

CHAPTER 4

SOCIOECONOMIC DISPARITIES IN HEALTH

Intro

- Previously...
 - ▣ Grossman model
 - ▣ Individuals make choices about their health based on time constraints, budget constraints, and preferences.
 - ▣ Optimal amount of health (H^*) changes based on decisions about trade-offs
- How does socioeconomic status (SES) affect health and choices about health?
 - ▣ **Does health determine SES? Or does SES determine health?**
 - ▣ Use empirical evidence to explore these questions

Health disparities are everywhere

- **Health Disparity:** (*def*) differences in health -- *incidence, prevalence, mortality, and burden of disease* -- between specific populations
- Ubiquitous worldwide across *rac*es, *educational attainments, employment grades, and incomes*
 - ▣ Broadly across all **socioeconomic statuses (SES)**
- Even in countries with universal health insurance, health disparities persist

Bhattacharya, Hyde and Tu – *Health Economics*

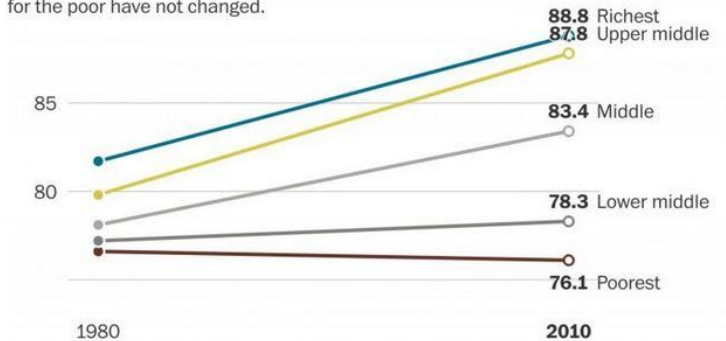
Health disparities across income

- High-income individuals can expect to live longer (fig for men)
- High-income individuals self-report a higher health status than those of lower incomes fig
- For most conditions, the poor exhibit more incidences of disease

Bhattacharya, Hyde and Tu – *Health Economics*

Inequality in life expectancy widens for men

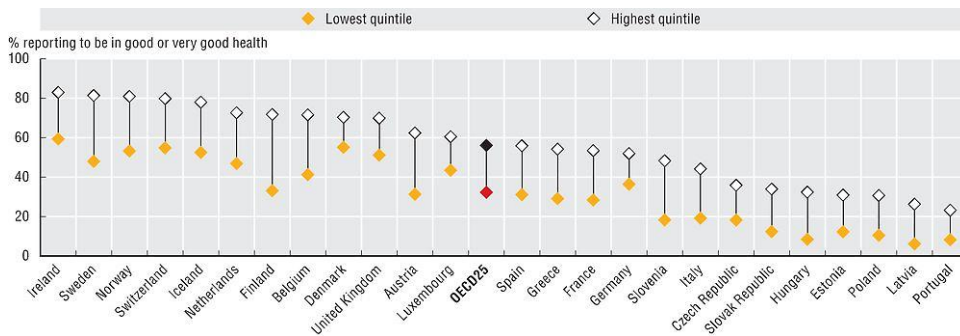
Wealthier men can expect to live longer than their parents did, while life expectancies for the poor have not changed.



Life expectancy for 50-year-olds in a given year, by quintile of income over the previous 10 years

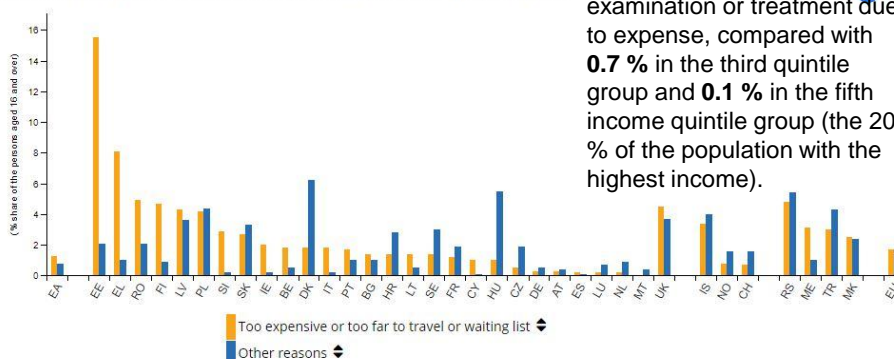
Source: National Academies of Science, Engineering and Medicine

