

## EC 483/597 Midterm #2 Study Guide

The exam will consist of one essay style question worth a total of 50% and 6-8 short answer questions worth 50%. You may include graphs, intuition, and math as you see fit to answer each question. Note that it is not always the case that more writing is better. Be concise, be clear, and state your points. If you get to a question and feel that you don't know how to answer it, write whatever you know about the topic, which I am sure is more than you realize. Do not leave answers completely blank.

For the first part of the exam, the long answer portion, I will provide you with a choice between two long answer questions. On exam day, you may write a long answer response to either of the two long answer questions below:

1) The Affordable Care Act is the most substantial piece of health care reform since the introduction of Medicare and Medicaid in 1965. Discuss some of the important features of the ACA. In particular, provide discussion of the individual mandate, the dependent coverage provision, and Medicaid expansion. Why did policymakers include provisions such as these? What are some of the issues associated with these provisions and despite these issues, has the ACA been a success? It may be helpful to cite some of the early economic studies of the ACA that we have covered in class. According to recent health economics literature, what are some of the successes/unintended consequences of the ACA?

2) Medicaid expansion is a hot topic not only in health economics, but within the current political landscape in the U.S. After the ACA's expansion of Medicaid there are still a number of states that have not expanded the program to cover a wider range of individuals. Provide a brief discussion of Medicaid including discussion of its purposes, who it covers, how it varies across states, and how state variation in Medicaid coverage has led to the so-called coverage gap. There are two additional phenomena that are quite interesting with respect to Medicaid. The first is the "crowding-out" effect that has been studied extensively in the literature. The second is the recent "woodwork" effect that has come as a surprise after the ACA. Discuss the causes of each of these phenomena and how they further complicate an already complex government program.

The remainder of the exam will consist of short answer/problem solving type questions. Here is non-exhaustive discussion of topics that we have covered:

### **Uninsurance, Uncompensated Care, and Employer-Provided Health Insurance**

It is shown that if a person purchases insurance, they are risk-averse. It is not necessarily the case, however, that all uninsured individuals are risk-neutral or risk-loving. There are a number of reasons why a risk-averse individual may fail to purchase insurance. These reasons include the inability to afford insurance, lack of knowledge of how to purchase insurance, and other factors such as the perceived probability of loss and the amount that the individual expects to lose. Due to the great recession, uninsurance reached its highest level in two decades at about 18% of the population. After passage of the Affordable Care Act (ACA), however, uninsurance rates fell to about 10% in 2015. Developing a better understanding of this subset of the population can help policymakers to better target mechanisms to aid these individuals in becoming insured.

The ACA has helped a number of people obtain insurance that previously went uninsured. Particularly, individuals that make below 200% of the Federal Poverty Level (FPL) as well as Hispanic individuals have seen dramatic decreases in rates of uninsurance. This is, in part, due to the expansion of Medicaid and government subsidies to aid in the purchase of health insurance stemming from provisions within the ACA. When asked about why they failed to purchase insurance in 2015, about half claim that insurance is simply unaffordable. In 2015, there are about 28 million remaining uninsured individuals within the U.S., with about three-quarters of these families having at least 1 full-time worker, roughly half making less than 200% FPL, and a disproportionate 32% from the Hispanic population. Uninsurance rates are higher in the Southeast region of the U.S., with many southern states electing to not expand Medicaid after passage of the ACA.

Through the institution of insurance, those that are covered by insurance plans pay a slightly discounted price for health care. Insurance companies have a good amount of market power in the health care system, and these companies are able to negotiate discounted prices for their clients. Clearly, those that are uninsured do not get to pay these discounted rates, they instead pay the “full price.” It is a well-known fact, however, that when an uninsured individual goes to the doctor, they usually do not pay 100% of their medical bills. The portion that remains unpaid by the uninsured out-of-pocket is called uncompensated care. In 2013, there was an estimated \$85 billion of total uncompensated care in the U.S. That is, \$85 billion was consumed of medical care and never directly paid by the consumer. A majority of this uncompensated care comes from hospital care, indicating that in many cases, this is likely to be emergency care. So if the consumer does not pay for this uncompensated care, then who does? A number of different organizations pay a portion of the uncompensated care, with medical providers themselves eating some of the cost. The biggest payer of uncompensated care is Medicaid, while Medicare and other state and local government programs pay smaller shares. To have such a large amount of

money unaccounted for, and even considered “wasteful” to our tax-funded government programs, is an obvious concern within the state of our health system.

Where do people obtain their insurance coverage? Well the largest provider for private insurance in the U.S. is the employer. First, note that loading costs or administrative fees are smaller for large pools of people. In other words, insurance is more expensive for individuals and smaller groups. Hence, it is often times beneficial for employers to offer insurance to their employees, as these groups are large enough to efficiently minimize loading costs. The first example of employer-provided health insurance in our nation occurred in Dallas Texas in a period very near the Great Depression. The Baylor Medical Center offered an insurance plan to a group of public school teachers. In exchange for \$0.50 per month, Baylor covered all of the medical expenses for the teachers. This idea became known as “Blue Cross.”

