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VALUE BASED HEALTH INSURANCE

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ABSTRACT

Many of the current strategies used to combat the increasing health care costs are plans which shift more costs to the patient. These strategies try to reduce the excessive spending on health care due to moral hazard. While effective at controlling costs, these plans have negative health consequences. Due to the increased cost sharing of these plans and the downward sloping demand curve, patients reduce their utilization of health care and are more likely to underutilize necessary health care. The underutilization suggests that the demand curve for health care is more inelastic than it is perceived. Under a new model which dictates the actual demand curve to be perfectly inelastic, moral hazard can be viewed as beneficial.

Value based health insurance is based on this new model. In value based insurance, cost-sharing is removed or reduced for health services deemed to be highly beneficial. These plans have been demonstrated in several studies to effectively control costs while increasing the overall health of the members. They are very costly to implement but they help to reduce hospitalizations and emergency room visits for people suffering from chronic diseases. Value based plans are currently being offered by health insurance companies, but the reduced cost sharing are limited to pharmaceuticals and preventive services because there is evidence to suggest spending in these areas are very cost effective. More evidence is necessary in order for value based insurance to be applied to other medical services.
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Chapter 1

Introduction

The US health care system is the most expensive in the world. The annual spending in the US on health care is estimated at 2.3 trillion, which is about 36% higher than that of the country with the next highest health care spending (Jonas, 2007). Health care costs are rising at an alarming rate and more and more families in the US are finding themselves struggling to meet the financial burdens of health care. Increasing premiums and other barriers are leaving many families uninsured and unable to access proper health care. Controlling health care costs is at the top of the agenda for the government, and as indicated by the passing of the the Patient Protection and Affordable Care Act and the Health Care and the Education Reconciliation Act of 2010 in the health care reform (United States Department of Labor).

A large problem in the health care system is believed to be due to inefficient spending. Strategies by private insurance companies have been trying to reduce the waste in the system by putting more of the financial burden on consumers. This has translated to insurance plans with higher cost sharing, and was believed to force consumers to be more careful with the utilization of medical services. While this strategy has indeed resulted in lower premiums, critics claim that it also may compromise the insured patients’ health. Patients are not obtaining necessary care as a result of the high out-of-pocket prices for health care services.

The focus of of the Patient Protection and Affordable Care Act and the Health Care and Education Reconciliation Act in the health care reform have been to improve the access of health care for all families. One of the provisions in the reform bill is the mandate to remove all co-payments and cost sharing for preventive services (Farmer). This type of insurance, called value
based insurance, is an innovative type of insurance designed to provide better access to health care. Instead of cutting costs, it focuses on offsetting the negative health consequences of high cost sharing and reducing overall health care costs by helping members stay healthy. This paper examines the theory behind this type of health insurance and looks at the results of employers who have experimented with this type of insurance design.

This thesis will introduce the health care system in the US and the issues associated with the increasing cost of health care. It discussed some of the previous attempts made at controlling the costs of health care. It will then introduce a model for moral hazard that the previous strategies for controlling health care were based on. Next it will examine the flaws of this model, and introduce a slightly different model which challenges the previous model. Using this model, it will discuss why attempting to control costs using the current methods of increasing cost sharing is wrong, and why value based health insurance is a better method.
Chapter 2

Introduction to the US Health Care System

The health care system in the US, as well as health care in other countries, is ultimately focused on providing services to improve the health of its people. The health care system in the United States consists of decentralized parts combined together to provide health care and generate profits. There is no centralized organization that oversees the health system functions; instead, the system is composed of four major components: workforce, suppliers, education, and financing. The workforce includes health professionals such as nurses, physicians, and pharmacists that provide the services. The suppliers provide the necessary supplies that the workforce requires for providing care such as medical equipment, medical facilities, and pharmaceuticals. Education consists of universities that train health professionals as well as research that provides new scientific knowledge and new treatments. Finally, financing is the component that provides the means by which consumers pay providers for health services. Through the interaction of these components, education for health professionals are provided, medical research is conducted, and health care is supplied and paid for (Jonas).

This chapter provides a chronological overview of the financing component and the fee-for-service system in health care. The first section describes the indemnity fee-for-service system of health care. The next section describes how the health insurance industry developed into the employer sponsored system that exists today. Furthermore, it discusses the rising health care costs and the introduction and evolution of managed care’s attempt to control cost. The final portion of this chapter discusses the current state of health insurance and the issues with the rising health care prices.
1. Indemnity Fee-For-Service System

In the US the financing for health care has predominantly been carried out on a fee-for-service basis. In the fee-for-service system, the patient reimburses the healthcare provider after the provider has provided the healthcare service to the patient. Currently in the US most people, about 83%, have some form of health insurance purchased through a private or government health insurer. People purchase health insurance to protect themselves against uncertain costly medical expenses. Without insurance, all medical expenses would be paid for by the individual’s own money. Unexpected illnesses could require treatments that cost an individual’s entire life savings. By purchasing insurance, the individual passes this risk to the insurance company. Extremely costly claims will be paid for by the insurance company. (Fodeman).

Another reason individuals purchase insurance is for the administrative services. If one simplifies the insurance arrangement down to its basic transactional steps, the primary task of insurance companies is to process medical claims and provide payments to the providers. Thus, when an individual visits the provider, the bill for the visit is then forwarded to the patient’s insurance provider with a request for payment. The insurance company will then reimburse the providers for the amount billed to the patient (Jonas). Since the rise of health insurance in the 20th century, this arrangement, frequently referred to as indemnity health insurance, has been the most commonly used insurance system to finance the cost of healthcare.

2. Employer Sponsored Health Insurance

Most people in the US, about two-thirds of all Americans, obtain their health insurance from their employer as part of their employee benefits, the non-wage portion of their compensation package.
The current system of employer sponsored health insurance did not come about intentionally, but was instead an accidental result from several events in US history. It started after the Great Depression, when President Roosevelt made the decision not to establish universal health coverage. The need for health insurance allowed for the establishment of private insurers to provide all of the necessary coverage. A short time later, during World War II in 1942, the economy boomed and employers competed for scarce workforce by increasing their wages. To try to control inflation, the federal government placed restrictions on the wages the employers could offer. However, the government did not restrict the benefits that the employers could offer. Thus employers began offering benefits in order to attract employees. Additional regulations put in place in the following years helped establish employer provided health insurance as the most common method individuals obtained health insurance (Blumenthal).
One of the most important regulations put in place that unintentionally shaped employer-sponsored plans into what it is today is the Employee Retirement Income Security Act (ERISA) established in 1974. Originally intended to protect employees’ pension benefits, ERISA nevertheless created incentives for employers to insure their own employees. These employers were exempt from many state regulations as well as many other benefits. Thus most large employers who had enough employees to insure themselves did so. This is the current situation of employer-sponsored health insurance (Blumenthal).