% reporting to be in good or very good health (OECD)



The frequency of reporting unmet needs for a medical examination or treatment for reasons of expense decreases with increasing income

Persons reporting unmet needs for medical examination or treatment, 2019



In 2019, 2.1 % of the population in the first income quintile group (the 20 % of the population with the lowest income) in the EU reported unmet needs for a medical examination or treatment due to expense, compared with 0.7 % in the third quintile group and 0.1 % in the fifth income quintile group (the 20 % of the population with the highest income).

Note: The "Other reasons" is computed as: $(100 - (\text{"Too expensive or too far to travel or waiting list"} + \text{"No unmet needs to declare"}))$

EU-27 - Estimated data.

BE: Break in time series.

IS, UK: 2018 data.

EL, IT, LT: "Other" - not significant data.

Source: Eurostat (online data code: hth_silc_08)

eurostat



SAPIENZA
UNIVERSITÀ DI ROMA

Health disparities - individuals

- **Smoking** rates are twice as high for people with lower education level compared to those with tertiary education.
- **Overweight and obesity** are also more of a problem for those with lower education level, especially among women.
- A person with low income – and with the same level of health care needs as a rich person – is less likely to see a **specialist** doctor.
- Access to **preventive care** and income. E.g. for cervical cancer, the difference in screening rates reaches on average 17 percentage points across income groups.
- Nearly 17% of households in EU countries declare they have difficulties in affording care but the proportion stands at 30% for those below the poverty line.

(<https://www.oecd.org/health/health-for-everyone-3c8385d0-en.htm>)

Dr. Barbara, HSE and Tu – Health Economics

Health disparities across education and race

- **By education:**
 - ▣ College graduates are 25% more likely to survive to age 68 than high school dropouts ([fig](#))
 - ▣ Among 25 OECD countries, at the age of 30 people with the highest level of education can expect to live around six years longer than people with the lowest level of education at age 30 (53.4 versus 47.8 years) [fig](#).
- **By race:**
 - ▣ Hispanics report better health status than black individuals
 - ▣ White individuals report better health then both Hispanic and black individuals [fig](#)

