

POPULATION GROWTH

CGC1D1 - Unit 3: Human Systems - Mr. Wittmann



Questions to Ask Yourself...

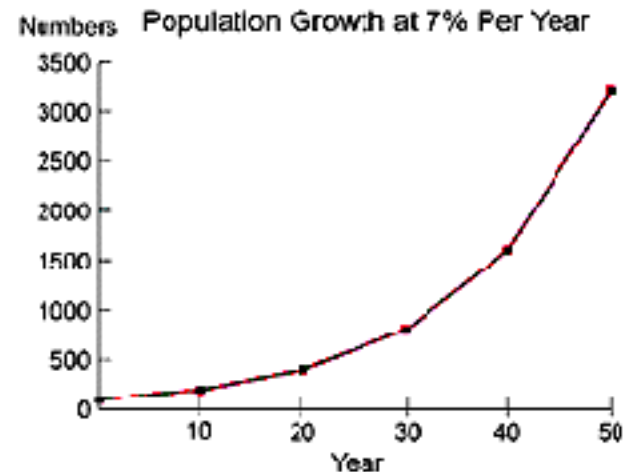
- Why do some populations grow to enormous size while other do not?
- What causes abrupt population increases or decreases?
- How many individuals does it take to make a viable population?
- What roles do competition, genetic diversity, and ecological adaptations play in maintaining or reducing wild species?

What is one way exponential growth is calculated?

- “Rule of 70”
- How long does it take a population to double?
- Dividing 70 by the annual percentage growth, will give you the doubling time for a population in years.
- EX: A population growing at 35% doubles every how many years?
 - $70 \div 35 = 2$ years
- EX: A country growing at 4% per year will double their populations in how many years?
 - $70 \div 4 = 17.5$ years
- Exponential growth is influenced by biotic potential

RULE OF 70

$$\begin{array}{l} \text{number} \\ \text{of years} \\ \text{to} \\ \text{double} \end{array} = \frac{70}{\text{annual} \\ \text{percentage} \\ \text{growth rate}}$$



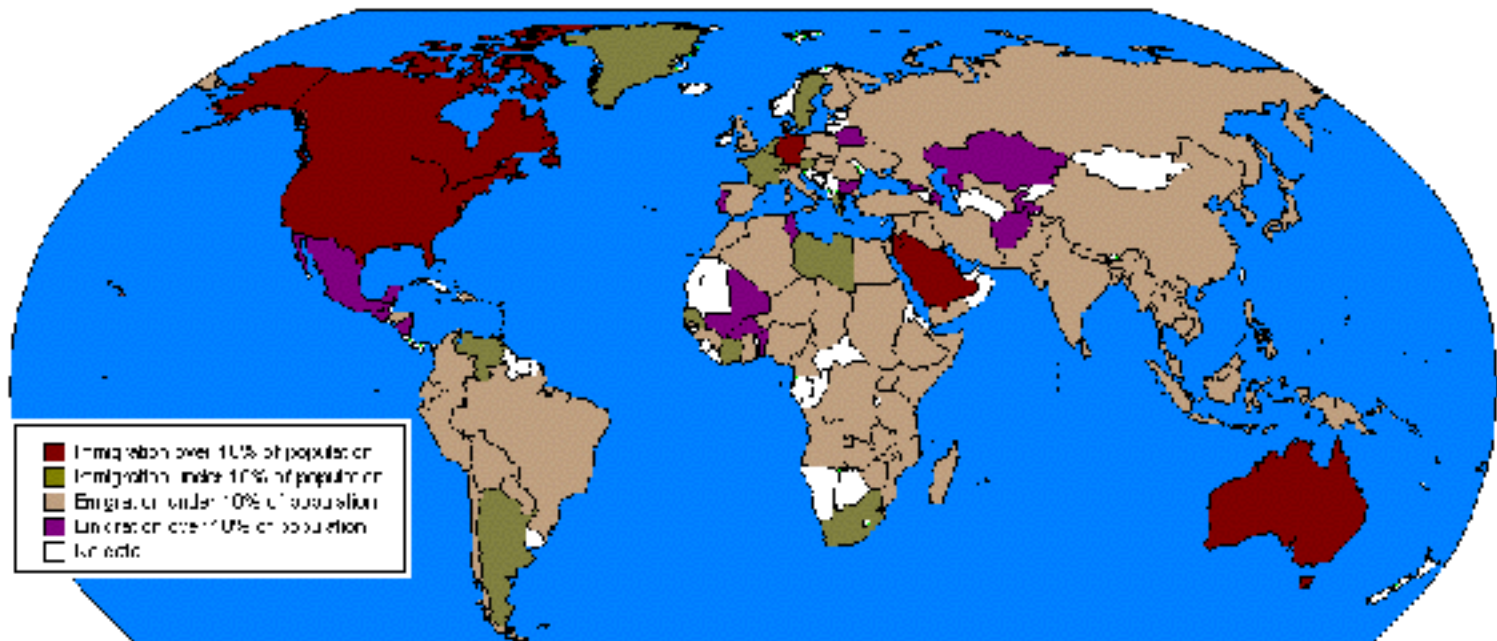
Factors that Increase or Decrease Populations

1. Immigration

- Movement of members into a population.

