Today we are going to start talking about **Demography** which means number of people, their distribution and the **indicators** that reflex the health services in general such as mortality, fertility, infants, population growth rate, emigration ... etc.

All of these (mortality rate, fertility rate, infants, population growth rate, emigration...) are indicators for health services and particularly **preventive services**.

**Lecture Objectives**

- Present the need of population studies which is actually demography
- Introduce the components of population dynamics like birth, death, migration
- Introduce the basics of fertility, mortality and morbidity and their measures
- Discuss determinants of fertility
- Describe population composition

**Demography**:

- Describes types of population profiles
- Introduces basics of population change
- Introduces the basics of population transition

**The definition of Demography**:
It is the study of human populations; their size, composition, and distribution as well as the causes and consequences of changes in these characteristics.

**The major factors that determine the population dynamics**:

1- Fertility rate (number of births)
2- Mortality rate (number of deaths) Now in Jordan we have the demographic transition include decreasing in both (fertility and mortality) and increasing life span.
3- Migration: can be immigration which means coming inside, or emigration which means going outside.

If some groups within a population grow or decline faster than others, the composition of the whole is altered. These three factors determine the most basic characteristics of a population, as well as its demographic future.
Fertility:
It is the number of births that occur to an individual or in a population.
- Fertility differs so much from one country to another, for example: in 1998 it was 1.2 children per woman in Italy, Spain and several other European countries, while it was 7.4 children per woman in the West African country of Niger. So the range of fertility is very wide.
- In US it was 2
- In Jordan at the early 80's the fertility was 7.2
- According to the last survey in 2007 the fertility rate in Jordan became 3.6 (about the half)
- For the world the average fertility rate is 2.9

Fecundity:
The physiological ability of individuals or couples to have children.
Whereas the fertility is the number of children per childbearing age woman, so they are different.

- Many things can affect the fecundity:
  Some are infecund due to disease or genetic dysfunction.
  Mothers could be infecund due to breastfeeding (physiological method).

- For individuals fecundity ranges from 0 to 30 children

Factors accounting for fertility fecundity gaps:
Fertility is to control the number of children, whereas Fecundity is the ability, and there is a gap between them, because the woman could be able to conceive but she isn’t conceiving. What are the factors which account for that (the gaps)? Mainly the family planning services: women are able to conceive but we are stopping the pregnancy by family planning services (use of contraceptives)...
So when the gap is big this means that we have good family planning services and vice versa.
Community medicine

Other factors accounting for fertility fecundity gap:

- Cultural values: for example there are limits for some cultures to have a certain number of children..
- Economical factors: the parents can’t afford to have 6 or 7 children and raise them up..
- Health factors: such as something called infertility which mean not being able to conceive..
- Social roles: Is the wife primarily a childbearer or a childrearer?

Childbearer means can only conceive and bear children

Childrearer is to raise children

The woman must be both actually..

Why at the last 5 years the fertility of Jordan has decreased only from 3.7 to 3.6? This is due to cultural factors.

There are some intermediate factors for fertility:

Cultural and economic factors affect fertility levels indirectly (intermediate variables). They operate in different societies. The relative importance of the factors vary by society.

What are the intermediate fertility factors?

1. Fecundity: not only means infertile physically it could be:
   - Ability to have intercourse or not: maybe due to the absence of the husband
   - Ability to conceive: sometimes the intercourse is there but they cannot conceive
   - Ability to carry pregnancy to term

So the fecundity is 3 stages: first the intercourse, second the conceive (to get pregnant) and third to have the baby out.

2. Sexual unions: percentage of women in union. This rate is affected by other demographic factors such as:
   - The formation and dissolution of unions (marriage, divorce...etc)
   - Age at first marriage: its important because the age at first marriage determine the duration of fertility (the duration of being able to bear children). It is 24 in Jordan according to 2007 Statistics.
   - Time spent before union
   - Male mortality levels

3. Birth control:
Community medicine

- Use of contraceptives: many kinds, some of them are modern others are traditional
- Contraceptive sterilization: irreversible method and it’s limited here in Jordan because it is forbidden.
- Induced abortion: is also forbidden method.