Bhattacharya, Hyde and Tu – Health Economics

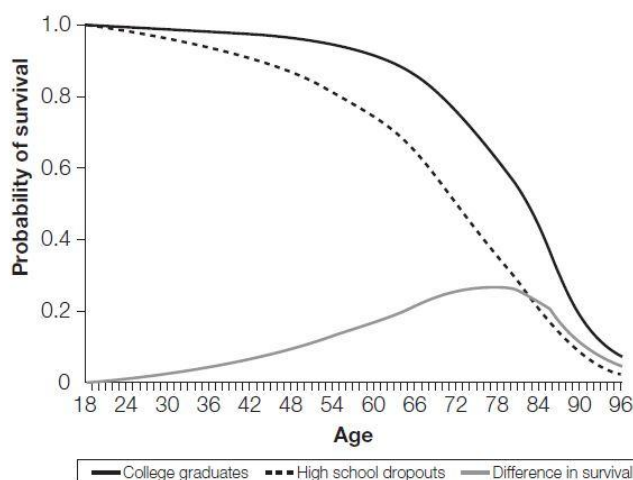
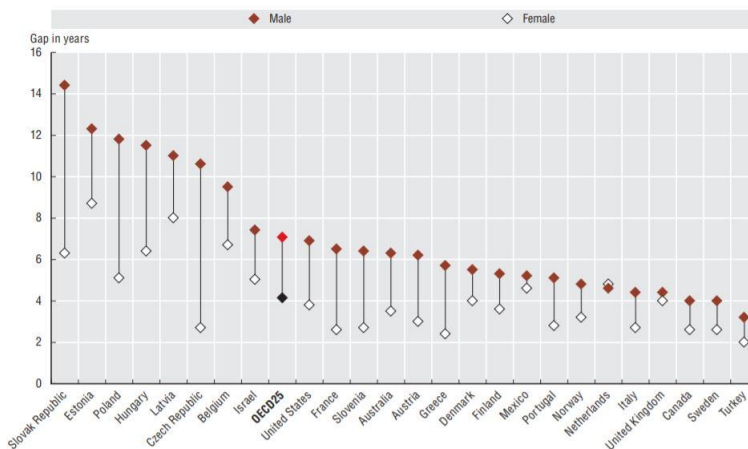
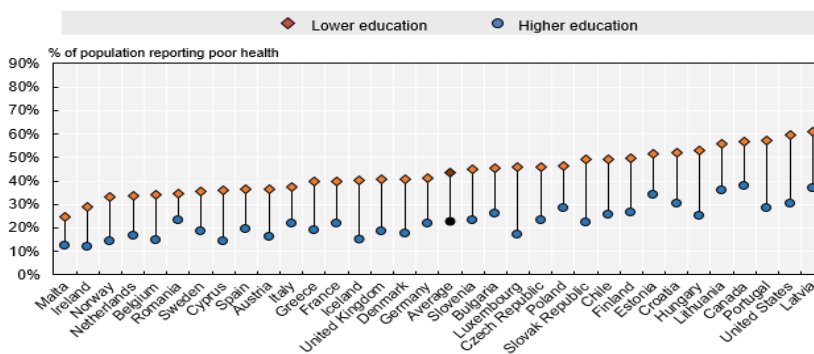


Figure 4.2. Male survival curves by educational attainment.

3.5. Gap in life expectancy at age 30 between highest and lowest education level, by sex, 2015 (or nearest year)



Note: The figures show the gap in the expected years of life remaining at age 30 between adults with the highest level ("tertiary education") and the lowest level ("below upper secondary education") of education.
 Source: Eurostat database complemented with OECD Statistics Directorate data and national data for Israel, Mexico and the Netherlands



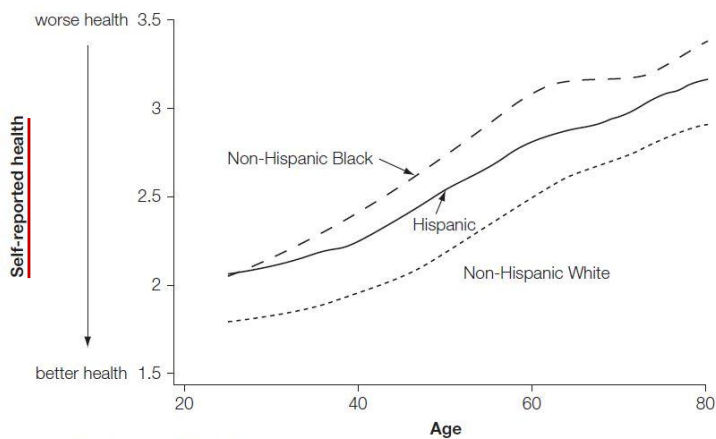
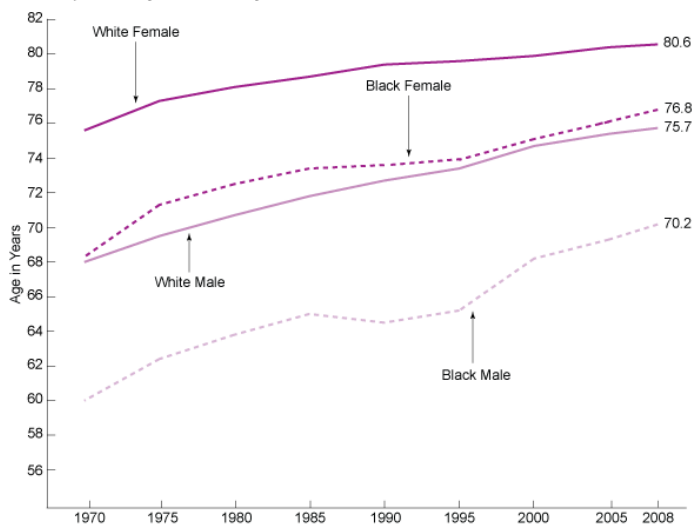


Figure 4.7. Health inequalities by race.

