The Production of Health

ECON 40656
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Introduction

- Most of this class we will examine markets for medical care
  - How they operate
  - What are economic issues
- Medical care is however only interesting in that it is an intermediate product – used to produce what people care about – health

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- Talk about the transformation of medical care into health
  - How to measure outcomes (and how outcomes are difficult to measure)
  - How to measure the productivity of investments
  - Limits of medical care?

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Aggregate measures of health

- Mortality rates
  - death per period/individuals alive at the beginning of period
- Infant mortality rate
  - deaths 1st year of life/births
- Broad brush strokes, mask lots of problems
  - E.g., Changing composition of population
    - Can 'standardize'

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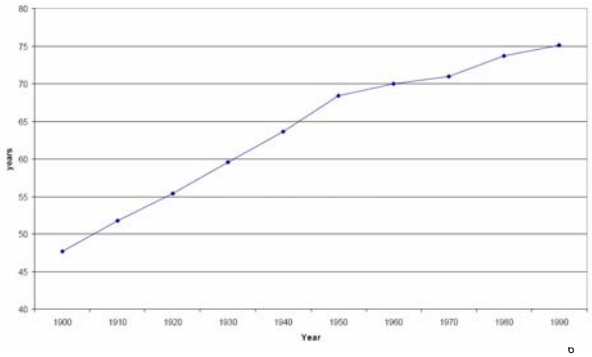
Fig. 1: All cause mortality[a]

a - Death rates shown are adjusted to standard population of U.S. in 1940

Fig. 2: Life Expectancy at Birth



Individual Measures

- **Self reported health status**
  - **Excellent/very good/good/fair/poor**
- **Happiness indexes**
- **Objective**
  - **Incidence of diseases/injuries**
  - **Bed days or sick days**
  - **Activities of daily living (do you need help walking, eating, bathing)**

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SRHS

- **Benefits**
  - **Easy/low cost variable to collect**
  - **Predicts other measures of health that are difficult to collect**
- **Shortcomings**
  - **No way to compare people**
  - **No way to compare aggregate data across countries**
  - **May be difficult to compare groups over time**
    - **Rise in disability**
    - **"Harvesting"**

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% Reporting Health Status, Males

Health	Age 30-44	Age 45-64	Age 65-74
Excellent	43.7%	30.6%	18.1%
Very good	30.3%	26.9%	22.5%
Good	19.8%	26.1%	31.6%
Fair	4.7%	10.6%	18.5%
Poor	1.5%	5.8%	9.3%

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5-Year Mortality Rate, Males

Health	Age 30-44	Age 45-64	Age 65-74
Excellent	0.7%	2.4%	8.6%
Very good	0.9%	2.9%	10.9%
Good	1.6%	5.2%	16.7%
Fair	2.9%	11.7%	25.2%
Poor	10.4%	22.8%	42.9%

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5-Year Mortality Rate, Females

Health	Age 30-44	Age 45-64	Age 65-74
Excellent	0.3%	1.7%	5.6%
Very good	0.4%	1.9%	6.3%
Good	0.9%	2.9%	8.8%
Fair	1.8%	6.2%	14.1%
Poor	7.1%	15.6%	32.2%

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How to measure the productivity of inputs

- Health production function
- Health, measured in some fashion, is a function of a particular input
- Examples
  - Income, education, medical care, etc.
- H=f(M)
- Greater values of H are 'good'
- Functional form
  - Increases in M increase H
  - But at an decreasing rate

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Three measures

- **Total productivity**
  - **H=f(M)**
- **Marginal productivity**
  - **$MP_m = \Delta H/\Delta M$**
- **Average productivity**
  - **$AP_m = H/M$**

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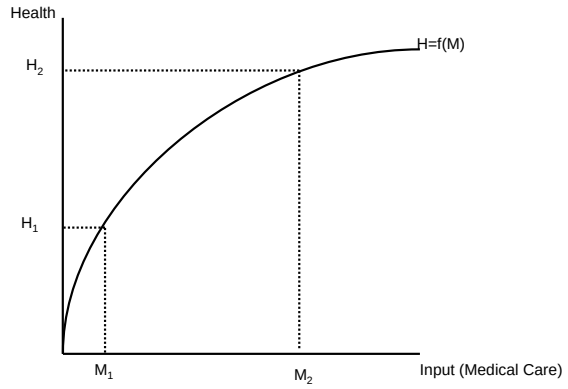

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- **What is the average productivity?**
  - **Outcome divided by input**
  - **AP = M/H**
- **How to calculate? Slope of a line from origin to a point**
- **Line 1, goes from (0,0) to (M_1, H_1).**
  - **Slope is $\Delta Y/\Delta X = (H_1-0)/(M_1-0) = H_1/M_1$**
  - **slope of line 1 is the average productivity**

