Demography (Lecture 2)

Population Composition
Age and Sex Composition

- Age and sex are the most basic characteristics of a population.

- Every population has a different age and sex composition—**the number and proportion of males and females in each age group—**

- This structure can have considerable impact on the population's social and economic situation, both present and future.

Population Composition
Age and Sex Composition

- Populations could be relatively young / developing countries, About 40 % <15 years e.g. Africa.. Jordan . Less than 4% are older groups.

- Relatively old populations (aging), developed countries, more than 10% over 65 years e.g. Europe/ Less than 25% of pop <15 years.

Age and Sex Composition

- Young and old populations have markedly different age compositions; as a consequence, they also have different proportions of the population in the labor force or in school, as well as different medical needs, consumer preferences, and even crime patterns.

Median Age

A population's age structure has a great deal to do with how that population lives.

- The **median age** is the age at which exactly half the population is older and half is younger (the age 'midpoint' of a population).

- **Examples:**

- **The median age of the Costa Rican population in 1995 was 23 years.**

- **In 1995, the median age in Jordan, with a young population, was 18. In 2012, median age in Jordan was 20,3 years. In 2017 it became 22 years.**
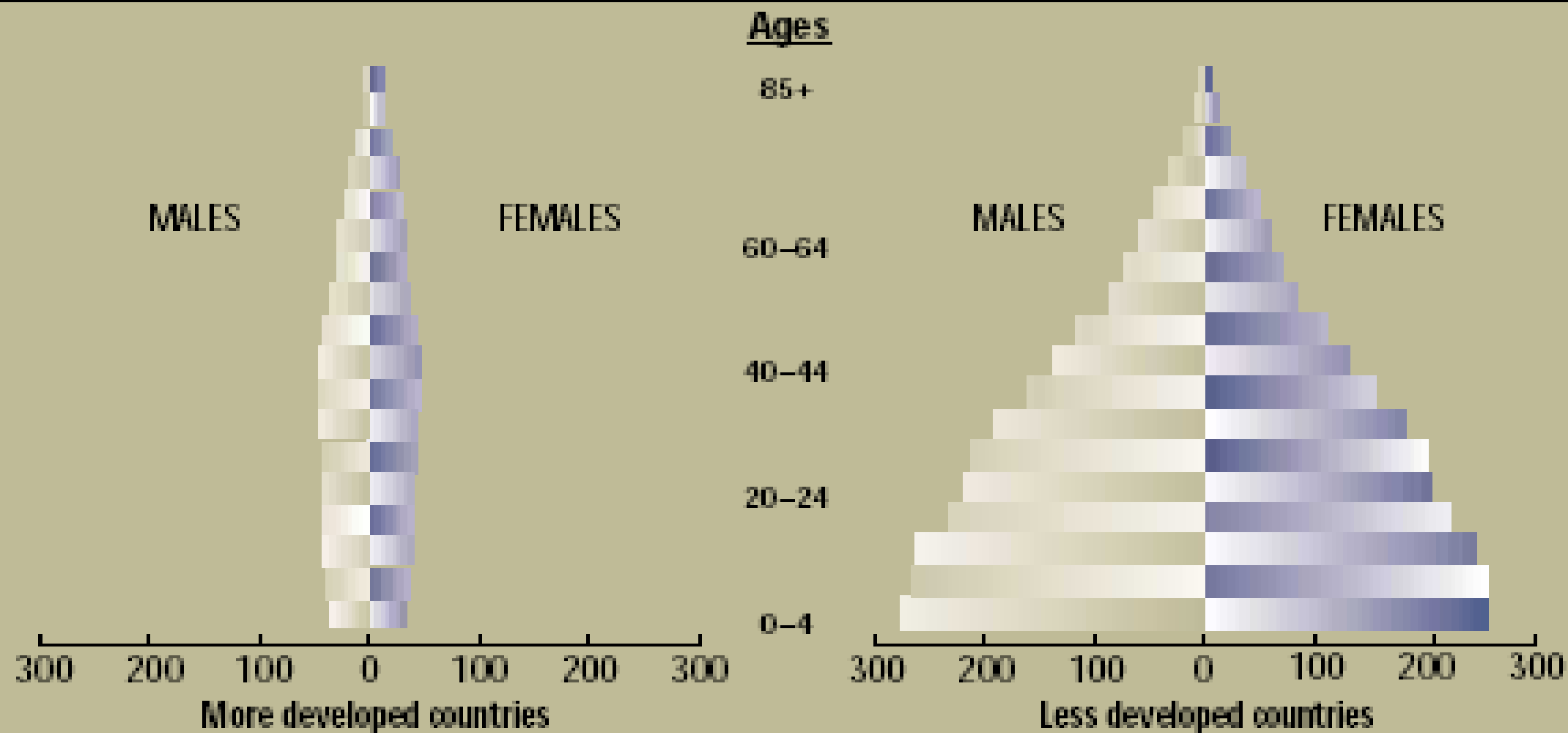
Sex Ratio

- The sex ratio is *the ratio of males to females in a given population*,

- usually expressed as the number of males for every 100 females.

- The sex ratio at birth in most countries is about 105 or 106 males per 100 females.

- After birth, sex ratios vary because of different patterns of mortality and migration for males and females within the population.

Population Pyramid

- A population pyramid graphically displays a population's age and sex composition.

- Horizontal bars present the numbers or proportions of males and females in each age group.

- The sum of all the age-sex groups in the population pyramid equals 100 percent of the population.