Notes: The curves reflect local linear regression estimates. The regressions are weighted using the survey weights provided by the NHIS.

Source: From *The Oxford Handbook of Health Economics*, edited by Sherry Glied and Peter C. Smith (2011), Ch. 7, Socioeconomic status and health: dimensions and mechanisms, by David M. Cutler, Adriana Lleras-Muney, and Tom Vogl, pp. 124–163, Figure 7.5b from p. 134. Reprinted by permission of Oxford University Press.

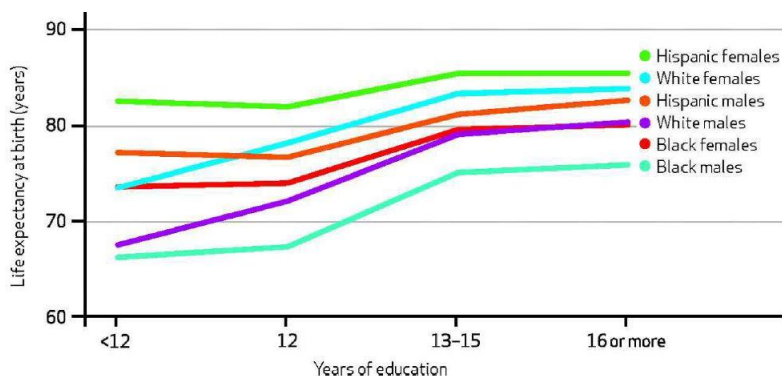
Life Expectancy at Birth, by Race* and Sex, 1970–2008**



*Both racial categories include Hispanics. **2008 data are preliminary.

Source: Minino AM, Xu J, Kochanek KD. Deaths: Preliminary Data for 2008. National vital statistics reports; vol 59 no 2. Hyattsville, MD: National Center for Health Statistics, 2010.

United States Life Expectancy At Birth, By Years Of Education At Age 25, By Race And Sex, 2008.



S. Jay Olshansky et al. *Health Affairs* 2012;31:1803-1813

HealthAffairs

12 by Project HOPE - The People-to-People Health Foundation, Inc.

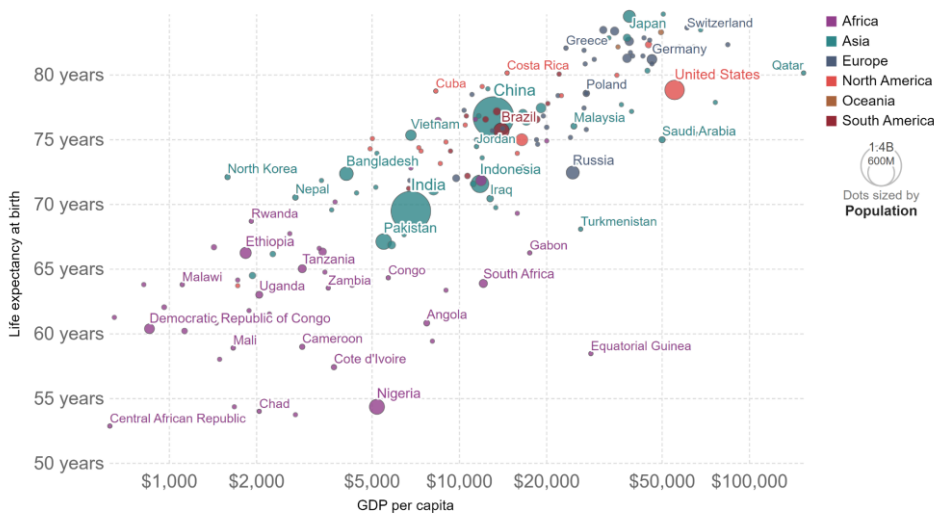


Health disparities -countries

- Positive cross-country correlation between health and economic growth.
- To establish causality between health and economic growth is empirically challenging.
- The relation between health and economic growth changes over the process of economic development.
 - ▣ Positive effect of health on economic growth is strongest for less developed countries

