Population Geography
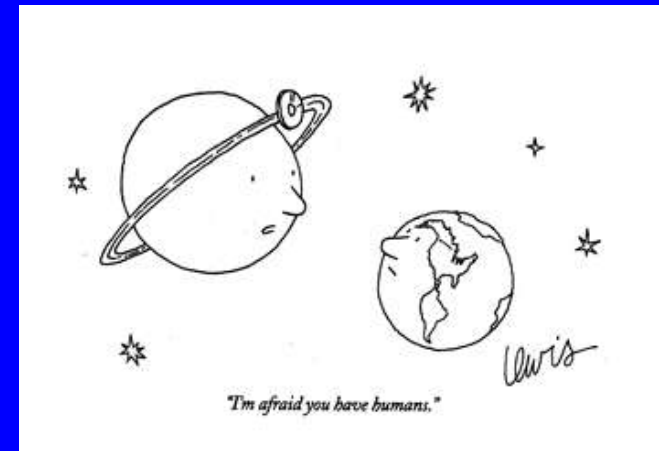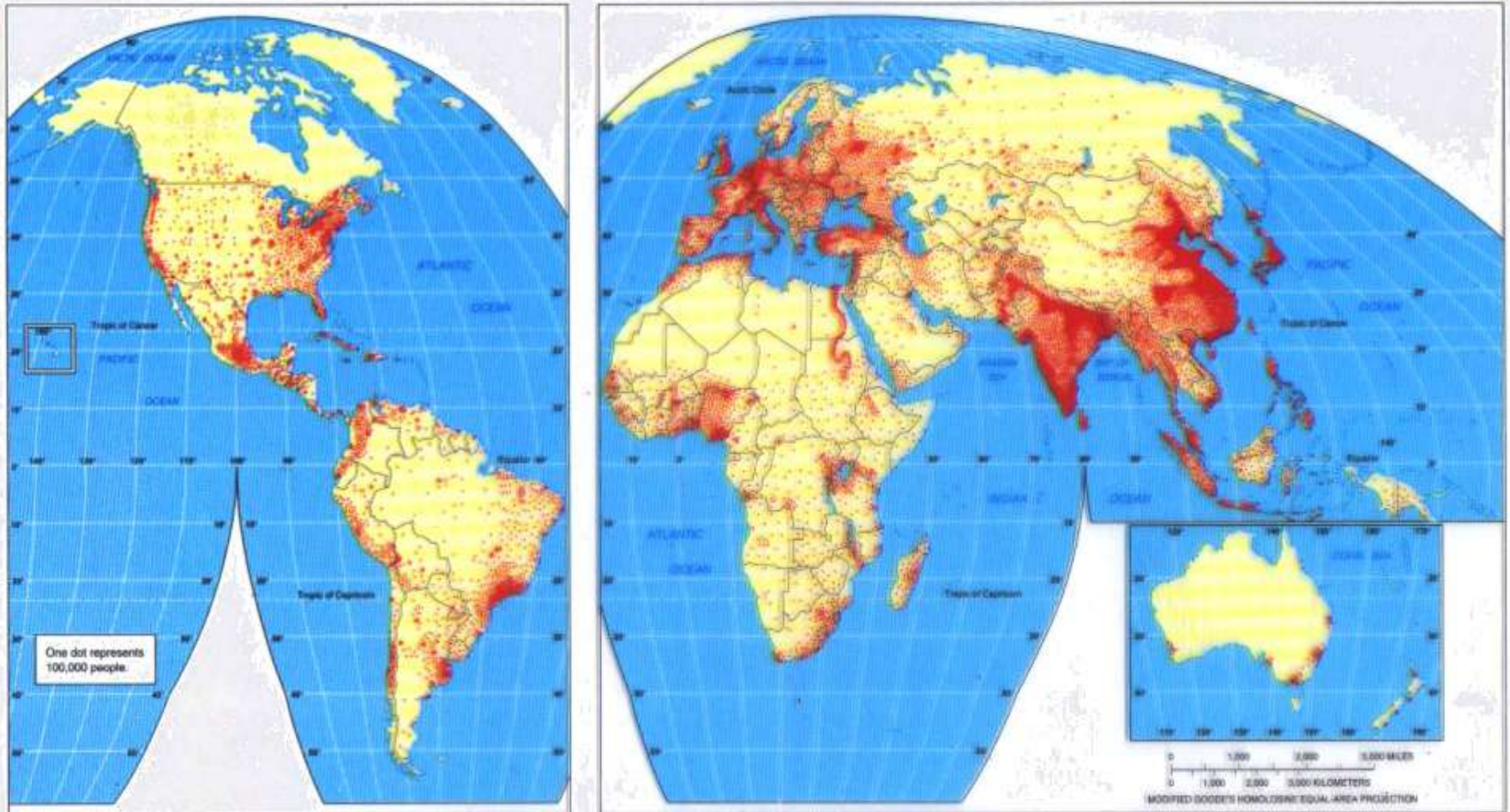
F Distribution of World Population

F Population Statistics

F Population Pyramids

F Demographic Transition Theory

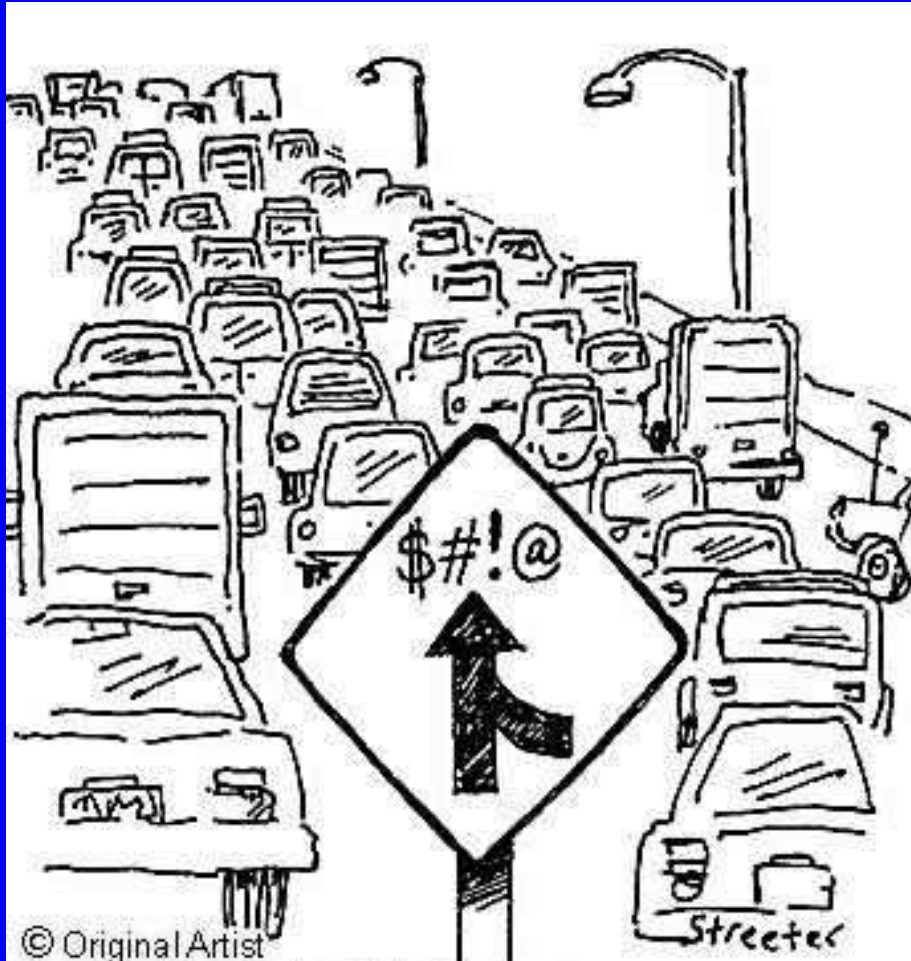F Population Control

F Overpopulation (Malthus and Neo-Malthusians

"I'm afraid you have humans."

T 11   Fig. 2-1   **Population concentrations**

One dot represents 100,000 people.

Arithmetic Density – the total number of people per a unit of land area. U.S. = 76/mi^2; NYC=1,000,000/mi^2; Australia = 7/mi^2

Physiological Density – the total number of people per a unit of arable (farmable) land.

I'M THINKING OF JOINING THE," PEOPLE WHO ENJOY SOLITUDE IN LARGE NUMBERS", GROUP.
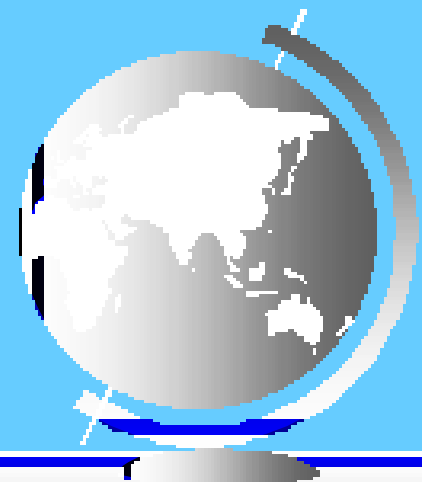
Population Distribution

- **Population Concentrations**
  - East Asia
  - South Asia
  - South East Asia
  - Europe
  - North America

- **Sparsely Populated Regions**
  - dry lands
  - wet lands
  - high lands
  - cold lands

World and Country Population Totals

Distribution and Structure: 3/4 of people live on 5% of earth's surface!

