

Global Population 2

Dynamics & Future

# Outline

1. Global population dynamics
2. Population stabilization
3. The demographic transition
4. World population future

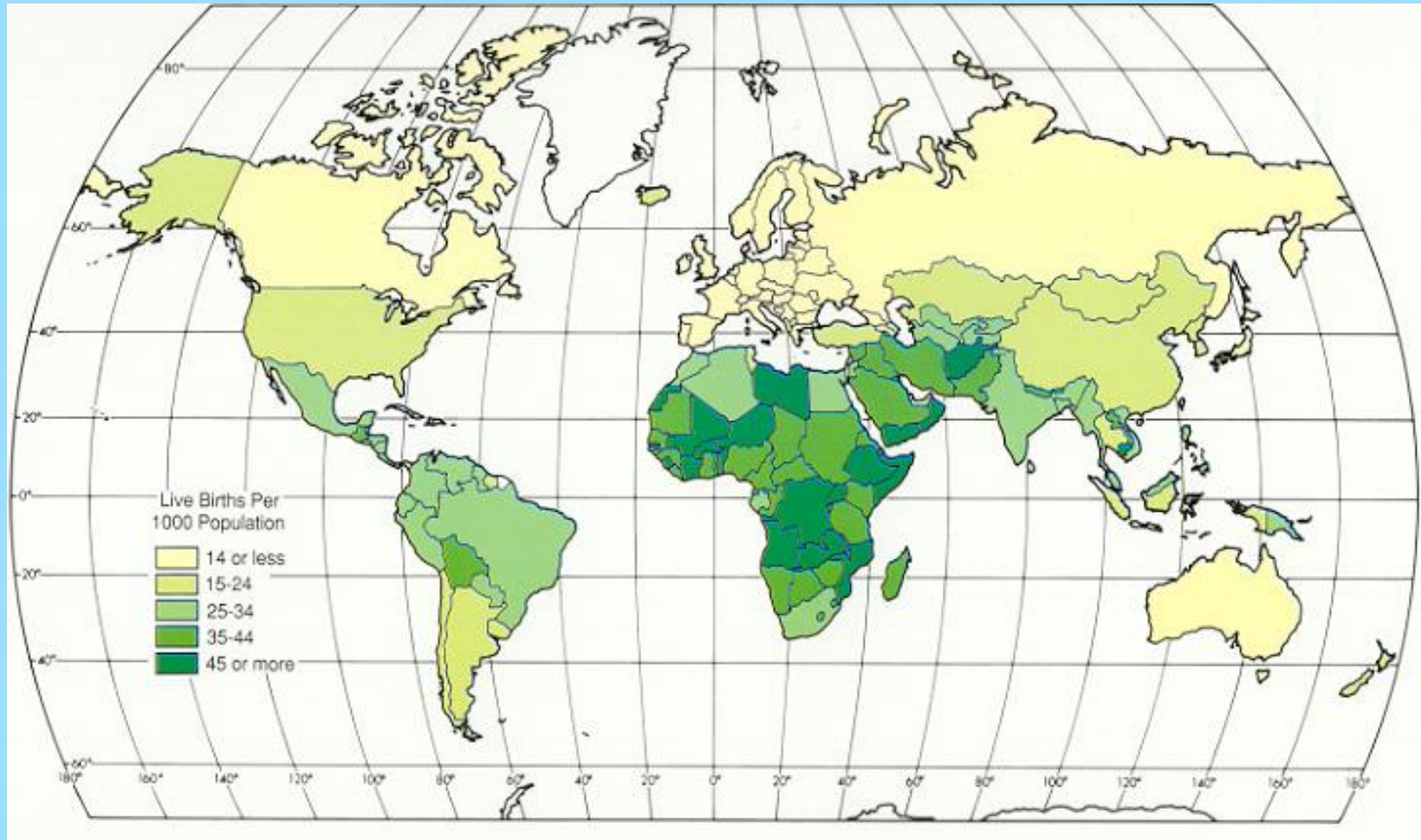
# 1. Global population dynamics

The human population is a dynamic entity in a constant state of flux.

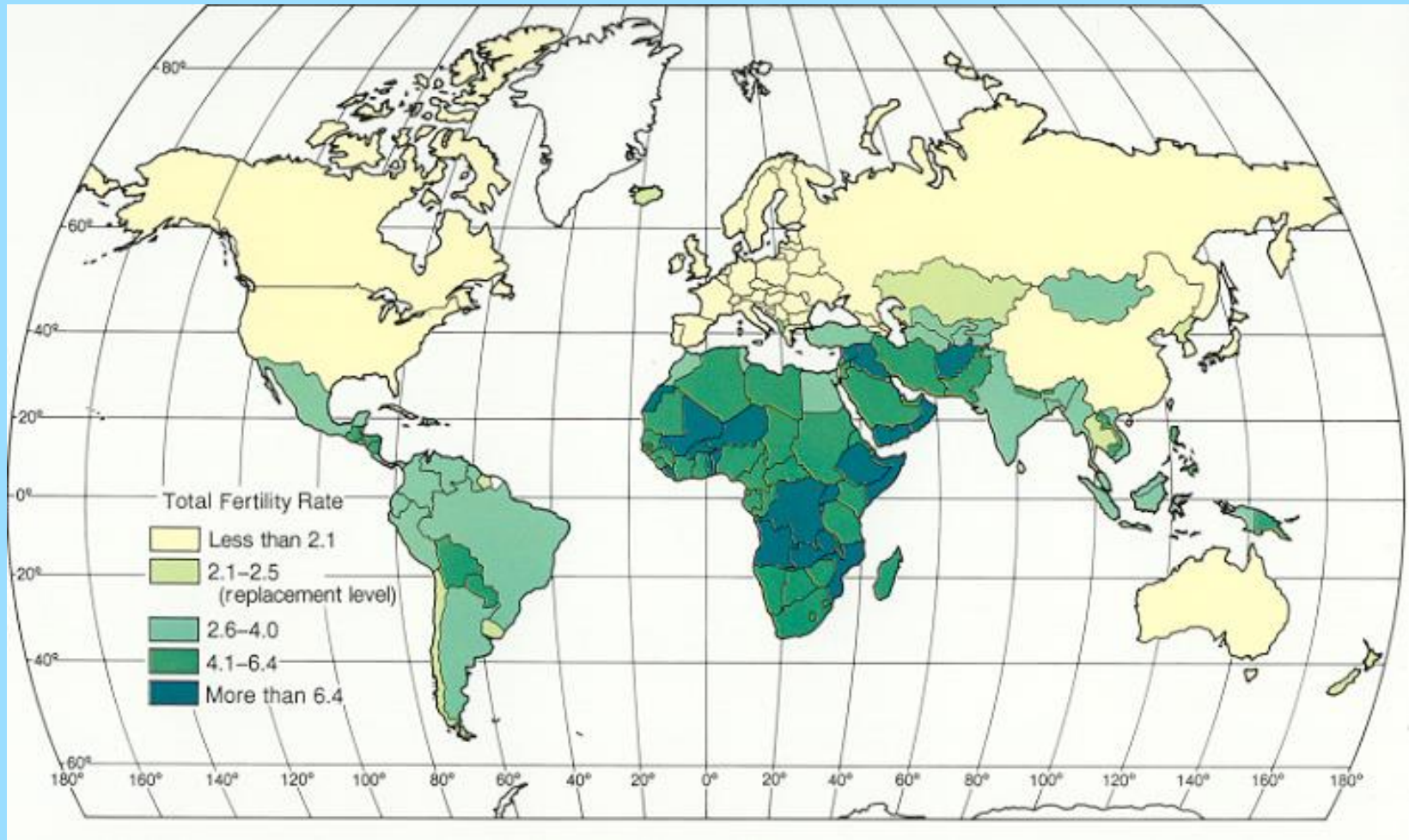
Many variables influence the rate at which populations change, either regionally or globally, i.e.

