

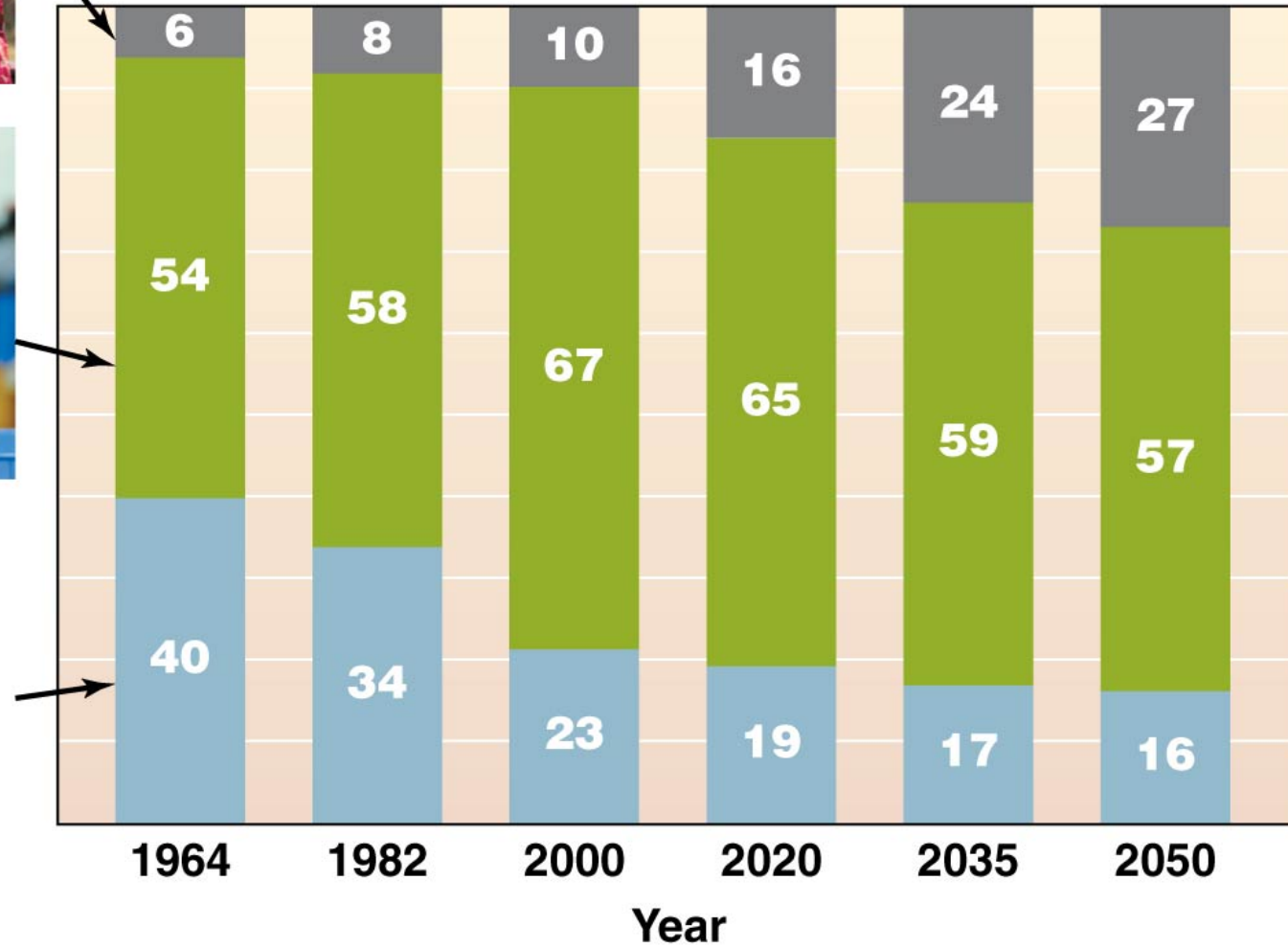
SMC Geog 7/Env Studies 7

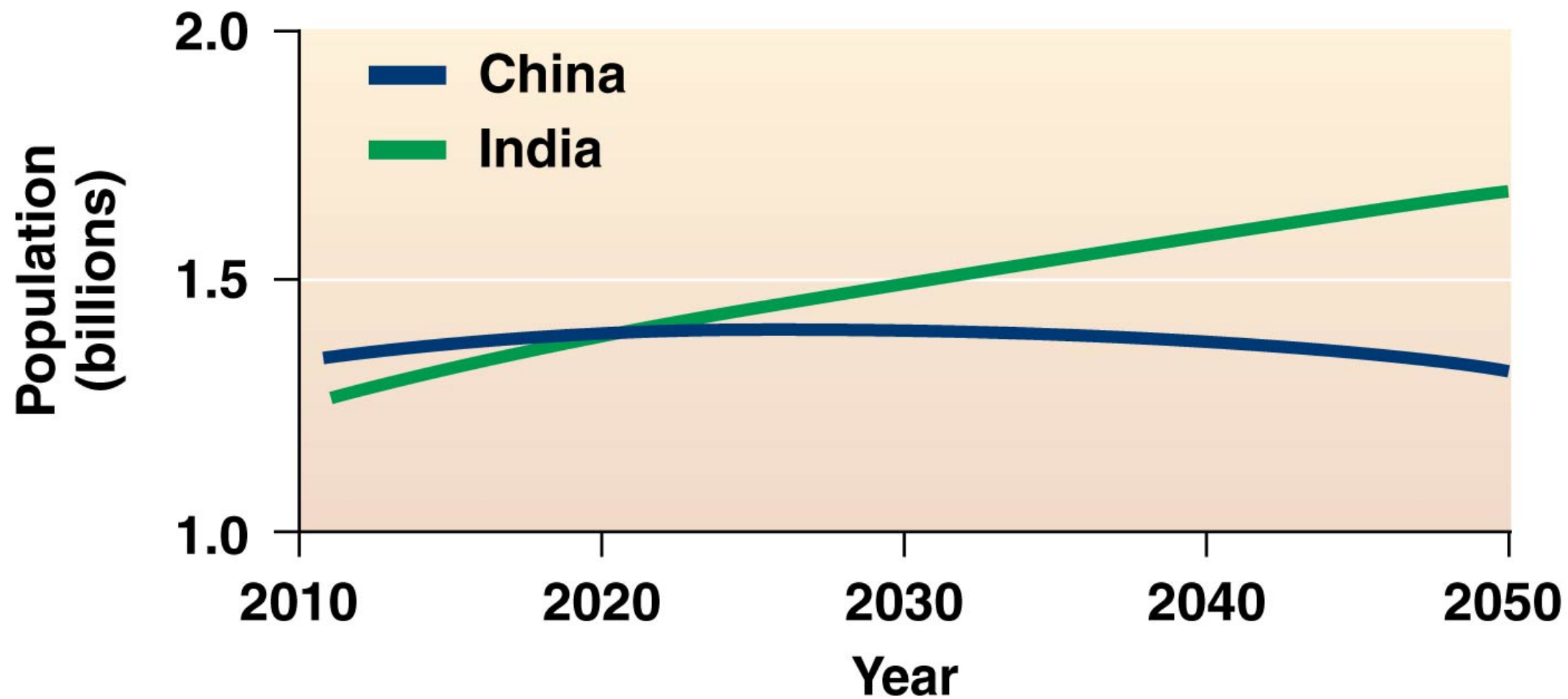
Lecture on human population

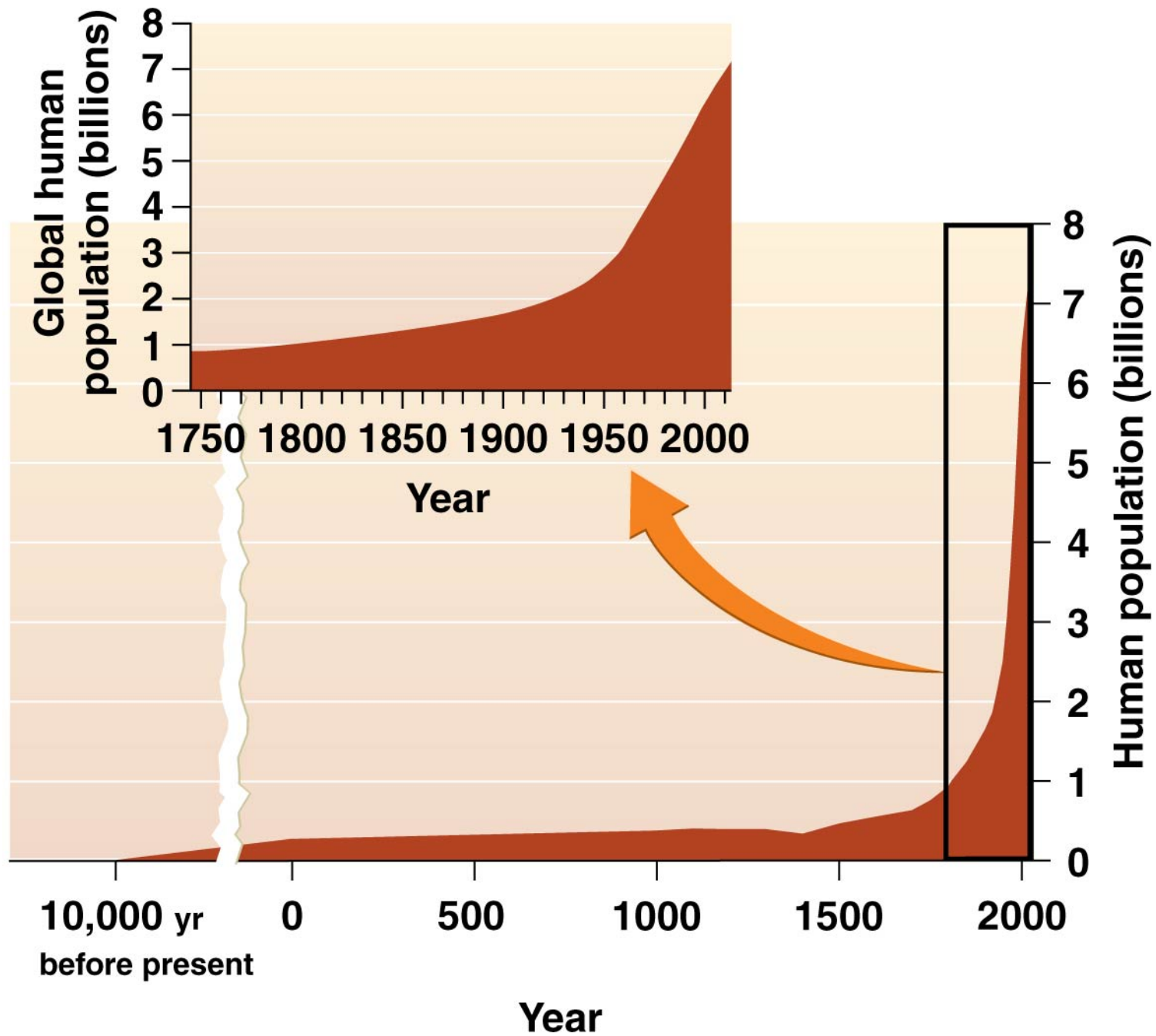
- Malthus and his critics
- Demography
- Demographic transition
- Fertility-decision making and women's rights
- Trends and change in human population growth
- Can we live with 10 billion people?