There are many benefits to the employer sponsored health insurance system, which has worked fairly well until recent years. Employer-sponsored healthcare created a broad insurance program that included a majority of Americans. In the system, people who were low-risk and low costing subsidized for the costs of higher-risk members. It allowed generous health plans to be offered at very affordable prices. For many years, the plans were effective at reducing the out-of-pocket expenses for most employees. For example, despite the continuously growing health care expenditure from 1960 to 2000, out-of-pocket spending fell from 48% to 15% of total health care costs during the same time period. The establishment of ERISA helped large companies provide health care coverage to employees at reduced the costs as well. In addition, most privately sold insurance allowed for competition between the health insurance companies. As a result of competition, insurers were pressured by employers to meet the demands of their employee groups. Employers pushed for more innovative methods of financing to help reduce costs. Some of the products developed by private insurers such as consumer-directed health plans and tiered-payment systems have been looked at by US Government programs such as Medicare as well as by the governments in other countries (Blumenthal).
3. The Increased Cost of Healthcare

In recent years, however, the firms that finance the cost employer-sponsored health insurance have found it increasingly difficult to combat the rising costs of health care in the US. The health care system in the US is currently the most expensive in the world, measured both as the percentage of a country’s total GDP that is spent on healthcare and as the cost per person.

Since the 1960s, US health care spending has been growing at a rate faster than inflation. The growth has been steady over the 40 year period between 1965 and 2005. The inflation adjusted spending in 2005 is about 9 times what it was back in 1965. More specifically, spending on health care in 1965 after adjusting for inflation was about $187 billion in 2005 dollars, or about 5% of the US GDP. In 2005 US health care spending was about 1.9 trillion, or 15% of the country’s GDP (Orszag, 2008). The graph below illustrates the rise in the premiums of health insurance plans over the past decade.

![Exhibit 2: Average Annual Premiums for Single and Family Coverage, 1999-2010](image-url)

Figure 2-2
In 2008 the spending on health care was estimated at around $2.3 trillion, and the breakdown of which is shown below (Orszag).

Breakdown of Health Care Spending in 2008. Source: Center for Medicare and Medicaid Services, Office of the Actuary, National Health Statistics Group (Kimbuende)

The largest portion of the costs, Hospital Care and Physician services, are also the fastest growing health care spending. Most of the growth in health care spending in the past years has been due to increases in the cost of these categories. The biggest driver for this has been the improvements in health care technology. Improvements in health technology have helped people live longer. There are now costs associated with treatments that were not available a couple of years ago. The other major driver has been the increase in demand. Both the increase in overall income as well as the increased portions of the costs paid by insurance companies has made the prices of health services seem lower to consumers (Congressional Budget Office).
It is estimated that out of the $2.3 trillion, about $1.2 trillion is due to wasted or avoidable costs (PricewaterhouseCooper, 2008). The wasted costs are broken down into three categories. The first is behavioral, and is defined by costs due to the individual’s health decisions, such as smoking and overeating. The second category is operational and includes costs due to inefficiencies during the administrative processes. The final category is clinical. This refers to the utilization of medical services that were not necessary and costs that could have been avoided if earlier opportunities for intervention were taken (PricewaterhouseCooper). Each of these categories accounts for roughly one third of the wasted costs. Many strategies to reduce health care costs have been targeted at reducing this waste.

4. Consequences of Increased Health Care Costs

The growing cost of health care is a big problem facing the US. It makes necessary care less accessible and leaves more and more people without health insurance to pay for health care. Along with the increasing costs of health care, the negatives of employer sponsored health insurance are becoming more apparent. With the health benefits offered as part of an employee’s compensation, the availability and generosity of the health plans is linked to events that have little relation to health care. During times when the economy is booming, employers are able to provide more expensive plans to employees. However, when the economy slows down and companies look to cut costs, one of the targets is the health benefits. The benefits are as much of a cost to the company as the wages to an employee, and companies often reduce the cost of total compensation by removing some of the coverage and increasing the cost sharing of the plans they offer. With the passage of ERISA and many companies self-insuring their employees, many low risk members such as healthy middle-aged employees, were removed from the insurance company risk pools.
Out of the remaining members, the people who chose to purchase private insurance plans were more likely to be people who thought they were going to need health insurance. The idea that purchasers are more likely to be people who are sickly rather than healthy individuals is a phenomenon called adverse selection. An insurance company collects premiums from all of its members and uses the collected money to pay for the medical costs incurred by all of its members. The premium that the insurance company collects depends on how much they expect the total medical costs for all of its members to be. If an increased percentage of an insurer’s customers are policyholders who are sickly, the expected medical costs for all the insured members go up.

As a result of adverse selection, insurance companies have been forced to raise the premiums for their small business and individual plans. These plans experienced dramatic cost increases as the number of healthy employees declined relative to the number of less healthy policyholders. Plans sold to individuals became far more expensive than similar plans offered by employers. The employers providing coverage have a big say in the health insurance market. Some critics suggest that employers are mostly concerned with reducing costs, and are not as concerned with providing the best quality. This, along with the lack of centralized insurance providers, makes it difficult to unify efforts to improve the current system (Blumenthal).

The increasing costs have already led to declines employer-sponsored health benefits. Reports by the Economic Policy Institute show that from the year 2000 to 2007, there has been a decrease in the percent of people under the age of 65 who are covered by employer-sponsored coverage. This decrease has been offset by increases in people who purchase individual insurance policies as well as people who were uninsured. The increase in the prices of medical services has made individual health insurance plans more expensive, while the costs of health services without insurance are even greater. Forecasts for health care costs suggest that the increasing trend in health care costs will continue (Gould). There is concern that soon the benefit costs for the
employers will be so high that employers will no longer provide them. Without employer-sponsored health coverage, employees will have to resort to the more costly alternatives. This could potentially exacerbate the problem of the growing cost of health care, making it more difficult for people to access necessary health care.

5. Controlling Medical Costs Through Managed Care

Managed Health Care has been the largest change to the payment structure of health care. It emerged as an alternative to the indemnity fee-for-service method in an attempt to control high costs and over-utilization of health care services. It was a movement in health care that began in the 1970s, and peaked in popularity in the 1990s when many companies began shifting their employees into managed care plans. Managed Care plans were introduced to help people make smarter decisions about health care spending. It was a response to criticism to the fee-for-service payment structure which many people thought led to excess procedures by providers (Fronstin).

Managed care integrated the health care providers with the health insurance companies offering these plans. The insurance companies offering these plans manage the health care spending for its members rather than just reimbursing for them. The health care providers often contracted with the Health Management Organizations, and in some cases were directly employed by them.

Managed Health Care plans encourages providers to use the most beneficial services to limit unnecessary spending and tries to prevent the use of services that offered little benefits for the patient. Insurance companies were taking a more active role in deciding what services the member should or should not get. Payments began moving away from fee-for-service and towards methods where providers are encouraged to treat patients as efficiently as possible. It introduced the capitation method of payment, where the insurance company pays the provider a fixed pre-determined amount for each patient to cover all of the necessary services they would
require for a given time period or condition. It compensated providers for outcome rather than for
the number of services they provide, which put some pressure on the providers to be as efficient
as possible (Massof and Lidoff).

Managed care seemed to be promising, and was successful at containing the rising health
care costs in the early 1990s. The large dip in the rate of increase of premiums during the 1990s
corresponds to the times when managed care was most popular.

