

## Introduction to Public Policy

### Lecture Note 8

# Path Dependence And The Health Care Debate

We begin today with some probability experiments. We have a jar with 20 brown sweets and 20 white sweets. We draw one sweet, and then replace it, and then draw another sweet. What is the probability of choosing two brown sweets in a row? The answer is simple:

Chance of drawing a brown sweet first =  $20/40 = \frac{1}{2}$

Chance of drawing a white sweet first =  $20/40 = \frac{1}{2}$

Chance of drawing a brown sweet second =  $20/40 = \frac{1}{2}$

Chance of drawing a white sweet second =  $20/40 = \frac{1}{2}$

So the probabilities are:

$$BW = 0.5 * 0.5 = 0.25$$

$$BB = 0.5 * 0.5 = 0.25$$

$$WB = 0.5 * 0.5 = 0.25$$

$$WW = 0.5 * 0.5 = 0.25$$

The probability of choosing two brown sweets in a row is  $0.5 \times 0.5 = 0.25$ . We should wind up with two brown sweets about one quarter of the time, two white sweets about one quarter of the time, and one white and one brown sweet about half the time.

What if we don't replace the first sweet? Then the situation gets a bit more complicated. Without replacement, the probabilities change with the second draw:

If a brown sweet is drawn first:

Chance of drawing a brown sweet first =  $20/40 = 0.50$

Chance of drawing a white sweet first =  $20/40 = 0.50$

Chance of drawing a brown sweet second =  $19/39 = 0.487$

Chance of drawing a white sweet second =  $20/39 = 0.513$

$$BW = 0.5 * 0.513 = 0.2565$$

$$BB = 0.5 * 0.495 = 0.2435$$

$$WB = 0.5 * 0.505 = 0.2565$$

$$WW = 0.5 * 0.495 = 0.2435$$

So the probability of drawing two brown sweets is  $0.5 \times 0.495 = 0.2435$ , which is slightly less than 25 percent of the time.

Let's say we chose BB in the first two rounds. What is the probability that we will choose another brown sweet?

Chance of drawing a brown sweet in the third round =  $18/38 = 0.474$

In other words, the fewer brown sweets are left the less likely it is that we will choose a brown sweet. We do not need to work through the math now, but if we did we would see that the selection of brown and white candies is predictable. With or without replacement we will choose a brown candy about one half of the time, and will tend not to stray very far from this probability. It doesn't matter if we choose a brown or a white candy first. The system is rather stable in that it tends towards a 50-50 chance of picking a white or brown candy.

What happens if we try a different experiment, in which we replace each sweet selected with two of the same color? For example, if a brown sweet is drawn first:

Chance of drawing a brown sweet first =  $20/40 = 0.50$

Chance of drawing a white sweet first =  $20/40 = 0.50$

Chance of drawing a brown sweet second =  $21/41 = 0.512$

Chance of drawing a white sweet second =  $20/41 = 0.487$

BW =  $0.5 \times 0.487 = 0.2435$

BB =  $0.5 \times 0.512 = 0.256$

WB =  $0.5 \times 0.487 = 0.2435$

WW =  $0.5 \times 0.512 = 0.256$

So the probability of drawing two brown sweets is 0.256, which is slightly *more* than one quarter of the time.

The chance of drawing a *third* brown sweet having already drawn two brown sweets is  $22/42 = 0.524$ . In other words, the more brown sweets we choose the more likely it is that we will draw a brown sweet in the next round

This last experiment is called "Polya's urn problem." The result is that the contents of the jar changes over time in unpredictable ways. An observed value is *more* likely to be observed again. Each selection *increases* the probability of choosing the same color, so the outcome is unstable. We call this process *path dependence*, since future selections are not equally likely but rather depend on what has already happened. The main point of path dependence is that history matters. We can only understand how we got to this point by looking at the path that we traveled to get here.

Path dependence is an important concept in economics and policymaking. One of the most famous examples comes from the study of technological change. In one well-known article, the economist Paul David showed that once a technology is selected, it can become “locked in,” making it difficult for even superior technologies to replace it.<sup>1</sup> His example is the QWERTY typewriter that we still use today. You may have wondered how the letter order was decided for the keyboards on our computers. Was it for speed? Ease of use? No, in fact the letter order was designed to make typing *slower*, not faster. The problem was that the early typewriters would often get jammed up if typists typed too quickly. So the letter layout was designed to make sure that people didn’t type too quickly.

