

Chapter 9

TABLE 9.1 Linkages between Investments in Health and Education

Health and education are investments made in the same individual.
 Greater health capital may raise the return on investment in education because:
 health is an important factor in school attendance
 healthier children are more successful in school/learn more efficiently
 tragic deaths of school-age children also increase the cost of education per worker, while
 longer life spans raise the return to investments in education
 healthier individuals are more able to productively use education at any point in life
 Greater education capital may raise the return to investment in health because:
 many health programs rely on skills learned in school (including literacy and numeracy)
 schools teach basic personal hygiene and sanitation
 education is needed for formation and training of health personnel
 Improvement in productive efficiency from investment in education raises the return on a
 lifesaving investment in health.

TABLE 9.2 Progress in Education and Health

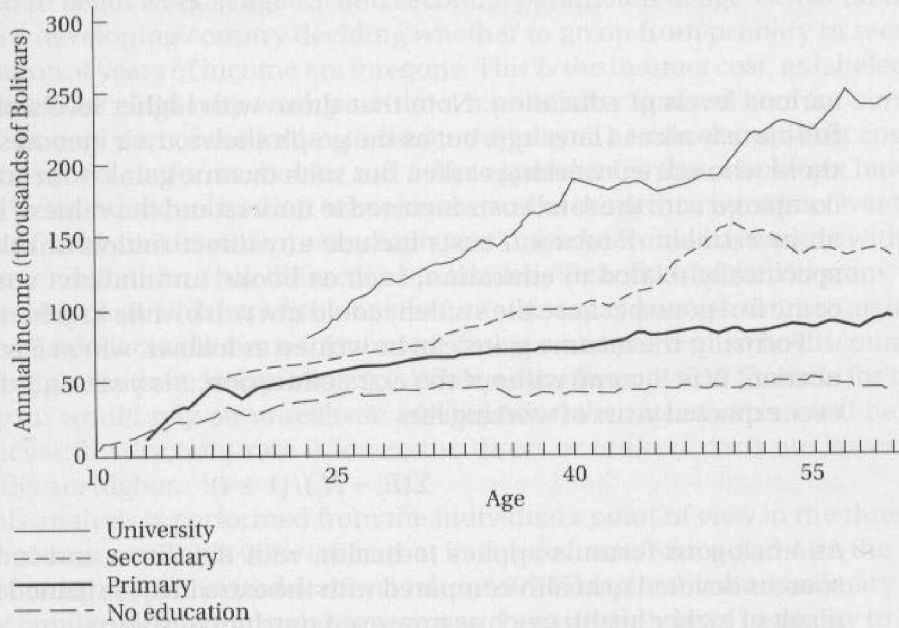
| | Averages | | Difference in the Average 1970–1996 |
|---|----------|---------|---|
| | 1970 | 1996 | |
| Primary Enrollment Rate | | | |
| World | 85.783 | 98.974 | 13.19*** |
| Advanced countries | 103.892 | 102.283 | -1.61 |
| SSA | 63.181 | 86.926 | 23.74** |
| Asia | 73.221 | 103.779 | 30.56*** |
| MENA | 86.723 | 98.523 | 11.80 |
| WHD | 101.205 | 107.359 | 6.15 |
| Secondary Enrollment Rate | | | |
| World | 34.651 | 62.848 | 28.20*** |
| Advanced countries | 70.167 | 111.025 | 40.86*** |
| SSA | 9.795 | 29.304 | 19.51*** |
| Asia | 25.371 | 47.929 | 22.56*** |
| MENA | 37.469 | 68.738 | 31.27*** |
| WHD | 30.650 | 57.473 | 26.82*** |
| Female to Male Primary Enrollment Rate | | | |
| World | 0.845 | 0.927 | 0.08*** |
| Advanced countries | 0.995 | 1.000 | 0.00 |
| SSA | 0.707 | 0.836 | 0.13** |
| Asia | 0.749 | 0.890 | 0.14* |
| MENA | 0.763 | 0.942 | 0.18*** |
| WHD | 0.958 | 0.975 | 0.02 |
| Female to Male Secondary Enrollment Rate | | | |
| World | 0.727 | 0.931 | 0.20*** |
| Advanced countries | 0.921 | 1.036 | 0.12*** |
| SSA | 0.467 | 0.729 | 0.26*** |
| Asia | 0.584 | 0.868 | 0.28*** |
| MENA | 0.610 | 0.930 | 0.32*** |
| WHD | 0.994 | 1.106 | 0.11** |
| Teacher-Pupil Ratio at the Primary Level | | | |
| World | 0.033 | 0.042 | 0.01*** |
| Advanced countries | 0.043 | 0.065 | 0.02*** |
| SSA | 0.024 | 0.024 | 0.00 |
| Asia | 0.033 | 0.032 | 0.00 |
| MENA | 0.038 | 0.053 | 0.02** |
| WHD | 0.030 | 0.040 | 0.01*** |