- birth rate.
- fertility.
- death rates – especially infant mortality.

# World Birth Rates



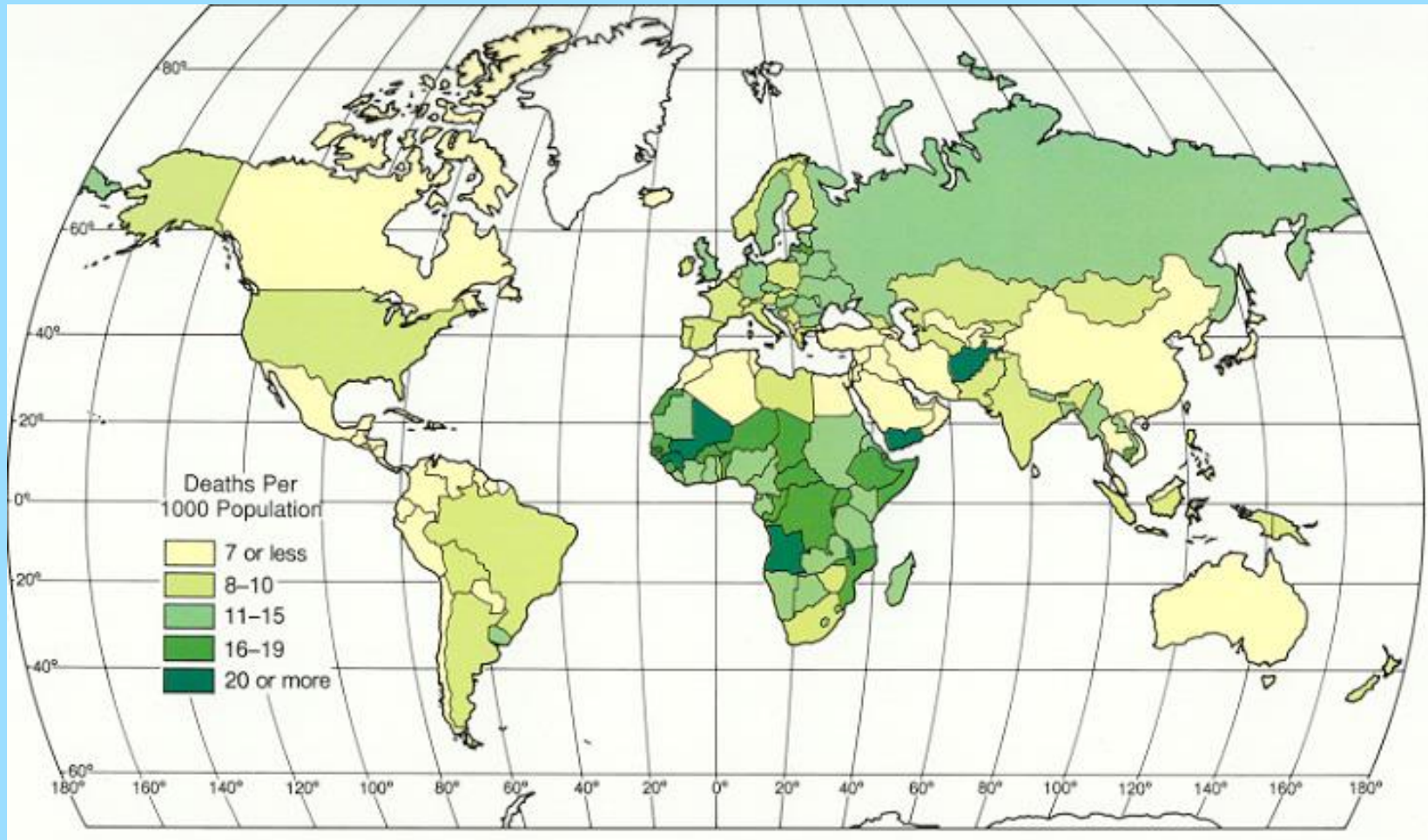
# World Fertility Rates



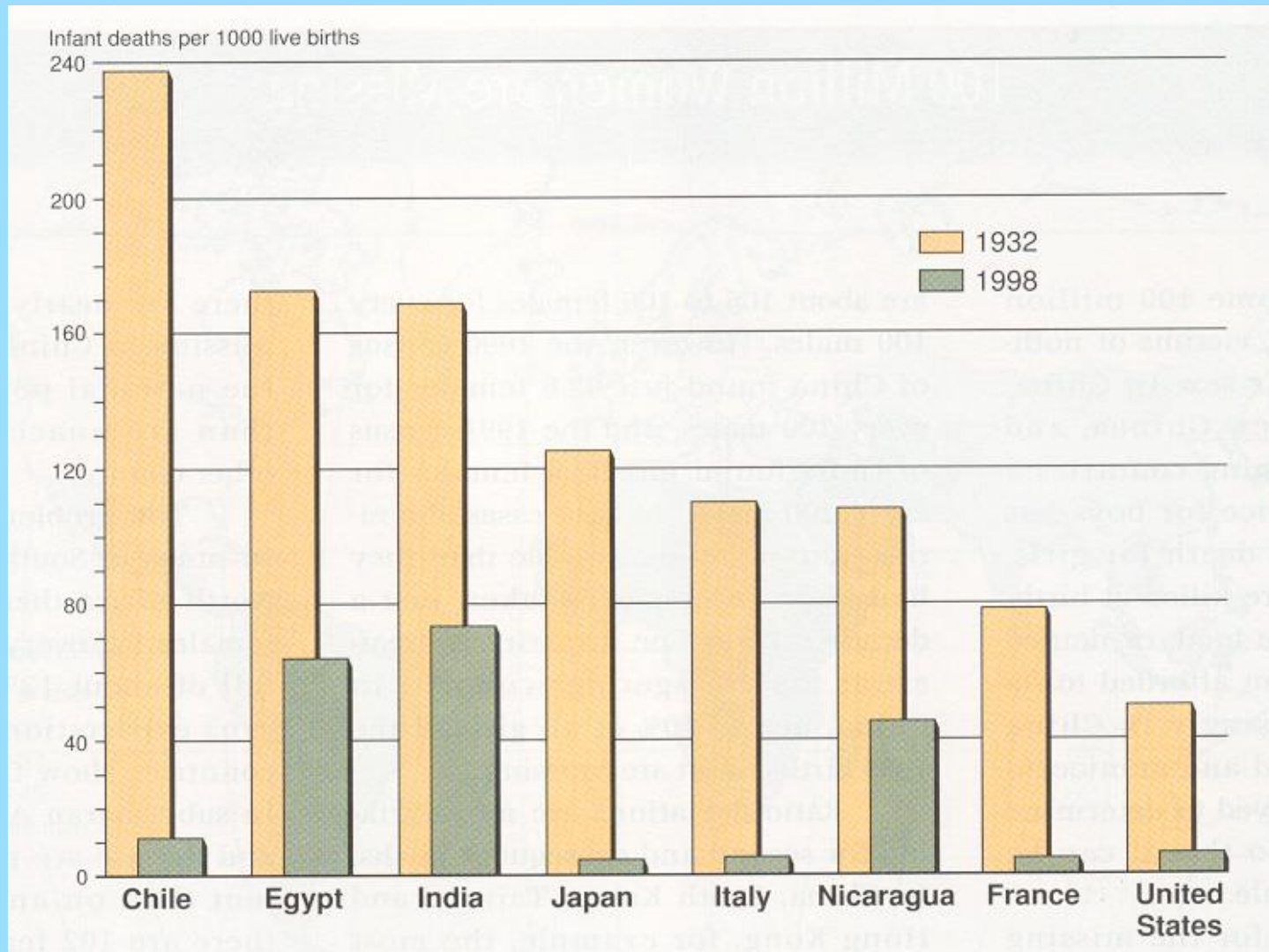
Fertility rate: mean number of babies born to a woman during her reproductive years.