While the idea of employer-provided insurance originated during the Great Depression, it did not become widespread until World War II. Our government was aware of the massive hyperinflation experienced in post WWI Germany due to high levels of government spending. In an effort to prevent such inflation within the U.S. the government implemented wage and price controls during the war. In response to such wage controls, workers became disgruntled, and in several cases threatened to go on strike. In order to appease the workers, employers began to offer “fringe benefits.” For example, instead of raising wages, employers would offer employer-provided health insurance, access to a company car, subsidized meals while at work, etc. The War Labor Board declared that employer-provided health insurance were exempt from these wage controls, and moreover they also allowed insurance to be exempt from income taxes. The government also offered tax benefits for employers to offer insurance to employees. From this point, employer-provided health insurance took off, and by the mid-1960s it was almost universal.

Employer-provided insurance has some direct effects on the market for labor. Recall that firms demand labor, while workers supply labor. The point of which the supply curve for labor crosses the demand curve for labor determines the equilibrium price of labor, i.e. the wage rate, and the equilibrium quantity of labor, i.e. the number of workers. If employers offer health insurance to employees, and employees value these benefits at \$z, then employees are willing to accept \$z less in wages. Hence, workers are willing to supply the same amount of labor as before, however at a lower wage rate. This will indicate a shift of the supply curve in a right-downward direction. Likewise, if employers offer health insurance to employees, and it costs employers \$y to fund these benefits, then employers will demand less labor at the original wage rate. This describes a shift in the demand curve in a left-downward direction. In the new equilibrium, there will clearly be a lower equilibrium wage rate. Effects on the equilibrium quantity are less clear, and depend on a comparison between the costs of the firm, i.e. y, and the benefits of the worker, i.e. z. If  $y > z$ , then in equilibrium there will be a lower quantity of workers, and if  $y < z$ , then there will be a higher quantity of workers. If  $y = z$ , the same equilibrium quantity as before is realized. In summary, employees pay for health benefits through lower wages, and the amount of wages that a worker has to give up is called a compensating wage differential.

One concern of employer-provided health insurance is known as “job-lock.” The idea is that people do not want to leave their jobs because they have good insurance benefits. Suppose I work for company A and I have very nice health insurance benefits. I get an offer from company B that pays a higher wage rate, however the insurance coverage is either nonexistent or not as nice as that of company A. Then I may be inclined to remain at the less productive job for company A. In a pre-ACA world, this is particularly a concern for those that suffer from preexisting conditions. Studies have shown that those with employer-provided health insurance stay on 16% longer than those without, and are 60% less likely to voluntarily leave jobs.

## **Insurance Experiments**

The idea of cost sharing is heavily debated in many discussions of health insurance. Cost sharing refers to the idea of shifting a larger burden of health spending onto the consumer and away from the insurance company. If consumers have to bear a larger share of the burden of health costs, how does this affect utilization and subsequent health status? There are two famous health insurance experiments that intended to study this question. The RAND Health Insurance Experiment and the Oregon Health Insurance Experiment were two large scale, randomized experiments that essentially gave insurance coverage to those that were previously uninsured, and then monitored changes in utilization and health status.

The RAND HIE is discussed at length in Manning et al. (1987), and is a pioneer experiment of the effects of health insurance. The experiment was conducted from 1971-1982 and the experiment recruited almost 8,000 individuals under the age of 65. Individuals were obtained from six different locations that offered a regional and urban/rural balance. Each person or family was assigned to 1 of 5 types of insurance plans and were studied for 3-5 years. Of the 5 different types of plans, one plan offered free health care, and three plans offered plans with varying levels of coinsurance (25%, 50%, and 95% coinsurance). Finally, the fifth plan is similar to what might be considered a high-deductible, catastrophic plan today.

RAND monitored health care utilization and health care spending of members across each plan. They found that those with free health care visit the doctor 5 times per year, and those with a 95% coinsurance plan only 3 times per year. Moreover, those with free plans spent about \$750 per person per year (or the insurance company spent that much), while those with 95% coinsurance spent \$518 per person per year. These spending levels are statistically significantly different from one another. Overall, those with more generous or more complete health insurance coverage go to the doctor more often and spend more money at the doctor than those with less generous plans. RAND also tracked health outcomes in an effort to determine whether this increased spending actually improved health. They found no improvements of health within normal adults, however among the poorer participants in the study, they found improvements of blood pressure. This brings about the question of whether it is worth it to have health insurance, or just programs targeted for prevalent, inexpensive chronic diseases.

A second famous study is the Oregon HIE. In 2008, Oregon expanded its Medicaid program by randomly selecting 30,000 low income adults from a waiting list of 90,000 people.

Those that won the lottery were able to apply for Medicaid, and those that were eligible were able to enroll. Finkelstein (2012) and Baiker et al. (2013) each study the Oregon HIE. From Baiker et al. (2013), participants in the treatment group (winners of the lottery that received Medicaid), were significantly more likely to have utilized health care in the past 12 months than their counterparts in the control group. Additionally, individuals in the treatment group were significantly more likely to report that their health had improved since one year prior. The Oregon HIE also tracked health outcomes both in terms of mental and physical health. Those that were part of the treatment group showed improvements in various mental health measures including depression, while there were little to no effects for physical health. Those in the treatment group were more likely to be receive diagnosis and treatment for diabetes when compared to subjects in the control group. In terms of health care spending, those in the treatment group spent on average 45% more on health care than those in the control group, indicating once again that more complete health insurance coverage leads to higher levels of utilization.