![Figure 2-4](image)

However, managed care soon became very controversial on how cost saving was
achieved, and created many issues that eventually led to its failure. For the patient, managed care
became very troublesome. There was frustration from patients when managed care denied
coverage of procedures recommended by their physicians. Some critics suggested that, as a result
of managed care, there was an increase in the cases where patients were denied life-saving
procedures. In addition, patients were irritated by the all of the limitations and barriers that
managed care companies placed to accessing care. Patients were limited in the providers they can
see. They also were required to get permission from their primary care doctors in order to go to specialists.

Managed care was very unpopular among physicians as well, who felt that the Managed Care Organizations were interfering with their practice of medicine. Insurance companies were involved with most of the treatment decisions. Physicians needed to verify with the patient’s Health Management Organizations before performing any procedures on the patient. Furthermore, the employees of Health Management Organizations usually did not have extensive medical knowledge or personal knowledge of the patient. (Greene).

These factors lead to the eventual change of health management organizations. While they are still around today, they are not the same as they once were. The HMO plans offered by insurance companies today are no longer involved with any clinical decisions for the patients (Fronstin).

6. Preferred Provider Organization

After the decline in popularity of managed care, the payment system went back to a pay-for-performance system. However, the new fee-for-service system incorporated the provider networks introduced by managed care. Under the new fee-for-service systems, the current Health Management Organizations (HMO) plans retained the networks with providers, but the restrictions were nowhere near as restrictive as the Managed Care systems. The health insurance company sends its members to the preferred providers within its network. In exchange, the providers offer the insurance companies a large discount. This allows insurance companies to transfer these lower prices to lower premiums to their members. A new type of fee-for-service plan called preferred provider networks (PPO) gained popularity to take the place of HMOs.
PPO is a fee-for-service payment structure where health insurers establish network with the health care providers. The new PPO plans were less restrictive but slightly more expensive than the HMO. Most members were willing to abide by the restrictions of the PPO in order to enjoy lower premiums. Currently about 60% of people are covered under a PPO. The graph below shows the immense growth of the popularity of PPOs.

![Distribution of Health Plan Enrollment for Covered Workers, by Plan Type, 1988-2010](image)

Figure 2-5

*(Kaiser Family Foundation, 2010, p. 66)*

PPOs were very welcomed because they were able to reduce costs without putting too many restrictions on the members. They allowed health insurance providers to negotiate lower prices which results in lower premiums for the members. Providers are willing to offer insurance companies discounts to become a preferred provider in exchange for the insurance company to send their PPO members to these preferred providers. The PPO was a very effective way because insurance companies can usually receive very generous discounts. In addition the insurance companies were able to choose which providers would be covered by the network, which
provided incentives for providers to improve their efficiency in order to join the network. On the other hand, the fee-for-service system did not encourage overutilization because hospitals were not held financially accountable (Gabel & Ermann, 1986).

7. Controlling Health Care Costs Through Cost Sharing

In response to the continued rise in health care spending, recent strategies to control health care costs have been to shift more of the medical costs to the patient. By shifting the costs to the patient, these strategies try to reduce moral hazard, a phenomenon that many believe to be the cause of excessive spending. The next chapter discusses why moral hazard creates excessive spending in health care and how cost sharing reduces the effects of moral hazard.
Chapter 3

Theory of Moral Hazard

The presence of insurance is itself one of the causes of excessive spending, a phenomenon called moral hazard. Moral hazard in health care can be defined as the extra spending in health care due to the presence of health insurance. With insurance reducing the cost of health care to the patient, people may utilize more health care. They would purchase more health care than they otherwise would at the market price because the insurance company will be paying for it. The effects of moral hazard can be illustrated in an example.

In traditional health care economics, the demand curve for health care is viewed as downward sloping.

Figure 3-1

Figure 2.2: Medical service with elastic demand curve

Suppose that for a medical service, the market price is determined to be $100. At the market price, the consumer’s quantity demanded is 10 units, thus the total spending is 10 X ($100) = $1,000 paid by the consumer. Now suppose the consumer is covered by a health
insurance plan that covers 100% of the incurred health care costs for the consumer. The cost of the service would remain the same at $100 but the price to the consumer is now $0. In this case, when the out-of-pocket cost is zero, the quantity demanded will increase to 20. At a unit price of zero, the consumer will consume 20 units of service while the total costs for the insurance company is $2,000. The value of the total medical service consumption has increased by $1,000 as a result of the insurance policy.

The RAND experiment is the largest health policy experiment in history. It suggested that demand for health care follows a decreasing sloped demand curve. In the experiment families were randomly assigned different health insurance plans with different amounts of cost sharing that ranged from free care to high-deductible plans with up to $1,000 deductibles, which in today’s dollars would be around $6,000. The results showed that members of the high cost sharing plans used an average of between 25% to 30% fewer services when compared to those on the free plans. The results from this study shows that medical services decreased with increasing costs which indicates a downward sloping curve (Newhouse).

Moral hazard is criticized because many believe it to cause wasteful spending. It induces extra spending that moves the consumption of health care away from the market equilibrium. In traditional economics, the market equilibrium price is considered to be the optimal utilization. It is where the price where the marginal cost of the health service is equal to the marginal benefit. The utilization at the equilibrium is the optimum utilization for the service. Any excessive utilization beyond the equilibrium would result in a lower marginal benefit compared to the cost. Thus moral hazard induces extra spending in health care in which the benefits are not worth the price that was paid for them. The difference between the additional costs and additional benefits is called a welfare loss.

The loss of welfare is illustrated in Figure 2.3.
The market price of the medical service is $100, while the price with insurance is $0. In this model, the cost of the extra utilization was calculated to be $1,000. In Figure 2.3, this cost is represented by rectangle ABCD, the area under the price curve. The benefit of the extra medical service to the consumer can be defined as the area under the demand curve. This can be calculated by taking the integral of the demand curve over the increase in utilization:

$$\int_{10}^{20} -10x + 200 = 500$$

In this case, $1,000 extra dollars were paid while the patient gained a benefit worth only $500. The welfare lost is $1,000 - $500 = $500. Graphically, the area that represents the welfare loss is represented by the triangle ABD, which is the rectangle ABCD – triangle BCD.

To reduce the effects of moral hazard, insurance companies use cost sharing to reduce excessive health care utilization. Increased cost sharing would lead to higher prices for the consumers, which in economic theory will decrease health care utilization. There are several ways that the expenses are allocated between the patient and the insurance company.
Controlling Moral Hazard through Cost Shifting

One of the ways to control moral hazard is to increase cost sharing is through coinsurance and deductibles. In coinsurance policies, the patient pays a portion of the bill for each service with the remainder paid by the insurance company. This type of insurance will put some of the financial burden on the patients. Faced with an out-of-pocket cost, people will most likely be a little more careful with usage. This will help reduce some of the excess utilization associated with zero cost sharing (Pauly).

