

Demography-II

Dr. Nedal Alnawaiseh: M. B. Ch. B (MD), Baghdad, Iraq. MSc, JUST, Jordan.
MSPH, Tulane University, USA.
PhD, UKM, Malaysia. PhD, UNU, IIGH.
Public Health & Community Medicine Department, Medical School, Mutah
University, Jordan.

3. Distribution of the population

✓ In describing the distribution of any population the following questions have to be answered:

1. What is the percentage of **inhabitant land** in relation to available land within the national borders of a given country?
2. What is the **population density /km²** for the inhabited area?
3. What is the population density **/km²** for the available land?

Distribution of the population

- ✓ What are the occurring population movements between different areas of the country (rural- urban)?
- ✓ Data on distribution are notable politically, economically as well as socially.
- ✓ Changes in distribution are caused by the Cumulative Effects Of Fertility, Mortality, External And Internal Migration

MAJOR DEMOGRAPHIC PROCESSES

Major demographic processes

Components Of Population Dynamics

- I. Fertility
- II. Mortality
- III. Migration

I. Fertility (Natality)

- **Fertility** is the actual **Reproductive Performance** of a woman or a group of women.
- Statistically a woman's reproductive period is from **15 – 49 years**.

Measures of Fertility



- 1. Crude Birth Rate**
- 2. General Fertility Rate**
- 3. Age Specific Fertility Rates**
- 4. Total Fertility Rate**
- 5. Gross Reproduction Rate**
- 6. Net Reproduction Rate**

Measures of fertility

❑ **Crude birth rate (CBR):** it is the number of live births per 1000 mid year population in a given year and locality

CBR = معدل المواليد الخام

Total no. of live births in a certain year and locality

x 1000

Estimated midyear population (same year and loc.)

CBR in Jordan = 30.1 births/1,000 population 2010

CBR: (per 1,000 people) in Jordan was reported at **26.47 in 2016**

Measures of fertility

- ❑ CBR is a crude index of fertility as it relates births to total population (males, females outside the reproductive period as well as unmarried)
- ❑ CBR is useful in:
 - A. Making annual comparisons
 - B. Detect trends in fertility in a given country
(30.1 \longrightarrow 26.47)/1000
 - C. Comparing different population
 - \longrightarrow Gaza Strip Birth rate. Birth rate: 31.4 births/1,000 population (2017 est.)

Measures of fertility

Factors affecting the crude birth rate:

A. Factors affecting the Numerator:

1. Number of females in the community specifically those 15 -49 years
2. The age of marriage
3. The level of infant and preschool mortality rates
4. The rate of having children

Measures of fertility

Factors affecting the crude birth rate:

B. Factors affecting the Denominator:

1. Epidemics
2. Wars
3. Famines
4. Migration

Measures of fertility

- **General Fertility Rate (GFR)**: the number of live births a given year and locality per 1000 females in the child bearing period (15-49 years)
- It is equal to:

Total no. of live births in a certain year and locality

x 1000

Reproductive Female Population In The Same Year And Locality: عدد النساء في سن الانجاب

Measures of fertility

- ❑ GFR is refinement of the CBR as it relates births to those who will carry them in the future.
- ❑ It eliminates the influence of the difference in the proportion of males in the community

- ❑ **The weakness of GFR is that it does not take into account:**
 1. The marital status
 2. The differences in fertility levels in various age groups of reproductive period.

Measures of fertility

Age specific fertility rate (ASFR):

- ❑ Major refinement in measuring fertility allowing for the age differences among women
- ❑ The whole reproductive life of women is divided into 7 age groups, each of 5 years duration (15 – up to 45 – 49)
- ❑ There are **seven (7)** age specific fertility rates.

Measures of fertility

ASFR =

Total no. of live births born by females in a specific age group in a certain year and locality

Female population in the same age group

x 1000

Measures of fertility

Total Fertility Rate (TFR)

- The Total Fertility Rate (TFR) is a standard demographic indicator used internationally to estimate the Average Number Of Children that a woman would have over her childbearing years (i.e. age 15-49), based on current birth trends.
- **In Jordan TFR = 3.8 children born/woman in 2010**
- It is an **estimate** of the **average number** of children born to a **woman or a cohort of 1000** women throughout her or their child bearing period subjected to prevailing age specific fertility rates.

