major challenge is how value is to be measured. MACRA has mandated the reporting of health outcomes, patient satisfaction scores, and utilization of health information technology as value measurements. Bonuses and penalties have been established based on the reported data findings. CMS states that the goal is to have 50% Medicare payments tied to quality or value measures by 2018 (CMS, 2017b).

The patient's satisfaction with services has been shown to correlate with the quality of services (Fagan, 2016). The impact of patient satisfaction and financial responsibility has created the need to involve patients and caregivers in the health care delivery system. These health care recipients are being included as advisors, specialized councils, and incorporated into care delivery operations. In the USA the health care delivery paradigm is shifting from quantity to quality of services. Consumer groups play a minimal role in the Greek health care system (Economou, 2010).

The payment system in Greece is complex because of the mix of public and private provision and funding (Ecomou, 2010). Payment consists of fixed budgets, per diem rates, bundled payments, and fee for service. The public hospitals and rural health centers operate on a fixed budget which covers the operational costs and capital investments. Each year the Ministry of Health and Social Solidarity defines the prices of hospital care and per diem rates by which ESY hospitals will be reimbursed from social insurance funds. However, these funds may not cover the actual costs of services. Therefore, to avoid bankruptcy the government subsidizes these entities from the public budget.

Also, more costs have been shifted to out-of-pockets payments for Greeks (Economou, 2010). These payments may include an extra charge for an

upgraded hospital room, direct payments for pharmaceuticals, co-payments for services such as outpatient clinic visits, labs, or diagnostic procedures, and private clinic payments. These expenses have been increasing over the past years (Karanikolos & Kentikelenis, 2016).

Providers working in the public sector are typically paid on a salary basis (Economou, 2010). The salary is meant to control cost and deter unnecessary usage. Despite ESY physicians being salaried with limits on seeing private patients, some may work fewer hours than stipulated in their contract and use their public service time to recruit patients for their private practice. Such actions are encouraged by low wages and outdated fee schedules, as well as ineffective control mechanisms. Doctors may be paid on a fee-for-service basis during their private clinic sessions with flat rates ranging from 25 to 90 euros. These payments may be split between the hospital and the physician.

Some doctors and dentists are contracted by social insurance funds on a fee-for-service basis (Economou, 2010). Occasionally, physicians may charge for additional visits or prescribe more diagnostic tests or drugs to increase their salary. Fees may be set at a low level resulting in frequent informal payments by patients to the physicians.

Physicians and dentists in private practice are usually reimbursed on a fee-for-service basis (Economou, 2010). These fees can be set by the provider or the medical associations. Specialist fees may range from 40 to 100 euros. Overall, in Greece the fee-for-service reimbursement method dominates.

Health Care System Evaluation

Health care profiles include indicators of a country's health status which is a reflection of the culture and the health care system. The reported statistics reflect general demographics, birth rates, death rates, infant mortality, mortality rates, and longevity. The USA population is slightly younger than in Greece. Infant mortality is markedly lower in Greece. Life expectancy at birth is similar between the two countries. See Table 2.

Table 2. Basic Health Profile

Statistics	Greece	USA
Population under 15 yrs (2013)	15%*	20%**
Population over 60 yrs (2013)	26%*	20%**
Median age in yrs	43*	37**
Population Living in Urban Areas	77%*	81%**
Total fertility rate per female	1.5*	2.0**
Number of live births (thousands)	108.4*	4229.9**
Number of infant deaths per 100,000 live births	2***	24****
Total number of deaths (thousands)	107.5*	2688.9**
Life expectancy at birth male/female in years (2015)	77.8/84*****	77/82*****

*Data from WHO 2017g, **Data from WHO 2017h, ***Data from WHO 2017b, ****Data from WHO 2017d, *****Data from WHO 2017a, ***** Data from WHO 2017c

The health of children is considered a quality indicator of the health care system. The top five causes of death for children under five years old have been compared between Greece and the USA. The causes of death are similar; however they rank differently between the countries (WHO, 2017g;WHO 2017h). In Greece, congenital anomalies are ranked as the number one cause of death in children under five years at 46% compared to 25% in the USA. Prematurity as a cause of death in this age group is similar in both countries. Injuries are higher in the USA with 12% compared to 4% in Greece. See Table 3.