**Standard replacement rate = 2.1**

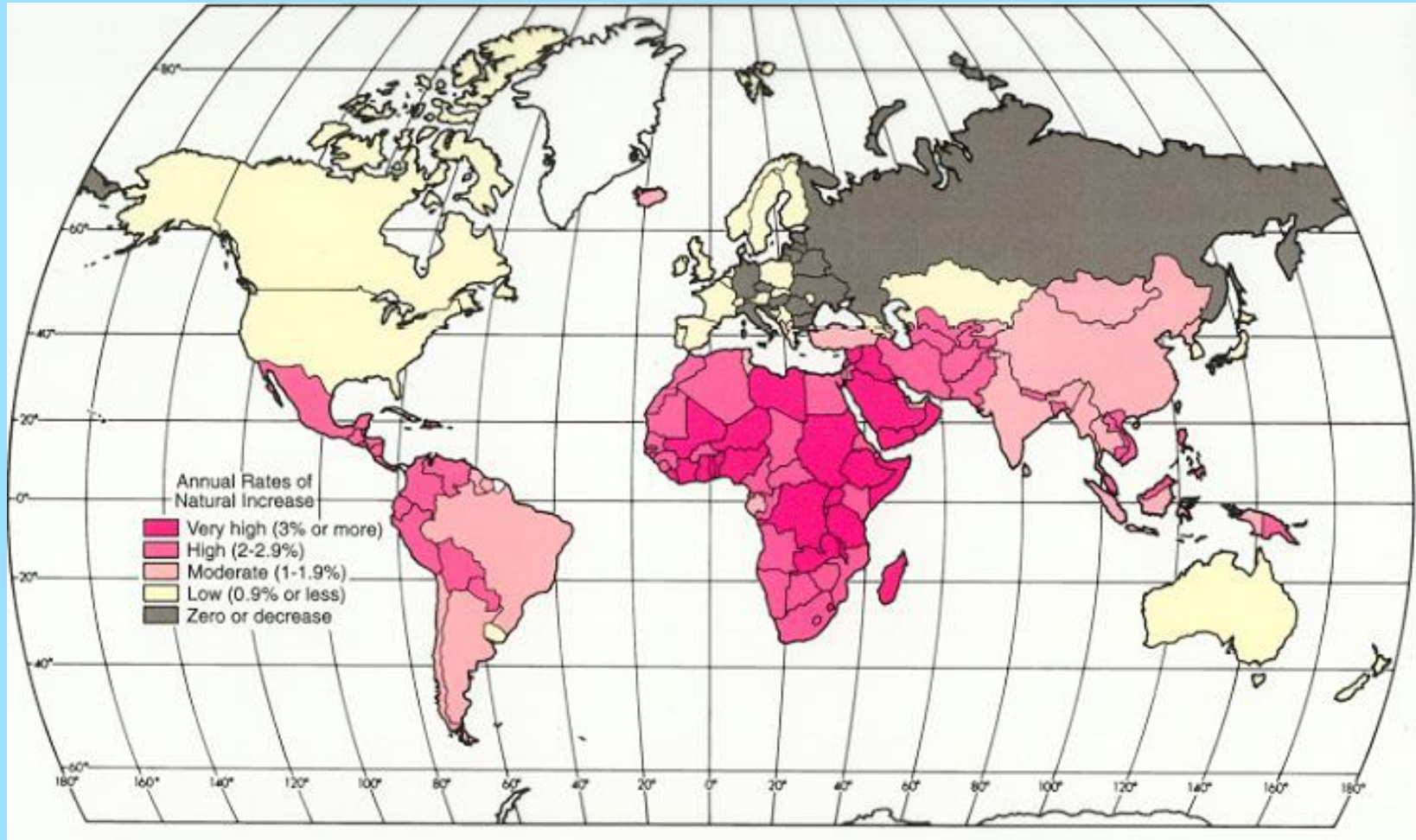
# World Death Rates



# Selected Infant Mortality Rates

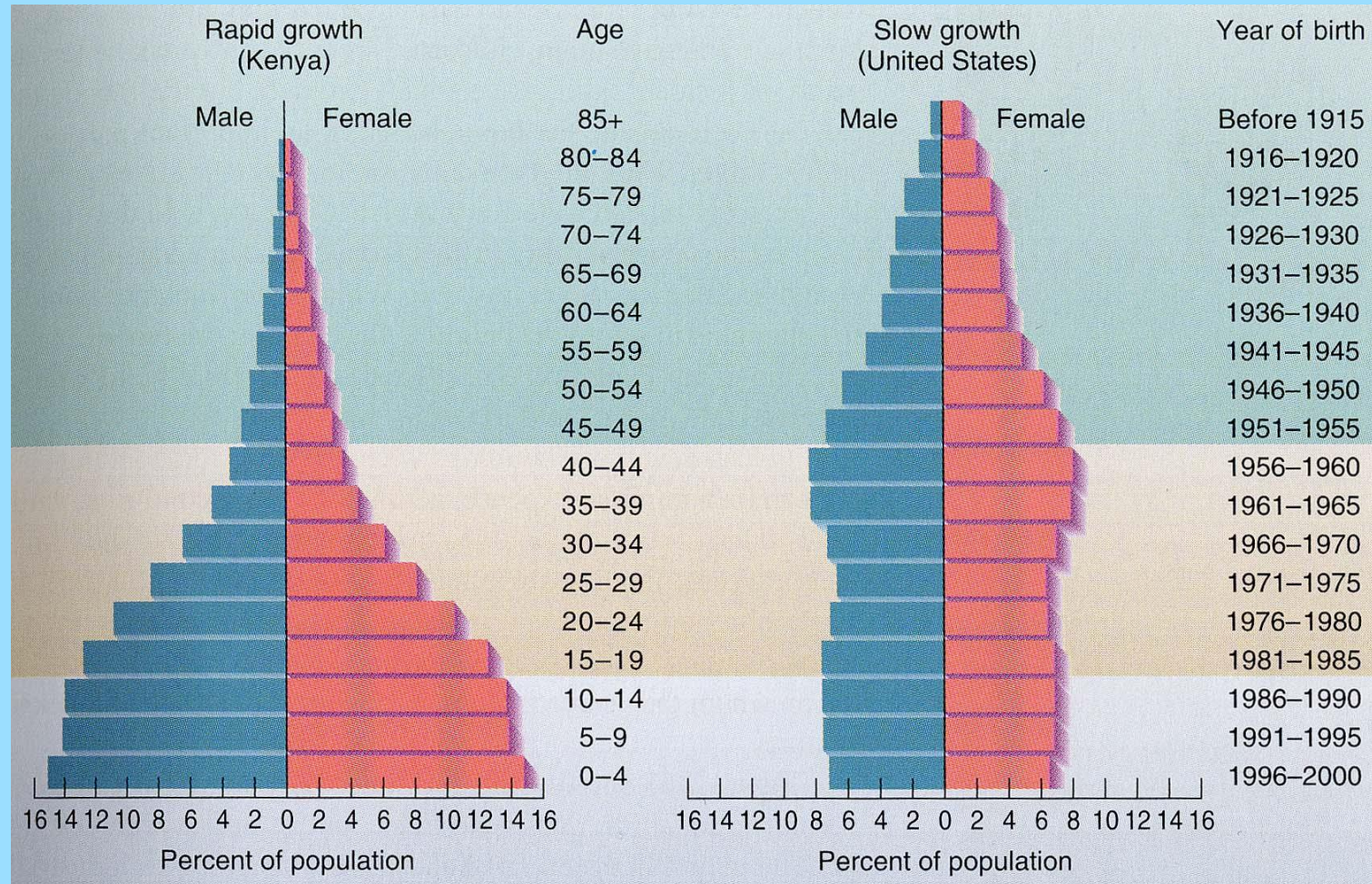