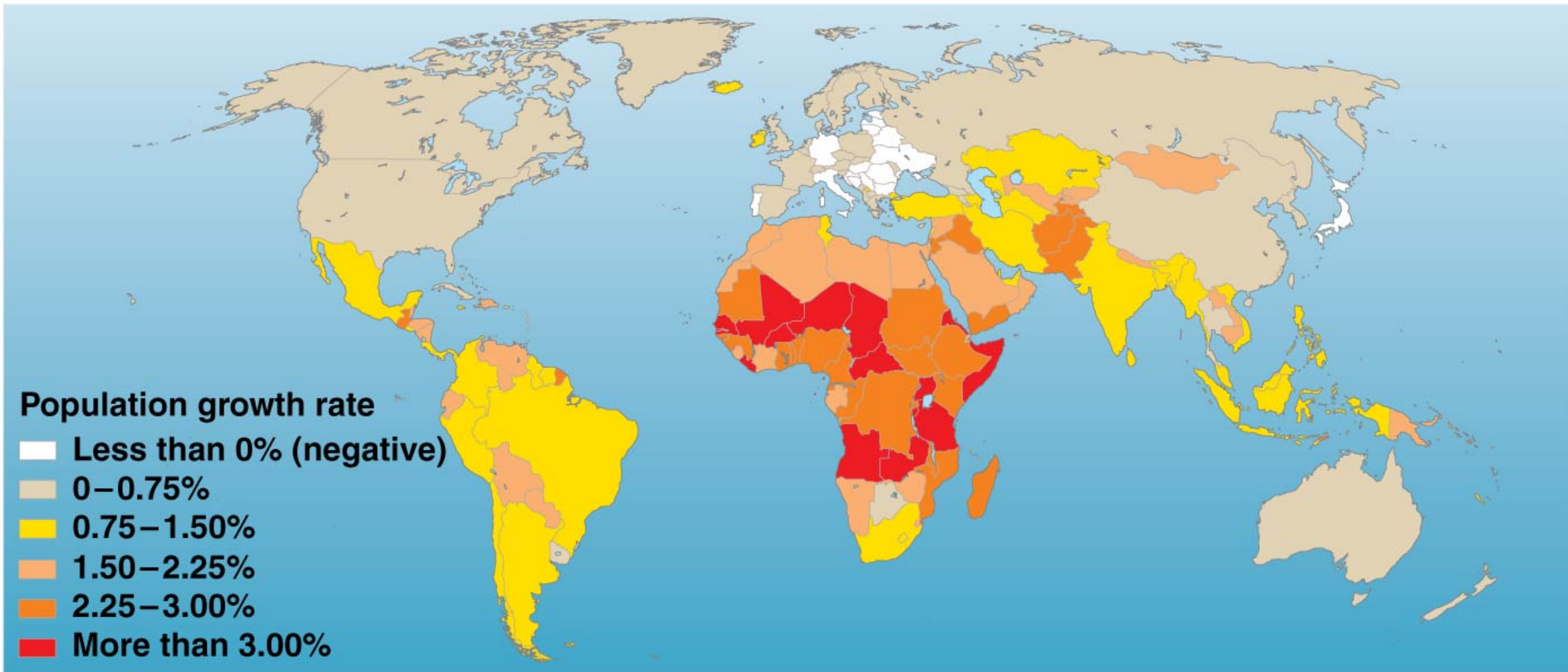


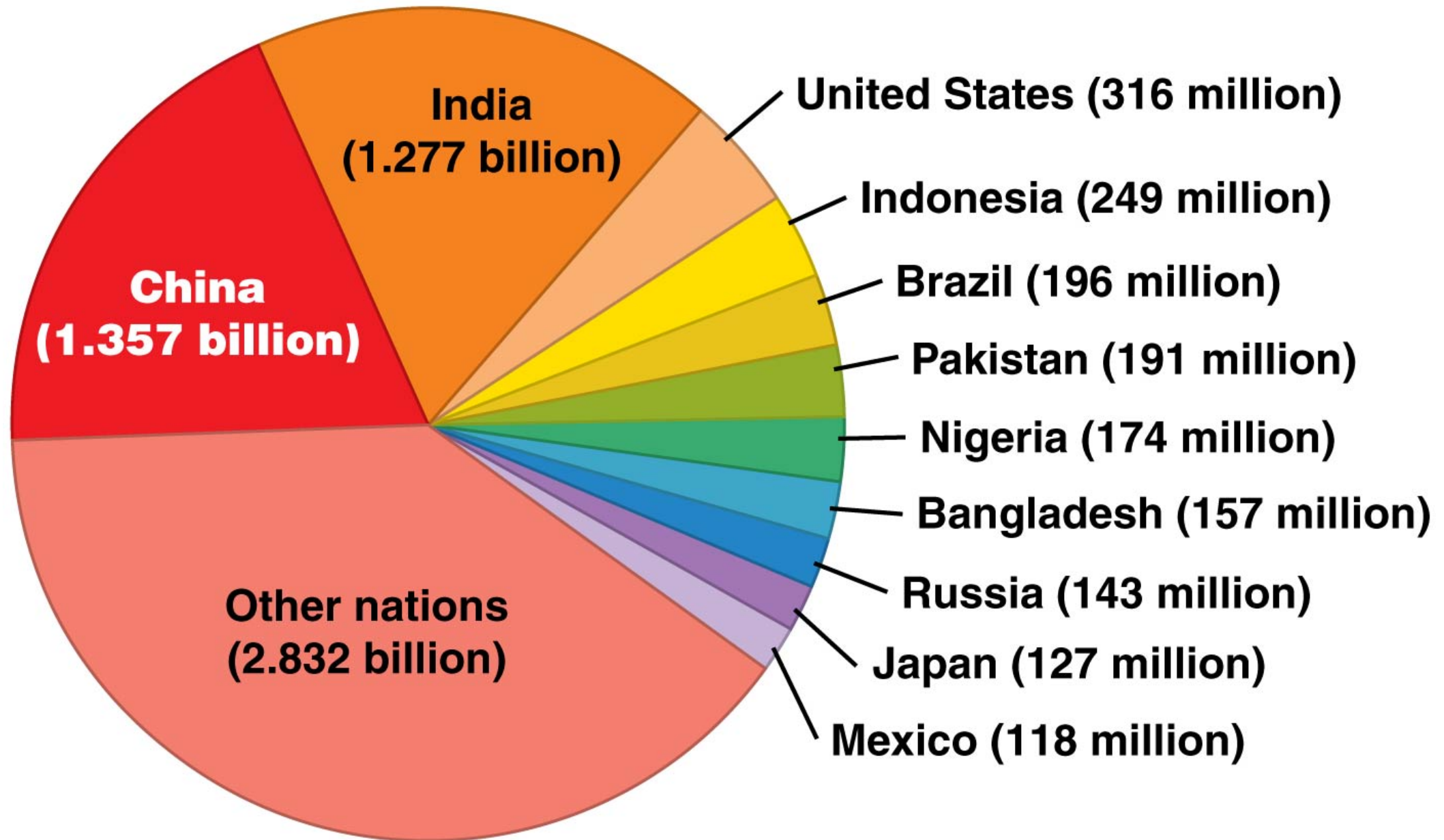
Age 60+
Age 15–59
Age 0–14

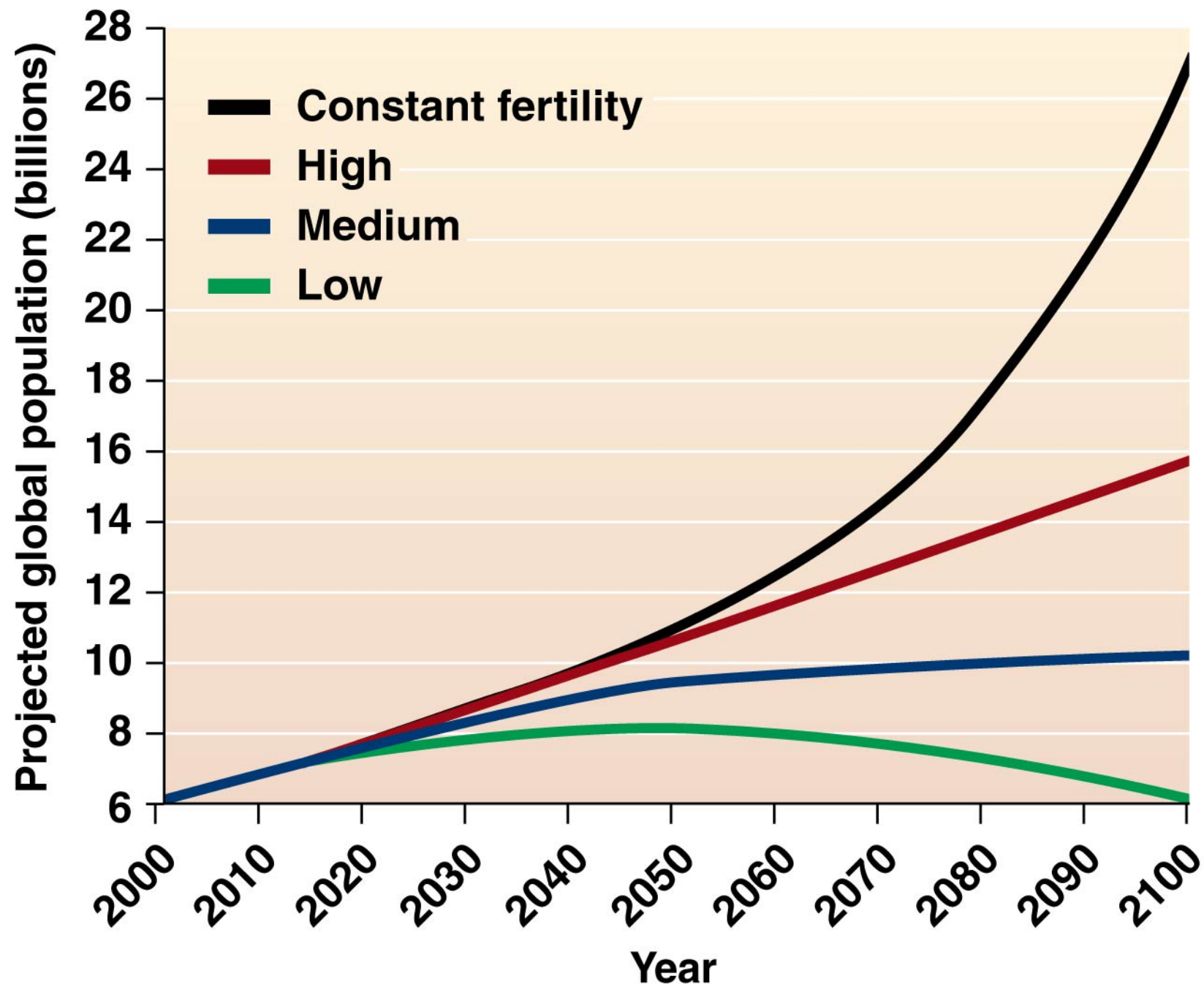


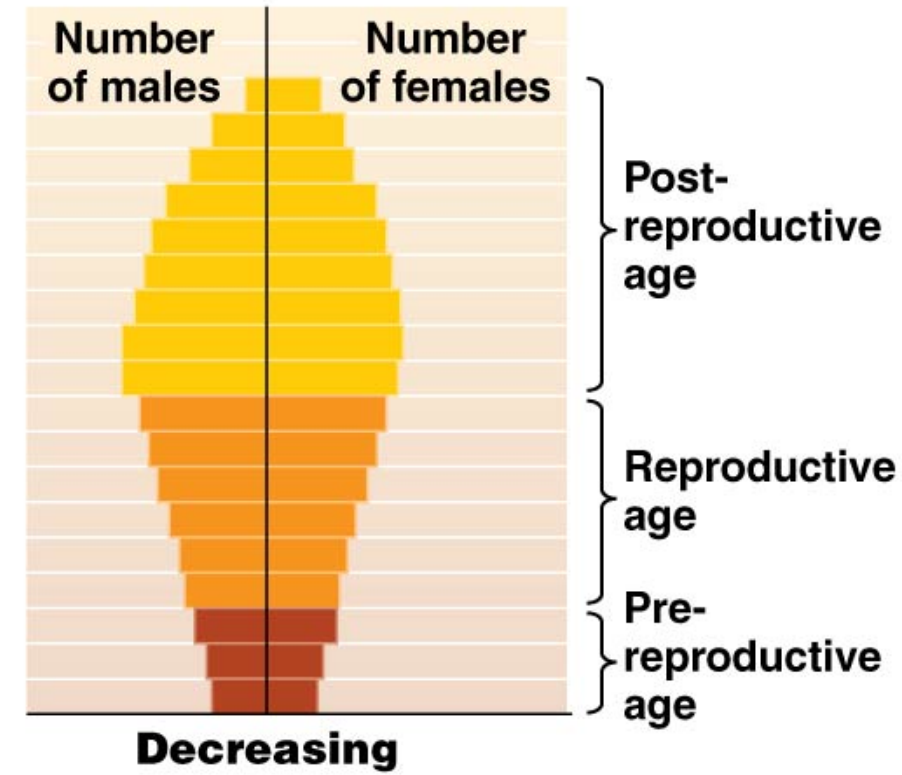
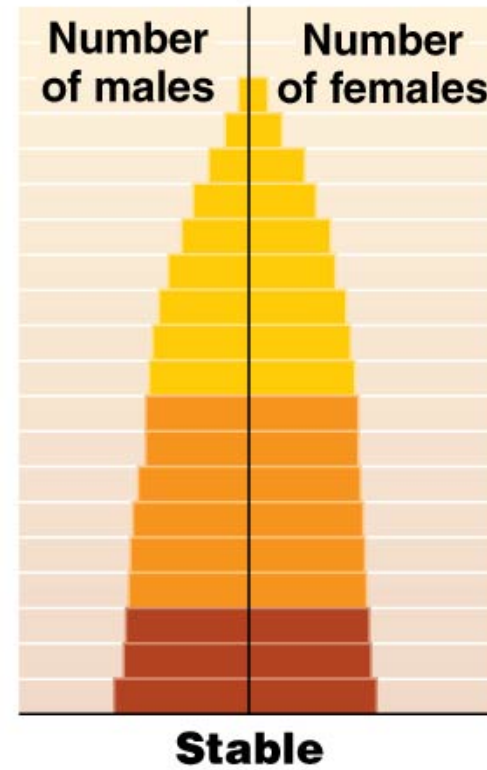
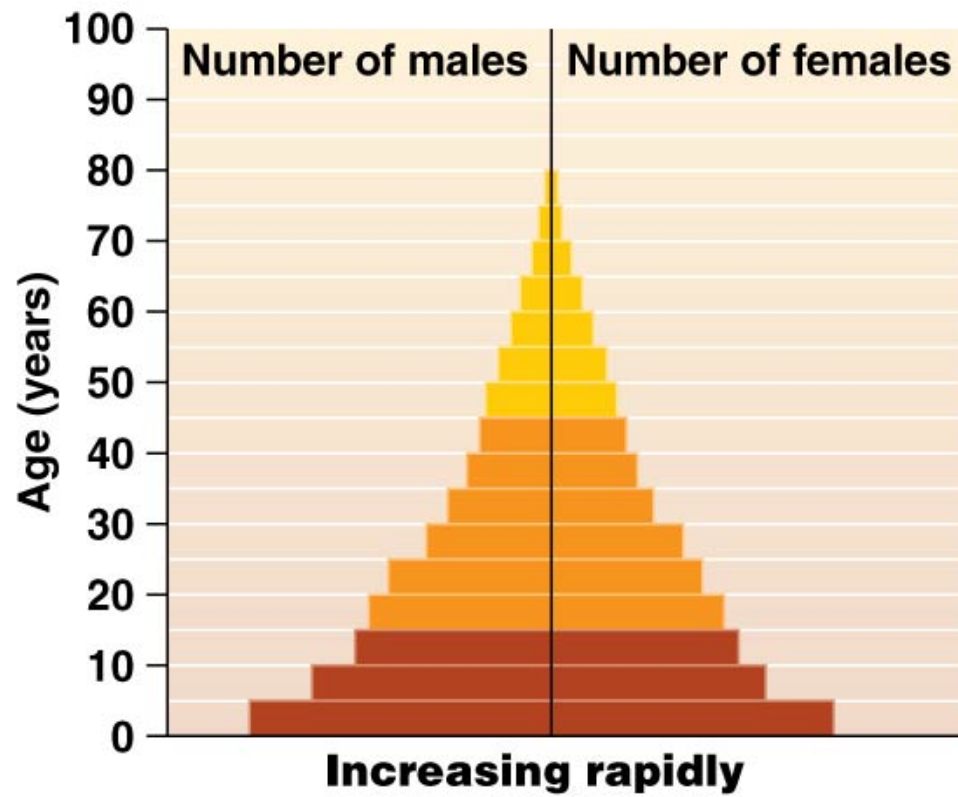


