

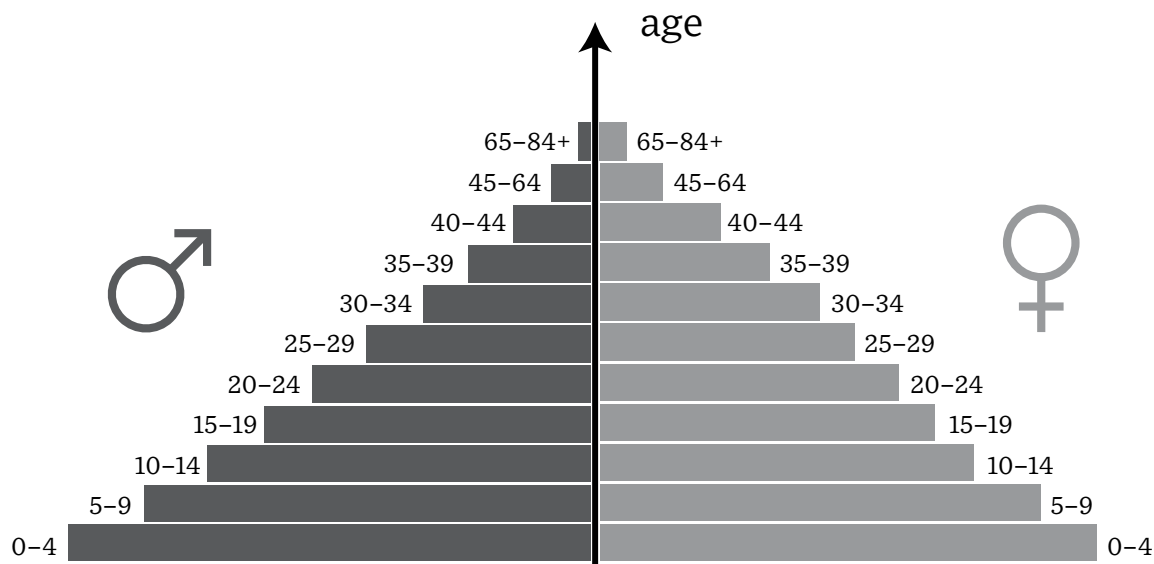
Population age structures

Focus questions

What is an age structure diagram? How does age structure affect population growth? Why is this important in food production?

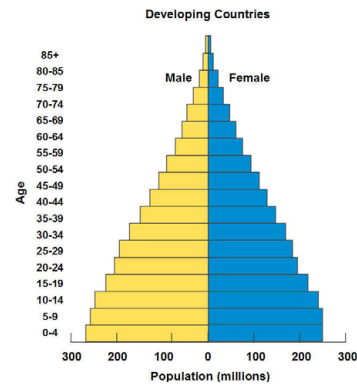
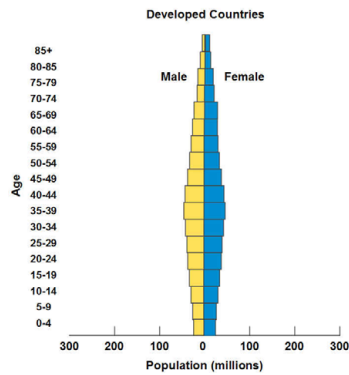
A population age structure diagram is the proportion of the population (and of each gender) at each age level. (Each level in the above graphic represents an age group in increasing order—youngest at the bottom and oldest at the top.)

Procedure



1. Draw two lines on the pyramid above.
 - a. The first line should be drawn above the third level of the pyramid which encompasses the pre-reproductive age group, 0–14.
 - b. The second line includes the next six levels, so draw it above the ninth level of the pyramid. This is the reproductive age group (15–44).
 - c. Above the line drawn in b is the post-reproductive age group (44–85+).

These diagrams help to determine how a country's population will grow. Take a look at the two structures below:



2. Which of the structures above shows imminent population growth?

The percentage (or the actual number) of the population that is of reproductive age is the percentage that will be responsible for increasing population, in addition to the percentage that will be reaching reproductive age in the following years. In the diagram to the left, the reproductive population is much smaller and there are fewer children in the age categories below the reproductive age groups. As you might think, the populations of less-developed countries are increasing at a greater rate than those of developed countries. In addition, a larger number of malnourished people also live in those developing countries. Almost all the hungry people, 780 million, live in developing countries, representing 12.9 percent, or one in eight, of the population of developing countries. There are 11 million people undernourished in developed countries (FAO, 2018).

