

The Insurance Paradox

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November 21, 2003

Outline of Talk

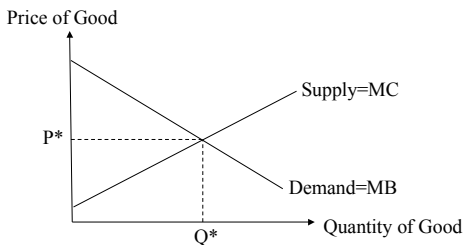
- What's so special about medical care markets?
- Theory of risk and insurance demand
- Efficient insurance markets
- Insurance market failures
 - Adverse selection
 - Moral hazard
- The insurance paradox
- Painful prescriptions

Standing on the Shoulders...

- Arrow, Kenneth (1963). "Uncertainty and the Welfare Economics of Medical Care," *American Economic Review*, 53(5), 941-973.
- Pauly, Mark (1968). "The Economics of Moral Hazard: A Comment," *American Economic Review*, 58 (3), 531-537.
- Arrow, Kenneth (1968). "The Economics of Moral Hazard: Further Comment," *American Economic Review*, 58 (3), 537-538.

Efficiency of Markets

- Under right conditions, markets allocate resources efficiently
 - Fully informed consumers
 - Individual demand is stable/predictable
 - No market power
- Implication:
 - Consumers only consume goods if marginal benefit (MB) of add'l consumption > price
 - Producers only produce goods if marginal cost (MC) of add'l production < price
 - Therefore, $MB > MC$ for every unit produced/consumed



- In a free market, prices adjust to an equilibrium (P^*) at which point producers have no interest in producing more and consumers no interest in purchasing more

Markets for Medical Care

- "Virtually all the specific features of this industry... stem from the prevalence of uncertainty." (Arrow, 1963)
- Many of the characteristics of medical care markets can be viewed as attempts to "compensate" for uncertainties
- These attempts "largely explain the observed noncompetitive behavior of the medical-care market, behavior which, in itself, interferes with optimality." (Arrow, 1963)

Types of Uncertainties

- Demand for medical care is irregular and unpredictable
- Risk of illness extends to risk of income
- Product (medical care) cannot be tested prior to consumption, requiring element of trust
- Information possessed by physician with respect to treatment uncertainties is necessarily greater than that possessed by the patient

*Focus today is on the first of these...

Unpredictable Demand for Medical Care

Stylized Example:

- Individuals live one period
- All individuals have same income, $I = \$100$
- Single health conditions exists
 - Probability of affliction, $p = 0.25$
 - Loss associated with condition, $A = \$90$ (dollar equivalent)
- Single treatment for condition exists
 - Cost of treatment, $C = \$80$
 - Benefit from treatment, $B = \$90$ (dollar equivalent)

Case 1: No Insurance Markets

Potential Outcomes:

State	Utility("Income")
Not afflicted ($p = .75$)	$U(I) = U(100)$
Afflicted, no treatment	$U(I-A) = U(10)$
Afflicted & treated	$U(I-A+B-C) = U(20)$

- Risk of affliction = risk of \$80 loss
- Expected loss of $(0.25)\$80 = \20
- For risk-averse individuals, expected *utility* loss exceeds loss of \$20 with certainty

Figure 1a: Risk Aversion

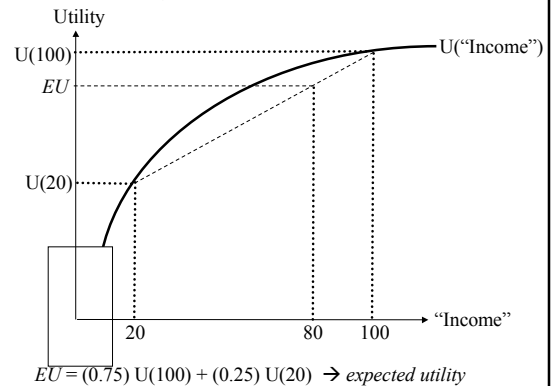


Figure 1b: Risk Aversion

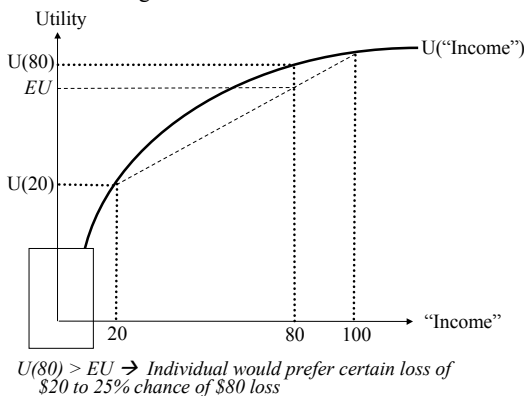
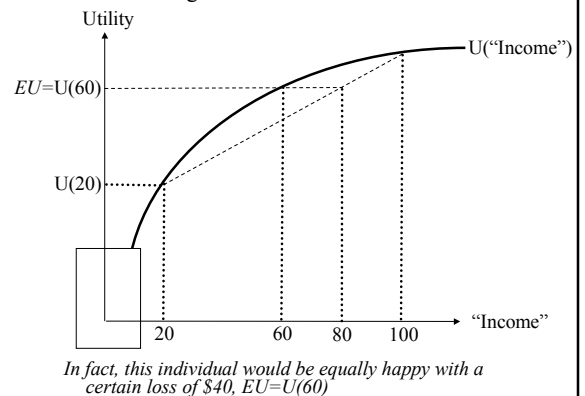