Table 3. Top Five Conditions Causing Death under Five Years of Age 2013

Conditions	Greece*	USA**
Congenital anomalies	46%	25%
Prematurity	31%	28%
Other causes	11%	23%
Birth asphyxia	6%	5%
Injuries	4%	12%

*Data from WHO 2017 g, ** Data from WHO 2017h

The perceived health status of adults between the countries did vary. Perceived health status is reported as very good, good, fair or poor (OECD 2017a) . In Greece, the health status of females over 15 years reported as good or very good was 71.8% in 2015, which was lower than the 87.7% for females in the USA. However, the self-reported health status of females declined in Greece from 74.6% in 2005. The 2015 rate in the USA remained stable as compared to 87.5% in 2005. Males within this age range reported a health status of good or very good in Greece of 77.2% in 2015, dropping from 80.4% in 2005. In the USA, the males with good or very good health status were 88.5% in 2015 as compared to 89.3% in 2005.

The top ten causes of death are similar among adults in Greece and the United States. See Table 4. Two exceptions are Alzheimer’s disease and diabetes which were not included in the Greek statistics. Possibly the determination of death and diagnosis are different between the two countries. In both countries, ischemic heart disease is the number one cause of death. However, the USA rates of death may be lower due to more aggressive treatment with interventional cardiology such as transluminal coronary angioplasty. In addition, the USA has been aggressive with invasive therapies for stroke. Breast cancer and prostate cancer death rates in the USA may also have been affected by more intensive screening and surgical interventions for these diseases.

Table 4. *Top Ten Causes of Death for Adults in Greece and the USA 2012*

Conditions	Greece*	USA**
Ischemic Heart Disease	22.2%	14.8%
Alzheimer's Disease	--	9.5%
Stroke	18.5%	5%
Diabetes	--	2.7%
Trachea, bronchus, lung cancers	6.4%	6.5%
Lower Respiratory Infections	5.4%	2%
Chronic Obstructive Pulmonary Disease	4.5%	5.8%
Colon & rectal cancers	2.3%	2.3%
Kidney Diseases	2.2%	2.2%
Breast cancer	1.9%	
Hypertensive Heart Disease	1.7%	2.7%
Prostate Cancer	1.6%	

*Data from WHO 2017g, **Data from WHO 2017h

Documentation of preventive services utilized were difficult to locate for both countries. However preventive services are a reflection of public health initiatives and funding, especially for immunization programs. The percent of children immunized in Greece is higher than in the USA with 97% immunized for measles and 99% for diphtheria, tetanus, and pertussis in Greece versus 92% and 95% respectively in the USA (OECD, 2017b). In contrast, the rate of breast cancer screening for females 50 to 69 years was 59.6% in Greece and 79.5% in the USA. The incidence of deaths from breast cancer may be related to the lower rate of breast cancer screening in Greece. Cervical screening for females ages 20 to 69 years was also lower in Greece with 75.5% compared to 79.5% in the USA. These rates may be a reflection of the lack of public health education or access to screening.

Health Care Expenditures

In 2014, Greece spent 8.0% of its Gross Domestic Product (GDP) on health expenditures. Of this, 38% was privately funded and 62% was from the government (WHO, 2017e). The average per capita cost of health care in Greece in 2014 was \$2,098 (WHO, 2017a). The share of government spending allocated to health care was low compared to other European countries (WHO, 2017b). In contrast, 17.0% of the GDP was spent on health care within the USA in 2014 with 52% from private sources and 48% from the government (WHO, 2017c; 2017f). This averages about \$9,403 per capita cost. The share of government expenditures allocated to health care in the USA was high compared to other countries in the Americas (WHO, 2017d). Out-of-pocket spending accounted for 35% of the national health expenditure in Greece as compared to 11% in the USA (WHO, 2017e; WHO, 2017f). See Table 5.

