Basic demographic analysis of census data

Regional Training on Using Population Census Data for Planning and Decision Making; *Thematic Analysis on Youth*

e-Learning Phase: 22 July – 2 August 2013

Outlines

- What is demography?

- Demographic data

- State of population

- Population pyramids

- Practical: *10 steps to population pyramid*

What is Demography?

- Demography tries to answer
  - *How many people, of what kind, are where?*
  - *How come?*
  - *And so what?*

- Demography is study of
  - *Size and composition of populations*
  - *Dynamic process that changes this composition*
  - *Relationships between above two and social and environmental issues*

What is Demography?

Some simply say it

"studies causes and effects of **population dynamics** *"*

Or simpler, say it
"is statistical study of human populations"

What is Demography?
"It is beyond only statistics"

- State versus dynamics of population
  - *State:* population characteristics at one point in time
  - *Dynamics:* short and long term changes in the size and composition of population and processes that influence these changes

- Isn't descriptive statistics enough for illustrating state?

"Without change, demography would not exist, but state and movement are central to the analysis"

Demographic data

- Population censuses
  - *Individual*
  - *Universal*
  - *Simultaneous*
  - *Periodic*

- Some difficulties
  - *Every 10 or 5 years*
  - *Costly*
  - *Reporting error*
  - *Coverage*

Demographic data

- Vital statistics
  - *Birth, death, marriage*
  - *Information about nature of the event (eg. cause of death, place of birth, ..)*
  - *Additional information on sex and age make it linkable to census*

- Some difficulties
  - *Its fixed cost is more than census cost*
  - *Coordination among different parties involved is a challenge*
  - *Maintenance and bureaucratic burden on the governments*

Demographic data

- Civil registration
  - *Continuous recording of data on particular events that occur to each individual, plus selected characteristics*

  - *It is main source of data for compilation of vital statistics*

Demographic data

- Demographic surveys

  - *To improve the quality of/substitute with other data sources*
  - *To supplement other sources with more details*

  "A general difficulty: Migration statistics are difficult to gather through demographic surveys"

State of population

- Size : *How many people*

- Distribution: *How many in each sub-population?*

- Density: *How many in one geographic unit?*

State of population

- **Population distribution**
  - Pattern of where people live

  - *What factors impact where a population is located?*

  - *Uneven distribution of population* (less developed (LD) more than more developed regions (MDR))

  - *What are concerns of MDRs?*
    - *Balance of power*
    - *Ethnic minority*
    - *Immigration*
    - *Overwhelmed with poverty in LD regions*

