

Demand for health insurance

HS 156_Economics of Health & Education

- Demand for Insurance
 - What is insurance – risk pooling
 - What is risk aversion
 - Demand for insurance
 - Factors affecting demand for insurance
- Problems with demand for insurance
 - Moral hazard
 - Adverse selection

What is insurance

- Meant to insure us against random uncertainty.
- Club of 100 members.
- On average, each year one member gets sick, it costs \$20,000. It is random who gets sick.
- This is a lot of money for one person to pay.

What is insurance

- Instead, they insure each other and each pay \$200 a year.
- They pay this to avoid the risk of uncertainty that they will have to pay 20,000.
- Money put in bank to get interest, and pay out when someone gets sick.
- Aim of insurance is to reduce the variability in one's income by pooling risks with a large number of people.

What is insurance

- Outlays for health may be variable for one person, they are fairly predictable for the group.
- Health insurance would not be necessary if everyone had average needs. But we do not it is variable.
- Insurance makes it possible to obtain health care without going Bankrupt (new cancer drug \$100,000 a year).

What is insurance

Desirable characteristics for insurance:

1. The number of insured should be large, and they should be independently exposed to potential risk
2. Losses covered should be definite in time, place, and amount
3. The chance of loss should be measurable
4. The loss should be accidental from view point of person who is insured

Concentration of personal health expenditures, in US in 2002

	All	Top 1%	Middle 75%	Bottom 15%
Persons (000s)	285,000	2,850	213,750	42,750
Health Exp. (\$ millions)	1,545,900	4,36,400	455,700	7,730
Per Person	5,427	153,126	2,135	184

Source: Getzen T. "Health Economics: Fundamentals and Flow of Funds",

Terminology

Loading Fee: general costs associated with the insurance company doing business, such as sales, advertising, or profit.

Premium: When people buy insurance policies, they typically pay a given premium for a given amount of coverage should the event occur. Should cover average medical care expenses

Demand for health insurance

- Results of uncertainty
 - Illness and medical expenditures are unpredictable
 - Hospitalizations, serious injury, and rehabilitation and other advanced modern treatments can be very expensive
 - Can save for possible medical expenditures
 - Most households are averse to risk
- Insurance companies pool risk
 - Don't take on risk, spread risk among many consumers
- What is risk aversion?

Risk aversion

Consider the gambling game:

- Zan and Forest flip a coin.
- If it comes up heads, Zan wins a dollar and Forest nothing.
- If it comes up tails, Forest wins a dollar and Zan nothing.
- How much should they each be willing to pay to play this game?
- Expected Return for Zan: $P(\text{head}) * \$2 + P(\text{tails}) * 0 = \1
 - Willing to pay \$1 cents

Risk aversion

- Would you be willing to play this game for \$5 get \$10 if win, for \$10,000 get \$20,000 if win?
- The fact that you are less willing to play at larger amounts shows you are risk averse

Risk aversion

- A simple test to see if you are “risk averse.”
- Which would you select?
 - Your pay check, OR
 - Double your pay check for correctly picking one coin flip.
- Equal expected values; most of us are risk averse and select the “certain” option.
- Risk aversion: - the degree to which a *certain* income is preferred to a *risky* alternative with the same expected income.

Risk aversion

Expected Value:

$$E [\text{income if heads}] = \text{Prb}(H) * \$2 + \text{Prb}(T) * 0 = 1$$

Actuarially fair gamble: is one in which the amount you pay for the gamble is equal to the expected value of the gamble.

