Demand and Supply of Health Insurance

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Outline

- Definitions of insurance

- Risk and Insurance

- Demand for Health Insurance

- Supply of Health Insurance

- Moral Hazard

- Conclusions

What is Insurance

- **Definition of Insurance**: Insurance is a **risk management mechanism** where a group of **individuals collectively contribute funds** to protect themselves from **financial losses caused by uncertain events**.

- **Illustrative Example**: Imagine a club with 100 members of similar age, interests, and lifestyles.
  - Occasionally, one member falls ill and faces K10,000 in healthcare costs.
  - To mitigate this risk, each member contributes K1,000 upfront, creating a fund. If a member becomes ill, the fund covers their treatment costs.

What is insurance - Features

Desirable Characteristics of Insurance:

- **Large Number of Insured:** Insurance works best when a large number of individuals are involved, ensuring risk is spread across a diverse group.

- **Definite Losses**: Insured losses should be clear in terms of time, place, and amount, making them predictable.

- **Measurable Risk**: The likelihood of loss should be quantifiable, allowing for accurate risk assessment.

- **Accidental Loss**: The losses should be accidental from the perspective of the insured, not caused by their actions.

What is insurance - Features

- **Reducing Variability:** Insurance reduces income variability by pooling risks among many individuals.

- Despite varying individual healthcare expenses, insurers can **predict average costs for the group**.

- The **law of large numbers** demonstrates that as the group size increases, the average rate of illness will converge around the expected probability of illness, reducing financial uncertainty for individuals.

What is insurance – Government Insurance

- Insurance markets rely on statistical estimations of rare events to protect buyers.

- Government insurance programs differ from private insurance by offering heavily subsidized premiums and limiting participation based on government-defined eligibility criteria.

- They frequently involve income redistribution between societal segments.

Key Insurance Terminology

Term	Description	Example
Premium / Coverage	Insurance involves paying premiums to secure coverage against specific events.	An insured individual may pay a K100 premium to receive K2000 worth of coverage.
Coinsurance / Copayment	Requires insured individuals to share the financial burden through copayments, expressed as a percentage known as the coinsurance rate.	With a 20% coinsurance rate, the insured might pay a K60 copayment out of a K300 expense, with the insurance company covering the remaining K240 (80%).
Deductible	A payment made before insurance benefits apply, irrespective of coinsurance. This amount may apply to individual claims or be limited to a specific yearly threshold, as is common in health insurance.	An insurance policy may require that an individual first pay the first K250 of her medical expenses out-of-pocket each year.

Key Insurance Terminology

- **Deductibles and Coinsurance**

- While some view deductibles and coinsurance as money-makers for insurance companies, economists argue they have beneficial economic effects.

- Copayments make consumers more **cost-conscious about their treatment** choices.

- Deductibles **discourage frivolous claims** and enhance awareness of actions' consequences, ultimately helping control costs.

Key Insurance Terminology

Term	Description	Example
Exclusions	Specific services or conditions not covered by the insurance policy.	Cosmetic or experimental treatments.
Limitations	Maximum coverage limits specified by insurance policies.	A policy with a K1 million lifetime maximum.
Pre-Existing Conditions	Medical issues not covered if they existed before the policy issuance.	An individual getting health insurance after they find out they have cancer
Pure Premiums	Actuarial losses associated with insured events. Represent the amount an insurer needs to cover claims without considering administrative expenses or profit margins	Pure Premium=Exposure Units/Total Losses
Loading Fees	General operational costs for the insurance company	costs associated with sales, advertising, and profit margins.

Types of Health Insurance

- **Public Health insurance Schemes**
  - **Social Health Insurance (SHI)**
  - a financing and management system for healthcare that pools health risks and contributions from individuals, households, enterprises, and the government.
  - It provides protection against financial and health burdens, offering a fair way to finance healthcare.
- **Private Health insurance Schemes**
  - which is provided through an employer or the marketplace

Types of Health Insurance

Public Health Insurance

VS

Private Health Insurance

- Treats all insured people equally.
- Insurance premium depends on income and not on age and health.
- Continuously adjusting the services.

- Shorter waiting times for appointments with specialists,
- Treatment by highly-paid specialists,
- Access to the latest medical techniques.

Examples of Health Insurance Schemes Zambia

- **NHIS** (National Health Insurance Scheme managed by NHIMA)
  - Public Health Insurance
  - Monthly premium is 1% of income, Mandatory for all >18 years
  - Calculated based on reported income if informal employment
  - Free if > 65 years and if indigent, disabled.

- **SES Health Insurance**
  - Private Health Insurance Scheme
  - Premiums can be paid monthly, quarterly, semiannually or annually
  - The minimum premium is US $50 per month

- **MADISON Health Insurance**
  - Private Health Insurance Scheme
  - Hospital cash plan, pays benefits per day if hospitalized for over 48 hours

Economics of Risk and Uncertainty in Decision-Making

- **Conditions of Uncertainty**: While we've assumed decisions under certainty (known prices, incomes, and tastes), real-life decisions often involve **risk or uncertainty.**
    - Economists use the terms interchangeably but contrast **risk (known probabilities, like a roulette wheel)** with **uncertainty (unknown probabilities, like a nuclear plant meltdown).**

- **Insurance and Probability**: We'll explore decisions under uncertainty by starting with insurance coverage for events with known probabilities (denoted as 'p') that result in predictable losses or payments. This approach lays the foundation for understanding choices in uncertain situations.

- **Health Insurance Variation**: We'll later delve into health insurance, where insurance can influence payments, building upon the fundamentals of risk assessment.

Expected Value Concept

- **The expected value** of a random variable **X, E[X**], is the sum of all the possible outcomes of **X** weighted by each outcome's probability.

- **General Expected Value Formula:** For situations with n outcomes, the expected value (E) is expressed as:

$$E = p_1R_1 + p_2R_2 + ... + p_nR_n$$

- where p_i is the probability of outcome i, and R_i is the return if outcome i occurs. The sum of probabilities (p_i) equals 1.

- **Example**: When evaluating a game like coin flip, we use the concept of expected value (E). The expected value, sometimes called the expected return, is:

E (heads is called) = **(probability of heads)× (return if heads) + (probability of tails) (return if tails)**

Actuarially Fair Insurance

- For instance, if Elizabeth wins K20 for heads and nothing for tails (both with a 0.5 probability), the expected value is calculated as:

$$E = (0.5 * K20) + (0.5 * K0)$$

$$E = K10$$

- If she uses the decision criterion that she will play the game if the expected return exceeds the expected cost, Elizabeth will play (pass) if it costs her less (more) than K10.

- **Actuarially Fair Insurance**: An actuarially fair insurance policy mirrors the scenario where the price of a gamble equals the expected return, in this case, K10

- In insurance, it signifies that expected **benefit payouts match the premiums collected.**

- While actual insurance policies include additional costs (loading costs), the concept of actuarially fair policies serves as a benchmark for insurance discussions.
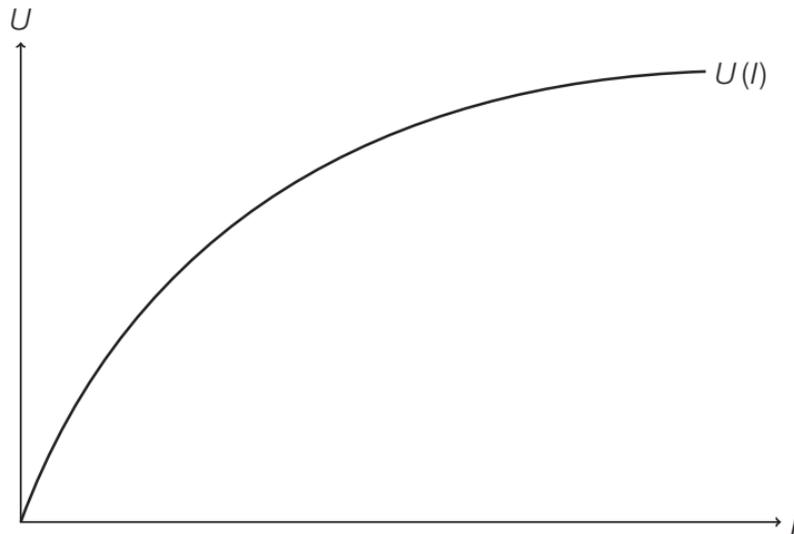
Utility and Risk Aversion

- **Indifference to Risk**: Elizabeth's indifference to risk means her joy in winning K10 (gain of K20 minus the K10 paid) balances her distress in losing K10 (gain of zero minus the K10 paid).