Total: 6 billion on planet as of Oct. 12, 1999

Current Population Counter

Five most populous regions and countries

REGIONPOPULATIONCOUNTRYPOPULATION

- F East Asia1.5 billionChina1.254 billion
- F South Asia1.2 billionIndia986 million
- F Europe750 millionU.S. 274 million
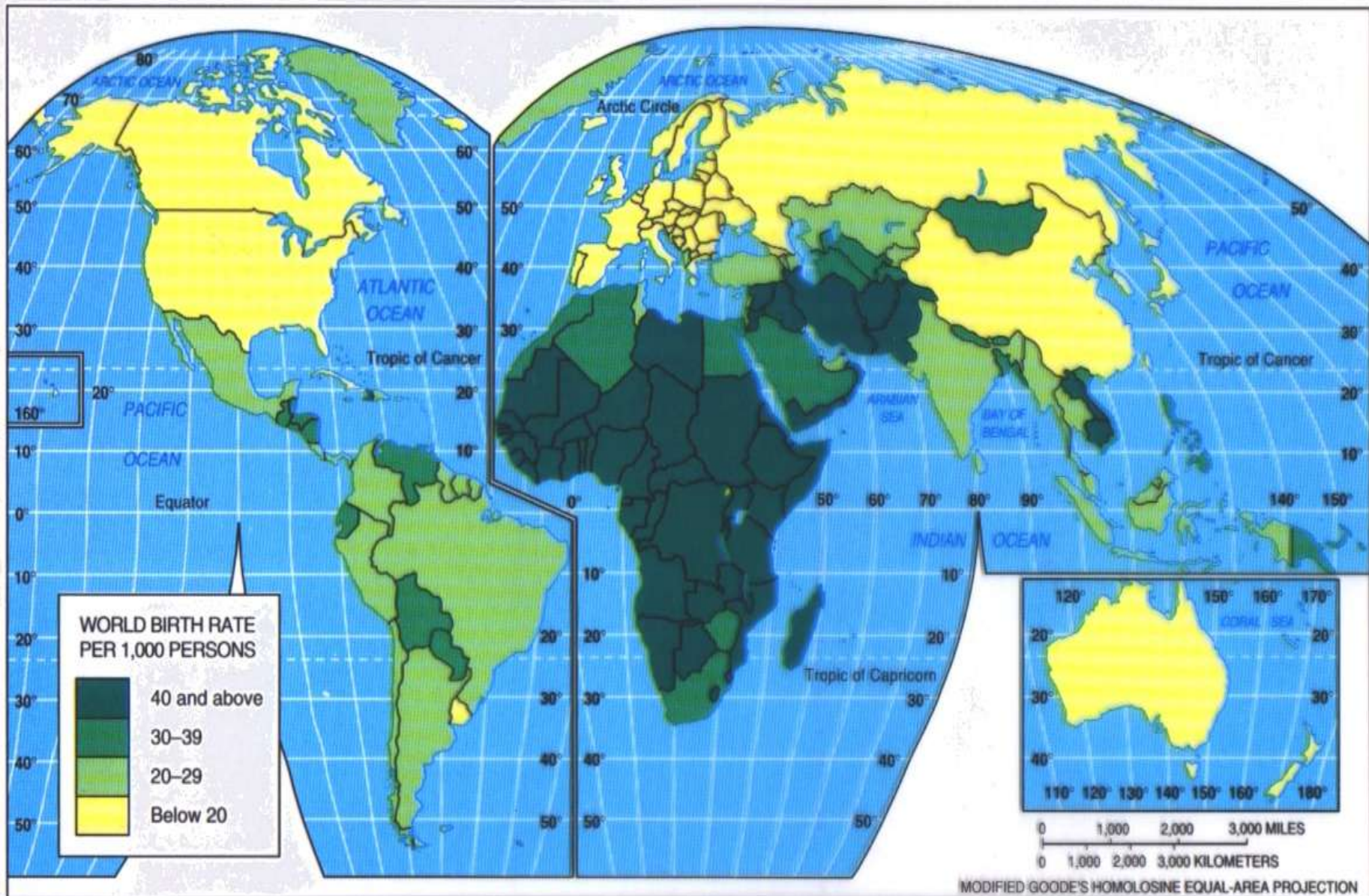- F SE Asia500 millionIndonesia206 million
- F East N. Am.120 millionBrazil168 million

Population Characteristics

+ Crude Birth Rate : The total number of live births in a year for every 1,000 people alive in the society.

+ Crude Death Rate : The total number of deaths in a year for every 1,000 people alive in the society.

+ Natural Increase: The percentage growth of a population in a year, computed as the crude birth rate minus the crude death rate.

Fig. 2-5   Crude birth rate

WORLD BIRTH RATE
PER 1,000 PERSONS

- 40 and above
- 30–39
- 20–29
- Below 20

MODIFIED GOODE'S HOMOLOSINE EQUAL-AREA PROJECTION

Total Fertility Rate - the average number of children a women will have in her childbearing years. This rate varies from just over 1 (Japan, Italy) to around 7 (Niger, Mali). The U.S. rate is 2.

2.1 is generally regarded as the replacement rate (the rate at which a population neither grows nor shrinks) in the developed world. In less developed countries this rate should be higher to account for so many children not reaching childbearing age.

Palestinian Territories	Fertility Rate
1975-1980	7.39
1980-1985	7.00
1985-1990	6.43
1990-1995	6.46
1995-2000	5.99
2000-2005	5.57

U.K.	Total fertility rate
1975-1980	1.72
1980-1985	1.80
1985-1990	1.81
1990-1995	1.78
1995-2000	1.70
2000-2005	1.66

Africa	Fertility Rate
1975-1980	6.60
1980-1985	6.45
1985-1990	6.11
1990-1995	5.67
1995-2000	5.26
2000-2005	4.97

Infant Mortality Rate – the number of deaths of children under the age of one *per thousand live births*. The rate ranges from as low as 3 (Singapore, Iceland) to as much as 150 (Sierra Leone, Afghanistan). The U.S. rate is just over 6. High *infant mortality* tends to result in higher fertility rates as families seek "insurance" for the loss of children.