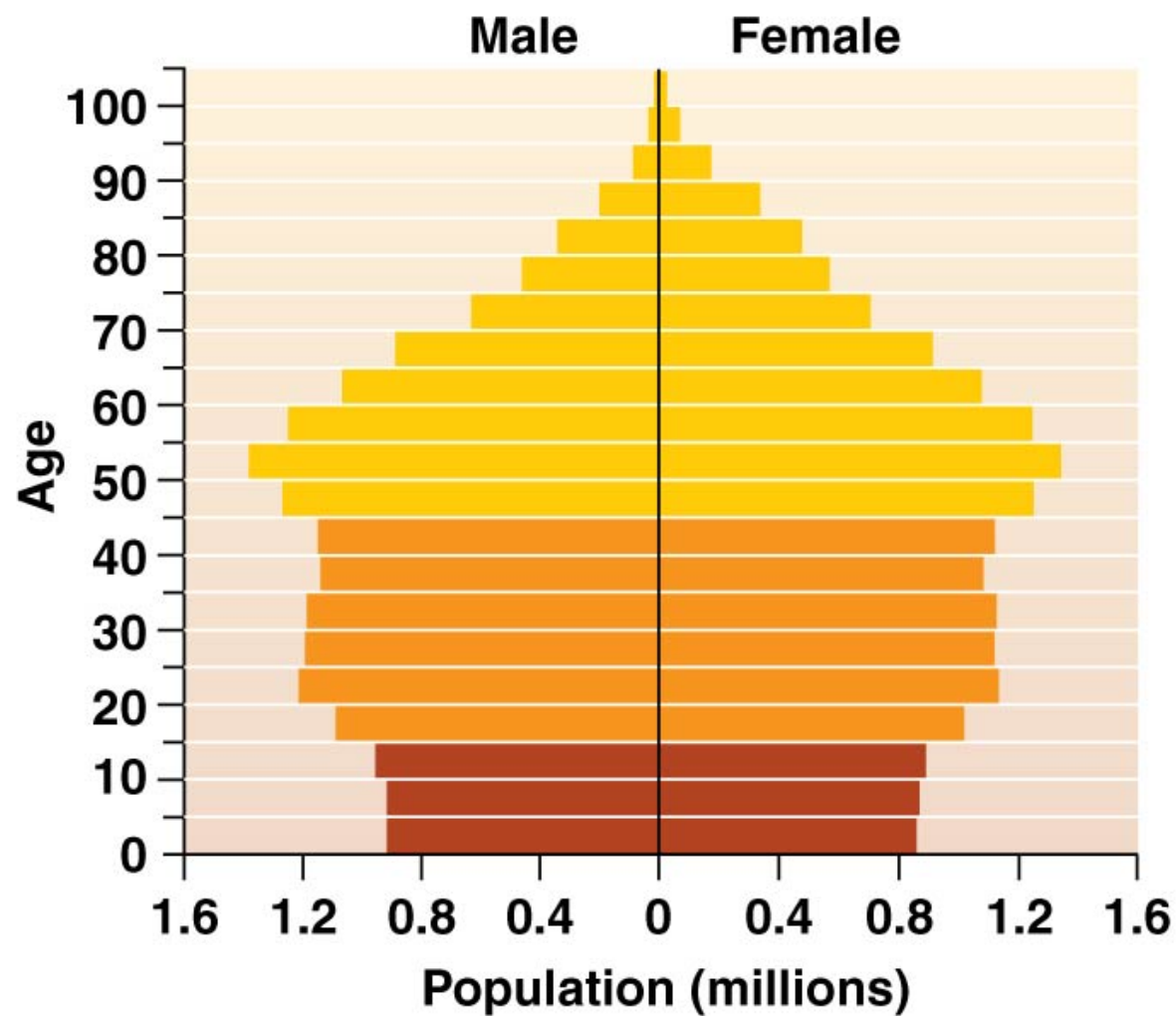






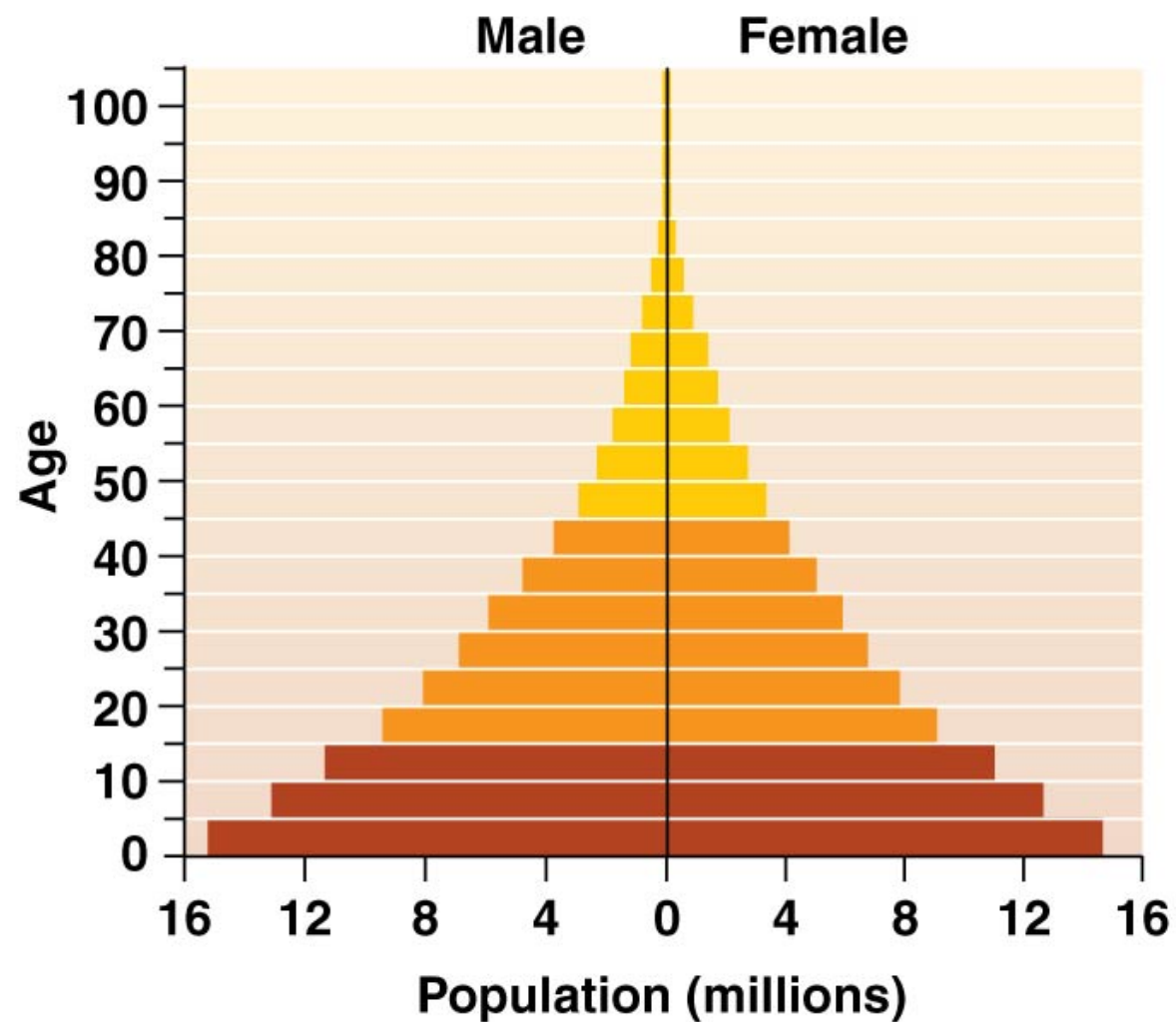






(a) Age structure diagram of Canada

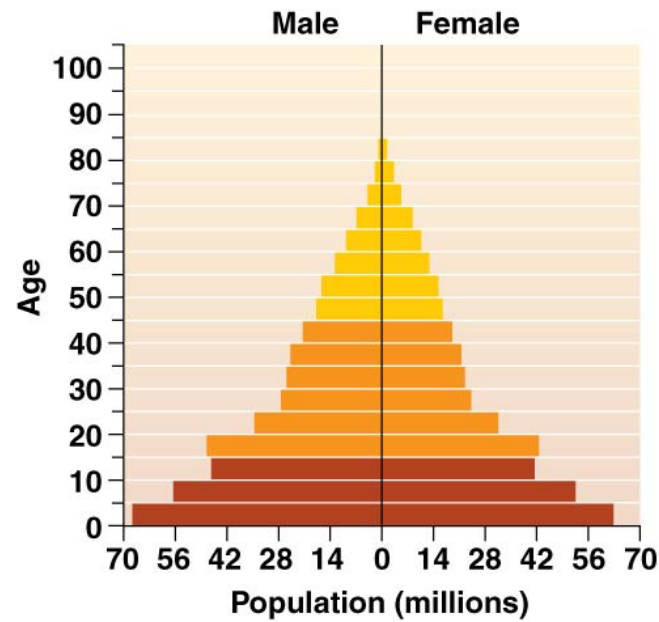
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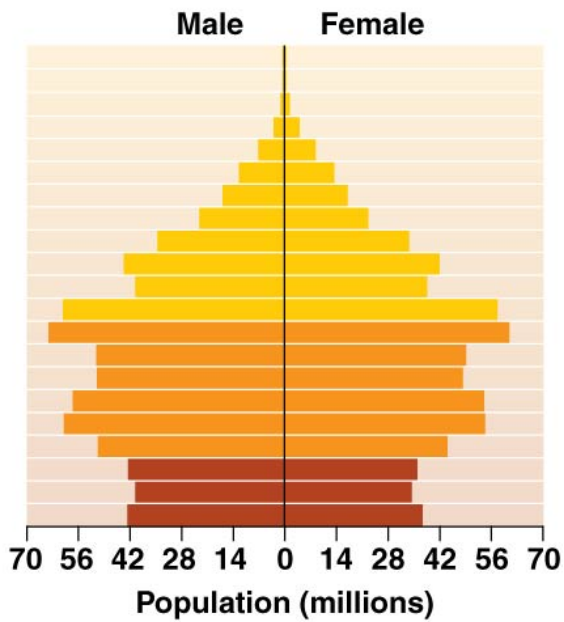
(b) Age structure diagram of Nigeria



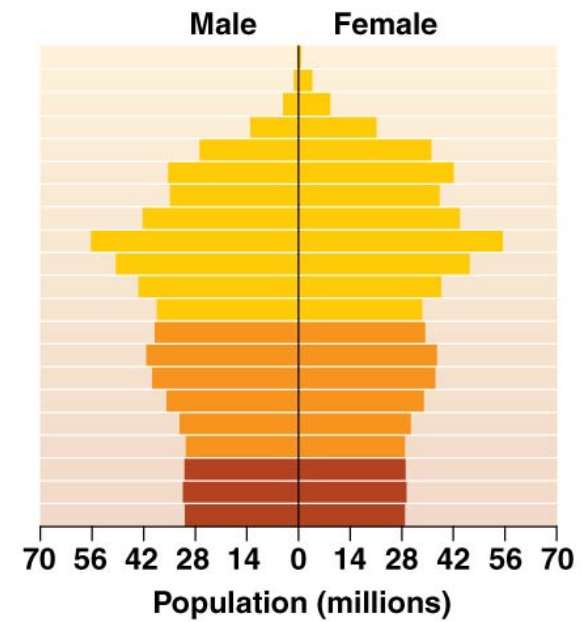
(a) Billboard promoting China's "one child" policy



(b) China in 1970

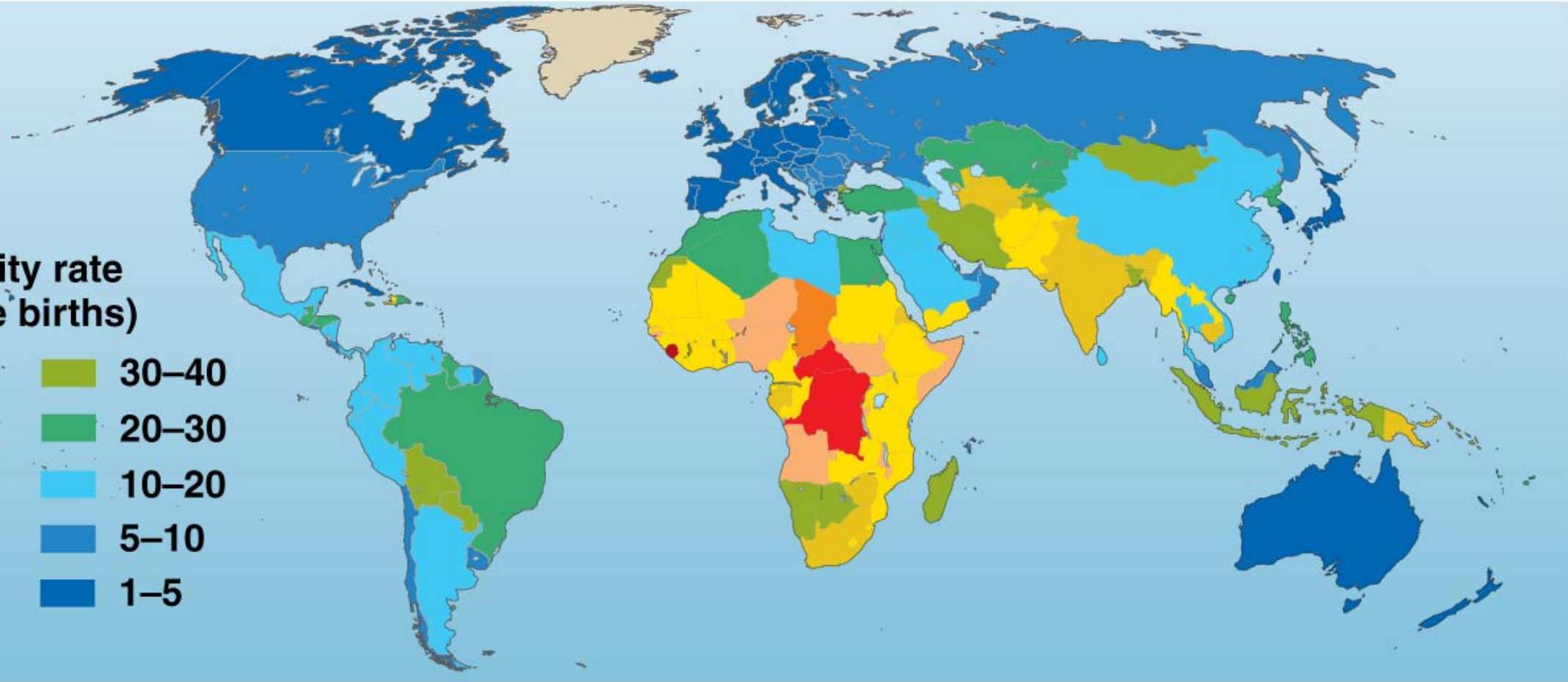


(c) China in 2013



(d) China in 2050 (projected)