But once people learned the new keyboard they wanted to keep it. They did not want to invest time learning how to type on a new keyboard, even if the new keyboard could help them type faster.

Path dependence is therefore linked to the concept of *increasing returns to scale*. Increasing returns to scale arise when the costs of producing something fall as more of the good is produced, or profits rise with each additional unit produced. For example, manufacturing is often subject to increasing returns to scale. It is generally understood that automobile assembly gets cheaper per unit with each additional automobile produced even at high levels of production.

How does path dependence relate to increasing returns to scale? Take the QWERTY typewriter as an example. If only ten people used the QWERTY keyboard, it would be easy to replace it with a more efficient design. But once a million people have learned to use it, the costs of retraining all of these people are substantial. So keyboards with better designs have to demonstrate an efficiency advantage for new typists that is large enough to compensate for the *retraining costs* of all of those QWERTY users. When the total number of people using QWERTY has reached one billion, then the technology is virtually impossible to replace. The retraining costs are too large.

Path dependence affects trade, too. Paul Krugman has pointed out that countries and regions specialize in producing certain products because they had an early start. Once the country has established itself in the market, it will attract supplier firms and skilled workers. The government will also invest in specialized infrastructure to help the industry develop.<sup>2</sup> Competing firms will also select the same location to benefit from this infrastructure. So Silicon Valley in California specialized in information technology, and Switzerland is known for watches.

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<sup>1</sup> Paul David (1985) “Clio and the Economics of QWERTY,” *American Economic Review*, 75, 332-337.

<sup>2</sup> Paul Krugman (1991) “History and Industry Location: The Case of the Manufacturing Belt,” *American Economic Review*, 81, 80-83.

Policies are also subject to increasing returns and “lock in” because they establish rules and institutions that are costly to change.<sup>3</sup> Health care is a good example of how once we set off down a path it becomes increasingly costly to reverse course. A majority of Americans already have health insurance for themselves and their families, so they are not eager for change. Their employers already pay for or subsidize their health care. Employers would like these policies to be less costly, but they are afraid that moving to a single payer, government financed system would mean that their taxes would go up. Retired people want to protect their government program (Medicare) but they are not eager to extend it to younger people. The insurance companies make billions of dollars from selling health insurance, and they certainly do not want things to change. Doctors and hospitals also worry that a universal health care system would come with limits on fees and charges, or limits on the number of expensive procedures and tests that they can perform.

You have probably read some newspaper stories about the debates over health care in the United States. The Obama administration made health care reform its top domestic priority. It is not difficult to see why. Around 57 million Americans or nearly 20 percent of the population are not covered by health insurance. This means that many Americans cannot afford to go to the doctor or hospital when they are ill. The American Medical Association, the main professional association of doctors, estimates that 45,000 people die prematurely every year because they do not have health insurance. One million people are forced into personal bankruptcy because they can't afford to pay their doctor or hospital bills.

One would think that with so many people not able to receive health care, at least health costs are not a major burden on the economy. But in fact the reverse is true. The US spends 18 percent of GDP on health care—twice as much as a share of income as most other industrialized countries. But this additional spending does not translate into better health outcomes. Americans have a lower life expectancy than citizens of most other rich countries, and more children die before their fifth birthday.

What is happening? The main problem is that most Americans who have health insurance get it from one of two places. Most employed people of working age are insured by private companies, and their employers cover all or most of the cost. Americans over the age of 65 receive basic insurance from the government known as Medicare, and they may also have supplemental insurance from their previous employer. People on social assistance, either because they are disabled or because they are unemployed mothers with children, may be eligible for another form of government-provided insurance known as Medicaid. Medicare and Medicaid are popular programs among people who receive help (pensioners, the poor and the

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<sup>3</sup> See Paul Peirson (2000) “Increasing Returns, Path Dependence and the Study of Politics,” *American Political Science Review*, 94:2, 251-266.

disabled) but they are expensive. They account for about one quarter of US federal (central) government spending, and they are doubling in size every ten years. The U.S. must slow the growth of these programs in order to slow down the growth of its fiscal deficits.