In summary, the RAND and Oregon HIEs study the effects of more complete health insurance coverage on health care utilization, spending, and health outcomes. Each study finds significant increases in utilization and spending, however effects on health outcomes are less clear. These studies are very interesting as through randomization they are able to eliminate or at least minimize issues of selection bias. Due to the financial and time costs associated with large-scale controlled experiments, RAND and Oregon remain two of the few major studies of insurance.

## **A History of Health Reform and the ACA**

After passage of the Patient Protection and Affordable Care Act (PPACA), aka Obamacare, health care reform has become one of the most debated topics in America today. Though this topic brings about a huge political division, health reform is not a new idea and attempts at health reform have been made at several points in our history. Bipartisan politics often becomes the barrier to health reform, and in many cases politics clouds what is best for the health system of our country. In class we discussed a history of health reform dating all the way back to WWII. Though some presidencies put less emphasis on health care reform than others, practically every administration focused at least some energy on health care.

Prior to the ACA, the largest overhaul of our health care system came in 1965 under the administration of President Lyndon B. Johnson. Passed under democratic control of the house and the senate, the Social Security Amendments of 1965 created Medicare and Medicaid, the two largest social programs in our country today.

President Richard Nixon proposed a complete overhaul of the health care system. In his proposal, he recommended government-prescribed minimal levels of insurance coverage, an employer mandate of such coverage, and government subsidies for those that could not afford such insurance. Though this republican proposed system never passed, it sounds quite similar in many ways to several provisions within the ACA of today. During the Clinton administration

(1993-2001), another proposal was produced by a second set of republican policymakers. This plan, named the Health Equity and Access Reform Today Act of 1993 (HEART). Under this plan, employers are required to provide health insurance coverage for employees, insurance providers are prohibited from denying coverage based on preexisting conditions, low income individuals that do not qualify for Medicaid will receive vouchers to help pay for health insurance, and all U.S. citizens are required to obtain coverage from some type of health care plan. Though this bill never came to a vote, once again this is an example of a republican led plan that seems quite familiar to the ACA.

During the Bush administration, an interesting piece of health reform emerged from the state of Massachusetts. This plan, nicknamed Romneycare after Massachusetts governor Mitt Romney, mandated that all residents of Massachusetts purchase some minimum standard level of health insurance, provided free health care benefits to residents earning less than 150% FPL, and mandated that employers of more than 10 full-time employees provide health insurance. This is the model after which the ACA was built.

Finally, on March 23, 2010, President Barack Obama signed into law the Patient Protection and Affordable Care Act (PPACA). This is the largest health care overhaul since creation of Medicare and Medicaid in 1965. Built into the ACA are a set of provisions that brought about change to our health care system. First, the ACA implemented what are called industry standards. Within these industry standards, young adults are able to remain on their parents' health insurance plans until the age of 26, insurance companies cannot drop sick people, insurance companies can no longer deny coverage based on preexisting conditions, and there are no longer lifetime limits of coverage. As you might imagine, these added benefits come at cost. In order to pay for this cost, as well as improve the problem of adverse selection, the ACA requires that every U.S. citizen purchase some minimum standard of health insurance. Those that cannot afford to purchase insurance may receive government subsidies to pay for coverage. If people do not purchase insurance and meet the requirements of the individual mandate, then they are subject to a penalty or a tax each year. In order to better facilitate insurance availability, the ACA created a number of online health care exchanges. Through the online health care marketplace, consumers can become more aware of available plans, and insurance providers can compete for customers through a readily available online marketplace. Other provisions built into the ACA include a substantial expansion of Medicaid. The ACA expands Medicaid to 133% of the FPL, that is, in states that elect to expand. Also, there is an employer mandate built into the ACA. If employers have more than 50 full-time employees, then they must offer health insurance to these workers.

Many might question the provision of government subsidies to aid low income individuals to pay for health care, and essentially as a society we have three options. Option A, allow uninsured individuals to die in the street in an emergency situation. After passage of the Emergency Medical Treatment and Active Labor Act (EMTALA), emergency rooms are forced to treat individuals, and hence unless this law is repealed, they must provide care to uninsured individuals. Option B, pay for health care expenses of the uninsured individual through uncompensated care. In this case, an average of 80% of the uninsured individual's treatment is

paid by various government bodies through uncompensated care. Finally, Option C, wealthier people pitch in and subsidize the insurance costs of low income individuals. In this option, the low income person has access to preventative care, obtains treatment when sick, and is covered in the event of an emergency. Moreover, the individual now has access to the negotiated, discounted price obtained via the insurance company. Other members of society can reap the benefits of the positive externality of the low income individual receiving medical care and potentially becoming healthier. Under this framework, subsidizing the health care costs of low income individuals may not seem to be a terrible option, although as we know in economics nothing is perfect, and everything comes with a tradeoff or a cost. Remember, there is no free lunch.