TABLE 9.2 (continued)

| | Averages | | Difference in the Average 1970–1996 |
|--|----------|---------|---|
| | 1970 | 1996 | |
| Teacher-Pupil Ratio at the Secondary Level | | | |
| World | 0.056 | 0.060 | 0.00 |
| Advanced countries | 0.065 | 0.079 | 0.01* |
| SSA | 0.050 | 0.042 | –0.01** |
| Asia | 0.048 | 0.052 | 0.00 |
| MENA | 0.052 | 0.067 | 0.01* |
| WHD | 0.064 | 0.062 | 0.00 |
| Life Expectancy | | | |
| World | 57.731 | 66.088 | 8.36*** |
| Advanced countries | 71.081 | 77.554 | 6.47*** |
| SSA | 45.235 | 51.060 | 5.82*** |
| Asia | 51.692 | 64.050 | 12.36*** |
| MENA | 60.381 | 70.771 | 10.39*** |
| WHD | 60.782 | 70.555 | 9.77*** |
| Survival Rate | | | |
| World | 914.381 | 957.302 | 42.92*** |
| Advanced countries | 978.133 | 994.930 | 16.80*** |
| SSA | 867.636 | 911.377 | 43.74*** |
| Asia | 891.543 | 944.056 | 52.51*** |
| MENA | 907.408 | 974.109 | 66.70*** |
| WHD | 920.855 | 971.113 | 50.26*** |
| Average Schooling Years in the Total Population | | | |
| World | 3.76 | 5.28 | 1.52*** |
| Advanced countries | 6.98 | 8.68 | 1.70*** |
| SSA | 1.29 | 2.28 | 0.99*** |
| Asia | 2.57 | 4.05 | 1.49** |
| MENA | 3.51 | 5.85 | 2.34** |
| WHD | 3.68 | 5.08 | 1.40*** |

Note: SSA denotes sub-Saharan Africa; MENA constitutes Middle East, North Africa, and developing Europe; WHD indicates Western Hemisphere countries; ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Figure 9.1 Age-Earnings Profiles by Level of Education—Venezuela, 1989



Source: George Psacharopoulos, *The Profitability of Investment in Education: Concepts and Methods* (Washington, D.C.: World Bank, 1995). Reprinted with permission.