Other insurance policies have deductibles, an agreed out-of-pocket amount that the patient needs to pay first before the insurance company begins sharing the costs. In policies with deductibles, the patient pays all of his or her own costs until total medical costs reach the deductible. Once the medical costs of the patient reaches the deductible amount, the plan will become a coinsurance plan and the insurance company will start covering a portion of all of the costs incurred beyond the deductible. In most plans there is also an out-of-pocket maximum. When the patient has paid up to that amount, the insurance company will start covering 100% of the costs beyond the out-of-pocket maximum. This type of insurance keeps the original prices of the medical costs, thus the demand remains at the original level. (Pauly).
Figure 4.1: Quantity demanded with 50% coinsurance

Cost sharing reduces the welfare loss of moral hazard in the following way. Consider the welfare loss in the graph 4.1, which is the same demand as the graph in Chapter 3. If the insurance company offers a co-insurance plan which only covered 50% of the costs, then the consumer now has to pay 50% of the costs for the health service. For the $100 service, the price to the consumer is now $50 compared to the $0 in the previous example. The quantity demanded is now 15 units. In this case the total costs for the services are 15X$50 which is $750. The benefit to the consumer is again the area under the curve. The benefit is

\[ \int_{10}^{15} -10x + 200 = 375 \]

The new welfare loss is $750 – $375 = $375. The inclusion of the coinsurance decreased the calculated welfare loss from $500 to $375.

**Controlling Moral Hazard with High Deductible Health Insurance**

The most recent methods to address the increased cost of health care are insurance plans with very high cost sharing called high deductible health insurance. Employers began offering high-deductible health insurance as a way to reduce welfare loss and provide employers with low premium health insurance. High-deductible health insurance plans are low premium plans with a very large annual deductible, usually in the thousands that the members need to pay out of pocket before the insurance starts providing coverage. To mitigate the burden of out-of-pocket costs, members enrolled in high deductible plans that meet certain requirements are eligible for a Health Savings Accounts. Members can save tax-exempt money into these accounts and use the money from these accounts to pay for medical expenses. The combination of the Health Savings Account and High Deductible Insurance Plans are referred to as consumer directed health care. They shift
more costs onto the member. Faced with the market prices of medical services, consumers are pressured to make more careful decisions (Hoffman and Tolbert).

The movement toward high deductible health insurance has not come with universal support from medical community, however, critics suggest that the movement by employers toward increased use of cost shifting arrangements efforts may have unintended negative consequences. For example, consumer directed health plans have been criticized because in many cases it increases the overall cost of health care to patients and families. The increased out-of-pocket costs often leads to underutilization of health care services. This is not only detrimental to a person’s health, but could also lead to the necessity of even higher costs. Some diseases, when undetected for a period of time, can lead to complications that would require much more expensive treatments (Reed, Fung and Price). The following chapter discusses the possibilities.
Chapter 4
Theory of Moral Hazard Revisited

The traditional model has been accepted for some time, and many of the health policies today are based on this model. However, analysis of the impact of these new policies has suggested flaws in the traditional model. As a result, several scholars have developed a slightly modified model for the health care demand curve. Under the new model, it is necessary to reexamine the effects of the cost sharing and moral hazard.

As described in the traditional healthcare economics literature moral hazard is thought of as wasteful spending. The additional utilization is excessive because the extra spending is not justified by the benefits gained. This is based on the assumption that when consumers are faced with a purchasing decision, they will make decisions that minimize costs while maximizing benefits. Providers compete to provide the best product at the lowest possible cost in order to attract consumers. Consumers will search for the best value they can get for their money. The market pressure will force the equilibrium of the supply and demand curves towards the most optimal utilization where the marginal cost is equal to the marginal benefit. In such a situation, insurance will reduce the price for the consumer to less than the optimal market price. When faced with a lower price, consumers will utilize extra services where the marginal benefit is less than the actual marginal cost before insurance is applied. The solution to the problem has been to increase the cost sharing for the consumer. Giving patients some financial burdens will automatically help adjust the equilibrium back towards the optimal equilibrium where money is spent in the most efficient manner.

In recent years, scholarly authors have been reexamining this economic model when applied to health care services. Several have indicated that due to the nature of the health care
industry, the traditional moral hazard argument may not hold true. The theory that the market equilibrium will yield the optimal utilization and price assumes that the consumers and providers are all fully informed about the cost-benefit of each medical service performed. It requires the consumers to understand how much benefit they will receive from each medical service and then made decisions about whether the benefits will be worth the cost. Most of the time, consumers are not in the position to make this type of decision in health care. Most consumers are not fully informed because of the complexity of the products and services that they are purchasing. They do not understand the exact value the medical services would have for them, and instead rely on their doctors to provide the information of what to purchase. On the other side, health care professionals understand the benefits of the treatments, but may not be able to explain the benefits for each individual patient.

Due to imperfect information, the consumer’s demand curve will most likely deviate from the demand curves of the traditional model. As a result, the market equilibrium does not represent the most optimal utilization. This new line of thinking suggests that when the health benefits are not fully factored into the demand curves, it could shift the curve to the right or left depending on the misinformation. This could mean overutilization when the effectiveness of the medical procedure is over estimated. In the opposite case, it could also lead to underutilization, something that was not considered in the old model when analyzing moral hazard. Many scholars have tried to use empirical evidence to determine where the optimal utilization is.

There is evidence from studies to suggest that consumers do not make the most beneficial decisions when faced with high cost sharing. In addition, the evidence suggests that high cost sharing leads to underutilization of medical services. An analysis of the results from 22 past studies on the effects of cost-sharing on utilization suggested that patients are not fully informed and that high co-pays could lead to underutilization. The studies were focused on seniors and in most of the studies there was an indication that the higher cost-sharing led to a reduction of the
utilization of both high and low value services. In particular, there is evidence to indicate a reduction in utilization of prescription drugs and less definitive evidence that other medical services are reduced as well. In addition, the higher cost sharing lead to a higher mortality rate. Seniors who have more generous insurance plans tend to have lower mortality rates, but there is not enough evidence to conclude direct causation. The results from this analysis indicated that when faced with higher co-pays, the health status of the seniors decreased. It showed that when seniors had less to spend on health care, they were not fully capable of adjust their spending to the most necessary services. It supports the notion that consumers of health care are not informed enough to make the optimal cost-benefit decisions (Rice and Matsuoka).

Consumers have been shown to underutilize services that have been deemed to be of high value. In many cases consumers with chronic conditions were shown to have underutilized recommended services. These services have been proven to have a high benefit when compared to its costs. A study conducted used a health performance measure Health Plan Effectiveness Data and Information Set (HEDIS) to determine where optimal utilization is. In the study, consumers who had higher co-pays generally had lower performance on the HEDIS (Rice and Matsuoka). Other large scale analysis have shown that patients analyzed in the study receive less than 55% of the care recommended to them (McGlynn and Asch). Still others have indicated the underutilization of medications that have been proven to be beneficial (Randall S. Stafford).