- **Understanding Risk Aversion**: Increasing the stakes to K2000 or nothing, with a K1000 bet, makes Elizabeth think twice. The Expected value is calculated as;

$$E = (0.5 * K2000) + (0.5 * K0)$$
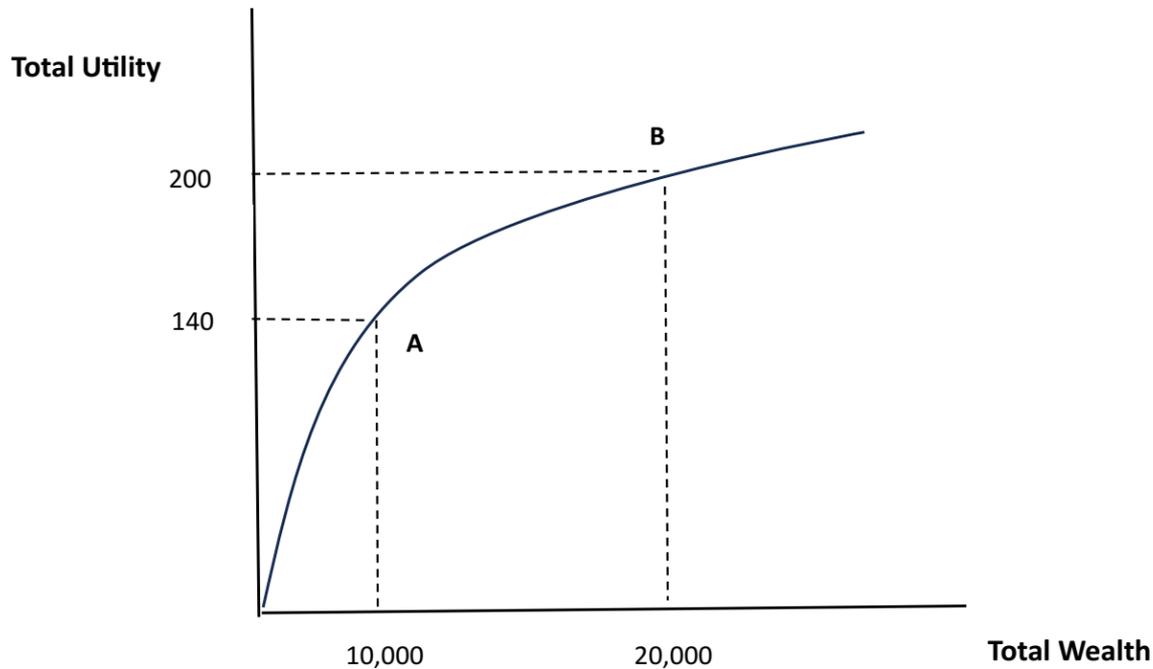
$$E = K1000$$

  - She might refuse an actuarially fair K1000 bet because she can't afford the K1000 loss if the coin lands tails.
  - This implies that her disutility of losing K1000 may outweigh the utility of winning K1000, indicating the concept of **diminishing marginal utility of wealth**.

# Declining Marginal Utility of Income/Wealth

- **Incorporating Utility of** : To analyze risk behavior, we incorporate Elizabeth's utility of wealth function.

- Unlike our earlier assumption, consumers can **rank alternatives and compare satisfaction magnitudes**.

Utility and Risk Aversion

- Illustrative Figure 8.1: Imagine Elizabeth has K10,000 in wealth, resulting in a utility level of U1 = 140 (point A) that covers basic necessities.

- If her wealth doubles to K20,000, her utility won't necessarily double. This illustrates the concept of diminishing marginal utility of wealth.

Utility and Risk Aversion
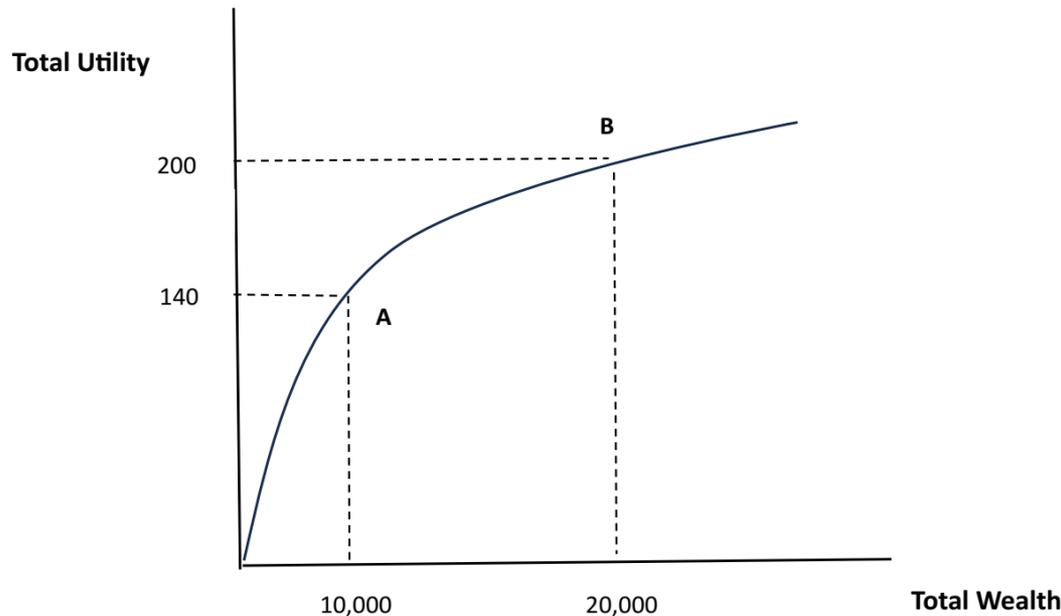
- **Concept Explanation:**
  - As wealth increases, the **incremental utility** gained tends to diminish.
  - An additional K10,000 may not bring the same utility as the first K10,000.
  - Utility levels are **not necessarily linear** with wealth.

- **Illustrative Figure:**
  - Example: U2 = 200 (point B) when wealth doubles from K10,000. to K20,000.
  - The curve suggests diminishing marginal utility of wealth.
  - The utility curve likely bows out, or is concave, to the x-axis.

Marginal Utility of Wealth
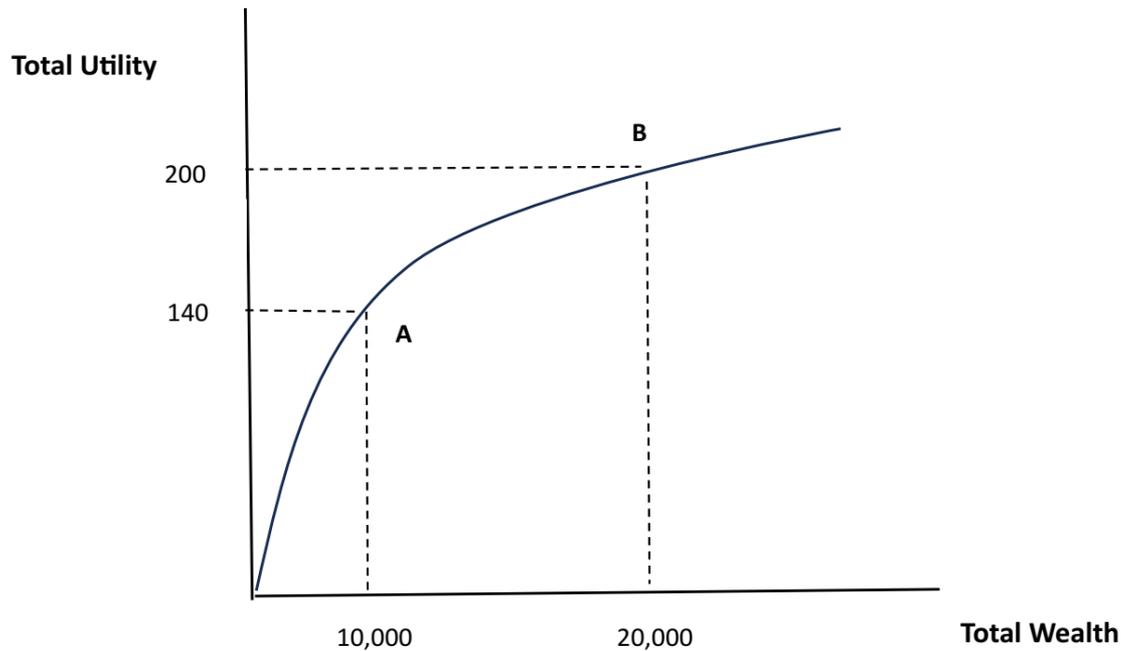
Marginal Utility Defined

- Marginal utility of wealth is the increase in utility when wealth increases by K1.