Figure 9.2 The Financial Tradeoffs in the Decision to Continue in School

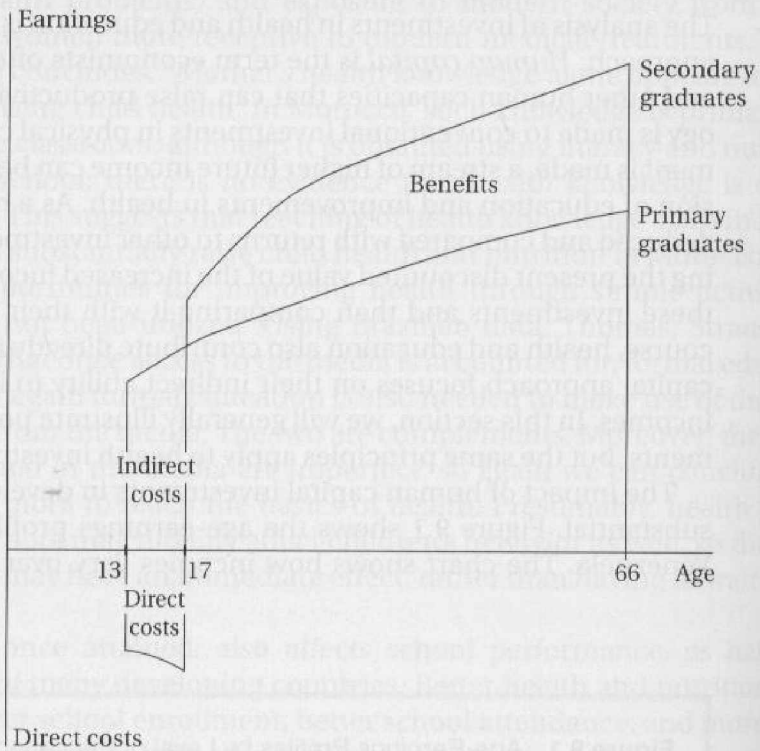


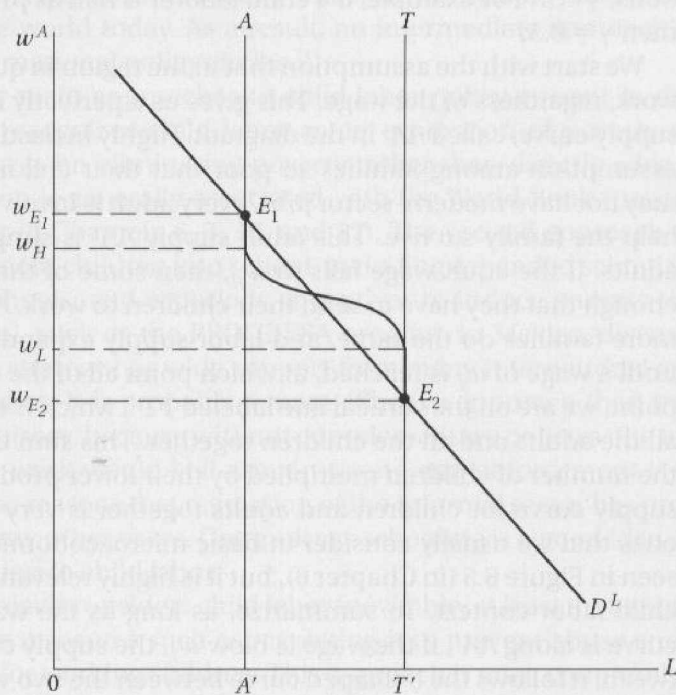
TABLE 9.3 Rates of Return to Investment in Education by Level of Education, Country, Type, and Region (percent)

| Country Type and Region | Social Rate of Return ^a | | | Private Rate of Return ^a | | |
|-------------------------|------------------------------------|-----------|--------|-------------------------------------|-----------|--------|
| | Primary | Secondary | Higher | Primary | Secondary | Higher |
| Developing | | | | | | |
| Sub-Saharan Africa | 24 | 18 | 11 | 41 | 27 | 28 |
| Asia | 20 | 13 | 12 | 39 | 19 | 20 |
| Latin America | 18 | 13 | 12 | 26 | 17 | 20 |
| Developed | 14 | 10 | 9 | 22 | 12 | 12 |

Source: George Psacharopoulos. "Returns to investment in education: A global update," *World Development* 2 (September 1993): tab. 1. Reprinted with permission.

^aHow these rates of return are calculated is explained in note 19 at the end of this chapter.

Figure 9.3 Child Labor as a Bad Equilibrium



Source: From Kaushik Basu, "Child Labor: Cause, consequence, and cure, with remarks on international labor standards," *Journal of Economic Literature* 37 (September 1999): 1083-1120. Reprinted with permission.

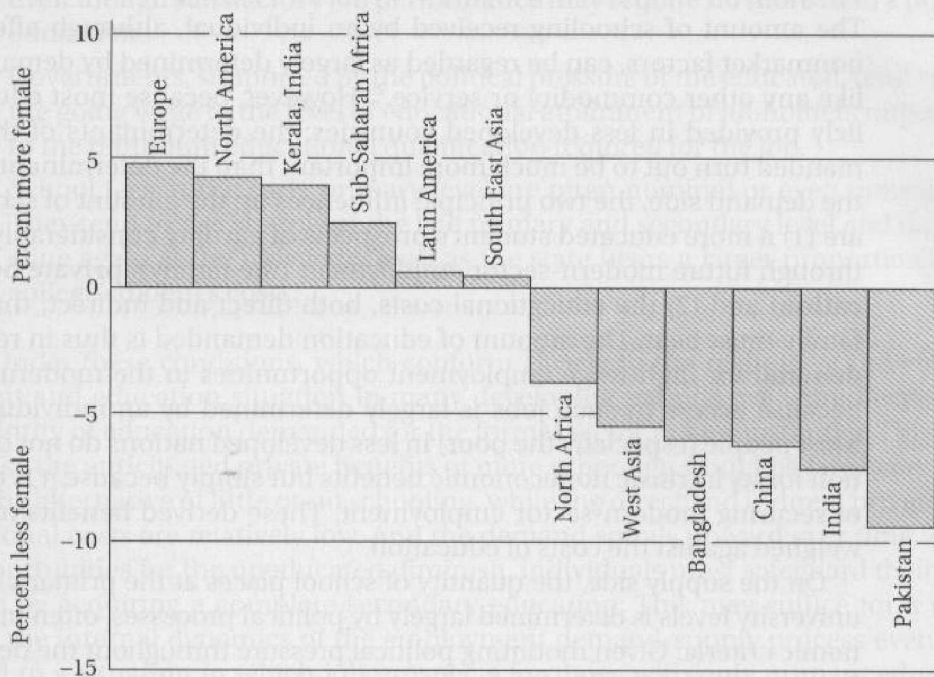
TABLE 9.4 The Educational Gender Gap: Females as a Percentage of Males

| Country | Adult Literacy | Mean Years of Schooling | Primary Enrollment | Secondary Enrollment | Postsecondary Enrollment |
|-------------|----------------|-------------------------|--------------------|----------------------|--------------------------|
| Afghanistan | 32 | 14 | 52 | 50 | 24 |
| Algeria | 66 | 18 | 89 | 79 | 44 |
| Bangladesh | 47 | 29 | 86 | 46 | 19 |
| Egypt | 54 | 41 | 79 | 82 | 52 |
| India | 55 | 34 | 97 | 57 | 45 |
| Mexico | 94 | 96 | 97 | 100 | 76 |
| Morocco | 62 | 37 | 68 | 70 | 58 |
| Nigeria | 65 | 28 | 93 | 74 | 37 |
| South Korea | 95 | 61 | 100 | 96 | 49 |
| Sudan | 28 | 45 | 71 | 87 | 70 |
| All LDCs | 71 | 55 | 91 | 72 | 51 |

Source: United Nations Development Program, *Human Development Report, 1994* (New York: Oxford University Press, 1994), tab. 9. Reprinted with permission.