# World Rates of Natural Increase

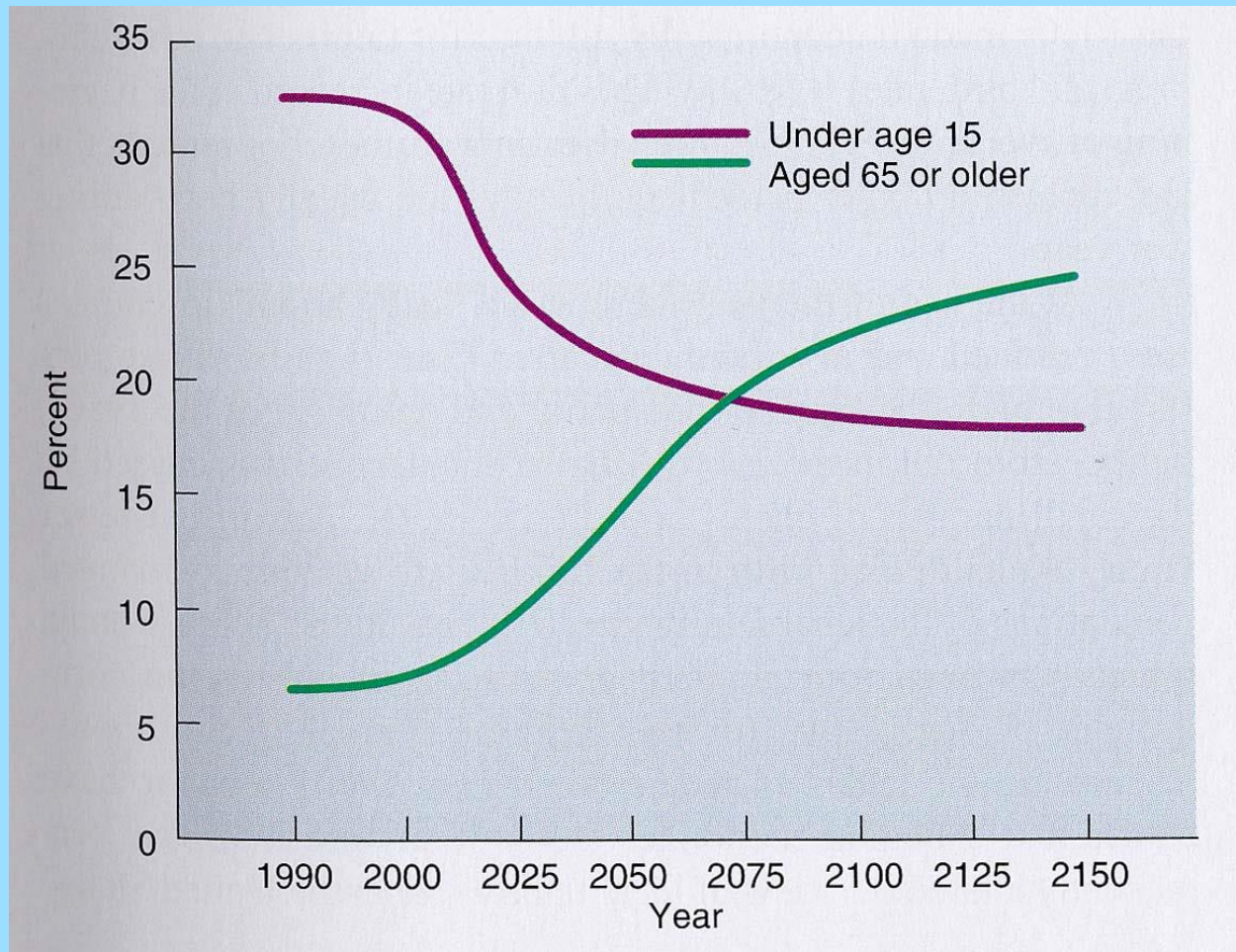




# Age class histograms – rich vs. poor nations



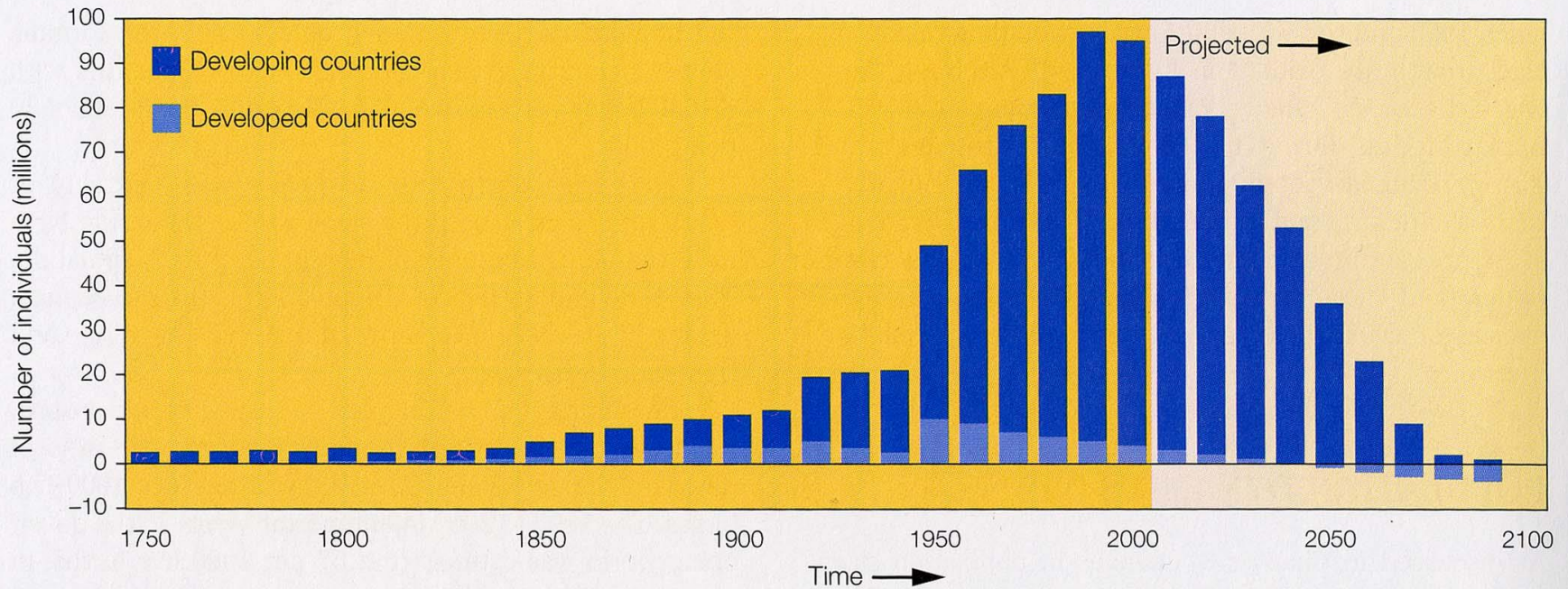
# Changing age structure of the global population