Measures of fertility

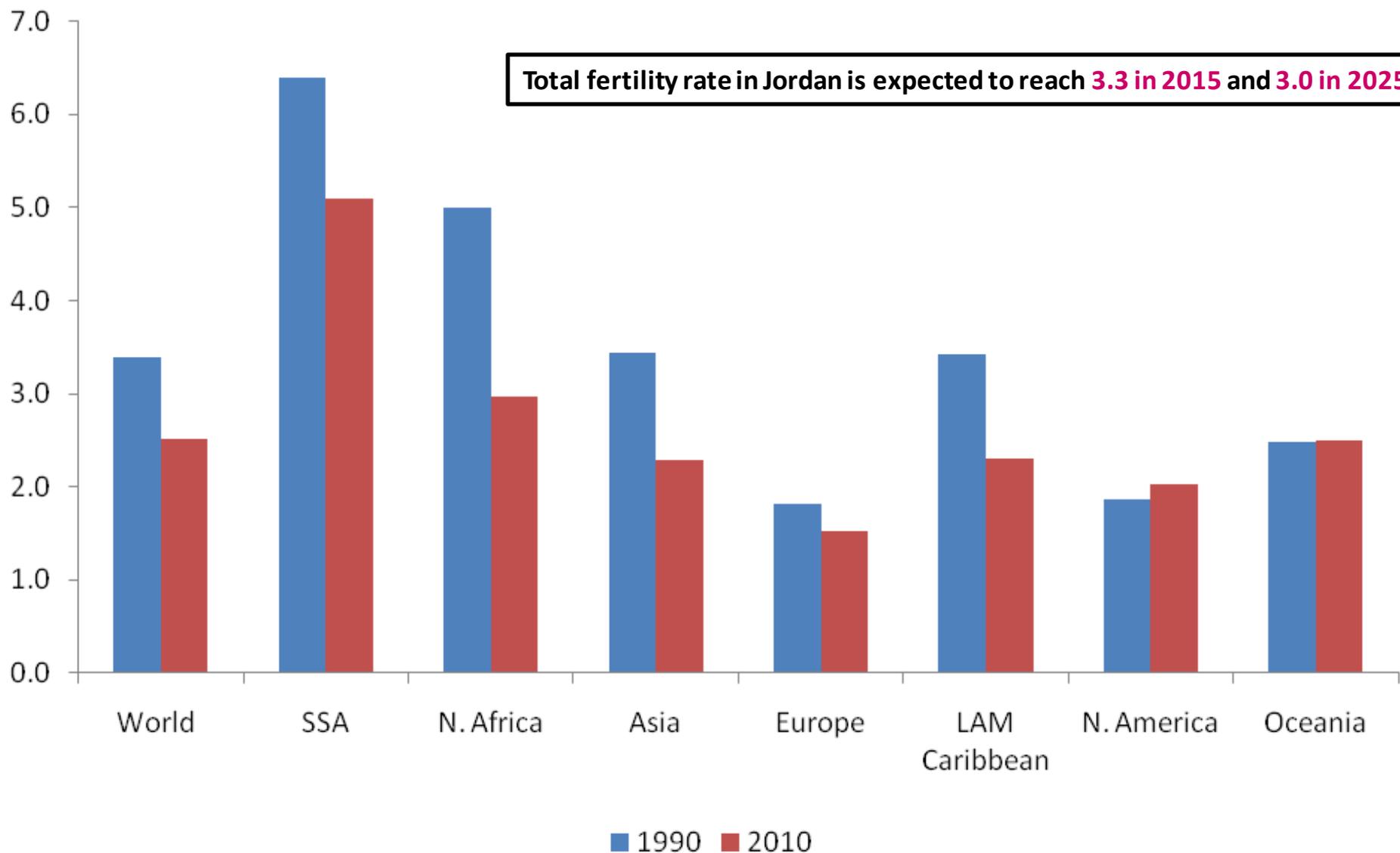
Total fertility rate entails two assumptions:

- 1) The ASFRs remain constant for this cohort of females till the end of their reproductive life.**
- 2) Non of the women beginning their reproductive life will die before reaching their menopause**

Measures of fertility

- In most developed countries the TFR is **below 2.0**
- In a number of developing countries it is **over 6.0** (very high rate)
- **In Jordan TFR = 3.8 children born/woman in 2010**

Total fertility rates in 1990 and 2010 for the world and its major regions



Measures of fertility

- ❑ Even if this target is achieved the population will grow for another period by the effect of **Demographic Momentum** (large % of women will reach reproductive age **الزخم الديموغرافي**). So, Total number of births can increase even if TFR falls.

Measures of fertility

Gross Reproduction Rate (GRR):

- ❑ It shows only the number of Female Births who are expected to be future mothers
- ❑ It is defined as the number of female births / 1000 women or /woman throughout her or their child bearing period subjected to prevailing age specific fertility rates.
- ❑ In calculation it is similar to that of TFR but except that it refers only to female births only vs.

$$\text{TFR} = \frac{\sum (\text{average number of children (males + females)})}{\text{Female population in the same age group}}$$

Measures of fertility

- ❑ GRR is calculated by multiplying the TFR to the **percentage of females to the total births.**
- ❑ $GRR = TFR \times \% \text{ of female births.}$
e.g. $3.8 * 0.55 = 2.09$
- ❑ **The drawback** of the rate is that the deaths of women during their reproductive period are not taken into consideration

Measures of fertility

Net reproduction rate (NRR):

- ❑ It is derived from and is less than the GRR
- ❑ It **corrects the drawback** of the GRR where deaths of women during their reproductive period are taken into account using **life tables of females**.
- ❑ NRR measures the **actual number** of female children born to a woman during her child bearing life, **subject to prevailing age specific fertility and specific mortality rates**.

Measures of fertility

- Drawback of NRR is that it Assumes that the ASFR and the death rates in a certain year will remain constant through a generation.

N.B:

- TFR, GRR, and NRR are **hypothetical** measures of fertility.

II. Mortality

❑ Mortality data are relatively easy to obtain and reasonably accurate.

Measures of mortality:

1. Crude death rate
2. Age specific mortality rates
3. Sex specific death rates
4. Cause specific death rate
5. Proportionate mortality rate

Mortality

Crude Death Rate: CDR

Number of deaths in a certain year and locality

X 1000

Estimated mid year population in the same
year and locality

**The Jordanian figure for CDR 2010 = 7
deaths/1000 population**

Mortality

- ❑ The main advantage of CDR is its **Summarizing Power** (its ability to portray a general impression by a single value).
- ❑ However it **lacks comparability** between different communities that have different structures as regard factors governing the probability of death e.g. **age, sex and race composition**

Mortality

Age Specific Death Rate:

Total deaths in a certain
age and a certain year and area

X 1000

Total number of the same age group
in the same year and same area

Mortality

Sex Specific Death Rate

Number of deaths in a certain sex
during a year in a certain locality

X 1000

Total number of the same sex
during the same year and locality

Mortality

Cause Specific Mortality Rate;

Total number of deaths due to a certain cause during a year and a given locality

X 1000

Estimated midyear population during the same year and locality

Mortality

Proportionate Mortality Rates

Total number of *Deaths Due To A Certain Cause* during a year and a given locality

X 100

Total number of *Deaths From All Causes* during the same year and locality

III. Migration

Definition:

- ❑ It is the **movement** of populations **across a specific boundaries** for the purpose of residing.
- ❑ It is the **change of residence** of a person or a group of persons for better life and higher standard of living.

Migration

- ❑ The terms **Immigration** and **Emigration** are used for **international migration** (movement between countries); also called **external migration**. It can be **temporary or permanent**.
- ❑ The parallel terms **in-migration** and **out-migration** are used for **internal migration** (internal movement between different areas within a country)

Migration

- Although migration affects the characteristics of the population, its **role is minimal** when compared to fertility and mortality, in most of the countries