Figure 1c: Risk Aversion



Demand for Insurance

- Risk-averse individuals prefer losses *with certainty* to smaller *expected* losses with high variance
- Implies willing-to-pay exceeds expected treatment costs
- Profit-making opportunity!
 - Insurer could sell full insurance policies for \$30
 - Expected loss per policy = \$20
 - Over large pool of policy-holders, insurer virtually guaranteed profit of \$10 per policy

Case 2: Efficient Insurance Markets

- Supply Side:
 - Assuming no barriers to firms entering insurance markets, excessive profits are eliminated
 - Premiums for full insurance should converge to *expected cost of coverage* (AFP=\$20)
- Demand Side:
 - No reason for consumers to demand less than full coverage
 - Fully eliminating risk maximizes expected utility when premiums = AFP
- *All risk-averse individuals purchase full coverage → best possible outcome, risk fully eliminated*

Insurance Market Failures

- Optimality breaks down once we loosen the assumptions of our stylized model
- Adverse Selection Problem:
 - Individual risks vary
 - Insurers knowledge of risks imperfect
- Moral Hazard Problem:
 - More than one possible treatment available
 - People tend to consume more expensive treatments when insured

Adverse Selection

Modified example:

- Two types of individual (equal #s)
 - Low-risk: $p_L=0.1$
 - High-risk: $p_H=0.4$
- Insurer unable to distinguish between types
- Sets premiums based on *average* AFP (\$20)
- Exceeds the expected treatment cost of low-risk types: $(0.1)\$80 = \8

Case 3: Inefficient Insurance Markets due to Adverse Selection

- Premiums > expected loss of low-risk types
- Less risk averse, low-risk types exit insurance market (prefer to face the risk)
- Average risk of policyholders \uparrow , premiums \uparrow
- More low-risk types exit...
- *Result:* Only high-risk types end up purchasing insurance
- Inefficient b/c low-risk types are WTP > expected cost of coverage, but remain uninsured

Moral Hazard

Modified example:

- Equal risks ($p=.25$)
- *Two* treatment options:
 - Low treatment: $B_L=80, C_L=60$
 - High treatment: $B_H=85, C_H=100$
- Treatment choice depends on coverage
 - No coverage $\rightarrow L$
 - Full coverage $\rightarrow H$
- AFP for full coverage = \$25

Case 4: Inefficient Insurance Markets due to Moral Hazard

Potential Outcomes by Insurance Choice:

	No Coverage	Full Coverage
Not Afflicted	$I = \$100$	$I - AFP = \$75$
Afflicted	$I - A + B_L - C_L = \$30$	$I - AFP - A + B_H = \$70$

- Expected “income” higher without coverage
- Leads some (less risk averse) consumers to exit the market
- Inefficient b/c they are WTP to shield selves from risk of the low cost treatment

The Insurance Paradox

- Insurance *increases* welfare by shielding individuals from financial risk associated with adverse health outcomes
- Would optimally like to be *fully* insured
- Problem: full insurance induces the afflicted to inefficiently over-consume medical care
- Over-consumption *decreases* welfare because additional treatment costs exceeds the marginal benefit of higher treatment

“The underlying point is that, if individuals are free to spend as they will with the assurance that the insurance company will pay, the resulting resource allocation will certainly not be socially optimal. This makes perfectly reasonable the idea that an insurance company can improve the allocation of resources to all concerned by a policy which *rations* the amount of medical services it will support under the insurance policy.” (Arrow, 1968)

“Restrictive” Coverage

- Suppose a policy could be written that restricted policyholders to the *L* treatment
- AFP of such a policy = $(.25)\$60 = \15

Potential Outcomes by Insurance Choice:

	None	Full	Restrictive
Not Afflicted	\$100	\$75	$I - AFP_L = \$85$
Afflicted	\$30	\$70	$I - AFP_L - A + B_L = \$75$

Painful Prescriptions

Q: What can/should be done to limit patients to the L treatment?

- Demand-side cost sharing:
 - Coinsurance and deductibles reduce incentive to over-consume
 - *Ex:* Coinsurance rate of 25% would induce patients to restrict selves to *L*
 - Suboptimal because consumers ideally want to be *fully insured* against risk
 - “Solution” falls hardest on the sick (equity issue)

Painful Prescriptions (cont.)

- Supply-side cost sharing:
 - Structure provider reimbursements to encourage providers to restrict high-cost/low-benefit treatment
 - *Ex:* Prospective payments (do not reimburse enough for providers’ cost of *H*)
 - Problem: what if treatment *H* is efficient for some patients?
 - Incentives could induce inefficient under-provision of treatment in some cases
 - Imposes financial risk onto “good” providers (income depends on how many of their patients need *H*)
 - Changes nature of doctor/patient relationship

Painful Prescriptions (cont.)

- Managerial Controls:
 - “There might be a detailed examination by the insurance company of individual cost items, allowing those that are regarded as “normal” and disallowing others.” (Arrow, 1968)
 - *Ex:* Utilization Reviews, pre-authorization requirements
 - Benefits: could be coupled with full insurance, providers incur no financial risk
 - Problems: insurers making medical decisions?

Less Painful (but less workable?)

- Physician Norms:
 - “They may rely on the professional ethics of physicians not to prescribe frivolously expensive cost of treatment.”
- Patient Norms:
 - “The may even, and this is not as absurd as Mr. Pauly seems to think, rely on the willingness of the individual to behave in accordance with some commonly accepted norms.” (Arrow, 1968)
- *Q:* How do we get there when the economic incentives push the other direction?

Wrap-up

- Insurance Paradox demonstrates inherent difficulty in providing “optimal” insurance
- Unrestricted full coverage, while desirable from the perspective of the afflicted, leads to
 - high-cost/low-benefit treatments
 - higher premiums
 - more uninsured
- So what should we do?