Though the ACA seems quite complex, it is based upon a set of very simple ideas. Also, though it brings about much political divisiveness, passage of such law requires a bipartisan effort. Since the ACA is quite new, there are only limited economic studies of the law. We briefly discussed three recent studies: Antwi et al. (2013), Lenhart and Shrestha (2016), and Chatterji et al. (2016). Each of the three studies uses a similar difference-in-differences identification strategy by separating observations into a treatment group and a control group. Antwi et al. (2013) and Lenhart and Shrestha (2016) each study the effect of the ACA's young adult mandate on health insurance coverage and labor market outcomes. Antwi et al. (2013) finds that the ACA's young adult provision, which allowed young adults ages 19-25 to remain on parents' health insurance plans, led to more widespread health insurance coverage within the treatment group. Specifically, they estimate that about 1 million young adults gained insurance coverage due to this provision. Moreover, Antwi et al. (2013) and Lenhart and Shrestha (2016) each find that the provision may have led to some labor market disincentives. The idea is that if a young adult works solely for the purpose of maintaining health insurance, then allowing the individual to switch onto parents' plan may lead to decreased work hours or transition into part-time status. Moreover, Lenhart and Shrestha (2016) find that young adults went to work less, and instead watched TV more, while investing in health related activities less (moral hazard). Hence, the ACA young adult provision may have some unintended consequences in the form of labor market disincentives.

Finally, Chatterji et al. (2016) study a separate provision in the ACA, the prohibition of denial based on preexisting conditions. Prior to the ACA, insurance companies could deny coverage due to preexisting conditions. This led economists to become interested in a phenomenon called "job-lock." Job-lock refers to the idea that a person will remain in their job solely due to insurance, even if a higher paying job were to come available. Chatterji et al. (2016) studies a subset of the population that may be especially susceptible to job-lock, parents of children with preexisting conditions. If the ACA freed up any of these issues related to job-lock, then this job flight should have been especially apparent in parents of disabled children. They separate observations into a treatment group (privately insured parents of disabled children) and a control group (privately insured parents of healthy children). Using a difference-in-differences model they show that after the passage of the ACA, married fathers within the treatment group were about 35% more likely than those in the control group to voluntarily leave jobs. They found no significant effects among married and unmarried mothers with disabled

children. In short, these findings suggest that the prohibition of denial based on preexisting conditions provision within the ACA may have corrected some of the inefficiencies of job-lock.

Due to data limitations, empirical work studying the ACA is quite limited. Early studies show some potential positives and negatives of the policy, and further work is needed to gauge overall success or failure. It is still a bit too early to tell whether the ACA has been a success, and most likely it has in some respects, however as is the case with any policy change, there are likely some unintended consequences.

## **Managed Care**

Managed care is a type of health insurance setup that is different than the standard fee-for-service (FFS) type plan. In a FFS plan, a payment is made for each and every trip to the doctor. In a managed care organization (MCO) type plan, all members pay a monthly fee, and they are able to consume health care at a certain set of providers with which the manager has negotiated deals. Typically, members of an MCO cannot or will not go to any medical providers that are not “in-network” providers. MCOs originated in California through the birth of the Health Maintenance Organization (HMO) in the early 1930s, and California remains the largest HMO state today. An HMO is unique in that as a person enrolls into an HMO, they are assigned to a particular primary care physician and this doctor acts as a “gatekeeper.” In order to go receive more specialized care, the patient has to be recommended by the gatekeeper, and hence the gatekeeper acts as an authority to determine what care is completely necessary. Through the use of a gatekeeper, it is believed that MCOs successfully reduce costs through wasteful health spending. Some concerns of a gatekeeper type system are that it is in the best interests of the gatekeeper to minimize health spending, hence this may provide the incentive or underutilization. Additional concerns are dumping, creaming, and skimping, or gatekeepers seeking to treat only healthy individuals while avoiding those that are sickest.

We discussed in detail one particular piece of literature on HMOs. Evans et al. (2008) study a policy change in the state of California requiring MCOs to fund at least two nights in the hospital for mothers giving birth. Prior to this law change, many mothers with normal births were only staying for one night in the hospital. Managers of MCOs noticed that staying several nights in the hospital was wasteful, and they cut down coverage to only one night. A few infants became ill and died, and MCOs received a lot of the blame for refusing to fund a second night’s stay. In August, 1997, the state of California passed a law requiring that MCOs fund at least two nights for a normal birth and at least four nights for a c-section birth. A similar federal law took effect in 1998. Evans et al. (2008) study the effects of these law changes on both the average number of nights stay in the hospital as well as subsequent health effects, i.e. did staying an additional night improve the health of the infant. As a measure of subsequent health of the infant, they use 28-day readmission as an outcome variable, i.e. if the child is readmitted within 28 days, this is perceived as a negative health outcome.

They find that after passage of the new laws, there was a distinct decline in the percentage of mothers leaving the hospital in less than 2 days for a normal birth and less than 4

days for a c-section birth. This indicates that the policy did exactly as it was intended to do by allowing mothers a second night's stay in the hospital. In terms of 28-day readmission, they find little to no effects among mothers with normal childbirths, and they find significant reductions in 28-day readmission among c-section deliveries, complicated births, and Medicaid patients with complicated deliveries. Overall, they find that the policy was not cost effective, with costs of the additional night's stay outweighing the benefits for mothers giving normal births. They conclude that perhaps the best policy would be to allow complicated childbirths the extended stays in the hospital, however it may be unnecessary to force insurance companies to fund a second night's stay among mothers giving normal births.