Age and sex distribution in more and less developed countries, 1998

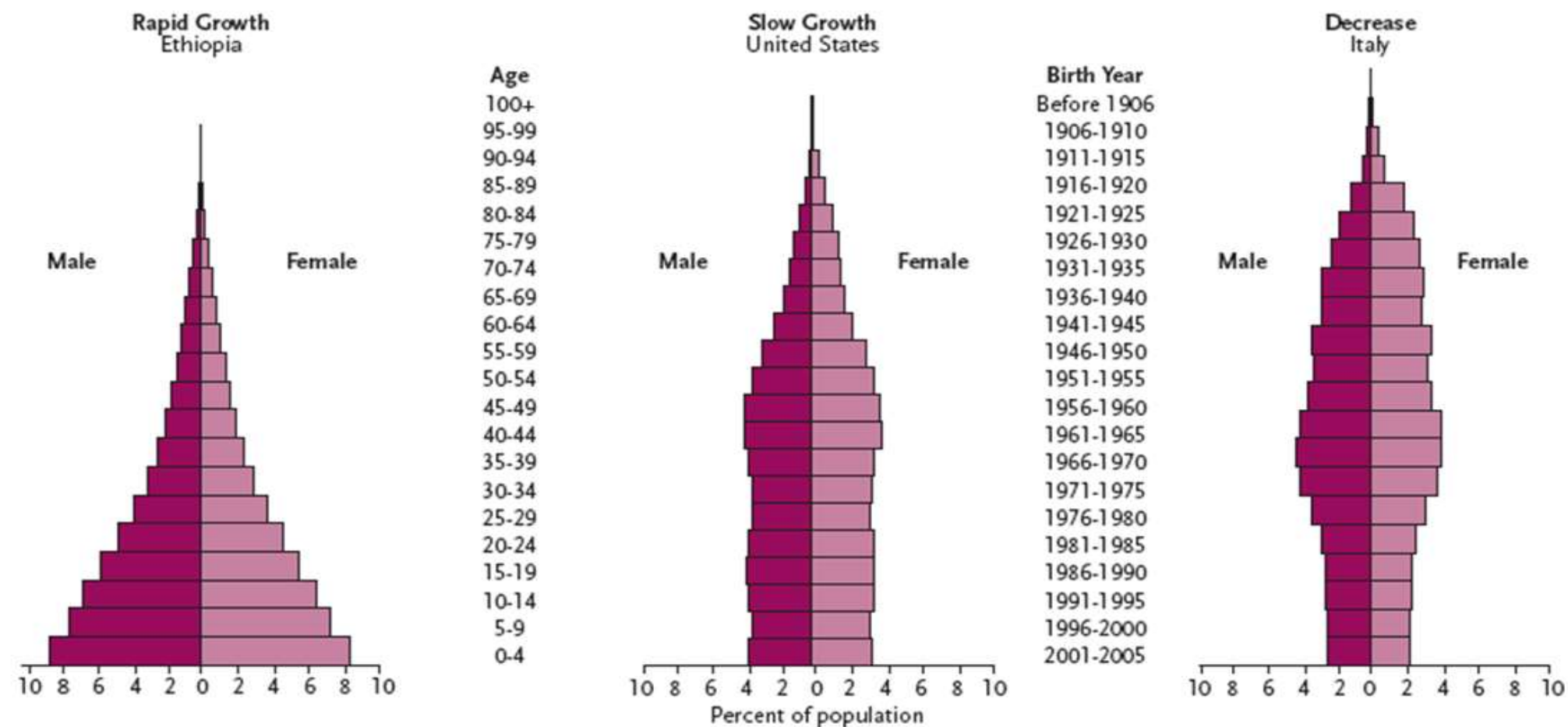*in millions*

Ages

MALES   FEMALES   MALES   FEMALES

85+

60–64

40–44

20–24

0–4

300   200   100   0   100   200   300   300   200   100   0   100   200   300

More developed countries   **Less developed countries**
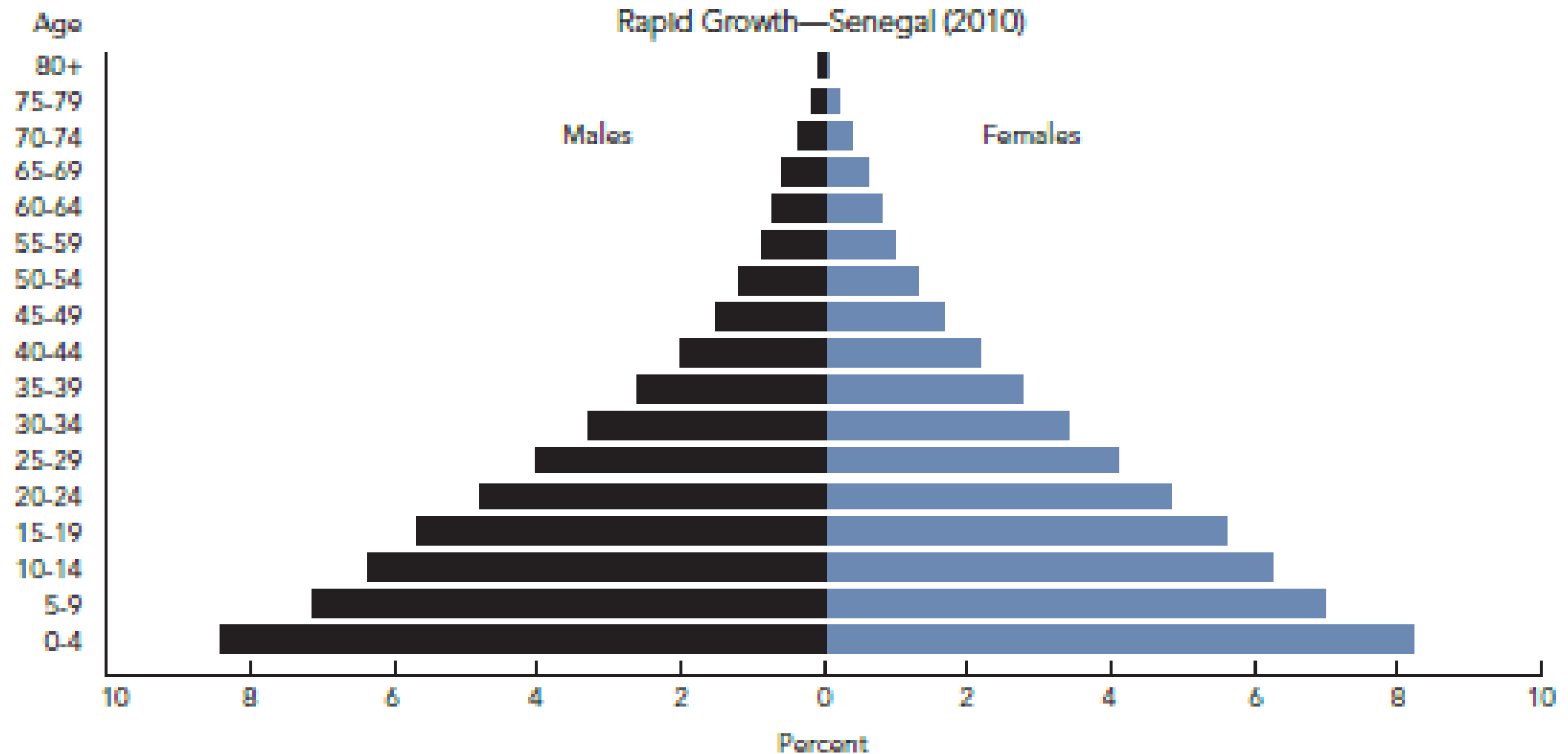
Population profiles

- Populations of countries can differ markedly as a result of **past and current** patterns of **fertility, mortality, and migration.** However, they all tend to fall into three general profiles of age-sex composition (types of growth):

1. Rapid growth is indicated by a pyramid with a large percentage of people in the younger ages.

2. Zero growth or decreasing is reflected by a pyramid with a smaller proportion of the population in the younger ages.

3. Slow growth populations are shown by roughly equal numbers of people in all age ranges, tapering off gradually at the older ages.