Note: All figures are expressed in relation to the male average, which is indexed to equal 100. The smaller the figure, the bigger the gap.

Figure 9.4 Female-Male Ratios in Total Population in Selected Communities



Source: Amartya Sen, *Development as Freedom* (New York: Alfred Knopf, 1999), p. 104. Reprinted with permission.

Figure 9.5 Private versus Social Benefits and Costs of Education: An Illustration

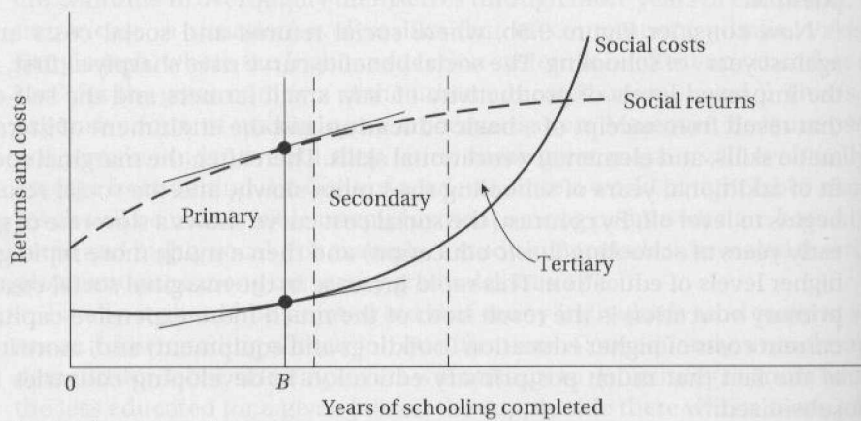
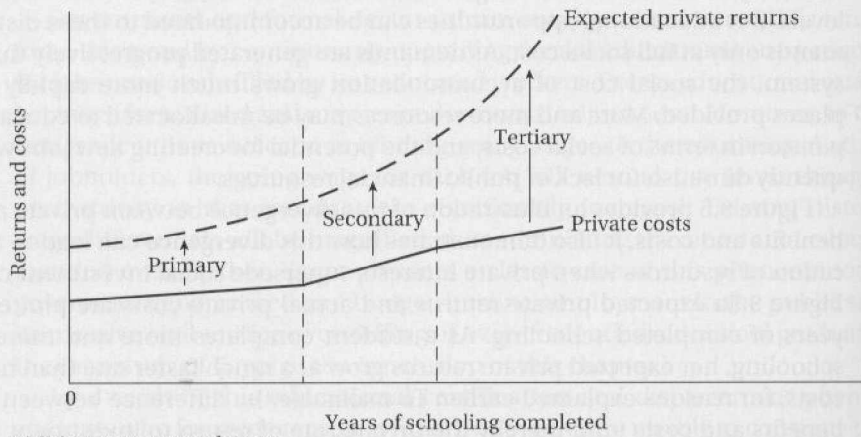
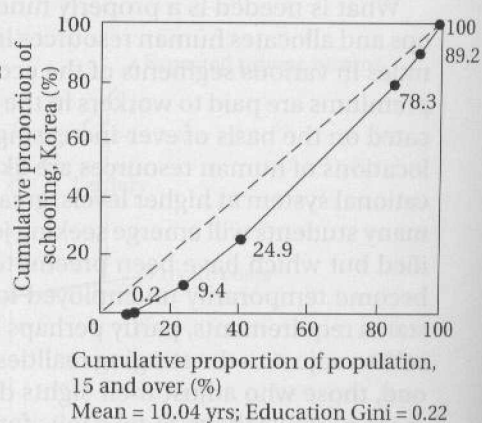
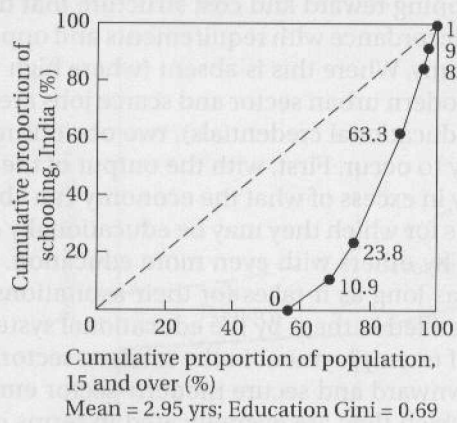
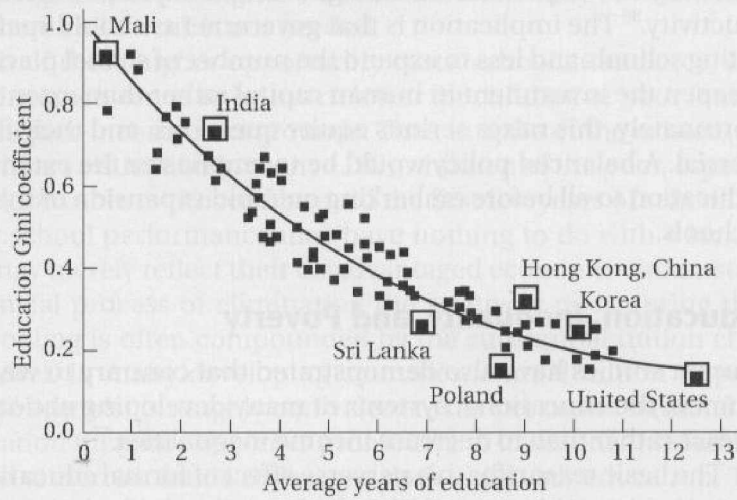