Table 5. Health Care Expenditures in Greece and USA 2014

2014	Greece*	USA**
Total Health Expenditures (Percent of GDP)	8.0%	17.0%
Total Health Expenditure per Capita in US\$	1,743	9,403
Total Government Health Expenditure per Capita in US\$	1,075	4,541
Total Health Expenditure in Purchasing Power Parity	2,098	9,403
Government Health Expenditures as Percent of Total Health Expenditures	62%	48%
Social Security Funds as Percent Government Health Expenditures	62%	88%
Government Health Expenditures as Percent of All Government Expenditures	10%	21%
Private Health Expenditures as Percent Total Health Expenditures	38%	52%

Private Insurance as Percent of Private Health Expenditures	9%	64%
Out of Pocket Expenditures as Percent of Total Health Expenditures	35%	11%
Out of Pocket Expenditures as Percent of Private Health Expenditures	91%	11%

*Data from WHO 2017e, **Data from WHO 2017f

In 2015 the USA spent 3,205.6 billions in US dollars on health care expenditures, more than any nation in the world (DHHS, 2017). Ninety-five percent of the expenditures were related to personal care. The majority of spending was on hospital care at 32.3% followed by physician and professional consults at 19.9%, 13.5% on retail including pharmaceuticals, and 13% on nursing home, home health, and personal services. Only 1.3% was spent on government health care administration and 4.8% in investment such as research.

In contrast Greece spent 14,140.9 in million euros on total health care expenditures in 2015 (ELSTAT, 2017). As in the USA the majority of expense was related to hospitals and long term care at 30.49%. The next highest expenditure was retailers at 20.6% followed by ambulatory care at 7.6%. A breakdown of expenses showed 63.7% expenditures were curative, rehabilitative or long-term care. Medical goods including supplies and pharmaceuticals were 28.3% of costs. The expenditures for ancillary services were 3.99% and another 3.9% for governance. Both countries' highest expenditures were hospital care and retail medical supplies with pharmaceuticals being the largest component.

In Greece, the government has universal coverage for prescription drugs, with a set price and a co-payment based on the patient's condition and income (WHO, 2010). Greece spent \$8.49 billion on pharmaceuticals in 2009, with the largest amounts spent on cardiovascular drugs (ELSTAT, 2017). In contrast, the U.S. spent \$324.6 billion on prescription drugs in 2015 (CMS, 2017a).

Public Health

A common definition of public health is the science and art of preventing disease, prolonging life and promoting health through the efforts of societies, organizations, and individuals (Skolnik, 2016). Public health involves disease identification, active surveillance, infectious disease control, prevention of non-communicable disease, identification of environmental risks, health promotion, and research. Active monitoring of disease is necessary to quantify and identify priorities for prevention (WHO, 2008). Identifying environmental,

social, and individual factors which affect health is an important step in the disease control and prevention continuum.

In Greece, the Ministry of Health and Social Solidarity is responsible for protecting the public from diseases, harmful work environments, exposure to water, soil and air pollution, and developing policies to improve health (Economou, 2010). At the regional level, authorities license health care practitioners and control public health laboratories which test food and water supplies. At the local level health authorities are responsible for implementing disease prevention programs and informing citizens about public health threats (Economou, 2010).

Across countries there are many factors that influence a population's health. Some of these include income level where in general, less income is associated with a poorer health status (Kullgren, McLaughlin, Nitra, & Armstrong, 2012). One's education level is also an important contributor to health where those with more education tend to make healthier decisions and may better understand the influence of risk factors. Age has a consistent effect on health in which younger individuals are generally more likely to experience physical injuries and older individuals are more likely to be affected by non-communicable disease (NCD). The environment may influence disease risk where polluted air, soil and/or water may exert strong influences on health status. Environmental supports are an important component of promoting healthy behaviors. Health behaviors such as smoking, physical activity, excessive alcohol exposure and seat belt use have strong associations with various diseases and injuries. Those with relatively easy access to health care may experience fewer effects of a disease than those who lack access to health care services.

Identifying and tracking diseases is an essential component of public health. Within Greece, the Hellenic Center for Disease Control and Prevention (HCDCP) leads efforts in disease surveillance and control, outbreak investigation, vaccine distribution, refugee and immigrant support, monitoring food and waterborne diseases, and ensuring epidemiological data management (HCDCP, 2014). These functions along with the maintenance of 24 hour emergency operations center serve to mitigate conditions that affect the health of all Greek populations. The work of HCDCP includes accurate disease diagnosis and quantification, identification of effective intervention efforts, and effective reporting of current disease states. These efforts occur through 1) the Mandatory Notification System, 2) the Primary Care Sentinel Surveillance System, and 3) the Laboratory Surveillance System. These systems are currently undergoing revisions to include automated data entry and standardization of data with WHO guidance (HCDCP, 2014).

