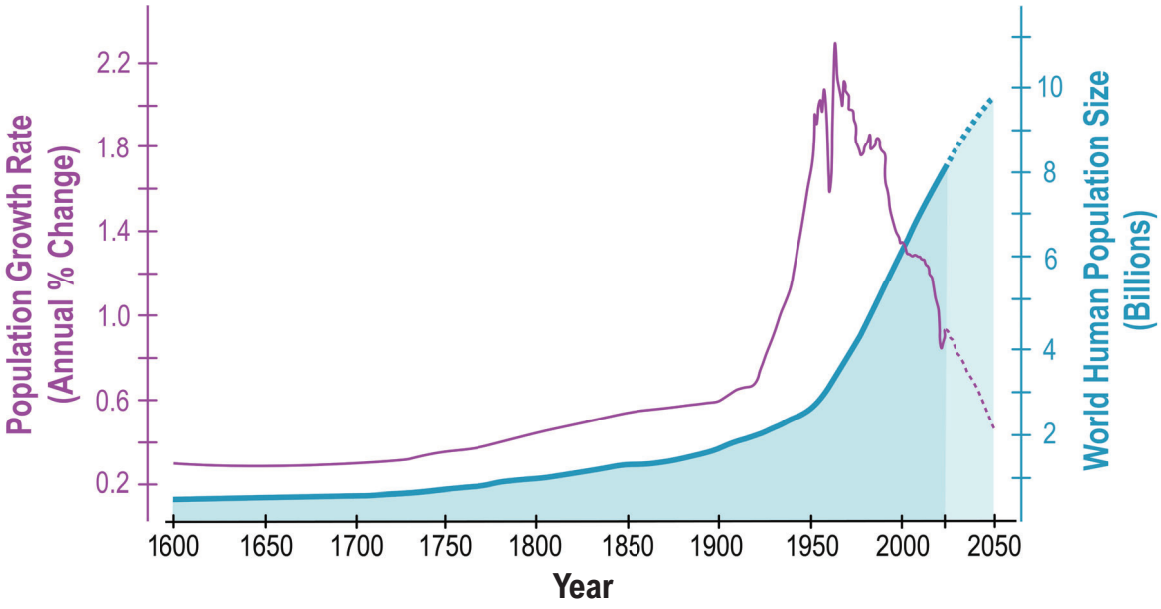
TOPIC: THE HUMAN POPULATION

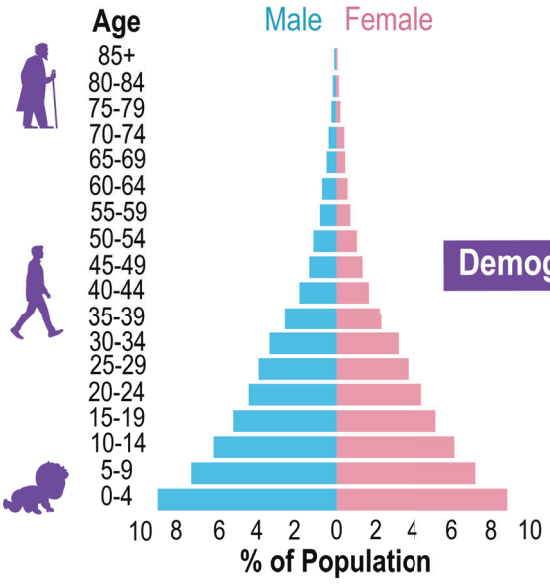
- Human population growth has been _____ than exponential models predict over the last 4 centuries!
  - Due to advances in agriculture, medicine/healthcare, living conditions, & technology.
  - The _____ of growth has _____ since the 1960s due to disease & voluntary population control.



Age-Structure Affects a Country's Human Population Growth

- **Age Structure:** number of living individuals in a population at each _____.
- **Demographic Transition:** _____ from high to low birth & death rates as a country industrializes.