Figure 9.6 Education Lorenz Curves for India and Korea, 1990



Source: World Bank, *The Quality of Growth* (New York: Oxford University Press, 2000). Reprinted with permission.

Figure 9.7 Education Gini Coefficients for 85 Countries, 1990



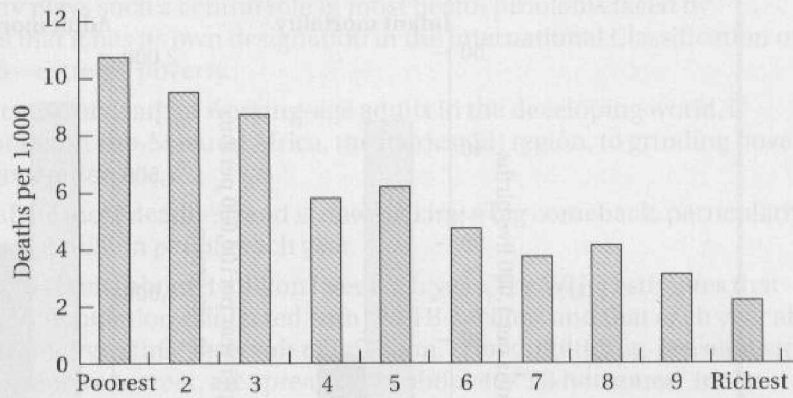
Source: World Bank, *The Quality of Growth* (New York: Oxford University Press, 2000). Reprinted with permission.

TABLE 9.5 Share of Public Resources for Education Appropriated by Different Socioeconomic Groups, by Region

| Region | Percentage in the Population | | | Percentage of Public School Resources | | | Ratio between Percentage of Resources and of Population | | |
|---|------------------------------|----------------------------|----------------------|---------------------------------------|----------------------------|----------------------|---|----------------------------|----------------------|
| | Farmers | Manual Workers and Traders | White-Collar Workers | Farmers | Manual Workers and Traders | White-Collar Workers | Farmers | Manual Workers and Traders | White-Collar Workers |
| Africa | | | | | | | | | |
| Anglophone | 76 | 18 | 6 | 56 | 21 | 23 | 0.73 | 1.19 | 3.78 |
| Francophone | 76 | 18 | 6 | 44 | 21 | 36 | 0.58 | 1.15 | 5.93 |
| Asia | 58 | 32 | 10 | 34 | 38 | 28 | 0.59 | 1.19 | 2.79 |
| Latin America | 36 | 49 | 15 | 18 | 51 | 31 | 0.49 | 1.04 | 2.03 |
| Middle East and North Africa | 42 | 48 | 10 | 25 | 46 | 29 | 0.60 | 0.35 | 2.87 |
| Members of the Organization for Economic Cooperation and Development (OECD) | 12 | 53 | 35 | 11 | 46 | 42 | 0.95 | 0.87 | 1.2 |

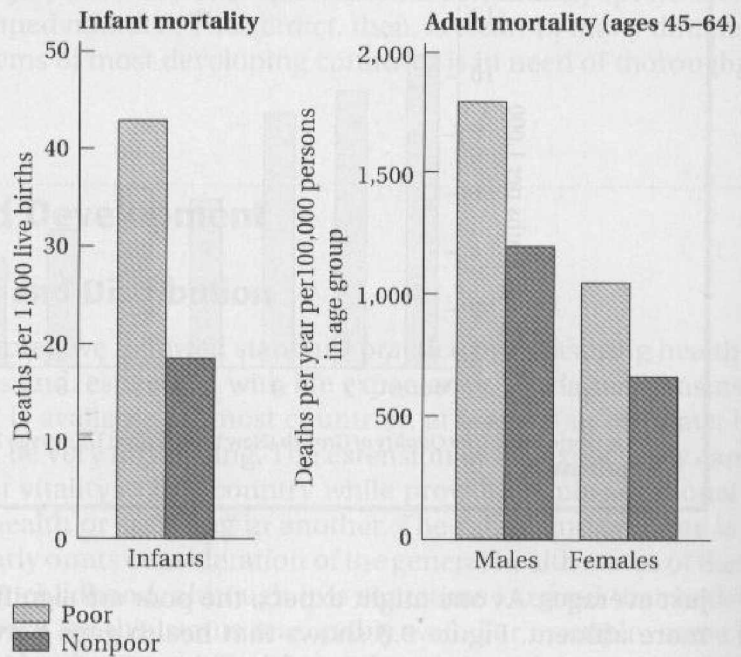
Source: Emmanuel Jimenez, "The public subsidization of education and health in developing countries: A review of equity and efficiency," *World Bank Research Observer* 1 (January 1986): tab. 3. Reprinted with permission.

