



Macro-Comparative Political Analysis: Do Different Health Care Systems Result in Differential National Health Outcomes?"

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Introduction

In this study, I will conduct a comparative analysis of how the the political-economic set-up of health care systems in affluent capitalist democracies may affect aggregate health care performance in designated OECD nations impact healthcare outcomes. The research question that will be answered is, “*How does national design of health care institutions and development influence comparative quality of healthcare systems?*” I will be looking closely at this macro-level relationship by identifying economic indicators and institutional rules that govern rational behaviors and that structure the interaction between individual actors, where there are *principals* who ultimately demand the health services and their outcomes—above all service recipients, but also their employers and the governments whose politicians try to deliver outcomes that will make voters reelect them. *Agents* are put in charge of the actual implementation of health services and thereby have superior knowledge of the operational steps it takes to deliver the requisite health care to restore sick patients, and principals (government and doctor) which influence patient care outcomes. A healthcare system is defined as an arrangement in which different category of actors combine in a system of institutionalized rules to deliver health services and thereby influence the physical and psychic health and satisfaction of customers with the system employing different patterns of resource expenditure (Ludwig, Van Merode, and Groot 2010). One evaluative measure of the efficacy of these components is to analyze the health service outcomes, the actual health of the citizens who are benefactors of the system. The main hypothesis explored in the thesis is that the design of health care systems, documented in

institutional rules governing the interaction between the various actor groups, shapes the actual health outcomes.

Chapter 1: A Theory of Healthcare Systems and Outcomes

In the first section of this chapter, I give a brief definition of health care systems based on the relevant literature. In the next section, I lay out individual components/actors of health care systems and how they can be deployed with differential implications for the efficiency of entire complex health care systems: What makes for the “best” or the “worst” health care system? In the third section, I turn to the real life health care systems, as distinguished in the empirical literature about health care systems. The most important objective is to determine which of the existing health care systems come closer to the “best” or the “worst” system. This provides the empirical specification of my lead hypothesis: Some countries have health care systems that should deliver empirically observable better results. In the fourth section, I will consider alternative hypothesis to my lead working hypothesis. Maybe it is not health care systems, but other factors that influence the health outcomes observable in advanced affluent Western democracies. In the fifth section, I will specify the dimensions on which I will distinguish health care outcomes. In the sixth and final section, I will outline my research strategy: the choice of comparison countries in two stages of comparative analysis.

1.1. The Concept of Health Care System

Health systems consist of a network of relations of delegation between principals and agents. Often the problems of designing a healthcare system are derived from agency problems, i.e., relations of informational asymmetry among the actors within the system. The actor(s) with the greatest knowledge are the health care providers, as agents of patients, the ultimate principals on

whose behalf medical procedures are set in motion, and political administrators and health insurers, as intermediaries who may be conceived as agents of patients, but principals of health care providers. The agents may not have incentives to maximize patients' health per se, but strive to maximize their own income, derived from health services and intermediation, and/or maintenance of political office and its perks are the guiding objectives. Agents 'income maximization and/or maintenance of political office and its perks are the guiding objectives (Kotzian, 238-240).

A variety of definitions of healthcare systems have been synthesized for the purposes of this study. The definitions are similar in that they view health care systems as the system by which medical care is provided to the citizens within a nation. However, they differ in what is considered to be the primary objective of the healthcare system. Some authors define healthcare systems by the actors involved and the social interactions that inherently are entwined.

A first definition is that, "Health systems are defined by the World Health Organization as comprising all the organizations, institutions and resources that are devoted to producing health actions. Health action is defined as any effort, whether in personal health care, public health services or through intersectional initiatives, whose primary purpose is to improve health. Formal health services, including the professional delivery of personal medical care, are clearly within these boundaries. So are actions by traditional healers and all use of medication, whether prescribed by a provider or not and home care for the sick people, especially in developing countries and rural areas where between 70% and 90% of all sickness is managed" (Laaser et al 2013). According to author Peter Kotzian whose article is used as a primary work of reference for this study, proposes a second definition. Health care systems, henceforth HCS, are societal

subsystems installed to provide health for the population. Using financial and human resources, HCS provide a bundle of quantity and quality of health services. During the last decades, health care expenditure, henceforth HCE, has reached levels which have made it incompatible with other political targets, for example, the lowering of non-wage labor costs or the stabilization of government budgets. This has led to increased discussion about the design and operation of HCS.” Wendt’s seminal text, “Mapping European healthcare systems: a comparative analysis of financing, service provision and access to healthcare” cites Freeman and Moran (2000) in discussing that, “Healthcare systems provide security against major life risks: ‘Not often, but sometimes, it is a matter of life and death. More usually it represents a powerful means of alleviating the anxiety, discomfort, and incapacity that come from sickness and ill health.’” A fourth definition is that health systems “ensure equity in access to needed health care irrespective of socioeconomic status and other non-need characteristics (Marmor and Wendt 2012). As Andersen points out [1], “equity in access to health care is best considered in the context of whether people in need of medical care receive it or not” (Pappa, 2013).

Healthcare systems may deliver rather different health outcomes, although their funding is equivalent. They require different amounts of resources for administration. Some encourage the provision of high quality services or attempt to expand or limit services provided. Countries that spend more for healthcare do not necessarily achieve better outcomes. Opportunistic behavior by agents can increase the consumption of financial resources by the healthcare system without actually improving the health of the population. This lowers the healthcare system’s performance while not seeking to improve the health of the population. In order to counteract this problem of opportunistic behavior by agents, control can be exercised by institutional mechanisms installed

in the healthcare system itself or through external mechanisms. Healthcare systems will be defined by how they incentivize or discourage these opportunistic behaviors by looking at how tasks within the system are delegated and how opportunistic behavior can be exercised.

I hypothesize that the institutional design of a nation's healthcare system will be reflected in the population averaged health outcomes. More specifically, my hypothesis is that a Social Health Insurance infrastructure will result in the best healthcare outcomes, and amongst the nations in this category, those that spend the most on healthcare will have the best qualitative and quantitative output. In order to evaluate the efficacy of healthcare systems in a qualitative manner, the hierarchy of healthcare actors described by Bohm et al (2013) and Wendt et al (2009) will be employed. The hierarchy focuses on the following factors: 1) coverage of the population in either public and private healthcare systems, 2) the principles of financing health services by both public and private sources, 3) the relationship between financing agencies and service providers, 4) the access of potential providers to healthcare markets, 5) the access of patients to service providers: the specific delivery of care to patients, 6) benefit package: the content and range of services offered to patients. All of these factors will be assessed when identifying how institutional designs shape healthcare outcomes.

In an empirical study conducted by Bohm et al., regulation, financing, and servicing provision were employed to categorize types of financing scheme and healthcare provision. Wendt's application of these systems to the concept of principal-agent relationships and possible institutional and organizational inefficiencies are considered in creating a coherent conceptualization of each healthcare system. Kotzian's (2008) integration of an analysis of both built-in controls and external mechanisms are to be employed.

1.2. Actors and Incentives: Components of Health Care Systems

Three dimensions are employed in order to categorize national healthcare systems. The first dimension deals with the relationship between the financing agency and the service provider: according to what principles will the financier compensate service providers for their work?

1.2.1. Relationship between Health Service Providers and Patients

Healthcare suppliers, doctors, and hospitals are the principal health service providers in all healthcare systems. Ideally, doctors are salaried and not paid on a fee-for-service basis. In the worst system, individually itemized services are charged. Doctors are compensated through fee-for-service compensation. Fee for service payments operate best when the goal of the system is quantity rather than the quality of care and acceptance of risk. Salaries operate best when the population density that the physician services is low and there is an emphasis on ensuring that physicians are accessible in rural and remote regions as salary-based care often requires a greater degree of quality for a larger quantity of patients.

The contribution for procedures, GP visits, and other patient-physician interactions may be limited to insurance premiums in some cases, and in other systems insurance companies cover a more marginal amount of the total cost of the healthcare cost. In an ideal system, there will be a copayment for each medical service yet this copayment will not act as a barrier to treatment. The copayment will be assessed relative to the ability to pay so that it does not exclude poor patients. The copayment will be assessed relative to the ability to pay so that it does not exclude poor patients. In the worst system, there will be no copayment and patients bill the insurer. This is often correlated with a very high copayment. Poor people are therefore discouraged from seeking medical care. Copayments that include moderate, flat fees are optimal as they allow for full

coverage of serious illnesses before they become untreatable/expensive to treat: High co-payments discourage patients from seeing doctors. No co-payments lead to over-use of the medical system for trivial complaints. Excessively high copayments can discourage treatment of diseases with early onset which could have been treated at an earlier stage (i.e cancer, tuberculosis). Early treatment of these diseases reduces overall cost of treatment and prevents potentially serious illnesses from becoming life-threatening. The cost of palliative care presents an excessive cost to the consumer and to the government, especially when federal programs provide for the treatment of the elderly and those who are low income. A high copayment acts as a barrier to entry for those who are low income; therefore, a moderate copayment is optimal. On the other end of the spectrum, no copayments can lead to the over-use of the medical system for trivial complaints.

Another question of healthcare provision is whether the patient has a choice in selecting a healthcare provider or if that healthcare provider is pre-selected for them. There will be general practitioners as gatekeepers that regulate access to specialists. Within these bounds, patients have choices among suppliers. In evaluating a system, the presence of gatekeepers regulating access to specialists and hospitals and the impact gatekeeping has on wait times to see a specialist will be evaluated. The presence of a public-private mix in the financing and organization of these healthcare services or cost-sharing mechanisms that regulate government payment will be taken as context. If supplementary private insurance assists those primarily of higher SES or is there state-provided supplementary services, then the system cannot be evaluated to be the “best”. Government redistribution of services may be required in order to facilitate access to health insurance between varying socioeconomic strata.

1.2.2. Relationship Between Health Service Providers and Patients

The first dimension is the relationship between service providers and potential beneficiaries: the choice of providers by patients and disclosures about the performance of service providers. The second dimension is the relationship between the financing agency and the service provider; according to what principles will the financier compensate service providers for their work? The third dimension is the relation between potential beneficiaries and financing agencies: how do financing agencies interact with patients to provide care for a fixed cost? It should be noted that in Bohm's categorization, the authors concede that it is nearly impossible to classify large sets of countries into non-overlapping categories. However, by employing these three dimensions, we can best analyze countries according to who operates each distinct function of the healthcare system.

In the "best" systems, the utilitarian objective is to maximize the life expectancy of individual in relative health measures of the largest number of citizens for the largest possible time. It is predicted that the outcomes of a Social Health Insurance system will most closely align with the parameters set forth for the "best system". In this best society, optimize life expectancy, quality of life, and the third element is to do this at a reasonable cost. the overall cost of the healthcare system is important (Böhm et al. 2013).

Operating Criteria for Ranking Systems

| <u>Condition</u> | <u>Outcome</u> |
|---|---|
| High average quality of life → | System should have compulsory coverage |
| Low variance in health quality of life/ equality of health chances between different socioeconomic strata → | Requires some redistributive financial arrangements |

| | |
|--|---|
| Moderate cost of health care system → | Necessitates some gatekeeping and rationing of medical services |
| Little rent-seeking by actors/enrichment of actors by exploiting intransparency of transactions and/or monopoly situations → | Requires regulation and/or competition, in addition to transparency and accountability of actors' contributions to the healthcare system. |

1.2.3. Financing Agency and Service Provider?

Healthcare suppliers can choose treatments which often dictates patient outcomes. In the best healthcare system, the range of technologies and medication is restricted by a list. In this “best” system, there is an indication of health issues that are covered by insured treatments. There are also regulations that restrict the purchase and use of expensive medical equipment. In the worst healthcare system, providers can decide on the course of treatment and technology. This often lends itself to providers choosing more costly procedures, or procedures for which they will be remunerated for a larger portion of the healthcare expenditure. In these poor healthcare systems, patients and providers have the ability to openly negotiate which health issues will be addressed within the healthcare systems. Providers are also autonomous in investment decisions such as investment in costly medical equipment like CT scanners or MRI machines. A third choice that can be made by healthcare suppliers is regarding the disclosure of past successes and failures. In the best healthcare systems, hospitals and doctors must disclose their past performance such as the rate of hospital infections after surgery or past medical malpractice issues upon request. Patient satisfactions reports with providers should be public in these “best” systems. In the worst systems there are no disclosure requirements, no satisfaction surveys, and no motivation for doctors to conform to patient requests regarding their prior treatment history.

Method of physician remuneration on regional variation in hospital treatments will be closely examined. A previous study conducted by Douven, Mocking, and Mosca evaluating differences in method of remuneration (FFS) versus salary explains the effect of financial incentives on medical production. It has been found that utilization rates are higher in geographical areas where more patients are treated by physicians that are paid FFS. There are disparities in the degree to entrepreneurialism exercised by physicians. Often, over provision of medical services results in a higher payoff - incentivizing doctors to keep patients within their financial foothold. While many systems safeguard against this — notably national healthcare systems which salary their physicians both in the hospital and ambulatory care sector — many permit pay-per-service which often leads to unnecessary procedures being presented as exigent ones (Bolin, Lindgren, Lindgren, and Lundborg 2009a, 86-93). Physician maximization of utility is governed by how patient benefits are regulated by insurance scheme, laws dictating coverage of national and supplementary insurance schemes, and potential financial incentives. Therefore, the physician often act as the agent in the principal-agent relationship and have an incentive to limit medical costs which may not always result in best healthcare outcomes (Douven, Rudy, Remco Mocking, and Ilaria Mosca, 2015a).

Fee-for-service private practices incentivize doctors recommending specialists who then profit off of the number of services (surgeries, check-ups, walk-ins) for ambulatory care and public hospitals care. Additionally, automatic enrollment (for health insurance) or compulsory enrollment vs. optional enrollment will be evaluated to see if they are correlative factors. Are there gatekeepers in regulating access to specialists and hospitals? Is there a public-private mix in the financing and organization of these healthcare services? Are there cost-sharing

mechanisms that regulate government payment? Does supplementary private insurance assist those primarily of higher SES or is there state-provided supplementary services? How does degree of micromanagement imposed on the healthcare provisions within a given system affect the product? The tension that can be created amongst principal agent relationships is exemplified by the French system – in which the level of health services used is high amongst citizens yet the prices per service unit are quite low. Therefore, leading to physician strikes and demonstrations. The “allowable fee” apportionment has been an object of contention in the French system and other Western European healthcare networks. To continue with the French paradigm, the allowable fee per office visit to a general practitioner is only twenty Europe. In a particularly unique situation, nearly half of the physicians within the country are general practitioners.

Health suppliers such as the pharmaceutical companies wield power by setting prices and investing in research and design dictates quality of the interaction- and therefore the healthcare system. In the best system, there will be rewards for research and design and a temporary monopoly through patent restrictions. Rewards for research and design fuel innovation. In this system, the coverage and prices of patented medication is negotiated between insurers, government and drug companies. In the worst system, there are no rewards for research and design. In extreme situations, patents can serve to limit innovation. Drug companies are free to set prices and there is no consumer cartel negotiating prices. All drugs available are covered. Health insurers who must answer to the question as to how they will set their insurance rates. In the best healthcare system, there are different packages of health insurance with simple and clear coverage alternatives from which the customers can chose. Insurers have to compete to offer the best price for their comparable package and therefore minimize administrative cost. In the worst

system, there is no competition among insurers – this may involve a government monopoly or a monopoly over private industry. In the worst healthcare system, there is no competition among insurers – this may involve a government monopoly or a monopoly private industry. Health insurance packages difficult to compare, and with obscure clauses that consumers do not understand.

1.2.4. Relationship between Public Sector and Patients

The government, a key actor in the healthcare space, yields two primary choices in how to regulate healthcare. The first choice is whether or not to mandate compulsory coverage or to allow for voluntary coverage. In an ideal system, there will be compulsory healthcare insurance. This guarantees the creation of a large insurance pool is created which prevents adverse selection; adverse selection occurring when there is a situation where there is imbalanced information and sellers maintain information that buyers do not have. Voluntary insurance will be a decision made by the government in the worst healthcare systems. Voluntary insurance creates free riders and illness-induced poverty. The second pivotal choice made by the government is how should the healthcare system be financed. The best system depends on value choices. In the best system, the method of financing depends on value choices. Effective insurance requires redistribution in which the wealthy will pay more than the poor. General revenue funding is based on progressive taxation – this includes both income and corporate taxes. The worst system will involve financing wherein there is consideration of pre-existing conditions and the rich and poor pay for health insurance that is based on actuarial probability of needing medical services.

1.2.5. Method of Evaluating “Best” and “Worst” Systems

In order to evaluate what are the “best” and “worst” healthcare systems, a qualitative scoring system will be utilized. The scoring systems takes into account various behavioral and financial mechanisms that characterize the principal-agent relationships in healthcare systems. These principal-agent relationships can be divided into three subcategories: the relationship between financial providers and patients, the relationship between financial providers and physicians, and the relationship between patients and their providers. Summary scores will be tabulated as a sum total of the values attributed to each country on each indicator. For example, one indicator is “patient co-pay”. A moderate, income-dependent copay is predicted to result in the most equitable, and highest quality healthcare treatment. A moderate copay is predicted to yield the best result as a copay limits abuse of the healthcare system on the part of patients as a copay free system may lead patients to request unnecessary doctor appointments which minimize physician attentiveness to cases that are more urgent. On the part of the physician, a moderate rather than high copay limits the incentive for physicians to request a patient to come back for follow-up consultations, appointments, or procedures that are superfluous to what is required. In this example, if a country had a moderate, income dependent co-pay, that nation would earn a “1” for that subcategory. The total numeric value for each nation will range from 0.0 to 10.0. The summary score for each country will be computed and then the average summary score for each system will also be calculated. The summary scores for the systems will be used as the primary method for qualitative comparison.

The relationship between financial providers and patients, or the state and insurance companies interacting with patients, is subdivided into the following categories: coverage,

contributions, and patient-copay. Coverage encapsulates what kind of healthcare coverage the government or state insurance funds provide for patients. A limited range is expected for this variable as initial research shows that nearly every nation except the United States has mandatory, universal healthcare coverage. Universal, compulsory healthcare coverage is defined as, “health care system that provides healthcare and financial protection to all residents of a particular county or region.” A “partly universal” system includes nations in which there is universal coverage provided to a certain sector of society (i.e. a lower socioeconomic class, elderly people). Voluntary coverage relies on individuals signing up for a specific healthcare plan at their own discretion. A general tax or payroll tax is the optimal form of contribution and the best system is predicted to have such form. A general tax is a general levy by the government to support government programs with a communal benefit. A payroll tax is, “a percentage that is withheld from employee wages”. An actuarial individual fee, a form of contribution predicted to be associated with the worst healthcare system. The actuarial individual fee involves periodic payments. Patient co-pay is categorized by the price of the co-pay. The optimal choice, a moderate, income-dependent co-pay, is a tax levied that is proportional to one’s salary. A flat co-pay is the same for all income levels. A high-copay is a copay that may not be financially feasible for some individuals within a given society.

The relationship between financial providers and physicians involves the interactions between state and insurance companies and hospitals or physicians who administer medical services. The first indicator, physician remuneration, in an optimal system will include a salary; a salary does not allow for physicians to be incentivized by the provision of unnecessary services for which they can be paid on a fee-for-service basis. The capitation remuneration method rewards

physicians for the number of patients that they treat within a given period. This method earns a .5 as it allows physicians to treat individuals in a timely manner because the average physician will see more patients, yet the quality of care may be diminished. Under this remuneration system, there is not an incentive to administer unnecessary services. The remuneration system that is expected to be administered in the worst healthcare system is the fee-for-service system in which physicians may be incentivized to provide more services for which they are paid. The second indicator subcategorized within the financial provider – physician relationship is the medical technology population. The optimal system will have readily accessible medical technology; including MRI machines, CT scanners, and mammography machines. The third subcategory, drug price bargaining, involves the means by which pharmaceutical companies negotiate with healthcare providers and the degree to which the government is involved in drug price bargaining. The optimal system will include a nationally bargained price schedule with a list of all pharmaceutical drugs available on the market with their appropriate pricing is available to the public. A mixed system in which the government plays a minimal role in overseeing price schedules and negotiation of pharmaceutical pricing will earn a score of “.5”. A drug company that is devoid of any government negotiation with pharmaceutical companies will earn a score of “0”. The last subcategory that is part of the financial provider-physician relationship is the transparency of pricing and performance of the healthcare system. There are strict requirements to post the costs of treatments and performance records publicly such as re-admission to a hospital and cost of standard procedures in the optimal system. The worst system will lack such requirement.

The third dimension, the interaction between patients and providers, reflects the level of choice that patients have in selecting a provider and patient access to their provider. The first subcategory of the dimension, patient choice of doctors, is defined as whether a patient has the ability to self-select their own physician regardless of their insurance plan. In an optimal system, patients should be able to select any general practitioner; yet, most patients will select a physician covered by insurance. The distinguishing feature between choice and no choice, is that the choice of physician in a “no choice” system is that the physician is randomly assigned to the patient. The second subcategory is the presence of “gatekeeping” in which general practitioners act as intermediaries for access to specialists and specialists cannot be seen without a referral by the general practitioner. In the worst system, the general practitioner serves as veto power. The third subcategory evaluates patient satisfaction records; in an optimal system, there will be strict surveys and publication of patient satisfaction. Publication of patient satisfaction ensures that there is a system of culpability for physicians who are not performing adequate medical services.

| | best | intermediate | worst |
|--|---|--|---------------------------------------|
| 1. Finance-patients (state & insurance interacting with patients) | | | |
| 1.1. coverage | 1.0 = universal, compulsory | 0.5 = partly universal | 0.0 = voluntary |
| 1.2. contributions | 1.0 = general tax or payroll tax | 0.5 = flat insurance fee (pool) | 0.0 = actuarial individual fee |
| 1.3. patient co-pay | 1.0 = moderate, income dependent | 0.5 = none or moderate, flat | 0.0 = high copay |
| 2.0. Finance - Physicians | | | |

| | | | |
|---|--|---|---|
| 2.1. phys. remuneration | 1.0 = salary | 0.5 = capitation/number of patients | 0.0 = fee for service |
| 2.2. med tech population | 1.0 = medical equipment readily available | 0.5 = some medical equipment is readily available | 0.0 = medical equipment is in limited supply |
| 2.3. drug price bargaining | 1.0 = nationally bargained price schedule | 0.5 = mixed system | 0.0 = drug company price setting with an absence of negotiation with the government |
| 2.4. transparency of pricing and performance (hospitals, doctors) | 1.0 = strict requirements to post costs of treatment and performance records publicly | | 0.0 = none of the above |
| 3. Patients-Providers | | | |
| 3.1. choice of doctors? | 1.0 = patient choice | 0.5 = limited patients choice | 0.0 = no choice |
| 3.2. GPs as intermediaries for access to specialists | 1.0 = GPs recommend and need to be consulted, but cannot bloc patient access to specialists; | 0.5 = patient's autonomous decision | 0.0 = GP as veto power |
| 3.3. patient satisfaction records and published? | 1.0 = strict surveys & publication | | 0.0 = no surveys and publication |

For the purposes of this initial evaluation, the indicators are not weighted. The relationship between the individual indicators, and especially those that are most important, and healthcare outcomes will be later analyzed.

In the National Health Insurance, health insurance coverage is universal in nature. Consumer copayments are negligible and physician choice is unlimited. Production of health care services is private. Physicians receive payments on a negotiated fee-for-service plan and hospitals receive global budget payments. General taxes finance the NHI through a single payer system.

Countries that operate under the National Health Service infrastructure have compulsory health insurance. In the United Kingdom, health insurance is provided to all permanent residents. Private healthcare companies can operate alongside public healthcare companies. However, the provision of universal health care within National Health Service countries maintains a high degree of variance. Australia maintains a system wherein the government pays two thirds and the private sector pays one third system. Pre-existing health conditions are not considered when calculating insurance premiums. In the National Health Service System, and particularly seen in the United Kingdom, it is not unusual for doctors who meet their prescribing budgets to be rewarded by keeping the savings. The United Kingdom operates on a system for paying physicians referred to as “merit pay” by which the efficacy of the system is based more on faith than fact. There are a lack of qualitative and quantitative assessment tools to identify a direct relationship between pay and performance.

Reward allocation therefore may rely on managerial judgment which can be skewed due to a host of factors ranging from discrimination to a lack of equal observation. Individual performance appraisals are not an accurate means of identifying workplace efficiency or efficacy. Performance can be a function of between-employee interaction, the job itself, equipment, materials, customer management, and the workplace environment — all of which are not signals of true “performance” (Abel & Esmail, 2006). In this system, there is a public, universal system, Medicare and everyone receives coverage including permanent residents, visiting students, asylum-seekers, and temporary visas. A deductible must be paid before government payment kick in. Half of the residents have paid for private health insurance to receive a higher quality of care. The system has been characterized by some as inefficient and an obstacle to economic

growth. The primary challenge is that it may not be economically substantial. There are high structural costs for the system as nearly all organizational and administrative matters are tightly regulated. At the national level, there are also a series of challenges. In order for this system to be truly efficient, there must be sufficient financial resources, operational efficiency, and competition must be utilized to enhance rather than stifle the quality of competing systems. At the global level, social health insurance systems must be buffered against or rally against pressure from globalized companies that seek to exert power over wage levels and benefits (Saltman, Busse, Figueras, 2004).

The Etatist Social Health Insurance system provides healthcare through public hospitals or through private hospitals and patients have universal access to any facility of their choice. Patients can see specialists however the copayment is higher unless referred by a general practitioner. Japan, a key example of an Etatist Social Health Insurance system, involves multiple payers similar to the United States. However, every city of Japan must have an attachment to a social insurance plan. In Japan, employer-based insurance can be subdivided into 1) government managed health insurance, 2) insurance societies, 3) independence insurance agencies, 4) mutual aid societies for public-sector employees. For these plans, the copayment rate is 10% for employees, and for dependents it is 20% for inpatient care and 30% for outpatient care. Despite the provision of universal healthcare services, it has been noted that only 65% of medical care costs are reimbursed by health insurance. This has led to Korean physicians blaming the government – noting that it has developed a universal health insurance system that has compromised their autonomy as physicians and their incomes. Korea suffers from the overlapping role of hospitals and clinics in allowing patients to choose primary care providers.

Since its introduction in 1977, the national health insurance program in Korea has employed a fee-for-service remuneration method. This had led to increased volume and quantity of medical care. The national health insurance program in Korea relies on using a fee schedule to reimburse physicians; the fee is regulated by the government. There is continual tension between the insurer and the provider over the adequacy of the fee level. Under the fee-for-service system, medical suppliers have an incentive for their to be more services, treatments, and drugs administered to patients regardless of true need. Within Korea, there has been an alarming oversupply of magnetic resonance imaging machines as they have a greater density of MRI machines than any other place in the world, yet lack demand. There is also an excessive use of antibiotics and cesarean deliver rates comprise 40% of live births. Patent restrictions dictating the length of protection conferred upon a drug is not abnormal in longevity. The major patent regulation that applies in South Korea is a prohibition on the copying of drugs that are discovered by multinational pharmaceutical companies. There are no rules that mandate that doctors disclose past failures and successes. There is competition among insurance companies as the system relies on various self-contained medical insurance societies that collect revenues, determine the benefits, and garner the reserves. These societies must ensure that their expenditures are lower than revenues. Societies are owned and operated by for-profit corporations (Lee, Jong-Chan 2003, 50-51).

The Etatist Social Health Insurance is the only completely mixed healthcare type which functions as a “catch all” for the five other forms that were not deemed plausible. Within the system, the underlying commonality is that the state regulates the health system with financing conducted by societal actors and provision of services by private funds. There are regional

differences in how this system operates within each respective nation. Within Asian nations, there are multiple health insurance funds with employer funds playing a large role. **is** Second, countries must have experience with social health insurance. Insurance contributions comprise the greatest share of health expenditures with more than 60% in all countries. For all these countries, out-of-pocket payments also comprise a substantial source of funding. The problem with the Etatist social health insurance system is that regulatory power is held by the state yet privileges for the financing and provision of health services is funded by societal actors who are unpredictable and often irrational (Grigorakis 2017, 262-278).

A Social Health Insurance System also provides universal access to all patient and coverage is compulsory. The manifestations of the Social Health Insurance System vary drastically depending on which country is under analysis; however the German system has been lauded as the pinnacle of success in social health and will be used for examination here.

In Germany, healthcare is provided by two separate programs. The first is a competing, not-for-profit nongovernmental health insurance fund, referred to as a “sickness fund”. The second program is a substitutive private program. The different layers of government do not directly finance or deliver healthcare or play a role in delegating the financing to different regions. The Public (Social) Health Insurance program is compulsory for those who earn less than €48,000 and their dependents. With nearly 75% of the country under this program, the publicly financed scheme places a large financial burden on Germany. Over 200 competing health insurance funds), “sickness funds¹⁰” finance the program in addition to mandatory contributions for those with high wages who must pay into the program. Private health insurance (PHI) is the second program available and covers civil servants - who are refunded a sizeable fraction of their health

care costs by their employer, the self employed - who are not eligible for publicly funded health insurance, and high earners who most typically opt out of the Public Health Insurance program. The German healthcare system is funded through insurance premiums paid by employees and employers. Statutory health insurance is compulsory as long as gross earnings are under a fixed amount. Anyone who earns more than that fixed amount is required to buy into private health insurance¹¹. In the German system, there are no network limitations — meaning that patients are free to see any doctor they want. There are no insurance deductibles — leading to more Germans seeking treatment regardless of potential insurance expenses.

While the formidability of the social health insurance is definitely a positive factor that contributes to the hypothesis of this paper, it also raises some macroeconomic concerns. First, why is it that the SHI system has been tied to political resiliency yet in some countries when the healthcare system was coupled with economic challenges. Political confounding factors must be examined.