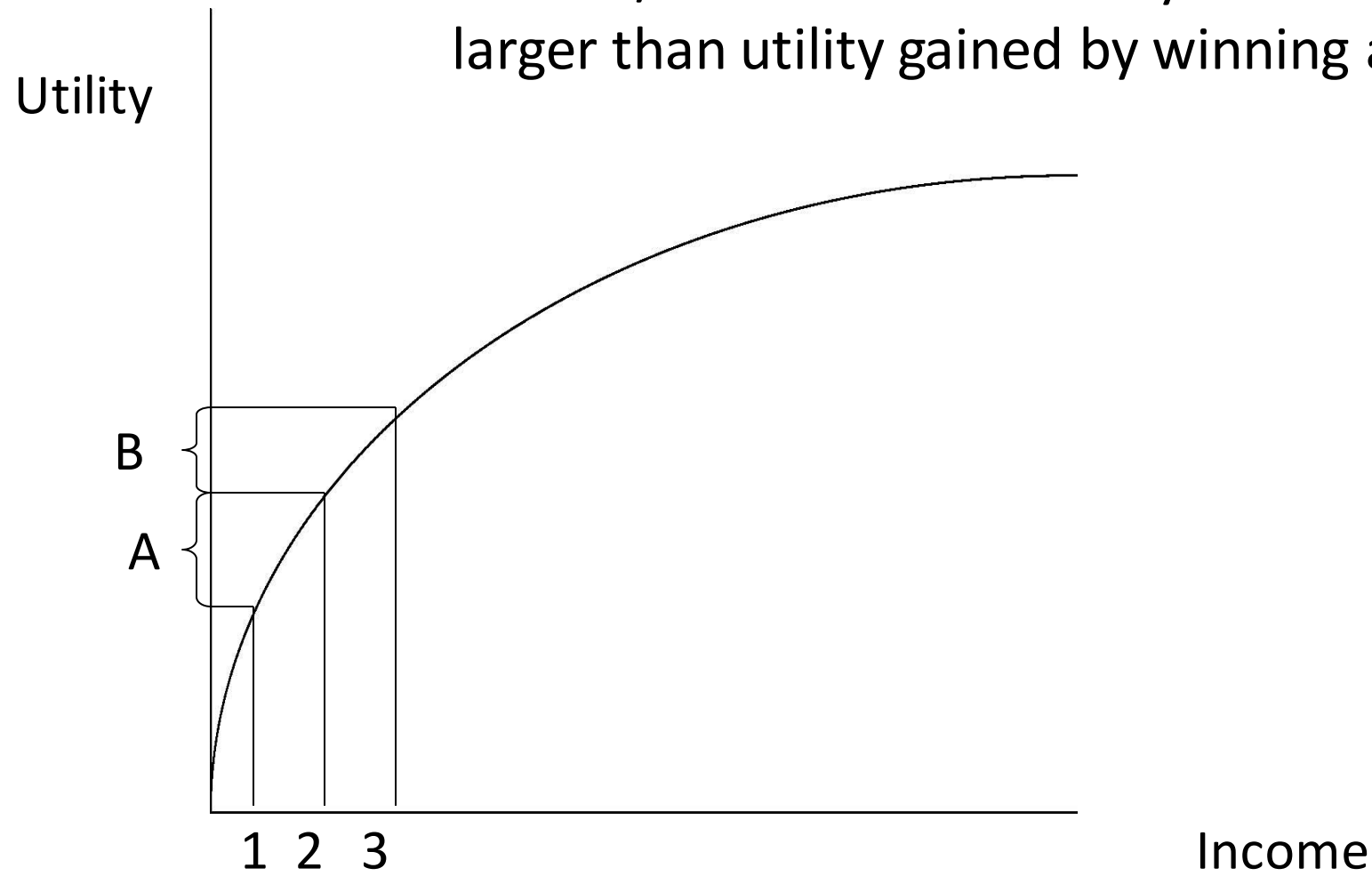
- You paid a \$1 to play, and the expected value of the game was \$1.

Risk aversion

- If price of gamble (amount pay to play game) is equal to the expected return, then the gamble is actuarially fair.
- In health, if *expected* benefit payment is equal to premiums, the insurance policy is actuarially fair.
- Now suppose the gamble was instead for \$5,000, would you want to play the game?
 - If not you are defined as being risk averse, because you do not want to take the actuarially fair gamble.

Risk aversion

Reflected by the diminishing marginal utility of income/wealth. $A > B$. Utility lost when lose a dollar is larger than utility gained by winning a dollar



Risk aversion

- Presence of aversion makes consumers willing to pay to spread risk with others.
- Insurance companies specialize in pricing risks, not in taking risks.
- Lesson from the theory of insurance: the losses that are insured are: large, infrequent, random, and not associated with a large moral hazard.

