

Demography and data

- Scientific study of human population
- Concerned with :
 - Size
 - Distribution (**arrangement**)
 - Structure (**distribution with respect to age and sex**)
- 3 causes of change are → **fertility , mortality , migration .**
- Development → with respect to socio economic aspects .
- **ROLE of demography :**
 - Locating and identifying diseases of public health importance .
 - Understanding health and health care needs .
 - Determination of success of failure of health problems
 - Description of community health level
 - Define the leading causes of morbidity and mortality
 - Relative importance of different fatal diseases with respect to age and sex .
 - Finding solutions to health problems
- **Terms :**
 - **Mortality rate**
 - **Jordan → 6.1 : 1000**
 - **US → 8.3 : 1000**
 - **Angola → 23.74 : 1000**
 - **Birth rate** → births per 1000 ppl per year
 - **US → 13.83**
 - **Niger → 51**
 - **Jordan → 28.6**
 - **Growth rate** → **percent change in population over time**
 $\text{Birth rate} - \text{death rate} + \text{net immigration} / 1000$
 - **Dependency ratio (Jordan : 61.4)**
 - **Migration rate**
 - **Life expectancy (74)**
 - **TFR (in the world : 2.59 / in Jordan : 3.5)**
- **Sources of demographic data**
 - Census , Vital events registers
 - Surveys , sample registration system

- **Methods of estimating and characterizing population :**
 - **Census** (censuses are conducted once every 10 years with intercensal update)
 - **Population surveys** → produce baseline population data and indicators relevant for risk and vulnerability ((used for update censuses)).
 - **Population projection** → تستخدم البيانات والصيغ المتاحة التي تتضمن التنبؤات → بالوفيات/المواليد/الحالة الصحية والتعليمية لتقدير نمو أجزاء مختلفة من السكان مع الوقت → used in countries where no recent reliable population data exist .
 - **National and global population databases**
 - **Proxy measures** → **supplementary source** for **population size and distribution** and **improves population estimates** and **locations for areas where little reliable information exists**
- **Population projection : estimating and forecasting the population of a country or region for a given time**
- **Population estimates :**
 - **Intercensal**
 - **Postcensal**
 - **Future**
- **Population estimates measures**
 - **Mathematical** → intercensal / postcensal
 - **Arithmetic**
 - **Geometric**
 - **Exponential**
 - *Component projection methods* (future estimates)
- **Replacement rate** → TFR that is needed for a population to replace itself or **zero population growth** . (2.1 babies in developing countries)'
- **RATE NATURAL INCREASE** (birth rate (Jordan : 28.6)-death rate (Jordan :6.1) /10 → **RNI in Jordan : 2.25**
- **Determination of RNI using :**
 - natural increase method .
 - Graphic method .
- **Law of 70** → calculation of population doubling time .

1% growth ratio (constant) → doubling time 70 years

2% growth ratio → doubling time =35 years

Jordan → $2.25(RNI)/70 = 31.1$

- Demographic transition → 5 demographic stages
 - High stationary
 - Early expanding
 - Late expanding
 - Low stationary
 - Declining
- High stationary → high births and high deaths . (very slow population growth).
- Early expanding → rise in population caused by ↓ in the death rate while birth rate remains constant
- Late expanding → ↓ in death rate , birth rate tends to fall → ↑ in population growth
- Low stationary → Low birth rate , low death rate → no population growth
- Declining → birth lower than death (decline in population growth).
- Population pyramid → series of bar graphs that show age structure of a population by sex .
 - Pre reproductive → <14
 - Reproductive → 15-44
 - Post reproductive → >45
- Population profile → show age structure
 - Age structure → distribution of population by age and sex

- Importance :
 - Project how population will change over time
 - Show age and gender composition of a region
- 3 types of population pyramids
 - Expansive → rapid growth
 - Stationary → slow growth .
 - Constrictive → negative growth
- Jordan population pyramid → expansive
- Positive returns of demographic opportunity requires continuous decline in TFR (3.5 → 2.2)by2030
- Data ^{processing} Information ^{commitment} knowledge → Action
- Data → raw facts and figures on their own (y3ni bdon processing) have no meaning
- Data processed in a context → to give a meaning / turned into a meaningful info
- Information is the data after processing
- Data either to be Constant or Variable
- What do we mean by Variable Data → any characteristic that varies from one member of population to another
- There are 2 types of variables :
 - Quantitative (Numerical)
Characterized :
 - Discrete
 - Continuous
 Devices :
 - Ratio Scale has true zero , ratios can be compared (ex : height , weight , Bp)
 - Interval Scale has no true zero , ratios can't be compared (ex: temperature) .

A quantitative variable can be transformed to a categorical variable → dummy variable.
 - Qualitative (Categorical) classes or categories into which an individual member falls
 - Nominal Scale (only name) .

- **Ordinal Scale** (nominal categories with an implied order (low , med,high))
- **AGE** → age in years
- **BMI** → body mass index ($\text{weight / height}^2_{\text{Kg/m}^2}$)
- Gender (0: male / 1 : female)
- FFNUM → average number of times eating **fast food** in a week
- **Data Types**
 - **Primary** : collected **by investigator**
 - **Secondary** : collected **by someone else(and being used by the investigator for a purpose)**
- **Data Sources (population) :**
 - **Census** → **periodic count** or enumeration of population
 - Necessary to : **accurate description of population**
 - **Vital registration system** → ongoing recording of all vital events (**births , deaths , marriages**)
 - Properties for this system:
 - **Comprehensive**
 - **Compulsory(الزامي) by law**
 - **Compiled centrally**
 - **Continuous**
 - **Surveys :**
 - **Sample household surveys**
 - **Special population surveys**
 - **Demographic**
 - **Risk group**
 - **Occupational**
 - **Area based**
 - **Biomarkers**
 - **Health service records** → advantages :
 - **Easily obtainable**
 - **Low cost**
 - **Continuous reporting system**
 - **AvaiQAvailable causes of illness and death**
 - **Health surveys** : **studies** conducted on a **representative sample population** to obtain more **comprehensive data** for monitoring the health status of population
 - Other sources of information ;,

- **Epidemiological studies** (valuable but **expensive,**)
 - Meteorological + environmental departments
 - Governmental offices
 - Data of controlled drugs and their utilization.
 - Dataset and data table:
 - **Dataset** → data for group of variables for a collection of persons .
 - Data table → **dataset organized into a table**
 - **Row** → for each **person**
 - **Column** → for each **variable**
- **DHS (demographic and Health surveys)**
 - Program responsible for **collecting** and **disseminating** accurate , representative data on **health** and **population** in **developing countries**
 - **Implemented by : ICF international**
 - **Funded by : USAID**
- **Data source types**
 - **Surveillance systems(combination of population based and institution based sources)**
 - **Population based sources (vital / household/censuses)**
 - Info on every individual
 - **Institution based sources (resource , service , individual - records)**
 - Only ppl that have had interaction with given institution
- **DHS** → is an example of multinational household survey programmes