The proximate determinants of fertility

Somebody called John Bonnagartes demonstrated 4 of these variables explain nearly all variation in fertility levels among population. These have a direct biological effect on fertility.

and here are these 4 factors:

- The proportion of women married or in a sexual union
- The Percentage of women using contraception
- The proportion of women who are breastfeeding
- The level of induced abortion (not in our country)

Some examples:

- In US. and most developed countries contraceptive use and abortion are the main two determinants. The rate of contraception use in US, Brazil, Australia, and few East and South East Asia have contraceptive use rates of more than 75%.

- Spain recorded the lowest fertility rate in a nation 1.15 births per woman of rep age. Basically due to 72% using contraceptives. Russia achieved low fertility rates due to having easier access to abortion.

- In Africa women marry early and bring more children, but they breast feed for 2-3 years and use this as a natural contraceptive.

- Others abstain as long as women are breast feeding.

- Polygamy and being away from home

- Sexually transmitted diseases affect fecundity.

Fertility Measurement
Birth Rate:

How we measure fertility?!

- we can measure it by many indicators one of them is the birth rate.
- The birth rate also called crude birth rate.
- It is the most easily obtained and most common reported Definition: it gives the average annual number of births during a year per 1,000 persons in the population at midyear.
- The birth rate is usually the dominant factor in determining the rate of population growth (the higher the birth rate, the faster the population growth). It depends on both the level of fertility and the age structure of the population (the younger the population the more the fertility).

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\text{Crude birth rate} = \frac{\text{number of births} \times K(1000)}{\text{the total population}}
\]

refer to slides for some examples

- In Jordan it is 26.79 (estimated 2011) >> we have to memorize this number
- So it is the number of births per thousand population..
- Around the world, birth rates vary widely. In Western Sahara’s, a very high birth rate 47 per 1,000 in 1996, while Italy’s it is very low, 9 per 1,000, also in 1996 (we don’t have to remember these numbers but we have to know that Western Sahara has one of the highest birth rates and Italy has one of the lowest, ...,)

General Fertility Rate:

Is another indicator or another determinant for the fertility measurement also called fertility rate, it is the number of live births per 1000 women (childbearing age women).

- The General Fertility Rate is a somewhat more refined measure than the birth rate (or crude birth rate) because it relates births to the age-sex group at risk of giving birth (usually defined as women ages 15-49 (childbearing age women)).

- The General Fertility Rate sums up in a single number the fertility of all women at a given point in time.
Yemen’s general fertility rate in the early 1990s was 238 live births per 1,000 women ages 15-49—(34 yrs) one of the highest in the world.

The Czech Republic’s, it was very low at a rate of 34 per 1000 women aged 15-49 in 1996.

**Total Fertility Rate:**

The average number of children that would be born to a woman by the time she ended childbearing if she were to pass through all her childbearing years conforming to the age-specific fertility rates of a given year.

- It is the average number of children in a family.
- Used to compare fertility among countries (it is an indicator to compare fertility)
- It tracks changes in fertility over time
- It is 3.6 in Jordan (2007) „it was 3.7 in 2002.. and we’ve mentioned the reason why they are close to each other .. (cultural factors)
- Fertility has been declining in Jordan since the mid-1970s. Surveys have found that the total fertility rate declined from 7.4 children per woman in 1976 to 5.6 in 1990, 4.4 in 1997, 3.7 in 2002 and to 3.6 children in 2007.

How to calculate total fertility rate?! (refer to the slides)

We divide the number of births to each age group by the number of women at that age group to get the age-specific birth rate then we sum all the groups up to get the total birth rate.

Done by: Baraa Saad ..

Sorry for any mistake ..