2. Emigration

- Movement of members out of a population



Factors that Increase or Decrease Populations

3. Mortality- death rate

- Determined by dividing the number of organisms that die in a certain time period by the number alive at the beginning of the period.
- Life expectancy- probable number of years of survival for an individual of a given age.
- Life span- longest period of life reached by a given type of organism.

Age	Both Sexes	Male	Female
0	76	73	79
1	75	72	78
5	71	68	74
10	66	63	69
15	61	58	64
20	57	54	59
25	52	49	55
30	47	44	50
35	43	40	45
40	38	35	40
45	33	31	36
50	29	27	31
55	25	23	27
60	21	19	22
65	17	15	18
70	14	12	15
75	11	9	11
80	8	7	8
85	6	5	6

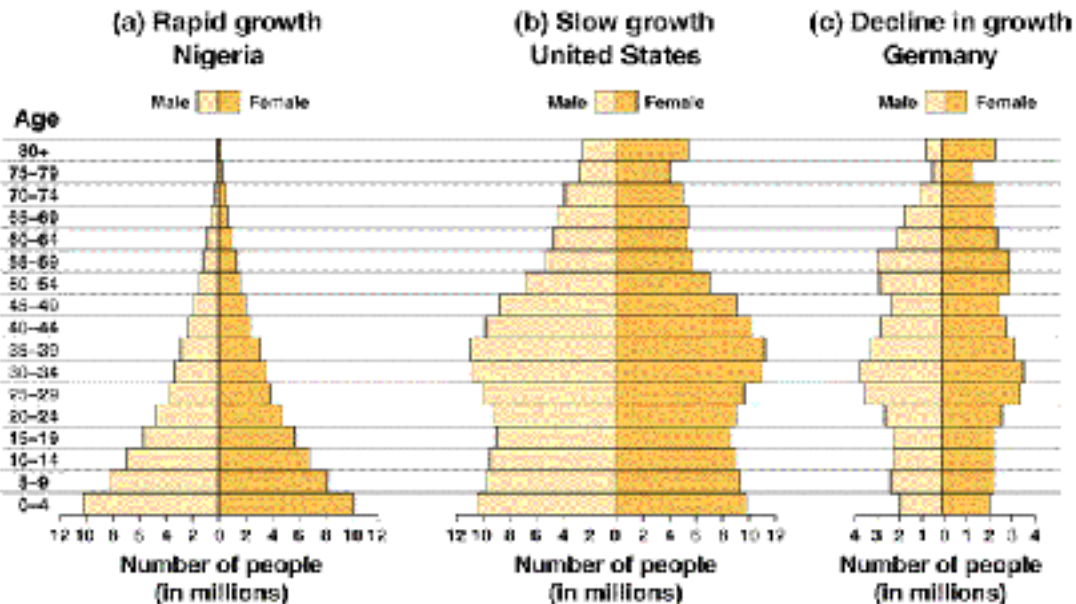
Life Expectancies in US: Numbers shown are remaining years of life

Age Structure Diagrams

Age Structure

- Growing & declining pop. will have very different proportions of individuals in various age classes.