Training professionals in public health is an important component of disease prevention and control. Greece has one school, The National School of Public Health (NSPH), that trains graduate students and other professionals in research, disease surveillance, infectious disease control, epidemiology, biostatistics, vaccine implementation and health promotion. The NSPH also

conducts research and consults with the HCDCP, the European Center for Disease Control (ECDC), WHO, and other public health organizations.

European member states are making progress to improve public health functions through efforts to identify and expand essential public health operations (EPHOs). The WHO Regional Office for Europe (WHO, 2015) identified a list of 10 EPHOs specifically designed to improve public health services and access. The 10 categories of these EPHOs include the following: surveillance of population health, monitoring and responding to emergencies, environmental and occupational health protection, health promotion including minimizing social inequities, disease identification and prevention, assuring a competent public health workforce, communication of health-related information to include the use of social media, and advancing research for health policies (WHO, 2015). These initiatives seek to identify and close gaps and limitations in public health services throughout the European region.

Recently an estimated one million refugees have entered Greece which may severely burden an already stressed medical system according to the United Nations High Commission for Refugees (NHCR, 2016). Sixty-two percent of the refugees in Greece have unmet health needs (Karanikolos & Kentikelenis, 2016). In addition, 53% of these refugees had difficulty accessing care due to cost and long waiting lists. The long-term effects of the refugee crisis are difficult to quantify, but certainly a heavy burden is likely to be placed on the existing medical establishment.

Continued economic austerities in Greece are influencing public health and may contribute to increased needs for medical care (Karanikolos & Kentikelenis, 2016). Reductions in governmental support along with decreases in personal income are affecting the nature and type of medical services needed throughout the region. Increased medication cost along with an increase in unemployment (50% in middle aged adults) is influencing the quality of medical care (Eurostat, 2016). Because of a lack of sufficient financial support, some doctors and other health care specialists may be seeking residence in other countries.

Effective public health is contingent on accurate disease surveillance and yet public health services in Greece have not been designed to meet current and future behavioral and environmental risk factors. Life expectancy along with predictions of increases in cardiovascular disease, mental health conditions and the number of individuals living with a disability may challenge the health and social care systems in both countries (Cylus & Stuckler, 2011; Shi & Singh, 2017). Health services often lack an emphasis on non-communicable health risk factors such as smoking, physical inactivity, obesity and safety issues, such as in Greece. Public health professionals are minimally financed and therefore are not a high priority profession for graduates seeking professional degrees.

The Ministry of Health and Social Solidarity in Greece is working on policies to shift health care efforts from curative medicine to health promotion and disease prevention. A national public health strategic plan is needed to confirm the importance of public health efforts to link primary health care services to public health interventions which reduce the burden of non-

communicable disease. Initiatives to help reduce tobacco use, obesity levels, and consumption of foods with high saturated fat and sugar levels may help reduce the impact of non-communicable disease in Greece. Some OECD countries are using mass media and social media strategies to effectively influence engagement in health behaviors (Mateo, Granado-Font, Ferre-Crau, & Montana-Carreras, 2015). Those collecting disease information should quickly provide information to the local communities so they can make informed decisions on policies and prevention programs.

Study Limitations

This study began in Greece in 2016, as a part of a Health and Wellness Study Abroad Program for undergraduates and graduates from a university in southeast Louisiana, USA. The researchers and students conducted interviews of Greek health care professionals including doctors, nurses, pharmacists, massage therapists and physiotherapists. In addition, the group visited the Greek Ministry of Health and the Greek Council on Refugees to gain further knowledge about the health and wellbeing of individuals living in Greece. Although salient information was gleaned from these interviews, more face-to-face meetings with Greek people, especially health care administrators, would have been helpful in understanding the complexity of the health care systems in Greece and the USA. Finally, many credible, published sources of information were used in the completion of this study. Main sources included surveillance systems from the USA's CDC, Greece's ELSTAT, and WHO. These latter sources were vital in providing current information about each country, since such data are often difficult and expensive to collect first hand. However, data collection differences in Greece and the USA was challenging when comparing various health care funding schemes and expenditures. In addition, some information may have been missed because of language barriers or misinterpretation. Both health care systems are extremely complex, which is difficult to describe in an abbreviated format.

