

Chapter 5

Populations

5-1 How Populations Grow

- Three important characteristics of a population
- Geographic distribution-area inhabited by the population
- Density-number of individuals in a certain area
- Growth Rate-how fast the density of the population is increasing

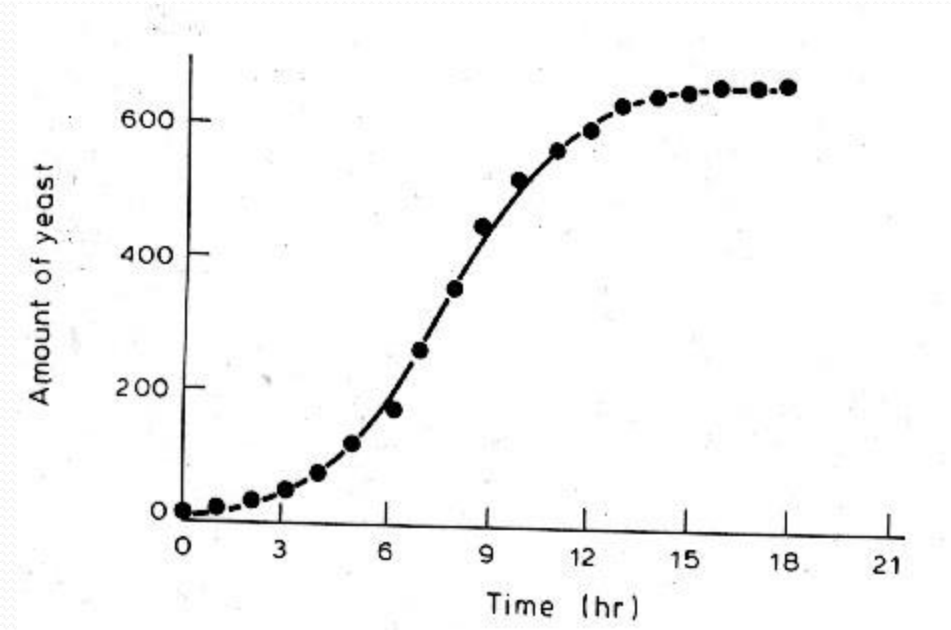
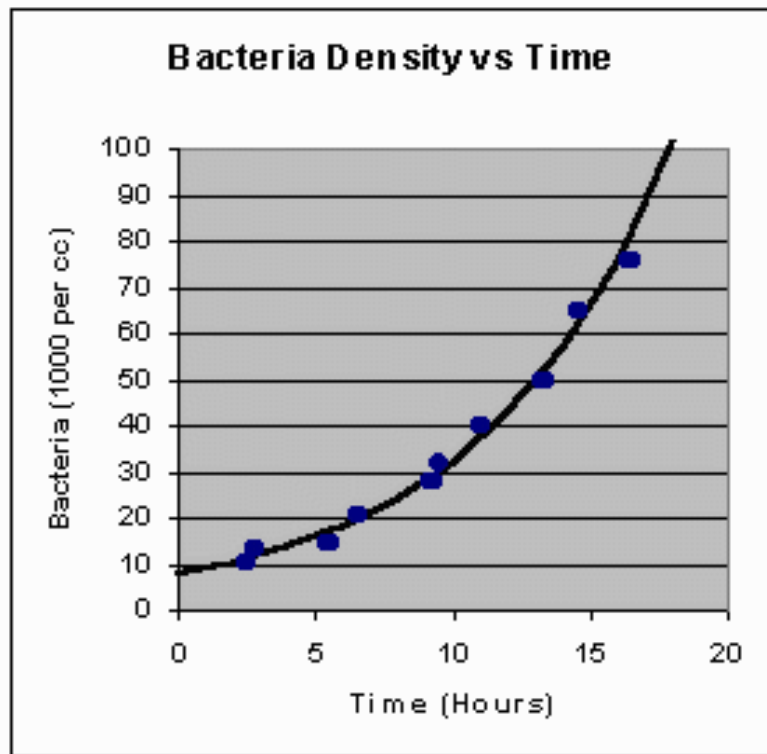
5-1 How Populations Grow

- Population Growth-Three factors affect population size
 - # of births
 - # of deaths
 - # of individuals that enter or leave the population
- Immigration-movement of individuals into a population
- Emigration-movement of individuals out of a population

5-1 How Populations Grow

- Exponential growth occurs when the individuals in a population reproduce at a constant rate
 - Happens under ideal conditions with unlimited resources
 - Example-bacteria grown in culture in the lab
- Logistic growth occurs when a population's growth slows or stops
 - Happens when resources become limited
 - Example-yeast fermenting grain in beer-making

Exponential and Logistic Growth



5-2 Limits to Growth

- Limiting factor is a factor that causes population growth to decrease
 - Competition
 - Predation
 - Parasitism and disease
 - Drought and other climate extremes
 - Human disturbances