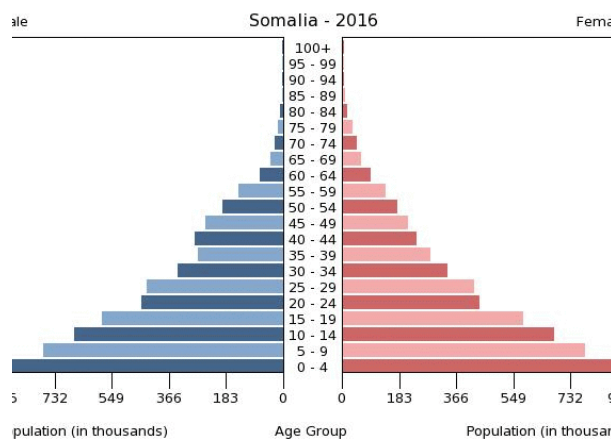
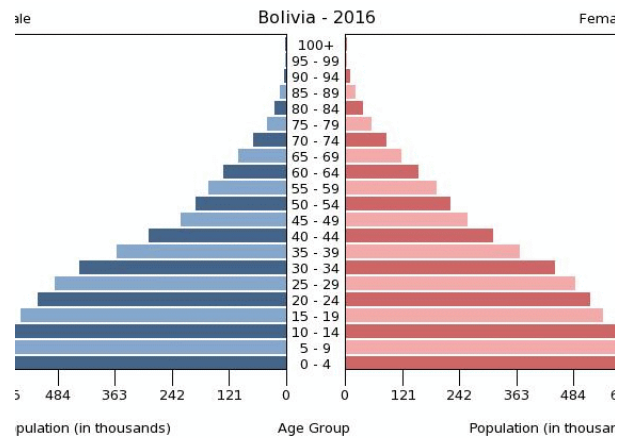
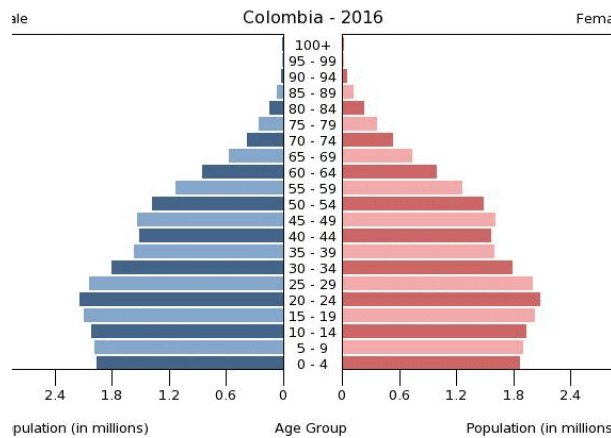
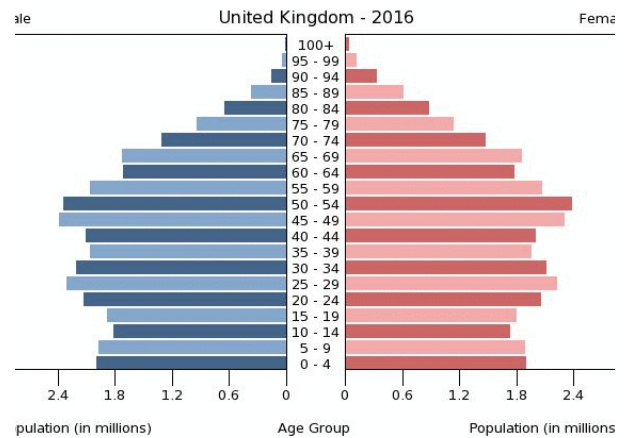
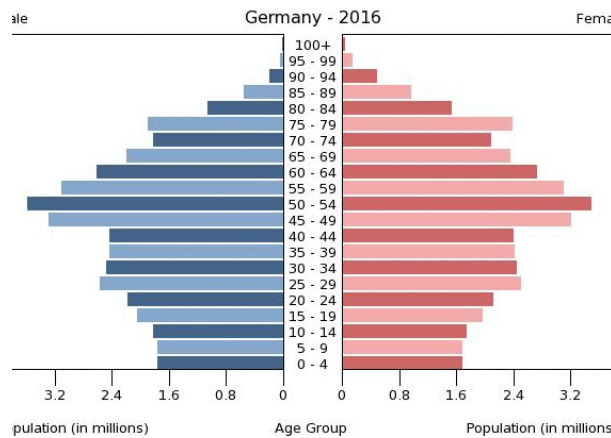
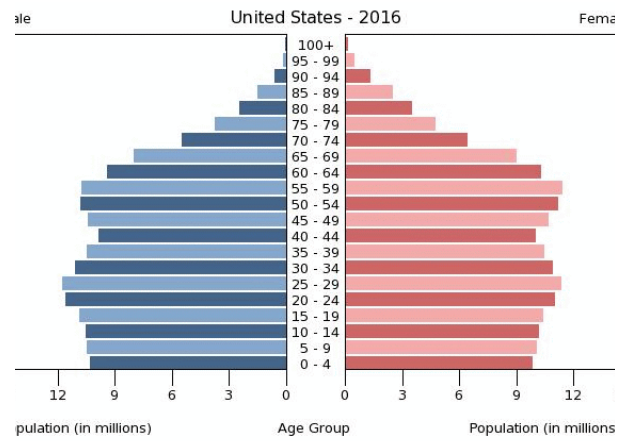
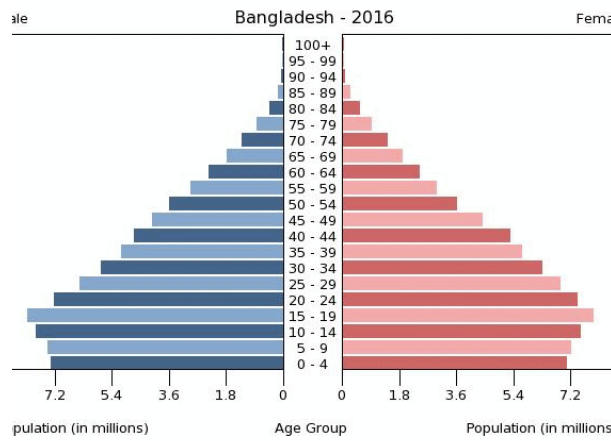
3. What are the implications of rapidly-growing populations and more malnourished people in developing countries? What might a country do to decrease population growth? What has been done (i.e. policies in China, Thailand, India)?

