Economics of Health and Health Care
Econ 131

Demand for Medical Care and Effects of Prices and Other Factors on Quantity

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Administrative notes

• Problem Set 1: upload this week
  – Key topics lecture Today+ Next Week
• Problem Set 1 Due (beginning of class) May 1st
Outline Today:

- **Medical Care Demand in Theory:**
  - Illness
  - Income
  - Price
  - Insurance

- **Empirics**
  - Empirical Issues in Measuring Impacts on Demand
  - Empirical Findings
  - Implications for Spending Growth
The Demand for Medical Care (MC)

- Fundamentally, people derive utility from being healthy
- But people can demand medical care to improve their health
- We focus on the demand for medical care (not for health)

Key Tradeoff between:

Medical Care consumption (MC)

and other consumption $X$ [e.g. video games]

- Utility: $U(MC,X)$ with diminishing marginal utilities
- Budget constraint: $I \geq P_{MC} \times MC + P_X \times X$
The Demand for Medical Care

- Utility: $U(MC,X)$ with diminishing marginal utilities
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![Graph showing medical care and consumption](image)
The Demand for Medical Care

- Utility: $U(MC, X)$ with diminishing marginal utilities
- Budget constraint: $I \geq P_{MC} \times MC + P_X \times X$
- Solution: 1) MRS = Price ratio and 2) Budget constraint is satisfied

**Budget Constraint:**

$$I \geq P_{MC} \times MC + P_X \times X$$

$$MC = \frac{I}{P_{MC}} - \frac{P_X}{P_{MC}} \times X$$
Numerical Example:

- Utility: \( U(MC, X) = MC^{0.75} \times X^{0.25} \)
- Income=12
- \( P_{MC} = 4 \)
- \( P_X = 2 \)

Solution:
Numerical Example:

- Utility: \( U(MC, X) = MC^{0.75} \times X^{0.25} \)
- Income = 12
- \( P_{MC} = 4 \)
- \( P_X = 2 \)

Solution:

- \( MRS_{MC,X} = \frac{MU_X}{MU_{MC}} = \frac{MC}{3X} = \frac{P_X}{P_{MC}} = 0.5 \) or \( MC = 1.5 \times X \)
- BC: \( MC = 3 - 0.5 \times X \)
- So: \( X = 1.5, MC = 2.25 \)
Effect of Illness on MC Demand

1) Illness changes the slope of the indifference curves (since MC will be more valued than X when one is sick relative to healthy; flatten curve) and

2) Possibly move the budget constraint inward (if ability to work is affected)
Effect of Income on MC Demand

1) Additional income (such as insurance coverage after illness) typically increases both consumption and medical care (normal goods).
Effect of Price on MC Demand

• An increase in the price of medical care is reflected by pivoting the budget constraint downward.
• The increase in the price of medical care decreases the amount of medical care demanded and increases the amount of other goods demanded
The MC Demand Curve

Each price results in a different quantity demanded, the demand curve for medical care is traced out as price is varied in the prior graph. Larger income results in an outward shift of the demand curve.

![Diagram of the demand curve for medical care with price (P_{MC}) on the y-axis and quantity demanded on the x-axis. The diagram shows two demand curves: one for high income (Demand_{High Inc.}) and one for low income (Demand_{Low Inc.}). The price axis is labeled as P_{high} for high price and P_{low} for low price.]
Back to Example:

• Utility: $U(MC, X) = MC^{0.75} \times X^{0.25}$
• Income=$I$, $P_X = 1$

Solution:

• $MRS_{MC,X} = \frac{MU_X}{MU_{MC}} = \frac{MC}{3*X} = \frac{1}{P_{MC}}$ or $X = \frac{P_{MC}*MC}{3}$

• BC: $MC = \frac{I}{P_{MC}} - \frac{1}{P_{MC}} * X$

• So: $MC = \frac{I}{P_{MC}} - \frac{1}{P_{MC}} * \frac{P_{MC}*MC}{3}$, $MC = \frac{3}{4} * \frac{I}{P_{MC}}$
MC Demand and Illness

Common sense and theory suggest that demand shifts out when illness occurs. Also, the elasticity of the curves generally diminishes (become more vertical) as illness severity increases. (....why cancer therapy is so expensive?)
MC Demand and Insurance

The effective marginal price of medical care decreases with health insurance due to coverage. As such the demand for medical care by the individual will be greater (at any given price) than without insurance. Consider a plan with a 50% coinsurance coverage:
MC Demand and Insurance

The effective marginal price of medical care decreases with health insurance due to coverage. As such the demand for medical care by the individual will be greater (at any given price) than without insurance. Consider a plan with a 50% coinsurance coverage: What is the relationship between OA and OB? (Notice: this is a demand curve, not a budget set)
Individual vs. Market Level Demand

The demand for a market population is simply the aggregation of the demand for all the individuals in the market.
Individual vs. Market
Level Demand

The demand for a market population is simply the aggregation of the demand for all the individuals in the market.

Price Medical Care ($P_{MC}$)
Welfare Loss and Health Insurance

Since individuals do not pay full price, more is consumed than socially optimal (assuming typical assumptions about markets). What is the area of the welfare loss?

More on “Moral Hazard” in insurance sessions.
Welfare Loss and Health Insurance

Since individuals do not pay full price, more is consumed than socially optimal (assuming typical assumptions about markets). What is the area of the welfare loss?
Welfare and Health Insurance

• Gain in Consumer Surplus

• Gain in Producer Surplus

• Loss in Insurer Payments

\[ P_{\text{MC}} \]

\[ \text{Supply}_{\text{MC}} \]

\[ \text{D}_{\text{MC\_Ins.}} \]

\[ \text{D}_{\text{MC\_No Ins.}} \]

Medical Care