Source: CIA World Factbook 2007 (est.)   World: infant mortality rate 2007   http://en.wikipedia.org/wiki/List_of_countries_by_infant_mortality_rate
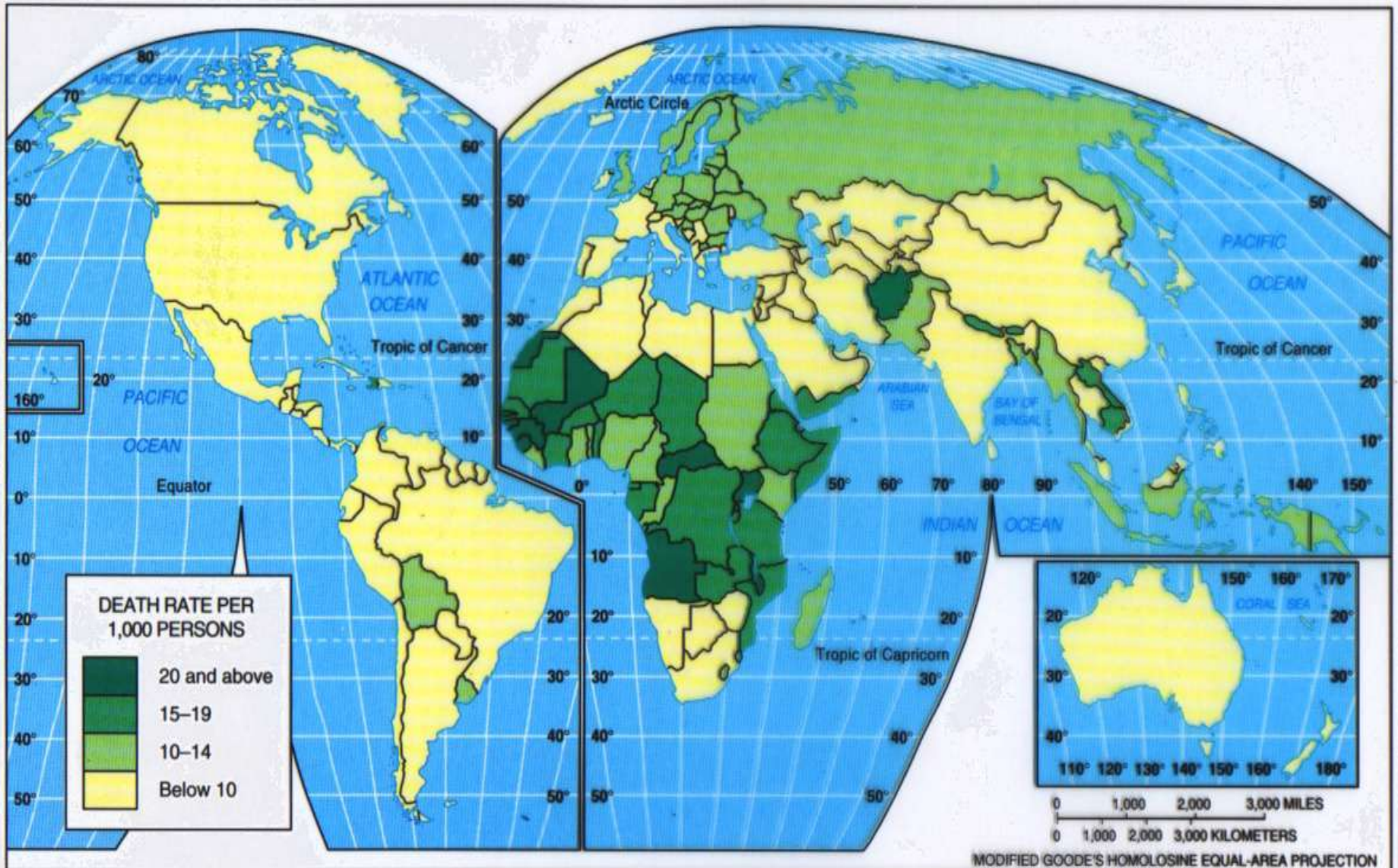
deaths / 1000 live births   No data   <0   5   10   15   20   25   30   35   40   45   50   55   60   65   70   75   80   85   90   95   100   105   110>   2007
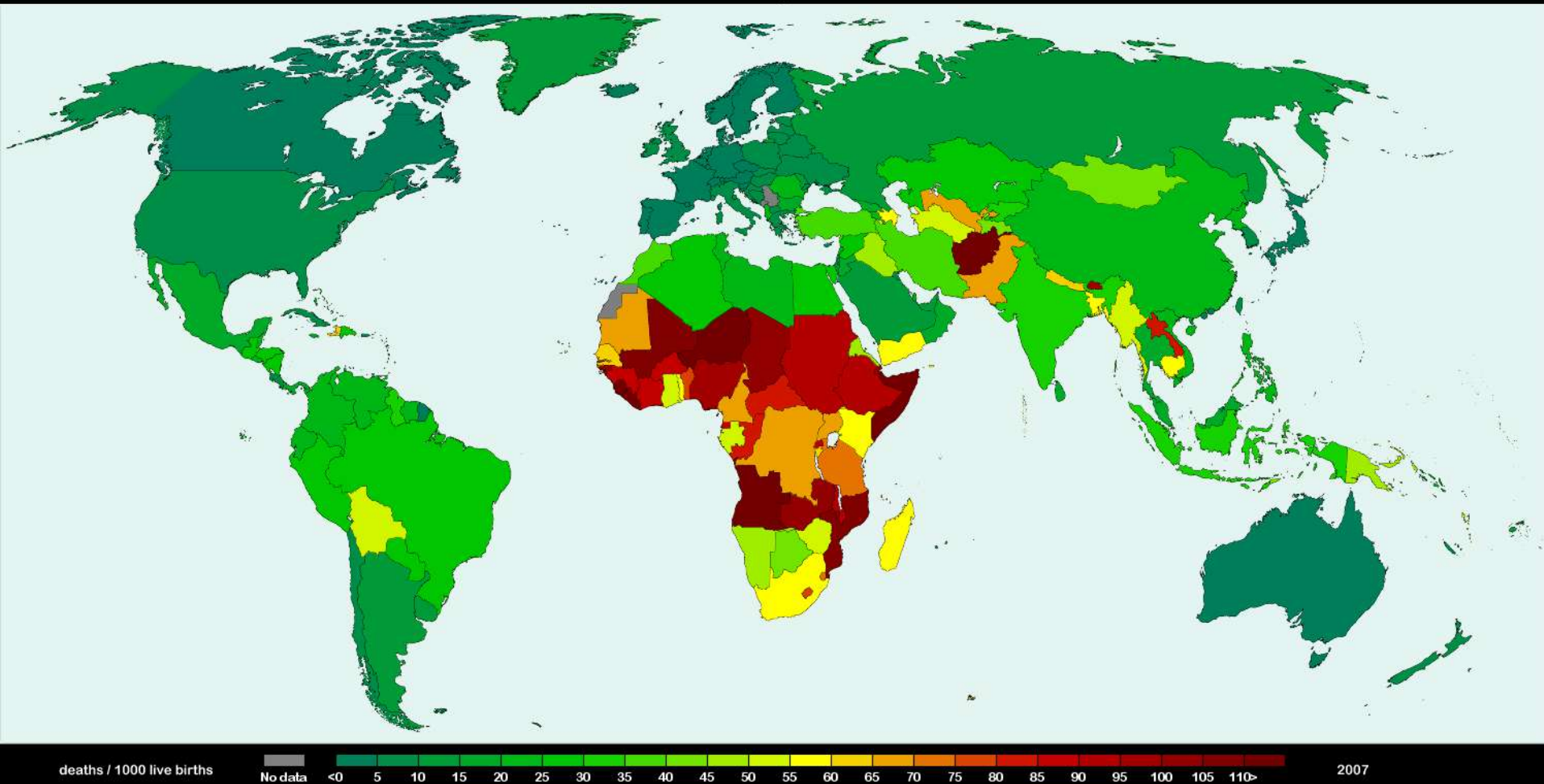
Birth Control Programs

F One family/one child policies
 – Female infanticide
 – Social compensation fees

F Sterilization

F Loss of status

F Termination healthcare/food coupons

F Free birth control

F Increased literacy

Fig. 2-8   Crude death rate

DEATH RATE PER 1,000 PERSONS

- 20 and above
- 15–19
- 10–14
- Below 10

MODIFIED GOODE'S HOMOLOSINE EQUAL-AREA PROJECTION

World Death Rates

F Infectious diseases
- HIV/AIDS
- SARS

F Degenerative diseases
- Obesity
- Tobacco use

F Epidemiology

F Epidemiological transition
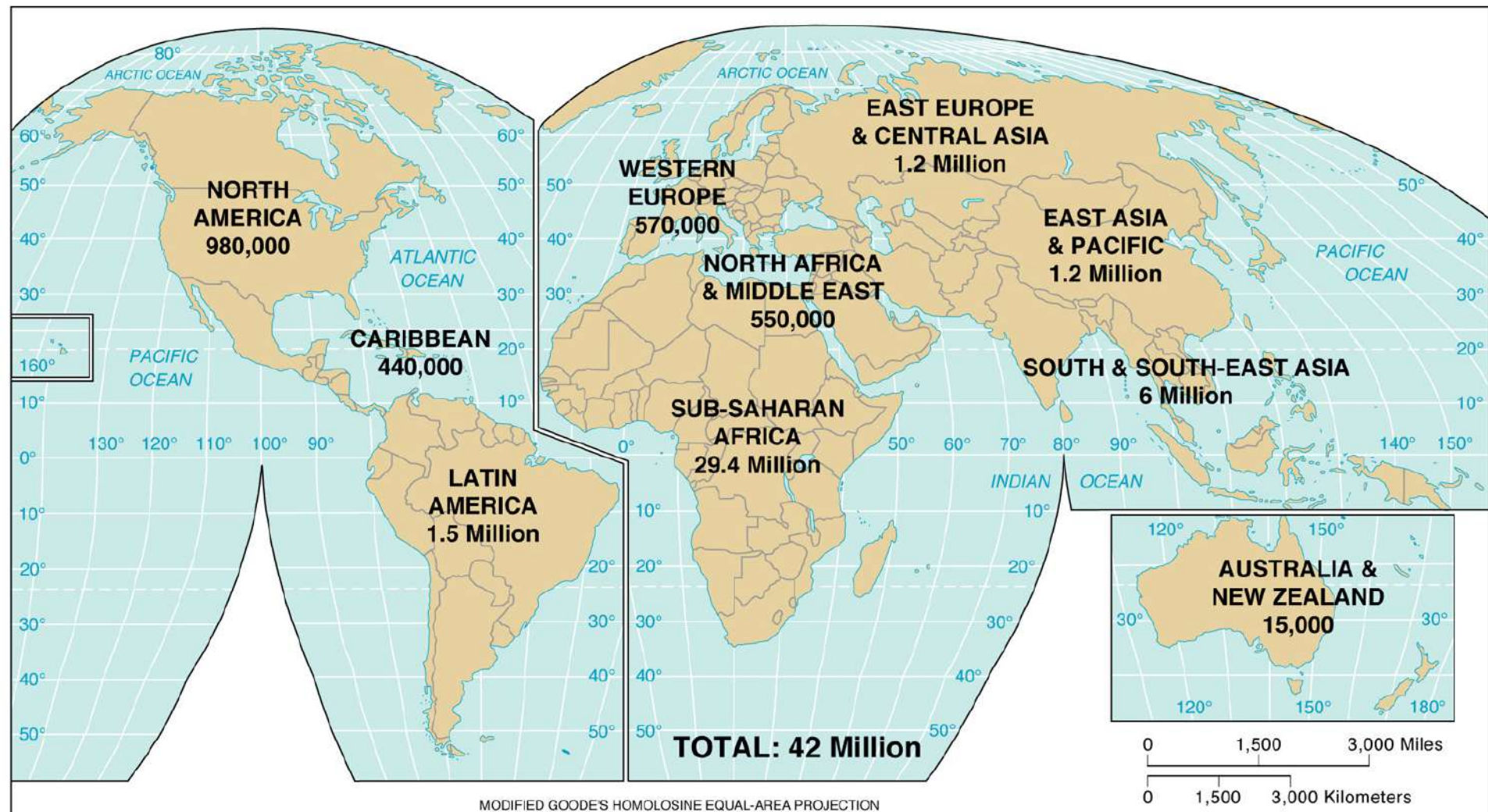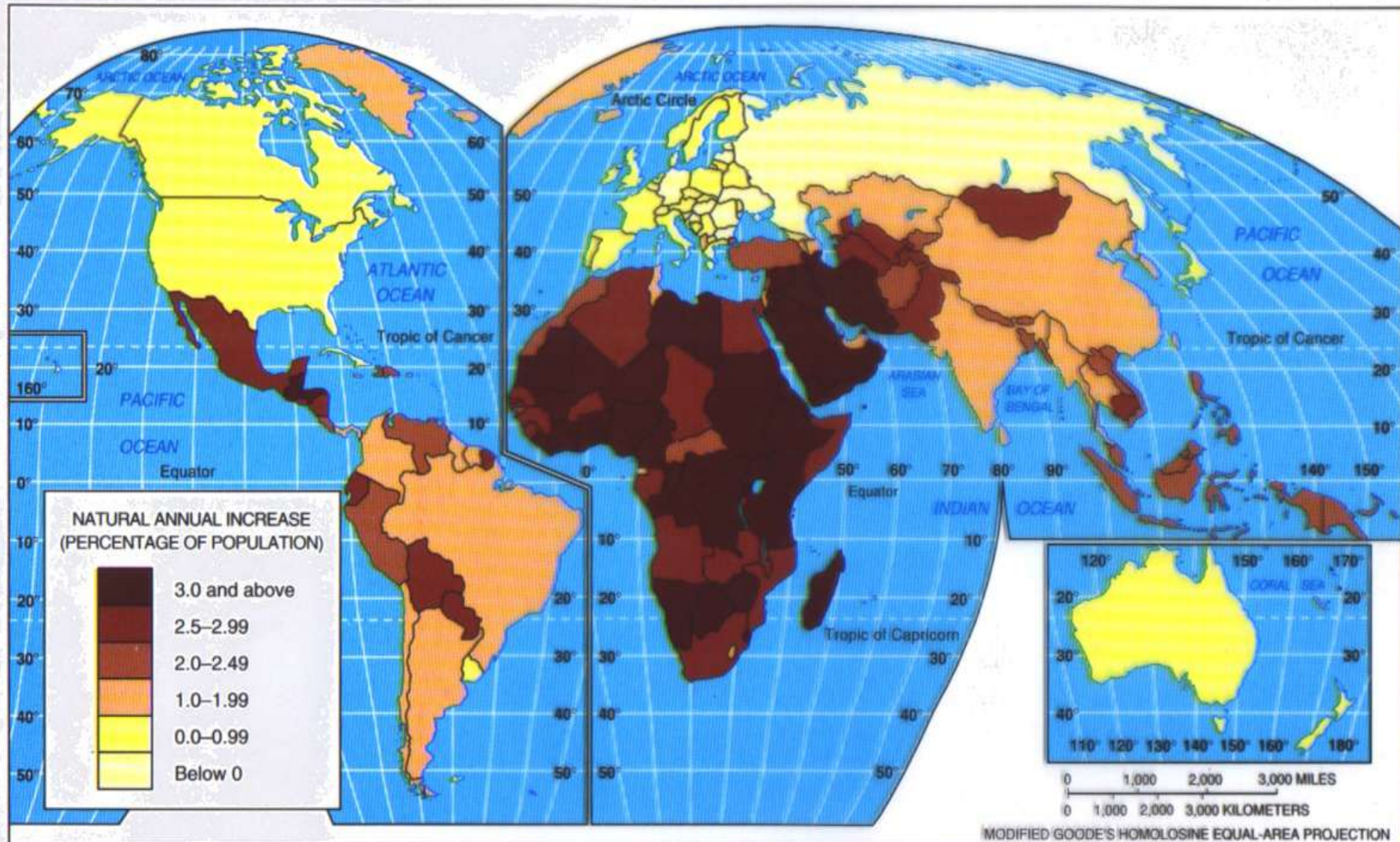
Rates of Natural Increase