- **Population density**
  - Number of people in one km^2

  - *What factors impact how many people share one space?*

  - *Impacts of high/low population density on development indicators?*

State of population
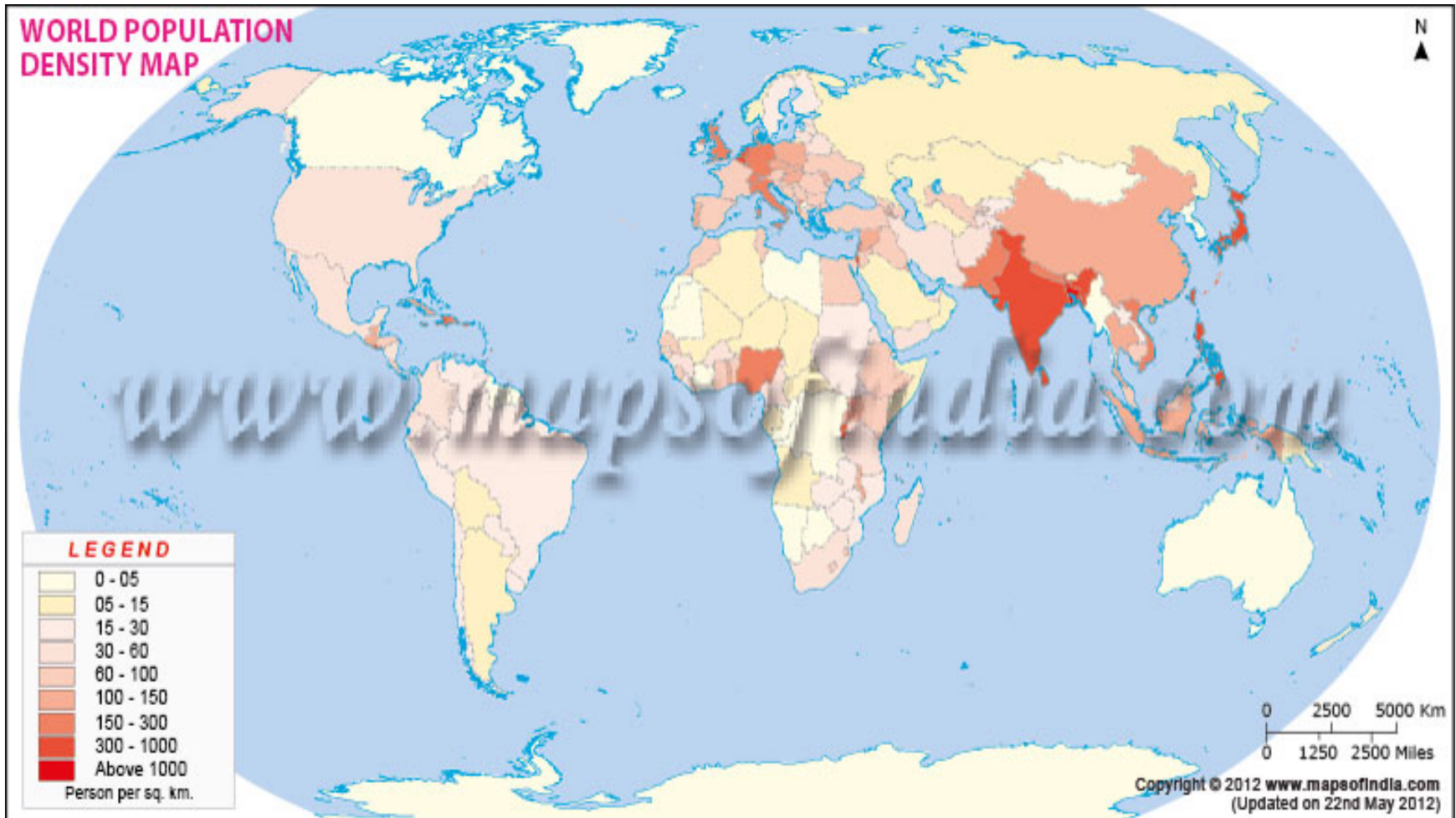
Density of world population, 2012

State of population

Age-sex structure

- Descriptive statistics:

  - *Frequency/percentage distributions*

  - *Ratios (age dependency ratio, sex ratio)*

  - *Bar charts*

State of population

Age-sex structure; *world 2010*

Age	In thousands			percentages		
	Females	Males	Total	Females	Males	Sex ratio
All ages	3,418,057	3,477,830	6,895,890	100	100	101.7
0-4	307,079	328,759	635,838	8.98	9.45	107.1
5-9	293,664	315,119	608,783	8.59	9.06	107.3
10-14	290,598	311,456	602,054	8.50	8.96	107.2
15-19	293,313	312,831	606,144	8.58	9.00	106.7
20-24	295,739	311,077	606,816	8.65	8.94	105.2
25-29	273,379	284,258	557,638	8.00	8.17	104.0
30-34	247,383	255,596	502,979	7.24	7.35	103.3
35-39	241,938	248,575	490,513	7.08	7.15	102.7
40-44	226,914	232,217	459,132	6.64	6.68	102.3
45-49	201,142	202,633	403,776	5.88	5.83	100.7
50-54	176,440	176,241	352,681	5.16	5.07	99.9
55-59	156,283	153,494	309,778	4.57	4.41	98.2
60-64	121,200	114,194	235,394	3.55	3.28	94.2
65-69	92,071	83,129	175,199	2.69	2.39	90.3
70-74	77,990	65,266	143,256	2.28	1.88	83.7
75-79	56,895	43,761	100,656	1.66	1.26	76.9
80-84	37,873	25,060	62,933	1.11	0.72	66.2
85-89	19,573	10,589	30,163	0.57	0.30	54.1
90-94	6,614	2,943	9,556	0.19	0.08	44.5
95-99	1,739	570	2,309	0.05	0.02	32.8
100+	230	62	292	0.01	0.00	27.0