## **Social Insurance and Medicare**

Social insurance programs can be separated into five categories: those aimed to help the impoverished, the elderly, those suffering from disabilities, health programs covering medical expenses for children, elderly, and the poor, and finally the unemployed. The origins of social insurance date back to late 1800s Germany, where Otto von Bismarck created the first social health insurance program in hopes of gaining the support of the German working class. The U.S. did not start social insurance until after most of Europe, and social insurance in the U.S. really did not begin until the introduction of Medicare and Medicaid in 1965.

Medicare is a social insurance program that provides "care" to elderly individuals aged 65 and up. Beginning during the civil rights movement, Medicare effectively desegregated hospitals through the threat that Congress could withhold funds to those that remained segregated. Medicare was expanded to the disabled nonelderly in 1972. As of 2013, there are over 50 million people covered by Medicare, and the program makes up approximated 15% of the federal budget.

Medicare is divided into four parts: A-D. Medicare Part A is the original form of Medicare that covers standard inpatient hospital care as well as other forms of care such as skilled nursing facility care, home health agency care, and hospice. Medicare Part B covers supplementary forms of care such as physicians' and surgeons' services, ambulance services, and some forms of specialized testing. Medicare Part D was created in 2003 and covers prescription drug needs for beneficiaries. Finally, Medicare Part C is essentially a managed care type plan that offers HMO style coverage for enrollees. Most Medicare beneficiaries get Parts A and B, while C and D are typically optional. Medicare is financed through payroll taxes, through the general fund of the U.S. treasury, and through premiums.

We studied two articles related to Medicare: Finkelstein and McKnight (2008) and Card et al. (2009). The former studies the effect of Medicare on mortality among the young elderly. Specifically, they use the young elderly (aged 65-74) as the treatment group, and the near elderly (55-64) as the control group. Though they note a decline in mortality rates across the groups, the decline seemed to begin prior to the introduction of Medicare in 1965. Moreover, they find that the mortality rates of those that are young elderly do not behave significantly differently from those that are near elderly in a time period surrounding 1965. They do find, however, that due to

the desegregation of hospitals following Medicare, pneumonia-related deaths among non-whites decreased significantly, indicating that perhaps it is not Medicare eligibility but instead legal access to hospitals that has significant impacts on mortality. Though they find no significant impact of Medicare on mortality, they do find that Medicare lowered the out-of-pocket expenditure of individuals in the right-tail of the spending distribution (those that are the highest spenders).

Card et al. (2009) study whether hospitals give preferential treatment to Medicare patients, and if they do, whether this improves health outcomes. They employ a regression discontinuity design methodology using the number of days from an individual's 65<sup>th</sup> birthday as a threshold. By doing this, they are essentially separating observations into two groups: those not yet 65 and those recently turning 65. They find that those above the 65 threshold are more likely to be admitted to the hospital, more likely to stay longer at the hospital, and are more likely to be charged for more items while at the hospital. This indicates that Medicare patients do receive preferential treatment. They go further and show that this preferential treatment leads to reductions in both short-term and long-term mortality.

One concern with Medicare is rising costs. Medicare costs are rising faster than general health costs, we have an aging population, life expectancy is going up, and as a larger proportion of our population becomes Medicare eligible, we have less workers to tax to fund the program. William N. Evans provides estimates of a few policy options to aid in the financial problems associated with Medicare. First, we could raise the eligibility of Medicare from 65 to 67 (or even 70). This would save an estimated \$113 billion over ten years. Second, we could raise Part B and Part D premiums. This would increase beneficiaries' costs from 25% to 35% out-of-pocket, and an additional \$241 billion over ten years would be generated. Finally, we could raise Medicare payroll taxes from 2.9% to 3.9%, with an additional 0.9% tax for high wage earnings. This would raise an additional \$651 billion in tax revenue over ten years.

## **Medicaid and Crowding-Out**

A second social insurance program is Medicaid, a federal-state matching program that pays for medical assistance and "aids" the poor, blind, and disabled. This program is the largest source of funding for medical and health-related services for America's poorest people, and it is the largest source of funding transferred from the federal to state governments. Medicaid effectively has four purposes: to provide coverage of medical expenses for low-income women and children families, to provide public insurance for low-income Medicare beneficiaries, to cover medical expenses for those that are low-income and disabled, and to pay nursing home expenditures of many of the institutionalized elderly. Though Medicaid is a federally mandated program, it gives a good amount of options to the states. Each state establishes its own eligibility standards, and these standards of eligibility vary drastically across states and across individuals.

In terms of physician payment, Medicaid reimburses physicians following either a FFS payment system or a MCO-type system. Physician reimbursement rates for Medicaid patients are typically lower than what a physician could charge to a standard insurance company. This retrospective, low rate of reimbursement coupled with the abundance of paperwork associated

with Medicaid patients leads many doctors to avoid treating such patients. This lack of access to care is yet another issue to be considered when expanding Medicaid.

An important provision of the ACA is Medicaid expansion. The ACA recommends that states expand Medicaid to cover adults earning up to 133% FPL. A number of states have elected to not expand coverage to this level, and this has created the so-called Medicaid gap. Individuals in this gap make too much to qualify for their state's Medicaid program, however too little to receive federal subsidies to help pay for insurance. There are currently an estimated 2.6 million people in the Medicaid gap, and about 90% of these people live in the south (states that generally have not expanded Medicaid).