Current & Emerging Issues

The recent austerities enacted in Greece have led to deteriorating health care conditions due to increases in unemployment, out-of-pocket health expenditures, utilization of health services, and cost-cutting measures by the health care system (Karanikolos & Kentikelenis, 2016; Kentikelenis, Karanikolos, Papanicolas, Basu, McKee, & Stuckler, 2011). Disproportionately these austerities have affected the poor, unemployed, homeless, and other vulnerable populations (Cylus & Stuckler, 2011; Karanikolos & Kentikelenis, 2016). Human Immunodeficiency Virus (HIV) infection rates in Greece have increased which may be due to a decrease in preventive services and an increase in injection drug use (Karanikolos & Kentikelenis, 2016). One study found that HIV infections among drug users has

increased 96% between 2009 and 2012 (Kentikelenis, Karanikolos, Papanicolas, Basu, McKee, & Stuckler, 2014). Multi-drug resistant tuberculosis (MDR-TB) has doubled in Greece as medical funds are reduced and more people lose jobs and increasingly find themselves without financial means. Reductions in mosquito abatement spending has historically increased the number of malaria cases.

Hospital budgets have been reduced resulting in increased staffing demands along with reductions in medicine and medical equipment repairs. According to the OECD, austerities have reduced hospital staff along with basic supplies, medicine, gloves, gauze and sheets (OECD, 2017a). Many Greeks are not able to afford private health care and resort to public hospitals which overly burdens existing staff. Low funding levels affect maintenance schedules of diagnostic equipment and many clinical labs are not performing standard tests due to a lack of supplies.

Medical insurance costs have increased along with those without employment who no longer have insurance benefits. As a result, patients delay medical treatment which increases the costs of care. The perceived health status of Greeks has declined. Reductions in financial support and employment has affected Greece psychologically. From 2009 to 2011, the rising prevalence of depression has been associated with an increase in suicide attempts by 36% between 2009 and 2011. Deaths from suicide have increased by 45% between 2007 and 2011 (Kentikelenis, Karanikolos, Papanicolas, Basu, McKee, & Stuckler, 2012). Delays in medical care has affected the numbers of complicated pregnancies with a 21% increase in stillbirths along with a 43% increase in neonatal deaths (Kentikelenis, et al., 2014).

The USA has also experienced a decline in economy, undergoing a recession in the last few years. health care costs have continued to rise above the general inflation rate (DHHS, 2017). Consequently, many employers have decreased or eliminated their percent in cost-sharing premiums. Out-of-pocket expenses have risen as evidenced by more high deductible insurance plans. The ACA was meant to make health insurance more affordable. However, several major insurance companies have chosen not to continue participation due to the fiscal losses. Currently Congress is struggling with a repeal and replace proposition to counter the existing ACA. However, MACRA has been predicted to remain in place at least for the next few years (AHA, 2017).

Both countries have an aging population. The elderly tend to consume a larger percentage of health care services. In addition, chronic diseases such as diabetes and cardiovascular conditions continue to rise in both countries. If these diseases are not managed well or preventive measures are lacking, catastrophic events leading to mortality and morbidity increase which impacts health care costs. Indirect costs also soar due to missed workdays and disabilities.

Despite the enormous expenditures of the USA on health care, the nation's health profile is not significantly better than Greece. The reliance on intensive high cost technology and pharmaceuticals in the USA has not demonstrated superior efficacy. The resultant costs have been a burden on the economy and has limited access to services. The advent of value-based reimbursement may

assist in controlling costs and improving health outcomes. Again, the emphasis is on primary care and prevention of disease and complications.

The USA and Greece have recognized the need for primary care to focus on preventive care and the management of chronic conditions. Generalists are lacking to provide these services. Access may be limited. Other health care professionals such as nursing, pharmacists, exercise physiologists, and health educators have a unique opportunity to assist with health promotion and disease prevention.