Under 15:   1,846,675 (26.8%)

15-64:   4,524,851 (65.6%)

65 and over: 524,364   (7.8%)

Age dependency ratio =

$$\frac{1,846,675 + 524,364}{4,524,851} \times 100$$
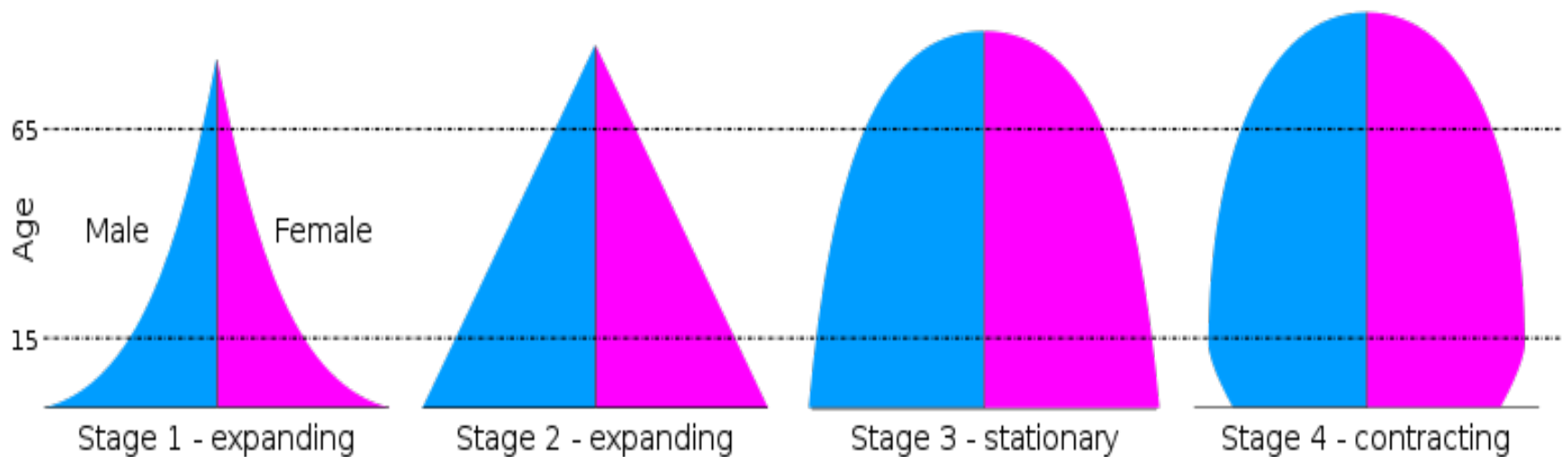
$$= 52.4$$

