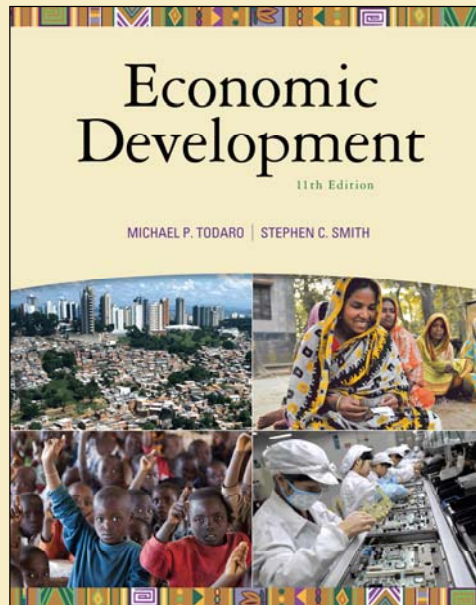


## Chapter 8

### Human Capital: Education and Health in Economic Development



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### 8.1 The Central Roles of Education and Health

- Health and education are important objectives of development, as reflected in Amartya Sen's capability approach, and in the core values of economic development
- Health and education are also important components of growth and development – inputs in the aggregate production function

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## Education and Health as Joint Investments for Development

- These are investments in the same individual
- Greater health capital may improve the returns to investments in education
  - Health is a factor in school attendance
  - Healthier students learn more effectively
  - A longer life raises the rate of return to education
  - Healthier people have lower depreciation of education capital
- Greater education capital may improve the returns to investments in health
  - Public health programs need knowledge learned in school
  - Basic hygiene and sanitation may be taught in school
  - Education needed in training of health personnel

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## Improving Health and Education: Why Increasing Incomes Is Not Sufficient

- Increases in income often do not lead to substantial increases in investment in children's education and health
- But better educated mothers tend to have healthier children at any income level
- Significant market failures in education and health require policy action

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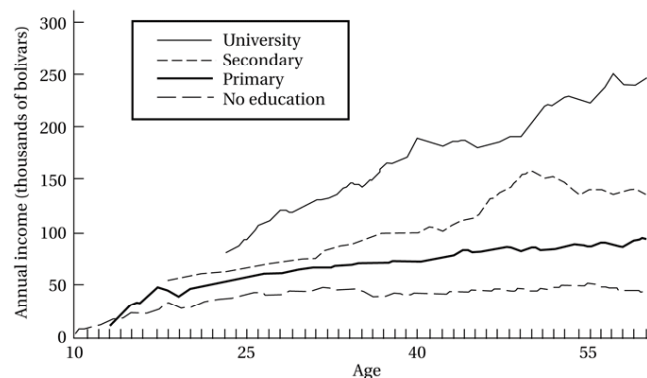
## 8.2 Investing in Education and Health: The Human Capital Approach

- Initial investments in health or education lead to a stream of higher future income
- The present discounted value of this stream of future income is compared to the costs of the investment
- Private returns to education are high, and may be higher than social returns, especially at higher educational levels

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**Figure 8.1** Age-Earnings Profiles by Level of Education: Venezuela

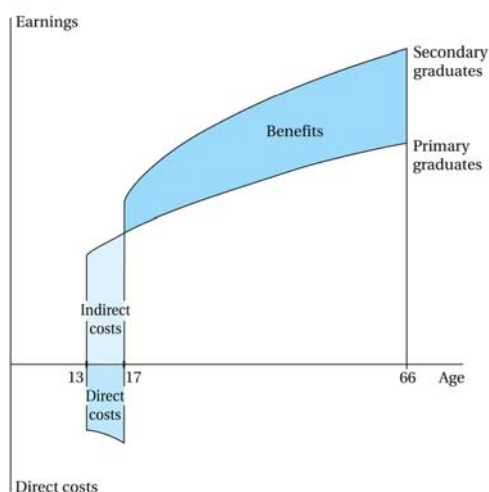


Source: International Bank for Reconstruction and Development / The World Bank: *The Profitability of Investment in Education: Concepts & Methods* by George Psacharopoulos, 1995. Reprinted with permission.