NATURAL ANNUAL INCREASE
(PERCENTAGE OF POPULATION)

- 3.0 and above
- 2.5–2.99
- 2.0–2.49
- 1.0–1.99
- 0.0–0.99
- Below 0

MODIFIED GOODE'S HOMOLOSINE EQUAL-AREA PROJECTION

Doubling Times

The doubling time is the number of years before a population will be twice as large as it is today.

World = 50
U.S. = 34
MDC = 543
LDC = 40
Honduras = 22
Belize = 19
Denmark = 700
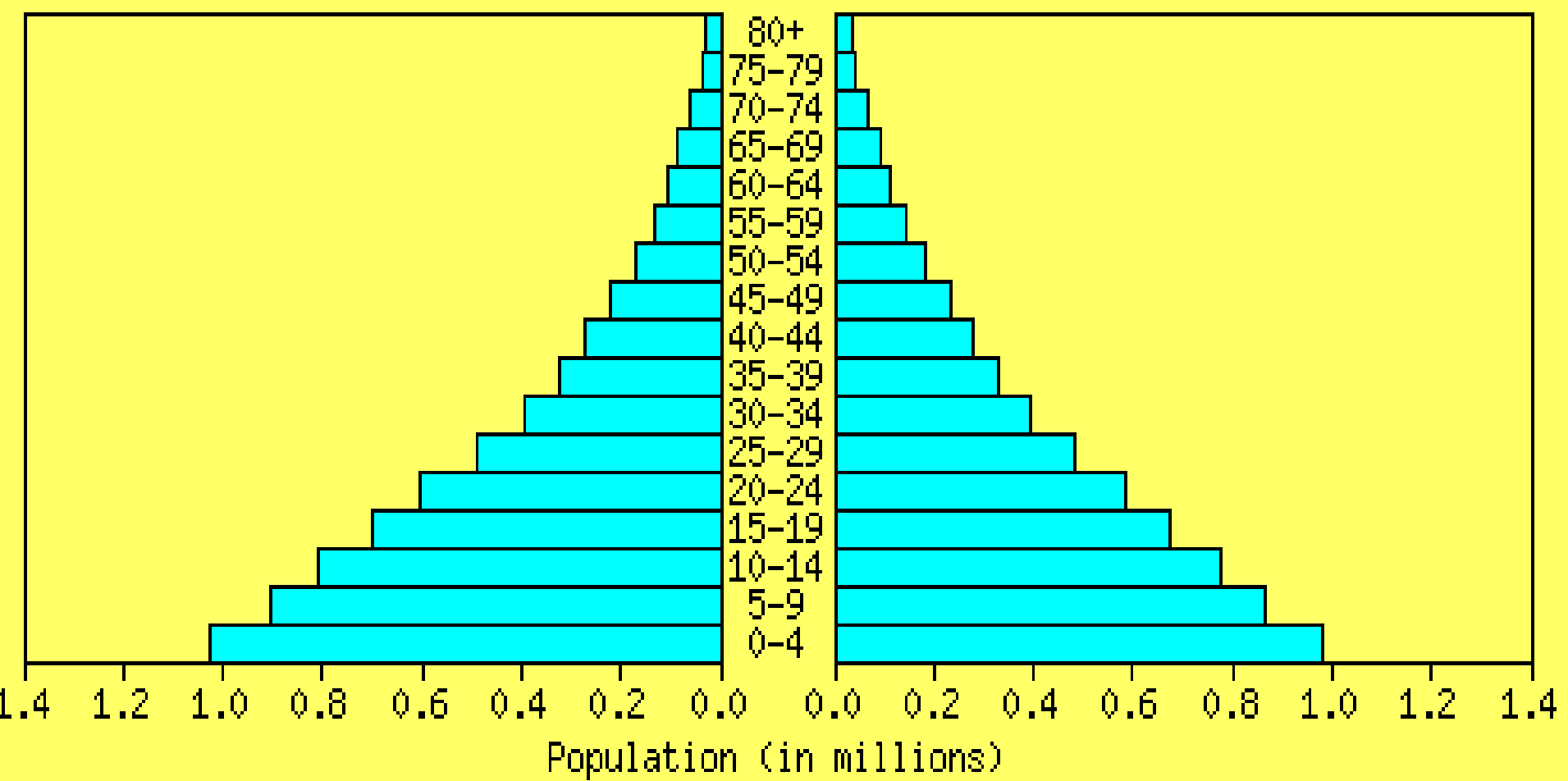Russia = never?