Demand for insurance

Factors affecting demand for health insurance:

1. Probability of illness
2. Loading fee
3. Magnitude of loss relative to income (cost of illness)
4. Degree of risk aversion
5. Price: Higher price reduces likelihood that an individual will insure against a given event

Demand for insurance

- Probability of Illness -- evidence
 - Increases with age
 - Affected by availability of public health insurance programs
 - Differs by gender
 - Result of women responsible for child birth
 - Affected by availability of public health insurance program targeting pregnant women
 - Differs by type of care needed
 - Chronic vs. acute vs. preventive
 - Elasticity of demand will differ

Problems in demand for insurance

Two main problems with demand for insurance

1. Moral hazard: The disincentives created by insurance for individuals to take measures that would reduce the amount of care demanded. OR, additional quantity of health care demanded, resulting from a decrease in the net price of health care attributable to insurance

Problems in demand for insurance

2. Adverse selection: A situation often resulting from asymmetric information in which individuals are able to purchase insurance at rates that are below actuarially fair rates plus loading costs
 - alternatively: occurs when high-risk consumers, who know more about their own health status than insurers do, subscribe to an insured group composed of lower-risk individuals to secure low premiums.

Moral hazard

- What are the effects of the new price system (with insurance) on demand for insurance.
- Buying insurance lowers the price per unit of health care service at time it is bought.
- Person with health insurance is more likely to go to the doctor for a small problem than someone without health insurance
 - Likely to affect good with higher elasticity of demand such as preventive care.

Moral hazard

Moral Hazard: refers to the increased usage of services when the pooling of risks lead to decreased marginal costs for services.

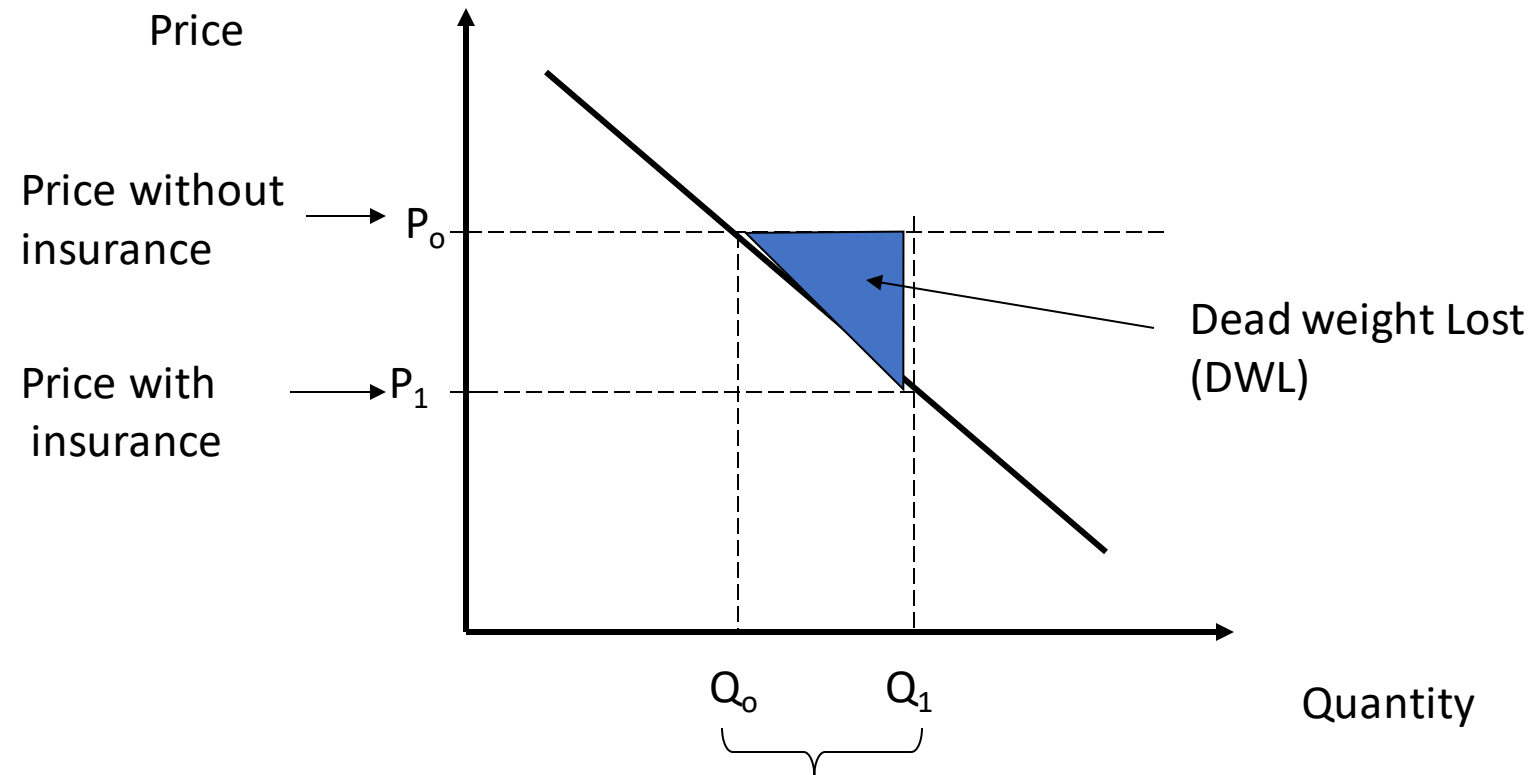
(i.e. the price is reduced).