References

- Agency of Healthcare Research and Quality (AHRQ, 2016). AHRQ profile 2016. Retrieved from <https://www.ahrq.gov/cpi/about/profile/index.html>.
- American College of Nurse Midwives (ACNM,n.d.). Become a midwife. Retrieved from www.midwife.org.
- American Hospital Association (AHA, 2017). MACRA: Five things to take away from the final MACRA rule. *Hospitals and Health Networks*. Retrieved from www.hhnmag.com/articles/7748-five-things-to-take-away-from-the-macra-final-rule/htm.
- Centers for Disease Control and Prevention (CDC, n.d.). About CDC 24-7. Retrieved from <https://www.cdc.gov/about/>
- Centers for Medicare and Medicaid Services (CMS) (2017a). National health expenditure fact sheet. Retrieved from <https://www.cms.gov/research-statistics-data-and-systems/statistics-trends-and-reports/nationalhealthexpenddata/nhe-fact-sheet.html>
- Centers for Medicare and Medicaid Services (CMS,2017b). CMS strategy. Retrieved from <https://www.cms.gov/About-CMS/Agency-Information/CMS-Strategy/Downloads/CMS-Strategy.pdf>.
- Cylus, J. & Stuckler, D. (2011). Economic crisis, austerity and the Greek public health system. *European Journal of Public Health*, 22, 4-5.
- Department of Health and Human Services (DHHS, n.d.). About HHS. Retrieved from <https://www.hhs.gov/about/index.html>
- Department of Health and Human Services (DHHS, 2017). *Health in United States, 2016: Chartbook on long-term trends in health*. Department of Health and Human Services Publication No. 2017-1232.
- Economou, C. (2010). Greece:Health system review. *Health Systems in Transitions*, 12 (7), 1 - 180.
- Eurostat. (2016). Quality of Life: Outcomes (data file). Available from c.europa.eu/eurostat/data/database.
- Fagan, M. (2016). 3 ways patients can drive health care improvements. *Hospitals and Health Networks*. American Hospital Association. Retrieved from www.hhnmag.com/artcles/7792-ways-patients-can-drive-health-care-improvements.
- Federal Drug and Food Administration (FDA, n.d.). What we do. Retrieved from <https://www.fda.gov/AboutFDA/WhatWeDo/default.htm>
- Hellenic Statistical Authority (ELSTAT, 2017). System of health accounts (SHA) of year 2015. Retrieved from <http://www.statistics.gr/en/statistics/-/publication/SHHE35/->

- Hellenic Center for Disease Control and Prevention (HCDCP, 2014). Epidemiological surveillance systems of infectious diseases in Greece: Actions and goals for the near future. Retrieved from <http://www2.keelpno.gr/blog/?p=5179&lang=en>
- Johnson, J., Stoskopf, C. and Shi, L. (2017). Comparative health systems: A global perspective (2nd ed.). Burlington, MA.: Jones & Barlett Learning.
- Karanikolos, M. & Kentikelenis, A. (2016). Health inequalities after austerity in Greece. *International Journal for Equity in Health*, 15, 83. doi:10.1186/s12939-016-0374-0.
- Kentikelenis, A, Karanikolos, M, Papanicolas, I, Basu, S, McKee, M, and Stuckler, D. (2011). Health effects of financial crisis: Omens of a Greek tragedy. *Lancet* 378: 1457–1458.
- Kentikelenis, A, Karanikolos, M, Papanicolas, I, Basu, S, McKee, M, and Stuckler, D. (2012). Effects of Greek economic crisis on health are real. *British Medical Journal*, 345, e8602. doi:<https://doi.org/10.1136/bmj.e8602>.
- Kentikelenis, A, Karanikolos, M., Reeves, A., McKee, M., & Stuckler, D. (2014). Greece's health crisis: From austerity to denialism. *Lancet*; 383: 748-753.
- Kullgren, J.T., McLaughlin, C.G., Nitra, N., and Armstrong, K. (2012). Nonfinancial barriers and access to care for U.S. adults. *Health Services Research*. 47(1 Pt 2): 462-485.
- Mateo, G. F., Granado-Font, E., Ferre-Grau, C., Montana-Carreras, X. (2015), Mobile phone apps to promote weight loss and increase physical activity: A systematic review and meta-analysis *Journal of Medical Internet Research*, Vol. 17(11). doi: 10.2196/jmir.4836.
- Medicare.gov. (n.d.). What's medicare? Retrieved from <https://www.medicare.gov/sign-up-change-plans/decide-how-to-get-medicare/whats-medicare/what-is-medicare.html>
- National Institute of Health (NIH, n.d.). Institutes and Centers. Retrieved from <https://www.nih.gov/institutes-nih/list-nih-institutes-centers-offices>.
- Office of Inspector General (OIG, 2016). OIG 40th Anniversary: Fighting fraud, waste, and abuse for 40 years. Retrieved from <https://oig.hhs.gov/about-oig/about-us/index.asp>.
- Organization for Economic Co-operation and Development (OECD, 2016). Health policy in Greece. Retrieved from <http://www.oecd.org/health/health-systems/Health-Policy-in-Greece-January-2016.pdf>.
- Organization for Economic Co-operation and Development (OECD, 2017a). Statistics (data file). Available from stats.oecd.org/index.aspx?DataSetCode=HEALTH_STAT.
- Organization for Economic Co-operation and Development (OECD, 2017b). Statistics (data file). Available from <https://data.oecd.org/healthcare/child-vaccination-rates.htm>.
- Organization for Economic Co-operation and Development (OECD, 2015). Pharmaceutical Spending. Retrieved from <https://data.oecd.org/healthres/pharmaceuticals-spending.htm>.
- Pechansky, R., Thomas, J.W. (1981). The concept of access: Definition and relationship to consumer satisfaction. *Medical Care*. 19(2): 127-40.
- Shi, L. & Singh, D.A. (2017). *Essentials of the U.S. health care system* (4th ed.) Burlington, MA.: Jones & Barlett Learning.
- Skolnik, R. (2016). *Global health 101*, 3rd ed. Burlington, MA: Jones & Bartlett.
- Social Security Administration. (n.d.). Medicaid information. Retrieved from <https://www.ssa.gov/disabilityresearch/wi/medicaid.htm>