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**Figure 8.2** Financial Trade-Offs in the Decision to Continue in School



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**Table 8.1** Sample Rates of Return to Investment in Education by Level of Education, Country, Type, and Region

Country Type and Region	Social Rate of Return (%)			Private Rate of Return (%)		
	Primary	Secondary	Higher	Primary	Secondary	Higher
<b>Developing</b>						
Sub-Saharan Africa	24	18	11	41	27	28
Asia	20	13	12	39	19	20
Latin America	18	13	12	26	17	20
<b>Developed</b>	14	10	9	22	12	12

Source: "Returns to Investment in Education: A Global Update" by George Psacharopoulos. *World Development*, Vol. 22, Sept 1994. Reprinted with permission.  
 Note: How these rates of return were calculated is explained in detail note 20 at the end of this chapter.

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### 8.3 Child Labor

- Child labor is a widespread phenomenon
- The problem may be modeled using the “multiple equilibria” approach
- Government intervention may be called for to move to a ‘better’ equilibrium
- Sometimes this shift can be self-enforcing, so active intervention is only needed at first

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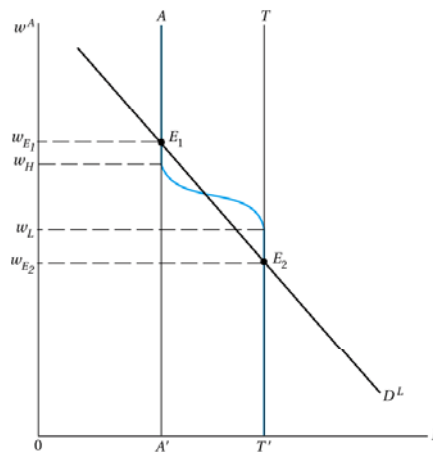
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### Assumptions of the Child Labor Multiple Equilibria Model

- Luxury Axiom: A household with sufficiently high income would not send its children to work
- Substitution Axiom: Adult and child labor are substitutes (perfect substitutes in this model), in which the quantity of output by a child is a given fraction of that of an adult:  $Q^C = \gamma Q^A$ ,  $0 < \gamma < 1$ .

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**Figure 8.3** Child Labor as a Bad Equilibrium

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## Other approaches to child labor policy

- Get more children into school (as in Millennium Development Goals), e.g. new village schools; and enrollment incentives for parents such as in Progresas/ Oportunidades
- Consider child labor an expression of poverty, so emphasize ending poverty generally (a traditional World Bank approach, now modified)
- If child labor is inevitable in the short run, regulate it to prevent abuse and provide support services for working children (UNICEF approach)
- Ban child labor; or if impossible, ban child labor in its most abusive forms (ILO strategy; "Worst Forms of Child Labor Convention")
- Activist approach: trade sanctions. Concerns: could backfire when children shift to informal sector; and if modern sector growth slows

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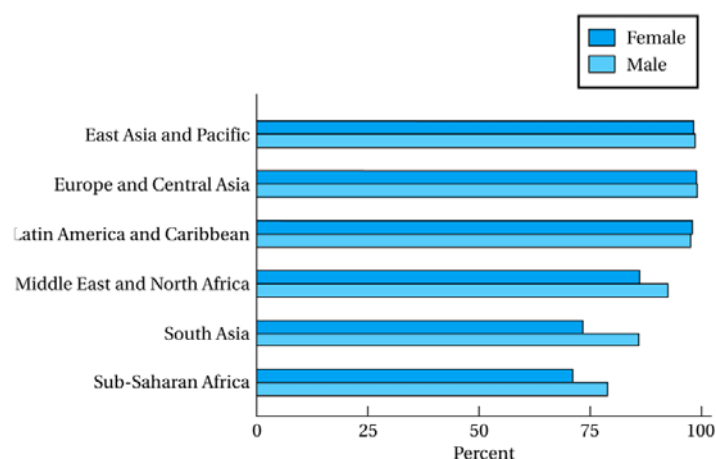
## 8.4 The Gender Gap: Discrimination in Education and Health