The fact that increases in price results in underutilization of high value services means that people are misinformed about the benefits of these health services. In reducing their use of beneficial healthcare in the face of increased prices for such services, consumers demonstrate that they mistakenly undervalue the benefits of such services, behaving in a manner consistent with a downward sloping demand curve for healthcare. By contrast, well informed consumers would maintain their demand for health services across different prices, actions which are more consistent with a model that assumes that healthcare demand is more inelastic with respect to
price. The results from the studies that suggest people are underutilizing medical services as a response to increased prices thus suggests that consumers are poorly informed about the value of many health services, as their actual demand curve should be less responsive to price changes. Inelastic goods tend to be goods that are necessities, where the people don’t have control over the demand and would purchase the same quantity at any price. This is reasonable way to categorize certain potentially lifesaving health services.

An example of a fully informed perfectly inelastic curve is shown in figure 4.1 along with a misinformed demand curve (Frick and Chernew).

![Figure 4-1](image)

As discussed in the previous chapter, the benefit to the consumer is represented by the area under the demand curve. The inelastic demand curve represents the actual benefits patients would receive, while the misinformed curve represents the benefit they perceive to be receiving. The effects of cost sharing under this new model is illustrated below.
At the market price the patient is utilizing 10 units of care. While the patient perceives this to be the optimal utilization, in actuality the patient is receiving only half of the potential benefits when examining the fully informed demand curve. This correlates to the underutilization discussed previously when patients were forced to pay larger portions of the cost.

See comment

In this model, if the consumer were covered under a health insurance plan that covered 100% of costs, the consumer’s demand would shift to 20 units. In terms of benefit, the consumer is not receiving 100% of the benefits from the medical service. In this case, moral hazard was beneficial and helped the consumer achieve the optimal utilization quantity. There would also be no welfare loss due to moral hazard as the benefit to the consumer is practically infinite. Perhaps most importantly, assuming that the actual demand curve of medical services is inelastic with respect to price suggests that the current strategies of increasing cost sharing to control moral hazard will not prove cost effective, as the decrease in utilization will decrease the quality of health care.
Chapter 5

Value Based Insurance Design

Value based health insurance is a relatively new strategy to combat health care costs that incorporates the new theory on moral hazard. Value based insurance is an insurance policy where the co-pays are lowered for medical services that are deemed to have a high value to the patient. It is based on the assumptions that the actual demand curve for health care is fully inelastic, and that most consumers mistakenly have a downward sloping demand curve for many types of high value medical care. In contrast to high deductible insurance plans, it looks to reduce total health care spending by receiving the maximum benefit from medical services. It focuses on improving the health of members, which could potentially lower health care costs in the long run.

Value Based insurance eases the traditional assumptions that consumers are fully informed and have downward sloping demand curves. It reduces the use of co-payments to shift utilization in order to optimize the benefit for patients. Instead of equal cost sharing across all health services, value-based design looks to match the amount of cost sharing that is proportional to the value the service provides. In value based design, co-payments are lowered or even removed for services that are considered to be necessary based on clinical evidence. Value-Based insurance design lowers the financial barriers for the most essential health services in hopes to promote the use of high value services. By directing more utilization towards the most beneficial services, it will help members utilize more of the most necessary services and thus reduce the occurrence of more expensive adverse health consequences.

A key issue in designing value based health insurance plans is determining which medical services to target for more complete coverage. Theoretically, value based health insurance would be very effective when the difference between the perceived and actual demand
curves are the greatest, such as the case when the perceived demand curve for the service is highly elastic. Value based insurance will cover a greater percentage of the cost of those benefits that prove effective in reducing the onset of more catastrophic medical treatments at a later time. VBID thus attempts to increase the utilization of high-value medical treatments by paying for a larger percentage of these treatments. VBID will be especially effective when small decreases in cost sharing can lead to large increases in utilization. In addition, the increases in health benefits resulting from increases in utilization would be greater if the actual demand curve for the service is closer to the perfectly inelastic demand curve. The more necessary a service is, the more closely the demand should resemble a perfectly inelastic demand curve. Since VBID is especially beneficial when insurers can determine the relative benefits of providing more complete coverage, an important aspect of value based insurance is the incorporation of clinical evidence to identify areas where VBID is most effective.

Value Based Insurance Plans for Pharmaceuticals

Currently, value based insurance options offered by health insurance companies are mostly focused on prescription drugs. Non-compliance to prescription drugs is a big problem in the US as many patients, estimated at more than one-third, fail to follow the recommended dosage prescribed to them. Underutilization of prescription drugs contributes to excessive spending in health care. In a report done by PriceWaterhouseCoopers, it was estimated that wasted health care spending due to prescription drug non-adherence was around 100 billion in 2007 (PriceWaterhouseCooper).

This is especially apparent for people with chronic diseases. The researchers conducted a retrospective observational study of members with specific chronic diseases between the years of
1997 and 1999. The chronic diseases studied were diabetes, hypertension, hypercholesterolemia, and congestive heart failure. The study focused on analyzing the utilization of both medical services and prescription by these members. All of the costs related to their disease, including hospitalization, drug costs, and other disease-related medical costs were measured. The results showed that for diabetes, hypertension and hypercholesterolemia, the adherence to prescribed medications was associated with lower overall medical costs. In addition all members in the study with high medication adherence had significantly lower rates of costly hospitalization (Urquhart).

There are many reasons people do not follow the recommended dosage. Value based health insurance targets one of the reasons: high costs. With the growing costs of health care, this is becoming a larger barrier. The value based plans urge utilization of drugs by offering zero or largely reduced co-pays for medications.

Value based health insurance works well with prescription drugs because there is plenty of evidence to demonstrate the benefits that result when underutilization can be prevented or minimized. Prescription drugs are also relatively elastic in their perceived demand curve as demonstrated in many studies where utilization was found to vary greatly in relation to the level of cost sharing. To examine the impact of increased cost shifting on the use of pharmaceutical drugs, a study compared two companies offering two different levels of co-payments and how increasing the co-payments for prescription drugs affected its utilization. One of the companies increased co-payments for all drugs while the other company increased co-payments for brand-name drugs only. The utilization for the employees in both plans was analyzed for about a three year period and compared. The employees belonging to the employer who increased the co-payments showed significantly lower utilization of all of the classes of prescription drugs covered by the plans compared with the other employer. In addition, these employees also showed significantly higher chances of stopping the use of prescription drugs altogether. Meanwhile, employees from the second employer most likely switched from the brand name to the generic
prescriptions which required lower co-pays. These results showed that the out-of-pocket cost of drugs has a pretty important impact on the utilization of the drugs (Goldman, Joyce and Karaca-Mandic).

Similar studies have demonstrated that members covered under Medicare were more likely to utilize what were determined to be essential hypertension medications compared to people who did not have coverage (Adams, Soumerai and Ross-Degnan). An article published in the Journal of American Medical Association summarizes the results from 132 similar studies which analyzed the relationship between prescription drug utilization and cost sharing. It was determined that a 10% increase in cost sharing decreased drug spending by roughly 2% to 6% (Goldman, Joyce and Zheng).