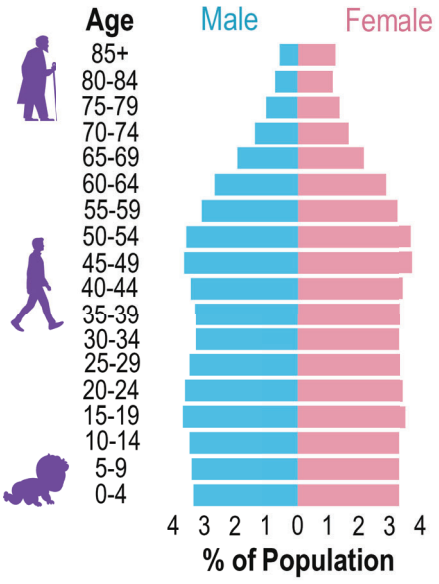
Developing, Non-Industrialized Nation: Zambia



- _____ birth/death rates
- Low life expectancy

Demographic _____

Developed, Industrialized Nation: USA



- _____ birth/death rates
- High life expectancy

TOPIC: THE HUMAN POPULATION

EXAMPLE

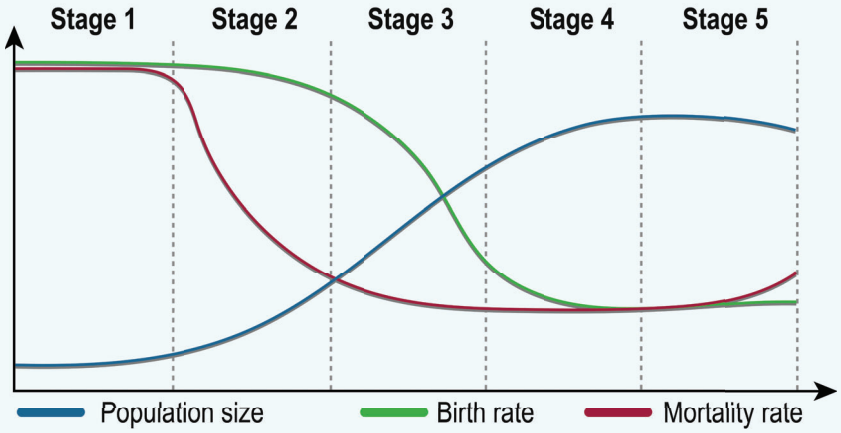
In the "Stages of Industrialization" graph below, mortality rate drops rapidly in stage 2. What is the primary reason for this?

a) Birth rates have increased so that more people are alive at any given time.

b) Healthcare improves, allowing people to live longer.

c) Farming technology improves, so fewer people are required to work on farms.

d) Birth rates decrease, so fewer people are alive at any given time.



PRACTICE

Which of the following occurs in a country that is going through demographic transition?

a) Birth rate drops rapidly while death rates remain constant.

b) Death rate drops rapidly while birth rate remains constant.

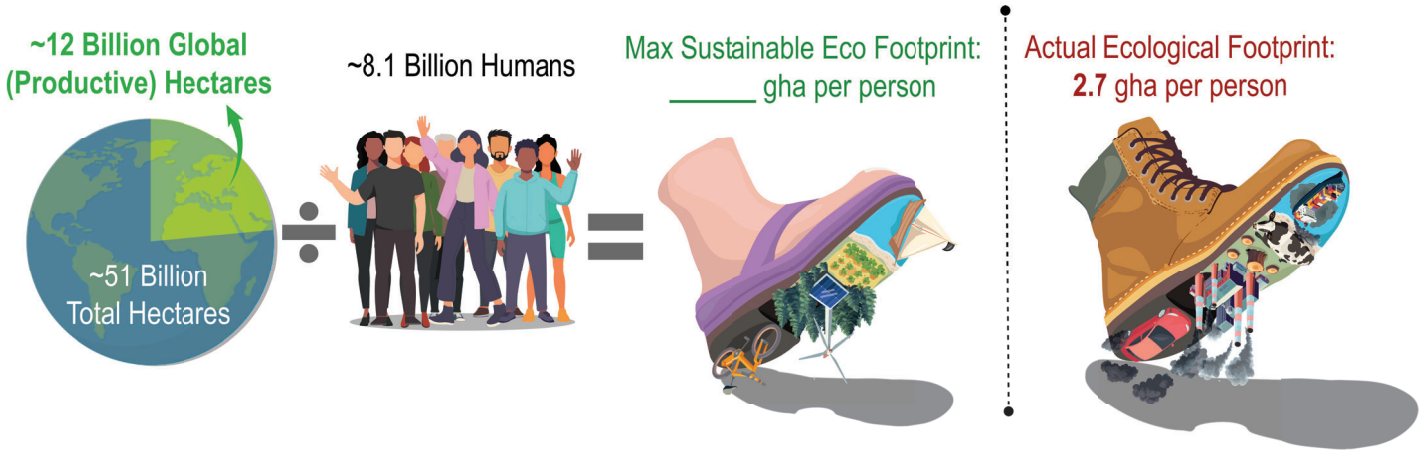
c) Life expectancy increases, death rates drop, & birth rates remain high at first but then gradually decrease.

d) Life expectancy increases & birth rates gradually increase.