Medical appointments do not require copays and patients are only asked to present a insurance card. In 2011, health spending per capita in Germany was \$4495 with was roughly median compared to other EU countries. The system has been termed “solidarity-based” as the Health Care Structure Act introduced competition between sickness funds to improve efficiency while regulators monitored regulation. Competition is enhanced among providers because there is free choice of office- based physicians. However, competition among payers is limited because sickness funds were assigned to payers originally. The system was then changed so that insured individuals could change funds on a yearly basis. Free choice of sickness funds led to funds having to publicize themselves and reduce contribution rates - therefore making healthcare

insurance more affordable for most. In 2007, sickness funds began to introduce tariffs which was previously only allowed for private health insurance companies. Each sickness fund could now provide various benefit package options. To provide increasingly accessible services, palliative care and hospice services were integrated into sickness fund coverage in 2000. Germany spends a substantial amount of wealth on healthcare. According to the OECD, expenditures on health totaled 333.5 billion dollars, amounting to 11.1% of GDP. Population coverage was expanded to include individuals receiving welfare benefits; with 113 sickness funds in total competing for client buy-in¹². As of 2017, the threshold for required statutory health insurance is €57, 600. Non-earning dependents are insured as well without additional payment. 87% of the population receives statutory health insurance; this overwhelmingly high percentage is indicative of a high average income. I conclude that the Social Health Insurance System will provide best outcomes as it aligns with nearly all the parameters previously set forth.

Comparatively, the Private Health Insurance System is the only system where coverage is voluntary. Private health insurance dominates the United States Healthcare system, the only system that operates as a PHI. In the United States, private insurance can be purchased from several sources: including one's employer, the state, the federal marketplace, or a private marketplace. There are also government run program such as Medicare and Medicaid, yet across the board, insurance is not compulsory. Most visits to a general practitioner or a specialist require the payment of a copay. This ensures that patients do not "doctor shop" and abuse the system. Most Americans maintain private healthcare insurance which they either obtain through their employer, retirement plan, or pay for on their own. In order to maintain healthcare insurance from year to year, individuals are responsible for paying an annual deductible – this is a set

dollar amount that individuals are required to pay towards their covered medical care within a year. There are several rules that dictate whether individuals are eligible for public health insurance assistance. For example, if an individual works for a company that has 50 or more workers, he or she is responsible for the cost of the entire premium and is not covered by the Affordable Care Act, or Obamacare. In the United States – which is the only modern example of the Private Health Insurance system, the rules that govern the dispensation of health insurance are highly dependent on the majority administration's policy preferences. Doctors in the United States are paid on a salary-basis and paid by the insurance companies. Depending on the insurance plan, physician pay varies. There has recently been reduced rates for some plans and due to this, there has been increased pressure to keep premiums at an affordable level. Physicians will compensate for the lower pay by seeing a higher quantity of patients since these plans that are associated with lower physician pay tend to have a smaller network of doctors. At the same time, physicians have limited time to care for patients as dictated by insurance companies which often articulate how long the patient can remain under hospital care and be covered by insurance.

The private health insurance system is characterized by market actors, private financing sources, and for-profit providers. The healthcare system type is generally considered the most common one up until early 20th century, but since Switzerland switched to the corporatist SHI model in The private system currently only exists in the United States which provides health services such as Medicare, Medicaid, and State Children's Health Insurance Program dependent on age and welfare need. The dominance of private actors encourages individual actors benefitting from high fees for services. Most of the regulatory competencies of the system lies within the management of public programs. The manifestation of this system in the US is

modified as there is a push towards more public funding and stronger state regulation (International Health Care System Profiles, 2018).

1.3. Comparing Ideal Types and Empirically Existing Health Care Systems: How Close Do They Come to “Best” or “Worst” Systems?

1.3.1. Categorization of Healthcare Systems

According to Wendt et al., there are 10 forms of healthcare systems, yet only 5 plausible forms (Appendix 1A). Whether or not patients are fully, partially, or not insured can determine whether patients create or restrain demand for hospital services. In some healthcare systems, hospital admission only occurs after being referred by a general practitioner. A patient could demand services that are counteracted by insurer payments. I additionally believe that the healthcare system will impact healthcare outcomes as the presence of incentives that encourage physicians to be paid per service has been shown to result in worse healthcare outcomes as often unnecessary hospitalizations and surgeries are conducted. Another hospital payment system termed the “diagnosis treatment combination” or DTC relies on episode-based registration within hospitals. In this system, physicians register DTC’s themselves and then can change the DTC registration during the treatment. While this system was intended to make the role of insurers more definite as being solely purchasers of care, and not decision-makers, it creates an effect of physicians being over-remunerated. Remuneration will later be analyzed in closer detail as a mechanism that can affect healthcare outcomes. The amount of money infused into a healthcare system, and the means by which these funds are allocated I hypothesize will have a clear correlation to healthcare outcome.

Wendt categorizes healthcare systems by healthcare expenditure, healthcare financing, healthcare provision, and institutional characteristics. Healthcare expenditures are considered by Wendt to be the major problem in all types of healthcare systems; the total health expenditure or THE includes the "sum of expenditure for activities in the area of preventative, outpatient, and inpatient healthcare, caring for people with chronic illnesses, as well administering the healthcare system (OECD, 2017)". Wendt proposes that this indicator can be used to categorize healthcare systems; especially when evaluating the proportion of out-of-pocket payments to other forms of payments and whether patients access to services is a function of the financial resources within a nation. Monetary input into a system and health employment indicators such as the density of physicians and nurses are used to categorize healthcare systems. Healthcare financing is often used as the only indicator for classifying healthcare systems yet Wendt posits that it should be used as one of several means of evaluation. Healthcare financing can come in the form of earmarked social insurance contributions, private payments, or citizenship. The share of public vs. private funding can be used to categorize systems because it indicates the power the government has to intervene in matters of healthcare and their level of involvement in the administration of healthcare. Additionally, the type of financing may dictate whether entry to medical treatment and services is restricted for people by socioeconomic status. The institutional characteristics described by Wendt include the relationship between healthcare provision and citizenship; if healthcare provision is limited on the basis of citizenship then there may be inequity in healthcare access. The remuneration of physicians is another major institutional mechanism, one that will be examined closely in this study. Physicians may be reimbursed on a salary basis, capitation basis, or fee-for-service method. The form of remuneration is indicative

of doctors' level of autonomy from state control of healthcare provision. Fee-for-service payments, as noted by Wendt, lead to an incentive for physicians to see their patients more than necessary. A fixed salary on the other hand may lead to complacency in treatment because of the knowledge that physicians will be paid the same amount regardless of how many patients they see or procedures they conduct. A third institutional mechanism detailed by Wendt is the regulation of patient access to healthcare providers. The concept of "gatekeeping" is set forth in which seeing a specialist is dependent on first seeing a general practitioner who then refers the patient to the proper specialist (Wendt, 2009).

1.3.2. Predicted Summary Scores for Health Care Systems on Qualitative Indicators

| | National Health System | National Health Insurance System | Social Health Insurance System | Etatist Health Insurance System | Private Health Insurance System |
|--|------------------------|----------------------------------|--------------------------------|---------------------------------|---------------------------------|
| 1. Finance-patients (state & insurance interacting with patients) | | | | | |
| 1.1. coverage | 1.0 | 1.0 | 1.0 | 1.0 | 0.0 |
| 1.2. contributions | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| 1.3. patient copay | 1.0 | 1.0 | 1.0 | 0.5 | 1.0 |
| 2. Finance-Physicians | | | | | |
| 2.1. phys. remuneration | 0.5 | 0.0 | 0.5 | 0.0 | 0.5 |
| 2.2. med tech population | 0.5 | 1.0 | 1.0 | 1.0 | 1.0 |
| 2.3. drug price bargaining | 0.5 | 1.0 | 1.0 | 1.0 | 0.0 |
| 2.4. Transparency of pricing and performance | 1.0 | 0.0 | 1.0 | 0.0 | 1.0 |
| 3. Patients-Providers | | | | | |
| 3.1 Choice of Doctors | 0.5 | 1.0 | 1.0 | 1.0 | 0.5 |
| 3.2 Presence of Gatekeeping | 0.0 | 1.0 | 1.0 | 1.0 | 0.5 |
| 3.3 Patient Satisfaction | 1.0 | 1.0 | 1.0 | 1.0 | 0.5 |
| PREDICTED SUMMARY SCORE | 7.0 | 8.0 | 9.5 | 7.5 | 6.0 |

The respective nominal scores based on predicted country-by-country performance on qualitative indicators are to be applied to each healthcare system for the purpose of system-to-system comparisons. These codes are termed the, “rank-order”, as they are the predicted hierarchy from best to worst of the healthcare systems being evaluated.

- 1 = Social Health Insurance
- 2 = National Health Insurance
- 3 = Etatist Health Insurance
- 4 = National Health Service
- 5 = Private Health Insurance

The National Health Service System

In a National Health Service system, there is universal coverage of health services. The first plausible form, the National Health Service type, involves substantial state regulation, financing, and provision of healthcare services. Within this form, there are three theoretical underpinnings for the way in which governments distribute healthcare services. Southern European nations that are categorized as national health services are controlled through either state led mechanisms or through “command-and-control” healthcare services. Amongst the Southern European nations, there is also a greater tendency for out-of-pocket spending and private provision of services as compared to their northern counterparts. Private actors are mostly involved in determining the level of access of patients to services since in a majority of these systems, there is a choice in providers. Funds are accrued through general taxes and government ownership of healthcare delivery. In most countries that maintain this system, the citizen does have some degree of flexibility in choosing a provider. The principal-agent relationships that define the system are of primary concern when considering the efficacy of the system. The state maintains an obligation to govern the relationship between the main actors in the system. Private actors only maintain a substantial interest in determining access of patients to services. Among many of the nations under the NHS, healthcare is delegated within an administrative region governed by councils for the planning and delivery of niche services. The regions own, manage, and finance hospitals and they also finance services that are provided by general practitioners (Abel and Esmail 2006, 489-493). As part of the system, healthcare is largely funded by the public and financed primarily through a health tax. Within some of these nations, societal actors, namely physician associations, have some regulatory power in determining access of providers to markets and

negotiating remuneration. This regulatory power can be over-exerted and lead to the abuse of the system. The state would wield a considerable amount of power and be able to leverage what percent taxation would contribute to the system, whether hospitals would serve individuals that are not from a particular geographical region, and often, what quality of care these individuals receive through manipulation of built-in control mechanisms. Within the system, there does not appear to be substantial variation in scores for most qualitative indicators with the exception of the form of remuneration and ability to choose doctors. Preliminary analyses show that there is substantial variation in regulation of medical technology, choice of doctors, and patient satisfaction report availability.

1.3.3. The National Health Insurance System

The National Health Insurance system involves a regulatory structure that is defined by tax financing with dominant private service provisions. The state holds responsibility for regulating the relationship between providers, payers, and patients. Public delivery is not a top priority of the system. In the case that public agencies do contract with private providers, universal free care cannot be guaranteed without forcing doctors into the public service. Countries that maintain a National Health Insurance program are defined by states exerting regulatory power between providers, payers, and patients – therefore patients do exert some choice in physician and hospital selection. The high degree of state controls within these systems raises questions of how regional delivery can vary depending on discrepancies in fund allocation and whether the state is vested in delivering the best care, or care at the lowest price, and whether these two considerations are mutually exclusive. There is substantial variation in patient copay, form of physician remuneration, regulation of medical technology, drug price bargaining, and

transparency of pricing among nations classified as National Health Service Systems.

1.3.4. The Social Health Insurance System

A Social Health Insurance System presents vastly different principal-agent concerns from both the National Health Services and National Health Insurance system. These systems include universal coverage in addition to funding from contributions. Among these systems, the government accrues money through autonomous funds but does not establish entitlements. Social Health Insurance systems permit societal actors to have a large role in regulation and financing with services managed by private for-profit providers. Health expenditures through social insurance funds are typically low. Premiums do play some role within these nations yet spending shares can be marginal. Private spending is often a low proportion of total spending. Out-of-pocket payments, or private spending shares, are often higher among the Western European nations than the Baltic states. Among these spending trends, one consistent factor is that the dominant mode of funding is tax spending. Many of the countries that are classified as SHI systems transitioned or are transitioning to primarily tax-funded healthcare systems. The SHI poses some problems because there is limited data on this particular system and often the western European SHI countries are viewed as a separate “sub-class”. The availability of widely accessible comparative knowledge could be helpful for health policymaking. While the SHI system may pose some concerns regarding principal-agent discrepancies in motive, there is reason to believe that it will be the best performing system when government expenditure is evaluated against healthcare outcome. First, the system is mostly private in that the funding and delivery of healthcare services is not administered by the government. Yet, doctors and physician unions do not act as autonomous decision-making bodies. SHI systems are managed by a series

of funds or agencies such as sickness funds in Germany (Kleophas, Werner, and Helmut Reichel 2007). Third, the systems have appeared to be durable throughout political turmoil and transitions in government. They are relatively insulated by what is occurring external to the healthcare system.

The system's self-regulation has been perceived by citizens and policymakers as a "way of life" rather than simply an insurance arrangement. SHI incorporates not only healthcare but also social security systems and income support. It is only effective if there is a social consensus that supports it. The SHI system extends beyond purely an institutional arrangement. Often the SHI is rooted in a national culture and is "socially embedded". The raising of funds is dependent not on taxes or government contribution, but on the incomes of the citizens. The mandatory contribution is often tabulated as a percentage of the citizen's wage. The contribution is not linked to the pre-existing health status of the citizen and therefore it does not disenfranchise those of low socioeconomic status. The organizational structure can be twofold: either the premiums are collected by the sickness fund directly and is distributed from a central state-run fund to various funds. The high degree of oversight and limited role that physicians play in determining remuneration is rooted in a belief in pluralistic decision making and competition. Safeguards are instituted in nearly all the organizational mechanisms within the system. Most hospitals regardless of whether they are privately or publicly owned and nearly all physicians in various practice types have mandatory contracts with sickness funds that are part of the SHI system. While the formidability of the social health insurance is definitely a positive factor that contributes to the hypothesis of this paper, it also raises some macroeconomic concerns. First, why is it that the SHI system has been tied to political resiliency yet in some countries when the

healthcare system was coupled with economic challenges. Political confounding factors must be examined (Kokkinen & Muntaner 2016, 857). Preliminary analyses show that there is substantial variation in form of physician remuneration and drug price bargaining yet somewhat consistent summary scores for most other nations within the system.

1.3.5. The Corporatist SHI System

In a Corporatist SHI system, providers and insurance funds are in charge of operating the healthcare system. Both the provider and insurance fund have an interest in increasing the overall budget for healthcare. The providers can extract a higher amount for organizational slack and on job consumption. Funds compete for clients by offering different contribution rates, the competition is actually limited due to an extensive system of financial equalizations among insurance funds. In this case, the government acts as a politically responsible actor and is not held directly responsible for the developments in the healthcare system. However, it is nevertheless potentially in charge of controlling the HCS. Parties competing in the political arena by offering different health policies such as budgets and coverage issues act as a mechanism by which the electorate's preferences are translated into policy. If the healthcare system performs poorly, a party will gain support by offering changes. If the government is in charge of the HCS as a politically responsible actor and has levers for intervening in the HCS, the performance of the HCS will be higher in comparison to a case where the actors share a common interest in increasing the overall budget of the HCS (Kotzian 2008, 241-242). For the purpose of this analysis, the corporatist model will be incorporated under the social health insurance systems. The system is nearly identical to the social health insurance system except that negotiations occur at the national or regional level rather than between each sickness fund and the central

government. While there may be lower transaction costs and a greater degree of uniformity in the distribution of services, decision-making power is administered in the same manner as a traditional SHI. For the purposes of this study, the Corporatist SHI system will be evaluated as simply an SHI system due to the low quantity of Corporatist cases that are classified as OECD nations.

1.4. Rival Hypotheses Accounting for Varying Health Outcomes

1.4.1. Level of Development and Inequality

There are several possible alternative hypotheses that may explain the results which can possibly confound the study. The overall resources of a country on a per-capita basis which are at the country's disposal and may affect healthcare outcomes are likely to influence healthcare outcomes. The presents of large scale infrastructure projects such as the implementation of potable water for all and sewage treatment is likely to influence population health.

Within country inequality itself is also likely to affect healthcare outcomes. First, prevailing income or wealth inequality in a society may dictate severe stratifications between social class and access to resources regardless of quality of healthcare provided by healthcare system. The system may be limited to "castes" that are defined solely by the previous economic condition of those inhabiting the region. Therefore, leading one to question whether it is in fact the government's provision or lack thereof of of healthcare systems influencing outcomes or income level determining outcome. The macrohypothesis is that countries that are more unequal will have worse healthcare quality and especially worse healthcare among the lowest socioeconomic strata. Lower socioeconomic groups may utilize more care services than those who are of a

higher socioeconomic status. For the purposes of this study, “amenable mortality” is used to describe the occurrence of premature deaths which could be potentially avoided. Previous studies have sought to analyze how health care factors impact mortality at the population level by examining inequalities in mortality from conditions that would be considered amenable to intervention. It is noted that those who belong to the lower socioeconomic groups are exposed to higher quantities of particulate matter, second-hand smoking, and unhealthy food choices - all of which would impact the respective health outcomes. The study found that the lower educated are less inclined to visit a specialist or any doctor - most likely due to the cost (Beckfield et al. 2015, 233-239). Likewise, the lower educated were less likely to seek prescription medication for preventative care purposes. Those who were poor were also more likely to be overweight and not seek cervical and prostate screenings. Smoking was also more pervasive amongst the lower class.

According to Reeves et al., there is an inevitable relationship between recessions and healthcare cuts. A change in GDP and a change in government spending on health across country-specific recession and austerity periods (see Figure 2). Healthcare spending and a lack of alignment between government infusion of funds into the system and healthcare outcomes is partially due to the distribution of services. In a study conducted by the Harvard Business Review, it was found that 8.4% of the variation in patient healthcare spending could be explained by differences in how much individual doctors charge. Within a single hospital, some doctors were spending 40% more than lower-spending doctors within the same hospital.

In preliminary studies, inequality in mortality from amenable conditions was larger in countries where sociological determinants were also more rampant. In regions with high

populations of smokers there were a sizable amount of smoking-related deaths and alcohol related deaths (Plug, 2012). A 22 country comparison identified differences in the magnitude of inequality in mortality. Self assessments serve as an accurate indicator of sentiment amongst citizens. The self-assessments of health were higher amongst groups of lower socioeconomic status and the rate of death was also higher for the same class. Therefore, lower income individuals think that they are far healthier than they are. Throughout Europe, mortality was higher for those who lacked an education. Inequalities in mortality from smoking-related conditions accounts for a substantial portion of the inequalities in the rate of death (Pickett & Wilkinson 2015, 316-323).

Cancer related deaths are more common amongst those who can barely afford tobacco or alcohol. The hypothesis states that problems including poor health are associated with low social status are far more common in more unequal societies. The methodology employed in this paper piqued my interest. The gradient (slope) was primarily analyzed as an indicator of whether there was a strong association between poor health and social status. I also plan to employ the “epidemiological criteria for causality” employed by Pickett and Wilkinson. Premature death was found to be strongly associated with lower socioeconomic class with the exception of those who commit suicide, who tend to be among the high socioeconomic strata.

The access to healthcare and outcomes of healthcare that a citizen may enjoy is often a function of social class (Machenbach 2008). There are also a series of sociological health factors that may lead to a lack of representativeness of the data. There have been significant health disparities between single and coupled mothers within countries across all healthcare systems. While the data may correct for a lack of responsiveness among single mothers of low SES, there

are systematic factors that may lead to their single mother status – health disadvantages and mounting hospital costs have been found to be two possible confounders that must be accounted for (Beckfield, Olafsdottir, and Sosnaud 2013, 228-238). Additionally, political factors can influence data analysis. The impact of politics on population health can be subjected to partisan bias depending on whether that country employs the government as a lever of control for the administration of healthcare. For example, the estimates of fatalities caused by the Chinese famine differ by tens of millions depending on what source is utilized. A similar situation has been seen when looking at the health and epidemiological impact of the transition of the former Soviet bloc from a centrally planned economy to a market economy – under which it was believed that healthcare was being improved while in actuality, there were more than 3 million premature deaths. These government-related healthcare tragedies are often obscured by data and cannot be accurately reflected in analyses (Granados 2010, 842-849).

1.4.2. Fertility

The demographic features of a society such as fertility rate may influence healthcare outcomes. High fertility rates are most often associate with poverty – therefore making the variables difficult to isolate. Additionally, some societies propagate early childbearing. In some nations, childbearing is associated with government payoffs to help offset the cost of a child. In other societies, having children is an economic liability. Both of these options imply a semblance of choice. However, in nations in which there is a lack of access to contraceptives, the object of choice is an unfamiliar concept. A lack of contraceptive availability has been found to be indicative of a lower accessibility to healthcare infrastructures. Additionally, having more children indicates places a financial strain on a family. The demographic features of a society

such as fertility rate may influence healthcare outcomes. High fertility rates are most often associate with poverty – therefore making the variables difficult to isolate. Additionally, some societies propagate early childbearing. In some nations, childbearing is associated with government payoffs to help offset the cost of a child. In other societies, having children is an economic liability. Both of these options imply a semblance of choice. However, in nations in which there is a lack of access to contraceptives, the object of choice is an unfamiliar concept. A lack of contraceptive availability has been found to be indicative of a lower accessibility to healthcare infrastructures. Additionally, having more children indicates places a financial strain on a family.

1.4.3 Total Medical Spending

Healthcare spending in terms of dollars per citizen spent on healthcare per citizen at purchasing power parity or as a percentage of a citizen's GDP per capita may act as a measure of healthcare efforts. Perhaps it is the health care effort in terms of absolute monetary amount spent on healthcare or in relative GDP per capita matters more for healthcare outcomes than the healthcare system itself or level of development.

The United States is a particularly interesting paradigm when evaluating the impact of health spending on healthcare outcomes; other wealthy nations spend approximately half as much as the United States on healthcare. Over the last four decades, the difference between healthcare spending as a percentage share of the economy and similar OECD nations (categorized as “similar” by level of development and GDP) has widened. The United States spent nearly 17% its GDP on healthcare while the next closest country in terms of percentage of

GDP spent on healthcare was Switzerland, with 12% of GDP spent on healthcare. If a higher percentage of GDP is correlated with better healthcare outcomes, then the institutional mechanisms that differ between different healthcare systems may not be significant for healthcare outcomes.

1.4.4. Cultural Factors

Cultural parameters such as dietary proclivities which may influence health are often unaccounted for and not included in previous studies. Dietary trends are often shaped by religious or spiritual limitations. Many religions find certain foods to be counter-religious and therefore may consume other foods in higher quantities to compensate. Additionally, cultural norms often dictate the foods consumed and the manner in which they are consumed – which may affect health outcomes and obscuring causal factors. Therefore, within some nations, the population may be less inclined to eat healthy or unhealthy foods depending on whether that food is prohibited by their religion.

Previous findings show that the greatest discrepancy in alcohol consumption was found amongst the Central and Eastern European nations. Inequalities in mortality from amenable causes were larger in countries with greater inequalities in doctor visits. These three studies point to a need to control for sociological factors. There is wide variation within a society rather than simply between societies. Smoking, obesity, and exposure to air particulates have the potential to severely limit an individual's ability to remain healthy throughout his or her lifetime. Smoking often leads to lung disease and lung cancer which is a prime contributor to death amongst the lower socioeconomic strata (Fullman et al. 2018, 2236-2256). Obesity, often rooted in the purchase of unhealthy and cheap foods, also primarily impacts the lower socioeconomic strata.

Similarly, exposure to air particulates is typically associated with utilitarian, working-class jobs which expose the individual to elements and toxins that are referenced as simply a byproduct of the job yet are contributors to premature mortality.

1.4.6. Additional Methods of Analysis

Built-in-control mechanisms will be analyzed; including method of remuneration (both supply side and demand side), incentives for supplier to expand or restrain services and resources, level of choice in selecting a provider, contribution to the medical system in which services are consumed. In order to ensure that this cross-country comparison is effective, the parameters set forth by Cacace, Ettelt, Mays, and Nolte (2013) will be employed: (1) appropriate use of theory, (2) explicit selection of comparator countries, (3) rigor of the comparative design, (4) attention to the complexity of cross-national comparison, (5) rigor of the research methods, consistent with the principles of good social research, and (6) contribution to knowledge. In this study, two case studies will supplement the data previously described. Tuberculosis incidence is chosen specifically because it serves as a telling measure of the efficacy of different healthcare systems due to the importance of a timely diagnosis, treatment adherence, and treatment completion and can be used to make deductions regarding quality of healthcare. The second will be the incidence of maternal death to evaluate the quality of the system. The healthcare outcomes to be evaluated are subjective satisfaction with healthcare system based on public opinion surveys, objective indicators of health outcomes, and then specific indicators of health outcomes such as tuberculosis, AIDS, and pneumonia. In order to evaluate the relative success of each healthcare system, several quantitative factors will be analyzed; a) healthcare expenditures by financing scheme, b) out-of-pocket expenditures, c) self-reported unmet need for medical care by

sex, d) delegation of healthcare restoration between agent and principal (Ludwig, Van Merode, and Groot 2010). Mechanisms that are external will not be directly analyzed however, operationalization of the political system and government in which the particular healthcare system exists will be controlled.

Additionally, widely available indicators such as infant mortality rate¹, adult mortality rate, morbidity rate, and maternal death rate will be examined. As utilized by Rodwin et al., in order to evaluate the physician presence within a nation, the following parameters provide a wide scope analysis: active physicians per 1000 population and the share of public beds and private beds are of consideration. The following statistics sources will serve as references; OECD, CNAMTS, National Center for Health Statistics, American Hospital Association, Bureau of Labor Statistics. The following countries will be evaluated: France, Germany, Spain, Portugal, Italy, Switzerland, Denmark, Belgium, Netherlands, Norway, Sweden, Finland, the United States, the United Kingdom, Austria, Iceland, Scotland, Ireland, Canada, New Zealand, Israel, Korea and Japan will be examined. I will evaluate how the infusion of government expenditures on health-related needs correlate to the efficacy (or lack thereof) of their healthcare systems. These countries were selected for the comparative study because they are all developed nations with healthcare systems that have had net positive outcomes on their populations. Additionally, they have all been sovereign nations for the last 100 years or more – minimizing error in isolating discrete rather than regional effects of healthcare expenditures.

¹ http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=hlth_cd_ainfo&lang=en

*This classification is primarily based on Wendt et al.'s classification

| Type of Healthcare System | Countries included in my study: |
|---|--|
| 1) National Health Service | Denmark, Finland, Iceland, Norway, Sweden, Portugal, Spain, the United Kingdom |
| 2) National Health Insurance/Statutory Health Insurance | Australia, Canada, Ireland, New Zealand, Italy, France, Israel |
| 3) Etatist Social Health System | Japan, Korea |
| 4) Social Health Insurance System | Austria, Germany, Netherlands, Belgium, and Switzerland |
| 5) Private Health Insurance | United States |

Chapter 2: Characterization of Health Care Systems

Qualitative evaluations of the degree to which the interaction between financial providers and patients, financial providers and physicians, and patients and their providers interact is predicted to govern what is found to be the “best” and “worst” healthcare systems.