Figure 6
Population Pyramids: Ethiopia, United States, and Italy, 2005

Rapid Growth
Ethiopia

Male   Female

Slow Growth
United States

Male   Female

Decrease
Italy

Male   Female

Age
100+
95-99
90-94
85-89
80-84
75-79
70-74
65-69
60-64
55-59
50-54
45-49
40-44
35-39
30-34
25-29
20-24
15-19
10-14
5-9
0-4

Birth Year
Before 1906
1906-1910
1911-1915
1916-1920
1921-1925
1926-1930
1931-1935
1936-1940
1941-1945
1946-1950
1951-1955
1956-1960
1961-1965
1966-1970
1971-1975
1976-1980
1981-1985
1986-1990
1991-1995
1996-2000
2001-2005

10 8 6 4 2 0 2 4 6 8 10

10 8 6 4 2 0 2 4 6 8 10
Percent of population

10 8 6 4 2 0 2 4 6 8 10

Sources: UN, *World Population Prospects: The 2004 Revision, Online Data* (www.un.org/esa/population/unpop.htm, accessed Jan. 29, 2007); and U.S. Census Bureau, *National Population Estimates for the 2000s* (www.census.com, accessed Jan 29, 2007).

Age pattern of Senegal population, 2010

Rapid Growth—Senegal (2010)

Males — Females

Age: 80+, 75-79, 70-74, 65-69, 60-64, 55-59, 50-54, 45-49, 40-44, 35-39, 30-34, 25-29, 20-24, 15-19, 10-14, 5-9, 0-4

Percent: 10 8 6 4 2 0 2 4 6 8 10

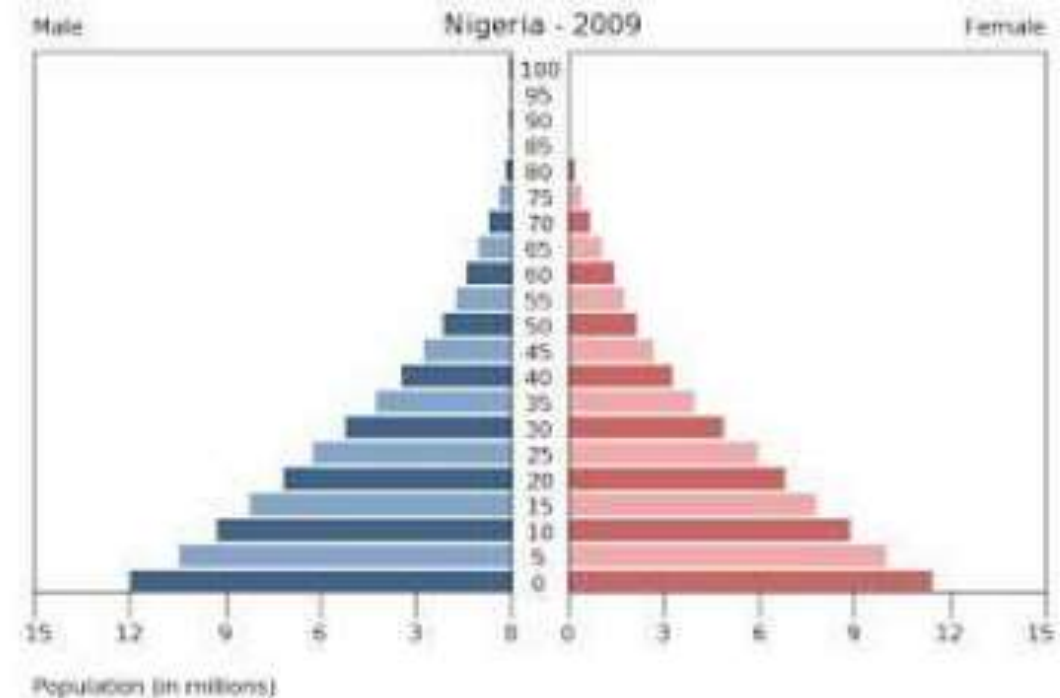**Rapid Growth Population Pyramid**

Shape: Looks like a typical pyramid with a large base that gets smaller as you ascend. This type of population typically has poor health care and short life expectancies. Mostly found in under developed and developing countries.