5-2 Limits to Growth-Density dependent factors

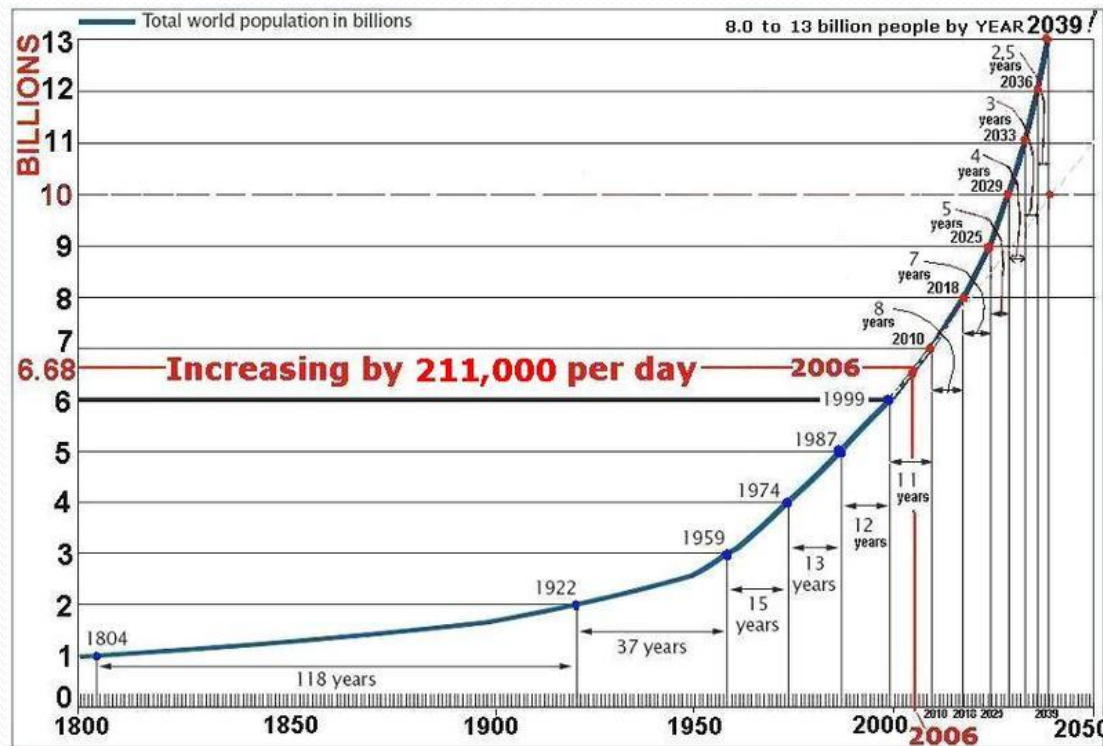
- Some limiting factors are density dependent-only has an effect when the population reaches a certain density
- Competition-organisms compete for resources-food and space; Puffins nesting on a rocky shore
- Predation-one species is a predator and predate on the other, the prey; wolf and moose
- Parasitism and Disease-Parasites take nutrients from the host at the host's expense; tapeworm

5-2 Limits to Growth-Density independent factors

- Other factors affect all populations the same and are not dependent on the density of the population-Called density independent factors
 - Unusual weather
 - Seasonal cycles
 - Certain human activities like damming rivers or clear-cutting forests
 - Read and discuss-Does the Gray Wolf need protection p. 128