Figure 9.8 Mortality of Children Two Years Old and Younger by Wealth, Brazil, 1996



Source: World Bank, *The Quality of Growth* (New York: Oxford University Press, 2000), p. 61. Reprinted with permission.

Figure 9.9 Infant and Adult Mortality in Poor and Nonpoor Neighborhoods of Porto Alegre, Brazil, 1980



Source: World Bank, *World Development Report 1993* (New York: Oxford University Press, 1993), fig. 3. Reprinted with permission.

TABLE 9.6 Health Challenges Faced by Developing Countries

- Absolute poverty.* Poverty plays such a central role in most health problems faced by developing countries that it has its own designation in the International Classification of Diseases: Code Z59.5—extreme poverty.
- AIDS.* Now the leading cause of death of working-age adults in the developing world, if unchecked it may condemn sub-Saharan Africa, the hardest hit region, to grinding poverty for at least another generation.
- Malaria.* Once in retreat, its most deadly strand is now making a big comeback, particularly in Africa; it still kills about 2 million people each year.
- Tuberculosis.* TB currently claims about 3 million lives each year. The WHO estimates that one-third of the world's population is infected with the TB bacillus, and that each year about 8 million new cases result from this "reservoir of infection." New, multidrug-resistant strains of TB, difficult and expensive to treat, are spreading in about 40 "TB hot zones" in the developing world.
- Hepatitis B.* Hepatitis B may now kill over 1 million people each year.
- Ascariasis.* *Ascaris* roundworm parasites cause clinical symptoms in as many as 21.4 million people at any one time, most commonly infecting children aged 3 to 8 years, who often become infected by putting their hands to their mouths after playing in contaminated soil, or by eating uncooked food grown in contaminated soil or irrigated with unsanitary water. The worst infections cause about 60,000 deaths per year, the overwhelming majority of them children.
- Cholera.* Once largely in retreat, cholera has been on the upsurge in recent years in many countries in Africa, Asia, and Latin America, as it has spread rapidly in this, its seventh pandemic. Untreated dehydration from severe diarrhea causes death.
- Dengue.* While many serious diseases have been in retreat, dengue and dengue hemorrhagic fever are now spreading rapidly, with millions of cases each year, and thousands of deaths; about a half million cases require hospital treatment.
- Leprosy.* There are still about 600,000 new cases of leprosy each year. Between 2 and 3 million people have been disabled by leprosy, including those who have been cured but crippled prior to treatment, in India and many other developing countries.
- Dracunculiasis* (guinea-worm disease). A debilitating illness infecting about 3 million people, largely among the poorest of the poor, who lack access to even minimally safe water.
- Chagas.* A disease afflicting an estimated 17 million people in Latin America, and causing about 45,000 deaths annually.
- Leishmaniasis.* A group of parasitic diseases infecting about 13 million people. Visceral leishmaniasis, also known as kala-azar, is the most severe form. Almost always fatal if untreated, it causes an estimated 80,000 deaths per year.
- Lymphatic filariasis* (elephantiasis). A disfiguring parasitic disease that still affects around 100 million people in the developing world.
- Many other parasites* are active, including *Trichuris*, now found in about 133 million people, and hookworm, which infects an estimated 96 million people.

Source: Authors' compilations from WHO data.