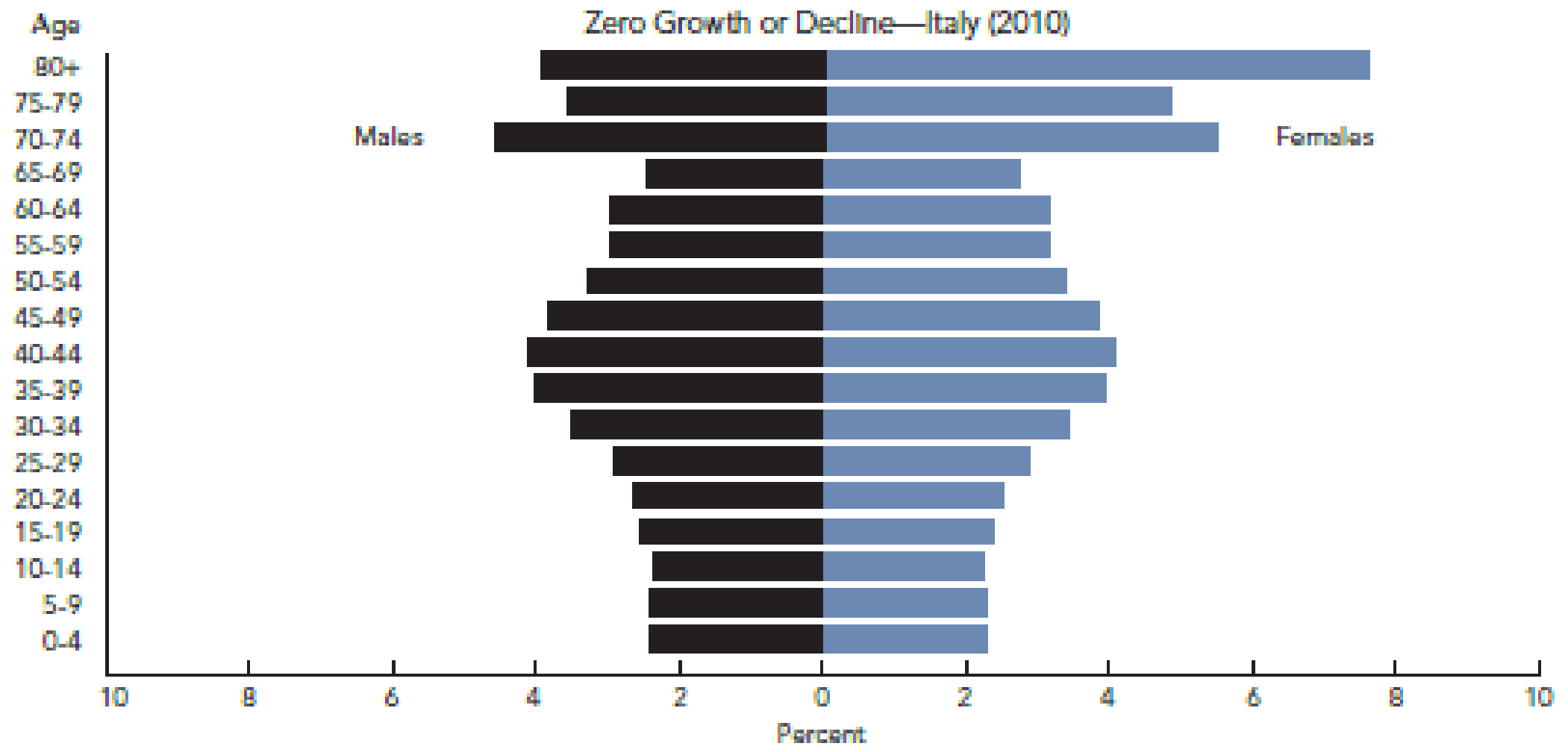**Age Ratio:** Large proportion of young high young dependency ratio
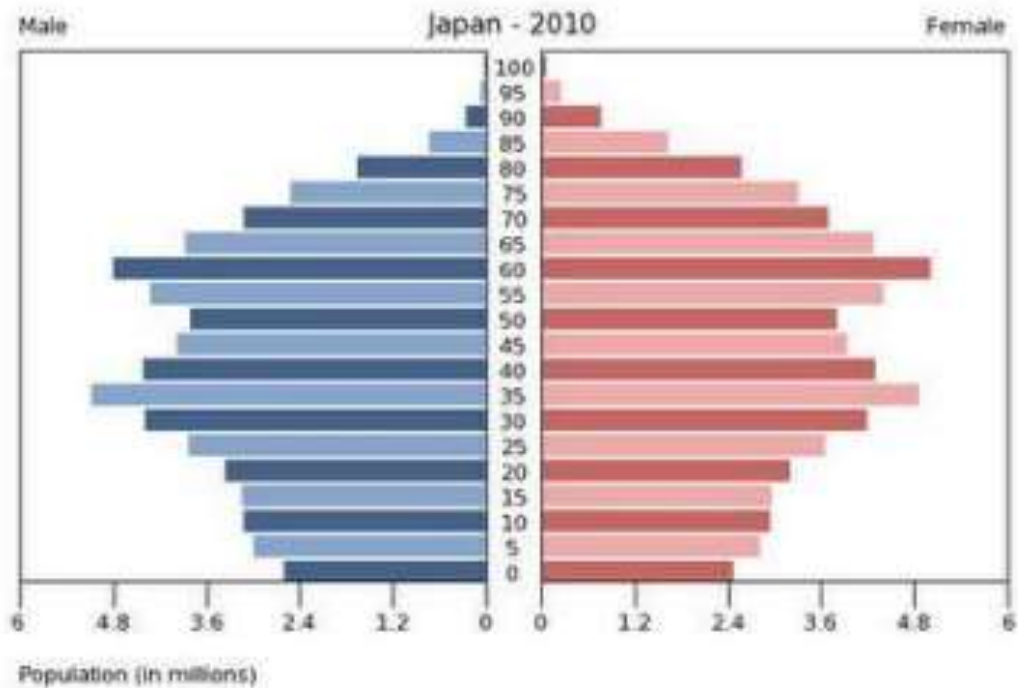
Sex Ratio: Balance sex ratio

Implications: Clear need for investment into water supplies, health care, food supplies, housing to reduce death rates and family planning to reduce birth rate.

Examples: Kenya, India

Male   Nigeria - 2009   Female

Population (in millions)

Age pattern of Italy's population, 2010

Zero Growth or Decline—Italy (2010)

Age: 80+, 75-79, 70-74, 65-69, 60-64, 55-59, 50-54, 45-49, 40-44, 35-39, 30-34, 25-29, 20-24, 15-19, 10-14, 5-9, 0-4

Males

Females

Percent

Negative or Declining Growth Population Pyramid

Shape: "Rocket shape" This type of population pyramid is mostly found in developed countries. These countries have good health care, long life expectancies and stable governments. However, their birth rates are lower than needed to replace the population.

Age Ratio: Large proportion of working Population, low proportion of young dependents

Sex Ratio: Mostly balanced pyramid, often higher older female population.

Implications: Aging population is taxing on the health care system. May not be enough workers to keep the society functioning, typically become dependent on migrant workers.

Examples: Germany, Japan

Age pattern of US population, 2009

Slow Growth—United States (2009)

Age: 80+, 75-79, 70-74, 65-69, 60-64, 55-59, 50-54, 45-49, 40-44, 35-39, 30-34, 25-29, 20-24, 15-19, 10-14, 5-9, 0-4

Males

Females

Percent

**Slow or Stable Growth Population Pyramid**

Shape: "Beehive shape" There is little change in the lower sections of the pyramid. Only after the upper ages do you see a marked change in population. This type of population pyramid is mostly found in developed countries sometimes middle income countries. These countries have good health care, long life expectancies and stable governments.