5-3 Human Population Growth

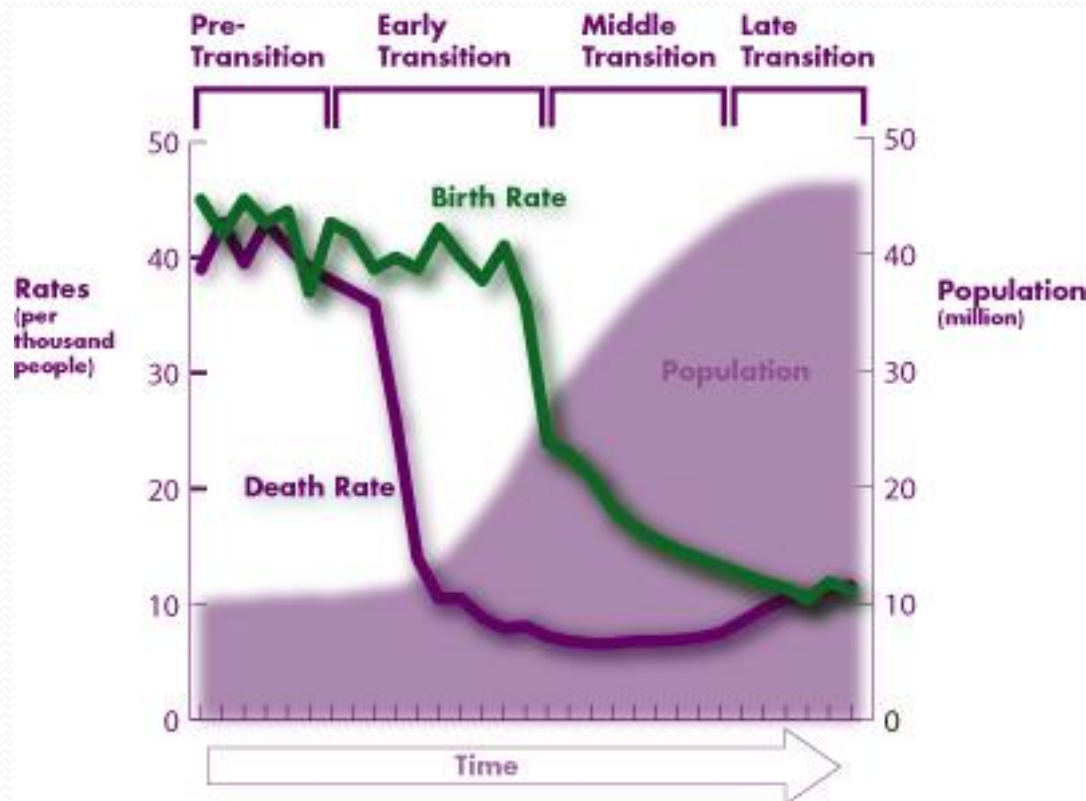
- The size of the human population has increased with time



5-3 Human Population Growth

- Patterns of population growth
- Demography- the study of human populations
 - Examines characteristics of human populations and attempts to explain how those populations change over time
- Birthrates, death rates and the age structure help predict growth rates
- A demographic transition is a dramatic change in birth and death rates
 - Has happened in several modernized countries-USA, Japan and some European countries

The demographic transition

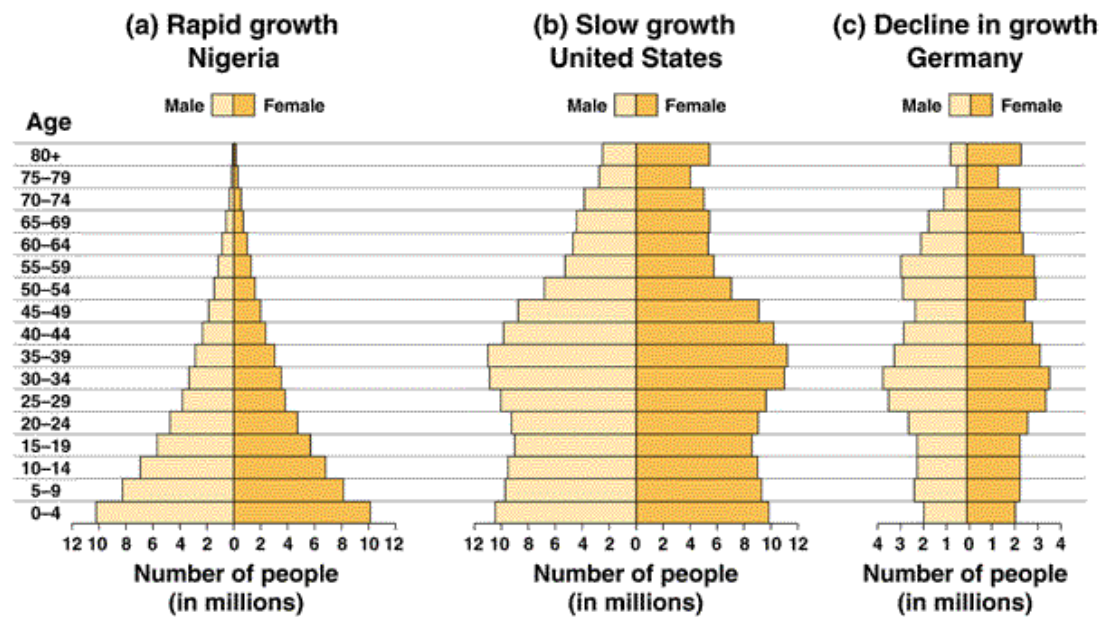


5-3 Human Population Growth

- Age structure
- Population growth depends in part on how many people of different ages make up a given population
- Demographers use models to predict population growth
- Use age structure diagrams or population profiles

Age structure diagrams

Raven/Berg, Environment, 3/e
Figure 8.14



5-3 Human Population Growth

- Future population growth
- Some models predict that by 2025 the world population will be 7.8 billion
- By 2050, 9 billion
- Will it grow exponentially or logistically?
- How will human population growth affect the environment?
- The global economy?
- How can science, technology and societal change help?