**Infant mortality rate
(per 1000 live births)**



- World
- Least developed countries
- More developed regions
- Global population
- Less developed regions

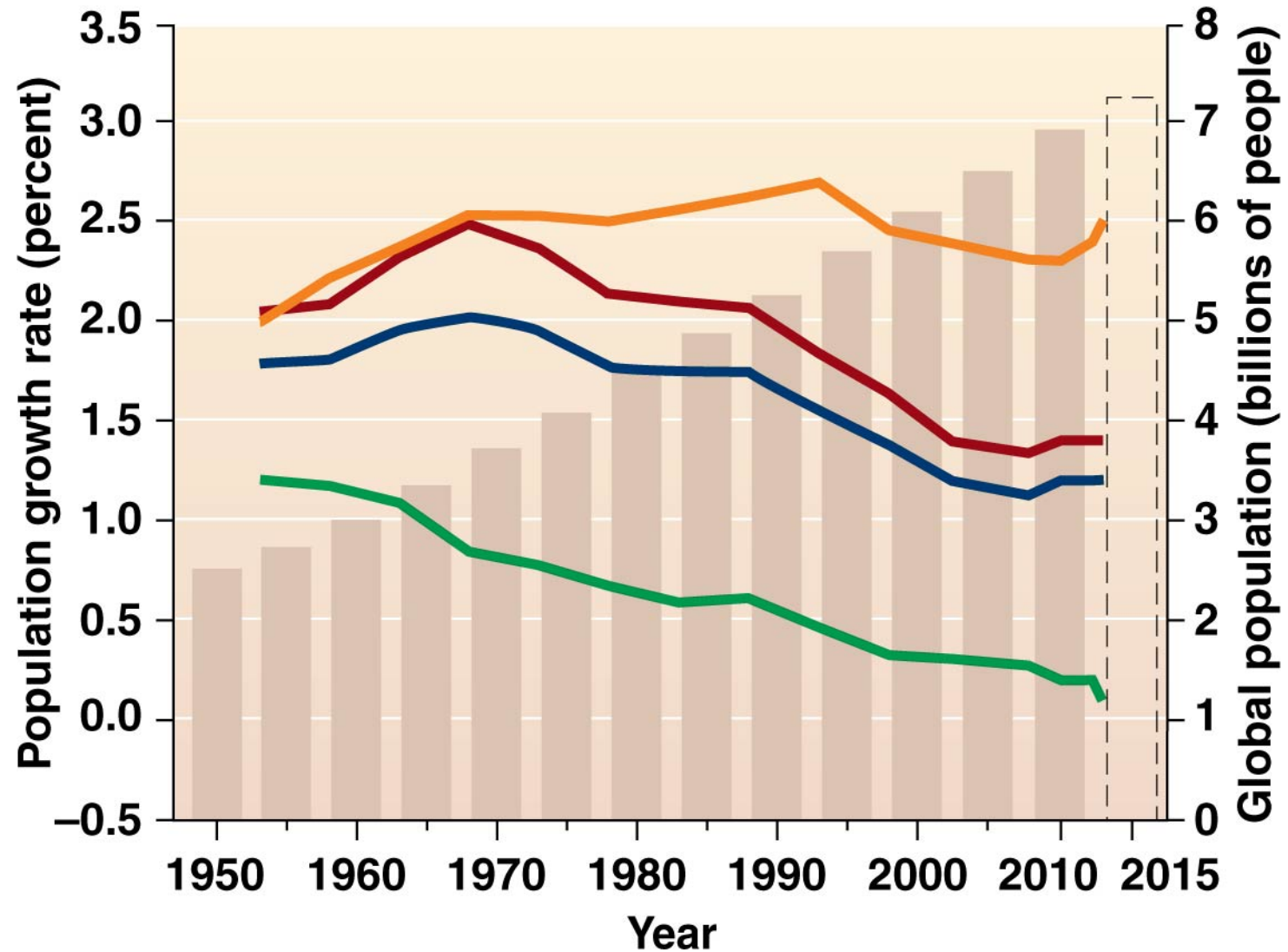
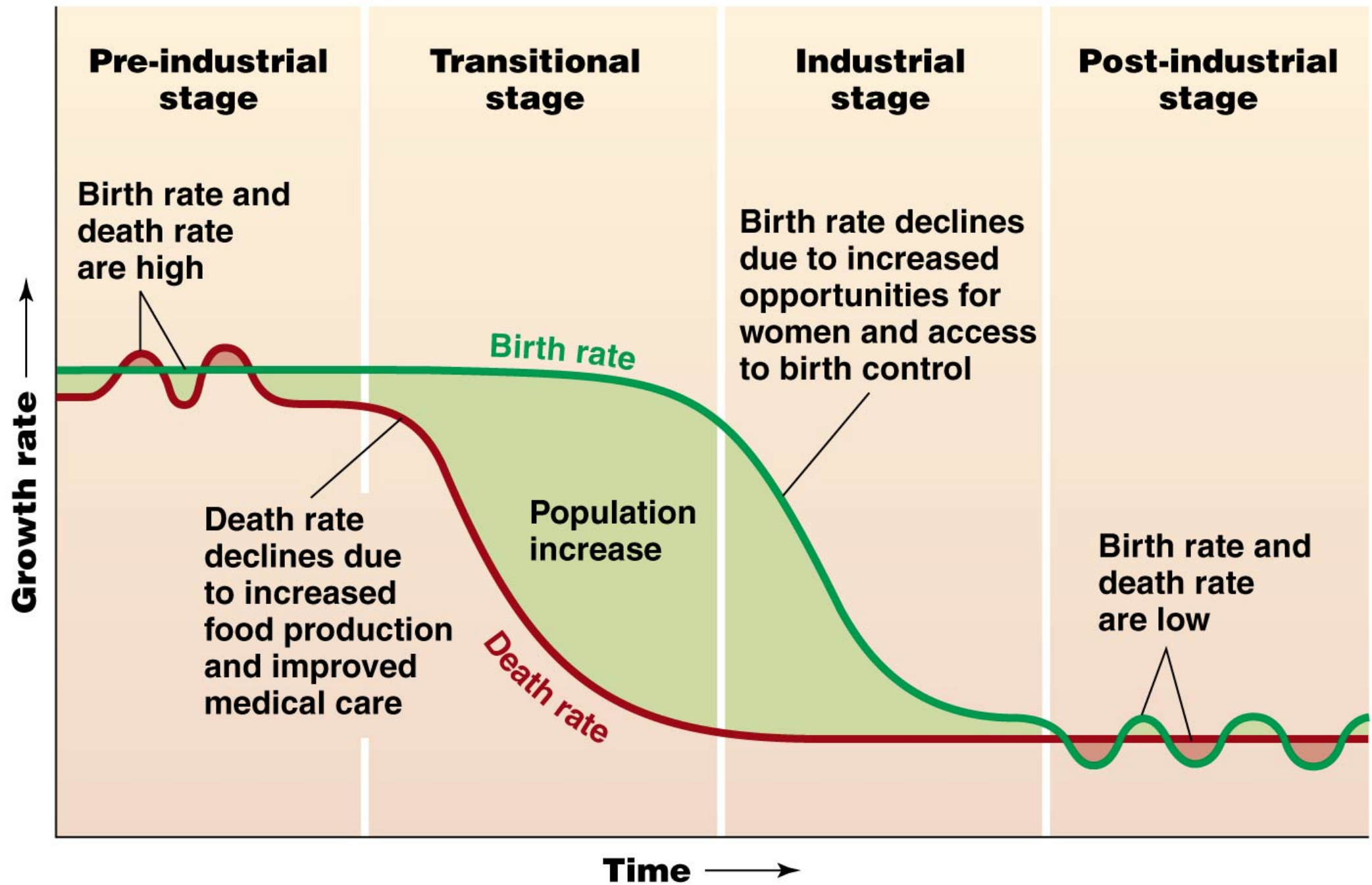
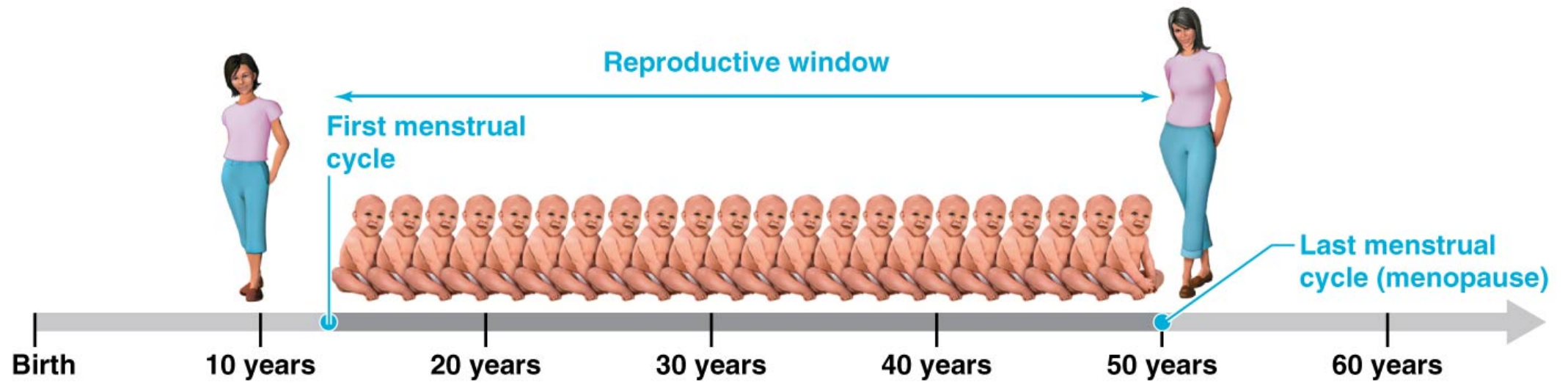


TABLE 6.1 Total Fertility Rates for Major Regions

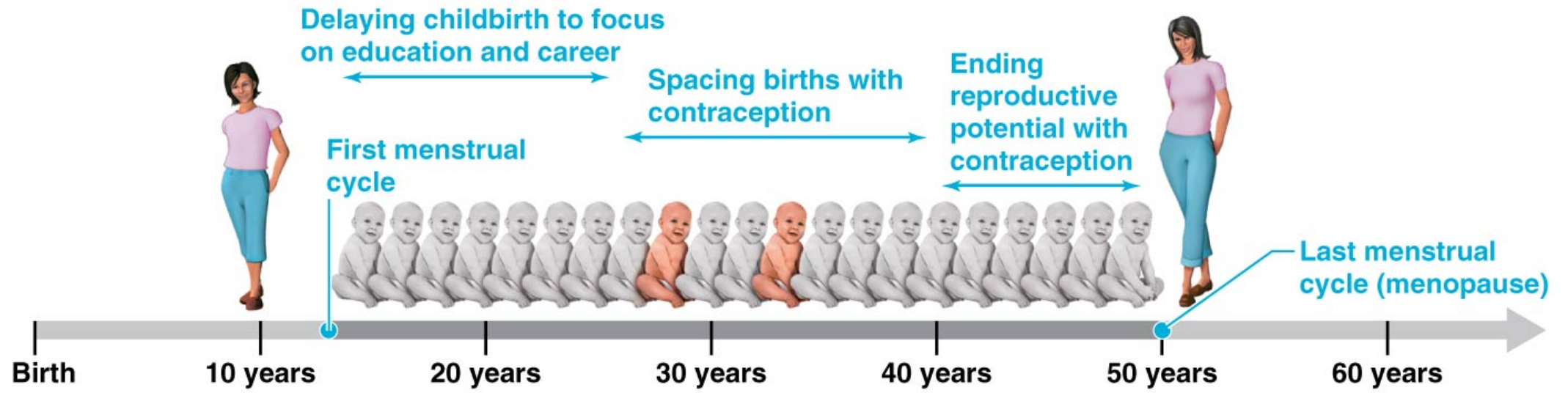
REGION	TOTAL FERTILITY RATE (TFR)
Africa	4.8
Australia and the South Pacific	2.4
Latin America and the Caribbean	2.2
Asia	2.2
North America	1.9
Europe	1.6

Data from Population Reference Bureau, 2013. 2013 World population data sheet.