- Young females receive less education than young males in nearly every low and lower-middle income developing country
- Closing the educational gender gap is important because:
  - The social rate of return on women's education is higher than that of men in developing countries
  - Education for women increases productivity, lowers fertility
  - Educated mothers have a multiplier impact on future generations
  - Education can break the vicious cycle of poverty and inadequate schooling for women
  - Good news: Millennium Development Goals on parity being approached, progress in every developing region

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**Figure 8.4** Youth Literacy Rate, 2008



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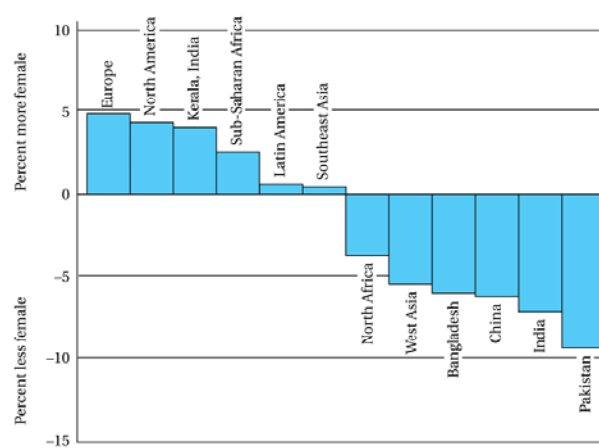
## 8.4 The Gender Gap: Discrimination in Education and Health (cont'd)

- Consequences of gender bias in health and education
  - Economic incentives and their cultural setting
  - “Missing Women” mystery in Asia
- Increase in family income does not always lead to better health and education

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**Figure 8.5** Female-Male Ratios in Total Population in Selected Communities



Source: Amartya Sen, *Development as Freedom* (New York: Knopf, 1999), p. 104. Copyright © 1999 by Amartya Sen. Reprinted with the permission of Alfred A. Knopf, a division of Random House, Inc..

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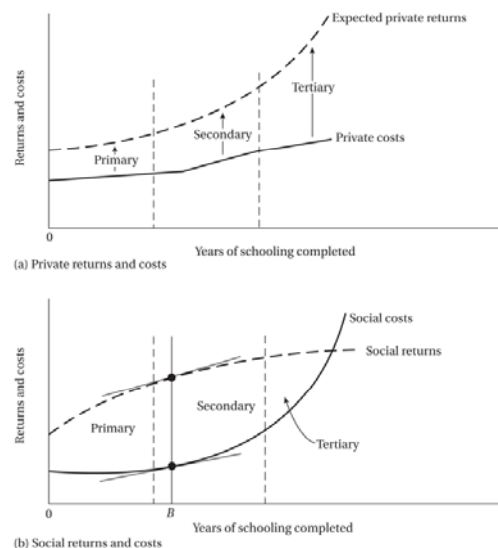
## 8.5 Educational Systems and Development

- The Political Economy of Educational Supply and Demand: The Relationship between Employment Opportunities and Educational Demands
- Social versus Private Benefits and Costs

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**Figure 8.6** Private versus Social Benefits and Costs of Education: An Illustration



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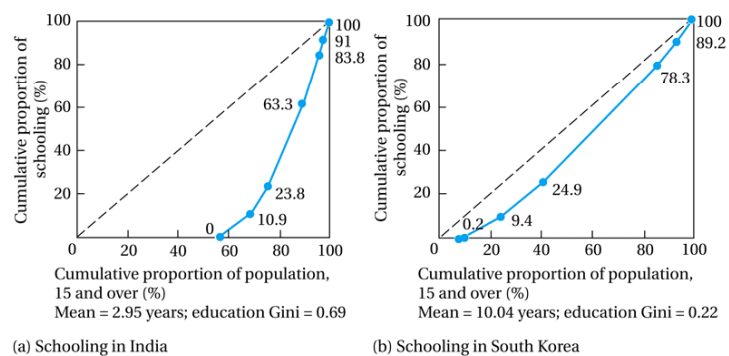
## 8.5 Educational Systems and Development

- Distribution of Education
  - Lorenz curves for the distribution of education
- Education, Inequality, and Poverty