Age Ratio: Bars of equal length – Balance Proportion
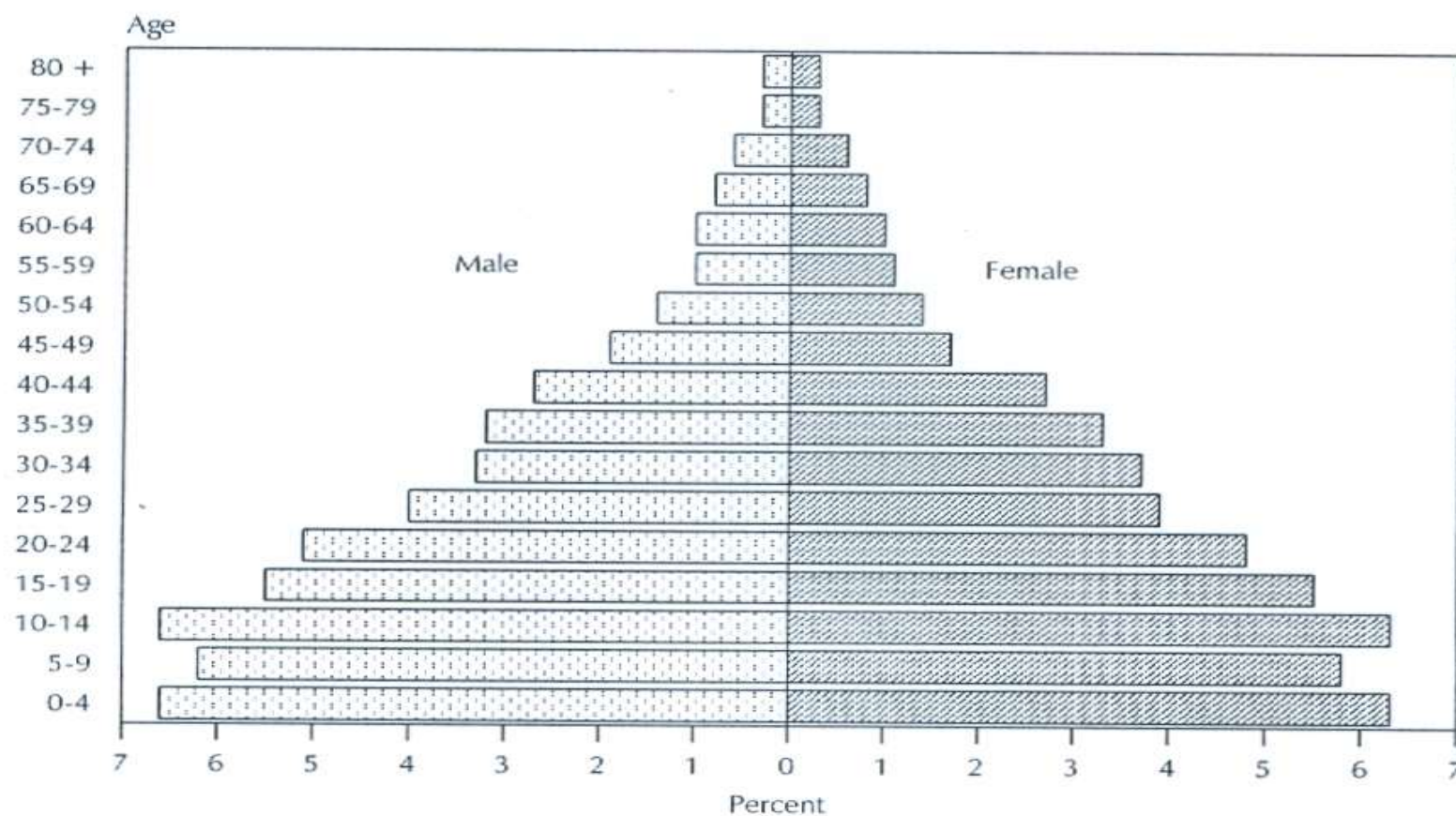**Sex Ratio:** Balance pyramid - Balance Sex Ratio
Implications: Sustainable, positive outlook
Examples: United States

United States - 2010
Male / Female
Population (in millions)
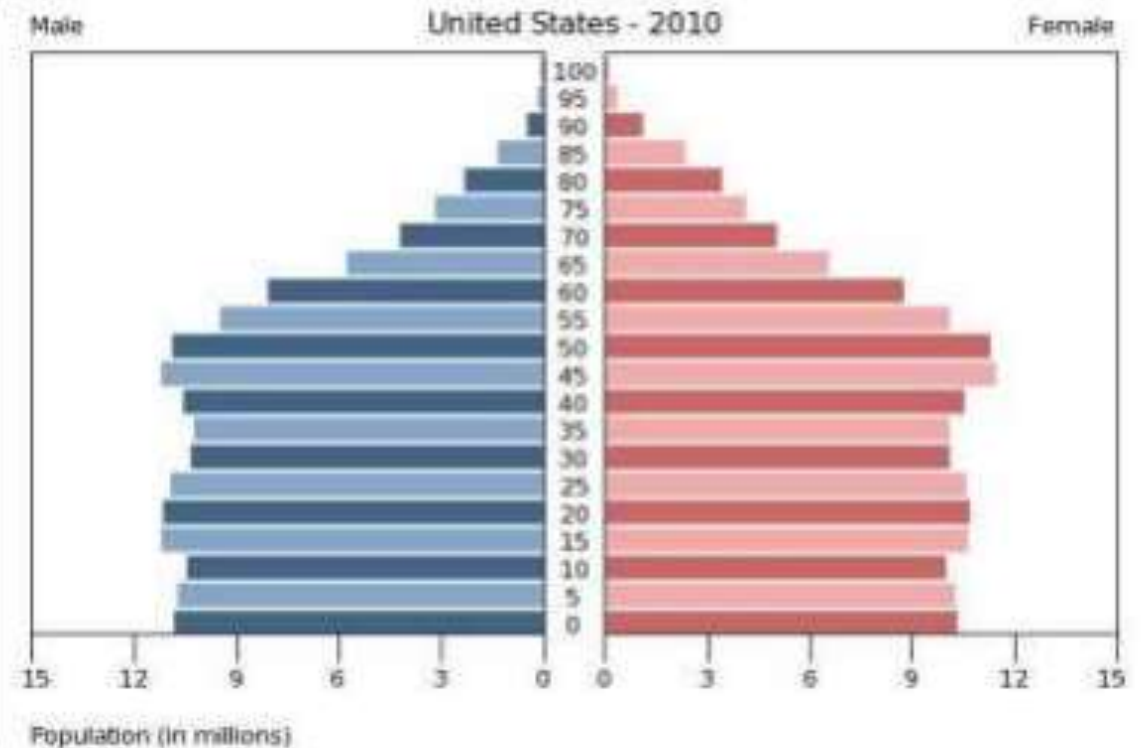
Jordan Population Pyramid