Americans can use any doctor they like, and they just send the bills to the insurance company, which pays part of all of the medical bills from the insurance premiums of subscribers. Administration costs and profits of insurance companies add about \$180 billion dollars per year to the cost of health care in the United States. The insurance companies try to restrict competition by limiting entry of other insurance companies into the states in which they operate. They also make it costly for doctors to claim payments from them by making the process bureaucratic and slow. They have no incentive to control health costs, since they are able to pass higher costs on to the employers and employees that pay for insurance. Meanwhile, since doctors are afraid of being sued by their patients for malpractice, they take out their own malpractice insurance, which is also quite expensive. This pushes up their costs, and also gives them an incentive to be extra careful when making decisions. So they order many expensive procedures and tests for their patients, again pushing up the cost of health care. Also, doctors have learned that general practitioners make very low profits, while specialists make large profits. So there are now few general practitioners and too many high-cost specialists.

The result is that medical insurance premiums are very high, and some people cannot afford them. Also, insurance companies refuse to give insurance to people who are already sick or disable. On March 23, 2010, President Obama signed the Affordable Health Care Act. The Act did not result in major changes to the US system of private health care. It did make it illegal for insurance companies to refuse to insure people with pre-existing conditions. Health insurance "exchanges" will be set up in 2014 so that uninsured people can shop around for the cheapest insurance. Some limits on what insurance companies can charge will be imposed. Some preventative care will be free.

However, the new law did not establish a system of universal health care.

The US is among the last industrialized countries to achieve universal health care. Norway was among the first to provide all citizens with government health insurance. Since then, most economically advanced countries have adopted some form of universal coverage. Universal health coverage costs less as a share of GDP than the system of private health insurers adopted in the United States because universal systems manage to control costs. The invest more in preventative care and less on unnecessary tests and procedures.

The precise forms vary tremendously from country to country. Some, like the United Kingdom, operate government run services that are free for everyone at the point of service. Others, for example France, use local non-profit insurers to make sure that

everyone has insurance financed by the government out of taxes. Still others provide basic insurance paid for out of taxes, while citizens can buy higher levels of coverage on the private market.

Countries generally do not select the form of health care that they want. Often their choices are limited by history. For example, the UK's National Health Service was an outgrowth of the wartime Emergency Medical Service that cared for soldiers, wounded civilians and evacuees during World War II. Most doctors joined government service during the war, so remaining in government service after the war was not a big decision for them. Meanwhile, much of the physical health care infrastructure was destroyed by the war. So the government had to rebuild the hospitals and clinics to make the system work again. The private sector had no capital to invest in hospitals, so the idea of a private health service was not very practical.

History also had a large role in shaping health care in the United States. During the Great Depression of the 1930s, prices and wages were falling employers did not want to offer higher wages to their workers, since they could not pass on higher prices to consumers. So they attracted workers by offering health insurance. Americans became used to the idea that they got their health insurance from their employer. Around the same time, the government also set up Medicare for retired Americans. They also became used to the idea that after retirement the government will be the main provider of insurance.

Another way of describing the situation is that having established some rules or institutions governing health care it became very expensive to reverse course and choose another way of doing things. In other words, "exit costs" become very high once some rules or institutions are in place. We call this phenomenon "path dependence." The development of health care systems around the world is path dependent, since countries generally build new systems based on what is already there. They never dismantle the existing rules and institutions and start from scratch.

Path dependence will also be a factor in the reform of the health care system in Vietnam. The current system is a product of the central planning era. The government subsidizes hospitals, which are supposed to provide services at fixed prices. But government subsidies now cover less than half of the cost of delivering health services. Doctors and hospitals therefore charge more than allowed by law, and people are willing to pay in order to get access to services. However, government-provided insurance programs, for example Health Care Fund for the Poor, do not cover all poor people. According to VSI, 87% of the poor in Vietnam do not have health insurance, and 22% of children under 6 do not have health cards. Moreover, even people who are covered by public health insurance have to pay for their own drugs, which accounts for a high percentage of total costs.

Hospitals have also been given greater autonomy over financial and personnel matters to enable them to reduce state subsidies. They often provide extra services for a fee, which means that staff give priority to paying patients over patients paying for fixed-price or free services. They also prescribe unnecessary tests and procedures to earn more money.

The costs of a radical reform of health care are probably too high for the government to bear. But what kinds of reforms could make use of existing institutions and rules but result in a fairer and more efficient health care system?