- It indicates the slope of the utility function.

- Diminishing marginal utility of wealth implies a flattening slope as wealth rises.

- The utility curve showcases the diminishing slope with increasing wealth.

- Marginal utility declines as wealth grows.

Impact of Risk and Uncertainty on Utility

Risk and Utility:

- Elizabeth starts with **K20,000 in wealth** but faces a **10% probability of falling ill** and reducing her wealth to K10,000

- Calculating expected wealth **(E(W))** and expected utility **(E(U))** helps understand the impact of risk.

  E(W) = (prob. well × wealth if well) + (prob. ill × wealth if ill)

  E(W) = (0.90 × K20,000) + (0.10 × K10,000)

  E(W) = **K19,000**

  Expected Utility

  E(U) = (prob. well × utility if well) + (prob. ill × utility if ill)

  E(U) = (0.90 × 200) + (0.10 × 140)

  E(U) = **194**

Impact of Risk and Uncertainty on Utility
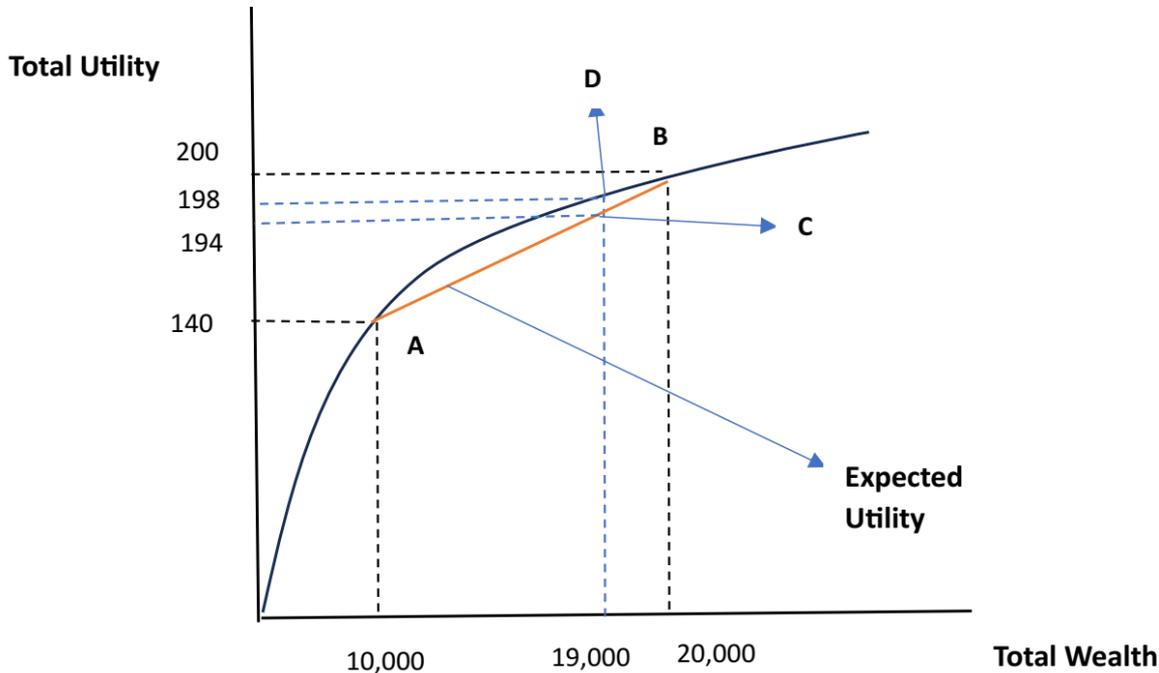
Comparison to Certainty and Insurance:

- Compare E(U) (point C) with utility of 198 (point D) if she could purchase actuarially fair insurance.

- Risk of loss places her below the certainty curve, resulting in a loss of 4 utility units (198 to 194).

- Uncertainty about wealth diminishes her utility, making her better off if she could eliminate this uncertainty through insurance.

The Benefit of Insurance
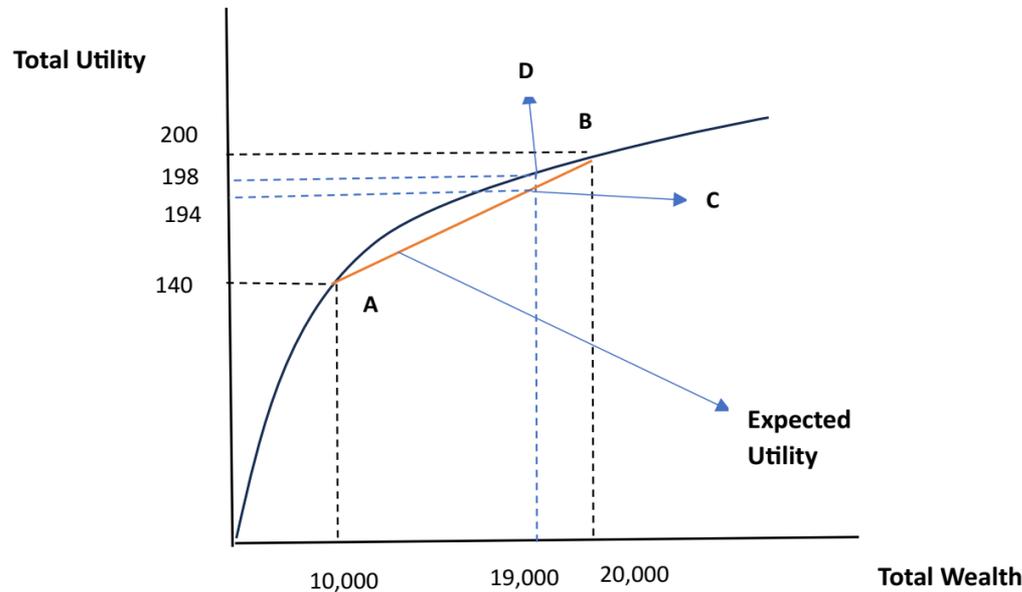
- **Insurance Option:**
  - Elizabeth can purchase an insurance policy with a K1,000 annual premium.
  - The policy maintains her wealth regardless of her health status, eliminating uncertainty.
  - If well, she ends with K19,000 (initial K20,000- K1,000 premium).
  - If ill, she receives K19,000 in benefits, resulting in K19,000 (K10,000+ K10,000 - K1,000 premium).

- **Is it a Good Buy?**
  - At a net wealth of K19,000 (initial wealth - premium), her certainty utility is 198 (point D).
  - Point D yields higher utility than point C, indicating insurance makes her better off.
  - Insurance provides certainty, which she values.

Calculating Maximum Willingness to Pay

Determining Maximum Payment:

- Using Figure 8.1, we calculate her maximum willingness to pay for insurance.
- Move down the utility function to U = 194, corresponding to point F (off the x-axis).
- The distance FC represents her aversion to risk.

Maximum Willingness to Pay:

- At **point F**, she'd pay up to K4,000 (initial wealth - wealth at F) for insurance.
- If she could buy it for K3,000, she gains K1,000 in consumer surplus.

Key Insights On Insurance and Risk

- **Insurance and Risk Aversion:**
  - Consumers buy insurance when they are risk-averse, experiencing diminishing marginal utility of wealth.
  - If marginal utility is constant (risk-neutral), an actuarially fair premium provides no benefit.
- **Expected Utility and Risk:**
  - Expected utility is an average measure; individuals either win or lose the bet.
  - Insurance guarantees a specific wealth level, eliminating uncertainty.
- **Impact of Insurance Pricing:**
  - Overcharging for insurance leads to lower expected wealth than not insuring but reduces risk.
  - Willingness to buy insurance depends on the gap between the utility curve and expected utility line.
- **Effect of Probability of Illness:**
  - As the probability of illness varies (from point B to C´ and near point A), gains from insurance change.
  - At high illness probability, "self-insurance" may be more favorable than buying insurance due to administrative hassle.

EXERCISE

1. Suppose that Nathan's employer provides a health insurance policy that pays 80 percent of K1 over the first K100 spent. If Nathan incurs K1,000 in expenses, how much will he pay out-of-pocket? What percentage of his expenses will this be?

2. Suppose that rather than flipping a coin, one rolls a die. If the value is 1, 2, 3, or 4, the player wins K1. If it is 5 or 6, the player loses K1. Calculate the expected return.