2.1.1. Finance-patients (state & insurance interacting with patients)

a. National Health Service System

In Denmark, Finland, Norway, Sweden, Portugal, Spain, and the United Kingdom, there is universal healthcare coverage. Denmark accrues contributions for the system by universal healthcare coverage. Denmark finances their healthcare system through a national health tax which is currently 8% of one’s taxable income. Finland finances their healthcare system through a payroll tax which is aggregated and then used to provide primary healthcare services. They also collect user fees and receive state subsidies if the tax is not enough for providing the necessary healthcare provisions. For long term illnesses, the out-of-pocket user fee is dependent upon the patient’s income. In Norway, healthcare costs are financed through a series of municipal general taxes. In Sweden, healthcare costs are financed through national income taxes and indirect taxes which are then redistributed. Portugal relies on general tax revenues to fund the system as is Spain’s healthcare system. The United Kingdom’s residents contribute to their healthcare system through county tax revenues. Denmark’s copayment ranges from EUR 2.50 to EUR 24.25 which is typically classified as “moderate”. Finland operates with a flat copayment system of EUR 13.80. Norway’s copayments are flat with NOK152 per general practitioner visits and NOK345 for specialist visits. Swedish copayments are based on copayment rates set by the county council. They are moderate in amount. For each type of service, there is a fee range; for example, the

range for a primary care physician visit copayment is 150 to 300 Swedish Kroner while the Fee Range for a hospital physician consultation is 200 to 350 Swedish Kroner. In Portugal, copayments are referred to as “moderating fees” intended to curb excessive use of healthcare services. Co-payments in Portugal are called “moderating fees,” flat user fees, meaning they’re aimed at moderating the use of healthcare services. In Spain, there are flat copay fees on pharmaceutical. The United Kingdom’s healthcare system has zero to moderate copays with none for most services and some copays for dental care.

b. National Health Insurance System

In Australia, there is universal healthcare coverage and the federal government funds Medicare, a universal public health insurance program which provides free or subsidized access to care for Australian citizens, residents with a permanent visa, and New Zealand citizens who can confirm identity. In Canada, there is universal health insurance coverage which covers residents of the provinces and Canadian territories. In Ireland, there is public, private, or universal health insurance dependent on how universal coverage is defined. 100% of the population has state coverage but the coverage is only free for 37% of the population. Many medical procedures are costly for services which are not covered. In New Zealand, most healthcare services are provided free of charge yet several outpatient services can only be covered by private health care insurance which is not universal in nature. In Italy, there are two types of private health insurance – corporate which involves companies covering employees and sometimes their families and then also noncorporate, individuals buying insurance for themselves and sometimes their families. Between these two forms of insurance provision, 100% of the population is covered by healthcare insurance. France operates on a traditional universal

healthcare system which is financed by the national government. Israel's coverage involves automatic coverage of all citizens and permanent residents. Australians contribute to the healthcare system through general tax revenue and an earmarked income tax. In Canada, the healthcare system is financed through provincial/federal general tax revenue. The Irish Healthcare System is predominantly tax-financed through a general tax levied on the population. In New Zealand, the healthcare system is financed through general tax revenue. In Italy, inhabitants pay national earmarked corporate and value-added taxes. Funds are also ascertained from general tax revenue and regional tax revenue. The French Healthcare System obtains funding from employer/employee earmarked income and payroll tax; general tax revenue, earmarked taxes. The Israeli Healthcare System is primarily financed through a special income-related health tax combined with general government revenues, which are funded through progressive income-related sources such as an income tax. In Australia, there is a high copayment for services rendered. In Canada, there are copayment which are dependent on income level and whether the individual is a senior citizen or not. The threshold for whether there is a copayment is set at an annual income of less than or equal to CAD19,300 (USD15,440) for single people and less than or equal to CAD32,300 (USD25,840) for couples. In Ireland, there is a high copayment. In New Zealand, there is a moderate copayment. The average adult copayment for a GP consultation falls between NZD15 to NZD45 (USD10–USD31), but copayments for general practitioners can vary significantly since they have no limits. In Italy, there aren't any user charges for GP consultations and hospital admission stays as patients pay a copayment for each procedure or specialist visit up to a certain price ceiling, which is currently at EUR36.15 (USD48.00). In France, there is a high copay for individuals seeking treatment. In

Israel, there are no copayments required for primary care visits or for hospital admissions. There are quarterly out-of-pocket caps for drugs to treat those who are chronically ill and age, income, and health status related discounts. There are copayment exemptions for holocaust survivors and also age, income, disability, and health status related exemptions on copayments for specialist consultations.

c. Etatist Health Insurance Cases

In Japan, there is universal primary coverage yet the definition of “universal coverage” is dubious; the majority of the population does hold some kind of private health insurance yet it plays only a supplementary or complementary role. In Korea, there is universal healthcare coverage and have ranked by the OECD as the nation with greatest access to universal healthcare. In Japan, healthcare financing is conducted from a general tax revenue and insurance contributions. In Korea, healthcare financing has been accrued from a general tax. Japan has a moderate copay. Higher copayments are counterbalanced by the ability to deduct these copayments from taxable income. In Korea, there is a high copay.

d. Social Health Insurance System Cases

Austrian healthcare coverage is statutory in nature; all individuals receive publicly funded care. In Germany, coverage is universal for all legal residents within the nation; all employed citizens who earn less than 56,250 euros are covered by the SHI and their dependents are covered free of charge. In the Netherlands, statutory health insurance is provided under the Health Insurance Act and provided for all citizens. In Belgium, there is both universal and private healthcare coverage but all individuals are guaranteed healthcare insurance through

private sickness funds. In Switzerland, healthcare insurance is universal and is regulated by the Swiss Federal Law on Health Insurance.

e. Private Health Insurance Cases

In the United States, there is not universal healthcare coverage. Healthcare coverage is fragmented and there is “shared responsibility” between the federal government, employers who often provide insurance through a third party, and individuals. Health coverage is fragmented and there are wide gaps in insurer rates throughout the United States. Medicare only provides Medicaid and Children’s Health Insurance Program (or CHIP) to the elderly and low income populations respectively. The system of individual contribution to the healthcare system is far more complicated than other OECD nations; with a combined system of tax funded healthcare administered by the states, matching funds from the federal government, and matching funds from the federal government for Medicaid at rates that are based on per capita income

2.1.2. Finance-physicians (state & insurance interacting with patients)

a. National Health Service System

In Denmark, physician remuneration ranges from fee for service for certain services and capitation-based payment for others. The same applies for Finland, Norway, Portugal, and Spain. The Swedish healthcare system remunerates physicians through solely a capitation-based system. The United Kingdom maintains a capitation-based system of remuneration with some fee-for-service components; capitation covers essential medical service while fee-for-service compensation is given for additional services such as vaccines and performance-related schemes. Capitation is also adjusted depending on the demographics of the patients treated; adjusted for

the age of the patient, gender, level of morbidity or mortality, patient turnover, and market factors. Denmark and Finland, medical technology, defined by the presence of MRI, CT, and mammography machines is plentiful within both hospital and ambulatory care centers. Sweden, Portugal, Spain, and the UK all have a high degree of access to medical equipment yet some medical equipment is far more plentiful than others. United Kingdom has a very low level of access to medical equipment. Drug price bargaining within all country in the National Health Service System operate with a mixed system; in which there is a nationally bargained price schedule for some pharmaceuticals, and in for some pharmaceuticals, the drug company price sets with an absence of negotiation with the government. There is transparency in pricing for all nations except for the United Kingdom; there have been several reports of a lack of accessibility to the hidden fees often incurred by hospital procedures and a lack of transparency in pharmaceutical drug pricing.

b. National Health Insurance/Statutory Health Insurance Cases

Physician remuneration within Australia is purely fee-for-service. Private physicians providing public services are paid per-session or fee-for-service basis. Canadian physicians are paid according to a negotiated fee schedule and on a fee-for-service basis. In Ireland, physicians are salaried, typically earning a higher salary if they are specialized than serving as a general practitioner. In New Zealand, general practice physicians are remunerated through capitation/number of patients based method while specialized physicians are remunerated on a fee-for-service. In Italy, the same trend applies. Within France, doctors are remunerated purely on a fee-for-service basis. In Israel, doctors are remunerated on a salary-basis. In Australia, all medical equipment is available but not in abundant supply, specifically in ambulatory settings, access

may be limited. In Australia, there is an extensive drug price negotiation processes in which the federal government wields a substantial degree of control by determining which pharmaceuticals are listed as part of the scheme and by negotiating each category of pharmaceuticals price with the supplier. The federal government also funds pharmacies' dispensation of medicine through the Pharmaceutical Benefits Scheme, PBS, a program of the Australian Government that provides subsidized prescription drugs and supports smaller companies that garner profits by wholesale supply of medicine. In Canada, most pharmaceutical companies negotiate fee schedules with provincial ministries of health, which are categorized as a "federal" service. In Ireland, there was an absence of drug price negotiation until 2018; the nation joined an international alliance to strengthen price negotiations. In New Zealand, Ireland has joined an international alliance designed to strengthen its hand in price negotiations with big pharma in an effort to improve Irish patients' access to new and innovative drugs. In New Zealand, the Pharmaceutical Management Agency uses mechanisms such as reference pricing and tendering to set pharmaceutical prices; these negotiations take place between the federal government which governs over the PMA and private pharmaceutical companies. These strategies have ensured that pharmaceutical costs remain low for consumers and that drug expenditure per capita is minimized. In Italy, prices for reimbursable drugs are set during negotiations between the federal government and the manufacturer of the drug. They negotiations typically revolve around ensuring that the drug is cost effective and there are not alternative therapies that are equally effective yet cheaper. In France, there are negotiations regarding some categories of pharmaceuticals which are then translated into laws passed by Parliament but these regulations do not apply to all pharmaceuticals. In Israel, drug prices can be

up to 50 to 70% less than in the United States. The Israeli federal government reigns in the prices for all drugs through extensive negotiation. Australia, Canada, New Zealand, and France all publish pricing for typical pharmaceutical products, physician services, emergency visit fees, and consultation costs in an open and accessible manner. Ireland, Italy, and Israel have not publicly produced reports about these items.

c. Etatist Health Insurance Cases

In Japan, physicians are remunerated on a fee-for-service basis. While the system is mixed with a nationwide price setting, or all-payer rate setting in which all third parties pay the same price for services at the hospital, these prices are per service, therefore there is an incentive for over-treatment of patients. The Korean Healthcare System has likewise utilized a fee-for-service remuneration method with contract-based healthcare reimbursement since 2000; this method has led to an increasing service volume. Japan and Korea both have a high density of MRI, CT, and mammography machines in both hospital and ambulatory care settings. In Japan, pharmaceuticals and medical devices are evaluated for quality, efficacy, and safety by the Pharmaceutical and Medical Devices Agency, a government regulatory agency, which oversees the Central Social Insurance Medical Council. This council sets a drug price list which lists all pharmaceutical and the prices covered by insurance. The criteria for coverage includes clinical effectiveness but not cost itself. The criteria for coverage include clinical effectiveness but not costs. Recently the agency has been implementing trials to use comparative cost-effectiveness studies in its decision-making. In Japan and Korea, there is a nationally bargained price schedule for pharmaceuticals. Japan and Korea both have failed to produce widely dispersed data and reports about the cost of treatment and essential medical services.

d. Social Health Insurance System

In Austria, physicians are remunerated through a fixed salary. Germany however operates on a fee-for-service remuneration method with a uniform fee- schedule which is negotiated between the sickness funds and the physicians. The payments to physicians are limited and only cover a predefined number of patients per physician practice and treatments per patient in order to avoid over treatment and abuse of the system. There is no pay-for-performance. In the Netherlands, there is a mixed remuneration method in which approximately 54% of physicians, those who are in a hospital-based or group practice, are paid under a fee-for-service method of compensation while those who work in clinics or university settings are paid through free negotiations as part of hospital payment and receive a salary. For all healthcare payments, ambulatory care specialists are paid fee-for-service and then the fee schedule is negotiated by the insurers. Medical specialists cannot charge above the amount that is specified by the fee schedule.

In Belgium and Switzerland, physicians are remunerated on purely a fee-for-service basis. In all SHI nations, there is a high density of CT, MRI, and mammography machines in both ambulatory and hospital care settings. In Austria, there is a mixed system of drug price negotiation in which the federal government plays in a minimal role in negotiations but pharmaceutical companies do not have to follow a predefined drug price schedule. Germany, and Netherlands, drug company price setting does take place yet in a restricted capacity a there is an absence of negotiation for certain pharmaceutical products. In Belgium, there is extensive negotiation between the federal government. The Swiss Healthcare System partially relies on negotiated contracts regarding pharmaceutical companies. The federal government regulates the financing of the system itself through its oversight of Mandatory Health Insurance. There is

transparency in pricing for all SHI nations wherein federal guidelines dictate that costs of treatment must be presented to the consumer of those services.

e. Private Health Insurance System

Physician remuneration in the United States is dependent on what kind of practice a physician is involved in; many physicians are paid on a salary basis; yet this salary includes additional payment for each individual test, procedure, and treatment provided. The prevalence of fee-for-service healthcare costs has been termed responsible for the unaffordable healthcare crisis in the United States. Some physicians additionally are compensated by hospitals dependent on the number of patients they see; the capitation-based method. There is a high density of CT scanners, MRI machines, and mammography machines in both ambulatory and hospital care settings. There is an absence of clear drug price bargaining in the United States; drug prices are typically determined through contract pricing; yet contract pricing can be derived from either a fee-schedule of allowed drugs or based on government regulation (i.e. Medicare, Medicaid, Veterans administration programs). All of these methods of drug pricing are based on a specific drug price number of ways; including contract pricing with or without the use of a fee-schedule of allowed drugs, or based on government regulation of prices for Medicare, Medicaid, and Veterans Administration Programs. There is transparency in pricing of pharmaceuticals, ambulatory and hospital services and procedures.

2.1.3. Patients-Providers

a. National Health Service System

There is limited patient choice in Denmark. The Danish Healthcare System, and more specifically outpatient treatment often involves limitations inpatient choice by geography; patients are expected to be treated at a hospital closest to their home and visit a physician within that hospital regardless of specialty. The general practitioners' advice regarding which hospital to go to strongly alters choice. Additionally, data shows that many patients are unaware of the fact they have the ability to exercise choice in selecting a physician. There is a substantial degree of patient choice in Finland; the system allows patients to choose their own general practitioner. Yet, new social service reforms will further expand choice by allowing for competition between public and private service providers. There is limited patient choice in Norway while the Swedish Health Care system allows for a considerable amount of choice in selecting a provider. . All hospitals, public and private, provide service to public patients and while patients can select a general practitioner of their choosing. In Norway, private health insurance is provided by for profit insurers and it is purchased for quick access and greater choice of provider; therefore, those who can afford the "private health insurance" enjoy a greater degree of freedom in selecting a physician. In Sweden, providers are responsible for providing patients with necessary information both about their condition and health status but also about options for a second opinion and provide referrals to specialists. There is considerable patient choice of physicians in Portugal and Spain. Within the public sector, patient choice is limited to the practitioner within the primary care unit within the patient's residence area. Therefore, patient choice is geographically restrained. In Spain, patients can see any healthcare provider that they choose.

Contrastingly, there is extremely limited patient choice in the United Kingdom. The UK's system is extremely restrictive, patients must first register with a local practice of their choice; yet choice is limited because many practices are already full and will not take new patients.

Denmark, Finland, Norway, Portugal, and Spain all produce reports regarding patient satisfaction while Sweden and the United Kingdom do not.

b. National Health Insurance/Statutory Health Insurance Cases

Australia permits a high degree of choice of physicians. Private health insurance is available and offers choice of providers; there is more limited choice under public health insurance; yet patients can still choose their provider. In Canada and Ireland there is also free choice over their primary care physician. In New Zealand, patients enroll with a general practitioner of their choice but in smaller communities, patients may have limited choice due to a lower concentration of physicians. Italy, France, and Israel all allow patrons a considerable amount of choice in selecting a provide. The Australian system does involve gatekeeping; specialists can only be seen after a referral from a general practitioner. Canada's primary care physicians act as gatekeepers; many provinces pay low fees to specialists for non-referred consultations as a penalty for not following the gatekeeping system. In New Zealand, a patient must first visit a general practitioner in order to eventually see a specialist. In Italy, there is a complex system of gatekeeping in which patients must register with a gatekeeping physician; in most cases, general practitioners and pediatricians who fall below a predetermined spending or consumption target profit the most. Patients can choose any physician who has not reached the maximum number of patients (which is set at 1,500 patients for general practitioners and 800 patients for pediatricians.) In France, there is a newly implemented gatekeeping system yet the system does

not restrict patient choice and cannot block access to specialists. The Israeli healthcare system involves gatekeeping in two out of the four major health plans; the largest healthcare plan, Cialit, requires a recommendation from a primary care physician in order to see a specialist. Therefore, the system for this study's purpose is classified as a "gatekeeping" system. Australia, Canada, New Zealand, Italy, and France produce substantive reports on patient satisfaction while Ireland produces some reports but not consistently and Israel does not publish verifiable patient satisfaction reports.

c. Etatist Health Insurance Cases

The Japanese and Korean healthcare system allows for free choice of physicians. In the Japanese Health System, there is no strict gatekeeping yet the government does encourage patients to select their preferred doctors. There are patient disincentives for going straight to a specialist without first seeing a general practitioner. Patient disincentives for self-referral lead to extra charges during the initial consultation within larger hospitals. In Korea, there is a strict gatekeeping procedure which does not permit patients to see a specialist without a referral from a general practitioner. Patient satisfaction reports are readily available for both nations.

d. Social Health Insurance System Cases

In every SHI nation except for Switzerland, there is completely free choice of physicians. In the Swiss system, public health insurance involves giving up free choice of first medical contact. Under the Swiss private health insurance schemes, there is supplementary coverage for free choice of physicians. Austria, Germany, and Belgium do not have restrictive gatekeeping; but rather they encourage visitation to a general practitioner first but seeing a specialist is not conditional on first seeing a general practitioner. The Netherlands and Switzerland do not permit

visitation to a general practitioner without first seeing a specialist. All SHI nations produce reports detailing patient satisfaction.

e. Private Health Insurance Cases

Patients typically have free choice of doctors within the US system; this choice is only limited by whether or not physicians and their practices are within their healthcare network, meaning that the patient's choice of physician is covered by the particular insurance scheme that the patient subscribes to, yet there is no formal gatekeeping function. The United States produces reports describing patient satisfaction.

2.2: Scoring of Countries on Individual Dimensions

Dimension 1 Table: **Finance-patients (state & insurance interacting with patients)**

| | Coverage | Contribution type | Patient copay | SCORE |
|----------------------------------|----------|-------------------|---------------|-------|
| National Health Service System | | | | |
| Denmark | 1.0 | 1.0 | 0.5 | 2.5 |
| Finland | 1.0 | 1.0 | 0.5 | 2.5 |
| Norway | 1.0 | 1.0 | 0.5 | 2.5 |
| Sweden | 1.0 | 1.0 | 0.5 | 2.5 |
| Portugal | 1.0 | 1.0 | 0.5 | 2.5 |
| Spain | 1.0 | 1.0 | 0.5 | 2.5 |
| United Kingdom | 1.0 | 1.0 | 0.5 | 2.5 |
| National Health Insurance System | | | | |
| Australia | 1.0 | 1.0 | 0.0 | 2.0 |
| Canada | 1.0 | 1.0 | .5 | 2.5 |
| Ireland | .5 | 1.0 | 0.0 | 1.5 |
| New Zealand | .5 | 1.0 | .5 | 2.0 |
| Italy | 1.0 | .5 | 1.0 | 2.5 |
| France | 1.0 | 1.0 | 0.0 | 2.0 |
| Israel | 1.0 | .5 | 0.5 | 2.0 |
| Etatist Healthcare System | | | | |
| Japan | 0.0 | 1.0 | 1.0 | 2.0 |
| Korea | 1.0 | 1.0 | 0.0 | 2.0 |
| Social Health Insurance System | | | | |
| Austria | 1.0 | 1.0 | 0.5 | 2.5 |
| Germany | 1.0 | 0.0 | 0.5 | 1.5 |
| Netherlands | 1.0 | 1.0 | 0.5 | 2.5 |
| Belgium | 1.0 | 1.0 | 0.5 | 2.5 |
| Switzerland | 1.0 | 0.5 | 0.0 | 1.5 |
| Private Healthcare System | | | | |
| United States | 0.0 | 0.7 | 1.0 | 1.7 |

Dimension 2 Table: **Finance-physicians (state & insurance interacting with patients)**

| Country | Remun. | Med tech pop. | Drug price | Transp. of pricing | SCORE |
|----------------------------------|--------|---------------|------------|--------------------|-------|
| National Health Service System | | | | | |
| Denmark | .25 | 1.0 | 0.5 | 1.0 | 2.75 |
| Finland | .25 | 1.0 | 0.5 | 1.0 | 2.75 |
| Norway | .25 | N/A | 0.5 | 1.0 | 1.75 |
| Sweden | .5 | 0.5 | 0.5 | 1.0 | 2.5 |
| Portugal | .25 | 0.5 | 0.5 | 1.0 | 2.25 |
| Spain | .25 | 0.5 | 0.5 | 1.0 | 2.25 |
| UK | .25 | 0.0 | 0.5 | 0.0 | .75 |
| National Health Insurance System | | | | | |
| Australia | 0.0 | 0.5 | 1.0 | 1.0 | 2.5 |
| Canada | 0.0 | 0.0 | 1.0 | 1.0 | 2.0 |
| Ireland | 1.0 | 0.5 | 0.5 | 0.0 | 2.0 |
| New Zealand | .25 | 0.5 | 1.0 | 1.0 | 2.75 |
| Italy | .25 | 1.0 | 1.0 | 0.0 | 2.25 |
| France | 0.0 | 0.5 | 0.5 | 1.0 | 2.0 |
| Israel | 1.0 | 0.0 | 0.0 | 0.0 | 1.0 |
| Etatist Healthcare System | | | | | |
| Japan | 0.0 | 1.0 | 1.0 | 0.0 | 2.0 |
| Korea | 0.0 | 1.0 | 1.0 | 0.0 | 2.0 |
| Social Health Insurance System | | | | | |
| Austria | 1.0 | 1.0 | 0.5 | 1.0 | 3.5 |
| Germany | 0.0 | 1.0 | 0.5 | 1.0 | 2.5 |
| Netherlands | 0.5 | 1.0 | 0.5 | 1.0 | 3.0 |
| Belgium | 0.0 | 1.0 | 1.0 | 1.0 | 3.0 |
| Switzerland | 0.0 | 1.0 | 0.5 | 1.0 | 2.5 |
| Private Healthcare System | | | | | |
| United States | 0.5 | 1.0 | 0.0 | 1.0 | 2.5 |

Dimension 3 Table: **Patients-Providers**

| | Choice of doctors | Presence of gatekeeping | Patient satisfaction | SCORE |
|----------------------------------|-------------------|-------------------------|----------------------|-------|
| National Health Service System | | | | |
| Denmark | 0.5 | 0.0 | 1.0 | 1.5 |
| Finland | 1.0 | 0.0 | 1.0 | 2.0 |
| Norway | 0.5 | 0.0 | 1.0 | 1.5 |
| Sweden | 1.0 | 0.0 | 0.0 | 1.0 |
| Portugal | 0.5 | 0.0 | 1.0 | 1.5 |
| Spain | 1.0 | 0.0 | 1.0 | 2.0 |
| United Kingdom | 0.5 | 0.0 | 0.0 | 0.5 |
| National Health Insurance System | | | | |
| Australia | 1.0 | 1.0 | 1.0 | 3.0 |
| Canada | 1.0 | 0.0 | 1.0 | 2.0 |
| Ireland | 1.0 | 0.5 | 0.5 | 2.0 |
| New Zealand | 0.5 | 0.0 | 1.0 | 1.5 |
| Italy | 1.0 | 0.0 | 1.0 | 2.0 |
| France | 1.0 | 1.0 | 1.0 | 3.0 |
| Israel | 1.0 | 0.0 | 0.0 | 1.0 |
| Etatist Healthcare System | | | | |
| Japan | 1.0 | 1.0 | 1.0 | 3.0 |
| Korea | 1.0 | 0.0 | 1.0 | 2.0 |
| Social Health Insurance System | | | | |
| Austria | 1.0 | 1.0 | 1.0 | 3.0 |
| Germany | 1.0 | 1.0 | 1.0 | 3.0 |
| Netherlands | 1.0 | 0.0 | 1.0 | 2.0 |
| Belgium | 1.0 | 1.0 | 1.0 | 3.0 |
| Switzerland | 0.0 | 0.0 | 1.0 | 1.0 |
| Private Healthcare System | | | | |
| United States | 0.5 | 0.5 | 1.0 | 2.0 |

2.3 Aggregated Summary Scores per Country

| National Health Service System | |
|----------------------------------|------|
| Denmark | 6.75 |
| Finland | 7.25 |
| Norway | 6.25 |
| Sweden | 6 |
| Portugal | 6.25 |
| Spain | 6.75 |
| United Kingdom | 3.75 |
| National Health Insurance System | |
| Australia | 7.5 |
| Canada | 6.5 |
| Ireland | 5.5 |
| New Zealand | 6.25 |
| Italy | 6.75 |
| France | 7.0 |
| Israel | 4.0 |
| Etatist Health Care System | |
| Japan | 7.0 |
| Korea | 6.0 |
| Social Health Insurance System | |
| Austria | 9.0 |
| Germany | 7.0 |
| Netherlands | 7.5 |
| Belgium | 8.5 |
| Switzerland | 5.0 |
| Private Healthcare System | |
| United States | 6.2 |

Chapter 3: Quantitative Comparisons of Indicator Variables Between Systems

3.1. Explanation of Outputs

I. Socioeconomic Determinants

The variable, *%_smokers* indicates the percentage of individuals within a given population who are regular smokers, defined as smoking at least once per day. The variable, *alc_consump*, denotes the average amount of liters of alcohol consumed by a single person within one year. The variable *obese_pop* indicates the percentage of the population that is overweight or obese. The variable *fruit_consump* provides a quantitative measure of the number of individuals who consume fruit at least once daily. The variable, *air_particul_expos* indicates exposure to air particulates with mean annual exposure expressed in PM2.5 mg/m³, the federal health standard for particulate matter.

II, Systemic Variables

The total population of physicians within the country, *md_pop*, the total remuneration of specialists, *remun_specialists*, and the total remuneration for physicians, *remun_physicians* provide an indication as to the total amount of money physicians earn in each country regardless of remuneration type. The differentiation between specialist and physicians will be especially pertinent in countries where there is a requirement for gatekeeping; wherein a patient must see a specialist first in order to eventually meet with a general practitioner.

III. Access Variables

The child vaccination rate, *child_vacc_rate* and the influenza vaccination rate, *influenza_vacc_rate*, reveal at what rate individuals are vaccinated. Vaccinations provide a

immunodefense against viruses that compromise individuals' health and can lead them to seeking medical treatment. A higher occurrence of vaccinations among a population often leads to lower occurrence of the virus itself, and therefore less money spent on ridding oneself of the virus. The length of the average hospital stay, *length_of_hosp_stay*, and hospital discharge rate, *hosp_discharge_rate* can illustrate the efficacy of the system in admitting and discharging patients, whether the agents (doctors and healthcare providers) are externally motivated to discharge patients sooner than is needed, or whether insurance companies are profiting off of extended hospital stays. By taking into context the healthcare system's principal-agent relationships and examining both the length of hospital stay and discharge rate, conclusions can be drawn about evidence that supports the notion that actors are either internally or externally motivated to pursue certain ends.

IV. Healthcare Expenditures

The total amount of government or compulsory spending, *gov_spend*, the total amount of voluntary spending, *vol_spend*, the total amount of out-of-pocket expenditures, *out_of_pocket*, and the percent of expenditures covered by insurance, *%_cov_ins*, will reveal what proportion of healthcare costs are being paid for by the government and what proportion is paid for by private citizens and among citizens, how much does insurance assist an individual in paying for their healthcare costs.

The total public spending incapacity as a percent of GDP, *incap_spend%*, refers to spending that is due to, "sickness, disability and occupational injury". This incorporates the disbursement of disability cash benefits which in turn consist of cash payments or the inability to participate gainfully in the labor market due to one's disability. The total amount spent on preventative care

as a share of GDP, *prev_careGDP*, and total spent on pharmaceuticals, *pharma_spend*, indicate propensity to provide access to provide cutting-edge drugs to individuals that can reduce mortality and also be used for palliative purposes.

V. Operational Healthcare Spending

The number of nurses per capita, *nurses_per_capita*, the number of doctors per capita, *doc_per_capita*, and the amount of hospital beds per 100 individuals, *hosp_beds_100*, identifies the quantity of personnel and capacity of the average institution. The presence of larger institutions or simply more hospital beds means that there is a greater capacity to care for patients regardless of their status. A greater number of nurses and doctors similarly indicates that care can be provided to a greater number of patients or more attention can be devoted to individual patients.

The number of MRI units in both ambulatory and hospital care, *MRI_units_amb/hosp* and the number of CT scanners within the country, *ct_scan_density*,

The number of mammography machines within the country, *mamm_density*

VI. Hard Indicator Outcomes

The infant mortality within each country, *inf_mort*, evaluates the age-sex standardize rate of infant death. Disability adjusted life years, *DALE*, and the number of potential years of life lost, *Pot_years_of_lost*, are both controversial factors as they are cited in specific literature yet not universally recognized. They are included in this study as DALY provides a measure of overall disease burde, expressed as the number of years that are lost due to ill health, disability, or early death. DALE was developed in the 1990s as a means of comparing health and life expectancy between countries.

DALY, Disability-Adjusted Life Year, evaluates the burden of disease. It is the measurement of the gap between what is the current health status of a population and the ideal health status (World Health Organization, 2019). The measurement itself evaluates the potential number of years of life lost that could have been saved if the healthcare system were “better” - more efficient, and more able. The calculation is derived from the following equation, $DALY = YLL + YLD$. YLL is the years of life lost and YLD is years of life lost due to disability. In order to compute the number of years of life lost, or YLL, is the number of deaths multiple by the standard life expectancy at age of death in years. The years of life lost due to disability is derived from multiplying the number of incident cases times disability weight times the average duration of the case until remission or death. DALY is an optimal means of evaluation as it combines several key measures of healthcare quality by aggregating the number of years of life lost due to an avoidable premature death, the number of years of life lost due to poor health or disability, and the numbers of healthy life lost due to a disability. The measure of healthcare quality was first incorporated into systematic evaluation of healthcare systems in the WHO’s Global Burden of Disease Study, GBD, from 2001 to 2002.

The difference in DALY between healthcare systems was not statistically significant; it did not relate in any systematic way to the presence of health institutions or the summary scores of any of the nations. The DALY only ranged from 78 to 82 among all healthcare systems.

The incidence of AIDS per 100,000, *inc_AIDS*, evaluates the number of new cases of AIDS per year and the prevalence among a population of 100,000 individuals within a given country. The prevalence of AIDS can indicate how well a healthcare system is at providing treatments to those who have the virus. The number of people who have AIDS within the population, *#_AIDS*,

also provides another numerical evaluation of how many people have AIDS within the country, but rather than taking a bootstrap sample, this variable quantifies how many people total within the country have AIDS. The rate of tuberculosis among a population of 1,000, *tub_rate*, similarly displays the rate of tuberculosis within the given population. The prevalence of typhoid fever is coded as *typh_fever* and evaluates the overall rate of incidence within the population. In addition to identifying the prevalence of various viruses within populations, the survival rate and prevalence for several cancers will also be analyzed. The survival rate for those with colon cancer, *colon_canc_surv*, prevalence of breast cancer, *breast_cancer*, and prevalence of prostate cancer, *prostate_cancer*, are indicators of how well a healthcare system treats cancer; treatments are typically dependent on healthcare infrastructure, an element of society tied to both development and government expenditure. The number of deaths from cancer, *canc_deaths*, takes into account the number of number of deaths from all forms of cancer; this is yet another means of evaluating the effectiveness of healthcare intervention within a given system.

