

## Teaching Notes

### Lesson 5

## My Country

In this lesson students design their own population distribution. Directions to students should be minimal. The intent of this lesson is to wrap-up Unit 1 by providing an opportunity to demonstrate the 3<sup>rd</sup> level of the **Modeling Continuum**. If an example is needed to help students understand the expectations, consider discussing the design and analysis of the data provided for a fictitious country identified as My Country in this lesson.

Launch this lesson by discussing the 3 scenarios described in the student lesson. Encourage students to select one of the scenarios. Students can also create, however, a distribution that does not fit one of these scenarios. For students that select to create their own distribution, ask them to indicate what challenges or opportunities they think their distribution reflects.

### Student responses or descriptions

#### Lesson 5 – Problems

1. After a discussion addressing the scenarios, students may intentionally design a country that is bottom-layered (similar to Kenya), or lower middle-layered (similar to the United States), or upper middle-layered (similar to Japan), or design a country representing a completely different shape.

Students may simply enter age group estimates without specifically thinking about a shape. For now, that is not a problem, and may even provide some insights when students incorporate their country's population in various projection models to estimate the projected population in 2050. Encourage students, however, to think about selecting one of the scenarios if they have no particular interest in the type of country they are creating.

A few other notes to consider regarding this lesson. As indicated, students may design a country that will pose unusual challenges later in this module. For example, if students create a country with all males or all females, the model does not alter estimates of the future. An improved model would take into account models in which the proportion of males and females is considered. Improving the model to include other factors of change demonstrates students' thinking at Levels 3 and 4 of the **Modeling Continuum**.

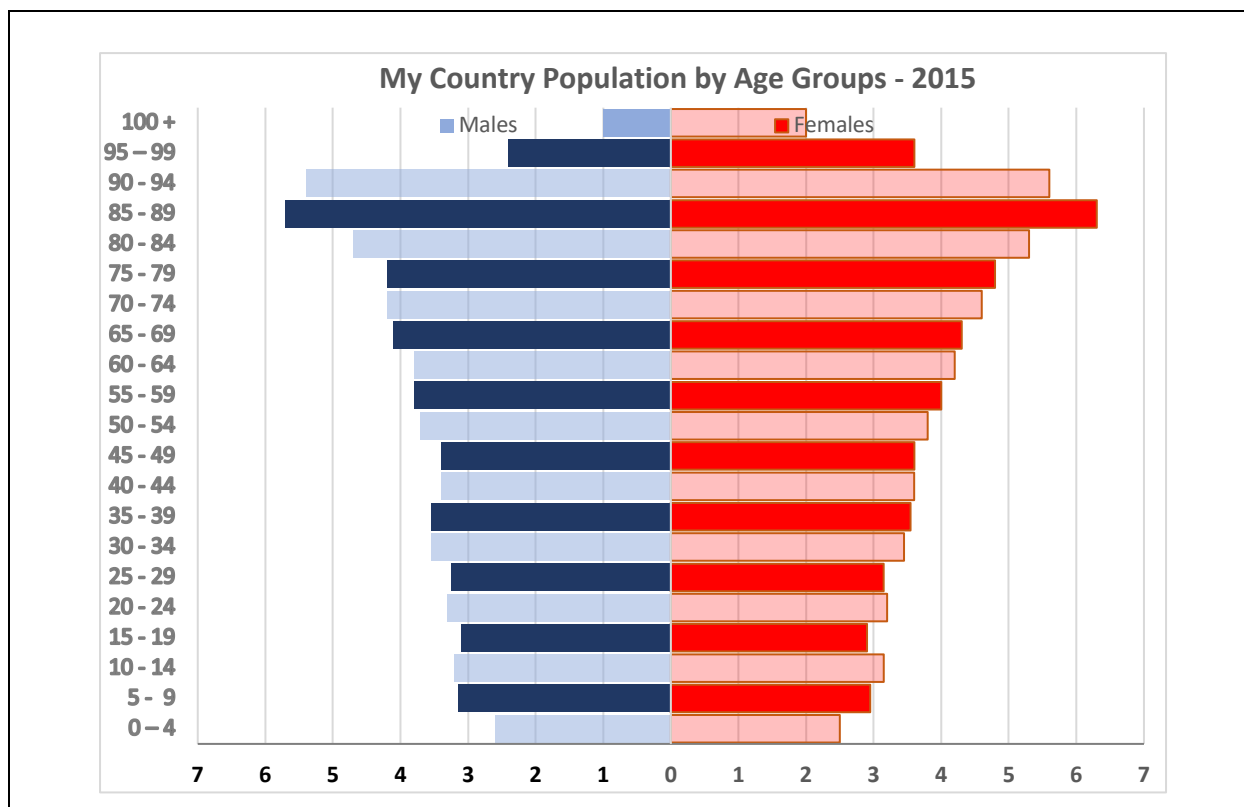
For students not confident of the directions in this lesson, share with them the following population distribution. This distribution represents a top-layered country. Provide students a copy of this distribution (printed or electronic or both) as you may want to include this country in the projection models of later lessons. (A copy of this distribution is provided as the last page of this lesson for distribution to students if this example is used.)