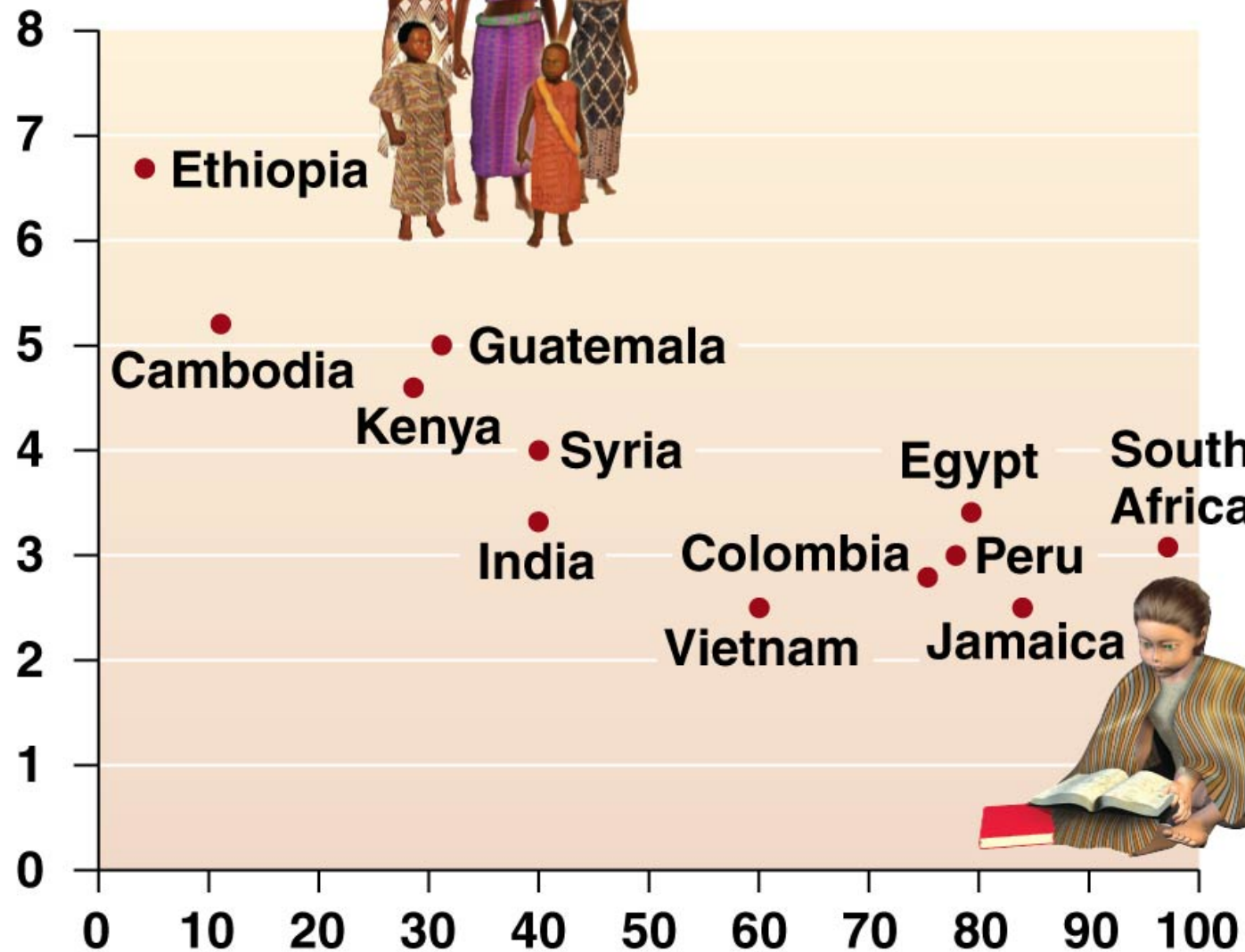


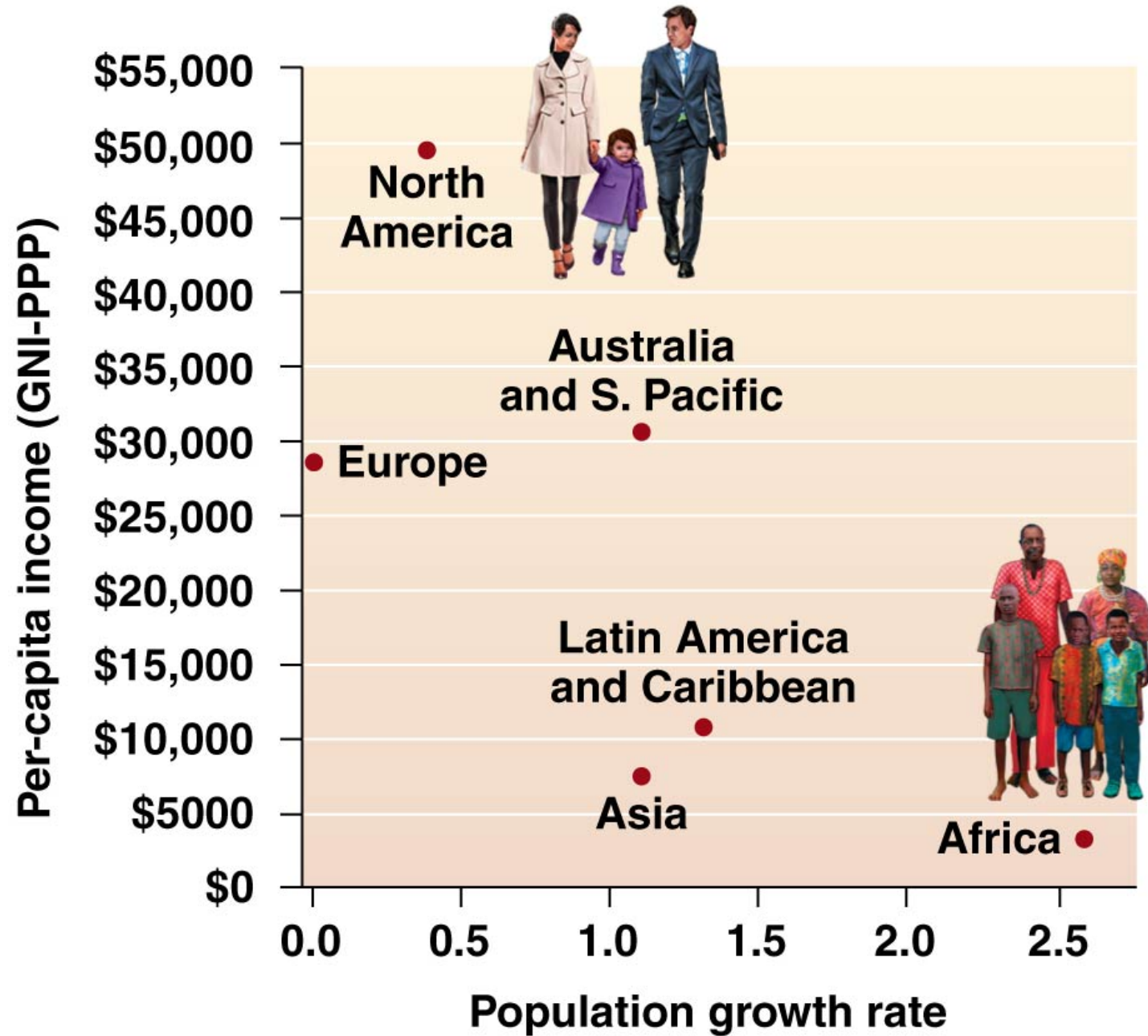
(a) Potential fertility



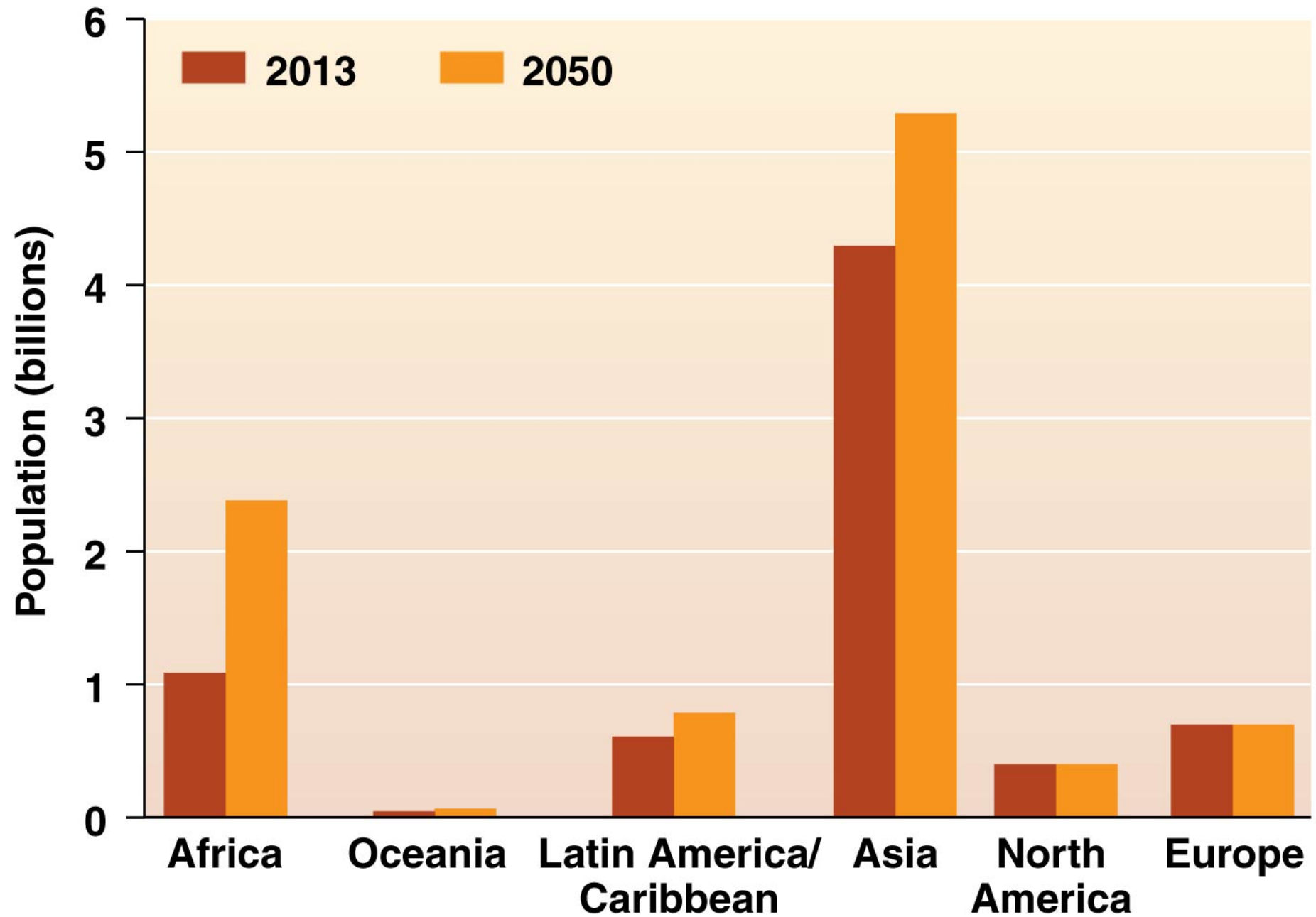
(b) Fertility reductions by delaying childbirth and contraceptive use

Total fertility rate (1995–2000)





