

Lecture 15 – Human Population Growth

READINGS FOR NEXT LECTURE: (some of these are from last week's lectures)

- Krebs Chapter 28: Pages 583-590.
- Krebs Chapter 9: "Population Parameters"
- Krebs Chapter 10: "Demographic Techniques: Vital Statistics"
- Krebs Chapter 11: "Population Growth"

Outline for today:

- 1. Historical population growth**
- 2. Carrying capacity and ecological footprints**
- 3. Life tables**
- 4. Guest speaker: David Greene**

Study Questions:

- Describe the concept of carrying capacity. Why is it hard to define the carrying capacity of a country?
- Doubling times for human population have decreased significantly over the past 2000 years. What does this imply about the rate of growth? (Use an equation)
- Define the concept of ecological footprint, and what is involved with calculating one. Compare the ecological footprint of N. America and Asia.
- Compare stable and expansive populations, and explain the idea of population momentum.
- How do life tables help you predict future population growth?

Life table

n_x = number of individuals in age group

q_x = mortality rate for individuals in age group

b_x = number of babies born per person (or female) over time interval

1. Fill in boldly-outlined boxes.

2. Is this an expansive or stable population?

3. Which of the above numbers would change if:

(a) teenage pregnancy rates went down?

(b) all women delayed having births by 10 years?

(c) infant mortality rates increased?

(d) a new drug is introduced which lowers heart attacks in 40-49 year olds?

Age group	1980 pop'n (millions) (n_x)	Mortality rate (q_x)	Birth rate (b_x)	1990 pop'n (millions)	2000 pop'n (millions)
0-9	215	0.005	0		
10-19	167	0.009	0.1		
20-29	132	0.015	0.3		
30-39	119	0.027	0.05		
40-49	86	0.042	0		
50-59	55	0.054	0		
...

in this case, b_x is based on number born per person (not per female)