- It is also used to refer to how one changes behavior when they are insured.
 - We may take more risks, which could have health care implications when insured rather than not insured.
 - Learning snow boarding (lot of people break their arms). May not learn if don't have health insurance.

Moral hazard

- Five sources of Moral Hazard
 1. Quantity demanded of medical care greater than amount consumer would purchase if he/she paid full cost
 2. Individual less likely to engage in preventive behavior and/or more likely to engage in unhealthy behavior
 3. Individual demands higher quality/more costly types of care than he/she would in the absence of insurance
 4. Individual's incentives to monitor health care providers lower than in absence of insurance
 5. Individual's incentive to search for lower prices lower in than in the absence of insurance

Moral hazard



Moral hazard

- For services that are not very price sensitive, insurance will not cause them to purchase more services.
 - E.g. purchase of insulin for diabetics.
- For those that are price sensitive (cosmetic surgery – not from accidents), insurance may encourage one to buy more.

Typical solutions to the moral hazard

- Increase cost sharing
 - Could do this through co-payments or deductibles
 - Reduce the quantity demanded by increasing price consumer faces
 - Increases preventive behavior/reduces unhealthy behavior since consumer faces part of “costs” from these behaviors
 - Increases the likelihood of consumer choosing less expensive types of medical care

Typical solutions to the moral hazard

- Raises the likelihood that consumer better monitors provider behavior
- Increases likelihood that consumer “shops around” for less expensive sources of care
- Offer less generous insurance for specific services with more elastic demand (e.g., mental health coverage, preventive care)

Adverse selection

- This theoretical idea comes from Arrow's 1963 article.
- Risk pooling works because everyone in the group is at risk and therefore has an interest in making sure that solid insurance benefits are provided.
- Suppose the risk was not random, you knew:
 - You had a higher chance of lung cancer because smoked all your life – insure
 - You never smoked, eat well, do exercise, so think there is a low chance of getting sick – would not want to pay a lot for health insurance.