Figure 2.2 Population Pyramid

JPFHS 2007

Jordan's Population Pyramid, 2017
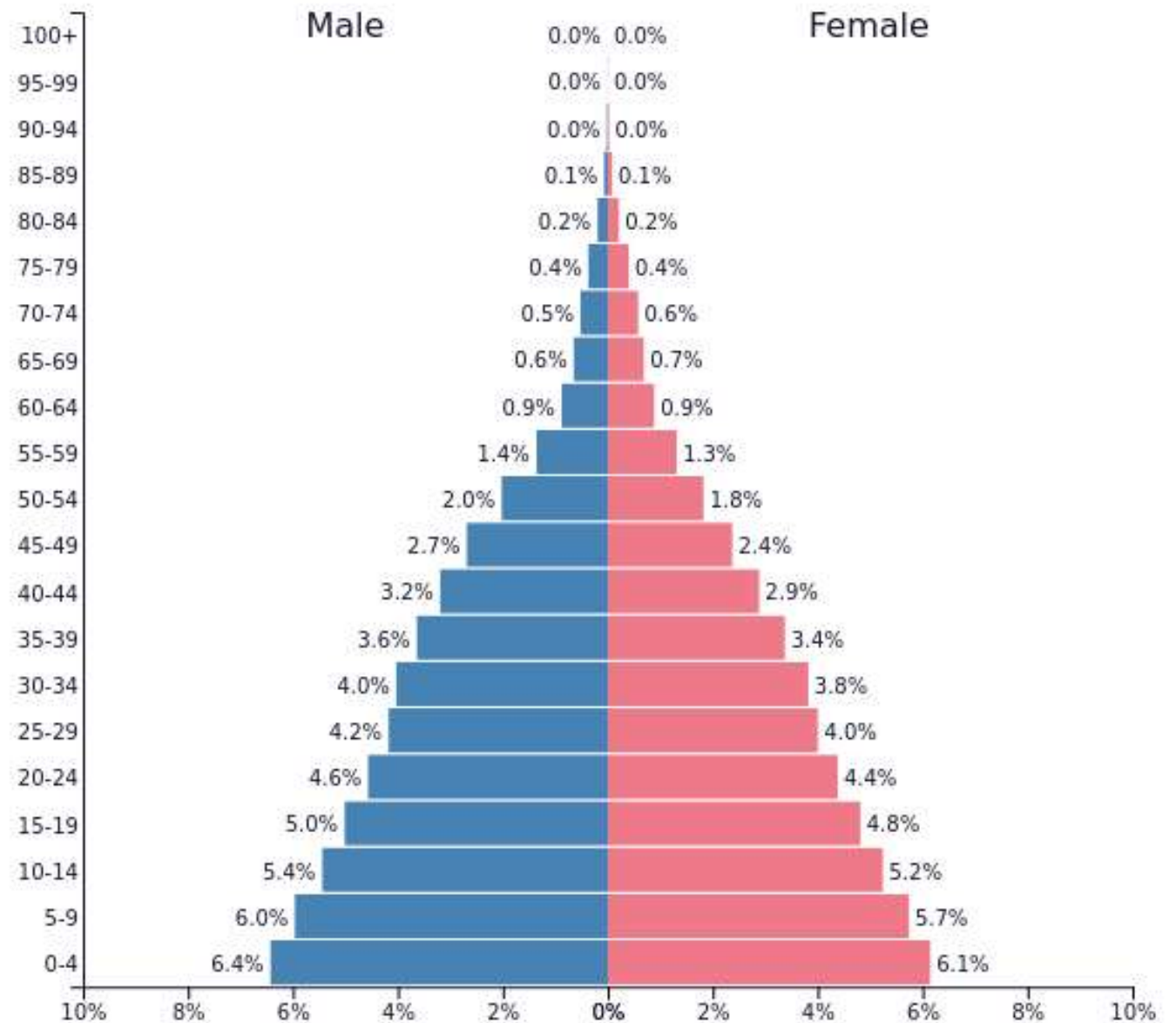
Jordan - 2017
Population: **7,876,702**

PopulationPyramid.net

Figure 2.2 Population Pyramid

Age

80 +		
75-79		
70-74		
65-69		
60-64		
55-59		
50-54		
45-49		
40-44		
35-39		
30-34		
25-29		
20-24	5.7	
15-19		
10-14		
5-9		
0-4		

Male   Female

Percent

Male   Female

	Male	Female
100+	0.0%	0.0%
95-99	0.0%	0.0%
90-94	0.0%	0.0%
85-89	0.1%	0.1%
80-84	0.2%	0.2%
75-79	0.4%	0.4%
70-74	0.5%	0.6%
65-69	0.6%	0.7%
60-64	0.9%	0.9%
55-59	1.4%	1.3%
50-54	2.0%	1.8%
45-49	2.7%	2.4%
40-44	3.2%	2.9%
35-39	3.6%	3.4%
30-34	4.0%	3.8%
25-29	4.2%	4.0%
20-24	4.6%	4.4%
15-19	5.0%	4.8%
10-14	5.4%	5.2%
5-9	6.0%	5.7%
0-4	6.4%	6.1%