## WORLD POPULATION: SOME KEY FIGURES

<b>Region</b>	<b>Birth Rate</b>	<b>Death Rate</b>	<b>Growth Rate</b>	<b>Approx. Doubling Time</b>	<b>1999 Population</b>	<b>2025 Forecast Population</b>
	(per 1000)	(per 1000)	(%)	(years)	(millions)	(millions)
North America	14	8	0.6	119	303	374
Europe	10	11	-0.1	-	728	718
Asia	23	8	1.5	46	3637	4923
Africa	39	14	2.5	28	771	1290
Latin America	24	6	1.8	38	512	709
Oceania	18	7	1.1	64	30	41
<b>World</b>	<b>23</b>	<b>9</b>	<b>1.4</b>	<b>49</b>	<b>5982</b>	<b>8054</b>

# Global population growth



## 2. Population stabilization

Obviously, the global population cannot increase indefinitely.

An exponential growth rate of only 1.5% would result in:

- 2100: pop of 25 billion
- 2200: pop of 100 billion
- 2300: pop of 500 billion
- 2400: pop of 2 trillion

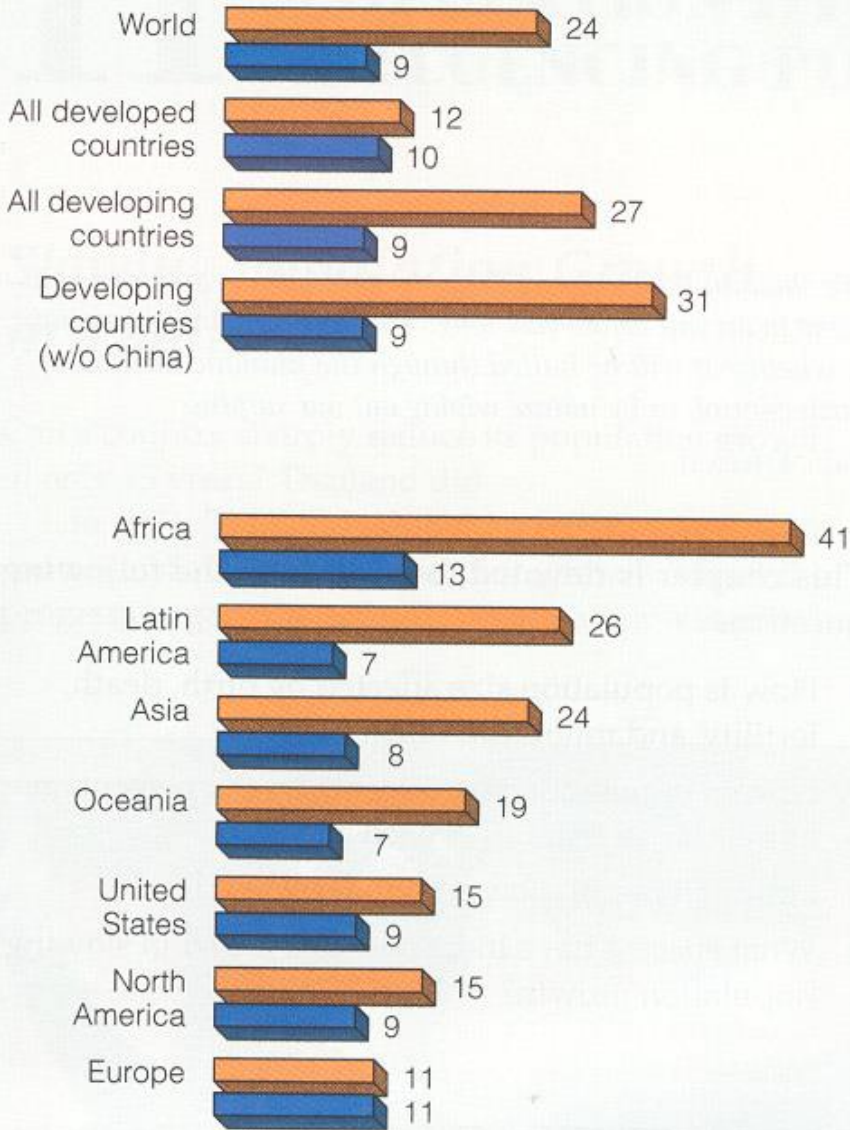
# Population stabilization

At some point, the world's population must and will stabilize.

Since stabilization implies a long-term balance between birth and death rates, it also follows that it can only be achieved in one of two ways, or a combination of the two:

- an increase in the death rate (which is presumably undesirable).
- a decline in the birth rate (which some people also see as undesirable).

■ Average crude birth rate    ■ Average crude death rate



**Figure 11-2** Average crude birth and death rates for various groupings of countries in 1996. (Data from Population Reference Bureau)

Birth and  
death rates  
(per 1000 people).

# 3. The demographic transition

Is a population change model that does several things:

- provides a framework to describe and understand past trends and variations in population growth.
- provides a framework both for forecasting the future and for providing prescriptions for population policy.
- explicitly links population to key related factors such as economic development, affluence, industrialization, urbanization, cultural norms and values, etc.



# The demographic transition

The model is inherently geographical in that trends, understanding, and predictions are based on subdividing the world into developed and developing areas – or, more properly, the Western and non-western experiences.