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**Figure 8.7** Lorenz Curves for Education in India and South Korea

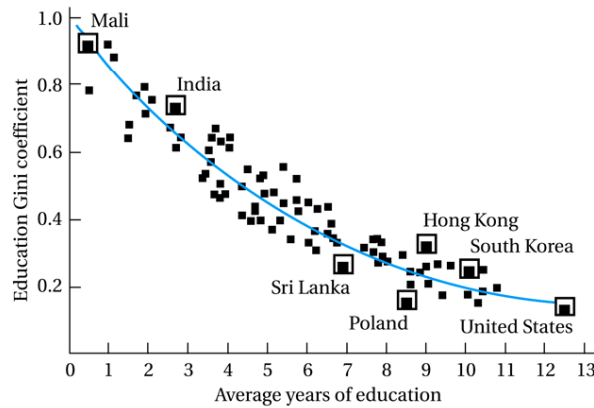


Source: From *The Quality of Growth*. Copyright © 2000 by World Bank. Reprinted with permission.

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**Figure 8.8** Gini Coefficients for Education in 85 Countries



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## 8.5 Educational Systems and Development (cont'd)

- Educational supply and demand: the relationship between employment opportunities and educational demands
- Social versus private benefits and costs
- Distribution of education
- Education, inequality, and poverty
- Education, Internal Migration, and the Brain Drain

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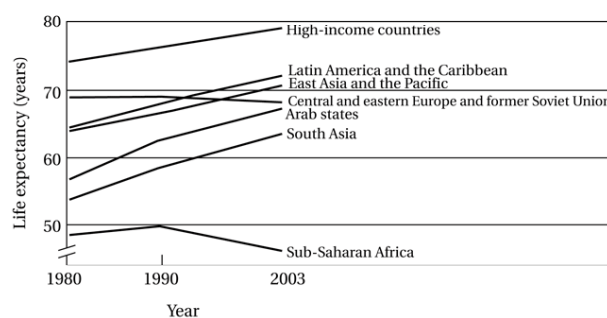
## 8.6 Health Measurement and Distribution

- World Health Organization (WHO): The key United Nations agency concerned with global health matters.

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**Figure 8.9** Life Expectancy in Various World Regions

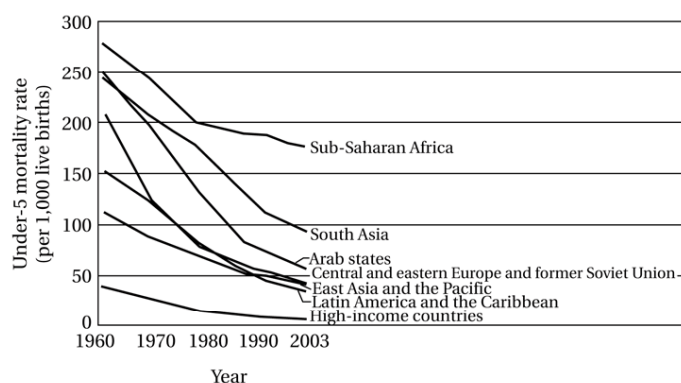


Source: From *Human Development Report, 2005*, fig. 1.1. Reprinted with permission from the United Nations Development Programme.

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**Figure 8.10** Under-5 Mortality Rates in Various World Regions

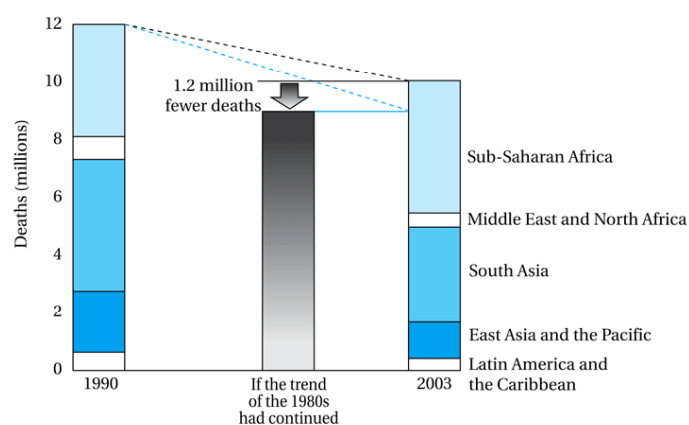


Source: From *Human Development Report, 2005*, fig. 1.2. Reprinted with permission from the United Nations Development Programme.