10% 8% 6% 4% 2% 0% 2% 4% 6% 8% 10%
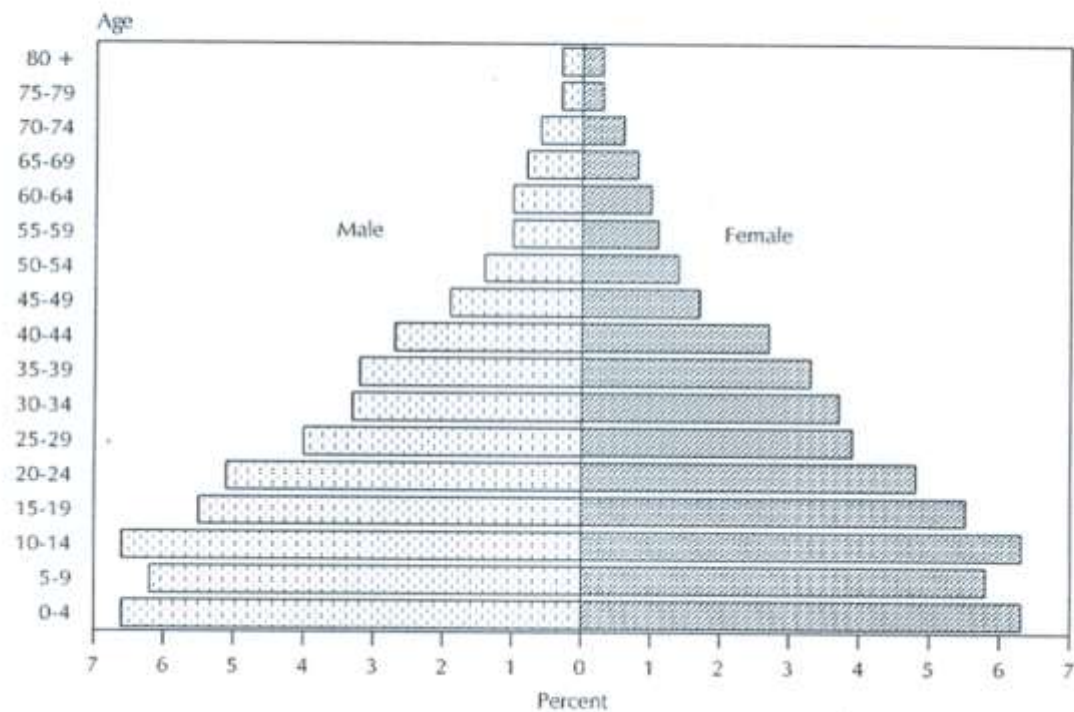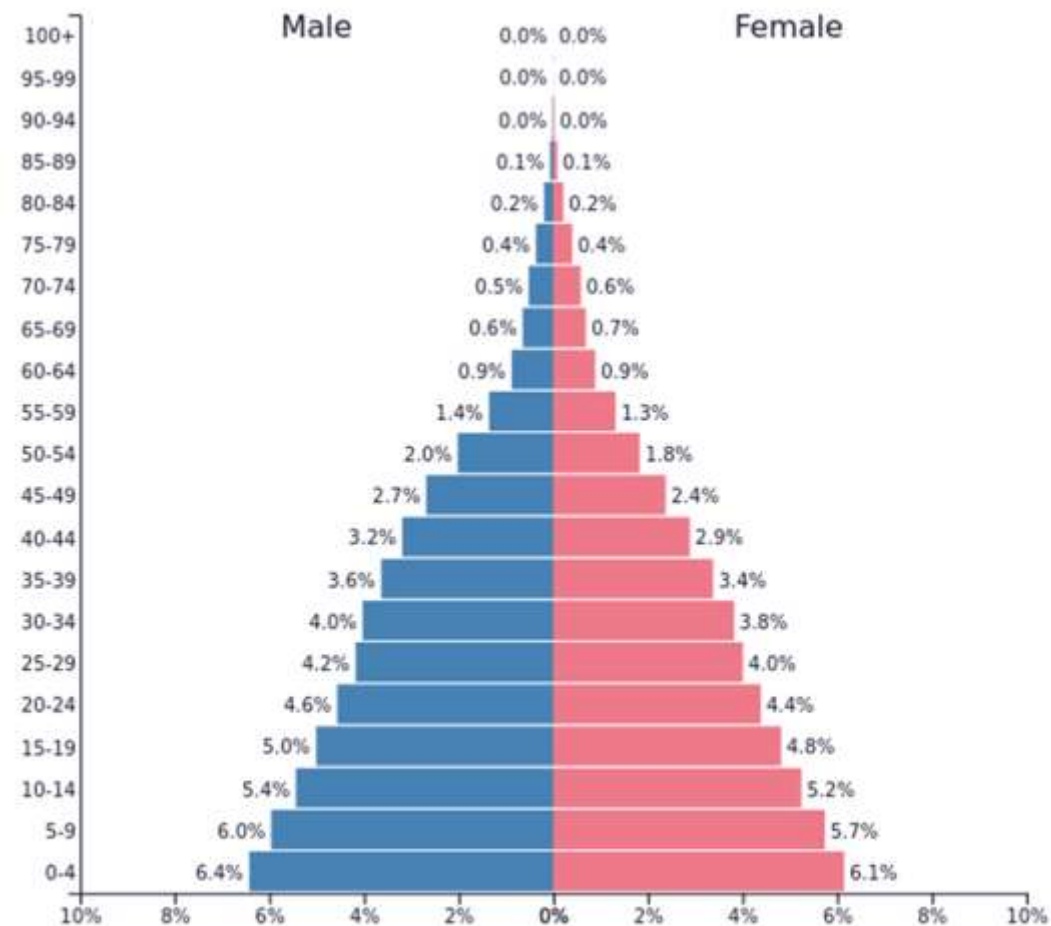
Jordan - 2017
Population: **7,876,702**

جدول 5.2 عدد سكان المملكة المقدر حسب الجنس وفئة العمر في نهاية 2017

Table 2.5 Estimated Population of the Kingdom by Sex and Age Group, at End-year 2017

نسبة الجنس * Sex Ratio	المجموع Total		اناث Female		نكور Male		فئة العمر Age Group
	%	عدد	%	عدد	%	عدد	
105.3	11.5	1154040	11.9	562050	11.1	591990	0-4
104.6	12.3	1233450	12.7	602750	11.8	630700	5-9
106.0	10.6	1065660	10.9	517330	10.3	548330	10-14
111.0	9.9	999660	10.0	473860	9.9	525800	15-19
121.6	9.9	997710	9.5	450160	10.3	547550	20-24
124.0	8.7	876030	8.3	391030	9.1	485000	25-29
117.0	7.7	774560	7.5	356950	7.8	417610	30-34
118.2	6.8	686800	6.7	314810	7.0	371990	35-39
118.6	5.9	591610	5.7	270630	6.0	320980	40-44
120.4	5.0	499300	4.8	226580	5.1	272720	45-49
115.1	3.7	368970	3.6	171540	3.7	197430	50-54
108.5	2.6	258080	2.6	123750	2.5	134330	55-59
106.7	1.8	176220	1.8	85250	1.7	90970	60-64
102.3	3.7	370910	3.9	183310	3.5	187600	65+
112.5	100.00	10053000	100.00	4730000	100.00	5323000	Total

Sex Ratio: Number of males Per 100 females

نسبة الجنس:عدد النكور لكل 100 أنثى *

Source: Department of Statistics

http://dosweb.dos.gov.jo/DataBank/Population_Estimares/2017/PopulationEstimates.pdf

Population change

- Population change has three components: births, deaths, and migration.

- As people are born, die, or move, their total numbers in an area change.

- During most of history, world population increased very slowly, but during the 20th century, this growth has accelerated.

How do populations change?

- A change in **population size** over a given period of time equals **the number of people in the population at the beginning of the period** plus any **births that occur during the period**, minus any **deaths,** plus **net migration during the period.**

Calculating population change over time

$$P_1 + (B-D) + (I-E) = P_2$$

$P_1 + (B - D) + (I - E) = P_2$

Where P_2 is the population at the later date and P_1 is the population at the earlier date; B is births and D is deaths between the two dates; and I is immigration (or in-migration) and E is emigration (or out-migration) between the two dates.

Jan. 2009 population	+ (2009 Births-Deaths)	+ (2009 Immigration-Emigration)	=	Jan. 2010 population of Sweden
9,256,000	+ (111,800 – 90,080)	+ (102,280 – 39,000)	=	9,341,000

During 2009, the population of Sweden increased by 85,000.

Population change

- The change in population size accounted for by more births in the population than deaths is referred to as "**natural increase.**"

- The term "**natural decrease**" refers to population decline resulting from more deaths than births.