TOPIC: THE HUMAN POPULATION

Estimating Earth's Human Carrying Capacity

- The concept of *ecological* _____ can help us estimate Earth's carrying capacity for humans.
- **Ecological Footprint:** the amount of land/water needed to support current human activities – measured in gha.
- **Hectare (ha):** unit of area = 10,000 m^2 ≈ 2.47 acres.
- **Global Hectare (gha):** a hypothetical hectare of land/water with world-_____ biological productivity.
  - Gha only includes hectares capable of supporting human activities & is a _____ measurement.
- Currently, humans have an unsustainably large footprint, using resources faster than nature can regenerate them.



EXAMPLE

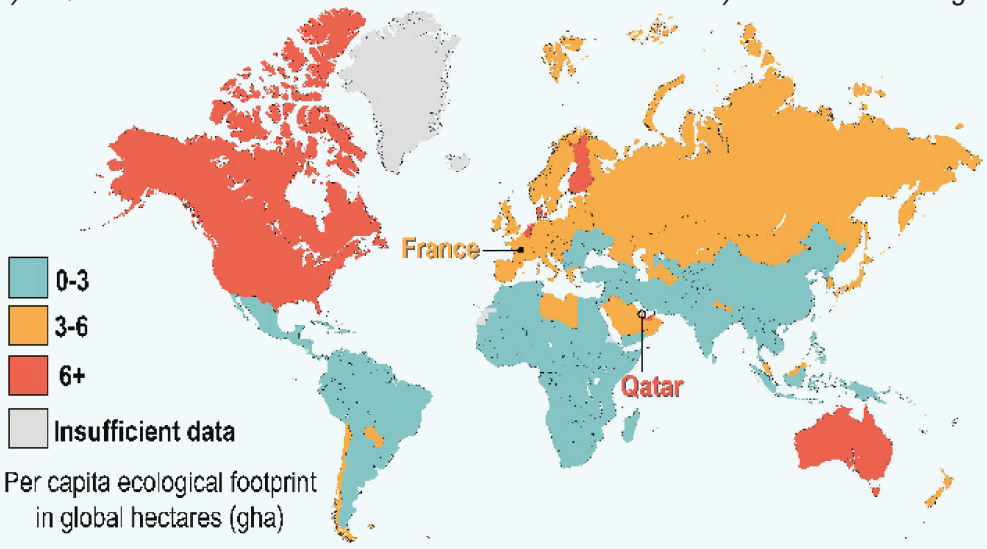
France has a population of 68 million & a total ecological footprint of 312.8 million global hectares. Qatar has a population of 2.67 million and a total ecological footprint of 39.7 million global hectares. Which of these nations has the higher per capita ecological footprint?

a) *France.*

b) *Qatar.*

c) *They have very similar per capita ecological footprints.*

d) *There isn't enough data to calculate their respective.*



TOPIC: THE HUMAN POPULATION

PRACTICE

The USA currently has one of the highest per capita ecological footprints of any country in the world. Which of the following steps can be taken to reduce the USA's ecological footprint?

a) Transition to more renewable energy sources such as solar & wind power.

b) Introduce more public transport to areas with large amounts of traffic & pollution.

c) Eating more locally sourced food.

d) All of the above.

PRACTICE

Suppose it's now the year 2100, the human population size has soared to 10.7 billion, and technology advancements allowed us to increase the biologically productive global hectares to 35 billion gha. Considering this, what would be the maximum sustainable per capita ecological footprint? If the actual per capita ecological footprint is estimated to be 4.00 gha per person, what could all of this imply about the Earth's carrying capacity for humans?

a) 1.43 gha per person.

b) 2.34 gha per person.

c) 3.27 gha per person.

d) 3.70 gha per person.