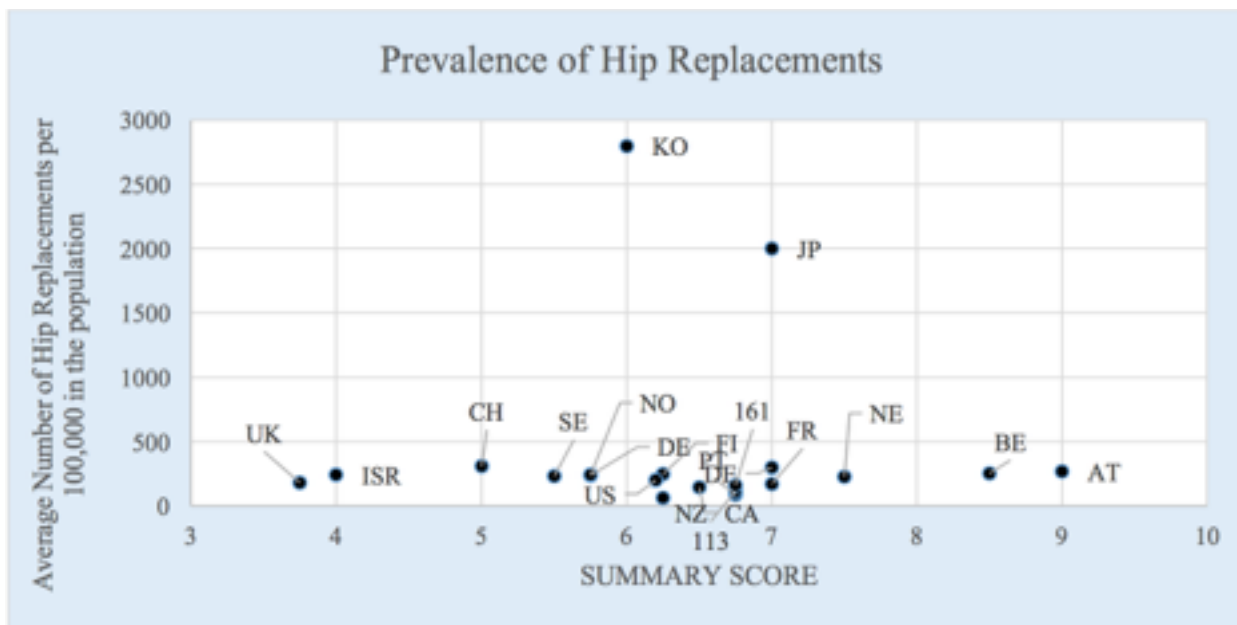
The number of deaths from ischemic heart disease, *death_heart*, indicates how effective hospitals' interventionist methods are. Often heart disease is caused by one of five factors: unhealthy diet, physical inactivity, obesity, excessive alcohol intake, or tobacco use. While these are all external, or epidemiological factors, the effectiveness of treatment and remediation of these factors within an institutional setting can provide insights as to the quality of the healthcare system as a whole. The number of hip replacements, *hip_rep*, is an essential indicator as hip replacements are a common form of surgical intervention and the surgery itself has rapidly evolved in terms of technique and cost-effectiveness. The presence of obstetric trauma at birth, *obst_trauma*, can clue in on healthcare systems that do not provide substantive healthcare

provisions for mothers in labor. Obstetric trauma may not only be impacted by effectiveness of the system; epidemiological factors may impact these indicators' viability when examined on the basis of healthcare quality alone.

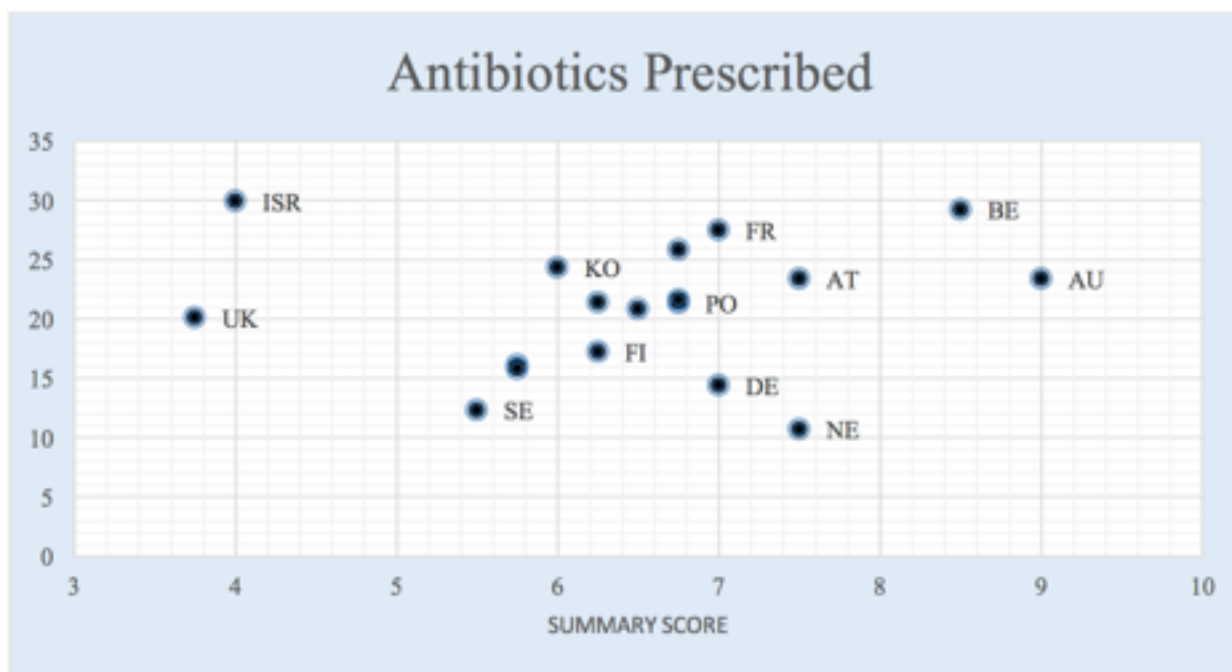
VII. Soft Health Indicators

The number of antibiotics prescribed, *antibiotics_presc*, indicates the overall volume of antibiotics prescribed. The number of individuals admitted to the hospital because of Asthma and COPD, *asthma/COPD_hospital_admit*, is an indicator that can be influenced by various socioeconomic and environmental factors yet provides insight to the overall health of the population. Asthma and COPD are commonly treated within OECD nations and in countries where agents are held accountable by their principals for ailments requiring short-term treatment. The number of consultations skipped due to cost, *consult_skip_cost*, identifies the number of consultations in a doctor's office or clinic, or in a hospital outpatient department that were skipped due to the healthcare cost. This is especially pertinent to countries where there is a system of gatekeeping, such as the systems of Denmark, Italy, the Netherlands, Norway, Portugal, Slovakia, Spain, and the United Kingdom. If seen fit, a GP can refer to a specialist and then patients can approach that specialist directly. The average wait time for cataract surgery, *wait_time_cataract*, incorporates data on patients who are waiting for surgery and have already submitted to surgery. Wait times are often an accurate indicator of the efficiency of a healthcare system. The average length of of stay for cardiovascular disease, *avg_length_cardio*, enumerates the in-patient average length of stay for diseases of the cardiovascular system. Similar to wait times for surgery, the average length of stay has proven to be a substantial barometer of healthcare quality.

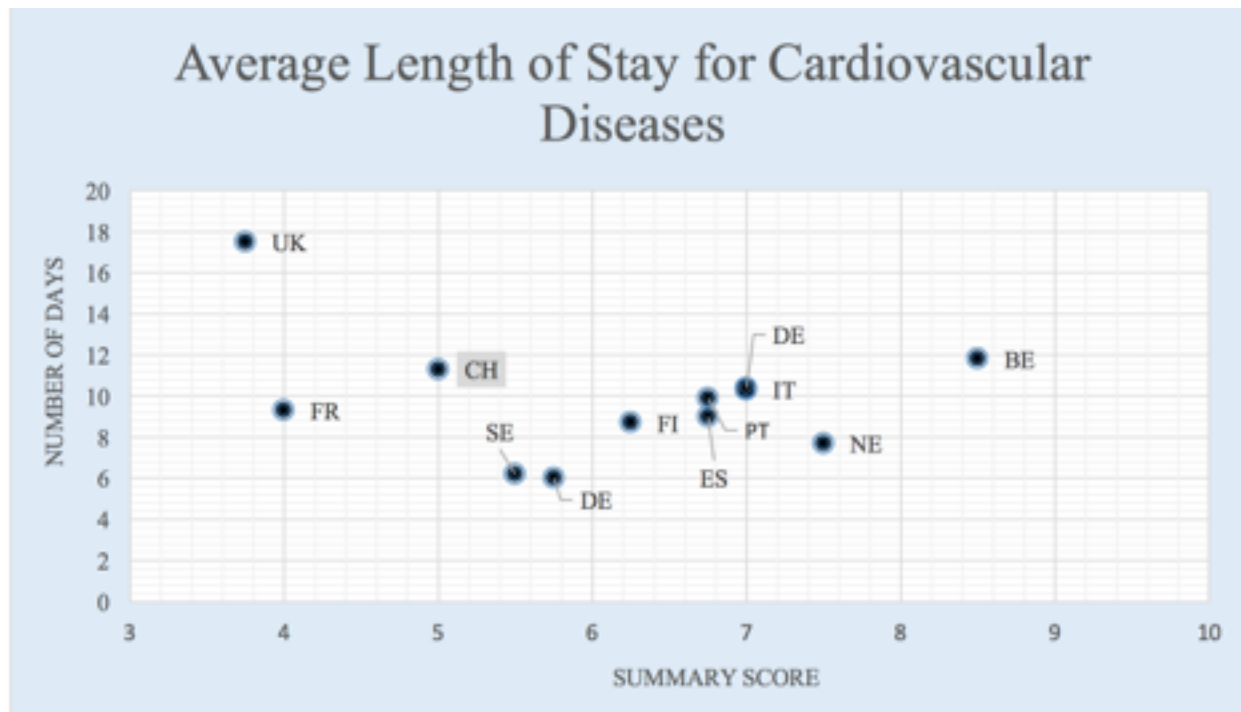
3.2 Quantitative Indicator Performance by Country



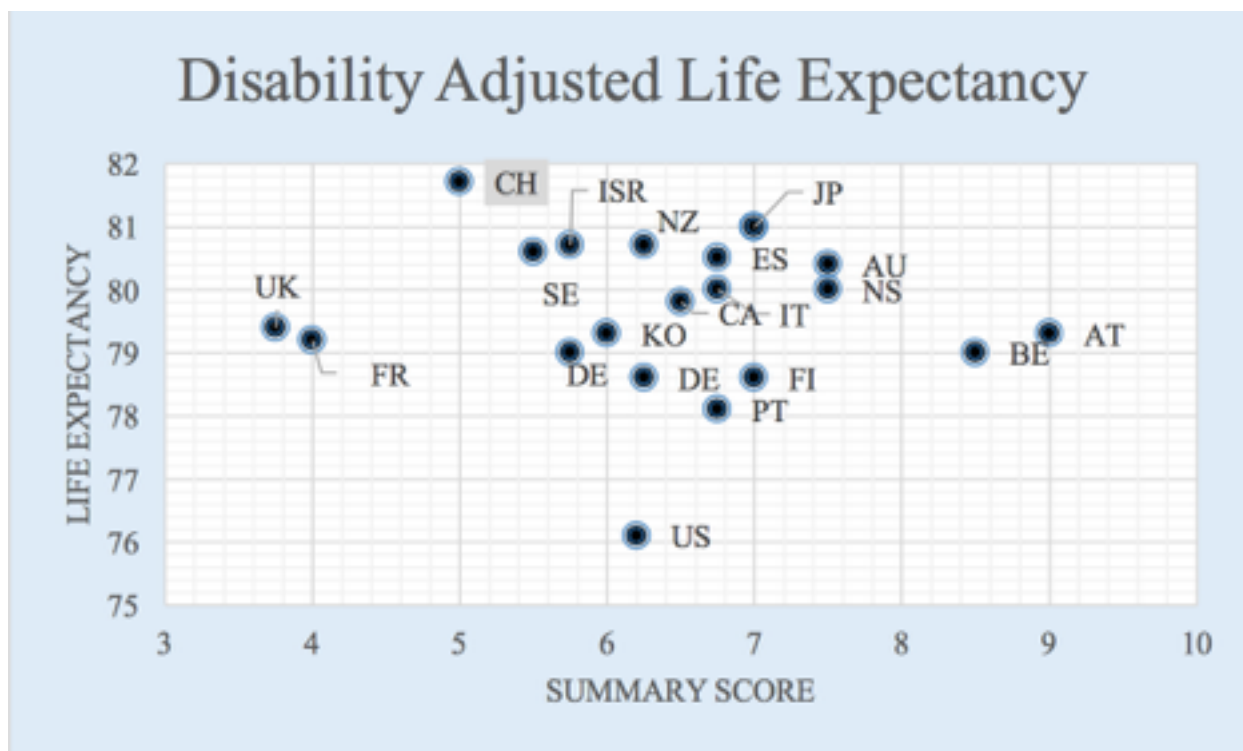
The prevalence of hip replacements was relatively the same for all nations except for countries that operated as Etatist healthcare systems.



The number of antibiotics prescribed was highest for the National Health Insurance System and Etatist Health System with 24.8 and 24.3 defined daily doses (DDD's) per 1,000 inhabitants. The number of antibiotics prescribed was lowest for the National Health Service system with 17.8 DDD's per 1000 inhabitants.



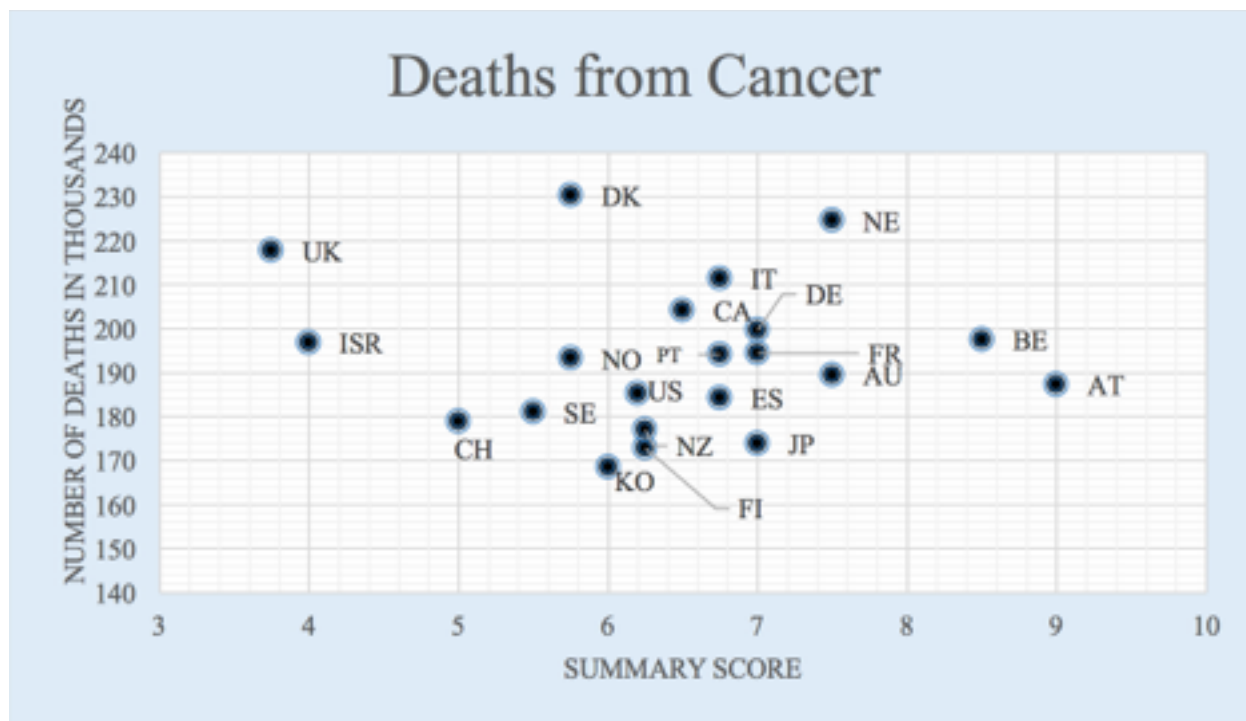
The relationship between average length of stay for cardiovascular disease and summary score illustrates nearly no correlation. Additionally, for this indicator, not all countries had OECD data that could be used in the analyses. The r-squared value describing the relationship between the values is only .077 and the regression equation is $-.596x + 13.505$. The only value that significantly skewed the data was the average length of stay for cardiovascular disease in the United Kingdom with an average of 17.5 days spent in the hospital for cardiovascular disease. The length of stay was not dependent on type of healthcare system nor was it dependent on summary score.



The DALE, Disability Adjusted Life Expectancy, was approximately the same for all healthcare systems, ranging from 79.6-80.2. The r-squared value was only .00254; near 0 – indicating no correlation between summary score and DALE. The regression function as $-.0499x + 79.987$.

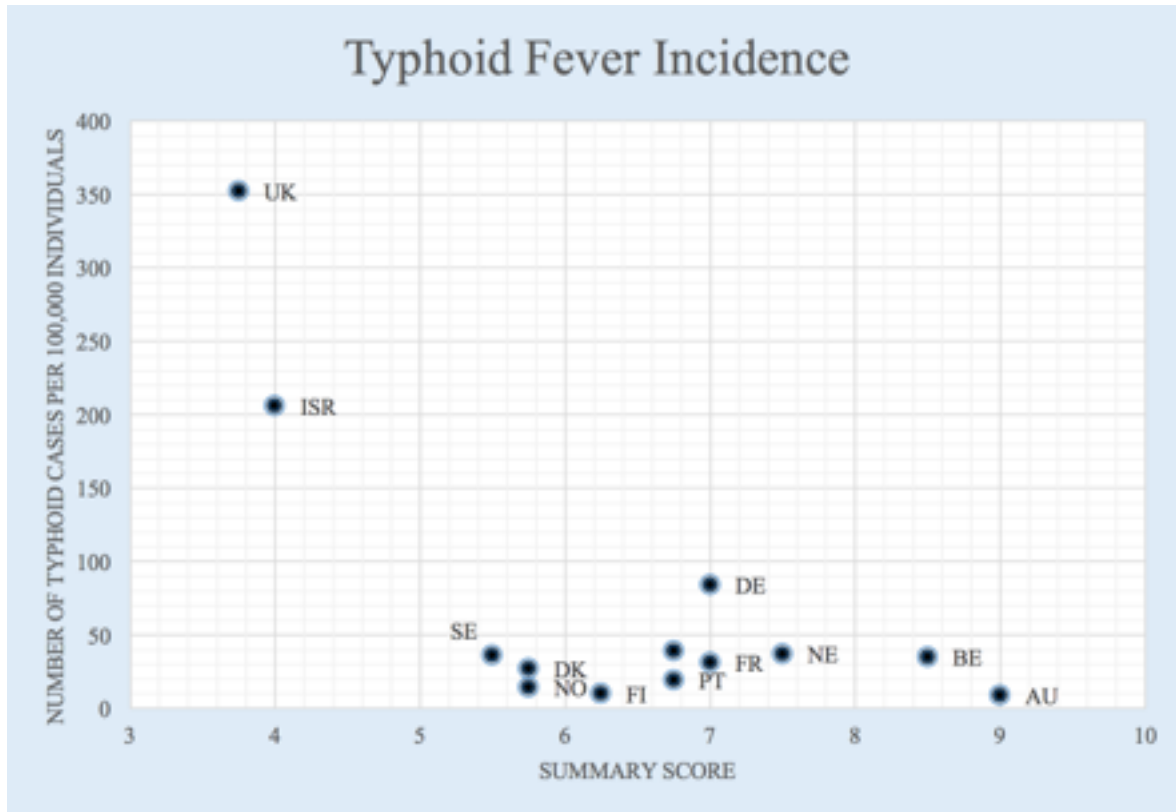
The number of deaths from cancer per 100,000 inhabitants was the lowest for the Etatist Health Insurance Systems was 171.1 individuals per 100,000 inhabitants; highest for the Private Health Service System at 197.6 deaths per 100,000 inhabitants. Yet, all systems had nearly the same number of deaths excluding the Etatist Heath Insurance System. Note that the “sister” indicators, potential years of life lost and infant mortality will be evaluated only by system by rank order as summary scores mirrored rank order for these indicators. The incidence of behavioral health

deficiencies and environmental factors that are aggregated in the DALE calculations in relation to summary score was also evaluated (see Appendix 3C).



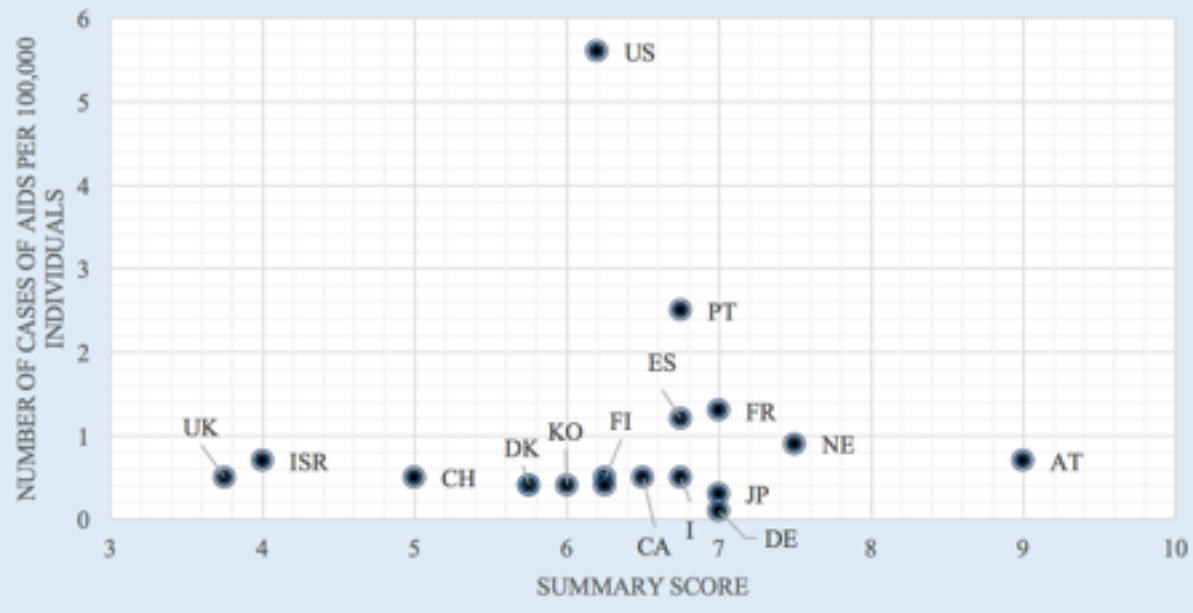
The r-squared value indicated a near zero relationship between summary score and number of deaths from cancer with only a value of .00438. The regression equation was $-.8879x + 199.13$.

The range of values by system illustrates how similar the number of deaths from cancer are between system. The National Health Service System had an average of 196.2 thousand deaths. The National Health Insurance System had an average of 195.55 thousand deaths. The average number of deaths for the Etatist Health System was lowest, yet still not statistically significant at 171.1 thousand people per year. The average number of deaths per year for the Social Health Insurance System was 197.58 thousand deaths per year and the average number of deaths from cancer per year for the Private Health Insurance System was 185.3 thousand deaths per year.

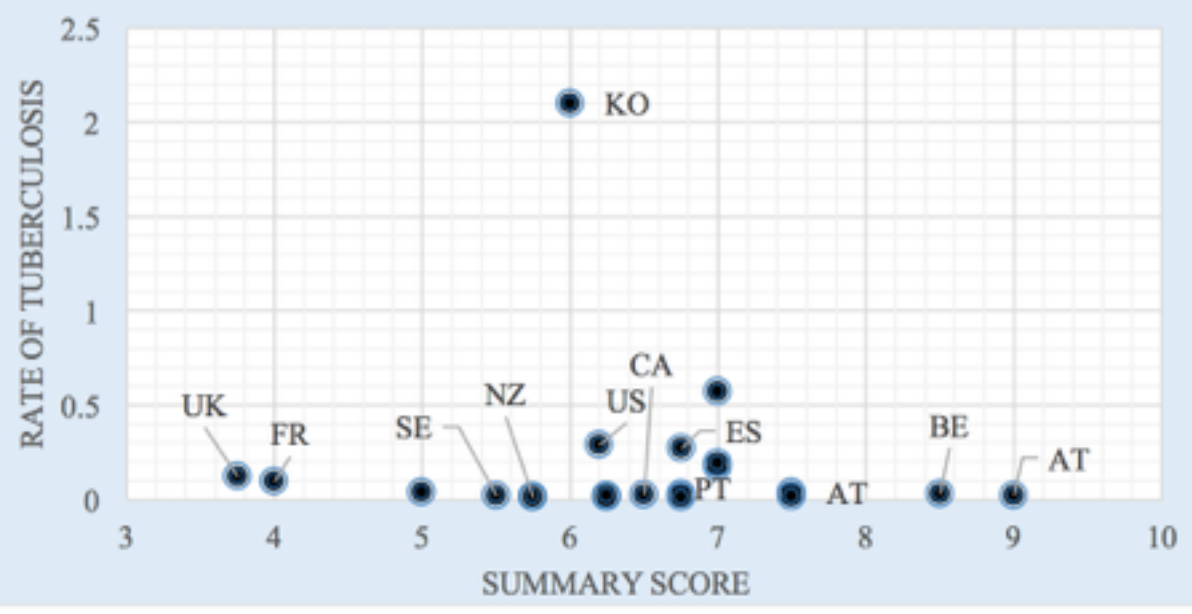


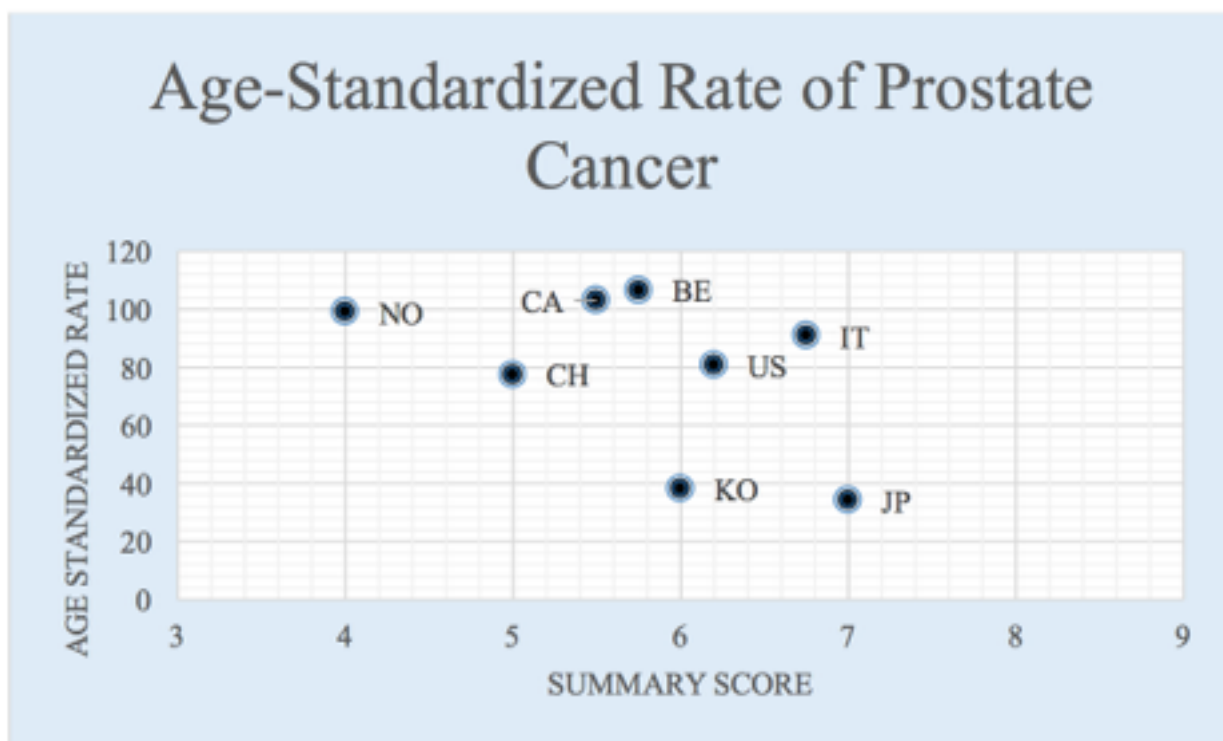
Typhoid fever incidence, evaluated by number and rate per 100,000 individuals in the population, was highest for the National Health Insurance System with 118.5 individuals testing positive. The Social Health Insurance System had the lowest number and rate per 100,000 individuals with only 41.25 individuals testing positive.