14

State of population

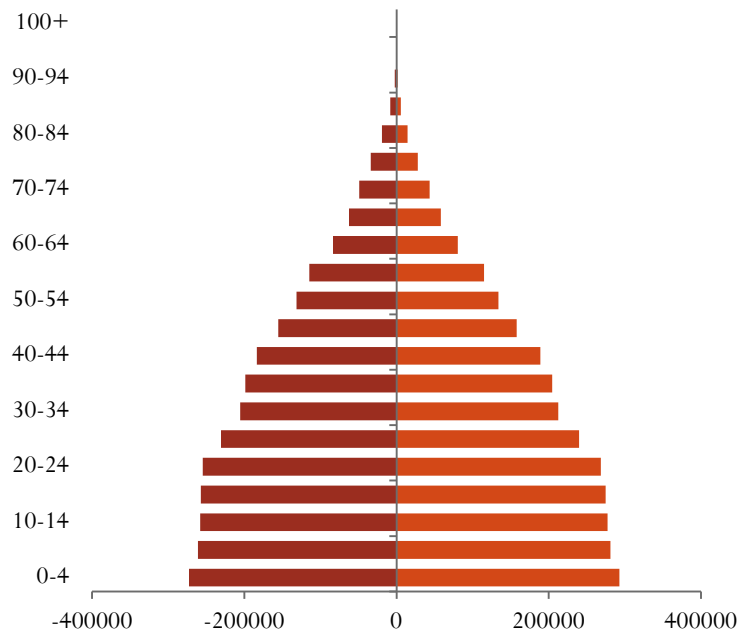## Age-sex structure; *bar chart*
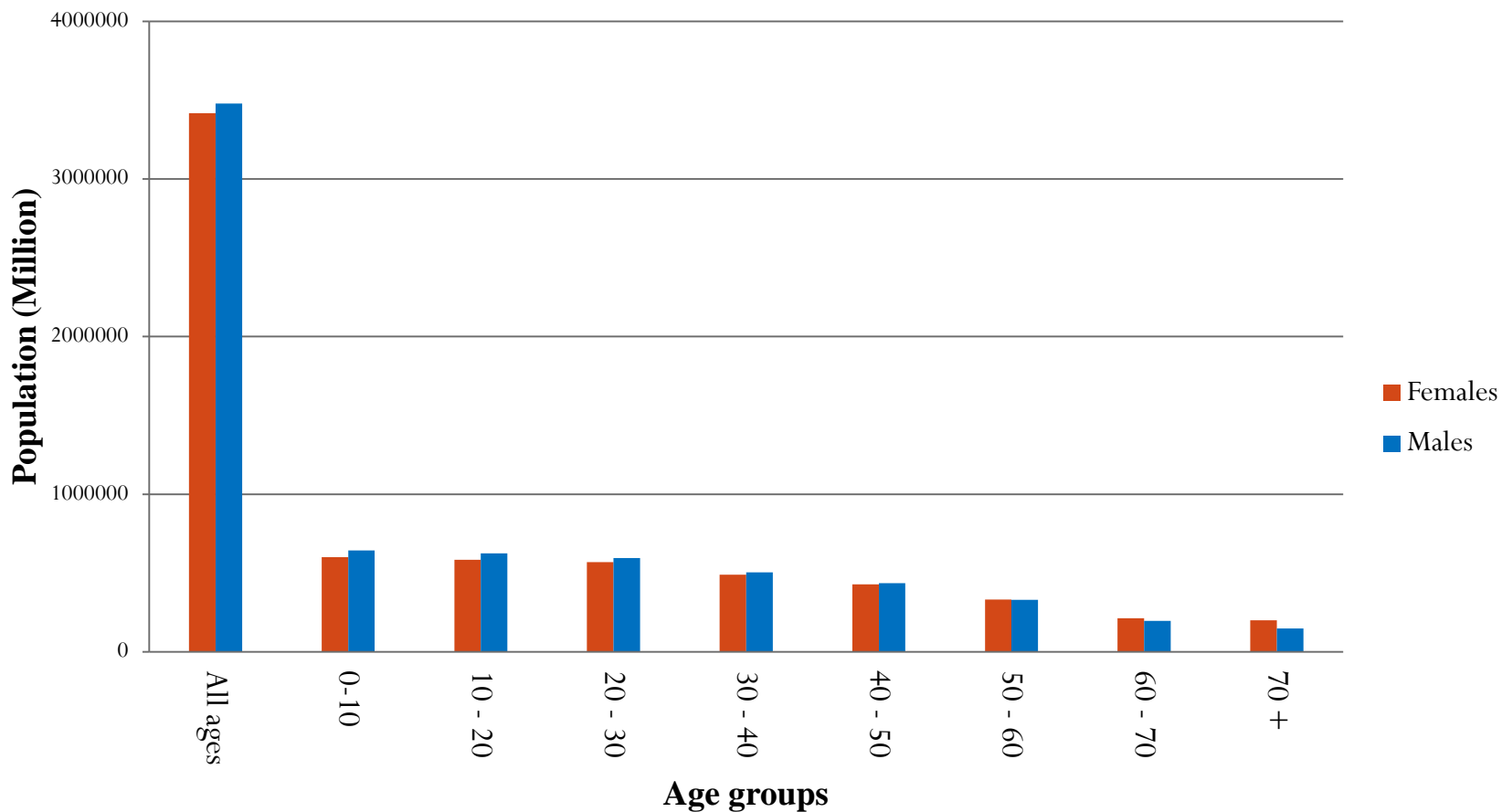
Population pyramids