In 1798, Thomas Robert Malthus predicted that short-term gains in living standards would be undermined as human population growth outstripped food production and create a population crash. However, we have not seen this to be the case. Over the last half-century, world population doubled while food supply tripled, even as land under cultivation grew by only 12% (FAO, 2012). Raising productivity, or getting more output from existing resources, has been driving growth in global agriculture and has proven Malthus wrong. In fact, at the global level, the long-run trend since at least 1900 has been one of increasing food abundance—in inflation-adjusted dollars, food prices fell by an average of 1% per year over the course of the 20th century. See more at: choicesmagazine.org/choices-magazine/submitted-articles/productivity-growth-in-global-agricultureshifting-to-developing-countries#sthash.G3Uw6q0Z.dpuf

Read the three statements below:

- Agriculture employs over 1.3 billion people throughout the world, or close to 40 percent of the global workforce.
 - In about 50 countries, agriculture employs half of the population, and even 75 percent in the poorer nations.
 - Agriculture is the world's largest provider of jobs. momagri.org/UK/agriculture-s-key-figures/With-close-to-40-%25-of-the-global-workforce-agriculture-is-theworld-s-largest-provider-of-jobs-_1066.html
4. In light of the predictions of Malthus, the realities of food production since 1900, including the Green Revolution and new technologies which include genetic modification of various types, and precision agriculture techniques, what is your prediction about food production in the next 30 years? What strategies can we continue to use, or develop, to meet the needs of growing populations and changing demographics?

Look at the age structures below to predict the growth of the populations in those countries as high, medium, low, or negative. (Visit indexmundi.com to compare the actual numbers of individuals in each age group.)



Additional resources

- Hans Rosling: Religion and babies
[ted.com/talks/hans_rosling_religions_and_babies](https://www.ted.com/talks/hans_rosling_religions_and_babies)
- Hans Rosling - Global Population Growth
[ted.com/talks/hans_rosling_on_global_population_growth](https://www.ted.com/talks/hans_rosling_on_global_population_growth)

Reflection

1. Looking at the countries that have the largest potential for population growth, what are the causes of their large population growth?
2. Are these causes related to resource availability?
3. What are the ecosystem limits?
4. What can humans do to address those limitations?

Assessments

Analyze and interpret data to provide evidence for the increase in number of the human population.

Rubric for assessment

Skill	Beginning	Satisfactory	Exemplar
Analyze and interpret data to provide evidence of whether resource availability affects human population growth.	Analysis includes some data that provides evidence that resource availability either does or does not affect human population growth.	Analysis includes specific age structure data that provides evidence that resource availability either does or does not affect human population growth.	Analysis includes data comparison across two or more different countries and includes interpretation of the predictive ability of the age structure diagram and that provides evidence that resource availability either does or does not affect human population growth.

Rubric for self-assessment

Skill	Yes	No
I analyzed data from age structure pyramids to predict human population growth.		
I interpreted data from age structure pyramids to provide evidence that resource availability either does or does not affect human population growth.		