TABLE 9.7 Regional HIV/AIDS Statistics and Features, End of 2000

| Region | Epidemic Started | Adults and Children Living with HIV/AIDS | Adults and Children Newly Infected with HIV | Adult Prevalence Rate* | % of HIV-Positive Adults Who Are Women | Main mode(s) of Transmission for Adults Living with the HIV/AIDS [#] |
|---------------------------------|----------------------|--|---|------------------------|--|---|
| Sub-Saharan Africa | Late '70s–Early '80s | 25.3 million | 3.8 million | 8.8% | 55% | Hetero |
| North Africa and Middle East | Late '80s | 400,000 | 80,000 | 0.2% | 40% | Hetero, IDU |
| South and South-East Asia | Late '80s | 5.8 million | 780,000 | 0.56% | 35% | Hetero, IDU |
| East Asia and Pacific | Late '80s | 640,000 | 130,000 | 0.07% | 13% | IDU, hetero, MSM |
| Latin America | Late '70s–Early '80s | 1.4 million | 150,000 | 0.5% | 25% | MSM, IDU, hetero |
| Caribbean | Late '70s–Early '80s | 390,000 | 60,000 | 2.3% | 35% | Hetero, MSM |
| Eastern Europe and Central Asia | early '90s | 700,000 | 250,000 | 0.35% | 25% | IDU |
| Western Europe | Late '70s–Early '80s | 540,000 | 30,000 | 0.24% | 25% | MSM, IDU |
| North America | Late '70s–Early '80s | 920,000 | 45,000 | 0.6% | 20% | MSM, IDU, hetero |
| Australia and New Zealand | Late '70s–Early '80s | 15,000 | 500 | 0.13% | 10% | MSM |
| Total | | 36.1 million | 5.3 million | 1.1% | 47% | |

Source: UNAIDS, accessed at: http://www.unaids.org/wac/2000/wad00/files...demic_report/css/WAD_epidemic_report_5.htm. Reprinted with permission.

*The proportion of adults (15 to 49 years of age) living with HIV/AIDS in 2000, using 2000 population numbers.

[#]Hetero (heterosexual transmission), IDU (transmission through injecting drug use), MSM (sexual transmission among men who have sex with men).

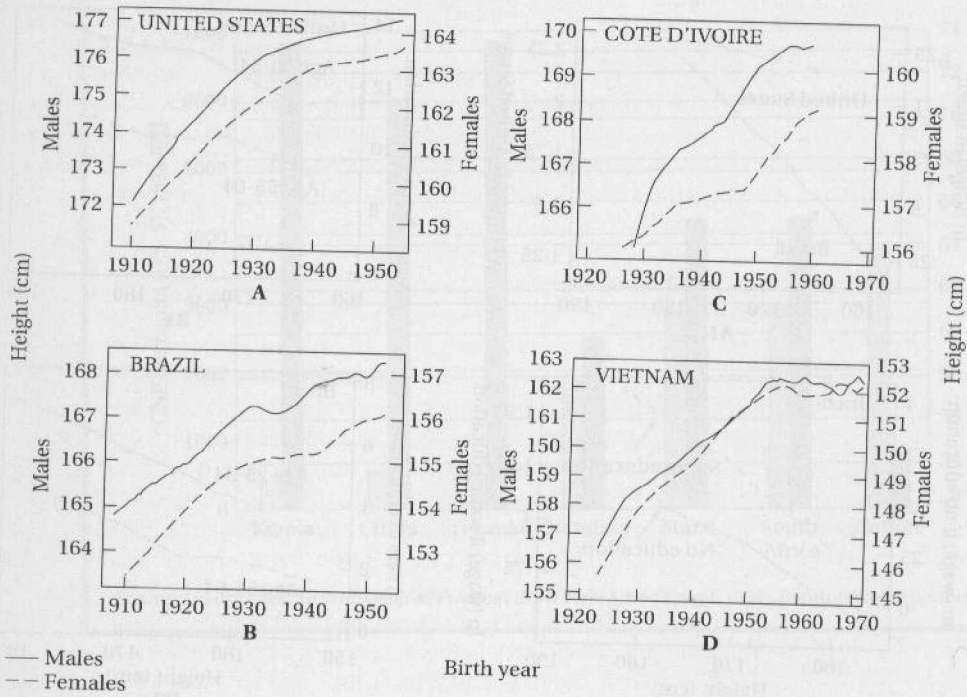
TABLE 9.8 Percentage of Adult Population Infected with HIV or Suffering from AIDS, Selected Developing Countries, 2000

| | | | |
|---------------------|-----------------------------|-----------------|-----------------|
| Botswana: 35.80 | Kenya: 13.95 | Haiti: 5.70 | Mexico: 0.29 |
| Zimbabwe: 25.06 | Central African Rep.: 13.84 | Congo: 5.07 | Vietnam: 0.24 |
| Zambia: 19.95 | Mozambique: 13.22 | Thailand: 2.20 | China: 0.07 |
| South Africa: 19.94 | Rwanda: 11.21 | India: 0.70 | Indonesia: 0.05 |
| Namibia: 19.54 | Cote d'Ivoire: 10.76 | Argentina: 0.69 | |
| Malawi: 15.96 | Uganda: 8.30 | Brazil: 0.57 | |

Source: Authors' compilations of WHO data and the UNAIDS website, accessed September 2001: http://www.unaids.org/hivaidinfo/statistics/june00/fact_sheets/index.html.