Population Pyramids

- Inverted bar graphs that show a wide population base (younger population) with a narrow top (older population).
- Population Pyramids show:
  - Age Distributions
  - Dependency Ratios of under 15 and over 65
  - Sex Ratio - Male vs. Female
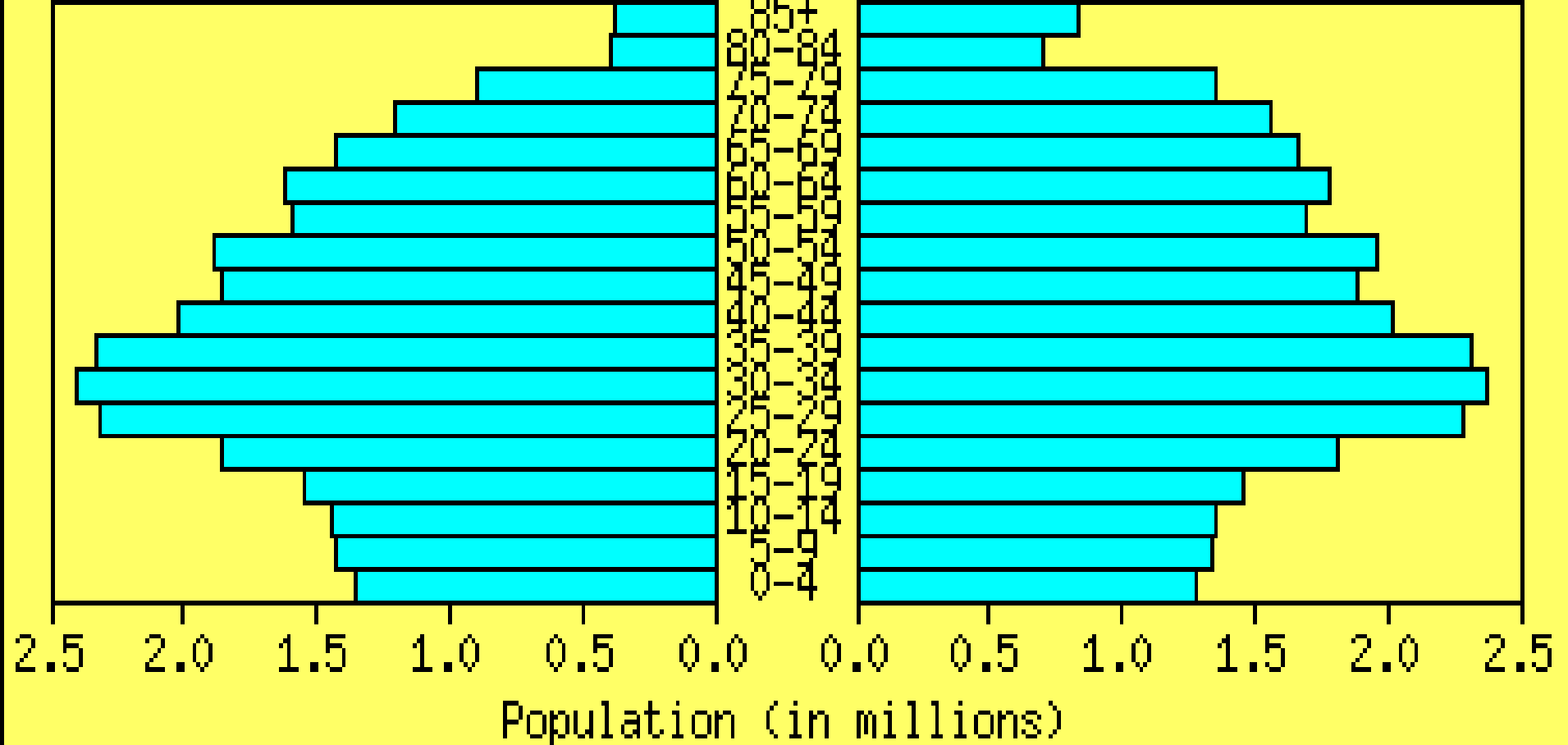
Guatemala: 2000

MALE

FEMALE

	80+
	75-79
	70-74
	65-69
	60-64
	55-59
	50-54
	45-49
	40-44
	35-39
	30-34
	25-29
	20-24
	15-19
	10-14
	5-9
	0-4

1.4 1.2 1.0 0.8 0.6 0.4 0.2 0.0   0.0 0.2 0.4 0.6 0.8 1.0 1.2 1.4

Population (in millions)

Italy: 2000

MALE | FEMALE

85+
80-84
75-79
70-74
65-69
60-64
55-59
50-54
45-49
40-44
35-39
30-34
25-29
20-24
15-19
10-14
5-9
0-4

2.5 2.0 1.5 1.0 0.5 0.0   0.0 0.5 1.0 1.5 2.0 2.5

Population (in millions)

Source: U.S. Census Bureau, International Data Base.

Nigeria: 2000

	80+
	75-79
	70-74
	65-69
	60-64
	55-59
	50-54
	45-49
	40-44
	35-39
	30-34
	25-29
	20-24
	15-19
	10-14
	5-9
	0-4

16 14 12 10 8 6 4 2 0   0 2 4 6 8 10 12 14 16
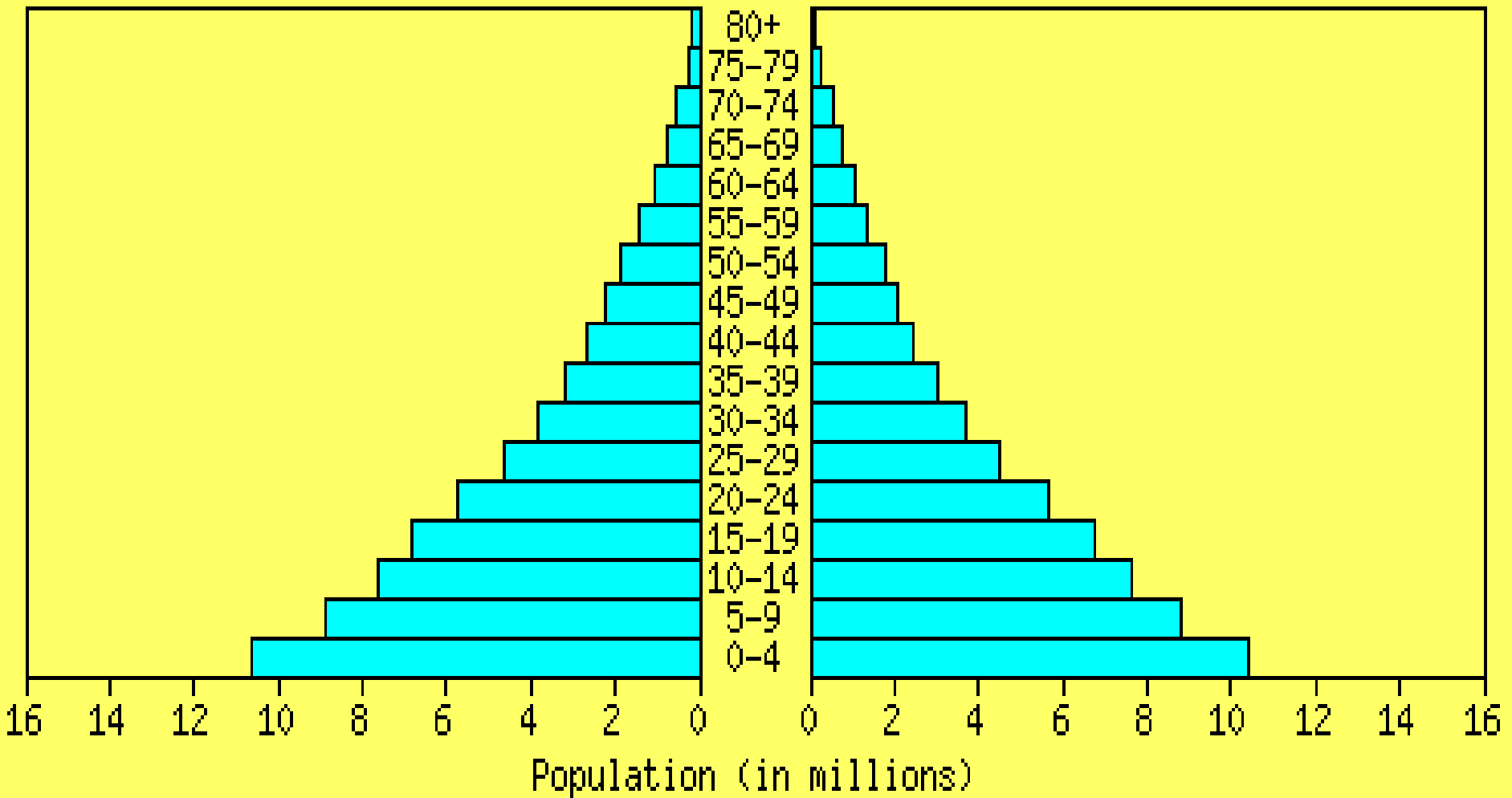
Population (in millions)

Source: U.S. Census Bureau, International Data Base.