Demand for Health Insurance

- Elizabeth's expected utility depends on her wealth when ill (10% probability) and when healthy (90% probability). If ill, her wealth decreases from K20,000 to K10,000.

- We analyze her optimal purchase of health insurance using marginal benefits and costs.

- **Initial consideration**: Insurance covering losses up to K500.

- Elizabeth might question a K500 insurance policy when facing a potential K10,000 loss due to illness.

- Maximizing total net benefits guides her health insurance choice.
    - **Benefits:** Received when ill, in the form of insurance benefit payments.
    - **Costs:** Premium payments when ill, which are offset by financial gains.

Demand for Health Insurance

- When healthy, only the premium is incurred, representing a net cost.

- Elizabeth's **marginal benefits and costs of insurance** vary depending on her health status.

- The law of diminishing marginal utility of wealth influences her decision.

- When well, **marginal benefits decline with additional insurance coverage** due to diminishing returns.

- Conversely, **marginal costs increase when well**, reflecting the diminishing marginal utility of wealth.

- Elizabeth seeks to balance these factors, **aiming for marginal benefits to equal marginal costs.**

Demand for Health Insurance

- Assume a 20 percent premium (K100) for insurance, equivalent to K2 for every K10 of coverage.

- **Initial coverage**: Elizabeth's wealth when well is K20,000 - K100 premium = K19,900.

- **Marginal benefit**: *Expected marginal utility of the additional K400* (K500 coverage minus K100 premium).

- **Marginal cost**: *Expected marginal utility of the K100 premium cost*.

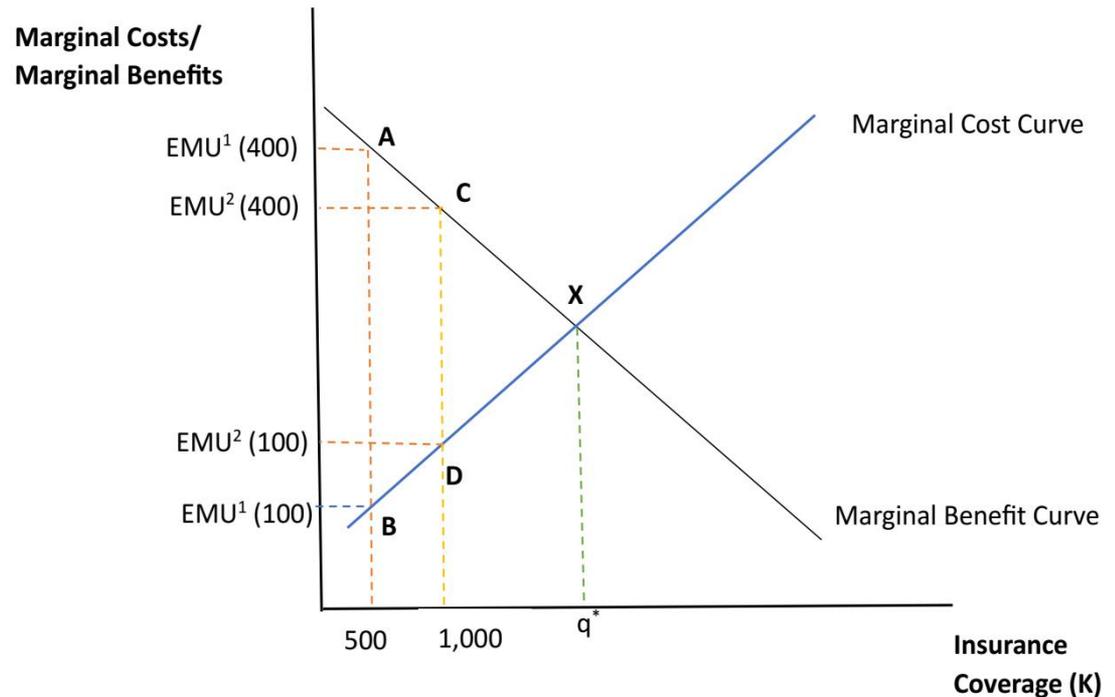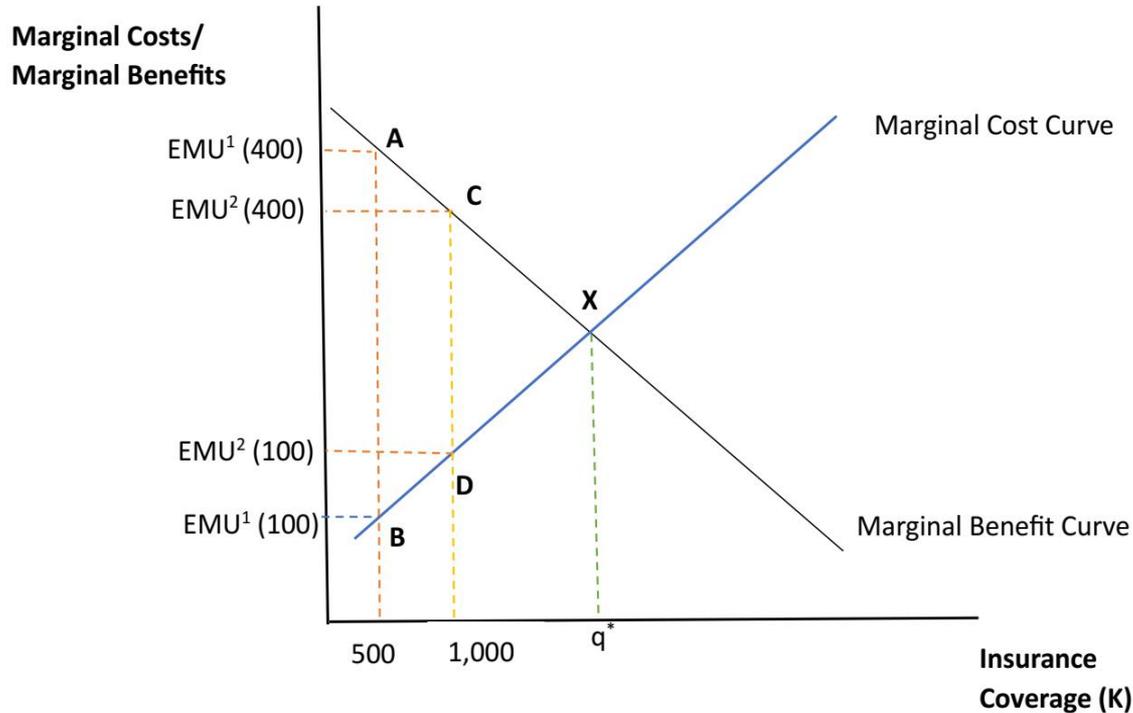| Insurance Coverage of K500 if ill		
	Original Wealth	K20,000
Less	Loss from illness	K10,000
	Remainder	K10,000
Plus	Insurance	K500
	Remainder + Insurance	K10,500
Less	Premium	K100
	New Wealth = Remainder + Insurance - Premium	**K10,400**

The First K500 of Insurance
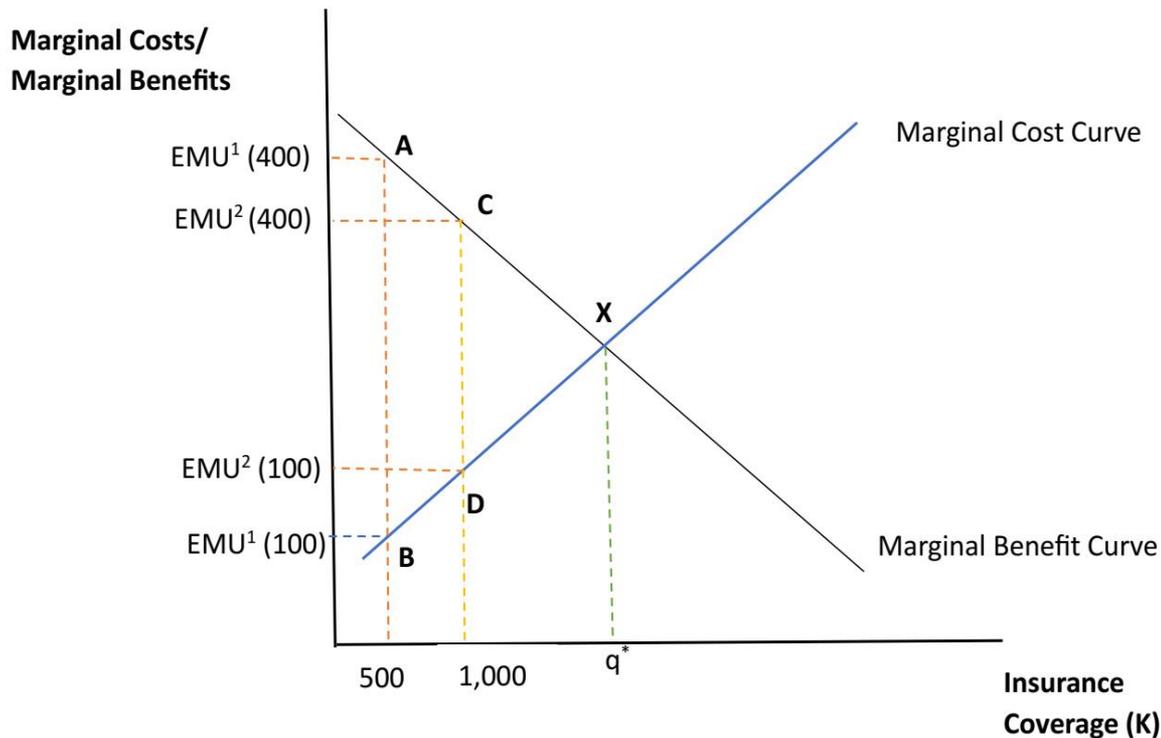
- In the Figure if Elizabeth is risk-averse, marginal benefit from the first K500 of insurance coverage (point A) exceeds marginal cost (point B).