Life expectancy vs. GDP per capita, 2018

GDP per capita is measured in 2011 international dollars, which corrects for inflation and cross-country price differences.



Source: Clio-Infra & UN Population Division, Maddison Project Database 2020 (Bolt and van Zanden (2020))
OurWorldInData.org/life-expectancy • CC BY

Theories to explain health disparities

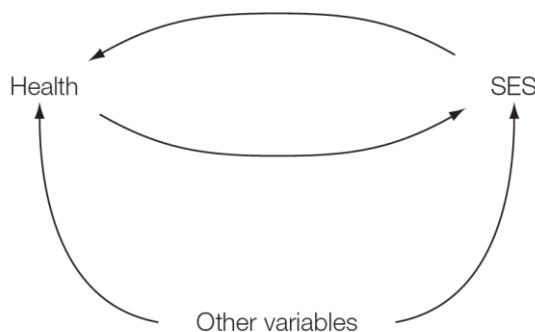
Why do health disparities exist?

- Reasons/theories
 - ▣ Early life events
 - ▣ Income levels
 - ▣ Stress of being poor
 - ▣ Work capacity
 - ▣ Impatience
 - ▣ Adherence to medical advice
 - ▣ Peer/network effects
- Policy: importance of understanding causes of disparities before addressing them

Bhattacharya, Hyde and Tu – Health Economics

What causes what?

- Does bad health cause low SES?
- Does low SES cause bad health?
- Are there other factors?



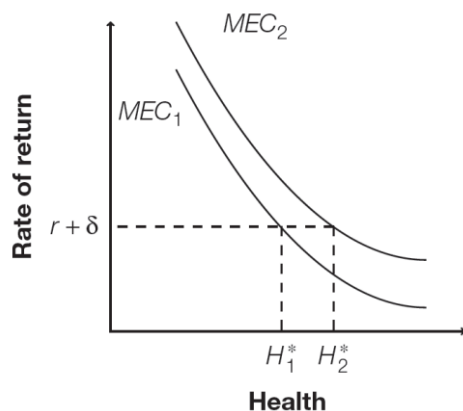
Bhattacharya, Hyde and Tu – Health Economics

Hypotheses for health disparities

- Efficient producer
- Thrifty phenotype
- Direct income
- Allostatic load
- Income inequality
- Access to care
- Productive time
- Time preference (The Fuchs hypothesis)

Bhattacharya, Hyde and Tu – Health Economics

The Grossman model and health disparities



- Recall MEC indicates the return on each additional unit of health capital
- Different SES groups may have different MECs
- **Why?**
 - ▣ Each hypothesis posits a different reason

Bhattacharya, Hyde and Tu – Health Economics

The efficient producer hypothesis

- **Hypothesis: better-educated individuals are more efficient producers of health** than less well-educated individuals
 - ▣ Grossman predicts that people who are more efficient health producers will have higher H^*

- Lleras-Muney (2005) find that an additional year of schooling *caused* ~1.7 year increase in life expectancy in 1920s US
 - ▣ Hence, education improves health

Bhattacharya, Hyde and Tu – Health Economics

Possible causal mechanisms

- Possible reasons for positive *correlation* between health and education?
 - ▣ Lessons in school help students to take better care of themselves
 - ▣ Schooling helps students be more patient when it comes to payoffs of investments (like health)
 - ▣ Better-educated more likely to adhere to treatment regimens
 - ▣ Peer effects