Russia: 2000

MALE | FEMALE

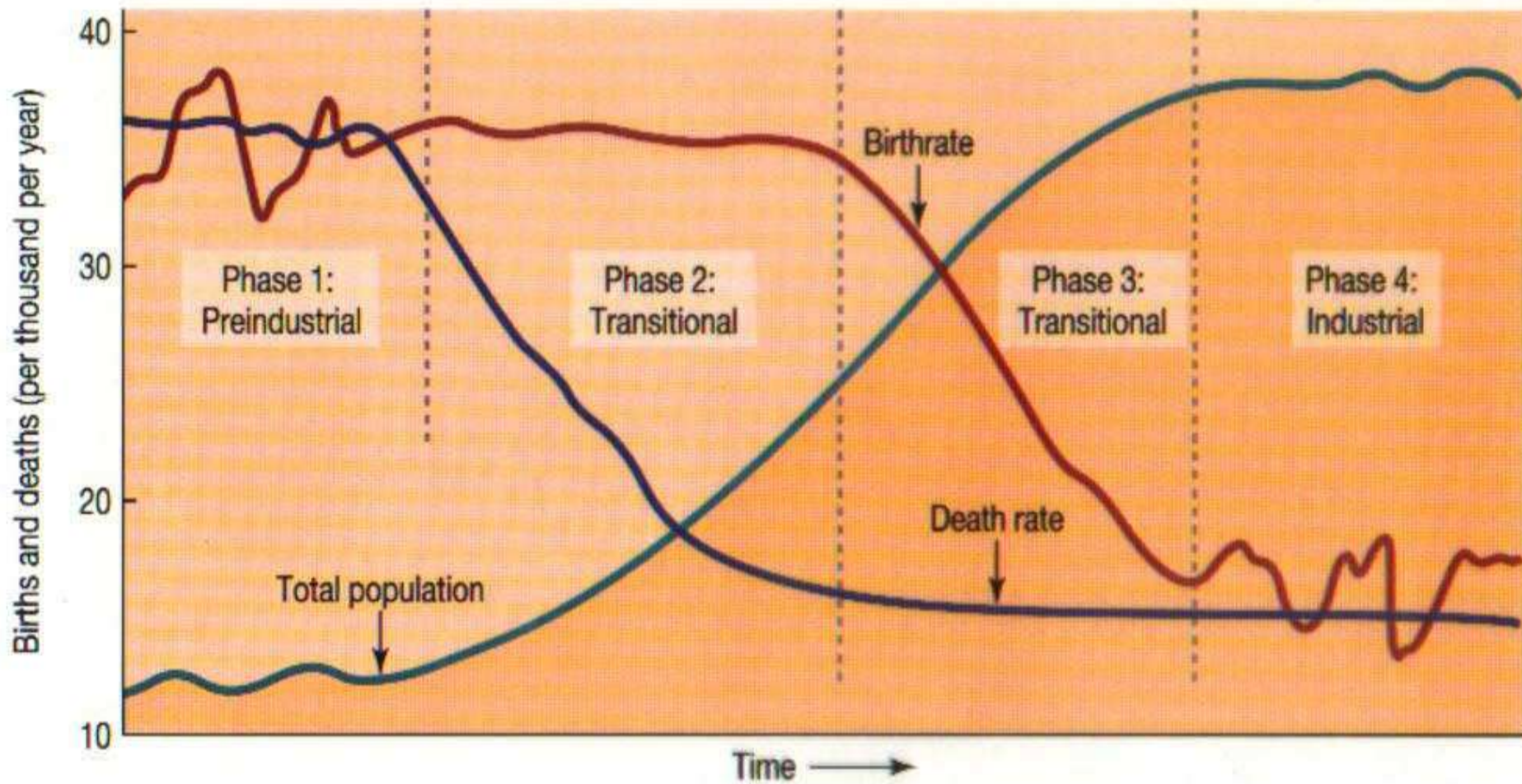| Age	
85+	
80-84	
75-79	
70-74	
65-69	
60-64	
55-59	
50-54	
45-49	
40-44	
35-39	
30-34	
25-29	
20-24	
15-19	
10-14	
5-9	
0-4	

Population (in millions)
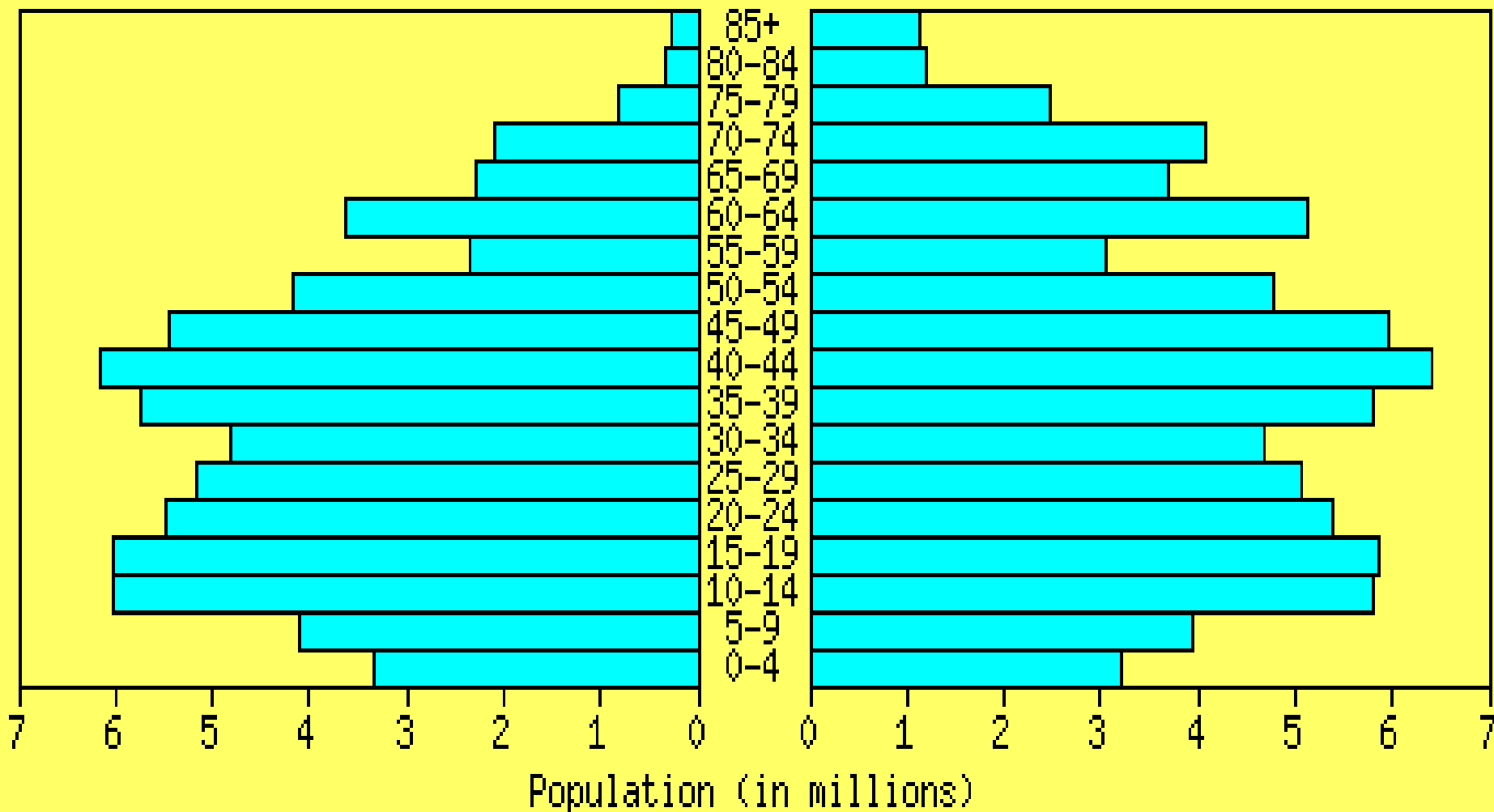
Source: U.S. Census Bureau, International Data Base.

Demographic Transition Model

Demographic Transition Model

F **Stage one (preindustrial/pre-agricultural)**
- Crude birth/death rate high
- Fragile, but stable, population

F **Stage two (improved agriculture and medicine)**
- Lower death rates
- Infant mortality rate falls
- Natural increase very high

F **Stage three (attitudes change)**
- Indicative of richer developed countries
- Higher standards of living/education
- Crude birth rate finally falls

F **Stage four**
- Crude birth/death rates low
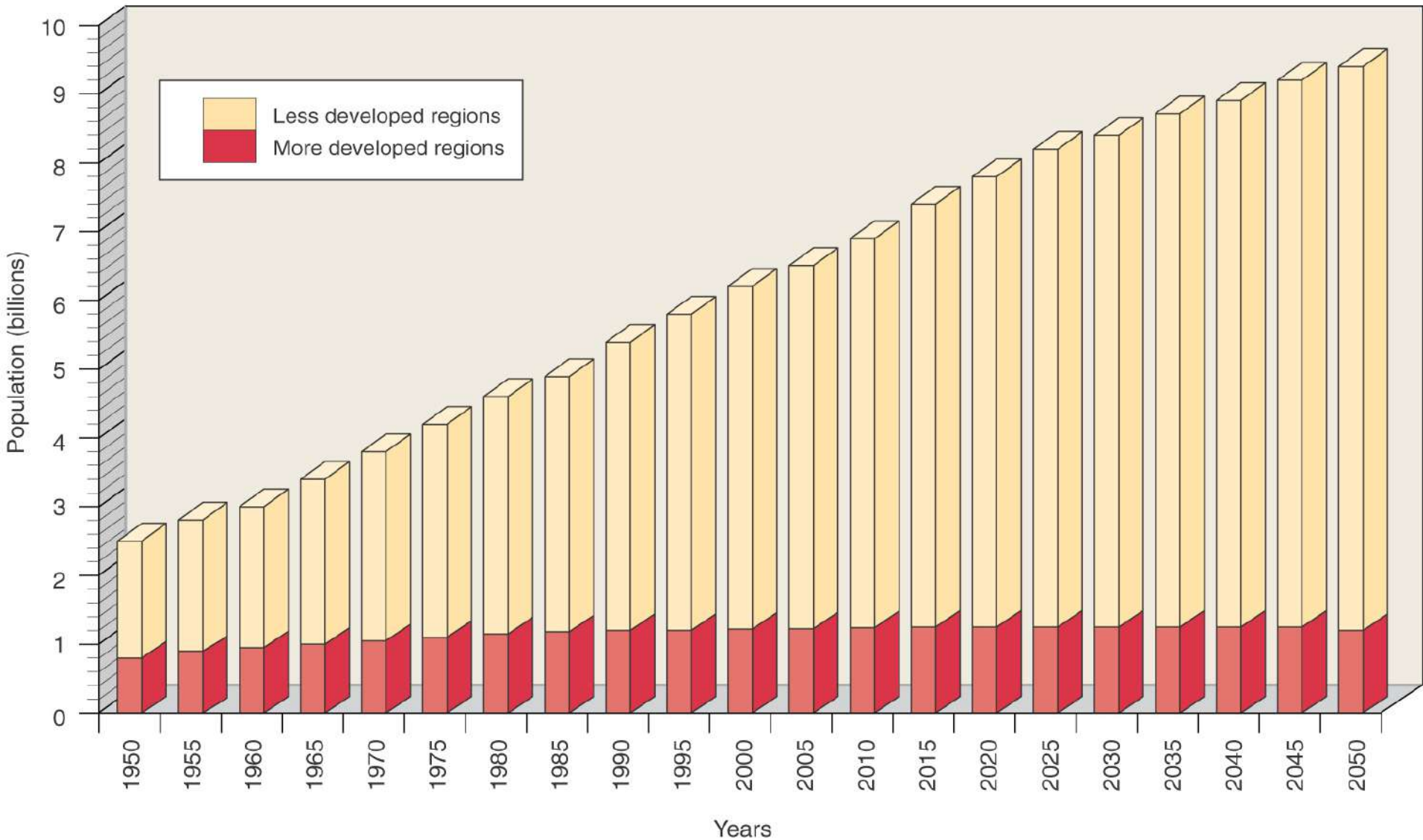- Population stable
- Populations aging