There is an abundance of evidence to support that non-compliance with drugs has many adverse consequences, both on the individual’s health as well as on the economy. Newer drugs, especially those that have been coming out in the past decade or so, have been demonstrated to provide significant benefits. An article in Health Affairs analyzed the medical data of 23,230 people that was gathered by the Medical Expenditure Panel Survey. The results indicated that people who used their prescribed drugs had a substantial reduction in their other medical costs. Overall, the estimated reductions in medical spending on average for a person were greater than the extra money they spent on prescription drugs (Lichtenberg). Other studies have suggested patients with diabetes mellitus showed a correlation between non-adherence and increased hospitalization (Ho and Rumsfeld).

A review of a large number of studies concluded that health consequences due to non-adherence vary among patients, depending on the nature of the drug as well as the status of the patient. For patients where the drug is not a necessity, skipping dosages have very little impact on the individual’s health. For others the consequences may be more serious. Some patients who skip dosages could end up with more severe health problems. Such cases are unfavorable for the
person’s health as well as for the economy because they often require hospitalization which are often much costlier than the cost of preventive drugs (Urquhart).

**Value Based Insurance for Preventative Services**

Preventative services are a popular target for value based insurance as well. Preventative services have been demonstrated to have relatively large price elasticity among health services (Ringel, Hosek and Vollaard). When prices of health care starts rising, preventative care is one of the first areas where people cut back to reduce overall spending. However, there is significant evidence to indicate preventative services are very cost effective to improve overall health. For example, studies conducted on a vaccine for pneumococcal vaccine suggested that preventative services did was able to decrease medical spending for older populations when used efficiently. A review of a number of other studies show that vaccines, while not always cost reducing, will most likely decrease the health risks due to the disease. Other preventative services, such as screening to detect diseases at an early stage, often provided health benefits while overall spending increased due to the screenings.

**Studies on VBID**

There are two major methods to implementation of value based insurance designs. Both methods require the use of clinical value to determine co-payments. The first is using clinical evidence to determine and reduce the co-payments for the most beneficial services. This is referred to as value based insurance design. The second method is to apply clinical evidence to determine the most efficient health care providers, and adjust co-payments based on their performance. This is called value based purchasing.
Value Based Insurance Design

Value based insurance design is focused on reducing co-payments for the medical services that have the greatest benefit. There are two approaches to finding the services that will provide the greatest value. The first is focusing on clinical evidence and finding the best and most cost efficient services. For such services, cost sharing would be reduced for all members. Another way to ensure high benefits is to target the high risk patients that need the services the most. Both of these approaches are demonstrated in past studies. This section discusses the results from some of the biggest studies on value based health insurance. The Active Health Management study is an example of the first approach, while the Pitney Bowes, Asheville, and Michigan studies are examples of the second.

Active Health Management

In a study conducted by a large employer in 2005, co-payments were reduced for five classes of medications for all of its members. The classes of drugs were: angiotensin-converting enzyme inhibitors and angiotensin receptor blockers, beta-blockers, diabetes medications, statins, and steroids. The drugs were broken down into different tiers, with brand-name drugs receiving a 50% reduction and generic medications a 100% reduction in co-payments. The care management company, Active Health Management, was involved with implementing the intervention.

The intervention was implemented as part of the company’s disease management program. As part of the program, members had phone access to nurses. The clinical conditions for members were monitored and recommendations were given to members when it was deemed to
be beneficial. The participation in the disease management program and the value based insurance intervention was optional for members. The patients participating in this study were observed a year prior and a year after the implementation of the new co-pays. The results were then compared to another large employer that offered the same disease management program without the reduced co-payments. During the same time, a second large employer where their employees received no co-payment reductions were observed as well for control.

The results from the study showed that the reduction in co-pays led to a significant increase in drug adherence. The table shows the pre and post intervention Medication Possession Ratios (MPR) for the both employers before and after the intervention. The graph shows the increase in the MPR due to the intervention.

![EXHIBIT 2](image)

**Figure 5-1**

It was found that for the 5 categories targeted in the intervention, four of them had significant increases in adherence after the intervention. Increases in utilization of were estimated to total a 7% to 14% decrease in drug non-adherence from the previous year. Drug adherence has
been previously linked to improved health and reduced overall health care spending (Chernew, Shah, Wegh, & Rosenberg, 2008). Decreases in nondrug spending were estimated to have decreased by 58% as a result of the increased drug adherence in this experiment. The estimated ranged from 13 to 51% for the other classes of drugs. From a cost analysis perspective, the intervention broke even in terms of the costs for the employer. However, there were additional benefits as a result of improved productivity due to the improved health of the employees (Chernew, Juster, & Shah, 2010).

**Pitney Bowes**

Pitney Bowes is a Fortune 500 company that offers its employees health benefits provided through self insurance. In 2002 the company modified its pharmacy plan in response to a cost increase of 13% for its employees in the year 2000. Analysis of the unexpected increase indicated that a contributing factor was non-adherence of drugs by employees with long term conditions. The new pharmacy plan reduced diabetic medication co-payments for employees who have diabetes. The co-insurance for brand name drugs for these patients was reduced to 10% from their previous rates of 25% and 50%.

As a result of this modification, drug adherence of diabetic drugs and diabetic testing supplies increased significantly. In addition, throughout the study the absolute rate of emergency department utilization for diabetic members decreased 26%. In relative terms, the medical utilization for diabetics at Pitney Bowes was 21% above average in 2001 before the use of VBID, but decreased one year after implementing a VBID plan to -16% below average when compared to other similar companies. The overall costs for diabetic member during this period were reduced 6%. These numbers have demonstrated the potential for value based insurance to save long term health care spending for people with diabetes. Furthermore, there are additional
immeasurable benefits such as increased productivity and reduced absenteeism from healthier employees. (Mahoney, 2006).

*Ashville*

Another study on value based health insurance was a pharmacist-directed program conducted on several employers in Asheville, North Carolina. The study was broken up into two separate analyses with focuses on two groups of patients: those with asthma and those with a high risk of cardiovascular disease. The goal was to determine the impact that interventions, including reduced or waived co-payments, would have financially and clinically.

The cardiovascular study was conducted over a course of 6 years and focused on two health conditions: hypertension and dyslipidemia. The employees eligible for this program were employees who were diagnosed to have symptoms for having a high risk for cardiovascular disease. In this study, two employers offered their employees a program that provided drastically reduced or waived co-payments for medications related to hypertension and high cholesterol levels. In addition, employees participating in this program were also required to meet with professional educators on a consistent basis to learn about the necessary steps that need to be taken to help reduce cardiovascular disease.

The experiment data was collected from January 1, 2000 to December 31, 2005. Data for 424 members were successfully collected and analyzed. The effects of the intervention were measured by comparing various measurements against the original values before the start of the study. Some of these variables included systolic and diastolic blood pressure and cholesterol level. The financial impact was determined by measuring all of the claims during the 6 year period and comparing them with claim data for the same population before the start of the intervention.
At the end of the study, employees in the program showed a significant decrease in the frequency of cardiovascular related visits or hospitalizations. The first graph shows the increase in the percentage of people who reached their targeted blood pressure level before and after the intervention. It also shows that the number of people suffering from the different levels of hypertension decreased during the same time period. The next graph shows the increase of the percentage of people who achieved their goals in other measurement pertaining to different types of cholesterol levels. These are factors that would lead to a lower risk of cardiovascular disease.