- This insurance policy is favorable for Elizabeth in this case.

Evaluating Increasing Coverage

- Should Elizabeth increase coverage from K500 to K1,000?

- She must compare the marginal benefits and costs.

- **Marginal utility from the extra K400 (ill) is slightly smaller than the first K400 thus marginal benefit is less whereas marginal cost is higher.**

- Marginal benefits curve is downward sloping, Marginal cost curve is upward sloping.

- New marginal benefit at point C and new marginal cost is at point D

Marginal Costs/
Marginal Benefits

Marginal Cost Curve

EMU^1 (400)   A

EMU^2 (400)   C

X

EMU^2 (100)

EMU^1 (100)   D

B

Marginal Benefit Curve

500   1,000 q^*

Insurance
Coverage (K)

Finding Optimal Coverage

- Elizabeth adjusts insurance quantity (q) until marginal benefits equal marginal costs.

- Optimal purchase point, q*, is where they are equal (point X).

- The figure shows that q* is approximately K3,000 on the x-axis.

- Elizabeth's optimum insurance purchase.

Changes in Premiums

- Initial premium is 20 percent (K100) for a K500 policy.

- Suppose we now have a 25% premium instead of 20%.

Insurance Coverage of K500 if ill		
	Original Wealth	K20,000
Less	Loss from illness	K10,000
	Remainder	K10,000
Plus	Insurance	K500
	Remainder + Insurance	K10,500
Less	Premium	K125
	New Wealth = Remainder + Insurance - Premium	**K10,375**

Changes in Premiums

- Marginal benefit from insurance is now K375 (down from K400), represented by point C on MB2 curve.

- Marginal cost, the expected utility cost of the K125 premium, exceeds previous costs, placing C on MC2 curve.

- Result: Consumers react rationally to higher premiums by reducing optimal coverage from q* to q** (e.g., from K3,000 to K2,300).
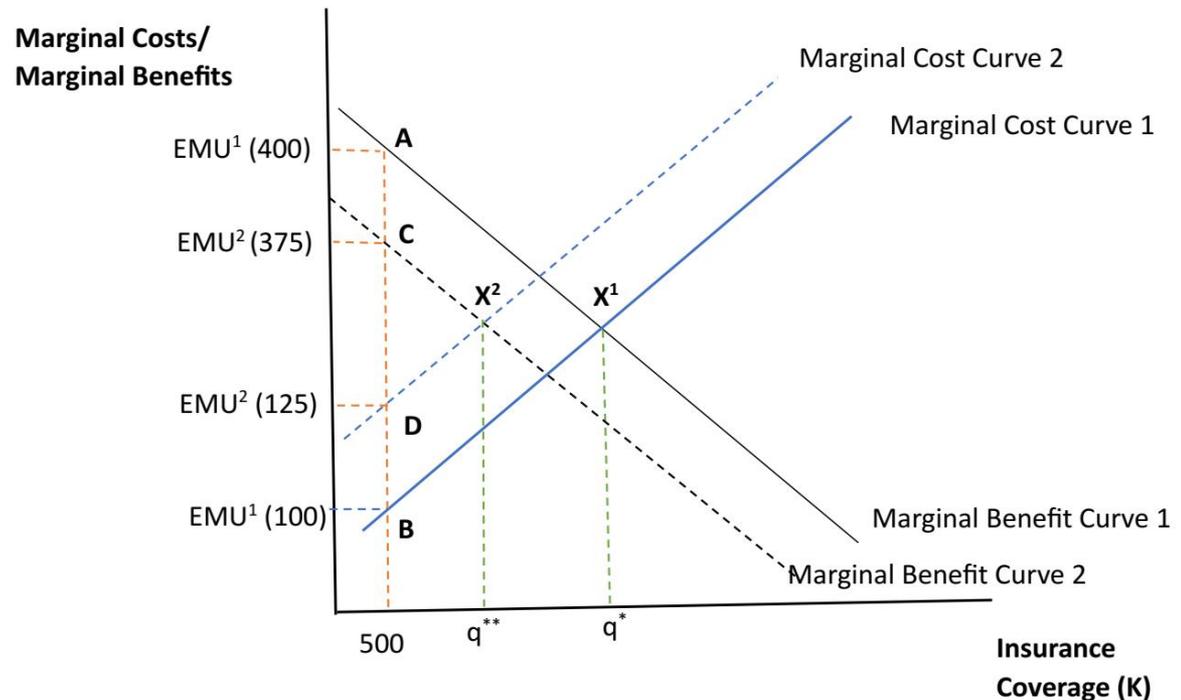
Changes in Expected Loss

- Original example: 20 percent premium and expected loss of K10,000 if ill.

- Suppose that instead of K10,000, Elizabeth is expected to lose K15,000 if ill.

- Consider the first K500 of insurance coverage.

- Marginal benefit calculation changes due to the increased expected loss.

- Insurance provides a net benefit of K400, but now it increments K5,000 rather than K10,000.

Insurance Coverage of K500 if ill		
	Original Wealth	K20,000
Less	Loss from illness	K15,000
	Remainder	K5,000
Plus	Insurance	K500
	Remainder + Insurance	K5,500
Less	Premium	K100
	New Wealth = Remainder + Insurance - Premium	**K5,400**

Changes in Expected Loss

- If an additional dollar yields more marginal benefit from a K5,000 base, the marginal benefit curve shifts upward.

- Equilibrium point Z on curve MB3 is reached.

- In equilibrium, an increase in expected loss increases the purchased insurance amount at point Z, or q***.

- q*** is approximately K3,500 in this scenario.
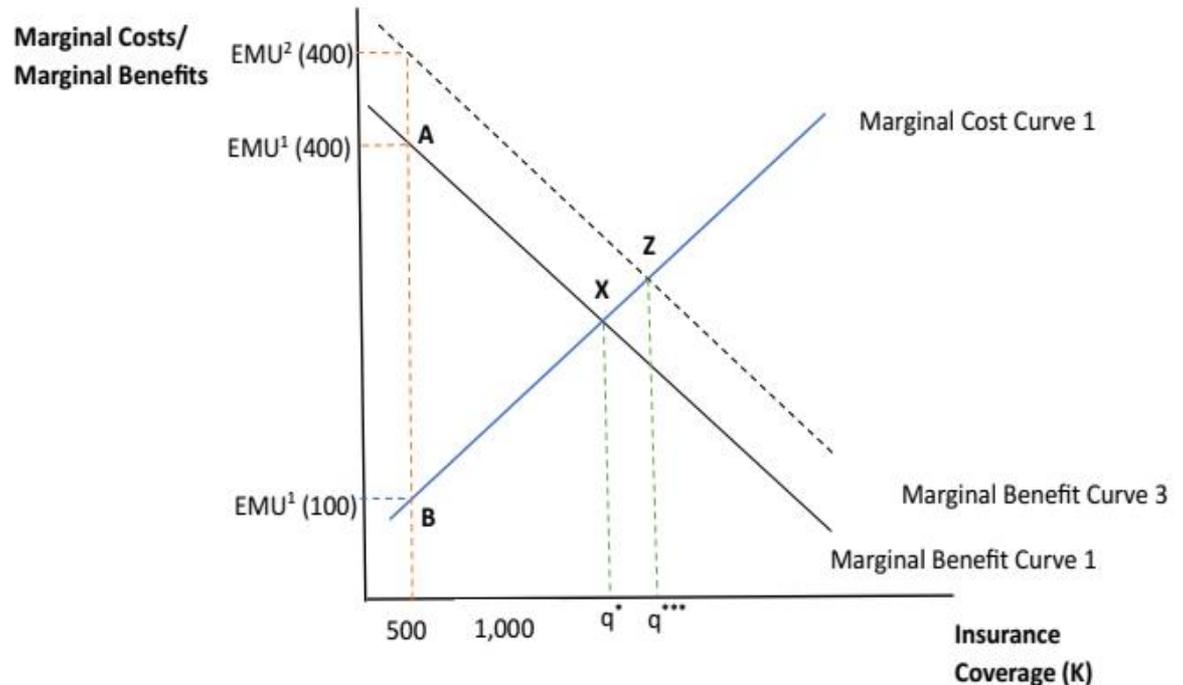
Changes in Wealth