Incidence of AIDS



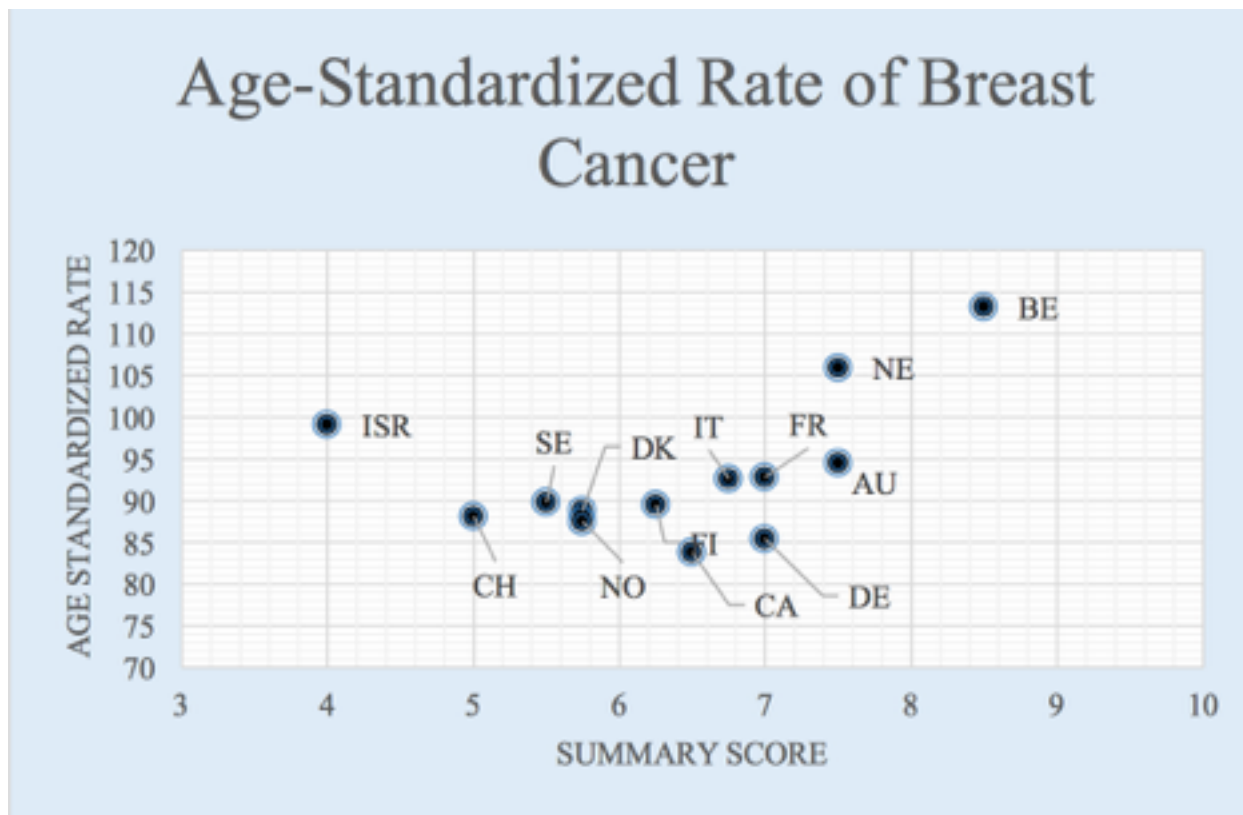
Rate of Tuberculosis (thousands)





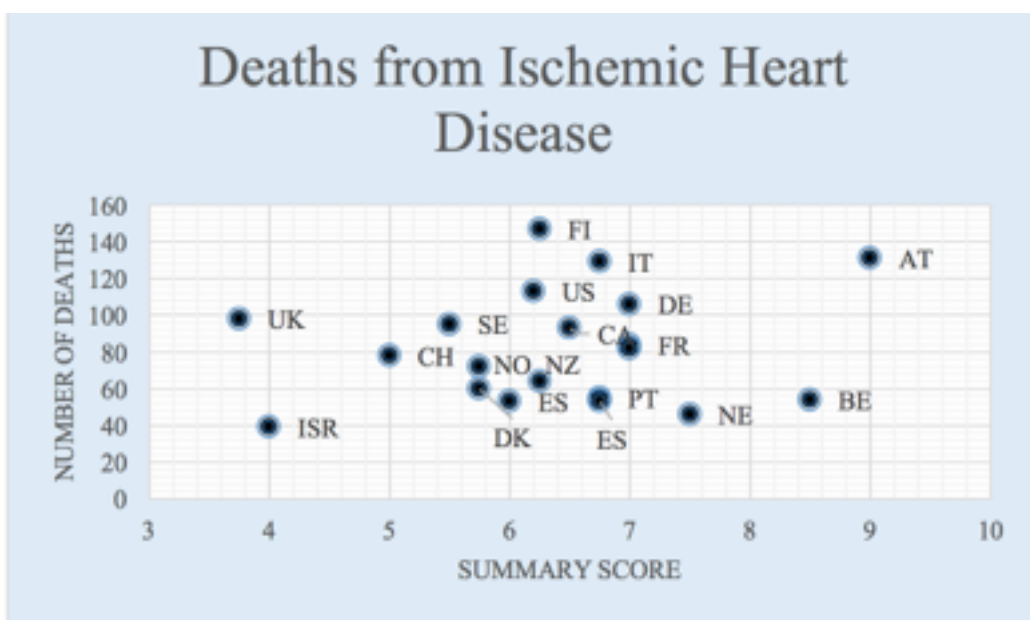
The incidence of AIDS and number of individuals with AIDS was tabulated. The Private Health Care System had by far, the highest concentration individuals with AIDS, with 5.6 cases of AIDS per 100,000 individuals and 25,355 new cases of AIDS in 2012, the examination year.

The r-squared value describing the relationship between summary score and the rate of tuberculosis indicates a weak link between the variables with only a .00422 value. The regression equation is $-.0236x + .3461$. The tuberculosis incidence was approximately the same for all countries, except for the only outlier among the cases, Korea. Korea's tuberculosis incidence was 2.1. Tuberculosis incidence was highest in the Etatist systems with 1.335 thousand individuals suffering from tuberculosis. The Social Health Insurance System yielded the lowest amount of individuals with tuberculosis with only .0584 thousand individuals suffering from tuberculosis.



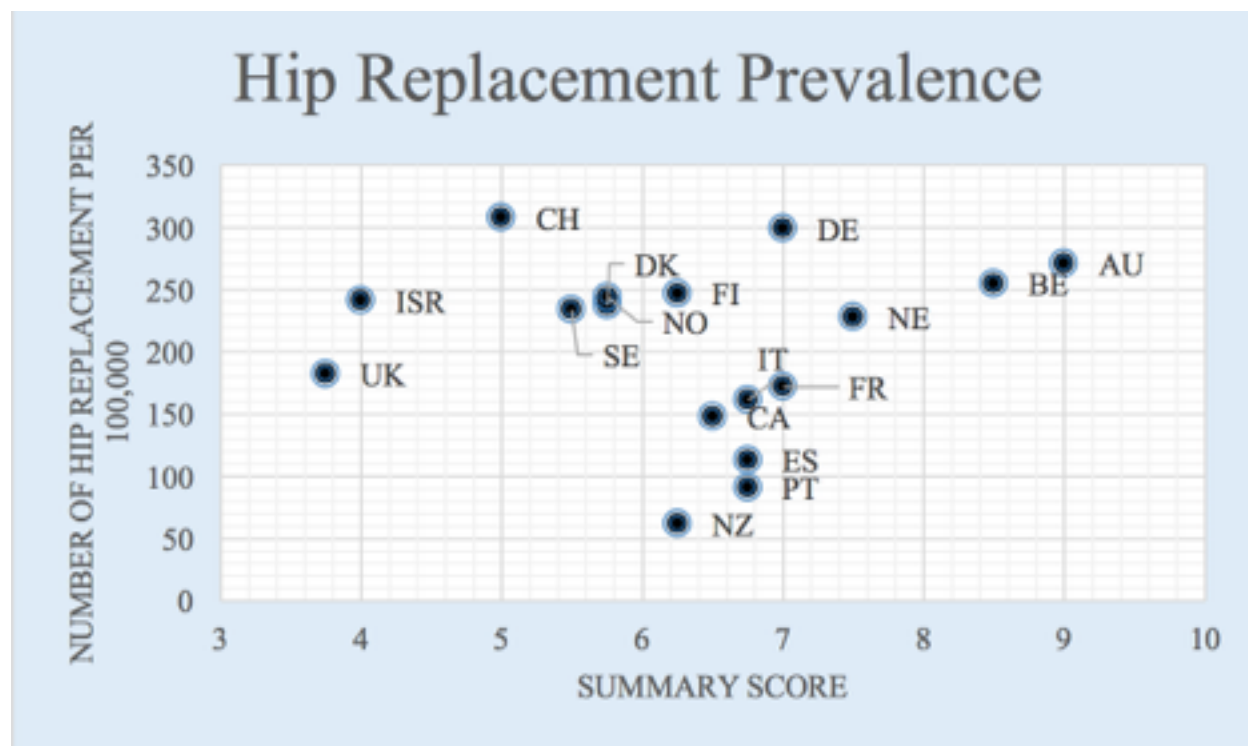
The r-squared value describing the relationship between summary score and rate of breast cancer had a small correlation with an r-squared value of .20434. The regression equation was $3.1903x + 72.785$. The age standardized rate of breast cancer per 100,000 individuals was not significantly different across systems. However, the age standardized rate of breast cancer per 100,000 individuals was significantly different across systems with only 36.05 individuals per 100,000 people testing positive within the Etatist System, and 104.75 individuals per 100,000 people testing positive within he National Health Service System.

The r-squared value describing the relationship between summary score and age-standardized rate of prostate cancer incidence indicates a small correlation between the two variables with an r-squared value of .2412. The regression equation was $-14.37x + 161.67$. The range in rate of prostate cancer incidence ranged considerably with Japan having the lowest rate of prostate cancer at 34.1% of the population and Belgium having the highest rate of prostate cancer at 106.5%. See Appendix 3B for summary of cancer incidence by rank order of nations.

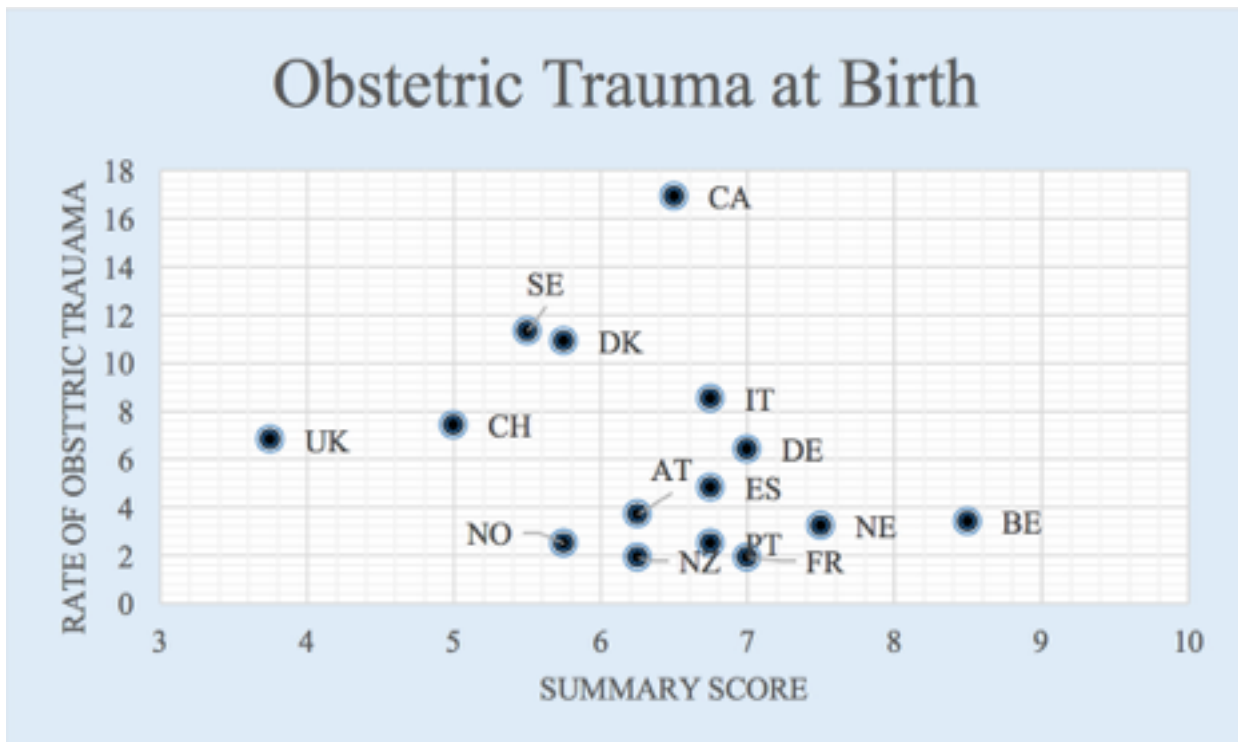


The relationship between summary score and the number of deaths from ischemic heart disease indicates a near zero relationship with an r-squared value of .02463. The regression equation was $3.8345x + 58.203$. The number of deaths from ischemic heart disease was the lowest for the Etatist Healthcare System with only 53 individuals per 100,000 dying from this means of mortality. The highest number of deaths per 100,000 individuals from ischemic heart disease was

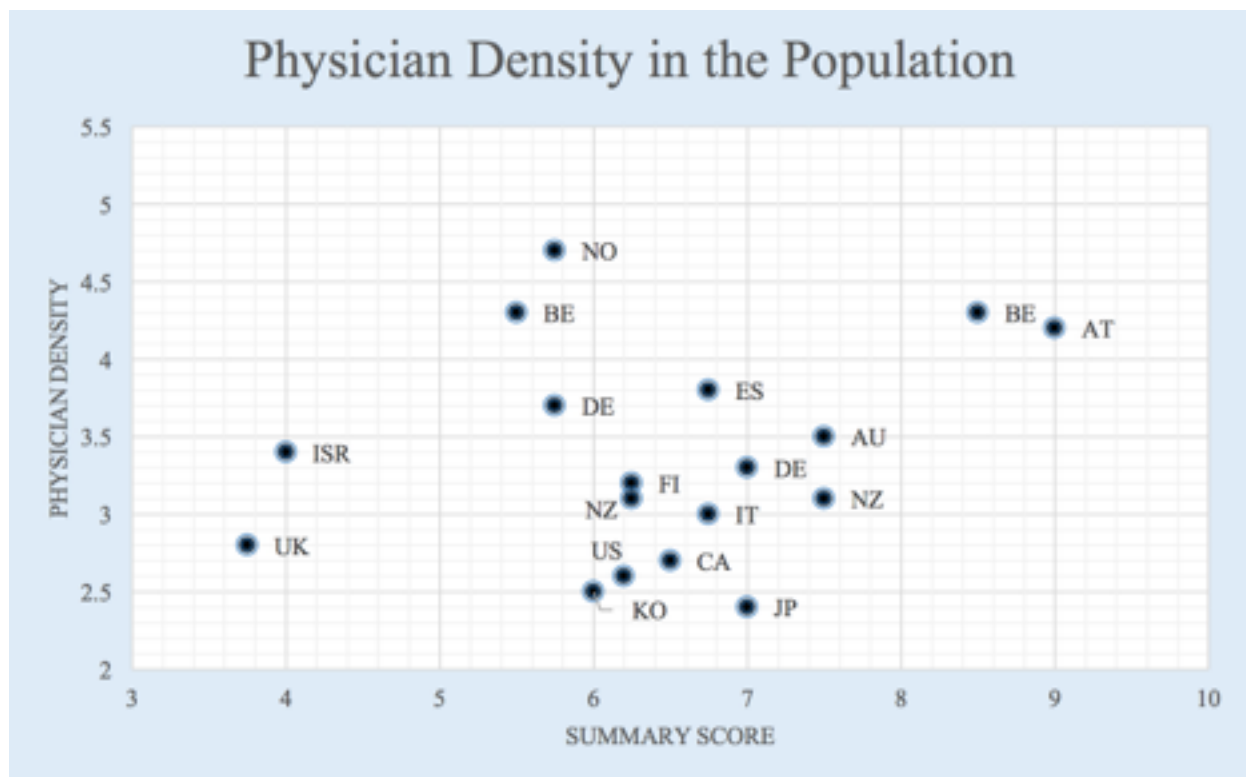
found in the Private Health Service System with 113 individuals dying from this cause per 100,000 people.



This indicator demonstrates the weakest correlation with an r^2 value of only .00015. The regression equation is $.6334x + 201.45$. The number of hip replacements performed in 2015 per 100,000 inhabitants was the highest in the Social Health Insurance System with 272.2 individuals undergoing hip replacement within the sub-population. The number of individuals undergoing hip replacement was lowest in the National Health Insurance System with 156.8 individuals undergoing hip replacement within the population.

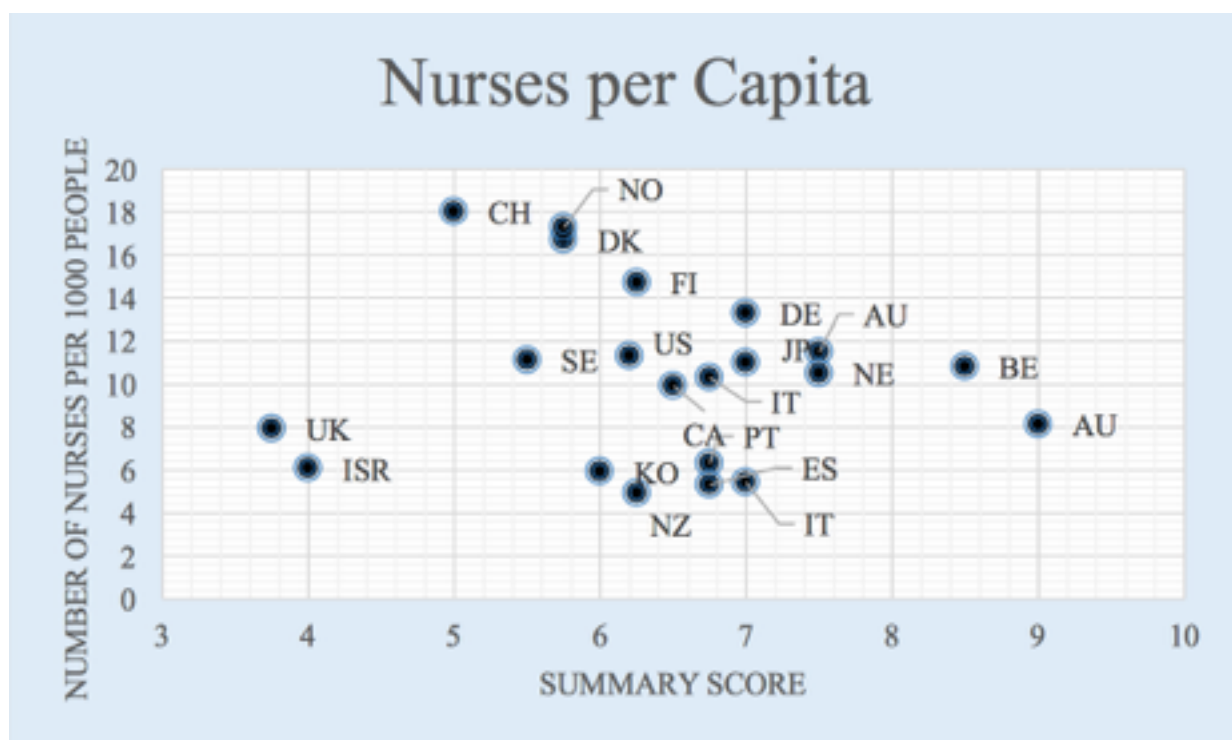


The r-squared value describing the relationship between summary score and rate of obstetric trauma was only .081. The regression equation is $-1.109x + 13.119$. The number of women who experienced obstetric trauma at birth was highest in the Private Health Care system with 9.6 births per 100,000 instrument-assisted vaginal deliveries involved this form of trauma. The rate was lowest in the Social Health Insurance System with only 5.1 births involving this trauma out of 100,000 instrument-assisted vaginal deliveries.



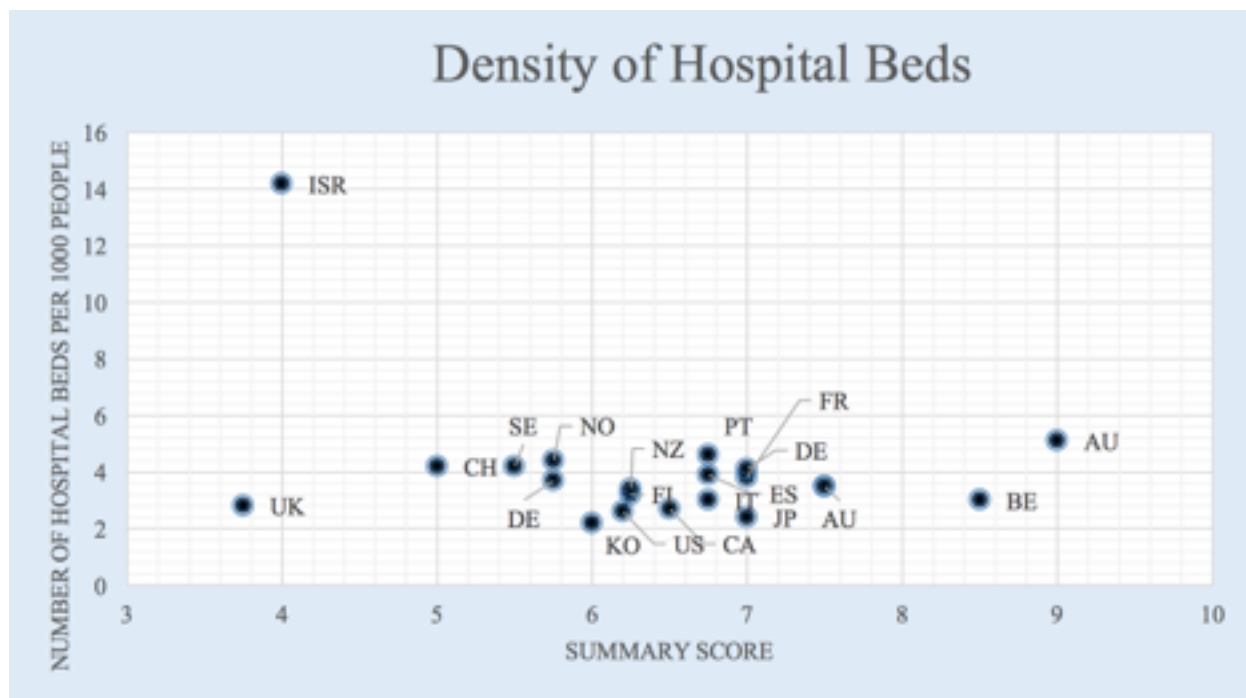
The r-squared value is .04962 indicating a near zero relationship; the regression equation is $.1157x + 2.6214$. The number of doctors per capita was lowest for the Statist Health Care System, which had an average of 2.3 physicians per capita. The range of values is narrow with the lowest value being Japan with only 2.4 physicians per 100,000 individuals and the greatest value being Norway with 4.7 physicians per 100,000 individuals. The Private Health Care System had a slightly higher concentration of doctors per capita (2.6). The number of doctors per capita was highest for the National Health Service system. The number of doctors per capita was highest for the Social Health Insurance System, with 3.98 nurses per capita. The number of nurses per capita was the lowest for the the National Health Insurance System with 8.0 nurses per capita on average and the Social Health Insurance System had 12.14 nurses per capita on average. Therefore, it can be said that there is not a correlation between the number of nurses and physicians per capita within a given country; yet in order to evaluate total access to medical

personnel, for the purpose of this analysis, the average number of doctors and nurses per capita can be added together to create a single composite number that encapsulates access to personnel. The highest composite score for access to personnel is for the Social Health Insurance System, with a sum of 16.12; followed by the National Health Service System with a sum of 15.158. Following these two systems are the Private Health Service System with a sum of 13.9, and then the National Health Insurance System with 11.288, and the Etatist Health System with an average of 10.75. The number of hospital beds per 1000 is the highest for the National Health Service system with 5.10 hospital beds; the lowest concentration of hospital beds was found in the Etatist nations with 2.3 hospital beds per 1000.



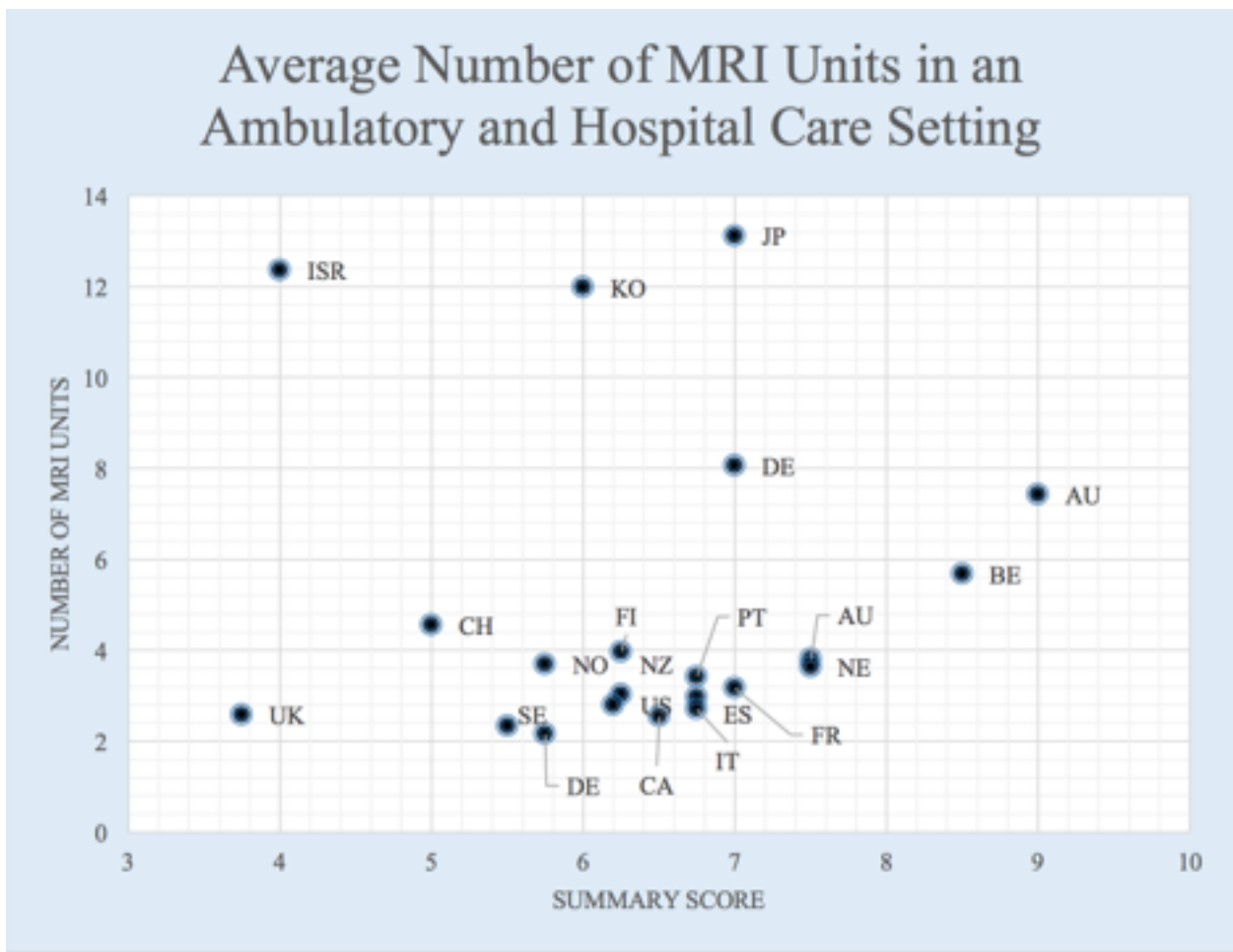
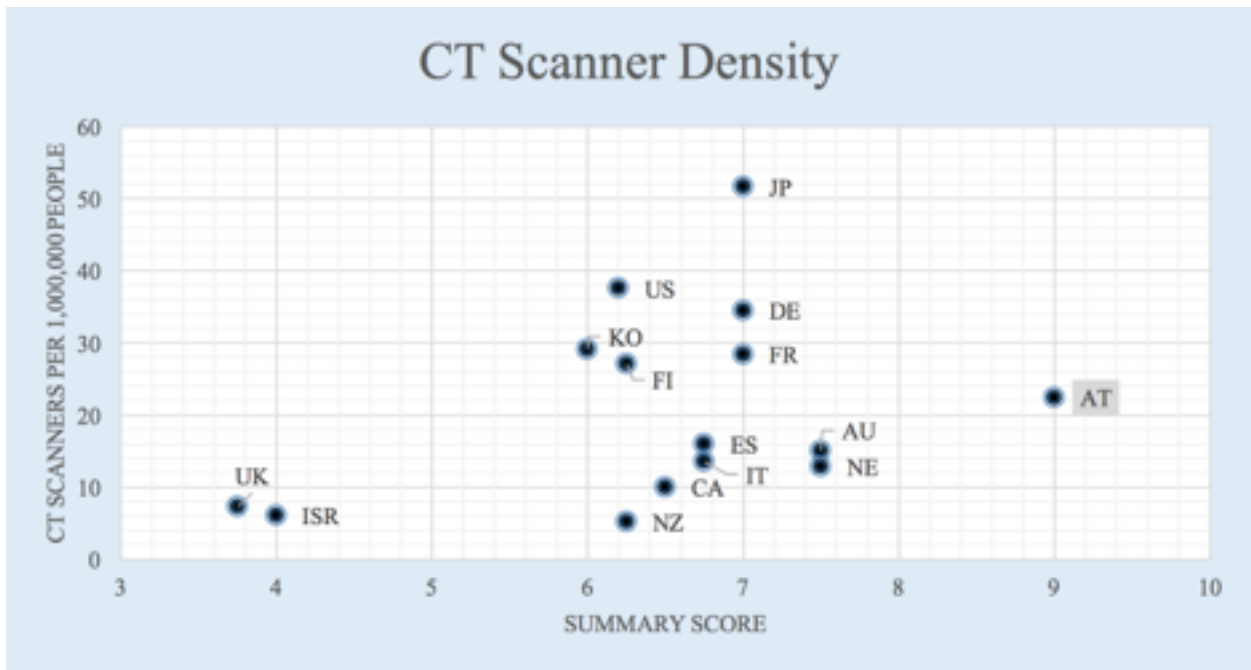
The regression equation describing the relationship between summary score and nurses per capita indicates a near zero relationship with an r-squared value of .051. The regression equation

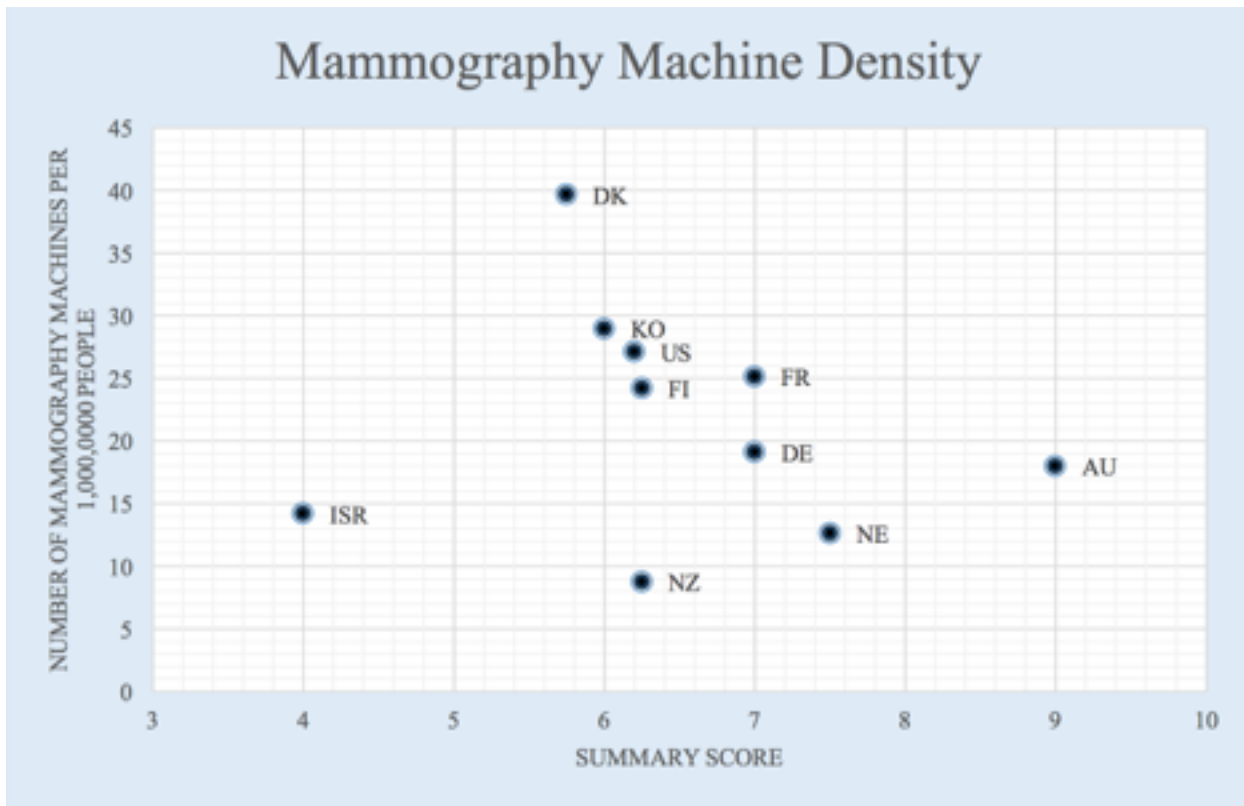
is $.1359x + 2.2667$. The density did vary considerably between cases with New Zealand having the lowest density – 4.9 nurses per 100,000 in the population and Switzerland having the highest density with 18 nurses per 100,000 individuals in the population.