A number of studies have looked at the effects of Medicaid expansion. Currie and Gruber (1996) perform a cost-benefit analysis of expanding Medicaid coverage to pregnant women. They study state-level Medicaid expansions in the 1980s, that expanded benefits to pregnant mothers, with first-time mothers previously being omitted from Medicaid coverage. They found that a 30-percentage point increase in the fraction of women eligible for Medicaid was associated with a decrease in infant mortality of 8.5%. They estimate that the benefits of these lives saved outweigh the costs.

A heavily discussed issue within health economics literature is crowding-out. The idea is that if we expand Medicaid coverage to more people, sure we many new people will become eligible, but all of these people will not have been previously uninsured. If a new person becomes insured due to expansion, we call this take-up. If a person shifts away from private insurance and onto government funded insurance, then this is called crowding-out. Cutler and Gruber (1996) is perhaps the most famous paper studying the crowd-out effects of public insurance. They look at Medicaid expansions that covered more pregnant women and more children over the period 1987-1992. They rely on an identification strategy that exploits variation across states and across time in Medicaid expansion. They find that Medicaid expansions over the period did lead to reductions in the number of people covered by private insurance. Specifically, they find that though Medicaid expansions increased insurance coverage by 2.3 million people, private insurance coverage decreased on the order of one-half to three-quarters of the Medicaid coverage increase. This indicates that crowding-out has occurred, and many would consider this to be a wasteful aspect of government provided insurance (as people that were previously able to afford insurance can now free-ride the government provided insurance).

## **Self-Assessed Health**

The National Longitudinal Survey of Youth (NLSY) collected information on individuals that included data on sex, race/ethnicity, age, family income, household size, number of children under 18 in the household, number of children under 6 in the household, highest education degree attained, marital status, and self-assessed health. The NLSY asked participants "In general, how is your health?" to assess the self-assessed health (SAH) of individuals. SAH answers include

excellent (a SAH of 1), very good (a SAH of 2), good (a SAH of 3), fair (a SAH of 4), and poor (a SAH of 5).

The following regression was estimated in Stata:

$$SAH = \alpha + \beta_1 male + \beta_2 black + \beta_3 hisp + \beta_4 mixed + \beta_5 age + \beta_6 income + \beta_7 hh\_size + \beta_8 hh\_under18 + \beta_9 hh\_under6 + \beta_{10} GED + \beta_{11} HS + \beta_{12} ASS + \beta_{13} BAC + \beta_{14} GRAD + \beta_{15} MAR + \beta_{16} NOTTOG + u$$

where *SAH* is the self-assessed health; *male* is a dummy variable equal to 1 if the person is male; *black*, *hisp*, and *mixed* are dummy variables equal to 1 if the person's race/ethnicity is Black, Hispanic, or Mixed, respectively; *age* is the person's age; *income* is the person's income; *hh\_size* is the size of the household; *hh\_under18* and *hh\_under6* are the number of children under 18 and 6, respectively, in the household; *GED*, *HS*, *ASS*, *BAC*, and *GRAD* are dummy variables equal to 1 if the person's highest education attainment is a GED, a high school diploma, an associate's degree, a bachelor's degree, or some sort of graduate degree, respectively; *MAR* and *NOTTOG* are dummy variables equal to 1 if the person is married or no longer with the person they married, respectively.

Here are the results from the above regression in Stata:

VARIABLES	(1) SAH
male	-0.190*** (0.009)
black	0.006 (0.010)
hisp	0.053*** (0.011)
mixed	0.052 (0.043)
age	0.040*** (0.002)
income	-0.000*** (0.000)
hh_size	0.027*** (0.004)
hh_under18	-0.002 (0.006)
hh_under6	0.007 (0.007)
GED	-0.130*** (0.018)
HS	-0.205*** (0.014)
ASS	-0.358*** (0.021)
BAC	-0.546*** (0.017)
GRAD	-0.637***

	(0.030)
MAR	-0.080***
	(0.010)
NOTTOG	0.018
	(0.021)
Constant	1.529***
	(0.045)
Observations	50,018
R-squared	0.062

Standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Males tended to report a better SAH than females, which is interesting since females live longer. SAH seemed to get worse as age increased. As income increased, SAH was better. SAH became better as education attainment increased. The reasons SAH increased as income increased might be attributed to the same reasons as why SAH increased as educational attainment increased. SAH varied among different marital statuses and different races/ethnicities, however we see that Hispanics have worse SAH which is interesting because Hispanics tend to live longer.

### **For-Profit and Nonprofit Hospital Models**

In 2016, there are over 5,600 hospitals with over 900,000 beds in the U.S. A number of these hospitals are nonprofits, and nonprofit hospitals cover about 70% of the hospital care in the U.S. Nonprofit hospitals emerged from ancient Egypt and Greece, and the first hospitals were created by religious organizations. Hospitals began to rise in the U.S. primarily due to urbanization and the rising urban middle class. In rural areas, hospital growth could not be supported due to transportation problems and low population densities. Over time, rural areas became more industrialized, and this industrialization not only led to more outbreaks of infectious disease, but it also created an urban middle class with higher willingness-to-pay for hospital care. These economic factors along with the belief that hospitals should be a public good further led to the emergence of nonprofit hospitals.