- The Henry J. Kaiser Family Foundation. (n.d.). Timeline: History of health reform in the U.S. Retrieved from <https://kaiserfamilyfoundation.files.wordpress.com/2011/03/5-02-13-history-of-health-reform.pdf>
- The United Nations High Commission for Refugees (UNHCR, 2016). Regional refugee and migrant response plan for Europe: Greece. January to December 2016 (Revision May 2016).
- United States Department of Labor (2016). *Occupational outlook handbook 2016*. Bureau of Labor Statistics. Retrieved from <https://www.bls.gov/ooh/healthcare/htm>.
- World Health Organization (WHO, 2008). Setting priorities in communicable disease surveillance. Retrieved from: http://www.who.int/csr/resources/publications/surveillance/WHO_CDS_EPR_LYO_2006_3.pdf?ua=1
- World Health Organization (WHO, 2010). Greece: Health system review. *Health Systems in Transition*, 12(7).
- World Health Organization (WHO, 2015). Self-assessment tool for the evaluation of essential public health operations in the WHO European Region. Retrieved from http://www.euro.who.int/__data/assets/pdf_file/0018/281700/Self-assessment-tool-evaluation-essential-public-health-operations.pdf?ua=1
- World Health Organization(WHO,2017a). Greece statistics. Retrieved from <http://www.who.int/countries/grc/en/>
- World Health Organization (WHO, 2017b). Health system financing country profile: Greece 2014. Retrieved from file:///C:/Users/Janet%20Jones/Downloads/Health%20System%20Financing%20Profile%20by%20country.pdf
- World Health Organization (WHO, 2017c). United States of America statistics. Retrieved from <http://www.who.in/countries/usa/en/>
- World Health Organization (WHO, 2017d). Health system financing country profile: United States of America 2014. Retrieved from file:///C:/Users/Janet%20Jones/Downloads/Health%20System%20Financing%20Profile%20by%20country%20(1).pdf.
- World Health Organization (WHO, 2017e). Global health expenditure database: Greece (data file) Available from <https://apps.who.int/nha/database/Search/Index/en?q=Greece+health+expenditures>
- World Health Organization (WHO, 2017f). Global health expenditure database: United States of America (data file). Available from <http://apps.who.int/nha/database/ViewData/Indicators/en>
- World Health Organization (WHO, 2017g). Greece: WHO statistical profile. Retrieved from <http://www.who.int/gho/countries/grc.pdf?ua=1>
- World Health Organization (WHO, 2017h). United States of America: WHO statistical profile. Retrieved from <http://www.who.int/gho/countries/usa.pdf?ua=1>