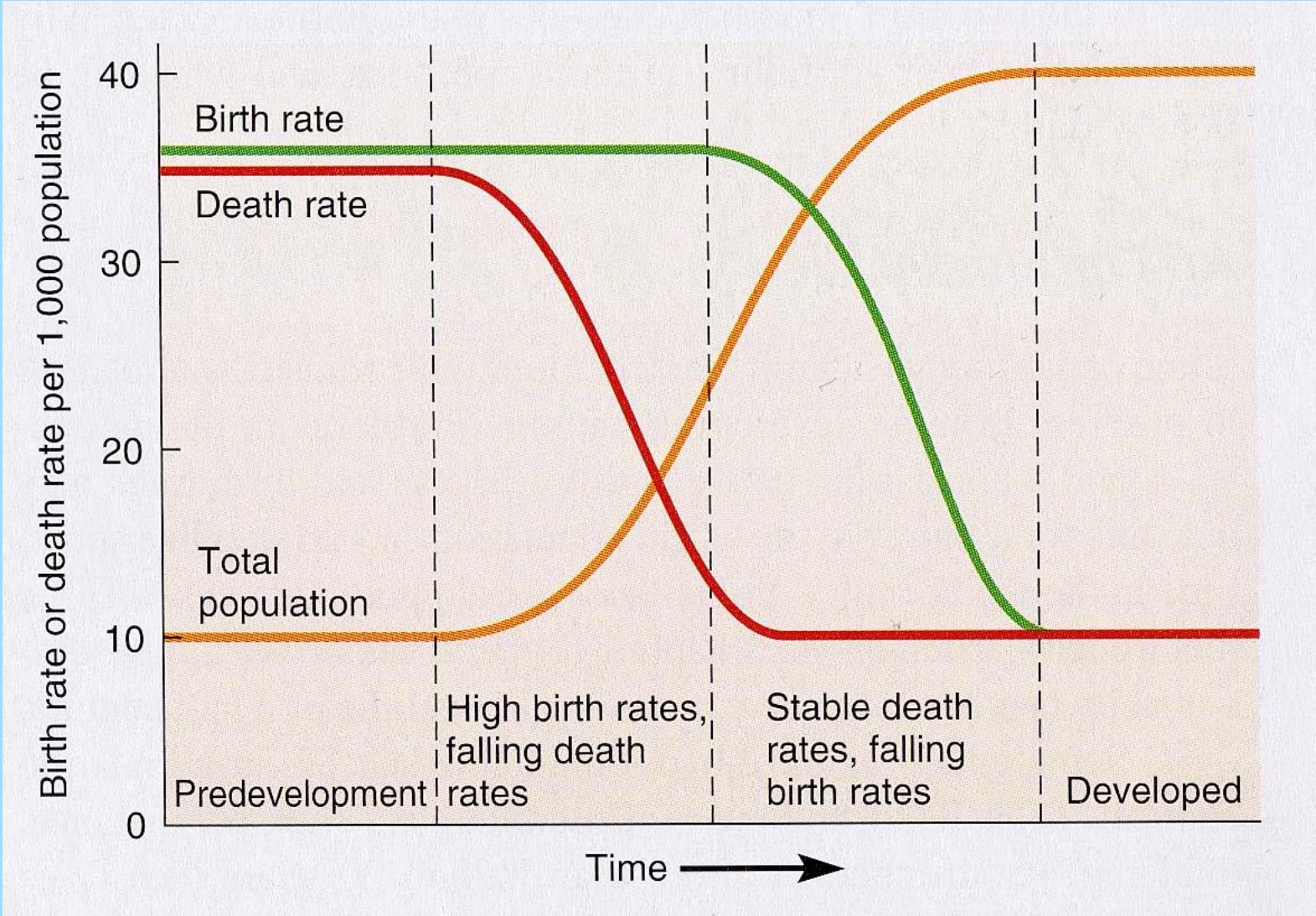
The model is also inherently environmental because of reciprocal relationships among population, resources, and the natural environment

# The demographic transition

Actual changes and associated issues are far more complex than the model can convey.

The model is based on observations about birth and death rates, how these vary geographically, and how they have changed historically in different parts of the world.

# Demographic transition model



Pre-industrial

Transitional

Industrial

Post-industrial

# Stage 1: The Pre-Industrial Stage

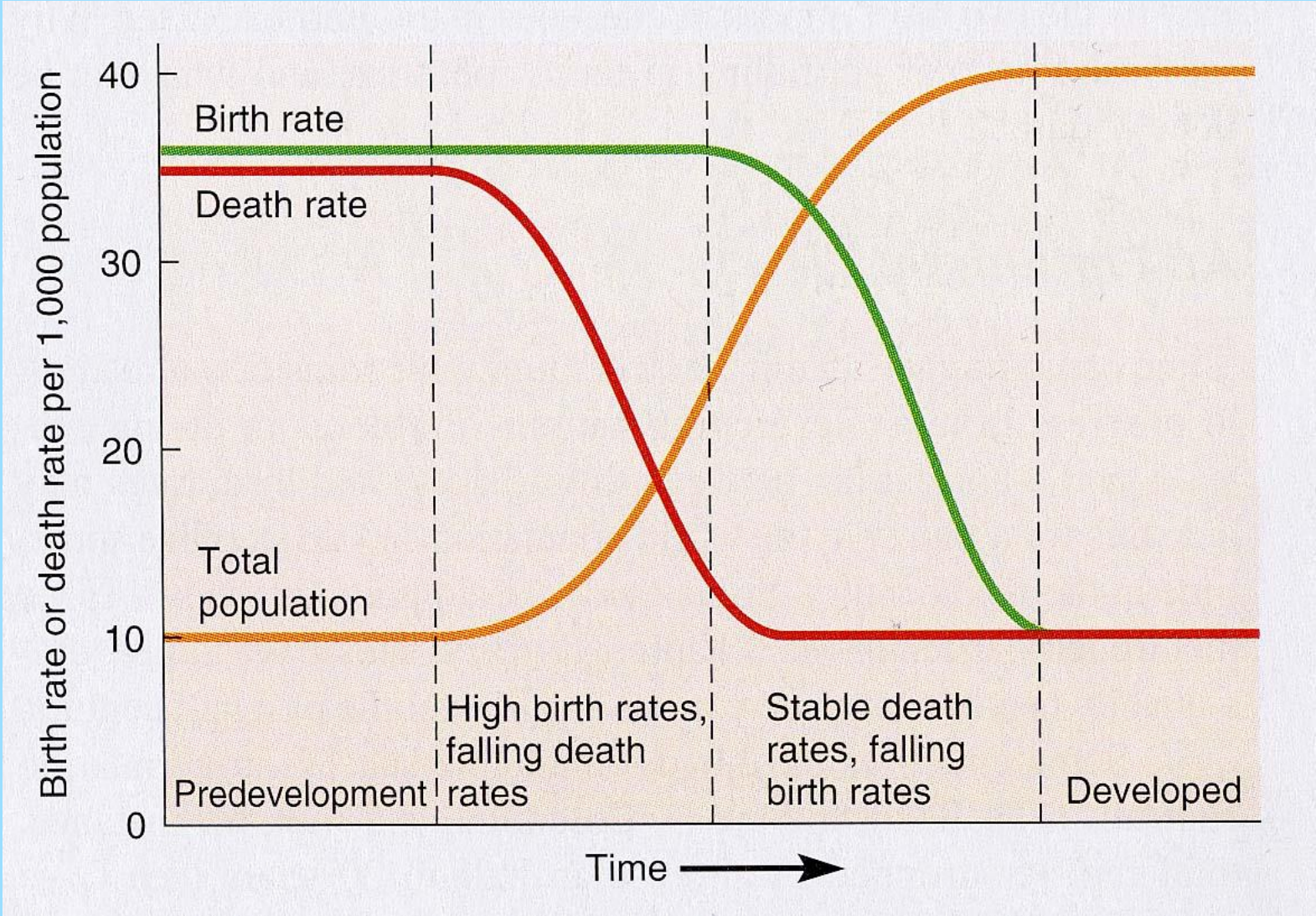
Birth and death rates high, but roughly in balance.

therefore, rate of growth slow.

Population size small, therefore annual increment small.

Stage continued to mid-18th C in developed world, thus accounting for period of slow growth to 1750.

# Demographic transition model



Pre-industrial

Transitional

Industrial

Post-industrial

# Stage 2: The Transitional Stage

Characterized by rapid drop in death rates.

Birth rates remained the same, thus two rates no longer in balance – result: rapid population growth.