Problems with the Demographic Transition Model

• based on European experience, assumes all countries will progress to complete industrialization

• many countries reducing growth rate dramatically without increase in wealth

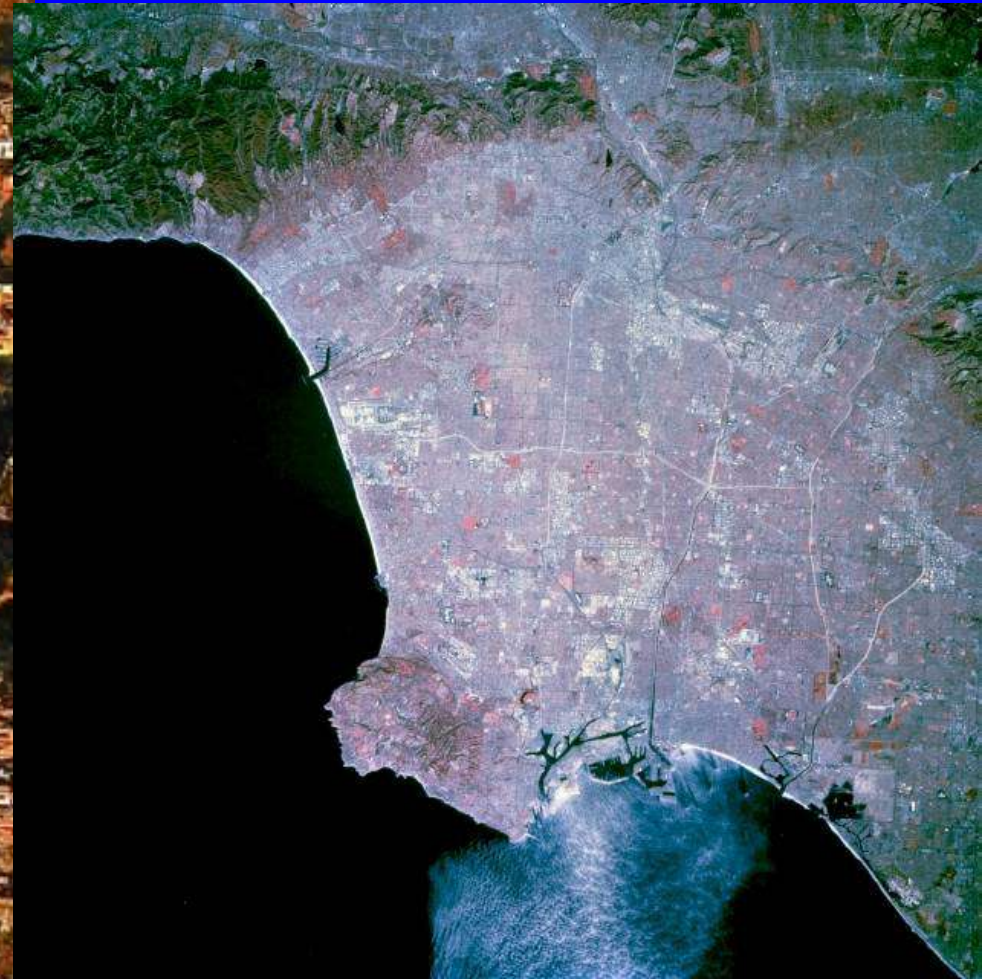• on the other hand, some countries "stuck" in stage 2 or stage 3
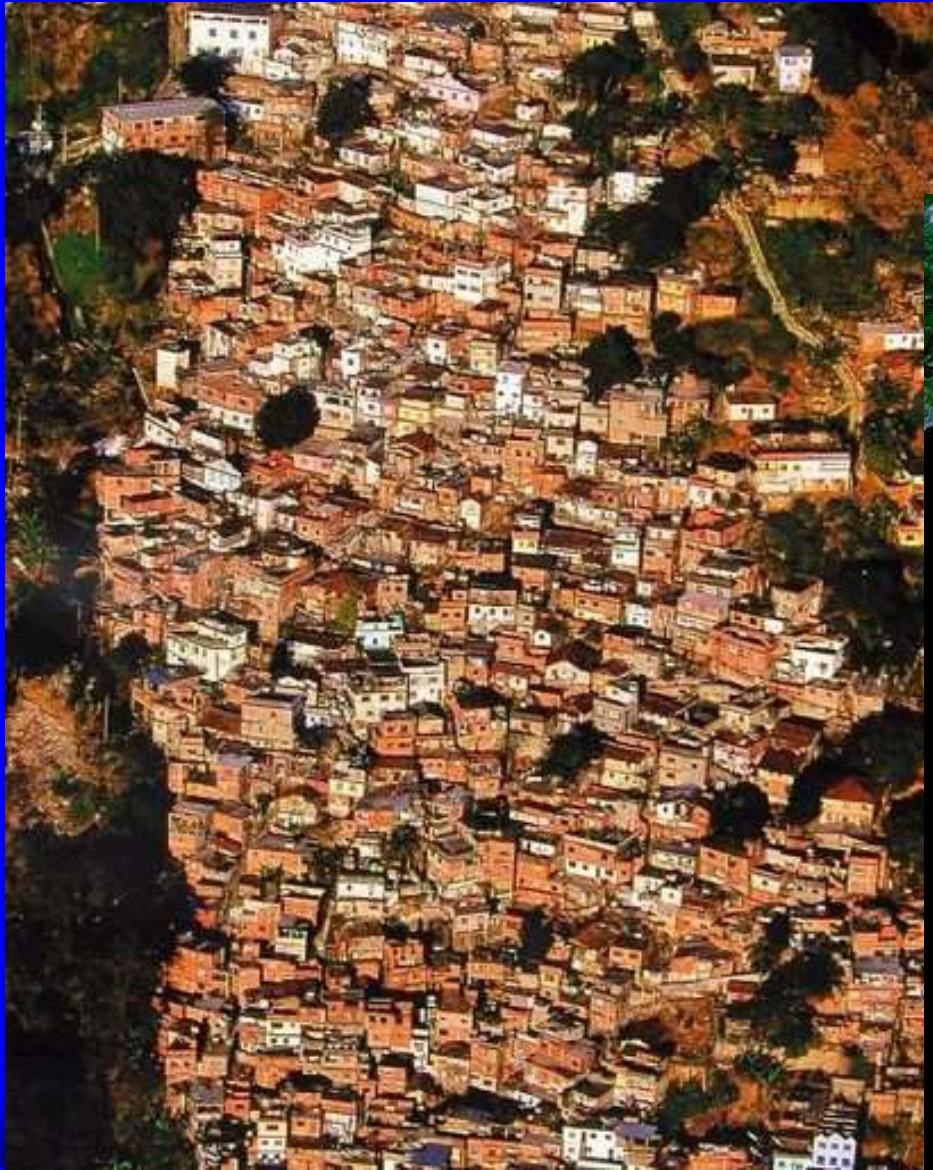
Population Shift

Overpopulation

F When consumption of natural resources by people outstrip the ability of a natural region to replace those natural resources.