Rate of Natural Increase

- The rate of natural increase is the rate at which a population is increasing (or decreasing) in a given year due to a surplus (or deficit) of births over deaths, expressed as a percentage of the base population.

- Net migration is the number of immigrants minus emigrants.

Growth Rate

- The growth rate is the rate at which a population is increasing (or decreasing) in a given year due to natural increase and net migration, expressed as a percentage of the base population.
- The growth rate takes into account all components of population growth: births, deaths, and migration.
- **It equals (births – deaths)+_ net migration/ total population X K (100).**
- It should never be confused with the birth rate, but it sometimes is.

The Demographic Transition

Frank W. Notestein (1902-1983)

- The demographic transition refers to the change that populations undergo from high rates of births and deaths to low rates of births and deaths.

- There are four stages to the demographic transition model.
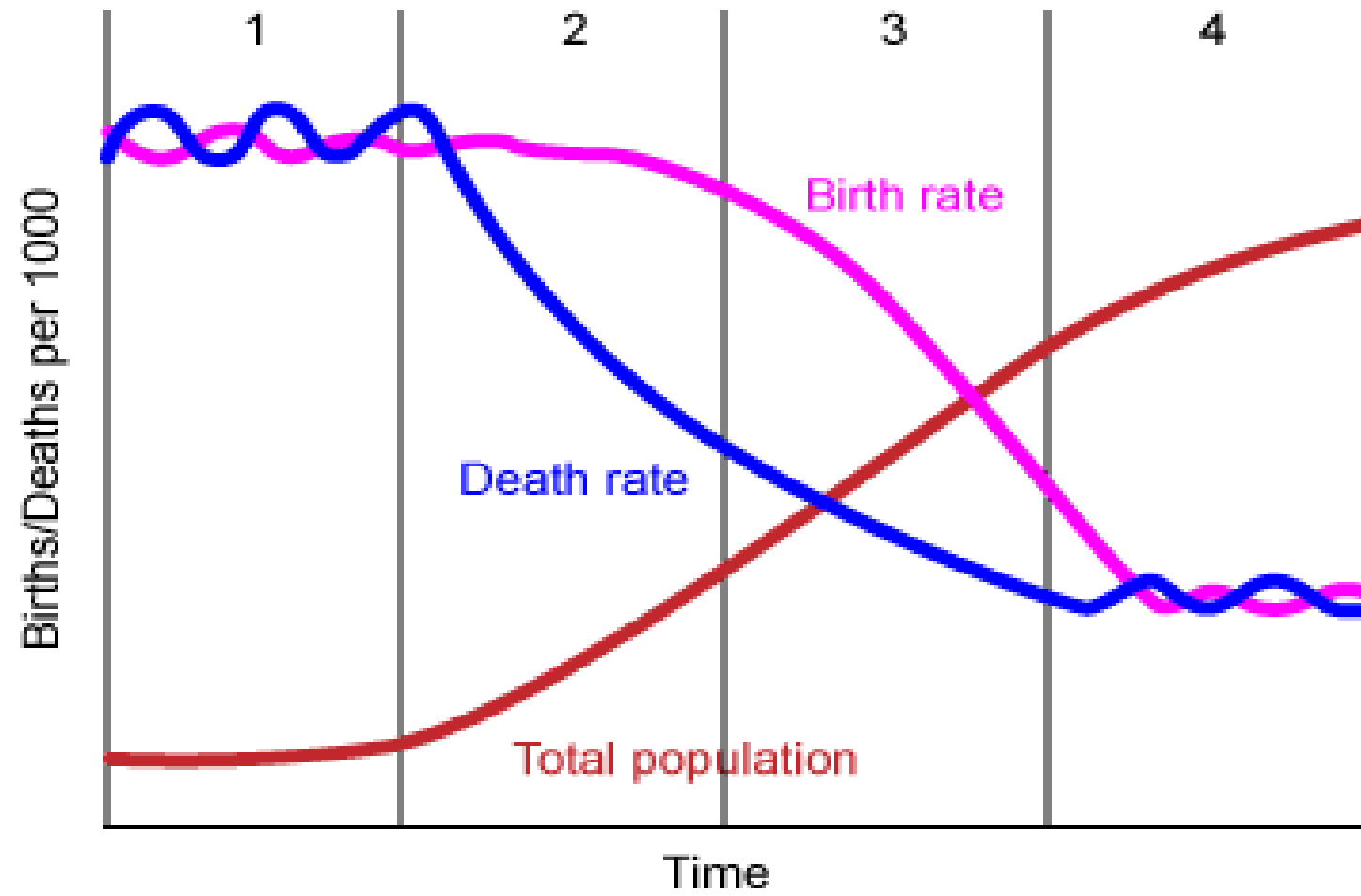
Finland is a good example of a country that has passed through the four stages of the demographic transition.

Stage I
High birth rate, high death rate = little or no growth
Finland in 1785-1790)
Birth rate: 38 per 1,000
Death rate: 32 per 1,000
Rate of natural increase: 0.6 percent

Stage II
High birth rate, falling death rate = high growth
(Finland in 1825-1830)
Birth rate: 38 per 1,000
Death rate: 24 per 1,000
Rate of natural increase: 1.4 percent

Stage III
Declining birth rate, relatively low death rate =
slowed growth
(Finland in 1910-1915)
Birth rate: 29 per 1,000
Death rate: 17 per 1,000
Rate of natural increase: 1.2 percent

Stage IV
Low birth rate, low death rate =
very low population growth
(Finland in 1996)
Birth rate: 12 per 1,000
Death rate: 10 per 1,000
Rate of natural increase: 0.2 percent

Population policies

- National population commissions were formed in different countries
- They formulated national population policies and action plans
- One major component of the action plan deals with reproductive health
- Reproductive health in the context of population includes reproductive rights, sexuality, family planning, reproductive morbidity, violence against women, gender based differences, male involvement in reproductive health.

Selected Indicators of Jordan

- **Jordan Population and Family Health Survey (JPFHS), 2017/2018**

Total population   10,234,315 by September 7, 2018
(including 3 million non-Jordanian residents)
Population Growth Rate (%)   2.2
Rate of natural increase (%)   2.1
Population Doubling time (year)   31.5
Population less than 15 years (%)   34.4

Population Age 15-65 years (%)   61.9
Population Age 65+ years(%)   3.7
Dependency ratio   63.5
Urban population (%)   90.3
Rural population (%)   9.7
Life Expectancy at birth (year) 73.5
Male   72.8
Female   74.3

Total fertility rate (Women 15-49 years) 2.7
Urban   2.7
Rural   3.1
General Fertility Rate (women 15-44)   90
Sex ratio   112.5 (Number of males/100 females)