![Figure 5-2]
These next graphs show the number of hospitalization events during the 3 years before the intervention, and the 6 years following. Graph 1 shows the decrease in the percentage of events related to myocardial infarction, or heart attacks. The next graph shows the decrease in total hospitalizations and emergency visits during the study.
Finally, the last graph shows the medical spending on medical care compared to the spending on pharmaceuticals. This graph shows the increase in the spending on the medications related to the targeted conditions during the study. At the same time there is a decrease in the spending on medical claims related to the same conditions.

Figure 5. Annual mean direct medical costs for cardiovascular, cerebrovascular, and peripherovascular events during historical and study periods. Abbreviations: CV, cardiovascular, cerebrovascular, and peripherovascular events; HTN, hypertension; Rx, prescriptions; PPPY, per patient per year.

Researchers calculated that the likelihood of hospitalization for this group was 53% less than compared with the same population before the program. Along with the number of cases, the cardiovascular-related expenditures decreased 46.5% after the program. During this time prescription drugs spending rose 290%, but the program produced a net savings of approximately 12.6%. In addition the percent of spending that was related to cardiovascular cases decreased from 30.6% to 19% of the total medical spending (Bunting, Smith and Sutherland).

The results from this experiment showed strong evidence that the increased utilization due of medications due to value based insurance can increase the overall health of the members while at the same time decreasing overall health spending. This was demonstrated by the blood pressure and cholesterol measurements taken of the member’s during the intervention. It is further
supported by the decrease in the hospitalization cases and the spending on medical claims related to cardiovascular disease.

The asthma study in Asheville was an extension of the cardiovascular study and involved a total of 207 employees with asthma. The participants in this study were selected from members employed in the city of Asheville. The study followed a similar procedure, with a span of five years during which time co-payments were reduced for asthma related drugs. Patients were also educated on the best ways to care for their conditions.

The statistics monitored throughout the study were various asthma related measurements which indicate the severity of Asthma. The severity of the asthma was classified according to the standard NAEPP classification criteria. Other statistics collected were the frequency of asthma related hospitalizations and costs of total asthma related cases. The results from the study showed a large decrease in the severity of asthma in the population. The percentage of people in the severe to moderate severity decreased from 82% to 49% after the first year of the new program.

Emergency room visits decreased during the intervention from 9.9% of the participants some type of hospitalization to 1.3% during the study. Similarly hospitalizations decreased from 4% to 1.9%. The frequency of hospital visits throughout the study was significantly lower compared to the projected number of visits for the same time period.
There was an increase in spending on asthma related medications from the intervention. Annual medical spending per patient decreased $918 from the expected medical costs for the duration of the study. The following graph shows that the overall spending during the study has been significantly lower than the predicted spending based on statistics from the trends in previous years.

**Figure 5-6**

*Figure 8. Asthma Care Events (Emergency Department and Hospitalization) Per Patient Per Year Versus Projected Totals*

BY3 is the baseline year 3 years before the patient’s enrollment. BY2 is baseline year 2, BY1 is the year before enrollment, Year 1 is the first year of the program intervention, and so forth. The gray bars indicate the percentage of patients in that year that had any emergency department/hospital events. The black bars indicate the number of events/100 patients (e.g., BY3 bar indicates an event rate of 21.3 per 100 patients).
The results from this study indicate that the intervention was successful in controlling the spending on asthma. The intervention was successful in reducing the hospitalizations for members and the overall spending related to asthma. Net savings were recorded for non-direct costs such as costs from lost productivity due to sick days from work. (Bunting & Cranor, 2006)

Value Based Purchasing

Another method of value based design, value based purchasing, is to target health care providers to improve the cost efficiency of care provided by health care providers. Value can be increased while keeping costs the same by encouraging patients to visit hospitals that offer better quality or efficiency. Resources can be relocated to the providers which provide the best results.
Evidence from outcomes research can be used to determine the quality of care provided by a hospital, and co-payments can be lowered for those hospitals that are designated to be high quality providers. This will act as motivation for hospitals to provide the best possible care, which would lead to the availability of higher quality care. This would hopefully be a way to deal with the usage of unnecessary procedures performed by doctors in order to make more money. Hospitals will be motivated to achieve a desirable designation by insurance companies in order to receive more patients (Goodman).

A plan for value-based purchasing was proposed by Medicare to provide evidenced based purchasing for its members. The goals for the plan were to come up with a way to measure the performance of a hospital, and then to convert this performance rating into benefit levels for the members. The biggest challenge faced with this plan is to find a method to gauge hospital performance. Prior to this, quality measurement efforts consisted mostly of anecdotal experiences of patients at the hospital. In order to implement value based purchasing, a more rigid set of standards on which to measure performance is necessary. The new standard needs to focus on new standards such as clinical outcomes and costs that were left out from previous performance evaluations.

The value based purchasing plan proposed is also focused on outcomes as a way to combat costs and also increase overall health. By placing a focus on outcomes, providers would be focused more on their quality of care. The method Medicare has come up with to rate quality includes measuring rates of secondary complications and disease progression. All of these statistics can be compiled and compared among hospitals. Information such as this could provide information about the relative quality of hospitals compared with each other. Motivation to visit quality providers can be implemented in the form of financial incentives through value based purchasing. Patients visiting higher quality hospitals would have to pay a lower co-payment. Hospitals can be penalized for their inefficiency by having a higher co-payment. This plan for
value based purchasing is awaiting approval from the government. Its design is currently being tested, and the results are necessary before further steps to implement value based purchasing can be possible (Tompkins, Higgins and Ritter).
Chapter 6

Barrier for Value Based Health Insurance

While results from the last sections suggested that value based insurance is very promising, there are several barriers which prevent value based insurance from being fully embraced. The few value based insurance plans offered today are also restricted to some classes of pharmaceuticals and preventive services. This chapter discusses some of the barriers for the implementation of value based insurance.

see comment

Increased Initial Cost

Value based insurance requires high initial costs due to the increase in utilization of medical services. The financial benefits, if any, would not be realized in the short-term. This may be a difficult burden for companies to justify, especially companies which experiences a high employee turnover rate. These companies may never receive the long-term benefits. Thus some companies may be reluctant to invest in providing this type of insurance (Chernew, Rosen and Fendrick).

Evidence from Research and Their Cost

An important consideration in the effective implementation of value based health insurance design is the need for clinical evidence to determine the most beneficial services. The
evidence required to make these decisions are collected through comparative effectiveness research. Comparative effectiveness research analyzes different treatment options to determine which is the most effective. It takes into account benefit analysis, technology assessment, and evidence-based medicine to determine the most beneficial in terms of both price and clinical effectiveness (Kelly and Cronin).

Generally speaking, comparative effectiveness evidence is not available to the extent that is necessary to design insurance policies. There is not extensive comparative effectiveness evidence for many medical services because frequently they are used without extensive clinical evidence. Most of the time, the treatments are recommended to patients based on the judgment of individual physicians. Pharmaceuticals are not normally required to perform comparative effectiveness research unless they hope to make the marketing claim that their drug is better than existing drugs on the market. In order to extend value based insurance to a greater range of medical products and services, more robust comparative effectiveness research evidence is necessary.