- How does a change in initial wealth affect insurance decisions?
- Scenario: Elizabeth's initial wealth is K25,000 instead of K20,000, with a 20 percent premium rate.
- The same insurance policy provides a smaller utility increment at the higher wealth level, causing the marginal benefit curve to shift down from MB1 to MB2.
- However, for the same expected loss, the K100 premium costs less in foregone marginal utility relative to the increased wealth, leading to a downward shift of MC1 to MC3.

Insurance Coverage of K500 if ill		
	Original Wealth	K25,000
Less	Loss from illness	K10,000
	Remainder	K15,000
Plus	Insurance	K500
	Remainder + Insurance	K15,500
Less	Premium	K100
	New Wealth = Remainder + Insurance - Premium	K15,400

Changes in Wealth

- Due to these downward shifts, the new equilibrium value of q at point W may be higher or lower than the original value of q* (slightly lower, about $2,800).

- If increased wealth is accompanied by increased losses, the MB curve may shift down less.

- A smaller shift down in the MB curve would result in a higher desired amount of insurance because increased expected losses make more insurance desirable.
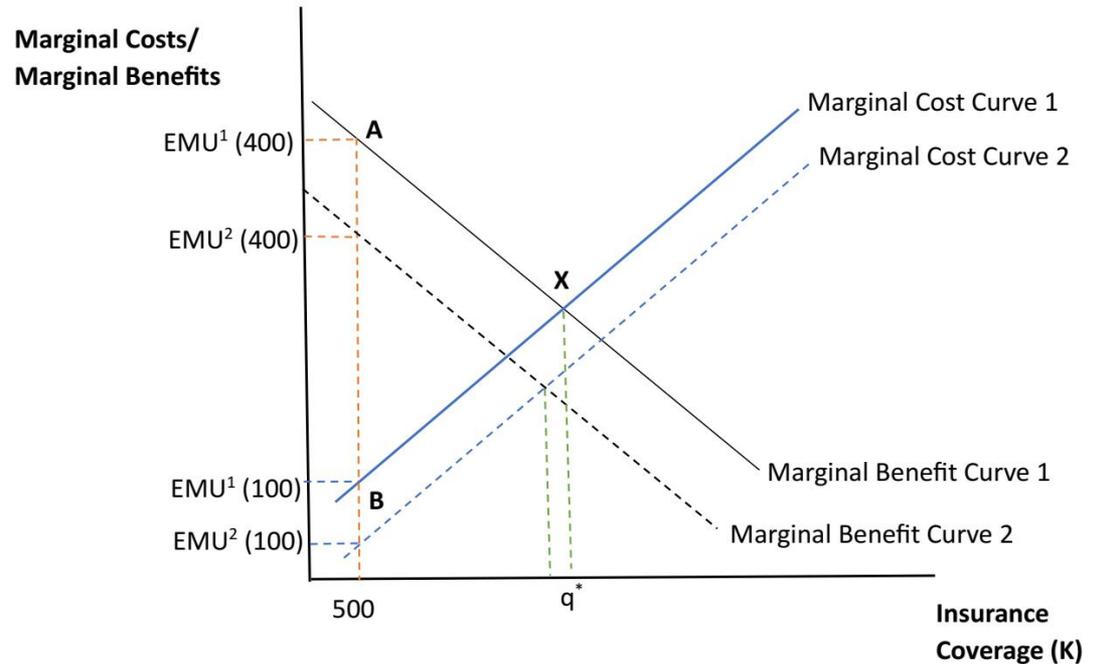
Supply of Health Insurance

- Now that we determined how individuals choose insurance policies, we must know **how insurers determine the premium.**

- Remember the club that insures its members against illness.

- The officers of the club do not know, nor necessarily care, who will file a claim.

- To function as an insurer, the **club must simply see that that revenues cover costs.**

- In practice, **insurers will also incur administrative and other expenses** that also must be covered by premiums.

Competition and Normal Profits

- Returning to Elizabeth's insurance problem in a competitive market with perfect competition.

- Elizabeth faced a 10% probability of illness and sought insurance in blocks of K500.

- Initially, Asteroid Insurance charged her a **20% premium (K100 as a fraction of K500).**

- Costs for Asteroid: **K8 annually to process each policy and potentially write a claim check.**

- Asteroid's Profits per Policy Calculation:

- Profits = Revenues – Costs
    - Costs for 90% of policies: K8 (no illness); Costs for 10% of policies: K508 (illness).
    - **Profits per Policy** = 100 - (Probability of illness * Costs if ill) – (probability of no illness * costs if not ill)
    - **Profits per Policy** = 100 – (0.1*K508) – (0.9*K8) = **K42**

Competitive Premium Calculation

Competitive Dynamics:

- Positive profits attract competitors like Comet Insurance.

- Comet Insurance enters with a 15% premium.

- Revenues for both competitors: Premium fraction multiplied by the insured amount.

- Profits for Comet:
    - Profits per Policy = 75 - (Probability of illness * Costs if ill) – (probability of no illness * costs if not ill)
    - Profits per Policy = 75 – (0.1*K508) – (0.9*K8) = **K17**

- Entry continues until the premium reaches approximately 11.6 ngwee per kwacha of insurance.

- The **algebra shows that the 11.6% premium is directly related to the 10% probability of a claim.**

Competitive Premium Calculation

- Quite simply, for Asteroid, the revenue per policy is aq,
- The cost per policy in terms of payout $= pq + t$, where
    - a is the premium, in fractional terms.
    - p is the probability of payout,
    - q is amount of payout
    - t is the processing cost, t, which is unrelated to the size of the policy (assuming it costs no more to administer a K10,000 policy than a K500 policy).
- Therefore the Profits per policy is given by
    - **Profits = Revenue (aq) − Cost (pq + t)**
    - **Profits = aq − (pq + t)**
    - **Profits = aq − pq − t**
- With perfect competition, profits must equal 0, so: **Profits = 0 = aq − pq − t**
- We solve for the **competitive premium** a as:
- **a = p + (t/q)**

Competitive Premium Calculation

- Competitive premiums ensure zero profits in a perfectly competitive insurance market.

- Premium (a) is determined by the probability of a claim (p), processing cost per policy (t), and the insured amount (q).

- Competition drives premiums down until no excess profits exist.

- Competitive Premium Equation Recap:

$$a = p + (t/q)$$

Competitive Premium Calculation (Continued)

- Competitive premium (a) consists of the probability of illness (p) plus loading costs as a percentage of policy value (t/q).

- Example: If loading costs are 10% of policy value (t/q = 0.10) and p equals 0.10, then a = 0.20.

- Premium for each Kwacha of insurance (q) is K0.20. Deviating from this balance leads to issues.

- Insufficient premiums won't cover claims; excessive premiums generate excess profits.

- Perfect competition ensures competitive rates.

Actuarially Fair Rates and Optimal Coverage

- **Actuarially Fair Rates**: Rates based solely on the probability of an event (t/q approaches 0).
- Actuarially Fair Rate: a = p + (t/q) = p + 0 = p

Solving for Optimal Coverage:

- Maximize utility by equating wealth when well to wealth when ill.
- Example: Illness probability of 0.10, K10,000 loss.
  - Wealth (if well) = K20,000 – premium (a) * coverage (q)
  - Wealth (if ill) = K20,000 - K10,000 (loss) + coverage(q) – premium (a) * coverage (q)

Equating wealth in both states:

- Q*= K10,000, irrespective of the event probability.
- Realistically, transaction costs (t) are positive, so optimal coverage is less than the full loss amount.
- This result contrasts with the consumer tendency to seek full coverage.