Country: **My Country** in 2015

Age Group	Males	Females	Total
0 - 4	2.60	2.50	5.10
5 - 9	3.15	2.95	6.10
10 - 14	3.20	3.15	6.35
15 - 19	3.10	2.90	6.00
20 - 24	3.30	3.20	6.50
25 - 29	3.25	3.15	6.40
30 - 34	3.55	3.45	7.00
35 - 39	3.55	3.55	7.10
40 - 44	3.40	3.60	7.50
45 - 49	3.40	3.60	7.00
50 - 54	3.70	3.80	7.50
55 - 59	3.80	4.00	7.80
60 - 64	3.80	4.20	8.00
65 - 69	4.10	4.30	8.40
70 - 74	4.20	4.60	8.80
75 - 79	4.20	4.80	9.00
80 - 84	4.70	5.30	10.00
85 - 89	5.70	6.30	12.00
90 - 94	5.40	5.60	11.00
95 - 99	2.40	3.60	6.00
100+	1.00	2.00	3.00
	75.50	78.05	156.55

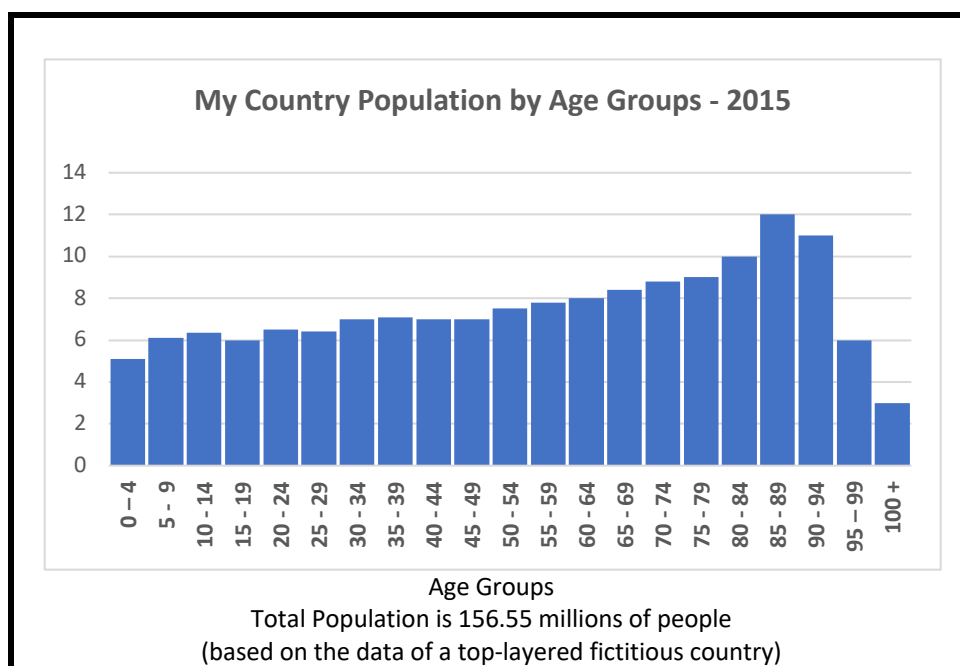
- Based on the table of counts in each age group, use the following template to complete a pyramid graph of **My Country**:

A population pyramid graph of the top-layered country provided above is included as an example of the expectations of this problem.