Bhattacharya, Hyde and Tu – Health Economics

Thrifty phenotype hypothesis

- **Genetic reasons for being inefficient at producing health**
- Deprivation of resources (food) *in utero* and early childhood leads to activation of “thrifty” genes that are useful for sparse environmental conditions
- These “thrifty” genes good for scarce environments but bad in conditions of abundance
- More likely to develop diabetes, obesity, and other disorders later in life
- *Disparities arise because poorer individuals are more likely to have resource deprivation early in life*

Bhattacharya, Hyde and Tu – Health Economics

Thrifty phenotype hypothesis

- Use natural experiments to test this hypothesis
 - ▣ A randomized experiment that randomly deprived some children *in utero* and not others would be pretty unethical!
- Natural experiments use environmental shocks that naturally create control and treatment groups
 - ▣ Ex: earthquakes, famine, snowstorms
- Good natural experiment eliminates selection bias

Bhattacharya, Hyde and Tu – Health Economics

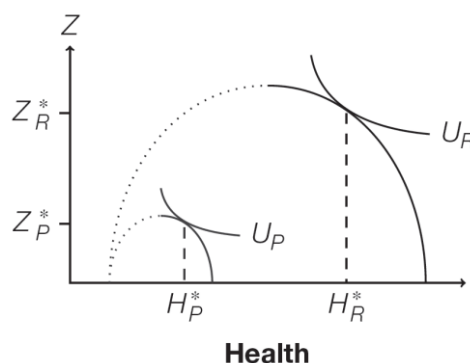
The Dutch famine study

- Natural experiment: Dutch famine in WWII (Rosebloom et al. 2001)
- Holland suffered a famine due to a German blockade of food
- Created two baby groups:
 - ▣ Those *in utero* during famine
 - ▣ Those conceived after famine
- Two groups are similar, **except** for *in utero* deprivation
 - ▣ So hopefully no selection bias!
- Findings:
 - ▣ **Babies *in utero* during famine had higher rates of diabetes and obesity in adulthood**

Bhattacharya, Hyde and Tu – Health Economics

The direct income hypothesis

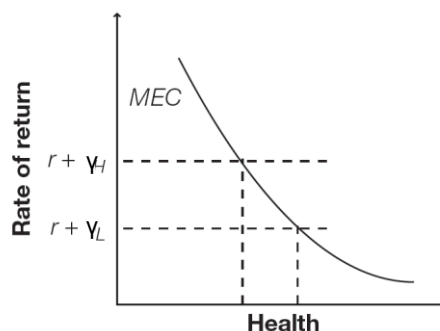
- **Hypothesis:** disparities exist because rich people have more resources to devote to health
- Rich individuals have an expanded PPF because of extra financial resources
- Expanded PPF → higher H^* can be obtained



Bhattacharya, Hyde and Tu – Health Economics

Allostatic load hypothesis

- **Hypothesis:** Prolonged or repeated stress is unhealthy and can cause an increased rate of aging
- In the Grossman model, aging is represented by rate of depreciation of health capital γ
- High stress load leads to a higher γ