In class, we considered two variants of a hospital model: a for-profit hospital and a nonprofit hospital. The for-profit hospital model assumes that the hospital acts as a monopolist, which is a reasonable assumption given the design of our hospital systems in the U.S. (DCH is the monopoly in Tuscaloosa). In economic theory, the monopolist chooses a level of output at a level such that  $MR=MC$ , where in terms of a hospital output may be considered the number of patients treated. A more realistic example is that not only does a profit maximizing hospital choose quantity produced, but it likely also chooses some level of quality for each of these units of output.

In terms of nonprofit hospitals, we considered the example of Newhouse (1970). In this example, the hospital board of trustees acts as a utility maximizing entity. The board chooses

some combination of quantity and quality in their utility maximization decision. They maximize utility subject to some financial constraint known as the quantity-quality frontier. The quantity-quality frontier is the combination of all affordable quantity-quality bundles, and it is depicted by an outwardly bowed curve surrounding the origin.

## **The Health Economics of Bads**

In health, we are concerned with both morbidity and mortality. According to the CDC, about 40% of annual deaths from each of the five leading causes of death (heart disease, cancer, chronic lower respiratory disease, stroke, and unintentional injuries) can be prevented through behavioral modifications. Bad behaviors such as smoking, drinking, and drunk driving contribute to many of these deaths. Often times, not only do people directly impact themselves through bad behaviors, but they also impact others. An externality is a side effect or consequence of an action or activity that affects outside parties in ways unrelated to the cost of the good or service. Smoking is a textbook example of a negative externality. By smoking, not only am I directly harming my own health, but I am also harming the health of those around me (through secondhand smoke). Hence, I am imposing a negative externality on these individuals.

When smokers and drinkers underestimate that probabilities of ill health due to their consumption, the imperfect information provides an efficiency rationale for government taxation or advertisement restrictions. In terms of taxation, an obvious question is if we impose a tax, do people actually demand less alcohol or less cigarettes? In terms of advertising, the question is by advertising against bads or by limiting their positive advertising, does this impact consumption levels?

Due to the deadweight loss from the social costs of a negative externality, there is a potential role for government intervention in the form of taxation. Excise taxes, or Pigouvian taxes, are a tool used by the government to discourage bad behaviors. Taxes occur at the federal, state, and local levels, and tax rates across states for alcohol and cigarettes vary drastically. Economists generally believe that the law of demand holds for all good, that is, increasing taxes on cigarettes increases the price and leads to lower consumption of cigarettes. Scholars within medical and psychology communities believe that the law of demand need not hold for addictive products such as alcohol and cigarettes.

There is a sizable literature studying the effects of excise taxes on smoking. There is a near universal agreement within the literature that increases the price of cigarettes by 10% leads to a reduction in demand by 4%. These reductions are found both along the extensive margin (a decrease in the number of smokers), and the intensive margin (a reduction in the number of cigarettes smoked per day among remaining smokers). These studies rely on variation across states and across time in cigarette tax hikes. Essentially, states that increase taxes on cigarettes are considered to be the treated group, and states that do not institute tax hikes are considered to be the control group. In the late 1990s and early 2000s, after the Tobacco Master Settlement Agreement, there was a lot of movement in cigarette taxation across states. These movements created the grounds for a natural experiment.

In terms of government programs such as Social Security, Medicare, and Medicaid, “bads” may actually lead to some positive externalities. For example, suppose that the average smoker dies at a younger age, and actually dies before reaching the age to qualify for Medicare. Then this individual pays into Medicare his entire life, however does not receive any of the benefits from the program. From the perspective of other taxpayers, this might be considered a positive externality of smoking. There is a stream of research analyzing whether smokers and drinkers “pay their way,” that is, pay enough in taxes to offset any societal costs due to negative externalities. The literature finds that though smokers do pay their way, heavy drinkers do not. The cited reasons for this is related to drunk driving fatalities. The cost associated with a drunk driving fatality is quite large, as it is the dollar amount associated with the value of a statistical life. Additionally, the real tax rate on alcohol has been going down across time. These two factors lead to the belief that heavy drinkers do not pay their way, that is, the societal costs of heavy drinking outweigh the taxation benefits.

## **Prescription Drugs and Medical Marijuana**

The prescription drug industry is one of the fastest growing industries in terms of spending in recent years. Additionally, the prescription drug industry is among the most profitable industries in America. The pharmaceutical industry has led to major breakthroughs in treatment of conditions that previously went untreated. Despite these successes, the industry is often labeled as one fueled by greed, and pharma companies often get represented negatively within the media.

One interesting aspect to the pharma industry is that it is highly regulated by the Food and Drug Administration (FDA). In the late 1950s, after a tragedy involving a drug used to treat morning sickness among pregnant women, the FDA was given substantially more control over the introduction and regulation of new drugs. Since then, the FDA has implemented a very tedious and lengthy review process for new drugs. The average approval time for a new drug is about 14 years, and this includes many different clinical trials testing both safety and efficacy. Many believe that this lengthy approval time is anticompetitive and that it discourages innovation. One study from 2008 estimated found that more rapid access to drugs saved between 140,000 and 310,000 life years, compared to an upper bound of 56,000 life years lost due to harmful effects of drugs before they were withdrawn from the market. Hence, it may be the case that the lengthy FDA review process is a deadly one.