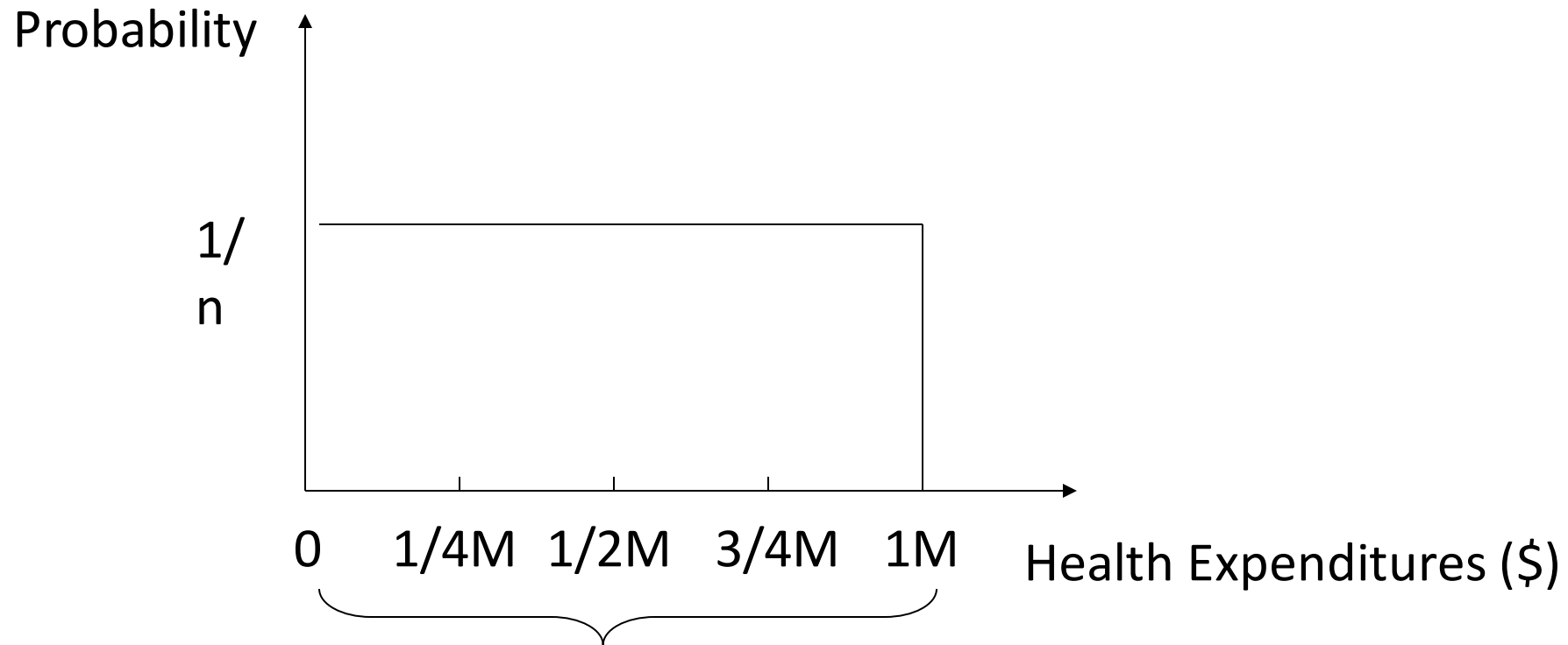
Adverse selection

- Adverse selection occurs when some factors are known to the insured (i.e. you) by not to the insurer.
 - i.e. there is asymmetric information
- Result of asymmetric information
 - Two types of consumers:
 - relatively healthy, with low risk of illness (p_L)
 - relatively unhealthy, with high risk of illness (p_H)
 - Insurance company observes overall risk in the market not the actual risk for each individual:
 - $p = f(p_H) + (1-f)(p_L)$; p is probability of illness
 - Sets premium based on observed average risk, you decide to take up health care or not based on your actual risk. Those who are healthier or less risk adverse are more likely to under insure or not insure and those who are sicker and risk adverse will insure

Adverse selection

- Example: suppose have n people all with the same demographic characteristics.
 - Each person knows what they will probably have to pay
 - So know where they are on the horizontal axis of the next graph.
 - Insurance company knows distribution of health expenditures by person but not which person pays what.
 - People know exactly what they will have to pay.
 - How much should insurance company charge?

Adverse selection



People know how much they have to pay

Adverse selection

- Suppose set price of insurance at \$0
 - Everyone will sign up.
 - Insurance company expects to pay out \$1/2M so would be losing money,

Adverse selection

- So suppose try to set the price of insurance at $\$1/2M$
 - Those who know their expenditures are less than $1/2M$ will choose to self-insure and will not sign up for the program.
 - Once they leave the market, the expected amount insurance company will have to pay is $\$3/4M$, so premium will need to be this much.
 - But then others will drop out of the market.
 - In fact, if adverse selection is very bad, there may be no health insurance offered!

Adverse selection

- People select into insurance based on their own risk of sickness
- Adverse selection into the health insurance market will be a problem if insurance companies only know the average risk of the population .
- To try to mitigate the problem of adverse selection insurance companies need to figure out each person's actual probability of illness

Possible solutions to adverse selection

- Waiting periods
- Pre-existing condition exclusions
- Risk rating (underwriting)
 - If the high risks are something the insurance company can observe in advance, they can adjust premiums up or down to account for varying risk.
 - Adjust insurance based on age, gender, behaviors (how much you smoke or drink), BMI, your cholesterol, blood pressure

Possible solutions to adverse selection

- Insurance that precludes individual selection according to subscribers' perceptions of their own risk
 - Mandate that everyone must purchase health insurance
 - Universal health insurance