Bhattacharya, Hyde and Tu – Health Economics

The Whitehall study

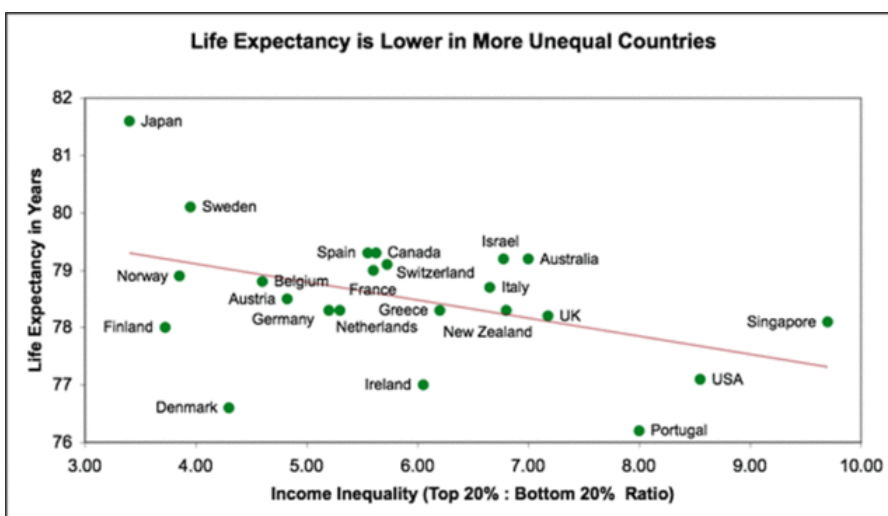
- Whitehall study by Marmot et al. (1978, 1991)
- Compares health status of British civil servants
 - ▣ British civil servants relatively homogenous in background and share workplace environments
 - ▣ All British citizens have the same access to health care through the National Health Service
- **Findings:**
 - ▣ Disease morbidity and mortality rates highest for low-grade civil servants
 - ▣ Low-grade civil servants reported **more stressful** work and home environments

The Allostatic Load Hypothesis Bhattacharya, Hyde and Tu – Health Economics

Income inequality hypothesis

- **Hypothesis:** Health disparities are caused by an unequal distribution of income
 - ▣ Related to the allostatic load hypothesis
 - ▣ More equal societies are less stressful and therefore healthier
- Policy implications?
 - ▣ If theory is true then policy makers should aim at reducing inequality within a community
 - ▣ The health status of a society may decline even if average income rises if income becomes more concentrated

Bhattacharya, Hyde and Tu – Health Economics



Access to care hypothesis

- **Hypothesis:** Those with high incomes can afford more generous health insurance compared to those of low income
- But health disparities persist in countries with universal health insurance
 - ▣ Canadian youth (Currie and Stabile 2003)
 - ▣ British civil servants (Marmot et al. 1978, 1991)
 - ▣ both countries have equal access to health care!

The access to care hypothesis Bhattacharya, Hyde and Tu – Health Economics

Productive time hypothesis

- SES differences are caused by disparities in health
 - ▣ Bad health leads to lower productive time and therefore less time to produce income
- Oreopoulos et al. (2008) and Black et al. (2007) study siblings growing up in same household
 - ▣ Those with worse health during infancy have higher mortality rates, lower educational achievement, and lower adult earnings

Bhattacharya, Hyde and Tu – Health Economics

The Fuchs hypothesis

- Bad health does not cause low SES, and low SES does not cause bad health
 - ▣ A third factor – time preference -- causes both!
- Health and SES both determined by willingness to delay gratification
 - ▣ People who are willing to delay gratification are more willing to invest in things like education and health
- People willing to delay gratification have high discount factors δ

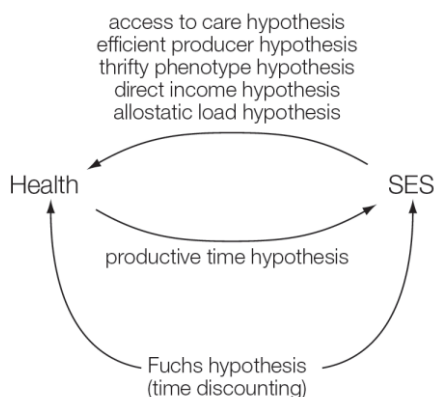
$$U = U(H_0, Z_0) + \delta U(H_1, Z_1) + \delta^2 U(H_2, Z_2) + \dots + \delta^\Omega U(H_\Omega, Z_\Omega)$$

The Fuchs hypothesis

Bhattacharya, Hyde and Tu – Health Economics

Conclusion

- Each theory has supporting evidence and each can explain some socioeconomic health disparities
- Key takeaways:
 - ▣ Better-educated people generally have better health even with the same resources
 - ▣ Health events early in life affect health into adulthood
 - ▣ Stress plays an important role in creating health disparities
 - ▣ Equalizing access to care does not eliminate health disparities
 - ▣ There is a two-way relationship between health and SES



Bhattacharya, Hyde and Tu – Health Economics