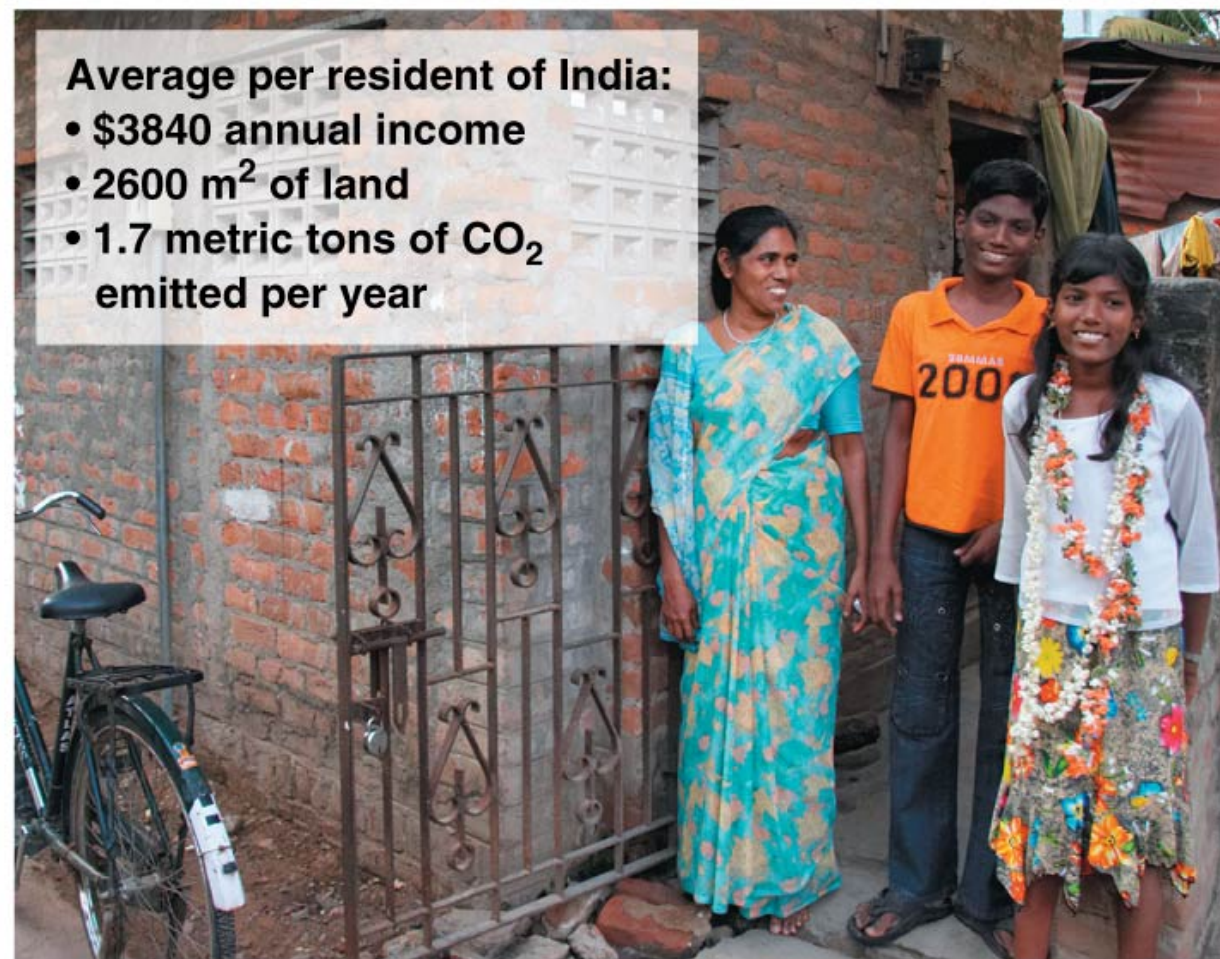






(a) A family living in the United States

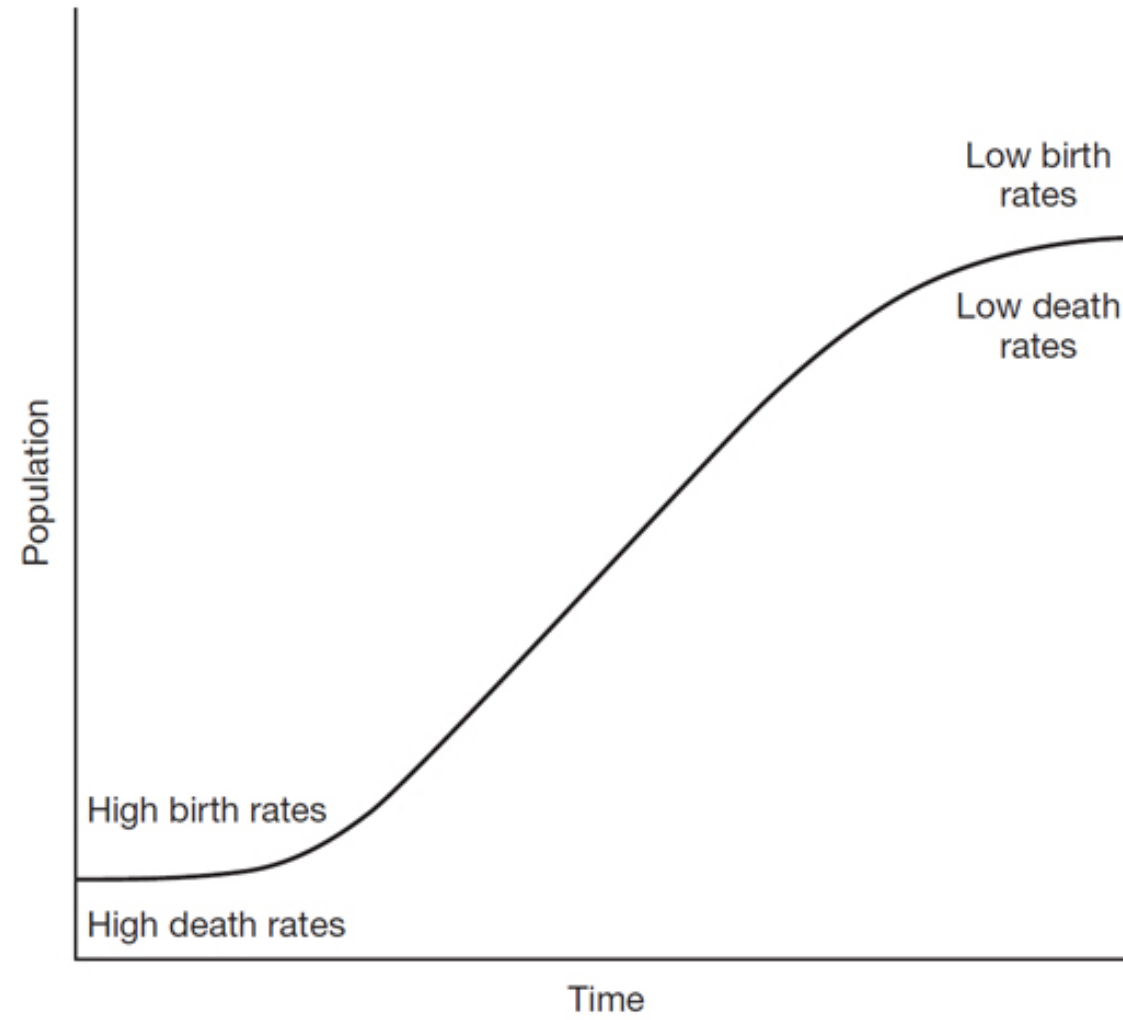
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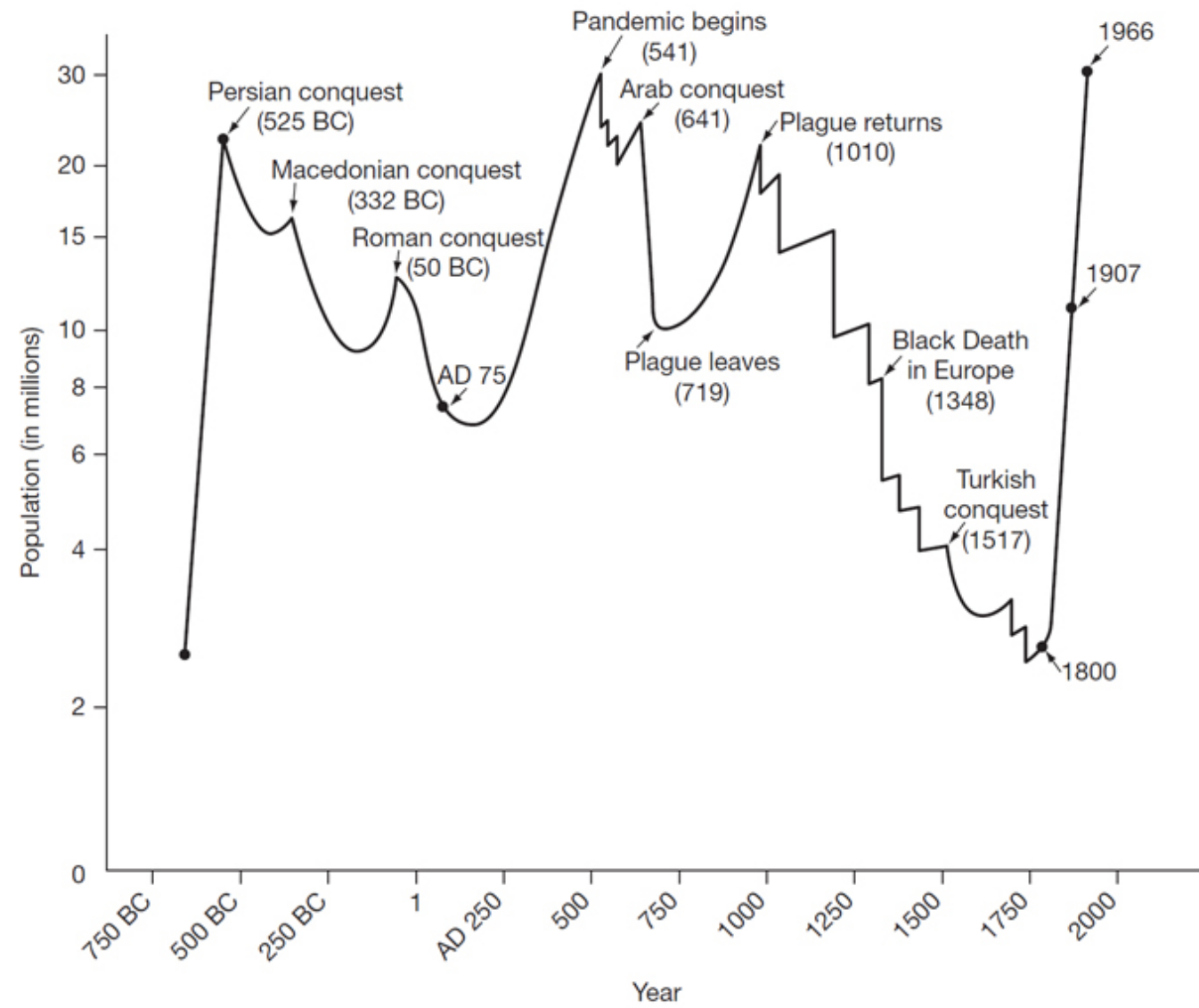


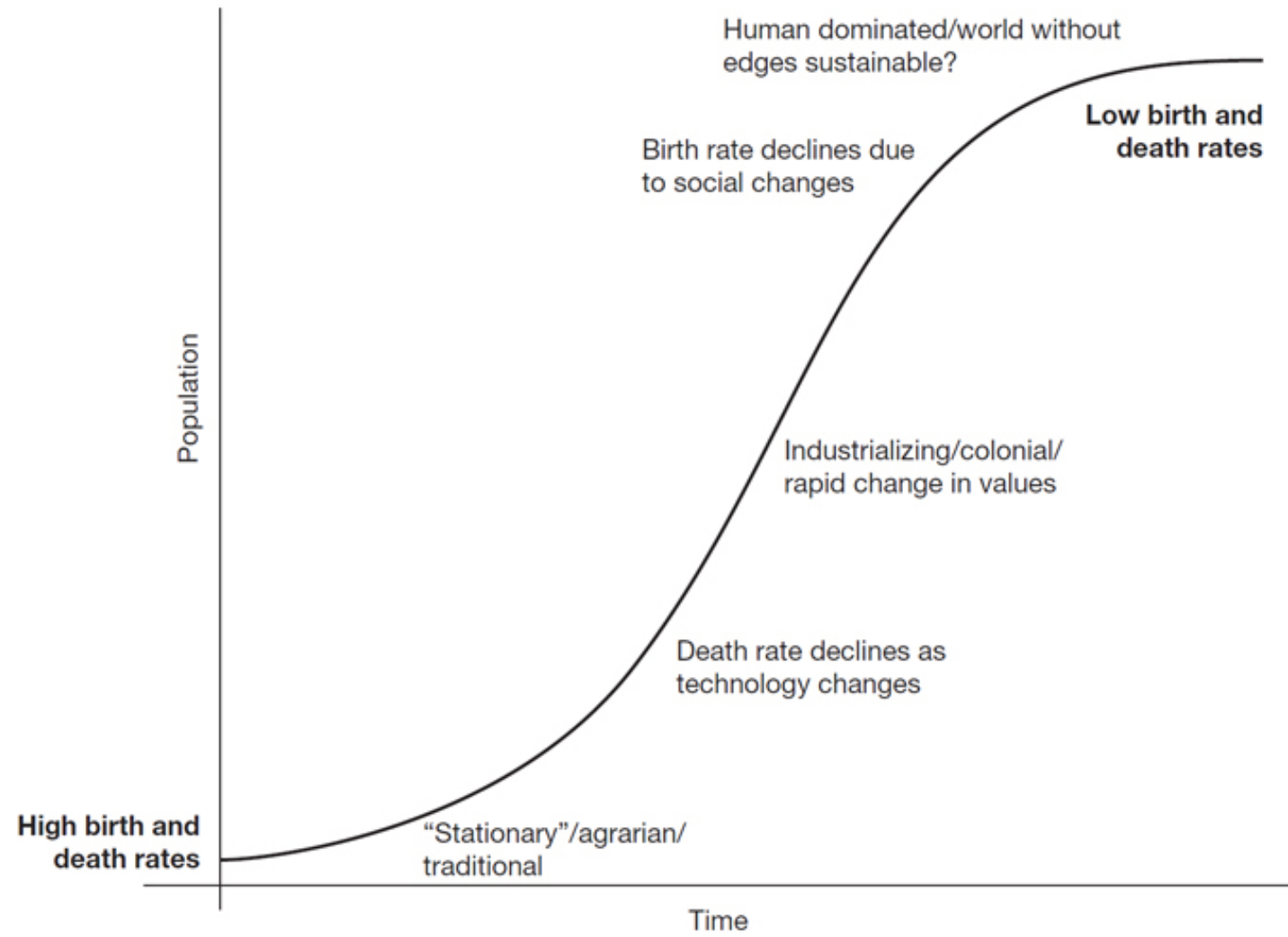
(b) A family living in India

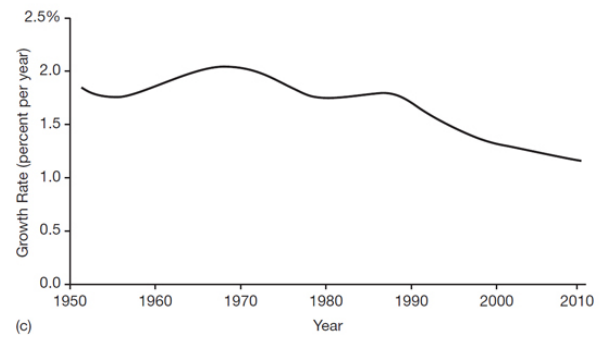
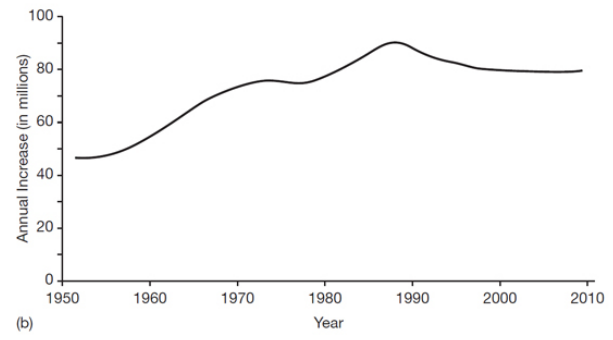
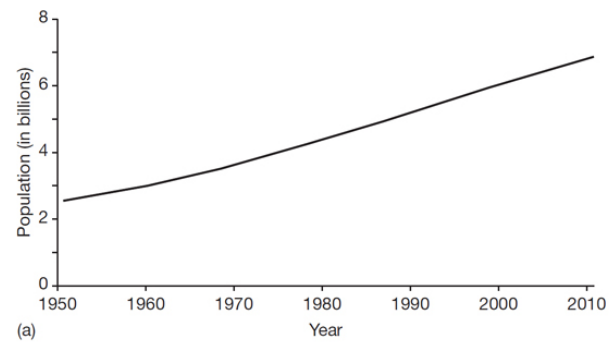
TABLE 8.1 WORLD POPULATION ESTIMATES, 2010. TOTAL FERTILITY RATE IS THE AVERAGE NUMBER OF CHILDREN BORN TO EACH WOMAN, IF CURRENT TRENDS CONTINUE.