Currently, most of the comparative effectiveness research is conducted in the private-sector. Pharmaceuticals use it as a method of better marketing their drugs. There are private-sector organizations such as health insurance companies which have departments focused on analyzing clinical trials and other similar studies to determine the most effective treatments. They use this information in designing their policies and making decisions about which service to cover. However, the amount of evidence produced from these sources is not enough to be used in value based health insurance design, and they focus only on selected services. Many believe that comparative effectiveness evidence would benefit the public, and that the government should provide more motivation to conduct this type of research (Congressional Budget Office).
Adverse Selection

Because value based health insurance has been shown to not produce significant savings overall, insurance companies are not very enthusiastic about implementing value based health insurance. Instead, value based health insurance is very useful for companies who self insure their own employees. The benefit of value based health insurance is that it has been shown to improve overall health. As a company, they would be interested because the improved health would lead to improved productivity from its workers (Kelly and Cronin).

A phenomenon this could lead to is called adverse selection. Adverse selection in insurance can occur when the insurance buyer has information regarding their own health conditions which they do not disclose to the insurance company. In health insurance, the insurance company basis its premiums on the expected health costs it will need to pay out into the future. If insurance applicants can conceal their high risk characteristics from insurers, adverse selection can arise, as individuals who know they are likely to use health services are more likely to purchase health insurance. This will lead to higher health care spending than the insurers originally predicted because the population purchasing insurance is more costly than the population they used to determine their average cost.

Value based insurance plans are even more attractive to people who know they are likely to require medical services because it will help them save a great deal of money. If only a small number of self insured companies offer value based insurance plans for their employees, they will attract an abnormally large proportion of high cost members. As a result, the medical costs for that employer would be much higher than what they can afford with the premiums they are collecting. This is another reason consumers may decided not to offer value based health insurance (Resende and Zeidan).
Raise Co-Payments for Low-Value Services?

With the decreases in co-payments for high value services, it seems necessary for co-payments to raise co-payments for the other services in order to balance out the price. The idea of raising co-payments for low-value services has been somewhat controversial. A paper analyzing this issue looked at the services that would be considered low-value through effective analysis. It was found that identifying these services was very difficult because it was difficult to define low value. The term “low value” was defined by the authors to be services that rarely offered any benefits and could possibly be harmful to the patient. In addition, it included services that were inefficient when compared to their costs. Using metrics developed by the researchers it was found that low value services included many treatments for life threatening diseases such as cancer and Alzheimer’s. The treatments were very costly and had very small chances of success. All of these treatments are very controversial in terms of whether they should be considered necessary or unnecessary. The overall conclusion is that in order for value based insurance to improve value and control the costs of health care, it is necessary to focus on the low value as much as the high value health services (Neumann and Aurebach).

Another article from Health Affairs analyzed a survey on consumers about whether they believe low-value medical services should have increased cost sharing. The conclusion was in general, people were willing to reduce the coverage on certain services in order to increase the affordability of health care. This will be a controversial issue when expanding the implementation of value based health insurance to more health care services (Ginsburg).
Chapter 7

Conclusion

I believe value based insurance is a step in the right direction towards a more efficient health care system in the US. While high deductible health insurance is effective at controlling cost, it compromises the quality of health care. At a similar cost as current health plans, value based insurance has been demonstrated to improve health. Co-pay levels have been demonstrated to have a significant impact on utilization of health services. If applied effectively, value based insurance could be very useful in directing consumers towards making smarter health care decisions.

The high initial costs of value based health care are a barrier that prevents value based insurance from being widely adapted. Value based insurance is an attractive to companies willing to make the investment in order to help their employees stay healthy. Companies that do not retain their workers do not receive the long term benefits offered by value based health insurance.

Currently, the services where value based insurance can be applied is limited to pharmaceuticals and preventive services. More evidence from comparative effectiveness research would most likely be able to increase the cost efficiency.

One of the big debates regarding value based insurance is whether co-payments for low value services should have increased co-pays. This would help offset the increased costs to the insurer for the reduced co-payments for high value services. However, insurance companies need to be careful with the extent to which they increase cost sharing. Too much cost sharing for “low-value” services would lead to an arrangement similar to managed care. The insurance company may be controlling what services patients should and should not get, a decision that should ultimately made by the patient’s physician.
Works Cited


Fan Xie

EDUCATION
The Pennsylvania State University - Schreyer’s Honors College
Major: Mathematics, Actuarial Option
Minor: Statistics
Honors Thesis Title: Value Based Health Insurance
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Exams:  
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VEE Requirements Met Upon Graduation: Economics, Finance, Statistics  
MCAT: 35 (95th Percentile)

INTERNSHIP EXPERIENCE
Actuarial Internship in Medical Cost Analytics—Aetna, Hartford Office
Summer 2010
• Solved urgent problem for company by designing Excel program that transformed thousands of pages of trends from PDF files into more usable Excel tables
• Improved efficiency of team’s analyses by creating tool in Access that ran analyses significantly faster than previous tools created in Excel
• Consolidated VBA code for team’s Trend Components Model automation tool
• Led 7 interns in competition to design recruiting campaign for Aetna and won 1st place out of 8 intern teams

Actuarial Internship in National Accounts—UnitedHealthGroup, Hartford Office
Summer 2009
• Developed new methodology used in calculating company’s Area Factors and Age-Sex Factors
• Collaborated with 8 other interns on health social networking website project and won 2nd place out of a total of 12 intern teams in a presentation competition
• Wrote SQL code to pull data from company database server

LEADERSHIP EXPERIENCE
Webmaster for Penn State Actuarial Science Club
Fall 2009 to Present
• Maintaining Actuarial Science Club website including the password protected resume portfolio sent to employers
• Organize club events including the actuarial science career fair

Landlord for House with 4 Tenants—State College, PA
Fall 2007 to Present
• Managing operation of house including creating and enforcing set of house rules, arranging showings of house to prospective tenants, resolving issues between tenants

Teacher’s Assistant/Tutor for Life Contingencies and Chinese Language Courses
Spring 2009
• Handled both workloads while taking 24 credits
Violin Lead Chair– Penn State Symphonietta Orchestra

*Fall 2006 to Spring 2008*
- Led entire violin section as appointed by audition

RESEARCH EXPERIENCE

Lab Assistant for PhD Student– Penn State Maize Genetics Lab

*Fall 2008 to Present*
- Investigating the epigenetic regulation of gene expression in maize by comparing expression in maize mutants with wild type maize
- Used biological lab techniques including RNA extraction, reverse transcription, real-time PCR

Study and Research Abroad– Beijing University, China

*Summer 2008*
- Collaborated with 2 Beijing University students on project using Matlab to analyze the errors in a Fourier series estimate of a partial differential equation

VOLUNTEERING

Volunteer– Mount Nittany Medical Center

*Fall 2009 to Present*
- Operating nourishment cart to provide patients with refreshment between meal hours
- Assisting patients to treatment facilities and discharging patients from hospital