Jean Antoine Condorcet

(1743 – 1794)

- **predicted that innovation, resulting increased wealth, and choice would provide food and resources in the future and lead to fewer children per family**

- **believed that society was perfectable**
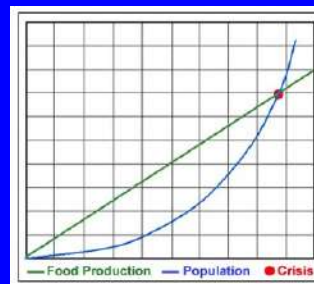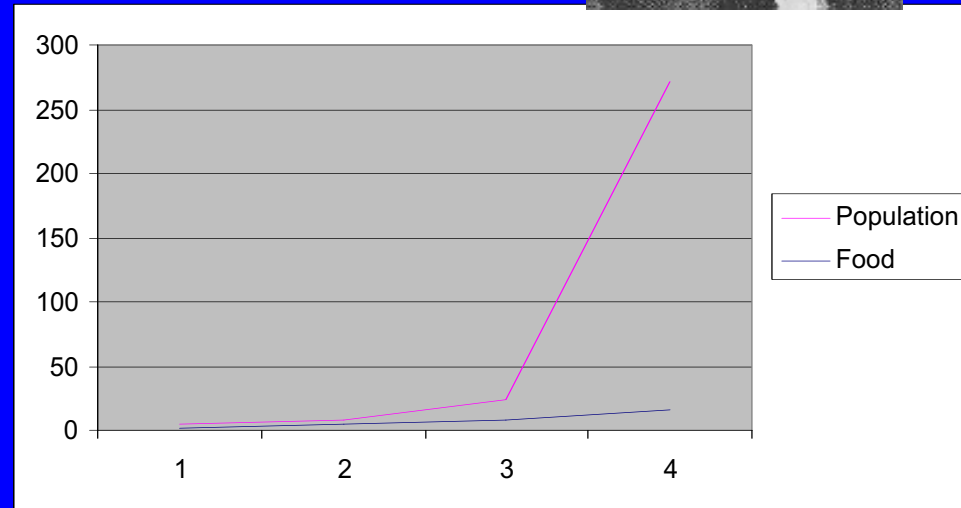
Thomas Malthus on Population

An Essay on the Principle of Population, 1798

Malthus, responding to Condorcet, predicted population would outrun food supply, leading to a decrease in food per person.
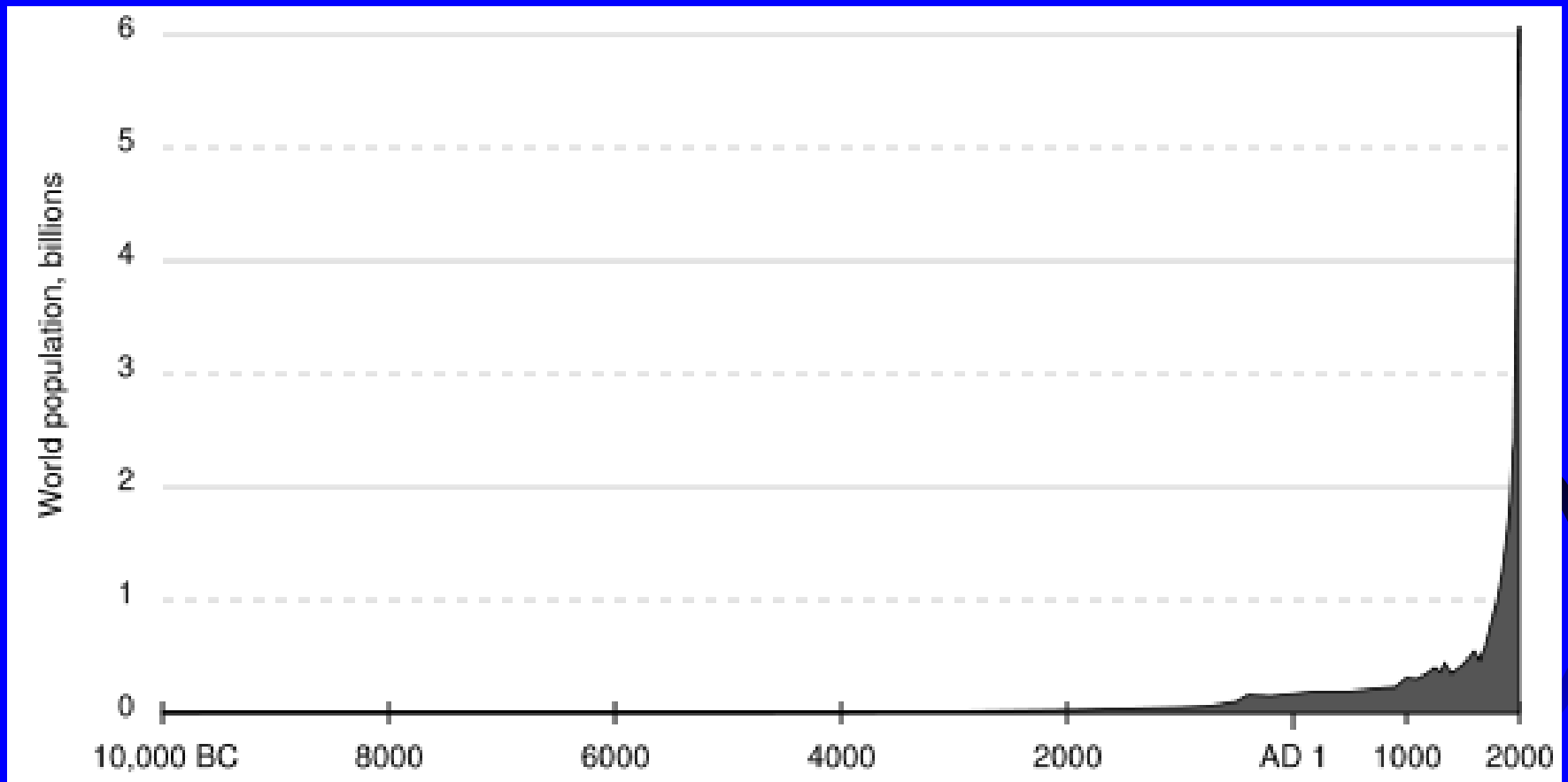
Assumptions

F Populations grow exponentially.

F Food supply grows arithmetically.

F Food shortages and chaos inevitable.

Food Production — Population ● Crisis

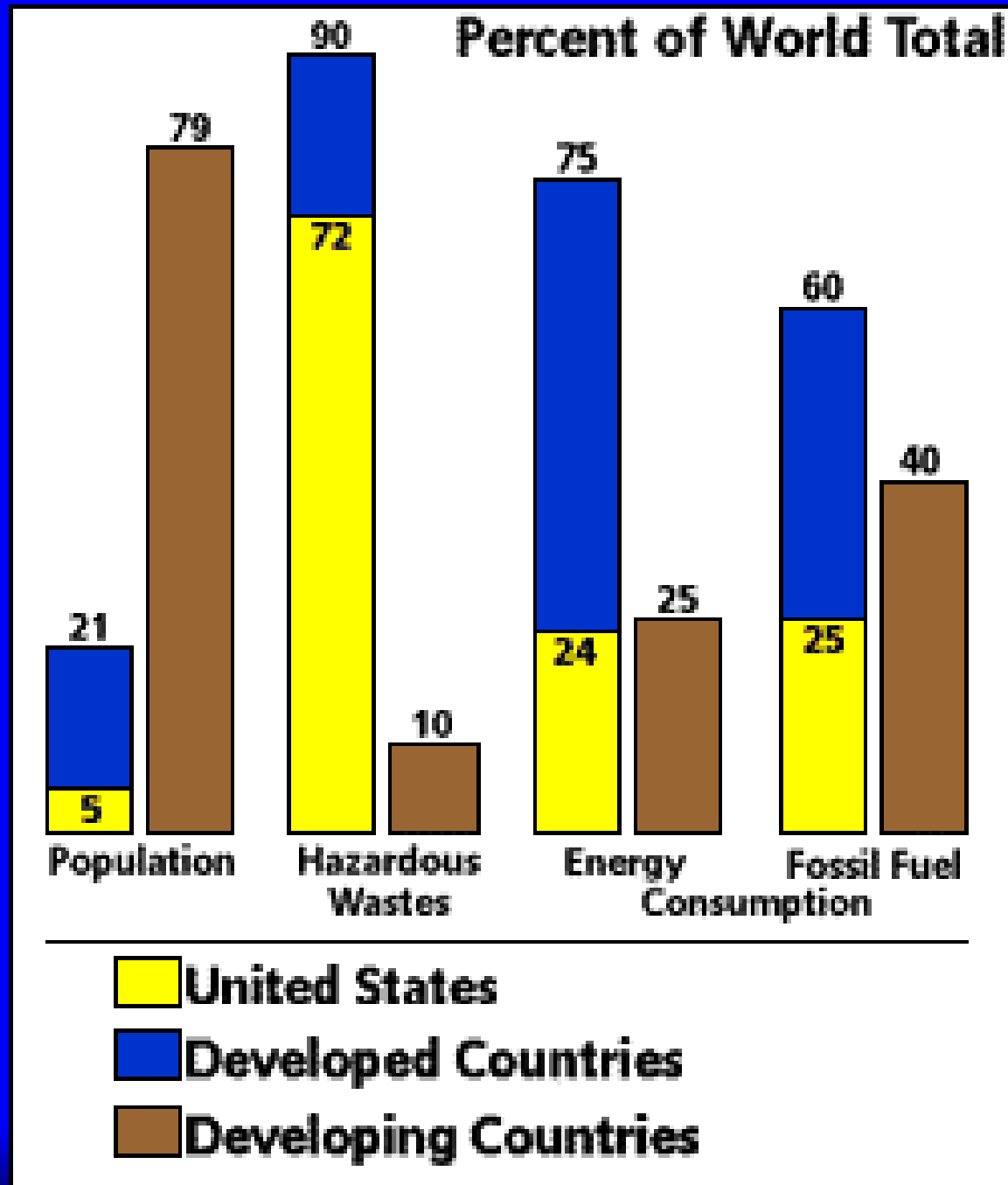| Food	Population
2	2
4	4
8	16
16	256

Population J-Curve

Population and the Environment
$I = P \times A \times T$

Impact = Population x Affluence x Technology
Population-influenced environmental problems:

- *Global Warming*

- *Habitat Loss / Endangered Species*

- *Resource Depletion*

- *Food Shortages? Not globally, but regionally.*

Population and Resource Consumption

Percent of World Total

	United States	Developed Countries	Developing Countries
Population	5	21	79
Hazardous Wastes	72	90	10
Energy Consumption	24	75	25
Fossil Fuel	25	60	40

The End