Graphical illustration that shows the distribution of various age groups in a population which forms the shape of a pyramid when the population is growing
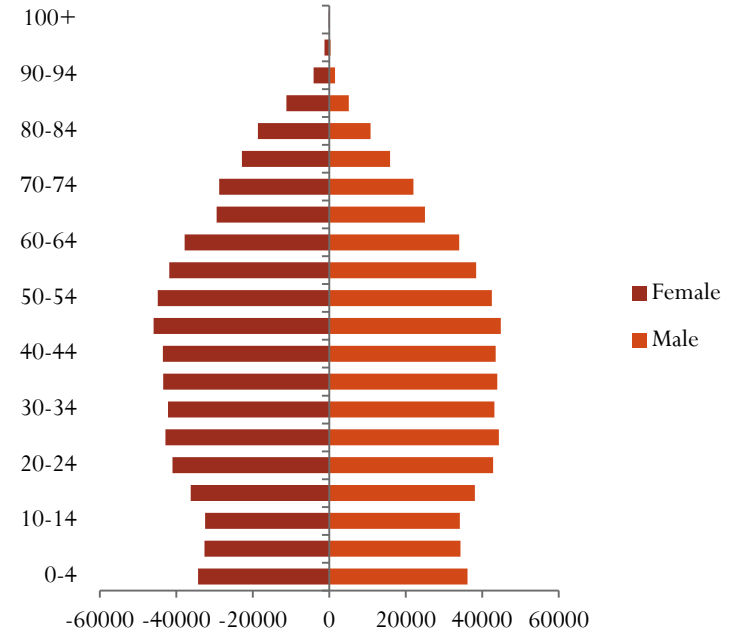
Population pyramids

- Population pyramid for the world in 2010; *less vs more developed regions*

Less developed

More developed

Open vs Closed Population

Open population: Its size is subject to increase or decrease through migration as well as through births and deaths.

Closed population: no migration, either inward or outward

Practical: *10 steps to population pyramid*

Step 1: copy your data in a blank excel sheet

Step 2: Group your population data by age and sex

See the next slide

Times New Rom · 12 · A⁺ A⁻ · Wrap Text

Paste / Cut / Copy / Format Painter — Clipboard · **B** *I* U · Font · Merge & Center — Alignment

A1 · fx · World population 2010

	A	B	C	D	E	F	G	H	I
1	World population 2010								
2									
3	Age	Males	Females	Total	Male (%)	Females (%)			
4	0-4	328,759	307,079	635,838					
5	5-9	315,119	293,664	608,783					
6	10-14	311,456	290,598	602,054					
7	15-19	312,831	293,313	606,144					
8	20-24	311,077	295,739	606,816					
9	25-29	284,258	273,379	557,638					
10	30-34	255,596	247,383	502,979					
11	35-39	248,575	241,938	490,513					
12	40-44	232,217	226,914	459,132					
13	45-49	202,633	201,142	403,776					
14	50-54	176,241	176,440	352,681					
15	55-59	153,494	156,283	309,778					
16	60-64	114,194	121,200	235,394					
17	65-69	83,129	92,071	175,199					
18	70-74	65,266	77,990	143,256					
19	75-79	43,761	56,895	100,656					
20	80-84	25,060	37,873	62,933					
21	85+	14,164	28,156	42,320					
22									

Practical: *10 steps to population pyramid*

Step 3: Put the cursor in cell **B22** and click on the **AutoSum** and then click **Enter**. This will calculate the total population. Then copy the formula in cell **D22** across the row **22.**