3. Create a histogram of My Country.

The following histogram is based on the age groups of the fictitious country provided with this lesson.



4. Determine if your country is bottom-layered, lower middle-layered, upper middle-layered, or top-layered or a combination of these descriptions.  
If the discussion involving the My Country data is conducted, the population pyramid graph and the histogram indicate a top-layered country with approximately 32.6% of the population 75 years old or older.
5. Identify any features of your country you want to watch as you look into the future.  
Consider sharing with students that a major question for a top-layered country is what happens in the future when many of the people are counted in the older age groups. Can a country like this survive? In time, it probably will “fade away”.
6. Use the templates provided to calculate estimates of the median age, the spread as defined in Lesson 4, and the mean age for My Country.  
Median age:  
Spread of ages from approximately 25% to 75% of the population:  
Mean age:  
If the My Country example is used, the following summaries describe the population of the My Country example:  
Median age is located in the 45 – 49 years old age count.  
Mean age is approximately 55.33 years (approximately 55 years old)  
Spread: Approximately 50% of the population is between the age groups 20 – 24 years old and 65 – 69 years old resulting in a spread of approximately 49 years.
7. Describe a typical person in your country.  
Students are expected to answer this problem by using the ages derived in problem 6 to describe a person in their country.

As an extension to this lesson, encourage students to research a country using the International Data Base (IDB) available at the United States Census Bureau website (<https://www.census.gov/programs-surveys/international-programs/about/idb.html>). At this website, navigate through the available options including selecting a country, the type of data summary (population pyramid graph or 5-year age intervals), and the year of interest. Over 200 countries are summarized at this site. Especially interesting shapes can be found for the 2015 population for Saudi Arabia, Cuba, Brazil, Italy, Spain, and Mexico.

Attached are templates for estimating the mean and the median ages of a student’s country.

## My Country – 2015

Template for finding the estimate of the mean age:

Age group	Mid-interval Age	Count of people (in millions of people)	Sum of ages in age group: (Estimated in millions of years)
0 – 4	2		
5 - 9	7		
10 - 14	12		
15 - 19	17		
20 - 24	22		
25 - 29	27		
30 - 34	32		
35 - 39	37		
40 - 44	42		
45 - 49	47		
50 - 54	52		
55 - 59	57		
60 - 64	62		
65 - 69	67		
70 - 74	72		
75 - 79	77		
80 - 84	82		
85 - 89	87		
90 – 94	92		
95 – 99	97		
100+	102		
	<b>Total</b>		

## My Country 2015

Template for finding the estimate of the median age:

Age group	Count of people (in millions of people)	Cumulative count of people (in millions)	Proportion of cumulative count of people to total population (to the near thousandth)	Proportion as a percent
0 – 4				
5 - 9				
10 - 14				
15 - 19				
20 - 24				
25 - 29				
30 - 34				
35 - 39				
40 - 44				
45 - 49				
50 - 54				
55 - 59				
60 - 64				
65 - 69				
70 - 74				
75 - 79				
80 - 84				
85 - 89				
90 - 94				
95 – 99				
100+				
Total				

Fictitious Country: **My Country** in 2015

Age Group	Males	Females	Total
0 - 4	2.60	2.50	5.10
5 - 9	3.15	2.95	6.10
10 - 14	3.20	3.15	6.35
15 - 19	3.10	2.90	6.00
20 - 24	3.30	3.20	6.50
25 - 29	3.25	3.15	6.40
30 - 34	3.55	3.45	7.00
35 - 39	3.55	3.55	7.10
40 - 44	3.40	3.60	7.50
45 - 49	3.40	3.60	7.00
50 - 54	3.70	3.80	7.50
55 - 59	3.80	4.00	7.80
60 - 64	3.80	4.20	8.00
65 - 69	4.10	4.30	8.40
70 - 74	4.20	4.60	8.80
75 - 79	4.20	4.80	9.00
80 - 84	4.70	5.30	10.00
85 - 89	5.70	6.30	12.00
90 - 94	5.40	5.60	11.00
95 - 99	2.40	3.60	6.00
100+	1.00	2.00	3.00
	75.50	78.05	156.55