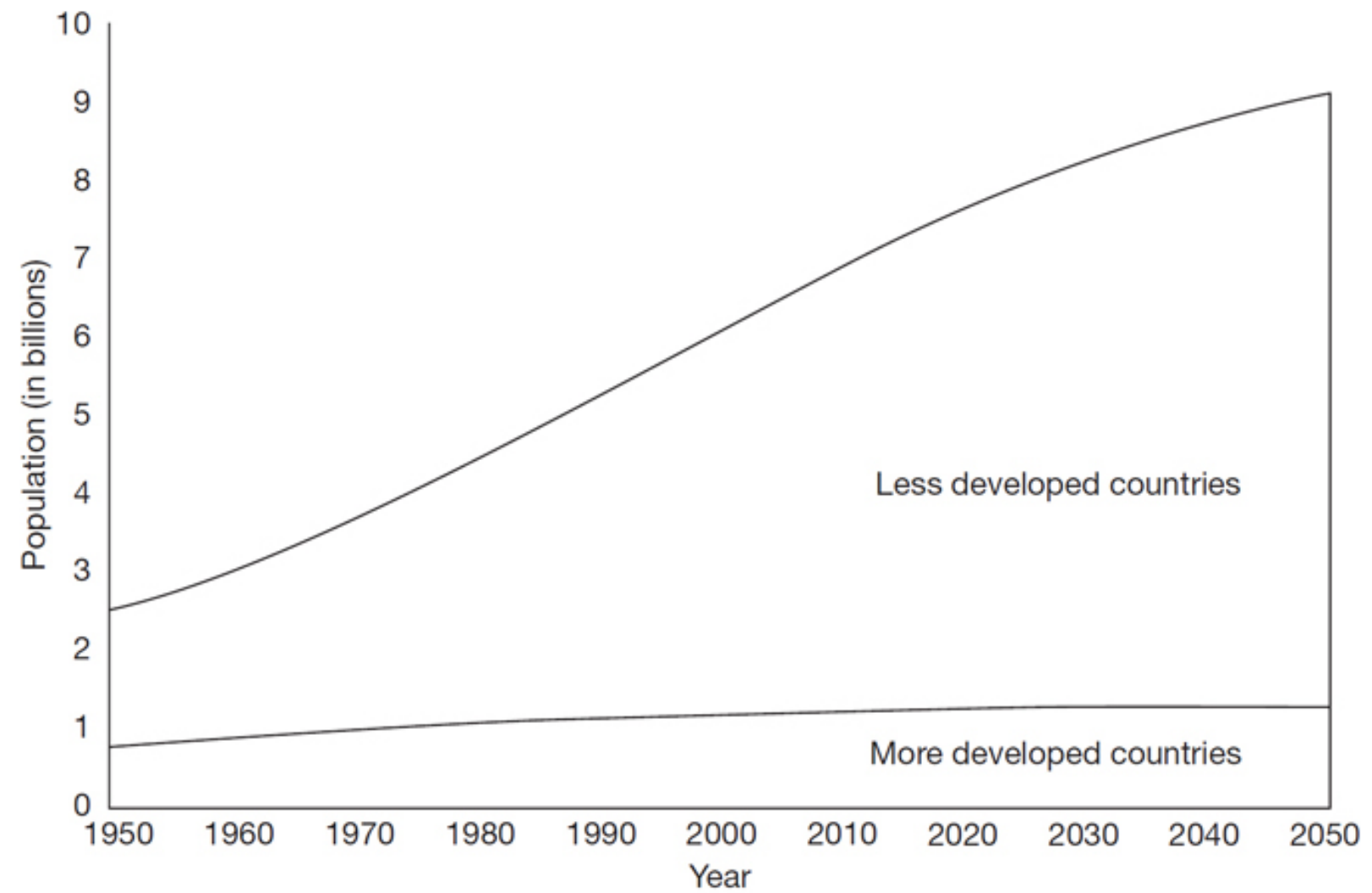
	Population estimate, 2011 (millions)	Growth rate, 1980–2011 (%/year)	Total fertility rate, 2005–10
World	6,974	1.45	2.54
Africa	1,046	2.49	4.64
Asia	4,207	1.51	2.28
Europe	739	0.21	1.53
Latin America and the Caribbean	597	1.61	2.30
North America	348	1.01	2.03
Oceania	37	1.55	2.49











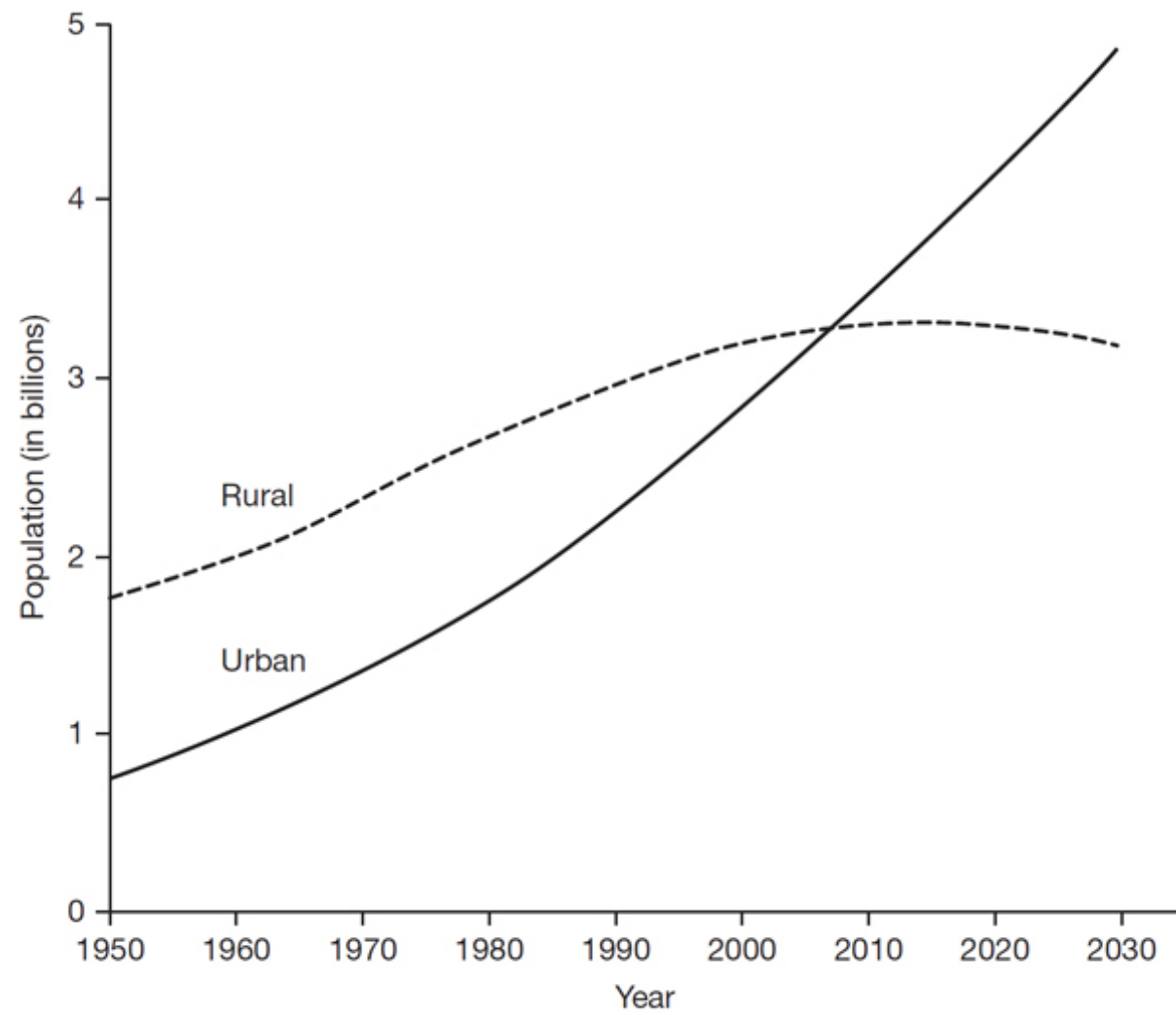
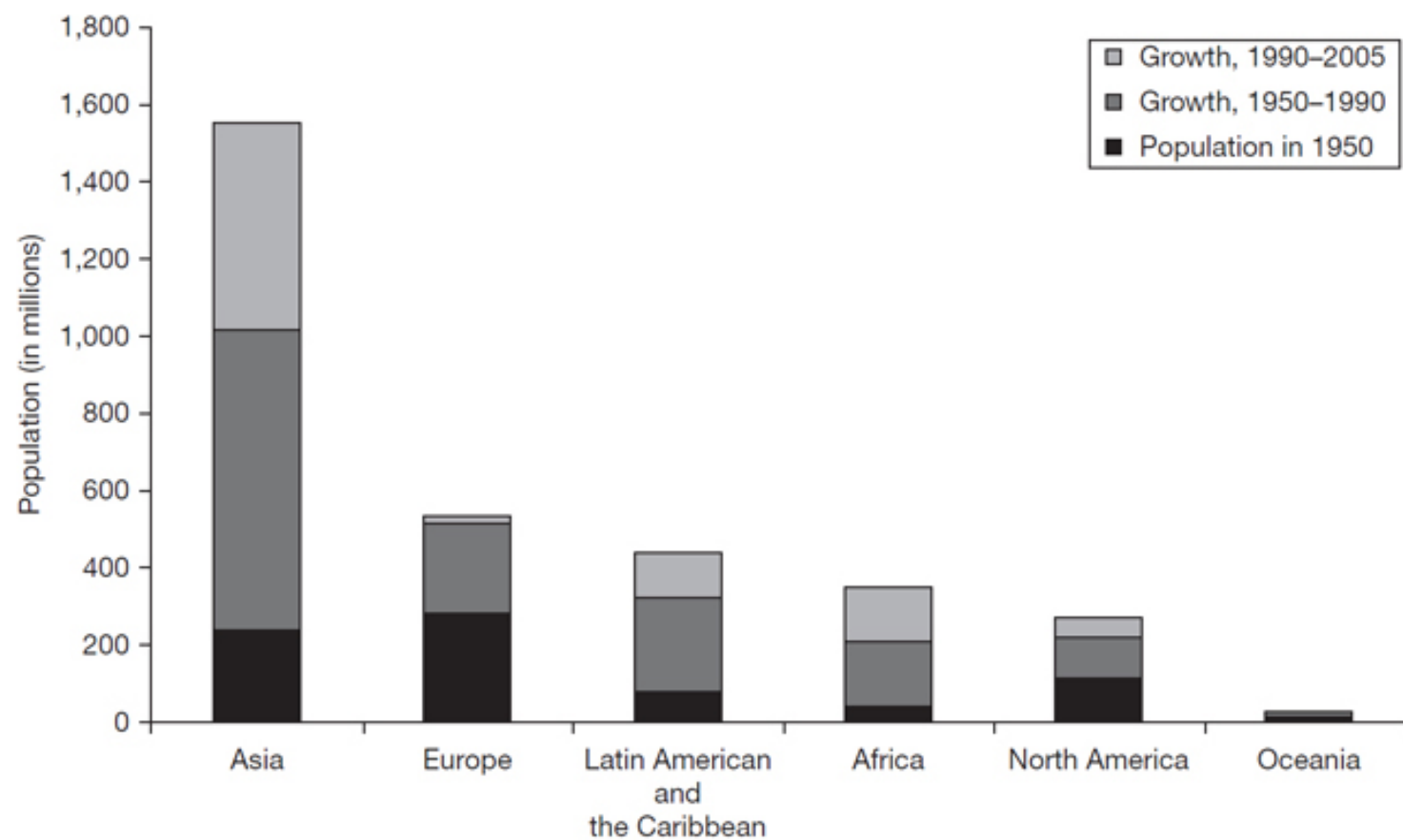
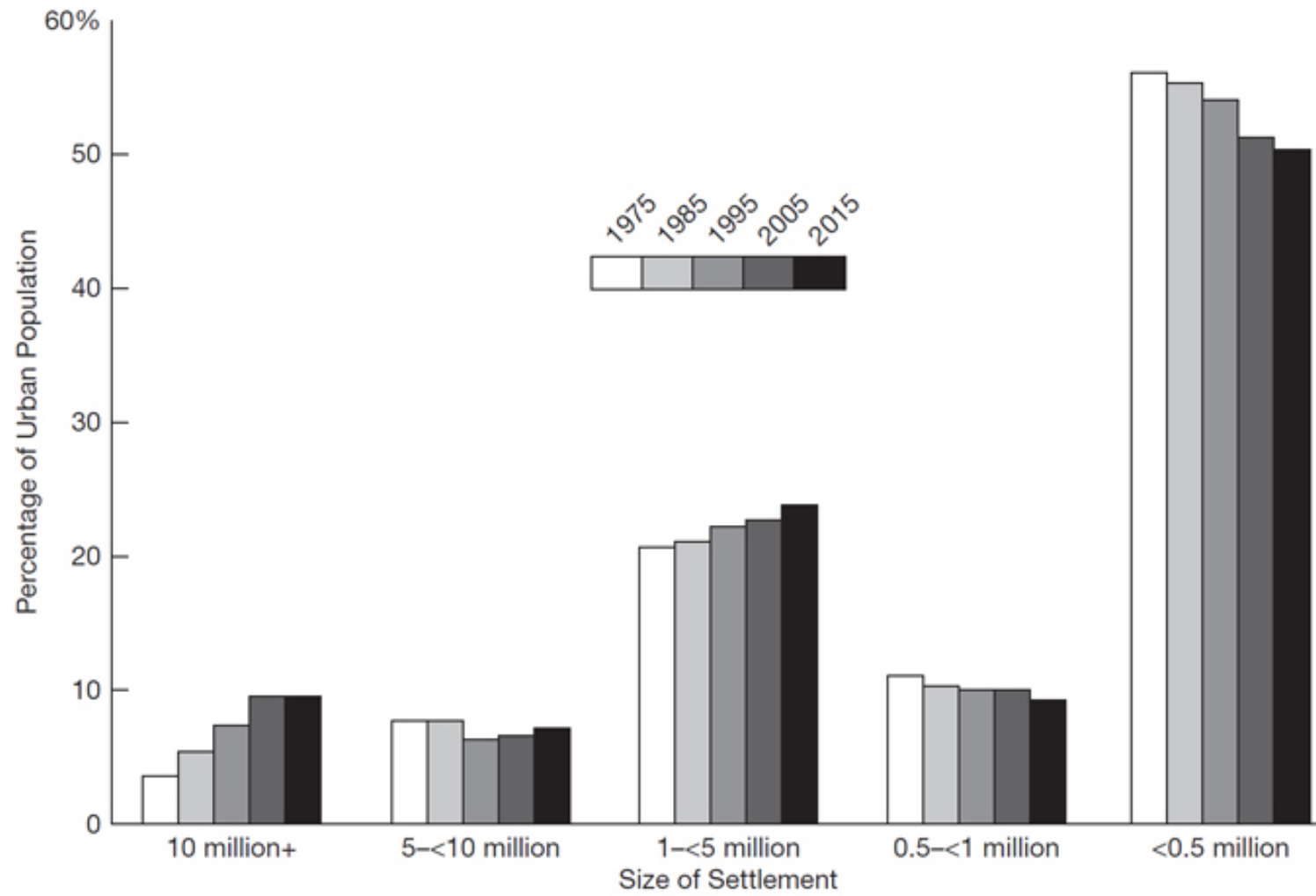


TABLE 8.2 CITIES WITH MORE THAN 10 MILLION INHABITANTS IN 1950, 1990, 2010, AND 2025 (PROJECTED) (MILLIONS)