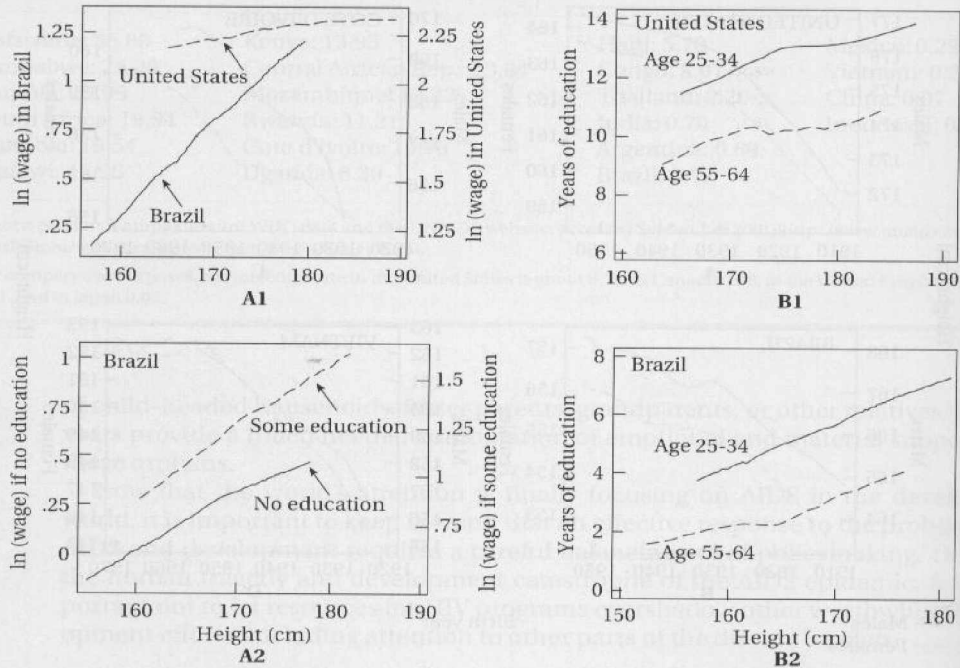
For comparative purposes, the infection rate in the United States is about 0.76, in Canada, 0.30, in the United Kingdom 0.11, and in Japan 0.02.

Figure 9.10 Adult Stature by Birth Cohort



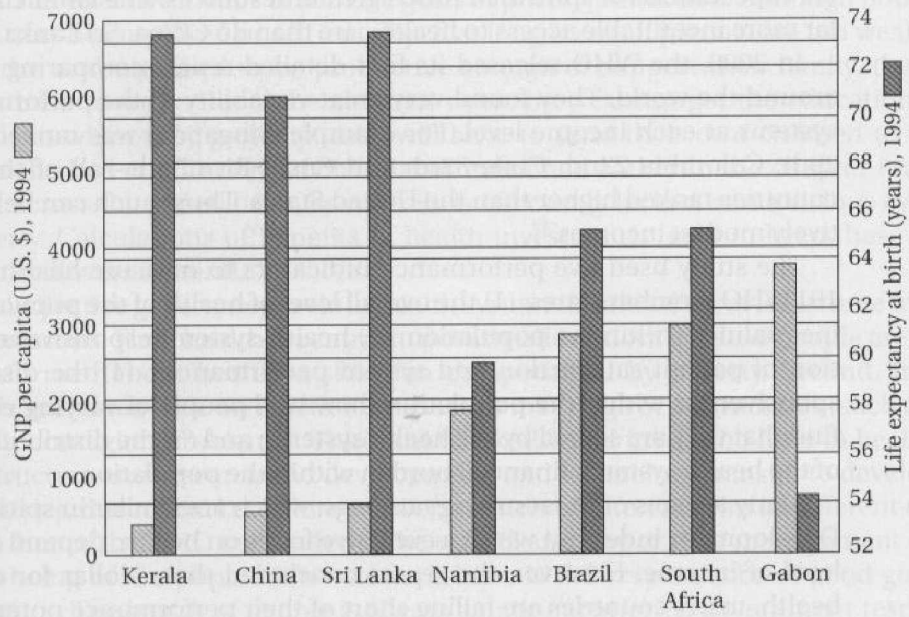
Source: John Strauss and Duncan Thomas, "Health, nutrition, and economic development," *Journal of Economic Literature* 36 (1998): 766-817; see also Strauss and Thomas, "Health and wages: Evidence on men and women in urban Brazil," *Journal of Econometrics* 77 (1997): 159-85. Reprinted with permission.

Figure 9.11 Wages, Education, and Height of Males in Brazil and the United States



Source: John Strauss and Duncan Thomas, "Health, nutrition, and economic development," *Journal of Economic Literature* 36 (1998): 766-817; see also Strauss and Thomas, "Health and wages: Evidence on men and women in urban Brazil," *Journal of Econometrics* 77 (1997): 159-85. Reprinted with permission.

Figure 9.12 GNP per Capita (U.S. Dollars) and Life Expectancy at Birth, 1994



Source: Amartya Sen, *Development as Freedom* (New York: Alfred Knopf, 1999). Reprinted with permission.