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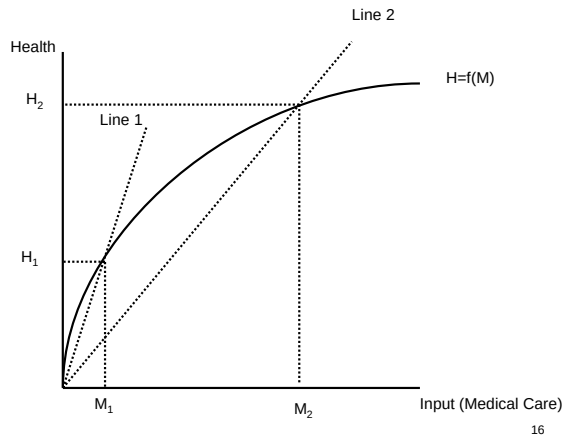

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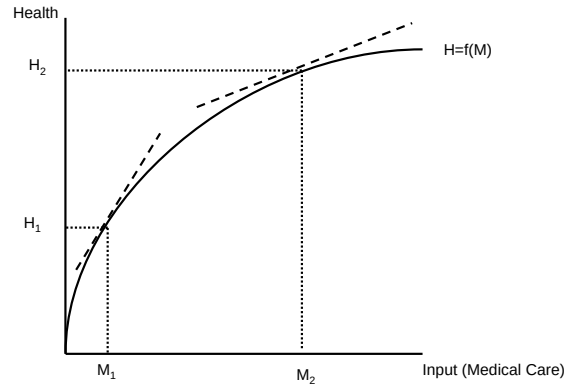

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- **Marginal productivity**
  - **RECALL: derivative of a function is equal to the slope of a line just tangent to the function**
- **Previous graph**
  - **Slope at M_1 > Slope M_2**
  - **Marginal benefit of more medical care declines throughout**
- **Next graph:**
  - **Notice that at M_2, slope of the AP line is greater than the slope of the MP line**
  - **Given the way I've drawn the graph, MP < AP**

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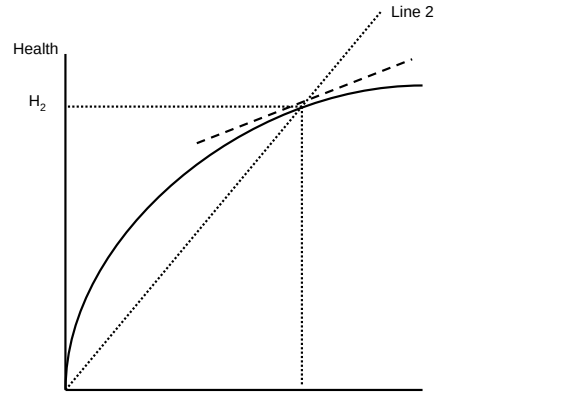

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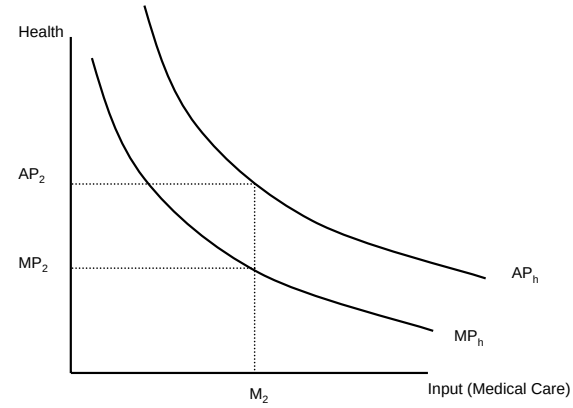

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- **Initial conditions can alter the placement of the graph**
- **Example: Low weight births**
  - **Defined as < 2500 grams**
  - **6% of births**
  - **Kids born low weight have**
    - **Higher incidence of diseases later in life**
    - **More medical costs**
    - **Higher learning disabilities**
    - **Higher mortality rates**

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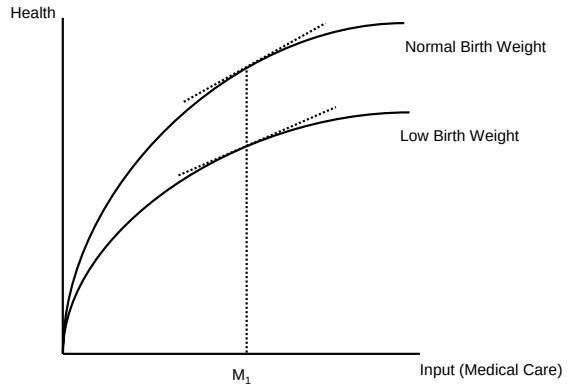

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