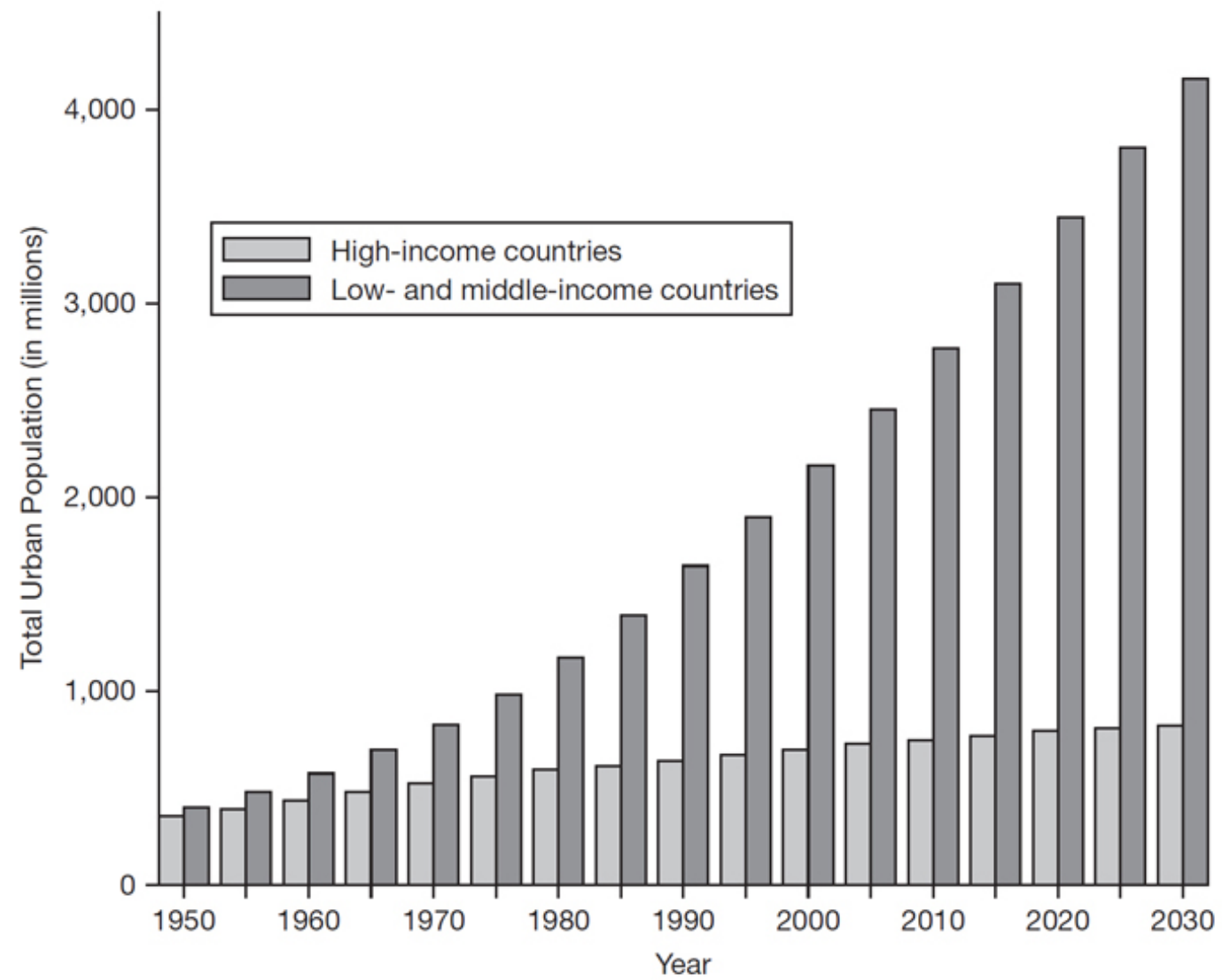
1950		1990		2010		2025	
City	Population	City	Population	City	Population	City	Population
1. New York–Newark, NJ	12.34	1. Tokyo, Japan	32.53	1. Tokyo, Japan	36.67	1. Tokyo, Japan	37.09
2. Tokyo, Japan	11.27	2. New York–Newark, NJ	16.09	2. Delhi, India	22.16	2. Delhi, India	28.57
		3. Mexico City, Mexico	15.31	3. São Paulo, Brazil	20.26	3. Mumbai (Bombay), India	25.81
		4. São Paulo, Brazil	14.78	4. Mumbai (Bombay), India	20.04	4. São Paulo, Brazil	21.65
		5. Mumbai (Bombay), India	12.31	5. Mexico City, Mexico	19.46	5. Dhaka, Bangladesh	20.94
		6. Osaka–Kobe, Japan	11.04	6. New York–Newark, NJ	19.43	6. Mexico City, Mexico	20.71
		7. Kolkata (Calcutta), India	10.89	7. Shanghai, China	16.58	7. New York–Newark, NJ	20.64
		8. Los Angeles–Long Beach–Santa Ana, CA	10.88	8. Kolkata (Calcutta), India	15.55	8. Kolkata (Calcutta), India	20.11
		9. Seoul, Korea	10.54	9. Dhaka, Bangladesh	14.65	9. Shanghai, China	20.02
		10. Buenos Aires, Argentina	10.51	10. Karachi, Pakistan	13.12	10. Karachi, Pakistan	18.73
				11. Buenos Aires, Argentina	13.07	11. Lagos, Nigeria	15.81
				12. Los Angeles–Long Beach–Santa Ana, CA	12.76	12. Kinshasa, Democratic Republic of the Congo	15.04

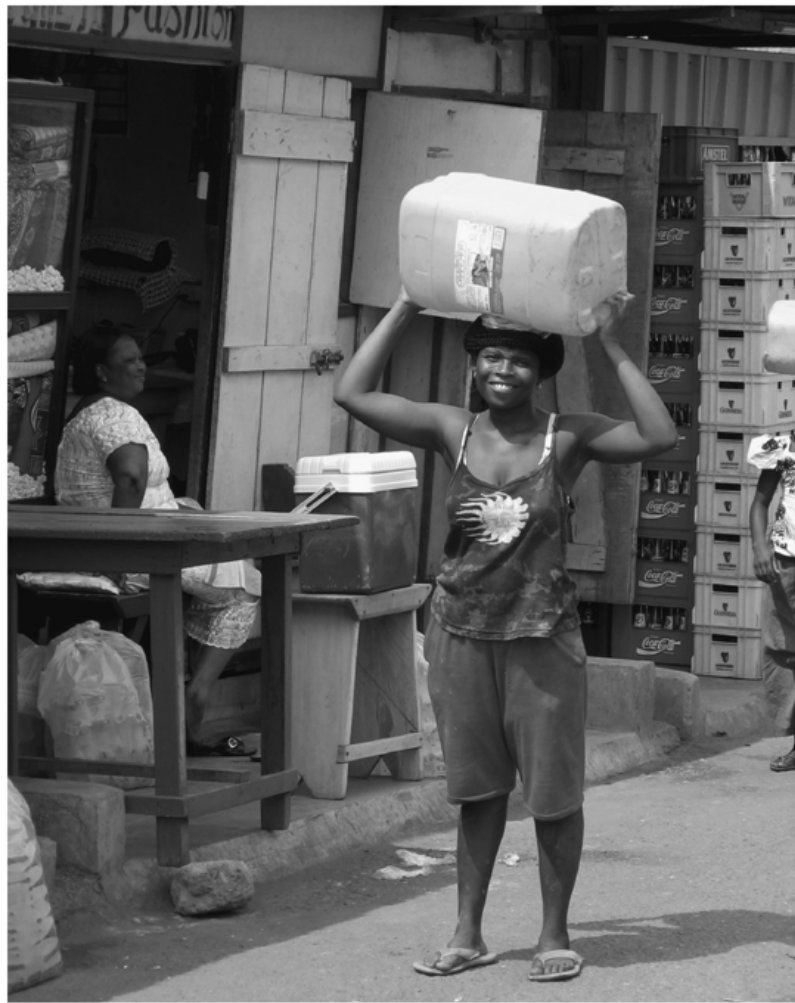
13. Beijing, China	12.39	13. Beijing, China	15.02
14. Rio de Janeiro, Brazil	11.95	14. Manila, Philippines	14.92
15. Manila, Philippines	11.63	15. Buenos Aires, Argentina	13.71
16. Osaka–Kobe, Japan	11.34	16. Los Angeles–Long Beach–Santa Ana, CA	13.68
17. Cairo, Egypt	11.00	17. Cairo, Egypt	13.53
18. Lagos, Nigeria	10.58	18. Rio de Janeiro, Brazil	12.65
19. Moscow, Russia	10.55	19. Istanbul, Turkey	12.11
20. Istanbul, Turkey	10.52	20. Osaka–Kobe, Japan	11.37
21. Paris, France	10.49	21. Shenzhen, China	11.15
		22. Chongqing, China	11.07
		23. Guangzhou, China	10.96
		24. Paris, France	10.88
		25. Jakarta, Indonesia	10.85
		26. Moscow, Russia	10.66
		27. Bogotá, Colombia	10.54
		28. Lima, Peru	10.53
		29. Lahore, Pakistan	10.31











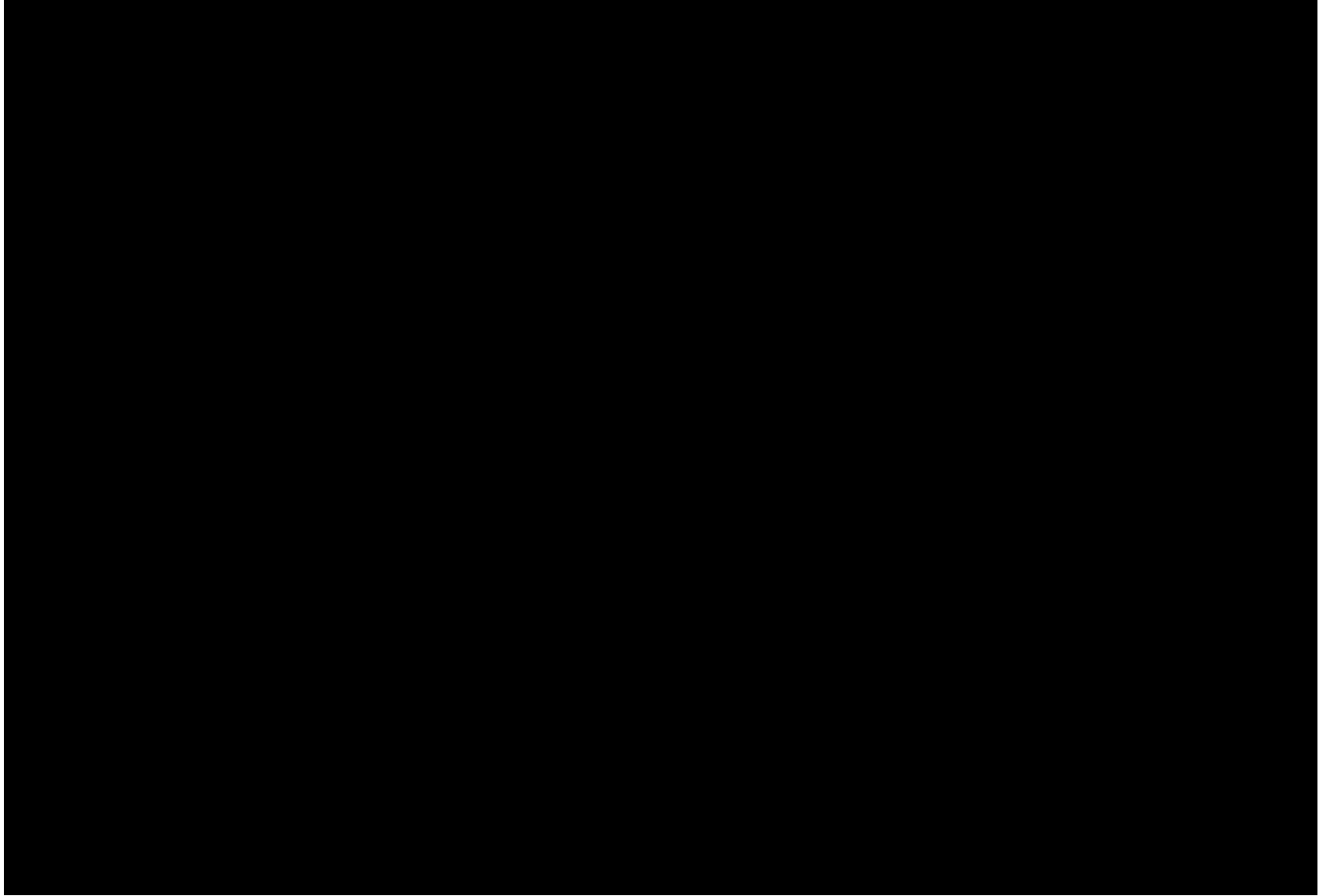


TABLE 8.3 COMPARISONS BETWEEN URBAN AND RURAL ENVIRONMENTS IN INDICATORS REFLECTING ACCESS TO BOTH ECOSYSTEM AND SOCIAL SERVICES

Comparison (and units of measure)	Urban	Rural
Population growth: total fertility rates (number of children born per woman over her lifetime)	4.16	5.55
Infant mortality (probability of death in first year after birth)	5.6–7.5%	8.6%
Education (percentage of adults who have completed secondary school)	26%	12%
Water: dwellings with inside supply (percentage with piped water or well)	55%	19%
dwellings without inside supply (time to fetch from nearest supply)	18 min	26 min
Sanitation (percentage with flush toilet)	42%	8%
Electricity (percentage with service to dwelling)	65%	25%

TABLE 8.4 AN URBAN WAY OF LIFE REPLACES NATURAL ECOSYSTEM SERVICES (FIRST NATURE) WITH TECHNOLOGICAL INFRASTRUCTURE (SECOND NATURE), WHICH CHANNELS FIRST NATURE AND ADDS NEW RISKS.

Problems that appear in Second Nature . . .	reflect continuing dependence on ecosystem services (First Nature).
Wastewater (sewage)	With high population density, sewage treatment plants are needed to serve as artificial streams and wetlands in which microbes can digest toxic or disease-bearing organic matter.
Inadequate or unclean food	City dwellers require food, but food systems can be disrupted by micro-parasites, human disorder, and poverty.
Dirty air	Vehicle and industrial emissions produce sulfur oxides and lead (no natural analog; effects can be delayed and subtle).
Solid and hazardous waste	Industrial materials and chemical hazards are not naturally recycled (no natural analog).