Occurred 1750 to 1900 in the developed world, this was the product of the Industrial Revolution and its aftermath.

# Some factors that have historically affected death rates

Increased food supplies

Improved food distribution

Better nutrition

Improvements in medical & public health technology

Improvements in sanitation & personal hygiene

Safer water supplies

War

# Stage 3: The Industrial Stage

Occurred during 20<sup>th</sup> century in developed world.

characterized by rapid fall in birth rates.

Low death rates continued, thus two rates back in balance, with slow growth rate (but don't forget; the annual increment is greater than in Stage 1).



# Some factors that have historically affected birth rates

Average level of education & affluence

Importance of children as part of the labour force

Urbanization

Cost of raising & educating children

Educational & employment opportunities for women

Infant mortality rate

# Some factors that have historically affected birth rates

Average age at marriage

Availability of private & public pension systems

Availability of legal abortions

Availability of reliable methods of birth control

Religious beliefs, traditions, & cultural norms

# Stage 4: The Post-Industrial Stage

Argued to occur when birth and death rates are exactly in balance, i.e., zero or even negative population growth.

# Demographic transition in the developing world

Same process is thought to occur in developing world, but at later dates:

- Stage 1 continued until about the start of the 20th century
- Most developing countries are currently in Stage 2

A hypothesis inherent in drawing inferences from the Demographic Transition model: increasing economic development would reduce the birth rates, leading to population stabilization -- as can be seen in factors affecting birth rate.

# Demographic transition

Overall implication: the key to pop stabilization is development.

However, there are “hidden” issues:

- increase in living standards equals increased resource use, so population stabilization may be viewed as the exchange of one set of problems for another.
- this emphasis on population, and where it is growing fastest, avoids the issue of the impact of affluent consumption in the developed countries.

# 4. World population future

Very difficult to predict the exact numbers or trend of the global population

- approximate trend is pretty obvious

Too many variables are involved:

- advances in health care and medicine
- environmental conditions
- disasters, either natural or anthropogenic

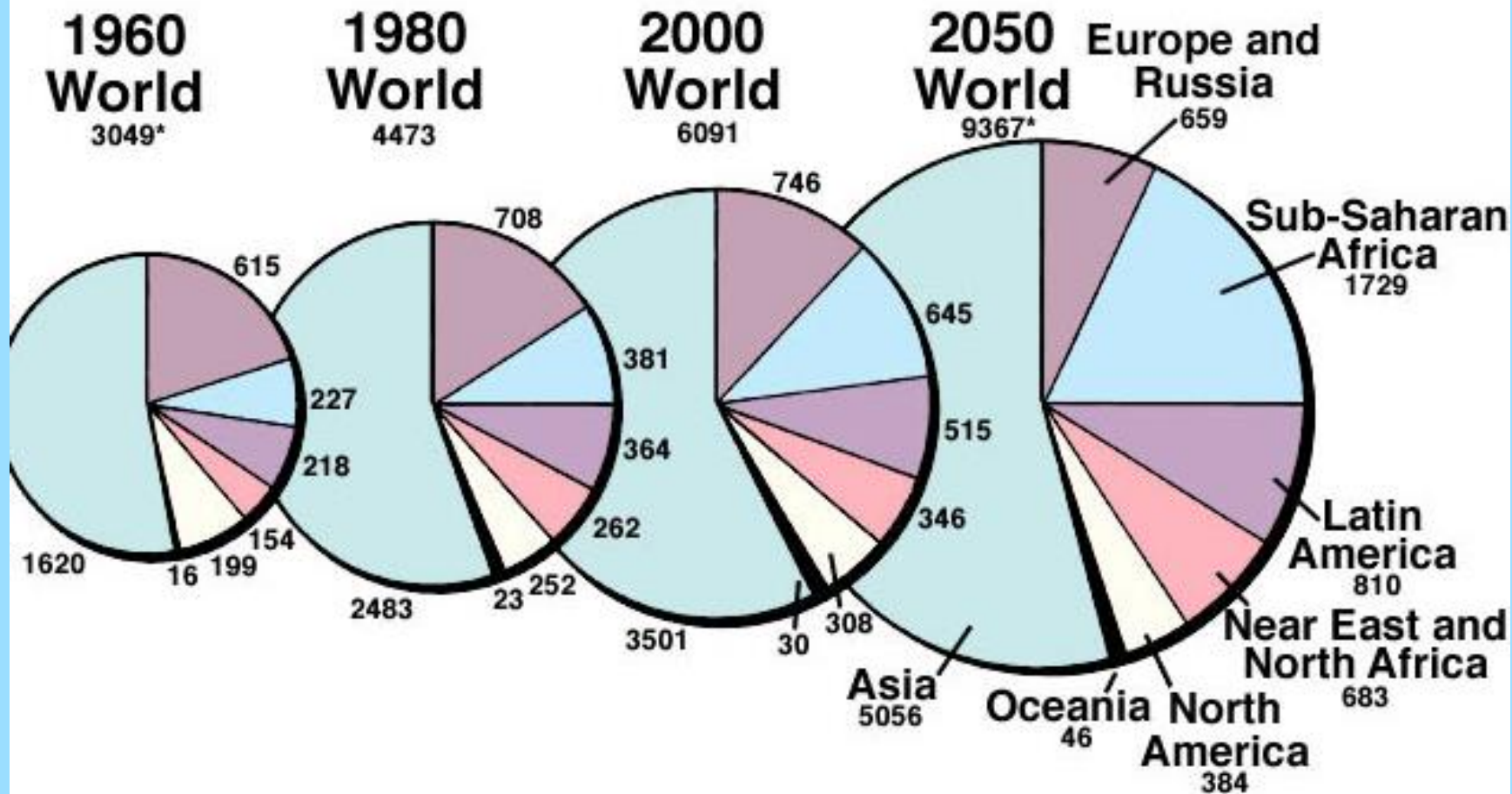
# Global population (millions)

Population Reference Bureau, 2004

2004		2050	
<u>Country</u>	<u>Pop.</u>	<u>Country</u>	<u>Pop.</u>
China	1300	India	1628
India	1087	China	1437
USA	294	USA	420
Indonesia	219	Indonesia	308
Brazil	179	Nigeria	307
Pakistan	159	Pakistan	295
Russia	144	Bangladesh	280
Bangladesh	141	Brazil	221
Nigeria	137	Congo	181
Japan	128	Ethiopia	173

The diagram illustrates population changes between 2004 and 2050. A red arrow points from China's 2004 population (1300 million) to China's 2050 population (1437 million). A yellow arrow points from India's 2004 population (1087 million) to India's 2050 population (1628 million). A green arrow points from Nigeria's 2004 population (137 million) to Nigeria's 2050 population (307 million).