The r-squared value of .1301 indicates that there is a near zero relationship between the two variables; the regression equation is $-.7019x + 8.248$.

The relationship between summary score and the number of MRI units is not tightly correlated; there is a near-zero correlation as the r-squared value is .000074. The regression equation is $.0238x + 4.894$.





There is a near zero relationship between summary score and the number of CT scanners with an r-squared value of .11018. The regression equation is $3.449x - 1.3122$.

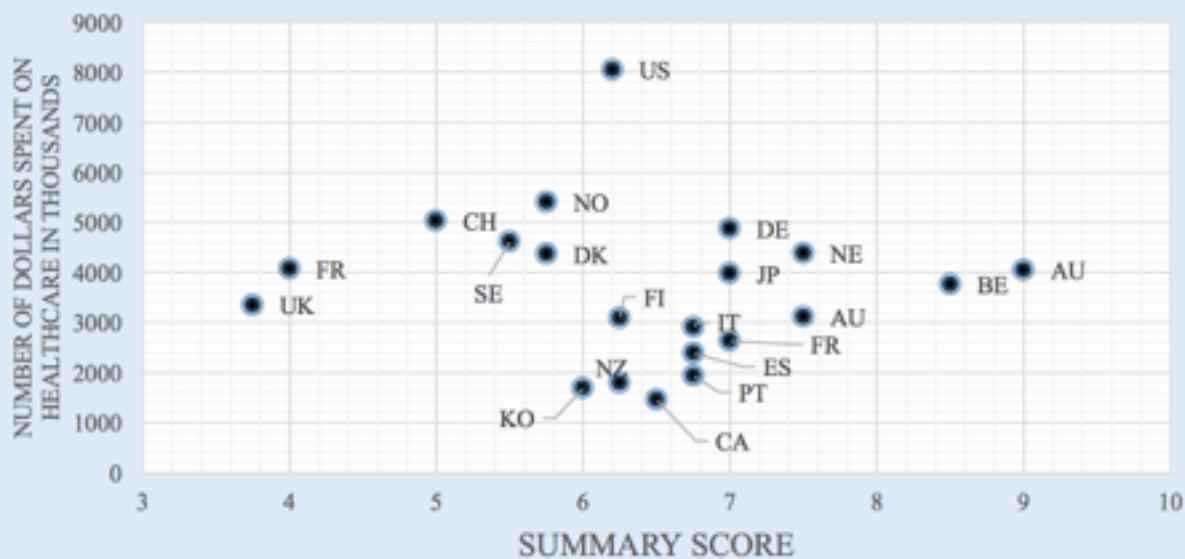
There is a near zero relationship between summary score and the number of mammography machines per 1,000,000 people. The r-squared value is .02076; the regression equation is $-1.0179x + 28.373$.

Medical Equipment Density Analysis

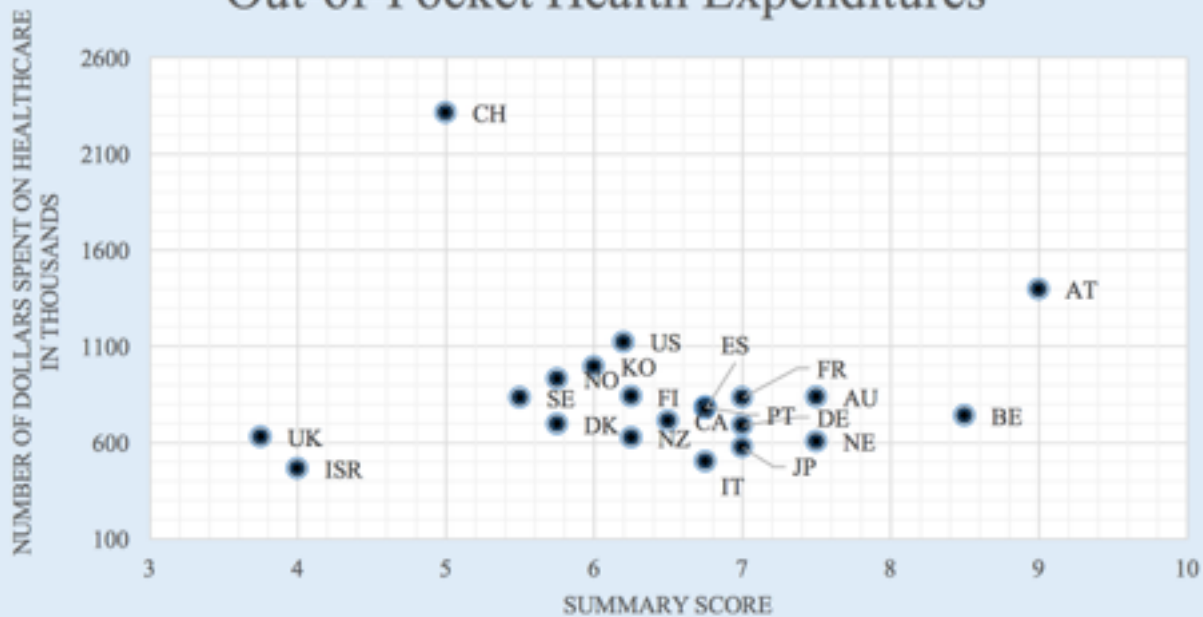
A similar method to the method of evaluating physician and nurse population will be taken to evaluate access to medical equipment. The number of MRI units in an ambulatory and hospital environment was far highest for the Etatist Health Care System with an average of 12.545 MRI units per 1000 inhabitants. The lowest concentration of MRI units was found in the Private Healthcare System with an average of only 2.8 MRI units per 1000 inhabitants. The concentration of CT scanners in hospitals per 1000 inhabitants was the highest for Etatist Health

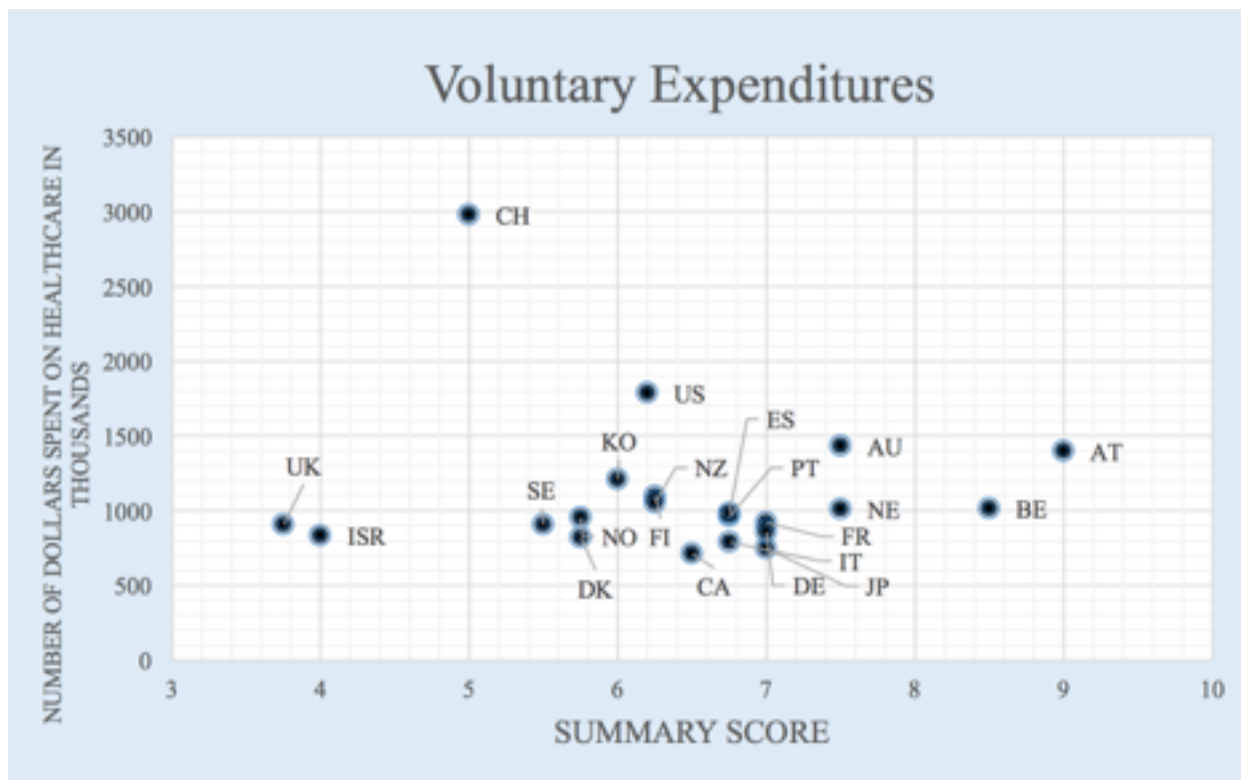
Care System with an average of 40.385 CT scanners per 1000 inhabitants. It is important to note that Japan had a far higher concentration of CT scanners than Korea with 51.69 CT scanners per 1000 inhabitants as compared to the 29.08 CT scanners per 1000 inhabitants. The Private Health Care System had a similar concentration of CT scanners with 37.56 CT scanners per 1000 inhabitants. The lowest concentration of CT scanners could be found in the National Health Insurance System. The concentration of mammography machines was the highest concentration of the private health care system with 55.45 machines per 1000 inhabitants and the lowest concentration of mammography machines could be found in the National Health Service System with 20.96 machines per 1000 inhabitants. The composite score for medical equipment can be found by adding together the three values for each type of medical equipment. The average total of medical equipment per 1000 inhabitants was highest for the Etatist Health Care System was 81.89 machines per 1000 inhabitants. The concentration of medical equipment within the Private Health Care System is 67.45 machines per 1000 inhabitants. The concentration of medical equipment within the National Health Service System followed with an average of 51.69 machines per 1000 inhabitants. There was an average of 45.67 machines per 1000 inhabitants within the Social Health Insurance System and 33.64 machines per 1000 inhabitants. Therefore summary score does not have a correlation to the access to medical equipment. The Etatist Health Care System had the highest population of all three forms of medical equipment. There is a near zero-relationship between summary score and the number of dollars spent on healthcare. The r-squared value is .01106. The regression equation is $-128.54x + 4481.8$. The relationship between summary score and the number of dollars spent on healthcare in thousands. The r-squared value is .00687. The regression equation is $-32.823x + 1323$.

Government and Compulsory Expenditures



Out-of-Pocket Health Expenditures



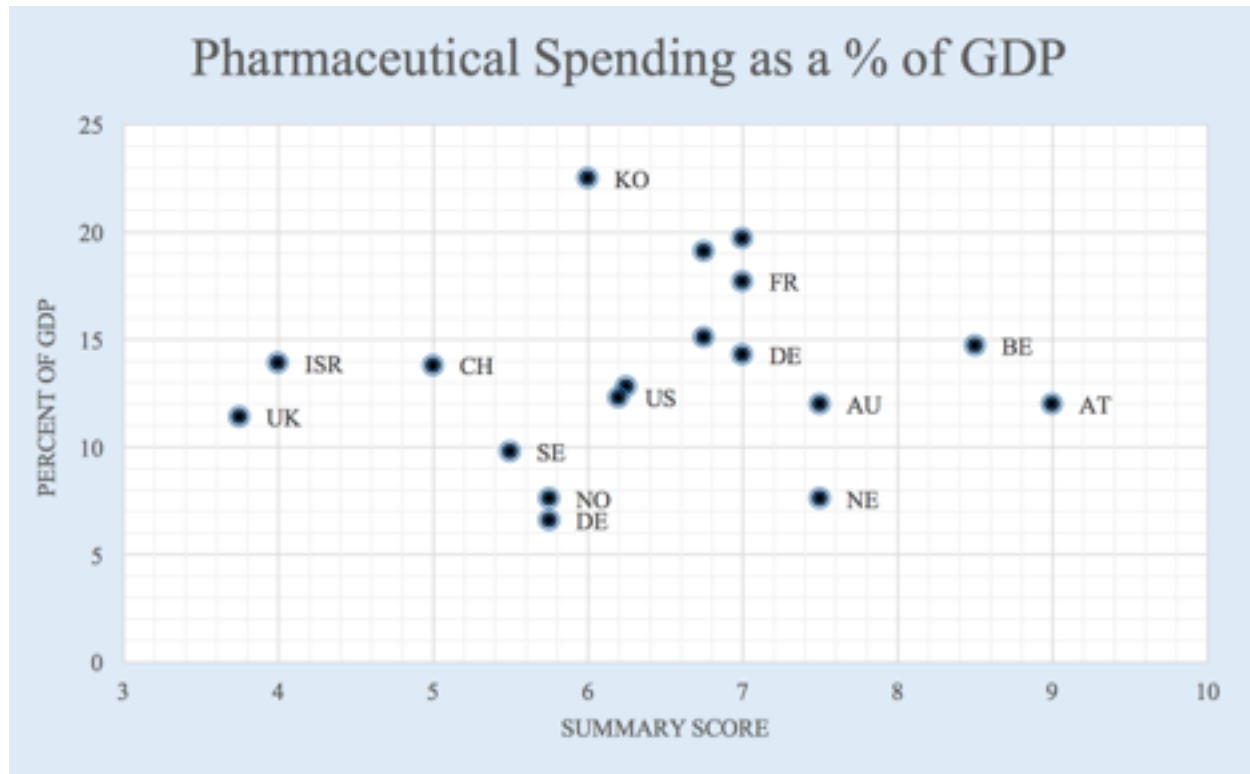


The relationship between summary score and the number of dollars spent on healthcare in thousands is extremely close to 0 when taking into account the outlier of Switzerland – whose out-of-pocket expenditures are extremely high. The regression equation is $-3.4403x + 874.23$ and the r-squared value is .00012. When removing Switzerland from analysis, there is a positive correlation between the two variables with a .2809 r-squared value.

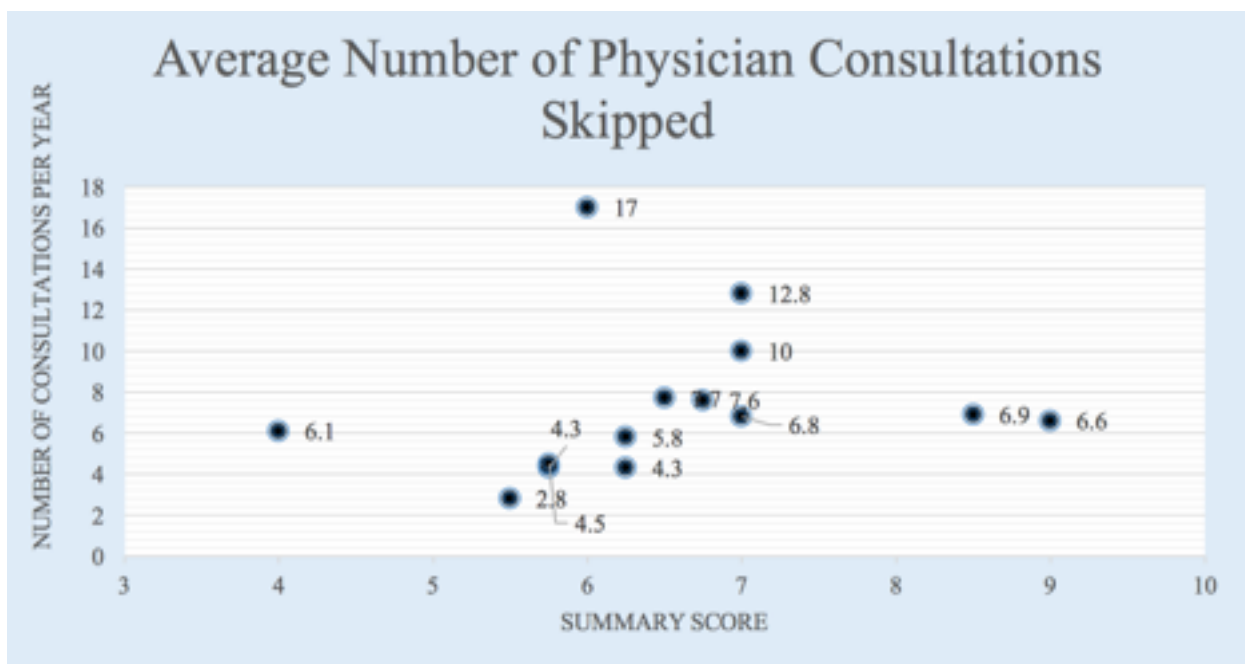
By far, the Private Health System, the United States spends the most in government and compulsory expenditures, with 8047.3 per capita. The National Health Insurance spends the least in government expenditures with 2653.2 per capita. The Private Health System also spends the most per capita in voluntary spending with 1785 dollars per capita; as opposed to the National Health Service and National Health Insurance Systems which spend the least with 946.22 and

956.83 dollars per capita. In Out-of-Pocket expenditures, the Social Health Insurance System spends the most with an average of 1148.56 dollars paid out; while the National Health Insurance System pays the lowest amount with 560.35 dollars per capita. Each healthcare system had near 100% coverage (ranging from 99.76 to 100%) except for the Private Health System, the only non-compulsory health insurance scheme in which 90.9% of the population is covered by healthcare. For public spending on incapacity as a % of GDP, the National Health Service system spends the most with 3.27 percent while the Etatist Health Insurance System spends the least with .825%. For preventative care measures, the National Health Insurance System by far spends the most with 7.36% of their GDP being paid towards preventative care. The other systems all have similar averages ranging from 1.16 to 1.3. Pharmaceutical spending comprises the greatest percentage of GDP for the Etatist Health System, 21.1%, while comprising the least for the National Health Service System, at 11.6% of GDP. Therefore, it can be said that for most expenditure indicators, the Private Health Systems involves the greatest amount of money spent per capita in each sector. Yet, the lack of universality in the system results in nearly one tenth of the population lacking health insurance. Pharmaceutical spending is the only area in which the Etatist system far exceeds the Private Health Spending in percent of GDP spent on a singular sector.

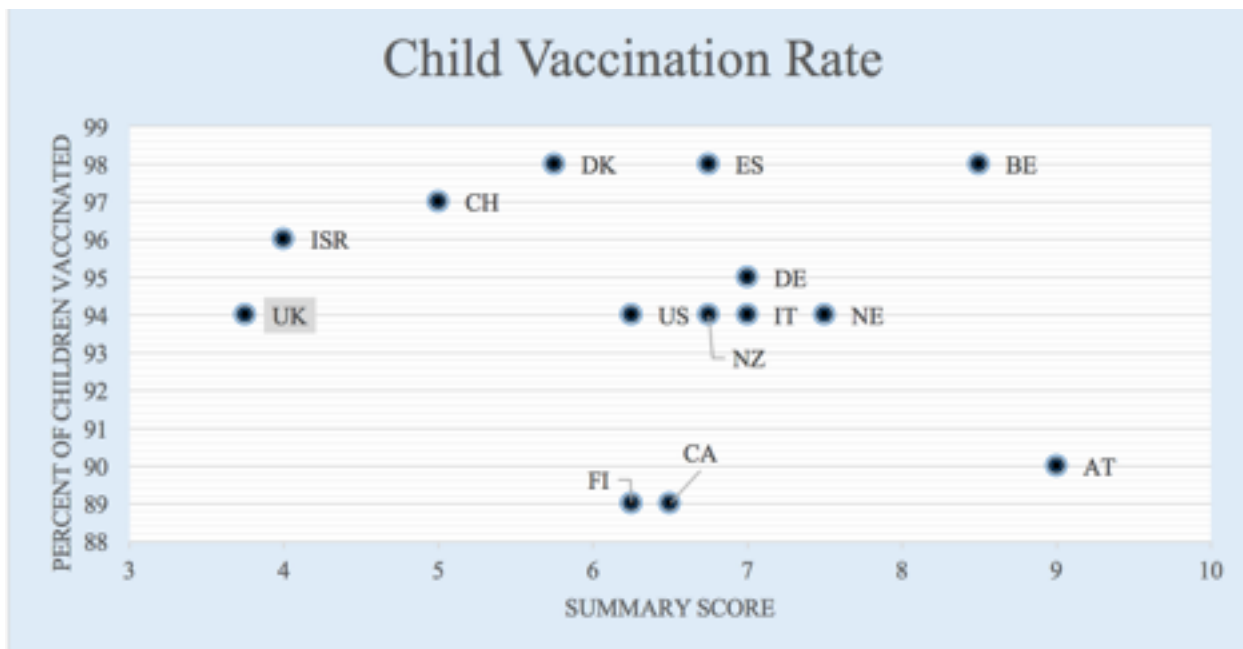
All cases included in the study had approximately the same percentage of their population covered by compulsory healthcare except for the Private Health Insurance System, for which the United States was the only case. Only 90.9% of the country is covered by healthcare insurance as it is voluntary in nature. Additionally, all cases spent approximately the same percent of their GDP on preventative healthcare.



There is a near zero relationship between summary score and percent of GDP as the r-squared value is only .01523. The regression equation is $.39x + 10.998$.

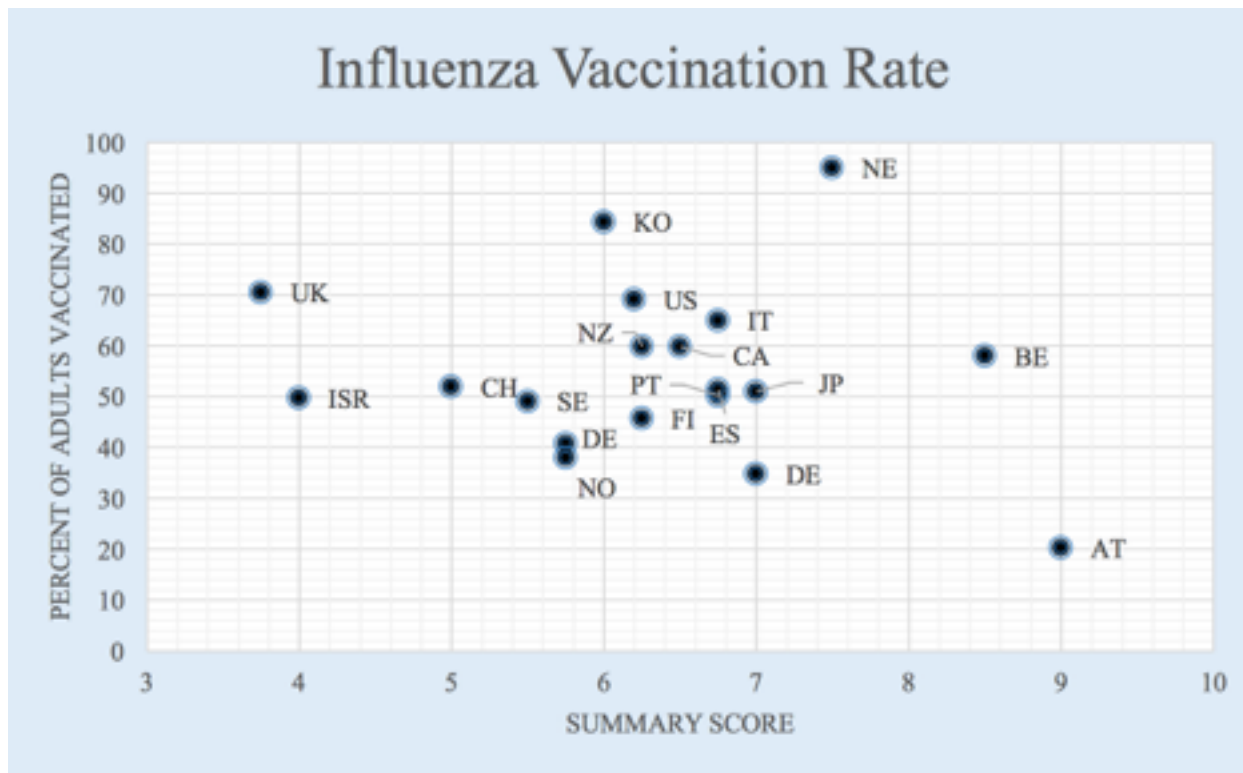


The r-squared value was only .02487 and the regression analysis yielded an equation of $.4787x + 4.2513$. The number of consultations skipped due to cost was the highest for individuals within the National Health Service System with 98 consultations skipped due to cost while the lowest number of consultations skipped due to cost was found in the Social health Insurance System. Skipping due to cost is tightly correlated to the presence of gatekeeping wherein in order for a patient to see a specialist, they must first consult a general practitioner and receive a referral.