Transaction Costs and Optimal Insurance

- **Standard result:** Consumers often **choose less than full coverage due to positive transaction costs**.

- In practice, **loading charges are significant**.

- Elizabeth's best choice is to insure for less than the full health expense.

- Optimal insurance (q*) varies with transaction costs, making it smaller when costs are positive.

- This mathematical result contradicts the consumer tendency to seek full coverage.

- Consideration of transaction costs is essential in real-world insurance decisions.

EXERCISE

- Suppose, if ill, that Fred's demand for health services is summarized by the demand curve

- Q = 50 – 2P,

- where P is the price of services.

a) How many services does he buy at a price of K20?

b) Suppose that Fred's probability of illness is 0.25. What is the actuarially fair price of health insurance for Fred with a zero coinsurance rate?
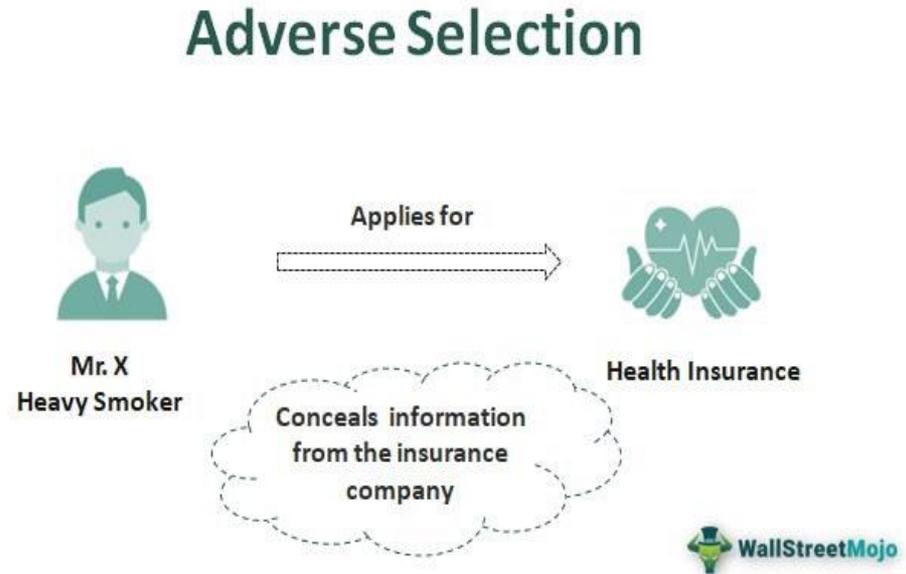
Moral Hazard

- Moral Hazard - arises when the **attitudes and behavior of a person or organization change** once they are covered for the potential costs.

- For example, once a person becomes insulated from the full costs of their healthcare they may **take less care of themselves and consume more healthcare**, goods and services than they would otherwise.

- Once a hospital secures reinsurance for business losses or indemnity against staff malpractice, they may **take less care in ensuring business losses or malpractice law suits are minimized**.
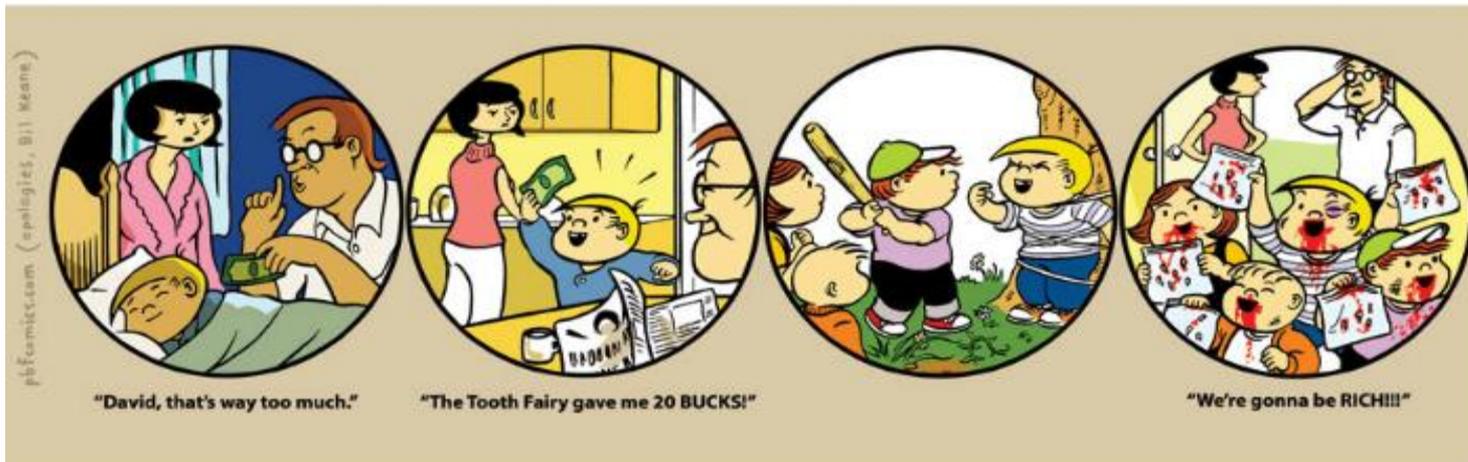
Adverse Selection

- Adverse selection is an event in healthcare **whereby one party decides not to reveal the full extent of their risk profile to the other party.**

- People at **higher risks are more likely to seek health insurance cover** but they will not wish to show they are high risks.

- Some people may be left uninsured as a result of adverse selection: those of low risk who do not bother to take up insurance as the premiums are too high and those of high risk who cannot get insurance as they cannot afford the premiums.

Moral Hazard

- Our discussions have assumed a fixed loss—that did not change merely because people bought insurance.

- However, in many cases, buying insurance lowers the price per unit of service to consumers at the time that they are purchasing services.

- If people purchase more service due to insurance, then we must modify many of the insurance propositions just presented

Moral hazard and the demand for health

- Suppose **Elizabeth faces the probability $1 - p = 0.5$** that she will not be sick during a given time period and so will demand no medical care.

- She also faces probability**, p, also equal to 0.5, that she will contract an illness that requires medical care.**

- Due perhaps to a family history, Elizabeth fears that she will contract Type 1 diabetes—if so, without insulin she will die.

Moral hazard and the demand for health

- In Figure 8.4, panel A, we assume that her demand for insulin is perfectly inelastic, that is, unresponsive to its price—diabetics do not buy more insulin simply because it is cheaper.

- We saw earlier (ignoring the transaction costs) that Elizabeth would be willing to pay insurance to cover expenditures P1Q1, her expenditures if she needs care.

- An actuarially fair insurance policy would then charge Elizabeth (0.5)P1Q1, and she would purchase the policy to insure her against the risk of diabetes.
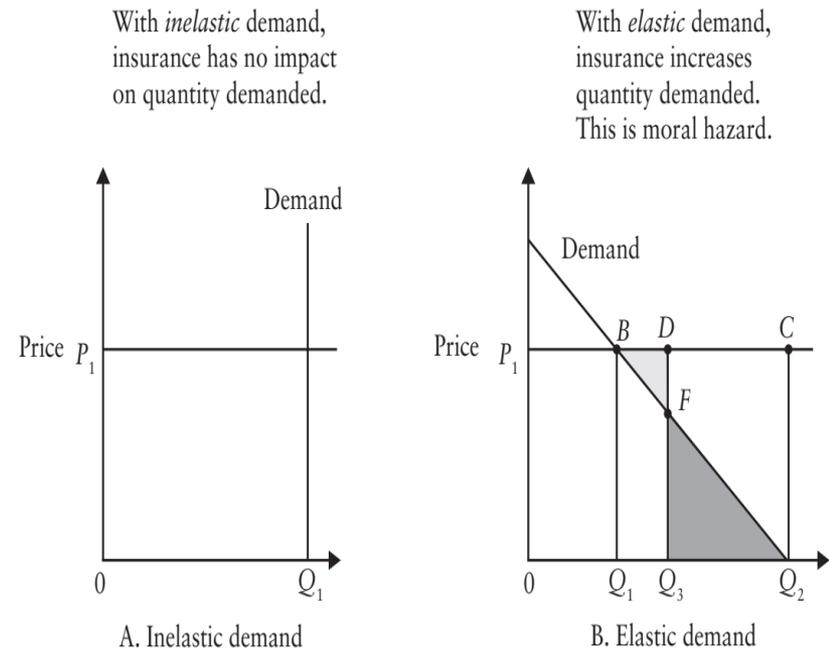
With *inelastic* demand, insurance has no impact on quantity demanded.

With *elastic* demand, insurance increases quantity demanded. This is moral hazard.