So why does the FDA have such a lengthy process? It is likely due to the FDA’s incentives to eliminate Type I errors. Type I errors occur when a drug is harmful, but the FDA allows the drug to hit the market. Consider an example of a child that dies from a harmful yet rare side effect of a drug that was approved by the FDA. The media is likely to cover such a story. Though FDA officials are immune to litigation, such a story is definitely embarrassing to these FDA officials. Hence, they go to great lengths to avoid any situation that may result in a Type I error, and they do so by having such a tedious review process. They do not, however, have too much of an incentive to limit Type II errors. A Type II error occurs when a drug is not

harmful, yet the FDA disallows the drug. Consider another example of a child that needs a particular drug, however the FDA has restricted such a drug from the market. Though the child goes untreated and dies, no one is in a suitable position to argue with the FDA, as the FDA can always claim that they must ensure with certainty that the drug is not harmful. Additionally, this type of story is less likely to get as much media attention as the case of the Type I error. For these reasons, a Type I error is self-correcting, while a Type II error is not. The lack of concern with Type II errors is a potential flaw within the FDA's process, and it may be a flaw that leads to a lot of deaths that don't get discussed within the media. This is all captured within the trade-off between consumer protection and the encouragement of rapid innovation.

In recent years, there has been substantial policy movement regarding marijuana legalization, both recreationally and medically. The legalization of recreational marijuana is more recent, and is limited to only a few states. Hence, economic studies on recreational marijuana are limited. Medical marijuana has been around for a longer period of time and is more widespread across states. Therefore, much of the health economics research to date has focused on medical marijuana. The literature largely relies on variation both across states and across time in the introduction of medical marijuana laws. Early studies have shown that medical marijuana laws lead to more marijuana consumption within the general public. Additionally, much of the early literature has studied whether medical marijuana is a complementary or supplementary good with alcohol and harder drugs such as cocaine or heroin. Results in the literature are mixed with respect to alcohol, with some finding complementary behavior and others finding supplementary behavior. In summary, this is a relatively young literature that needs more time and more work in order to draw uniform conclusions.

## **Obesity and Nutrition**

The U.S. has observed substantial increases in obesity across time. In 1970, 14% of the population was obese, while today, 36% of the population is obese. Individuals that are obese are at higher risk to suffer from type II diabetes, heart disease, and high blood pressure. For these reasons, the obesity epidemic is of huge concern to health economists and policymakers.

There are a number of mechanisms that may have led to the rise in obesity. One is the prevalence of fast food. The fast food industry has shown massive growth across time, and since the average fast food meal is calorically dense, perhaps obesity is in part driven by increased consumption of these unhealthy options. A second potential driver is TV or the internet. Today, we consume substantially more TV than in the old days, and hence we are sitting in place for longer amounts of time. Similarly, the rise in jobs that require computer and internet use may have led individuals to lead less active, sedentary lifestyles. We have seen a large rise of obesity among college educated individuals, those that are most likely to have jobs sitting at a computer all day. Moreover, perhaps those that are college educated have more stressful jobs, and stress eating could play a role in obesity prevalence. Finally, another potential cause is the rise in labor market participation among mothers. In the old days, it was far more common for a mother to be a "stay at home mom." These mothers would often prepare meals for the family. Today, mothers

are much more often engaging in labor market activity, and hence have less time with which to prepare meals. They may actually substitute into convenient yet less health restaurant options.

Cutler et al. (2003) develop a theory of mass production to explain the rise in obesity. This theory is related to the centralization of food preparation through development of new productive technology. For example, in the old days people did not eat French fries very often, as cutting, peeling, and preparing the fries took a large amount of time. Through technology, French fries are now cut, peeled, and prepared by corporations at a centralized location, frozen, and shipped to grocery stores across the U.S. Now, people can purchase these pre-processed fries, and it makes the prep time significantly lower for the individual. From 1977 to 1995, French fry consumption increased by about 30%.

Cutler et al. (2003) use French fries as an example, but they claim that this theory of mass production holds across a variety of food categories. They support their theory with four implications. Implication 1 says that if food prep costs are lower, consumers should demand more foods. They analyze food diary data and find that the consumption of snacks increased dramatically from the 1960s to the 1990s. Snacks are a category of food that may be most impacted by mass production. Implication 2 says that the foods that observed the largest increases in mass production improvements should have led to the largest increases in calories consumed. They plot the percent change in calories consumed against the farm share of value (a measure of mass production). They find that those foods that experienced the largest increases in calorie consumption are those that have the lowest farm share of value (and hence have the highest level of mass production). Implication 3 says that those that spent the most time prepping food in the initial period (hence those most impacted by mass productive technology) should have observed the largest gain in weight across time. They regress body mass index (BMI) on an individual's and a household's time allotment to food preparation in 1965. They find a positive and significant relationship between time spent prepping food in 1965 and the percentage increase in BMI, indicating that those that spent the most time prepping in the initial period were the most impacted by the mass preparation of food. Finally, implication 4 says that countries that experienced the most growth in mass preparation productive technology should have experienced the largest increases in obesity. They regress the percentage of the population in a country that is obese on a variety of food industry regulatory measures (countries that have more regulation on the food industry have the least incentive to develop mass production technology, and hence should have observed the smallest increases in obesity). They find negative and significant coefficients associated with each of the regulatory controls used, including the price of a Big Mac in a country (a higher price of a Big Mac leads to a lower gain in obesity). All of these implications taken together are suggestive evidence that it was the development of productive technology to mass produce foods that led to increases in obesity.