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**Figure 8.11** Deaths of Children under Age 5

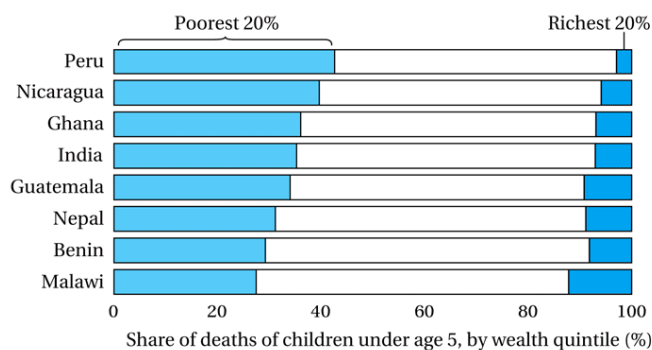


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**Figure 8.12A** Children's Likelihood to Die in Selected Countries

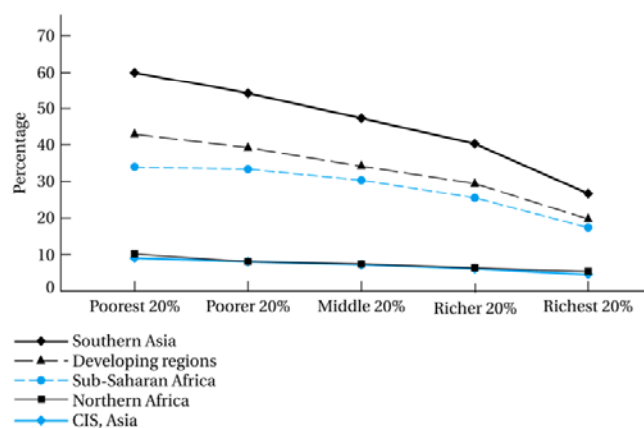


Source: Human Development Report, 2005, fig. 2.4. Reprinted with permission from the United Nations Development Programme.

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**Figure 8.12B** Proportion of Under-Five Children Who Are Underweight, by Household Wealth, around 2008



Source: From Millennium Development Goals Report, 2010, p. 14. Reprinted with permission from the United Nations.

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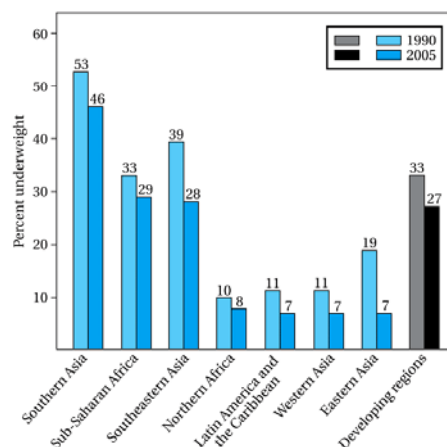
## 8.7 Disease Burden

- HIV/AIDS
- Malaria
- Parasitic Worms and Other “Neglected Tropical Diseases”

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**Figure 8.13** Proportion of Children under 5 Who Are Underweight, 1990 and 2005



Source: Adapted from United Nations, *Millennium Development Goals Report, 2007* (New York: United Nations, 2007), p. 6.

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**Table 8.2** Regional HIV and AIDS Statistics, 2009

Region	Adults and Children Living with HIV	Adults and Children Newly Infected with HIV	Adult and Child Deaths Due to AIDS
Sub-Saharan Africa	22.4 million	1.9 million	1.4 million
Middle East and North Africa	310,000	35,000	20,000
South and Southeast Asia	3.8 million	280,000	270,000
East Asia	850,000	75,000	50,000
Oceania	59,000	3,900	2,000
Latin America	2 million	170,000	77,000
Caribbean	240,000	20,000	12,000
Eastern Europe and Central Asia	1.5 million	110,000	87,000
Western and Central Europe	850,000	30,000	13,000
North America	1.4 million	55,000	25,000
Total	33.4 million	2.7 million	2 million

Source: Adapted from 2009 *AIDS Epidemic Update*, p. 11. © 2009 Joint United Nations Programme on HIV / AIDS (UNAIDS) and World Health Organization (WHO).