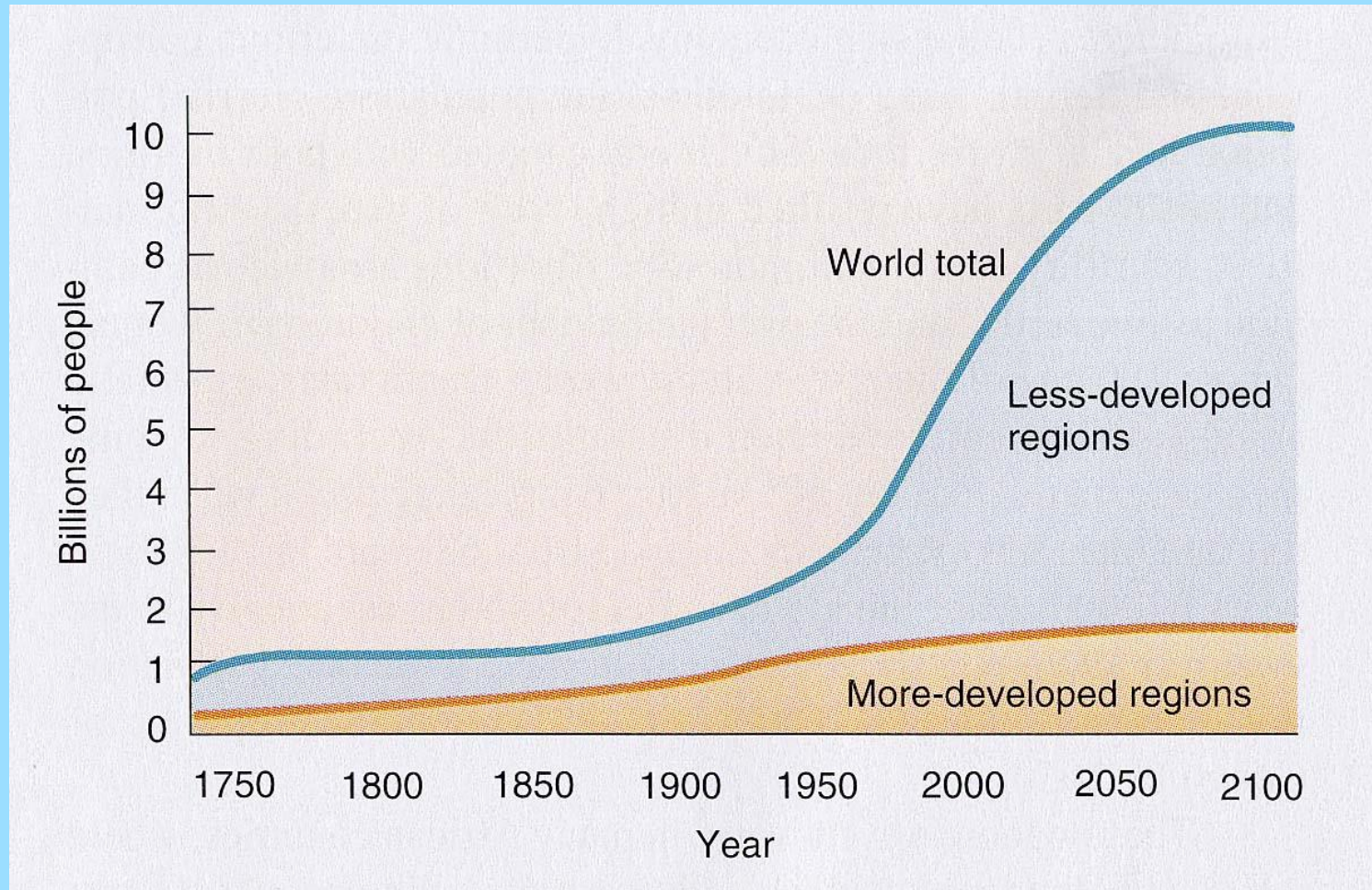
# Population Growth and Projections (2)



\*Figures in millions of persons

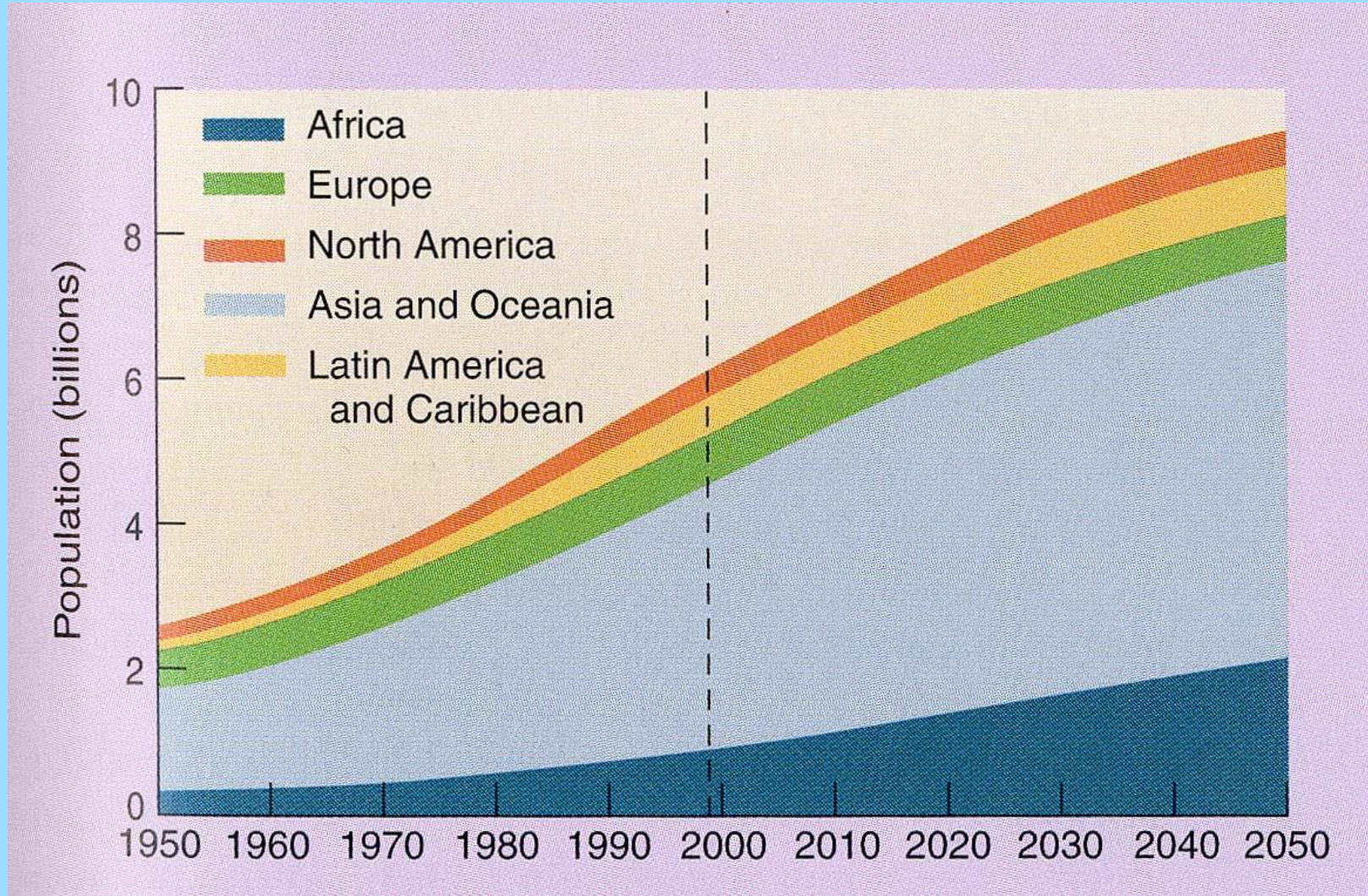


# Estimated human population growth 1750 - 2100



More than 90% of growth in 20<sup>th</sup> & 21<sup>st</sup> centuries will occur in poorer countries.

# Comparison of projected population growth rates



# Population Growth 2000-2015