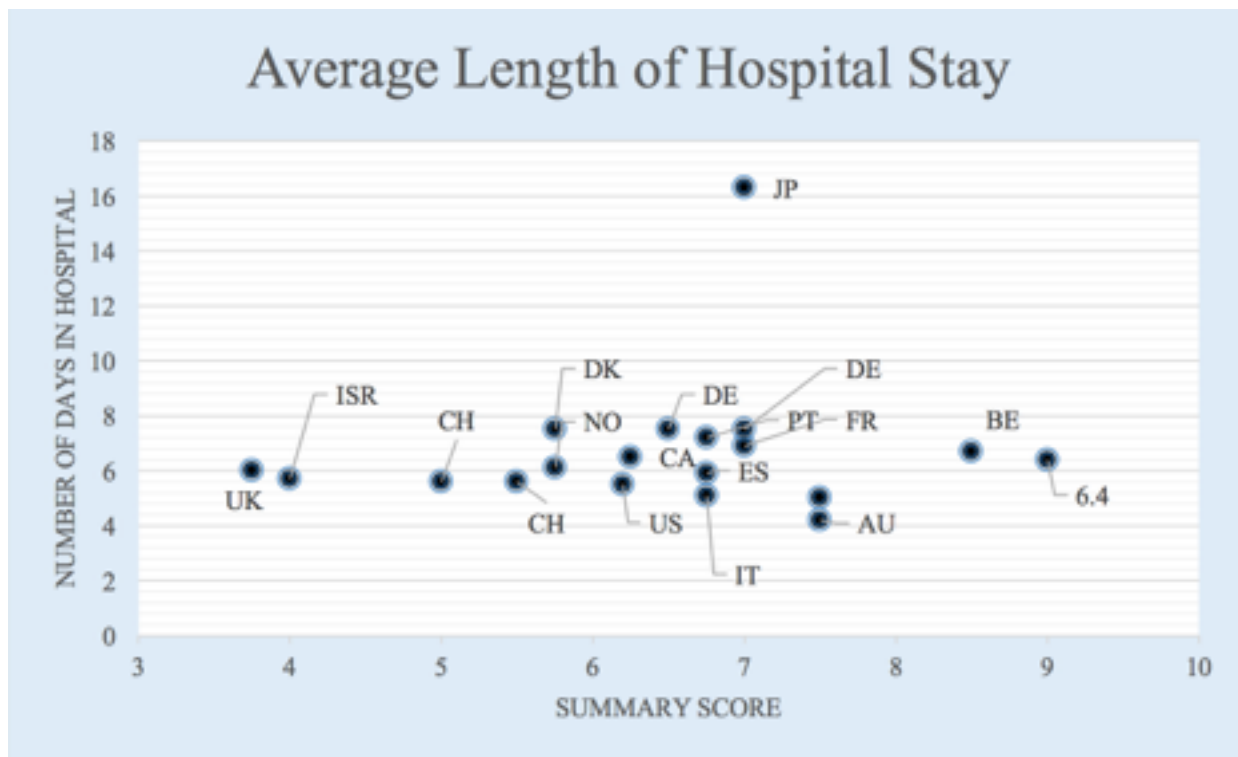


The relationship between summary score and percent of children vaccinated is near zero with an r-squared valued of .03628. The regression equation is $-.4015x + 96.867$. Child vaccination rates were the highest for the National Health Service System and lowest for the Social Health Insurance System. it is important to note that all systems with recorded data (all systems except

the Etatist System) had approximately 94% of their child population vaccinated, therefore identifying one system as having the highest rate is potentially misleading. The Social Health Insurance System however had a drastically lower percentage of the child population vaccinated, with only 78% of children.

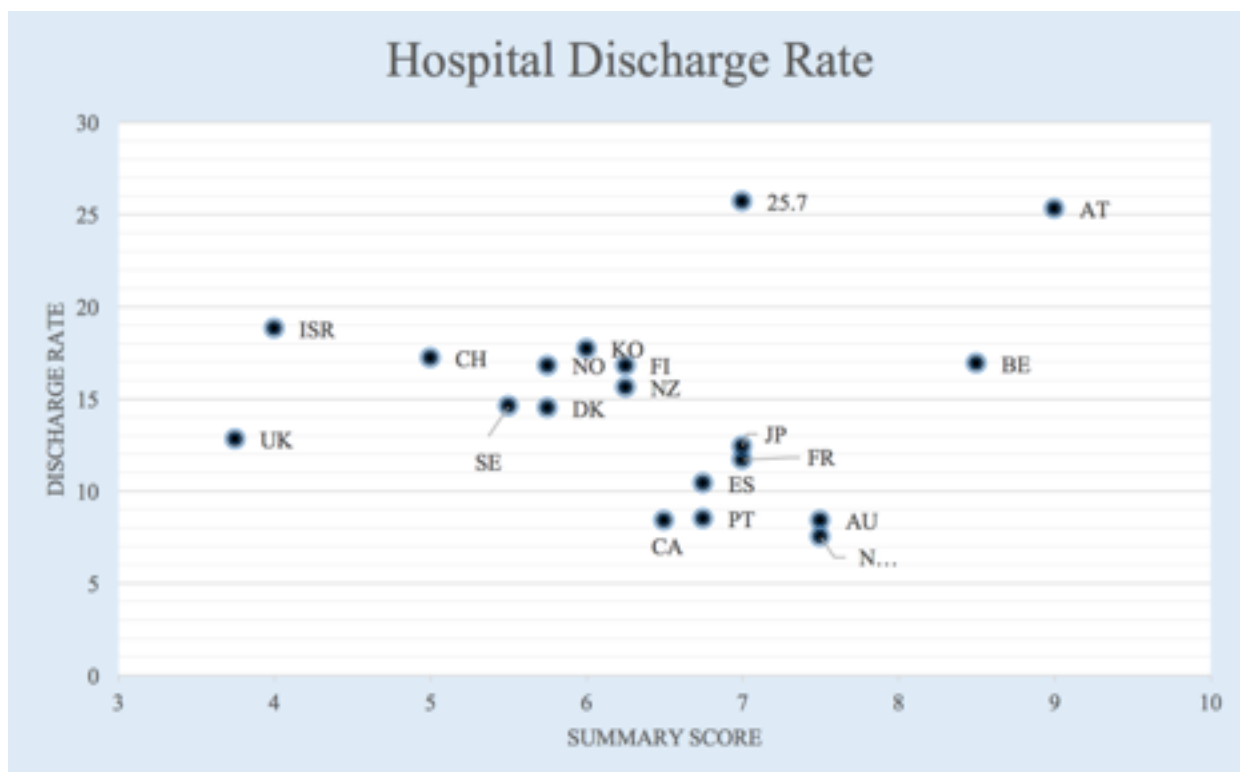


The summary score is not correlated to the percent of adults vaccinated; the r-squared value is .02716. The regression equation is $-2.0246x + 68.926$. The Private Health Insurance System, or the United States, has the highest adult influenza vaccination rate with 69.1% of the population vaccinated, the lowest vaccination rate could be found in the National Health Service System, wherein only 49.37% of the population was vaccinated.

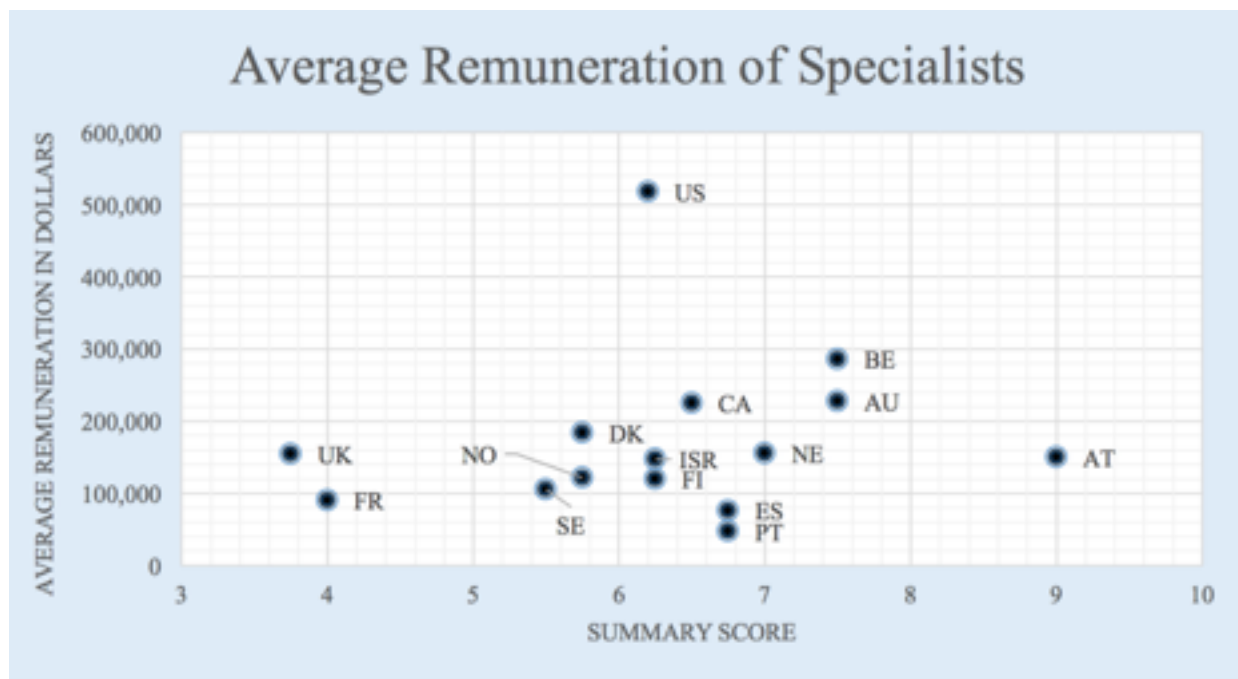


The r-squared value is .01506; the regression equation is $-.2321x + 5.1988$.

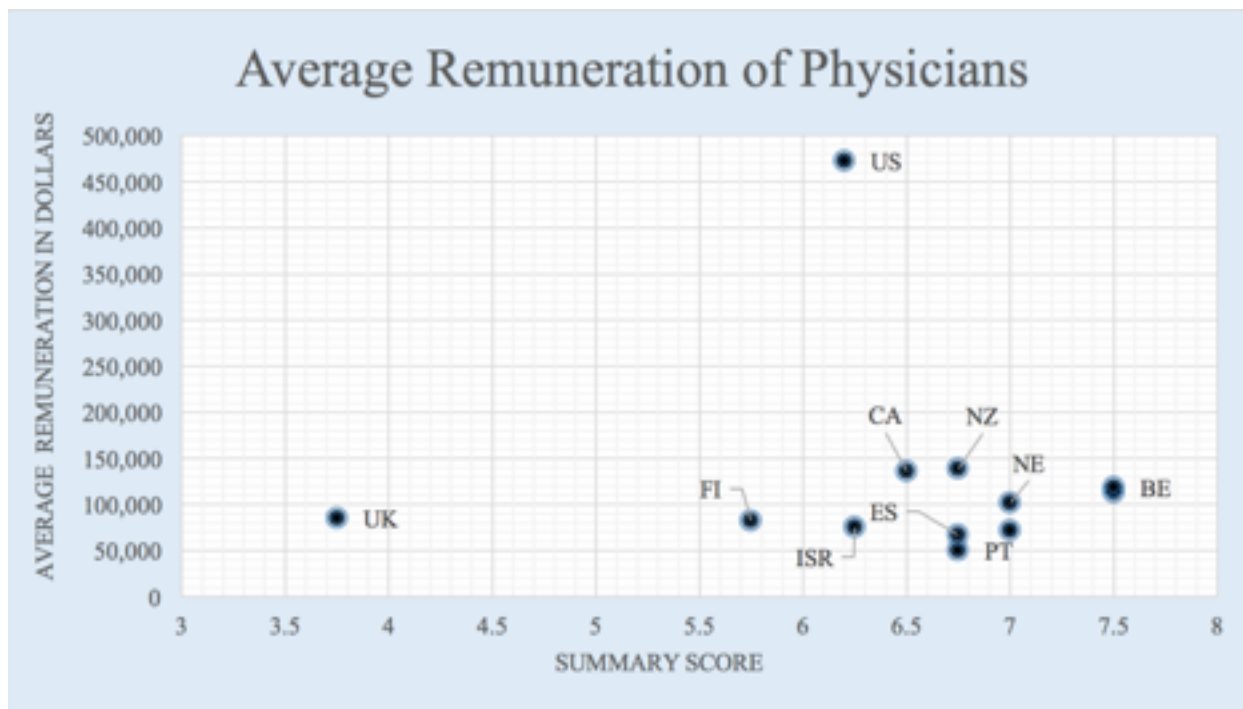
The average length of hospital stay was the greatest for the Etatist and Social Health Insurance systems, with an average of 16.3 and 12.2 days in the hospital. The average length of hospital stay was the shortest for the Private Health Insurance System and National Health Service System with 5.5 and 6.4 days respectively.



The r-squared value describing the relationship between summary score and discharge rate is near zero, with a value of .00186. The regression equation is $.1694x + 13.652$. There is a near zero relationship between summary score and discharge rate. The hospital discharge rate was the highest for the Social Health Insurance System at 18.52% and lowest for the National Health Insurance System at 12.58. Wait times were the highest for hip surgery, the sample medical procedure used for analysis, within the National Health Service System and the lowest wait times were found in the Social Health Insurance System.



The relationship between summary score and the average remuneration of specialists appears to be weak when the United States and Austria, both of which are outliers are included in the analysis. The r-squared value when the United States and Austria are included is .02335. The regression equation is $13259x + 90311$. When the United States and Austria are removed from the analysis, the r-squared value is .4163, indicating a positive correlation between increase in summary score and the average remuneration in dollars.



There is a near zero correlation between summary score and the average remuneration in dollars even when the outliers, the United Kingdom and the United States are removed from analysis.

The r-squared value is .00091 and the regression equation is $-3412.4x + 147985$. The Etatist Health Care System had the lowest concentration of physicians while the Social Health Insurance System had the highest concentration of physicians. Remuneration was highest for specialists in the Private Health System with the average remuneration for a specialist in the United States being \$518,128 per year and the average remuneration of the National Health Service System was lowest, with average remuneration for a specialist being 115,296.59. The average remuneration for a physician was once again highest for the Private Health Service System with the average remuneration being \$472,560. The average remuneration for a physician was lowest for the National Health Service System. The lowest remuneration was

correlated to lowest summary score while the highest physician population was correlated to highest summary score.

As previously stated, the rank order is:

1 = Social Health Insurance

2 = National Health Insurance

3 = Etatist Health Insurance

4 = National Health Service

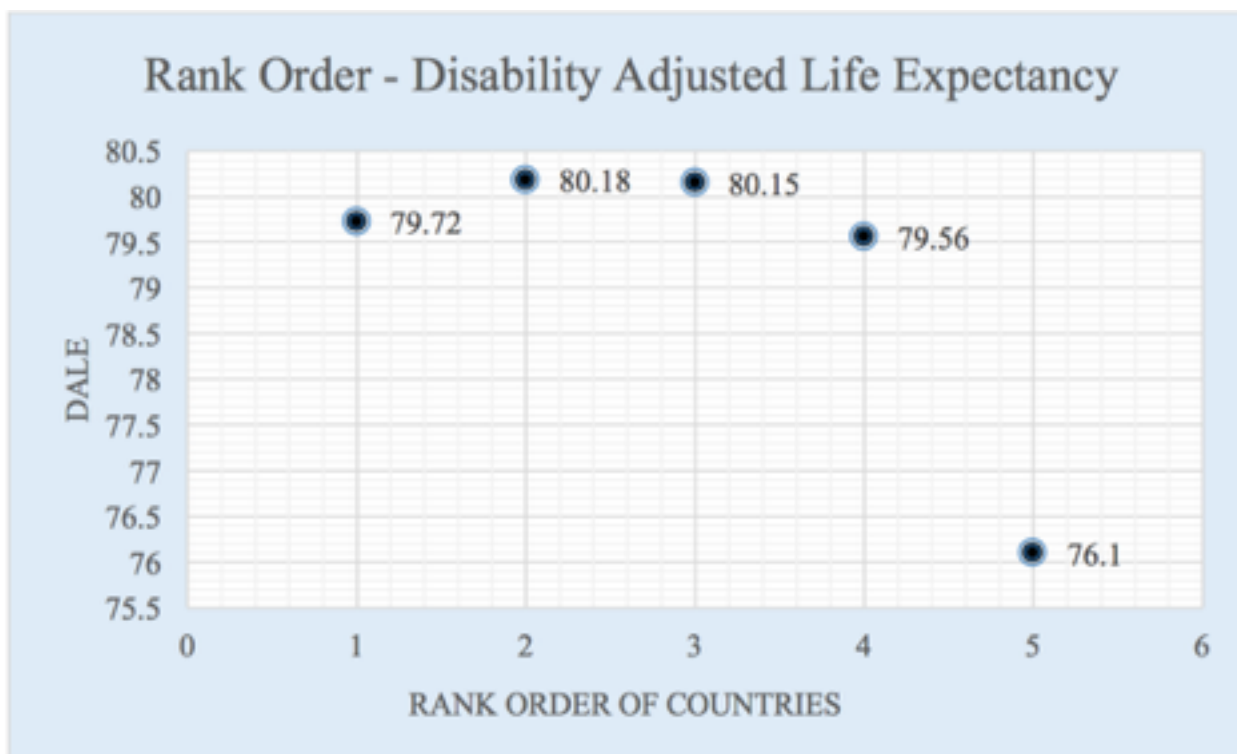
5 = Private Health Insurance

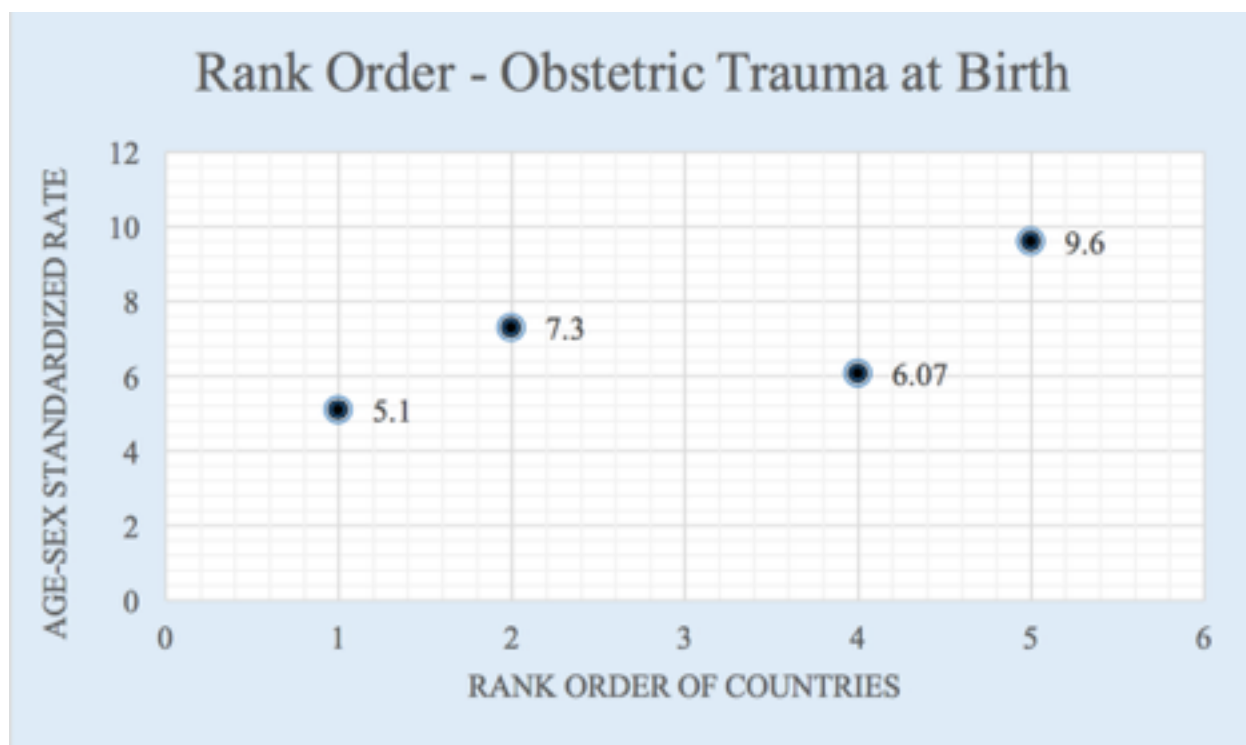


The infant mortality rate in the United States, the only case representing the Private Health Care System, illustrates a substantial disparity between what is the most well funded healthcare system and all other healthcare systems. The United States' IMR compares unfavorably to those

of other developed nations; twice the rate of Scandinavian countries. Several institutional factors may influence this rate; the presence of a modified gatekeeping system within the United States and stifled choice of physicians' dependent on insurance scheme and coverage can be presumed to impact the high IMR. Additionally, premature delivery and low birth weight are tied to poverty. The National Academy of Medicine found that Americans' health has fallen behind other high income nations due to fragmented health systems and risky health behaviors – unhealthy eating habits and excessive exposure to particulates may be environmental factors that contribute to the high infant mortality. Yet, the greatest factor most likely affiliated with a high IMR is the great disparity in wealth that exists within the United States. The GINI index for the United States, 45.0, is substantially higher than other OECD nations. There is a substantial disparity in wealth equality throughout the United States. Mayer & Sarin, researchers evaluating data from the United States Vital Statistics Linked Infant Birth and Death Records, found that economic inequality was associated with higher neonatal mortality even after controlling for the mother's age and race. The authors attributed this relationship to the non-linearity between parental income and infant death, economic segregation, and varied state health care spending. While the non-linearity between family income and infant health accounted for little of the inequality in infant deaths, the presence of economic segregation was affiliated with a higher probability of infant death. States in which there is higher economic segregation in turn also had spent less on healthcare, which was associated with a higher death rate. The increase in economic segregation increased infant deaths more than an increase in healthcare spending reduced death's therefore the net effect of income inequality, despite positive strides in infusing funds into a divided system, still led to infant deaths. Quantitatively, it is apparent that the United States'

GINI coefficient, the key measure of this economic inequality, is substantially higher than similar nations; the GINI index for the United Kingdom being 34.10 and the GINI index for France being 32.7. Therefore, I posit that the IMR as an indicator demonstrates that the principal-agent relationships within the United States are not responsible for the disparity in IMR between systems; rather inequality within the system that is embedded in social and structural arrangements can be isolated as one cause. When looking not purely at the system as a whole but at individual nations within each system, only the National Health Service System had an “outlier” and may have skewed the average IMR. Finland’s infant mortality rate being only 1.9 while most NHS nations have infant mortality rates near 2.8.







Chapter 4: A Case Study Approach - Evaluating AIDS and Tuberculosis Incidence in Select Nations

The prevalence of tuberculosis and AIDS will be examined closer within the countries of Spain, France, and Germany – nations which have experienced a surge in immigrant patterns, are within the same geographic region, yet maintain vastly different healthcare system structures. The means by which the healthcare systems of each of these nations either facilitates or hinders the treatment of these diseases, especially among immigrant populations, will be examined in order to draw conclusions about the efficacy of their particular healthcare system. Spain, a representative for the National Health Service System, France, a representative of the National Health Insurance System, and Germany, a representative of a Social Health Insurance System, can be predicted to have varying methods of treating patients dependent upon the principal-agent relationships that govern treatment patterns. The patient profile of those with tuberculosis within each nation will also be examined. The comorbidity between AIDS and tuberculosis incidence will also be examined and healthcare system reactivity will be assessed.

4.1.1. Preliminary Patient Profiles for Tuberculosis Incidence

The patient profile for an tuberculosis-infected individual in Spain demonstrates a high degree of comorbidity between HIV and the disease in addition to injection drug use and the disease. In Spain, 821 out of the 1284 cases surveyed were male; meaning that 64% of the subject pool was male. Among those who tested positive for TB, 54% were foreign born. 21% were alcohol abusers and 23% tested positive for HIV. 17% had participated in injection drug use. In Germany, there were a total of 5,915 tuberculosis cases; with more common occurrence among men. The likelihood of tuberculosis incidence was 19 times higher than the incidence for

German citizens. The difference between the two groups was 16.6 times higher than the difference in 2015. Native born Germans comprised only 30.9% of all tuberculosis cases; the remaining 69.1% of cases were those pertaining to foreign nationals. The most common countries from which patients who tested positive for TB were from were Somalia, Eritrea, Afghanistan, Syria, and Romania. The spike in tuberculosis incidence in Germany most likely can be attributed to the increased concentration of asylum seekers. In France, a historical perspective may be required to evaluate incidence of the disease as in the course of the last 30 years, tuberculosis prevalence has decreased among particular ethnic groups while increasing for others. Within the nation, the total number of TB cases reported increased between 1991 and 1993, yet that trend discontinued shortly thereafter. However, the rate at which there is co-incidence between AIDS and Tuberculosis has increased steadily since 1997. Among adults, the incidence rate of tuberculosis is 11x higher for migrant children than for French children (Supervie, Ndawinz,& Costagliola, 2014).

4.1.2. The Spanish National Health System: Tuberculosis as a Mechanism of Immigrant Suppression

The Spanish National Health System is structured around *Ley General de Sanidad*, “General Health Law” which was established in 1986. Article 46 of the universally recognized law establishes that there must be an extension of services to the entire population -- therefore making it universal in nature. Prior to 1986, Spain operated on a centralized model of healthcare planning and provision. After the 1986 reforms, 17 regional ministries and departments of health were established; leaving the once powerful Ministry of Health and Social Policy with a limited scope of authority. Problems inherent in the Spanish healthcare system may be associated with

the unparalleled devolution of health competence to autonomous communities (ACs). INSALUD served as the major centralized healthcare provider from 1978 to 2002 and managed the network. Two systems were established to manage patient care. The first of which, a fast track system, was experimental in nature; the second tier remained under the centralized network were both employed. The fast track system was adopted for the Basque Country, Navarra, Catalonia, Galicia, Valencia, Andalusia, and the Canary Islands. The rest of the regions remained under the second tier until 2002 and were directly controlled and supervised by the central administration. Since the Spanish Healthcare System is decentralized, each autonomous region dictates the structure of the healthcare system. While healthcare is administered by each autonomous region, it is not directly financed by them. The tax revenues from payments from private citizens goes to the central government, which then redistributes them to the different Autonomous Regions dependent on their needs and requests. Austerity cuts that are inconsistent between regions now threaten the equality of healthcare provisions throughout the country as Catalonia and Castilla La Mancha are seeking healthcare budget cuts and reductions in per capita expenditure (Legido-Quigley et al. 2013). These austerity cuts have been especially poignant in the treatment of tuberculosis and AIDS, which has been hindered by a lack of funding. Spanish healthcare law prevents treatment of illegal immigrants regardless of circumstances - which has created a mounting threat of increased transference of contagious diseases. In 2012, a large sector of the illegal immigrant population in Spain were diagnosed with TB; the disease continued to spread at a rapid rate due to the close proximity in which homeless illegal immigrants live. The exclusion of all undocumented migrants from all but basic emergency care, prenatal care, and pediatric

care has ended the principle of free services “for all”. An estimated 873,000 non-registered immigrants were not provided with non-emergency health care. The implications of which will be further explored in a later chapter of this paper. Health expenditures by Spain has been in line with the upwards international trend of investing in healthcare infrastructure and reached US\$ 2671 purchasing power parity (PPP) per capita and 8.5% of the total gross domestic product in 2007. Most health expenditures, 71% of them, rely on the public sector. The system heavily relies on specialist care; with 54% of public health expenditures being sourced for inpatient and outpatient specialists, only 16% of funds being sourced for primary health care and 19.85% of funds being sourced for pharmaceuticals. Only 1.4% of expenditures are spent on prevention of diseases and public health.

The program has been plagued by long wait times for procedures, appointments, and follow-ups. Patient choice is limited; the right to seek a second medical opinion is regulated by most autonomous communities. A patient’s ability to choose a specialist is dependent upon referral from a general practitioner who is a gatekeeper and for users under the age of 14, the referral is carried out by a primary care pediatrician. Between 2002 and 2008, patient perception of the quality of service they received decreased. By 2008, the percent of people who viewed the system positively dropped by 10 percent and the percent of people viewing the system negatively doubled – illustrating a massive decline in public sentiment. The same trend was seen amongst outpatient and hospital specialized care. Most complaints stemmed from long waiting lists to receive an appointment. Often, a patient would be asked to make a follow up appointment times to poor specialized care physician and would be told that the closest approximate time to get an appointment would not be for another 3 months even in cases in which a disease may require

urgent treatment.

Tuberculosis incidence serves as an indicator of health care infrastructure and the success; therefore, it will be used as a means of analysis in this paper. After the austerity cuts of 2012, the Spanish government ceased to provide unregistered immigrants with non-emergency healthcare. This may lead to a public health crisis in the future. The *Red Nacional de Vigilancia Epidemiológica* Review classifies respiratory and meningeal tuberculosis as a statutorily notifiable disease; In 2000, the registered incidence rate of respiratory tuberculosis was 19.6 cases/100,000 in the Spanish population. In 2001, the estimated rate decreased slightly as only 16.9/100,000 were diagnosed; despite these seemingly small quantities, Spain has the second highest tuberculosis incidence rate, only next to Portugal. In Germany, 45.7% of TB cases were derived from a foreign source. There were a total number of 4,330 cases. In France, 48.3% of TB cases were foreign, and there were a total of 5,116 cases. In Spain, 32.0% of TB cases were derived from a foreign source; with a total of 7,089 cases. Nearly 50% of Spanish lawful or unlawful residents were attributed to foreign born TB cases. These individuals were diagnosed with TB within the first two years of arrival in the nation. Treatment for immigrants remains the most difficult issue to surmount; the Spanish National Health Service System provides a considerable amount of choice for patients seeking an infectious disease doctor without the presence of gatekeeping. Yet, the regulatory factors discussed earlier do not provide the same degree of choice to immigrants. Physicians are remunerated with a mixture of fee-for-service and

capitation methods. Additionally, drug price bargaining operates on a mixed system between a nationally bargained price schedule for certain medication and drug company price setting with an absence of negotiation with the government for other medications. In the case of tuberculosis treatment within Spain, physicians within Spain are remunerated through capitation for treatment of infectious disease. The MDR-TB action plan is installed within Spain which allows for WHO funding, approximately .9 Billion dollars allocated worldwide. Tuberculosis medication is covered by insurance for all legal residents and therefore is subjected to government negotiation for drug price setting.