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**Table 8.3** The Major Neglected Tropical Diseases, Ranked by Prevalence

Disease	Global Prevalence (millions)	Population at Risk	Regions of Highest Prevalence
Ascariasis	807	4.2 billion	East Asia and Pacific Islands, sub-Saharan Africa, India, South Asia, China, Latin America and Caribbean
Trichuriasis	604	3.2 billion	Sub-Saharan Africa, East Asia and Pacific Islands, Latin America and Caribbean, India, South Asia
Hookworm infection	576	3.2 billion	Sub-Saharan Africa, East Asia and Pacific Islands, India, South Asia, Latin America and Caribbean
Schistosomiasis	207	779 million	Sub-Saharan Africa, Latin America and Caribbean
Lymphatic filariasis	120	1.3 billion	India, South Asia, East Asia and Pacific Islands, sub-Saharan Africa
Trachoma	84	590 million	Sub-Saharan Africa, Middle East and North Africa
Onchocerciasis	37	90 million	Sub-Saharan Africa, Latin America and Caribbean
Leishmaniasis	12	350 million	India, South Asia, sub-Saharan Africa, Latin America and Caribbean
Chagas' disease	8-9	25 million	Latin America and Caribbean
Leprosy	0.4	N.D.	India, sub-Saharan Africa, Latin America and Caribbean
Human African trypanosomiasis	0.3	60 million	Sub-Saharan Africa
Dracunculiasis	0.01	N.D.	Sub-Saharan Africa
Buruli ulcer	N.D.	N.D.	Sub-Saharan Africa

Source: "Control of neglected tropical diseases," by Peter Hotez et al., *New England Journal of Medicine*, 357: 1018-1027 (September 6, 2007). Copyright © 2007 Massachusetts Medical Society. All rights reserved.  
Note: N.D. = not determined.

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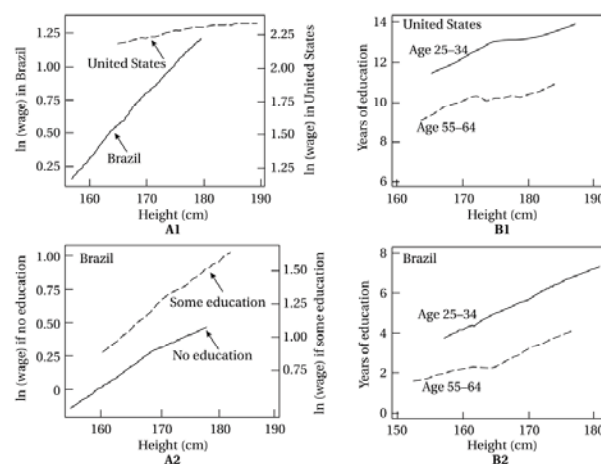
## 8.8 Health, Productivity, and Policy

- Productivity
  - Is there a connection?
- Health Systems Policy
  - Great variability in the performance of health systems at each income level

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**Figure 8.14** Wages, Education, and Height of Males in Brazil and the United States

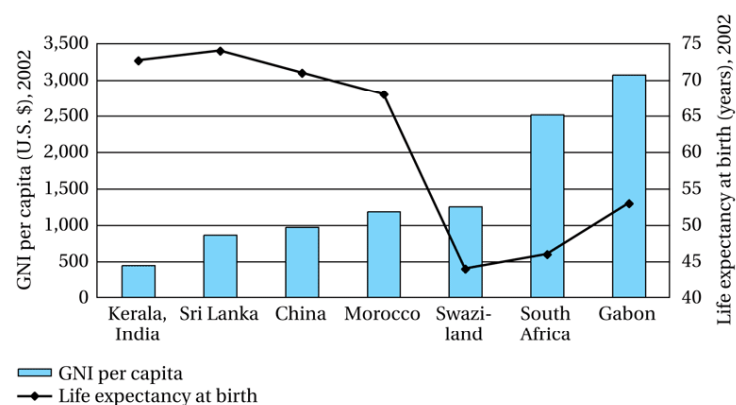


Source: "Health, nutrition, and economic development," by John Strauss and Duncan Thomas, *Journal of Economic Literature* 36 (1998): 766-817. Reprinted with permission.  
Note: ln (wage) stands for natural log of wage.