Step 4: To calculate the percent of males in cell **E4**, enter the formula =**-1*100*B4/$D$22** . And copy the formula in cell **E4** down to cell **E21.** *Notice that this column must be negative to get a side by side graph.*

Step 5: To calculate the percent of females in cell **F4**, enter the formula =**100*C4/$D$22**. Copy the formula in cell **F4** down to cell **F21.**

See the next slide

	Age	Males	Females	Total	Male (%)	Females (%)
4	0-4	328,759	307,079	635,838	-4.767	4.453
5	5-9	315,119	293,664	608,783	-4.570	4.259
6	10-14	311,456	290,598	602,054	-4.517	4.214
7	15-19	312,831	293,313	606,144	-4.536	4.253
8	20-24	311,077	295,739	606,816	-4.511	4.289
9	25-29	284,258	273,379	557,638	-4.122	3.964
10	30-34	255,596	247,383	502,979	-3.706	3.587
11	35-39	248,575	241,938	490,513	-3.605	3.508
12	40-44	232,217	226,914	459,132	-3.367	3.291
13	45-49	202,633	201,142	403,776	-2.938	2.917
14	50-54	176,241	176,440	352,681	-2.556	2.559
15	55-59	153,494	156,283	309,778	-2.226	2.266
16	60-64	114,194	121,200	235,394	-1.656	1.758
17	65-69	83,129	92,071	175,199	-1.205	1.335
18	70-74	65,266	77,990	143,256	-0.946	1.131
19	75-79	43,761	56,895	100,656	-0.635	0.825
20	80-84	25,060	37,873	62,933	-0.363	0.549
21	85+	14,164	28,156	42,320	-0.205	0.408
22	Total	3,477,830	3,418,057	6,895,890	-50.433	49.567

Practical: *10 steps to population pyramid*

Step 6: To build the population pyramid, we need to choose a horizontal bar chart with two series of data (% male and % female) and the age labels in column A as the **Category X-axis** labels. Highlight the range **A3:A21**, hold down the CTRL key and highlight the range **E3:F21**
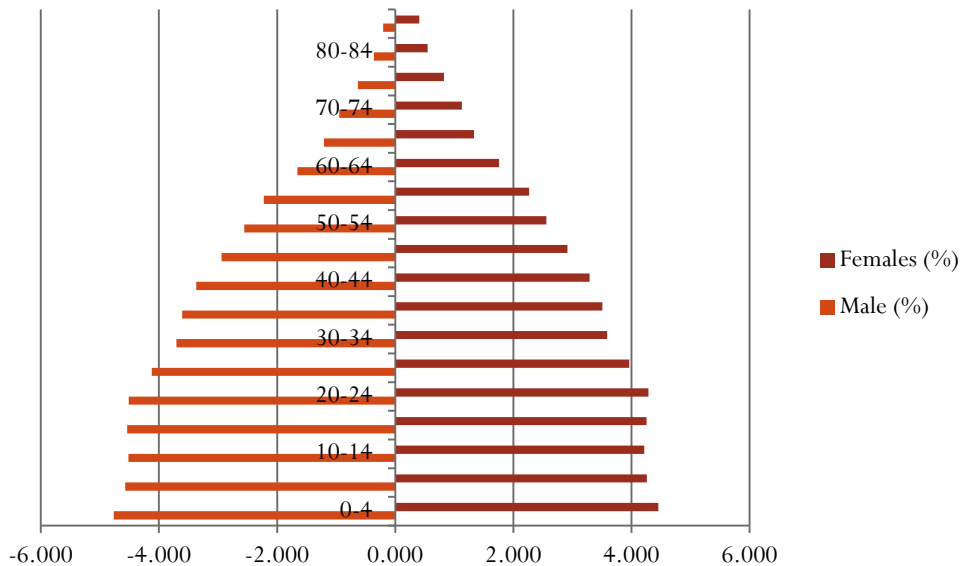
Practical: *10 steps to population pyramid*

Step 7: under **inset** tab, under horizontal bar charts select **clustered bar chart**

Notice: If you are using an old version of excel, chart wizard appears differently and you need to click on chart under insert tab.