Raven/Berg, Environment, 3/e
Figure 9.14

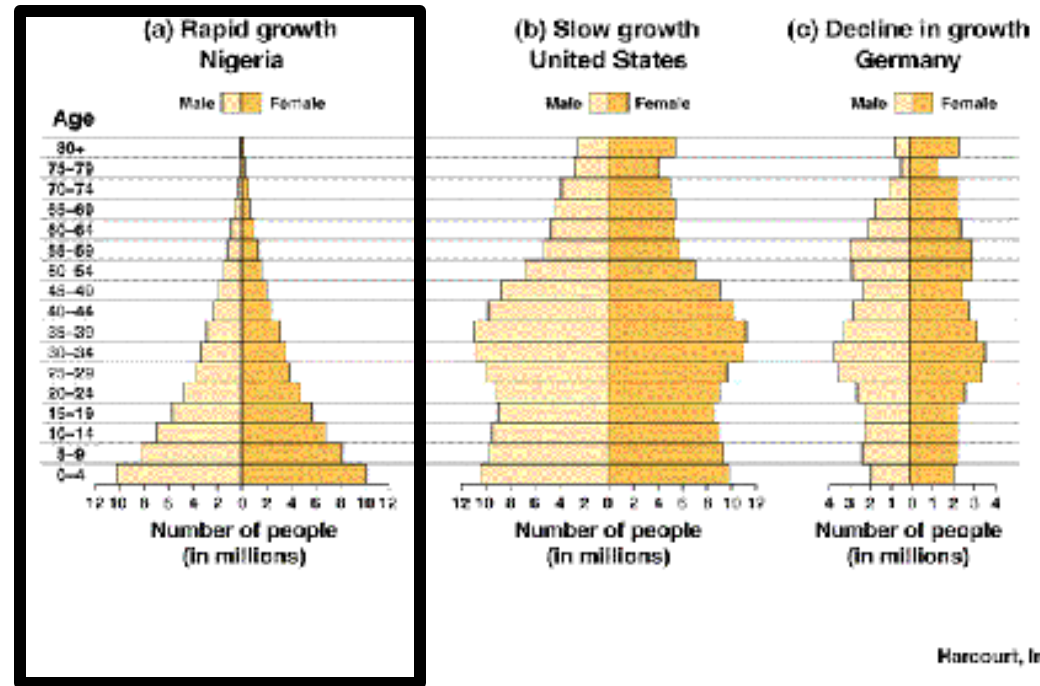


Types of Age Structure Diagrams

Expanding Population

- Young (pre-reproductive) dominates population
- Has population momentum- more children will move up to become reproductive
- Potential for rapid increase in birth rates once the youngsters reach reproductive age.
- EX: Developing countries- many countries in Africa

Raven/Berg, Environment, 3/e
Figure 9.14

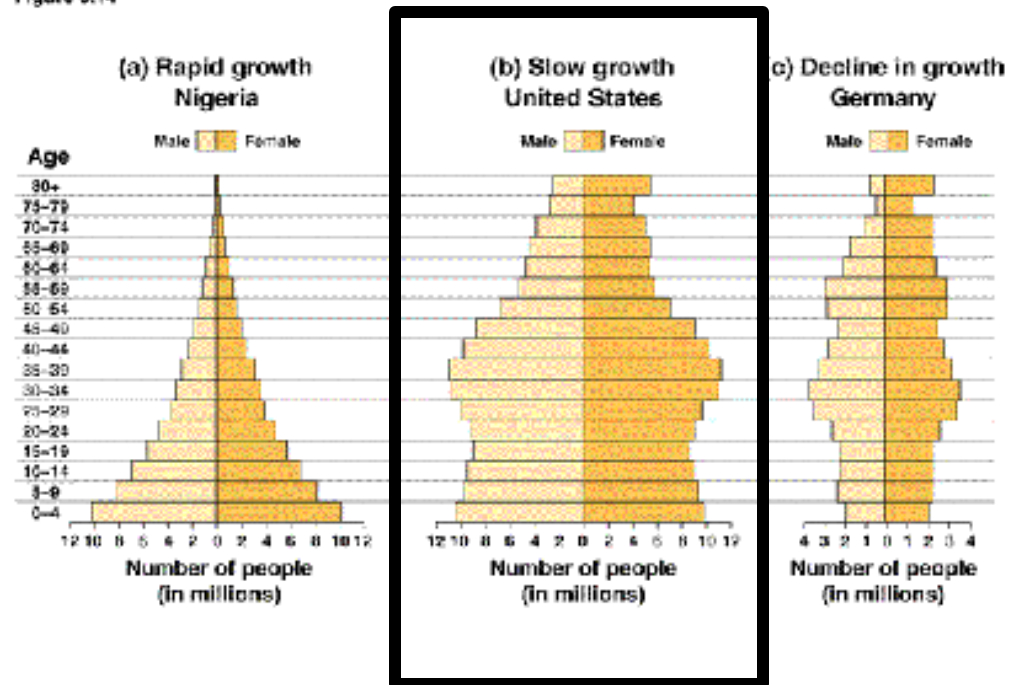


Types of Age Structure Diagrams

Stable Populations

- Birth rates = death rates
- All age groups are about equal
- EX: Most Western European countries, U.S.

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Figure 9.14



Types of Age Structure Diagrams

Declining Populations

- Birth rates are lower than death rates
- Many more older people who are not reproducing
- Population will become much smaller when they die.

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Figure 9.14