A. Inelastic demand

B. Elastic demand

Figure 8.4 Demand for Care and Moral Hazard

Impact of Price Elasticity on Dermatological Care Demand

- Elizabeth's demand for dermatological care may respond to price; lower price, higher quantity demanded (Figure 8.4, panel B).

- With insurance covering the entire loss, treatment becomes "free," leading to increased demand.

- Even free care has time costs (e.g., visiting providers or filling prescriptions).

- Quantity demanded (Q2) increases with insurance, with total cost P1Q2 (rectangle 0P1CQ2).

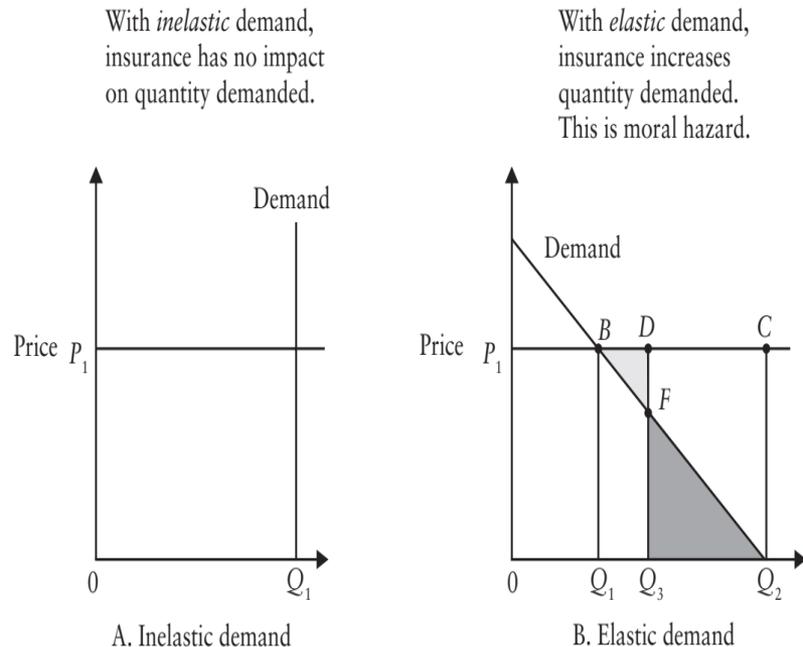- This responsiveness of quantity to price leads to potential problems.

Figure 8.4 Demand for Care and Moral Hazard

Moral Hazard and Insurance Premiums

- Two Possible Scenarios:

- Charging a premium (0.5P1Q1) where the company loses money due to increased demand (Q2) with insurance.

- Charging the appropriate premium (0.5P1Q but Elizabeth may choose not to buy insurance, considering self-insurance.

- Moral Hazard: Consumer behavior changes due to price elasticity of demand, increasing service usage with insurance.

- Moral Hazard Costs: Excess of premiums over expected outlays without insurance.

- Elizabeth's insurance premium includes pure premium and moral hazard cost, and she chooses coverage q* by weighing marginal costs against returns, considering both dimensions.

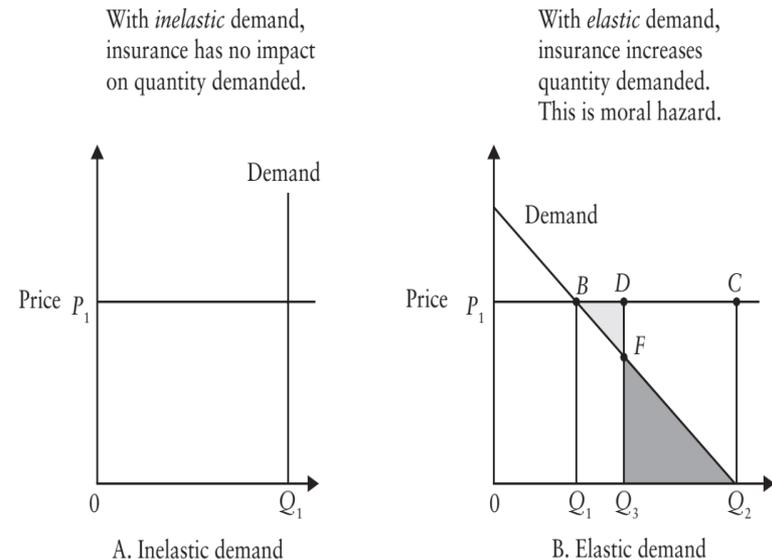With *inelastic* demand, insurance has no impact on quantity demanded.

With *elastic* demand, insurance increases quantity demanded. This is moral hazard.

A. Inelastic demand

B. Elastic demand

Figure 8.4 Demand for Care and Moral Hazard

Predicting Insurance Types and Coverage Levels

- Predicting Insurance Types:
  - Optimal insurance increases relative to expected loss as moral hazard decreases.

- Using demand price elasticity to indicate potential for moral hazard.

- Theoretical Predictions:
  - Deeper coverage for services with more inelastic demand.
  - Development of insurance for services with inelastic demand first, followed by those with elastic demand.

- Current insurance coverage data by service area support the first hypothesis.

- Historical data support the second hypothesis.

Implications of Moral Hazard:

Implications of Moral Hazard:

- Economic costs of increased service usage due to insurance.

- Two components in Elizabeth's insurance premium: pure premium and moral hazard.

- Theoretical predictions guide the development and types of insurance offered.

- Optimal insurance coverage varies with the degree of moral hazard and demand elasticity.

- Understanding these factors helps design insurance policies to meet consumer needs effectively.

Health Insurance and Disease Prevention in Ghana

- Study by Yilma, van Kempen, and de Hoop (2012) explores the impact of the Ghanaian National Health Insurance Scheme (NHIS) on malaria prevention efforts.

- NHIS was established to enhance access to healthcare services through district-level implementation.

- By 2008, every district had enrolled, covering 61% of the population.

- Financing involves premiums from insured individuals and the NHI fund, funded by taxes, social security contributions, budget allocation, and investments.

Insecticide-Treated Bed Nets and Malaria Prevention

- Insecticide-Treated Bed Nets (ITNs) are crucial for malaria prevention in sub-Saharan Africa and parts of Asia.

- While malaria carries a utility loss and risk of death, people may find using nets inconvenient.

- Health insurance may influence prevention behavior. Quotes from community members: "If you are insured, it is easier to go to the hospital," or "Why spend on bed nets when you can use the money for hospital visits?"

- The study found that health insurance had negative impacts on bed net ownership, the number of family members using ITNs, and ITN re-soaking rates.

Consequences of Health Insurance on Prevention

- Health insurance, while beneficial for hospital care, can have unintended consequences on disease prevention.

- In this case, insurance reduced user self-protection measures such as bed net usage.

- This situation illustrates another form of moral hazard, where individuals change their behavior due to insurance coverage.

- While the study did not definitively establish increased malaria incidence, it highlights the complexity of health insurance impacts on healthcare decisions and outcomes.

Main Take Aways From Lecture

- **Many illnesses occur rarely and seemingly at random,** but when they do, they entail **substantial costs.**

- **Insurance reduces variability of people's assets** by creating large pools of customers and operating according to the law of large numbers.

- Although outlays for a health event may vary significantly for any given unit in the pool, **average outlays for the group are fairly predictable. If they are predictable, they can be insured.**

Main Take Aways From Lecture

- One should **distinguish between insurance, as is provided through the pooling of risk, and government programs**, such as NHIS which also redistribute wealth.

- Insurance **can be sold only in circumstances with diminishing marginal utility of wealth or income** (i.e., when the consumer is risk-averse).

- With constant marginal utility, actuarially fair premiums would leave consumers no better off than if they were uninsured.

- **Expected utility is an average measure**; the individual either wins or loses the bet.

Main Take Aways From Lecture

- If insurance companies charge more than the actuarially fair premium, people will have less expected wealth through insuring than through not insuring.

- Even though people will be less wealthy by purchasing insurance, the increased well-being comes from the elimination of risk.

- In theory, the optimal **amount of insurance in the absence of loading costs** leads to full insurance against the expected loss.

- With loading costs, the optimal coverage is less than the expected loss.

Main Take Aways From Lecture

- **Moral hazard** refers to the **increased usage of service**s when the pooling of risks leads to decreased marginal price for the services.

- This suggests:
  - more complete coverage for price inelastic services, and
  - earlier development of insurance for services that are most inelastic

References

- Chapter 8 – Sherman Folland, Allen C. Goodman, and Miron Stano, The Economics of Health and Health Care, Eighth edition, 2017, Routledge