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**Figure 8.15** GNI Per Capita and Life Expectancy at Birth, 2002

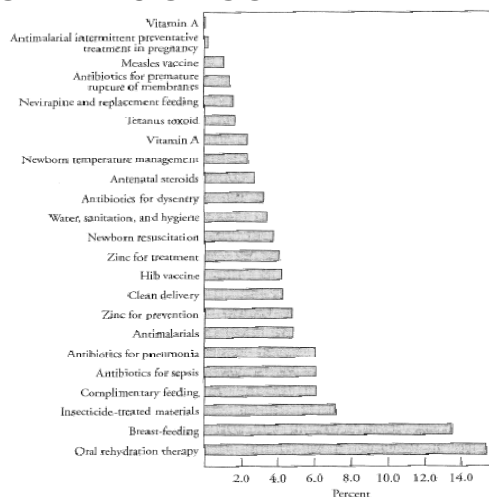


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## Clinical Evidence

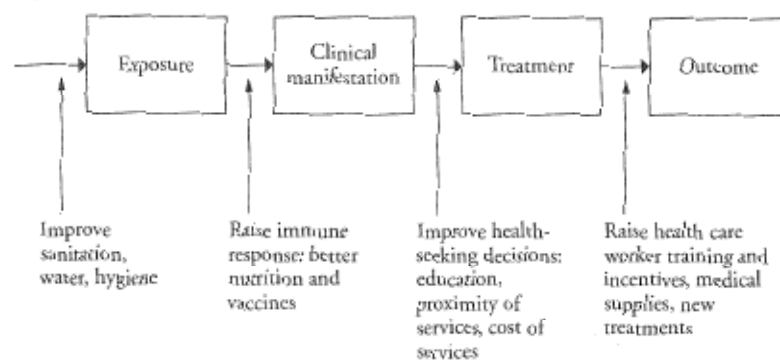


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## Level's of Interventions

Figure 3-3. *Steps to Child Mortality and Possible Interventions*

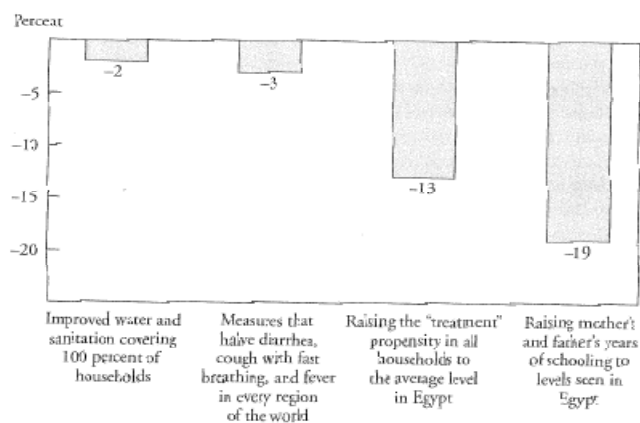


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## Impact of Package Intervention

Figure 3-4. *Impact of Four Package of Measures for Reducing Child Mortality Calculated from Global Data*



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## Concepts for Review

- Acquired immunodeficiency syndrome (AIDS)
- Basic education
- Brain drain
- Conditional cash transfer (CCT) programs
- Derived demand
- Discount rate
- Educational certification
- Educational gender gap
- Health system
- Human capital
- Human immunodeficiency virus (HIV)
- Literacy
- Neglected tropical diseases
- Private benefits of education

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## Concepts for Review (cont'd)

- Private costs of education
- Social benefits of education
- Social costs of education
- World Health Organization (WHO)

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