You are almost there! Only need to format your graph.

Practical: *10 steps to population pyramid*

Step 8: Put the tip of your mouse arrow on the **Y-axis** (vertical axis) so it says "Category Axis", right click and chose **Format Axis**

Step 9: Choose **Axis options** tab and set the major and minor tick mark type to **None**, Axis labels to **Low**, and click **OK**.

Step 10: Click on any of the bars in your pyramid, click right and select "format data series". Set the **Overlap** to **100** and **Gap Width** to **0**. Click **OK**.

Practical: *10 steps to population pyramid*

Here you go!
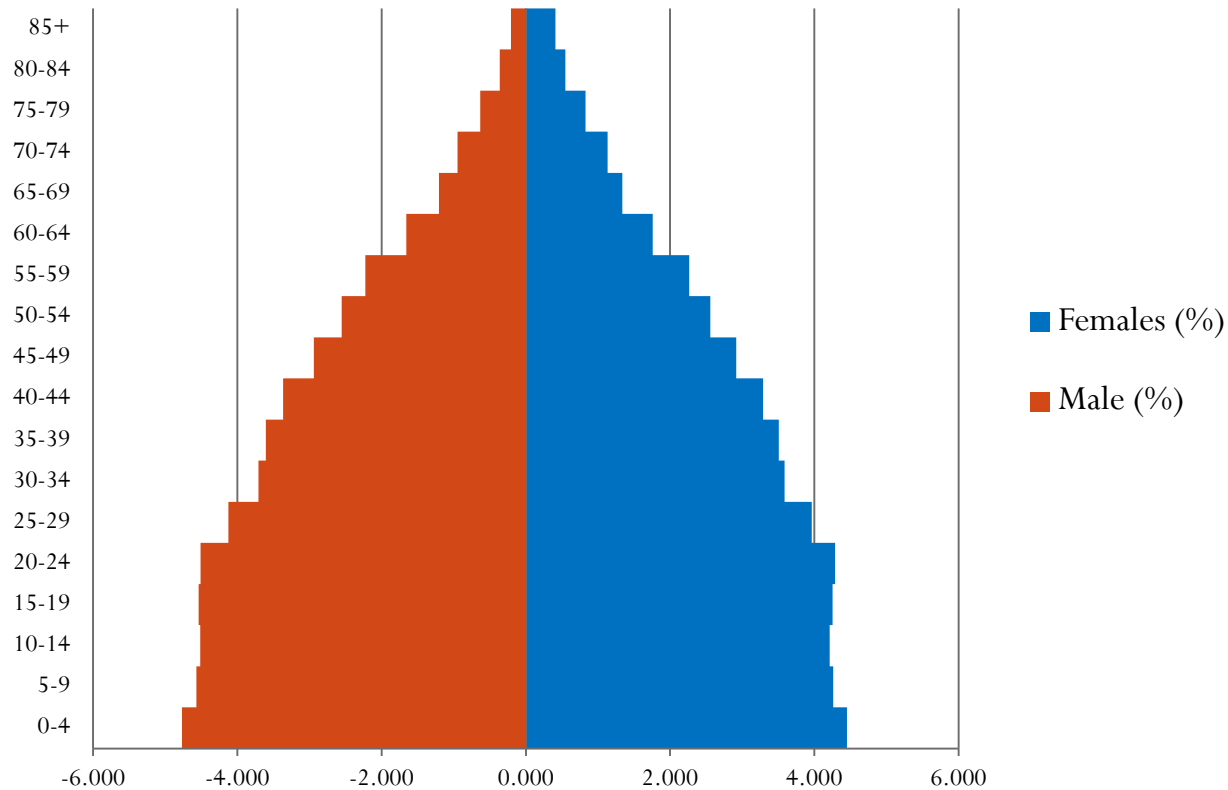
Thank you!

Now you can proceed to the assignment