There is a high diagnostic delay that occurs mostly amongst people seeking health care from primary care services. The government of Madrid is attempting to reduce this delay; however, it is difficult to differentiate whether the delay is primarily caused by a drawn out diagnostic process or if it is due to other problems that face the immigrant population. The high use of a public emergency service may be indicative of a lack of accessibility to the public health system. Immigrants were often unaware that a cough is an early warning sign of tuberculosis and therefore, it went unreported until the TB developed. The incidence of tuberculosis in Spain can be traced to the legislation governing how undocumented migrants are covered by the Spanish National Health System. In the wake of the post-2009 economic crisis, the regulation of health coverage for undocumented migrants in a publicly funded, decentralized healthcare was of particular interest. In 2012, the Spanish Government issued the Royal Decree Law which revoked their full right to public health care coverage. Many regions adopted legal, legislative, and administrative actions to void or limit the overall effects. However, the law has been unequally implemented across the nation. Around 2009, Spain was heavily stricken by the

economic crisis and was at the center of the austerity debate. The People's Party passed Royal Decree Law 2012 in April of 2012 which changed healthcare entitlements. For undocumented migrants, it revoked their equal right to public healthcare granted by Law 4/2000. Immigrants were left only with access to emergency care, maternal care, and child care under the age of 18. Ten regions in Spain have established alternative pathways for healthcare services for low-income undocumented migrants; mostly including primary and secondary care. However, most of the regions hold residency requirements. In Catalonia, there was a three-month residency requirement to grant access to primary care but a required one year for access to secondary or hospital care. In Andalusia and Asturias, there was no time required and therefore, immigrants had low difficulty in accessing treatment for tuberculosis. Other regions have limited treatment for those who are economically contributing to the country. In the Canary Islands, the first regulation required that applicants provide proof of identity, had more than one year of residence, and could provide income and asserts certificates in addition to a personal income tax return from their country of origin in addition to a tax return from Spain, then they would be able to access healthcare services. A second regulation allowed for a social worker to advocate on their behalf if they were unable to obtain some of these documents. Tuberculosis incidence was higher in autonomous regions in which access to healthcare at a primary or secondary facility was limited for immigrants for a period exceeding one year. While Tuberculosis incidence has declined since 2003, it still remains at an unsustainable level and is concentrated amongst immigrant groups. As Spain continues to receive more immigrants, the problem is projected to magnify unless the healthcare infrastructure is reformed.

4.1.3 The French National Healthcare System: Disparities in Treatment Between Options

The French system has been widely lauded by French residents. The government's expenditures as a proportion of GDP are far lower than that of the United States, yet there is higher satisfaction amongst its population. Additionally, consumers are given a wide choice of providers. The primary criticism of the system has been that it requires excessive centralization of decision-making and does not take into account regional disparities in wealth and chronic deficits incurred by French National Health Insurance (NHI). The program has proven effective in providing universal health insurance for the entire population without excluding private insurers from supplementary insurance market. The French national healthcare program is typically characterized as liberal - allowing cost sharing, selection of the physician by the patient, and the freedom for physicians to practice wherever they please within the country. Hospital care is primarily within public hospitals yet some hospital care is provided by teaching institutions (Rodwin, 2003).

Healthcare comprises a larger proportion of France's GDP relative to that of other countries in the OECD but France spends less in per capita health expenditures. France relies on a mix of public and private systems. In reforms made in 2000, a medical assistance program was established for the poor. Previously, access to healthcare and benefits varied depending on region. The antiquated system was replaced with a unified national Universal Medical Coverage plan which enrolled all residents below certain threshold in both a statutory health insurance plan and complementary insurance plan. Those with incomes up to 30% higher than the threshold

received a voucher that would help them finance a private complementary insurance. In 2000, about 1/2 of French NHI expenditures were financed by employer payroll taxes (51%) and a general social contribution. 34.6% of funding is levied by the French treasury on earnings and investment income. Taxes on the pharmaceutical industry and alcohol products are also diverted to fund healthcare. In contrast to Spain, healthcare services are not “rationed” for patients (Toullier, Benayoun, & Castro, 2016).

Regional Health Agencies were created in 2009 to adapt national policies and regulations to local circumstances. Regional health agencies allocate discretionary funds to different care providers and maintain authority over private hospitals and end-of-life care programs. RHAs have proven to be an effective tool in merging a centralized system with regional contracting. The ambulatory care sector, however, has been a fledgling element for which the advent of RHAs have been ineffective. Small hospitals have been closed down because doctors choose not to work in them and there is a large imbalance in the distribution of doctors between rural and metropolitan areas. The TB notification rate in France was far higher within the first 2 years after entering the country. This phenomenon has most often been attributed to differences in migrant networks and exposures to social and behavioral risk in host countries.

There are very apparent inconsistencies in the way in which Autonomous Regions report tuberculosis at disease sites. In total, 10,053 TB cases were identified during the study period. The most common disease site was the lung. As opposed to other European nations, the epidemiological pattern of Spanish TB cases shows some features that distinguish it from the nations. In contrast to Nordic state, immigrants are a minority in Spain. While those in Germany

have an elderly populace with the highest incidence of TB, it was mostly young people that were hit by disease in Spain. It has been advised that Spain engage in mandatory reporting at the national level, which is currently limited to respiratory TB and meningitis but should be expanded to all forms of TB. Ambulatory treatment of TB should also be promoted. There is also a high comorbidity between TB and HIV, therefore particularly HIV patients should be targeted in TB treatment and prevention (Toullier, Benayoun, & Castro, 2016).

The diagnostic delay of tuberculosis diagnosis in France is far greater than in neighboring European countries. The delay can be reduced through improved access to care, earlier hospital referral, and minimizing the use of empirical antibiotic treatment. Diagnostic delay was significantly related to socio-demographic characteristics. The mean age of diagnosis was 45.5; the first symptoms that present are caught, asthenia, weight loss, sweats, fever, and then hemoptysis. The average delay between symptom onset and first healthcare contact was 47 days. Two primary factors were found to lead to a lack of responsiveness to seeking medical care. The first factor, a lack of medical insurance, appeared to be highly correlated. Despite the lack of responsiveness, the TB rate was only 7.4/100,000 residents in 2014 (Yurtoglu, 2018).

The absence of medical insurance increased patient delay. Although medical insurance coverage is available for most people living in France, undocumented migrants suffer from administrative constraints linked to immigration policy. Fear of migration authorities has been associated with increased diagnosed delay. Being from a high burden country, or an “endemic” nation was associated with reduced health system delay as a consequence of a lower threshold for TB investigation in this population. The countries: Nigeria, Pakistan, South Africa,

Bangladesh, Philippines, DR Congo, Ethiopia, Myanmar, UR Tanzania, Mozambique, Viet Nam, Russian Federation, Thailand, Kenya, Brazil, Uganda, Afghanistan, Cambodia & Zimbabwe all had minimized wait times and increased early prevention of Tuberculosis. There were significantly shorter health system delays amongst patients whose first health care contact was the hospital rather than a primary care provider. Amongst the French patients evaluated, reasons for this trend may be a lack of TB suspicion among primary care providers, easier access to diagnostic tests, and more severe TB disease in patients who presented at the hospital, and preferential use of hospital services for patients who are at higher risk of TB. In response to the heightened incidence of tuberculosis in France, the nation has instituted a program to enhance early diagnoses and provide adequate treatment for all tuberculosis cases, improve screening, optimize the BCG policy, and maintain epidemiological surveillance.

In identifying factors influencing efficacy of TB control, three delays are analyzed. Diagnostic delay is split into three periods: 1) the health service delay, 2) the patient delay, and 3) the combination of both which is the total diagnostic delay. Delaying treatment for more than 30-60 days led to a greater number of increase infected contacts (Steffen, 2016).

4.1.4. The German Healthcare System: Tuberculosis Mitigation Through a Tiered System

Healthcare insurance is mandatory for any German citizen or permanent resident. Healthcare is provided by two separate programs. The first is a competing, not-for-profit nongovernmental health insurance fund, referred to as a “sickness fund”. The second program is a substitutive private program. Dissimilar to Spain or France, the different layers of government do not directly finance or deliver healthcare or play a role in delegating the financing to different regions. The

Public (Social) Health Insurance program is compulsory for those who earn less than €48,000 and their dependents. With nearly 75% of the country under this program, the publicly financed scheme places a large financial burden on Germany. Over 200 competing health insurance funds, “sickness funds” finance the program in addition to mandatory contributions for those with high wages who must pay into the program. Private health insurance (PHI) is the second program available and covers civil servants - who are refunded a sizeable fraction of their health care costs by their employer, the self employed - who are not eligible for publicly funded health insurance, and high earners who most typically opt out of the Public Health Insurance program. The German healthcare system is funded through insurance premiums paid by employees and employers. Statutory health insurance is compulsory as long as gross earnings are under a fixed amount. Anyone who earns more than that fixed amount is required to buy into private health insurance. In the German system, there are no network limitations — meaning that patients are free to see any doctor they want. There are no insurance deductibles — leading to more Germans seeking treatment regardless of potential insurance expenses. Medical appointments do not require copays and patients are only asked to present a insurance card. In 2011, health spending per capita in Germany was \$4495 with was roughly median compared to other EU countries. The system has been termed “solidarity-based” as the Health Care Structure Act introduced competition between sickness funds to improve efficiency while regulators monitored regulation. Competition is enhanced among providers because there is free choice of office-based physicians. However, competition among payers is limited because sickness funds were assigned to payers originally. The system was then changed so that insured individuals could change funds on a yearly basis. Free choice of sickness funds led to funds having to publicize themselves and

reduce contribution rates - therefore making healthcare insurance more affordable for most. In 2007, sickness funds began to introduce tariffs which was previously only allowed for private health insurance companies. Each sickness fund could now provide various benefit package options. To provide increasingly accessible services, palliative care and hospice services were integrated into sickness fund coverage in 2000 (Wiese, 2014).

Germany spends a substantial amount of wealth on healthcare. According to the OECD, expenditures on health totaled 333.5 billion dollars, amounting to 11.1% of GDP. Population coverage was expanded to include individuals receiving welfare benefits; with 113 sickness funds in total competing for client buy-in. As of 2017, the threshold for required statutory health insurance is €57, 600. Non-earning dependents are insured as well without additional payment. 87% of the population receives statutory health insurance; this overwhelmingly high percentage is indicative of a high average income (Karo, Haas, & Kollan, 2014). The occurrence of tuberculosis in Germany follows a similar trend to that of Spain; with foreign nationals residing in the country having 20x higher chance of having tuberculosis. The difference between the two groups significantly increased as opposed to the previous year. 34.1% of all cases were German and 65.9% had a foreign nationality. The foreign nationals were affected earlier in life than German nationals; with a median age of contraction of 28 years old as opposed to 60 years old. Germany only had 7.2 cases per 100,000 people – far lower than both Spain and France. A significant increase in the number of notified TB cases in 2015 compared to previous years was primarily due to an increase in the number of asylum seekers. However, overall Spain has had a relatively stagnant number of TB cases over the past 10 years. Most of those who seek asylum in

Germany are from countries with a high TB incidence; many of whom come from the Middle East. Since coverage is universal for all citizens, even immigrants who are temporary are covered under the German Healthcare System – receiving coverage from their sickness fund.

The German and French healthcare systems appear to be more equitable in treatment of tuberculosis than the Spanish National Healthcare System according to the qualitative and quantitative factors analyzed in this study. Economic factors such as government expenditures and expenditures by compulsory contributory health insurance schemes are indicative measures of the degree to which the government promotes autonomous regulation of healthcare; and the means by which it seeks to promote or dissuade institutions from promoting equity amongst the various classes, ages, and populations that rely on health care institutions. Overall, it was found that Germany and France's high investment in specialized health care was more effective than Spain's decentralized healthcare model which spent far more in out-of-pocket expenditures than the other two nations. Unmet health related needs were found to be dependent on social class; in Germany and Spain, unmet mental health, dental, prescription, and emergency related needs were met far less often among lower socioeconomic strata. Amongst Spaniards, the problem was largely concentrated in the ability to maintain "double" healthcare, for which community care was compromised amongst those who only held the statutory healthcare, and home care and long term care services actually favored those in lower socioeconomic strata. France's healthcare system was far more equal in its provisions across strata; yet dental care was universally compromised by the system's ignorance of dental care. Tuberculosis incidence appeared to be tightly correlated to the economic factors that were evaluated; in systems that were decentralized and divested power to regional governments, there was vast inequity. Amongst all three nations,

the influence of foreigners on the spread of tuberculosis was significant and is a causal factor for increased incidence.

Throughout the last two decades in western countries, the fight against HIV with biological and financial resources aimed at targeting early detection and treatment has led to a considerably lower incidence of hi infection. The life expectancy of those with HIV also has increased through the use of the combination antiretroviral treatment, cART. Pre-Exposure Prophylaxis (PrEO) has also been shown to be effective. I hypothesize that the level of access to specifically, cART, will determine the outcomes of HIV-infected individual; increased access will correlate with lower incidence. Even in high-income countries, late diagnosis, and therefore late initiation of cART treatment is common. The primary obstacles to beginning cART are remaining undiagnosed, and being diagnosed late. The primary mechanism leading to the spread of HIV is a lack of diagnosis.

France

Within the last decade, there has been an increase in the prevalence of sexually transmitted diseases. In 2012, the estimated incidence of HIV in France was 6400 new infections which increased to 7500 when the number of undiagnosed cases was included. Heterosexual transmission accounts for 56% of new infections and has decreased throughout the last 20 years, yet incidence among homosexual men has increased from 39% in 2003 to 42% in 2012. There are geographical disparities however in the density of HIV infected individuals. By the end of 2012, there were a total of 88,000 reported cases of AIDS and 47,000 AIDS-related deaths in France. France remains one of few Western European countries with a relatively high rate of

AIDS; the mechanisms of its healthcare system will be used to attempt to answer why this pattern holds.

HIV affects each region of France, yet 4 regions were more affected. 40% of new and undiagnosed HIV infections occurred in the region of Ile-de-France, even though only 19% of the population actually lives in that region. The most affected individuals within the region were foreign male homosexuals whose undiagnosed HIV prevalence was 44 to 108 times higher than the national level. The second highest group consisted of people who were born abroad and inject drugs; with a rate that is 11 to 18 times higher than the national level.

France, as part of the National Health Service System, has a strong gatekeeping presence; meaning that in order to see a specialist, one must first see a general practitioner who refers that patient to the proper physician. The first impediment that the gatekeeping system poses is an extended wait period for the patient to meet with an infectious disease doctor. Many infected with HIV go undiagnosed for lengthy periods of time; the low physician density of specialists within France, and specifically low density of infectious disease physicians coupled with the wait time between the consultation with the general practitioner and specialist leads to a higher chance of morbidity during that waiting period. The number of general practitioners per 100,000 inhabitants is 154.1; the number of doctors who operate a practice in dermato-venereology is only 6/100,000 (Soriano, 2018).

Additionally, in France, there has been a high incidence of reports that HIV-positive individuals are being denied medical treatment for non-HIV related health needs. In a situation-testing survey performed by French healthcare company, AIDES, 440 dental and 116 gynecology offices were selected in a random sample of 20 French cities with similar HIV incidence and

medical density. Two individuals would request an appointment for the same reason with the same sociodemographic characteristics, insurance status, but have a different HIV serological status. Within the dental office sub study, it was found that 148 dental offices refused to provide care, or 33.6% of the office stop those with HIV; 6% of gynecology offices refused to provide care. Among those that refused care, most were in the form of disguised refusals during dental visits; with 30.0% reported as claims that treatment could not be performed due to a fake reason. The second most type of discrimination was a discriminatory remark, for which 16.8% of individuals with HIV incurred (Hofmann et al, 2014).

Spain

In Spain, the current estimate for the number of people who live with HIV are 145,000; 20% of which are unaware that they have the disease. The high rate of late HIV-presentation stems from regulatory measures that plague the Spanish healthcare system. These regulatory issues affect both the research and development of HIV treatment and also hospital, ambulatory, and palliative care of AIDS. The Spanish Healthcare System has been largely success in the prevention and treatment of tuberculosis in HIV, anti-retroviral drug resistance, antiretroviral metabolic abnormalities, vaccine development, and immuno-pathogenesis (Soriano, 2018).

53.6% of HIV-infected individuals are male homosexuals, 2.8% of infections stemmed from injection drug use. There are approximately 10 new cases per days of AIDS with 3,428 new HIV diagnoses in 2015. 46.5% of new HIV infected individuals presented with a delayed HIV diagnosis. In Spain, the main cause of mortality is not AIDS itself but diseases that the immunodeficiency spurned from HIV infection facilitate such as liver disease. AIDS mortality in Spain illustrates the advances in therapeutic management that have come about from advances in

therapeutic technology. There is also a sharp increase in the chance of dying from AIDS as strides have been made in combatting AIDS mortality, but not AIDS incidence. Since the 1990s, there has been an upward shift in the age of the most affected groups among both men and women, with the average age of infection around 30. Primarily, immigrant women in Spain living with HIV have the worst adherence to medical treatment and follow-ups compared to native Spaniards. HIV positive Latin American immigrants living within the United States faced stigma not only with being associated with the virus but also with being undocumented. Sub-Saharan patients were taking herbal remedies without informing doctors; therefore, cultural conceptions of pharmaceuticals influence their HIV treatment and likelihood of seeking out treatment. Additionally, the language gap is a significant factor that influences vulnerability to HIV at preventing and treating the disease. In Spain, more than half of women diagnosed with HIV are immigrants and up to 30% of the AIDS cases among women were found among Latin American and sub-Saharan immigrants. The rate of medical loss in follow-up appointments was twice that of Spanish women. There is a lack of evidence to explain why there is lower adherence to HIV treatment (Soriano, 2018).

In the German ClinSurv HIV cohort evaluated by Karo et al., patients who were originally from sub-Saharan Africa and had a low CD4 cell count or a high viral load had an increased risk of tuberculosis. The co-infection of tuberculosis and HIV poses a risk for developing and industrialized nations. Germany has both low incidence for tuberculosis and low incidence of HIV. The population is 80.5 million; 8% of whom are foreign and 20% new migrated. The incidence of tuberculosis has continued to decrease in the general population but the rate of decline has become less and in recent years. 90,000 adults aged 15 and over are living with HIV.

The HIV prevalence in adults aged 15 to 49 is .2. 74% of people living with HIV are on ART.

The rate of newly diagnosed HIV infection was 3.5/100,000 within the population. The rate has slowly increased since 2004 when it was 2.7/100,000. The majority of new HIV infections within Germany were male. 66.3% of cases are transmitted through sex between men. Compared to France and Spain, Germany's incidence of HIV and AIDS is drastically lower (Hofmann et al, 2014).

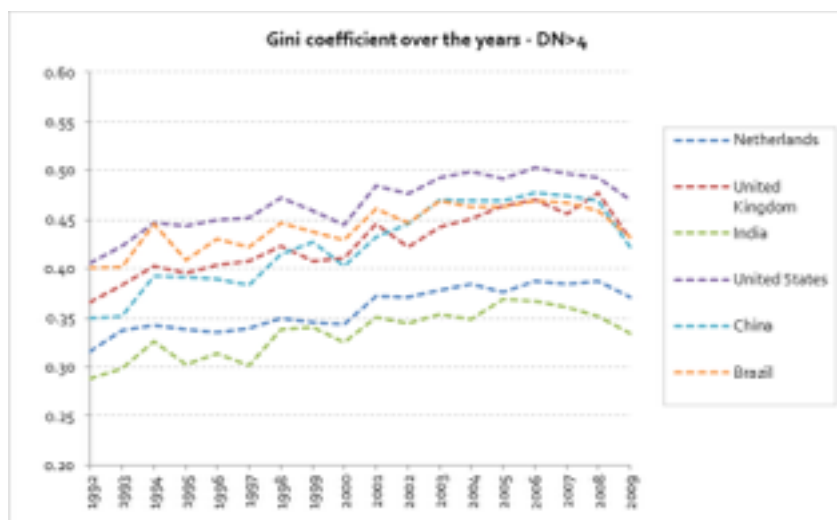
Chapter 5: Conclusions and Limitations

In this study, I first conducted qualitative research to determine the principal-agent relationships within each healthcare system. Employing this information, I then developed a “check list” of ten indicators, on which I gave each healthcare system a score based on whether that nation subscribed to a particular, predetermined condition. Each indicator was conditionally evaluated on a spectrum from 0.0 to 1.0. Each system was attributed either full points (1.0), partial points (0.5) or no points (0.0) depending on the indicator performance. Since there were ten indicators, and a maximum score of 1.0 for each indicator, the maximum summary score was 10.0 and minimum possible summary score was 0.0. These scores were then used to rank each system by nominal score. I then consulted literature by Boehm et al. and Wendt et. Al to evaluate how well their system scored on average relative to what is suggested to be the defining elements of the “best” and “worst” healthcare systems. The rationalizations for each country’s ranking were provided and based on the aggregation of data from the World Health Organization and Organisation for Economic Co-operation and Development. Each healthcare system was then evaluated based on a complete set of performance categories. These performance variables were quantitatively evaluated in both Microsoft Excel and STATA. The variables, categorized as systemic variables, access variables, health expenditure variables, operational variables, hard indicators, soft indicators, and social determinants. I then explored whether the individual healthcare system yield direct healthcare outcomes or whether the healthcare system yields outcomes that are achieved with variable inputs. I concluded that the healthcare systems yielded outcomes regardless of healthcare system. I then analyzed the incidence of tuberculosis and

AIDS and how institutional arrangements within specific healthcare systems can be seen to be causal factors in varying healthcare outcomes.

In concluded overall that the The United States is an anomaly in terms of analysis. The nation has the highest infant mortality and highest number of potential years of life lost. While potential years of life lost and DALE have been controversial indicators of healthcare system quality, the study confirms that the

United States' healthcare outcomes are most likely due to the alternative hypotheses that both dietary trends and socioeconomic divisions shape the healthcare of its citizens. Poor healthcare within the United States can be explicitly linked to the increasing inequality within



the United States between socioeconomic strata. This study disproves one of my hypotheses – the notion that summary score, the quantitative measure of the influence of principal-agent relationships on quality of healthcare system, on the healthcare outcomes of the country. The GINI coefficient increased from .41 to .47 between 1992 and 2009. The estimated number of years of life lost for the United States was drastically greater than any other country, 1.7x the number of years of life lost for the system with the second highest potential years of life lost. The United States had the lowest DALE. While the Private Health Insurance System did not have a drastically different number of cancer deaths compared to other healthcare systems, AIDS incidence was exponentially greater than that of other healthcare systems. The number of new

AIDS cases in a single year for the United States, 25,355 cases, superseded all other healthcare systems' counts of the number of new cases. The United States also had the highest number of deaths from ischemic heart disease.

My primary hypothesis, that the Social Health Insurance System would perform best was confirmed despite the lack of correlation between nearly any of the indicators and summary score. The Social Health Insurance System performed the best overall. The SHI system achieved a balance between mid-level remuneration of physicians and specialists, and an absence of consultations skipped due to cost. The hospital discharge rate and length of hospital stay with the exclusion of the Netherlands identified the least incentive for physicians to either overload their docket with patients or to compromise on quality of care. Countries that subscribed to the Social Health Insurance System largely relied on government expenditures and voluntary expenditures to fund the system; spending slightly less than the United States, yet providing compulsory, universal healthcare to all inhabitants. The system also spent less on pharmaceutical spending and more on preventative medicine - which was correlated to a higher disability-adjusted life expectancy and lower number of potential years of life lost. There also was a high quantity of hospital beds per 1000 inhabitants with a mid-range concentration of nurses and doctors per capita. Obstetric trauma and infant mortality were low for SHI nations - indicating that the healthcare system presents a high quality of care especially with regards to early life care. While death from ischemic heart disease was comparatively high, this is most likely due to biological factors that are not explained by this study.

The primary limitations of this study were that many of the healthcare systems lacked OECD data for many indicators, making the summary scores a somewhat inaccurate

representation of system as a whole. Additionally, many of the systems contained outlier nations (see Norway, “typhoid fever incidence”) which skewed the data. A third limitation proved to be the near zero correlation between many of the indicators and the the summary score for each system. In future studies, data should be derived from a larger pool of nations – many of which are not OECD nations. In expanding the case study approach taken within this report, I propose to analyze in future studies these series of quantitative and qualitative factors by NUTS 2 Region to evaluate whether these trends hold true for more economically and industrially diverse nations. The variance between systems may be greater when evaluating nations that do not have accessibility to as great amount of funds.

APPENDIX

Figure 1

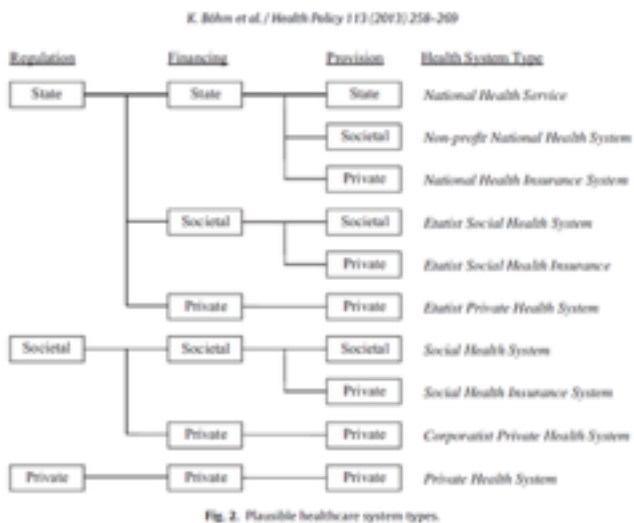
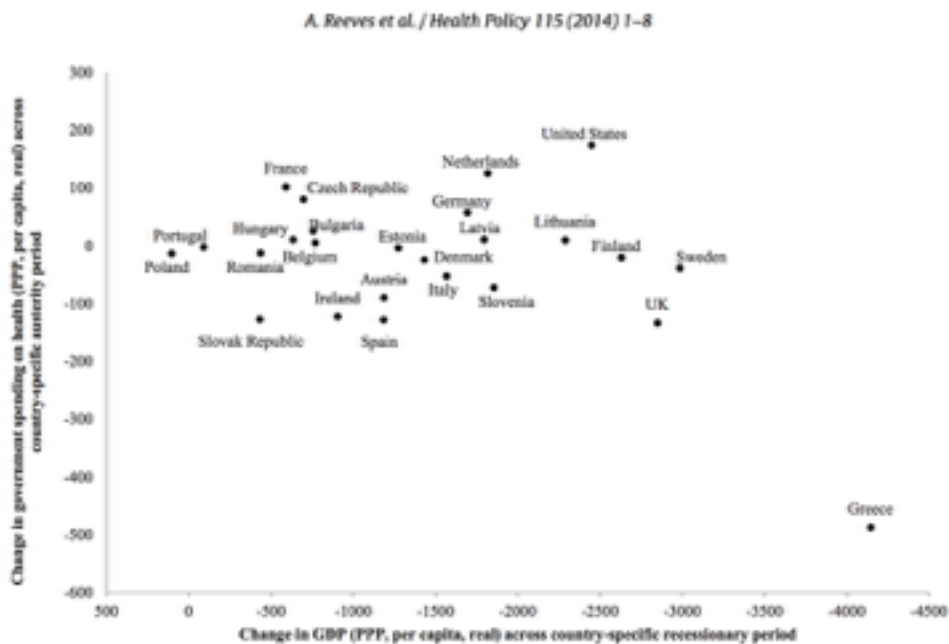


Figure 2



Appendix 3A: The percentage of smokers within the population was found to not be dependent upon summary score. The r-squared value from the regression analysis is .0862, indicating that nearly none of the variability of the response data around the mean is explained by the model. Looking at individual cases was more of an evaluative measure for this socioeconomic determinant. The % of smokers within the population was the highest within the Social Health Insurance System with 22.4% of the population smoking. The lowest % of smokers was found in the Private Health Service System with 11.4% of the population smoking. This trend is largely culture-driven with many of the SHI nations, including Austria, Germany, and Belgium involving smoking as a source of socialization and the United States, the only case categorized as a Private Health Service System, being largely focused on the health hazards of smoking and disregarding the perceived social benefits that some European see within smoking culture. The average alcohol consumption in liters was likewise evaluated as was found to be highest in the Social Health Insurance system with an average of 10.68 liters consumed per person per year. The average alcohol consumption in liters was lowest within the National Health Insurance and Etatist Health System with 8.13 and 8.15 liters per person. Air particulate exposure was highest within the Etatist system with Korea having substantially higher exposure than Japan. The Japanese population as exposed to an average of 13.3 PM_{2.5} mg/m³ while the Korean population was exposed to an average of 28.7 PM_{2.5} mg/m³; averaging to 21 between the two nations that comprise the Etatist Health System. The lowest concentration of air particulates was found in the Private Health Service System with only 8.4 PM_{2.5} mg/m³.

The r-squared value linking the prevalence of asthma/COPD and summary score was .188;

Indicating a minimal correlation. The age-sex standardized rate per 100,000 in the population with Asthma and COPD was the highest for the Private Health Service System with 262 individuals suffering from either condition. The number of individuals with Asthma and COPD was the lowest for individuals within the Etatist Health Insurance System with 183.5 cases per 100,000 individuals. Air particulates exposure and presence of Asthma and COPD was predicted in my study to be correlated due to the respiratory issues associated with environmental conditions that stem from high air particulate quantity. This hypothesis was proven invalid as the relationship was actually inverse of what was initially predicted.

Appendix 3B: The number of deaths from cancer when evaluated by “Rank Order” did not illustrate any particular trend. The number of cancer deaths was particularly low among Etatist nations yet prostate cancer incidence was highest for Etatist nations. Tuberculosis incidence was particularly high for the Etatist nations. AIDS incidence was found to be particularly high for the Private Health Insurance System but not notable for any other healthcare system. Only these systems had data published on typhoid fever incidence: the Social Health Insurance System, National Health Insurance System, and National Health Service System yet there was no trend seen in incidence of typhoid fever. The Social Health Insurance System had the lowest incidence of the three systems. No conclusive results can be drawn about how raw disease outcomes are linked to summary score or the institutional mechanisms of each type of healthcare system as some forms of cancer were more prevalent within particular healthcare systems. For example, prostate cancer was highest among SHI nations, Norway and Sweden, yet these nations’ breast cancer incidence was the lowest when compared to other healthcare systems.

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