



Polytechnic College / Al-Qadisiyah, Al-Furat Al-Awsat Technical University, Iraq

Radiology and Ultrasound Department

Second Stage

## Educational bag

# BiOstatic

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Kadhim



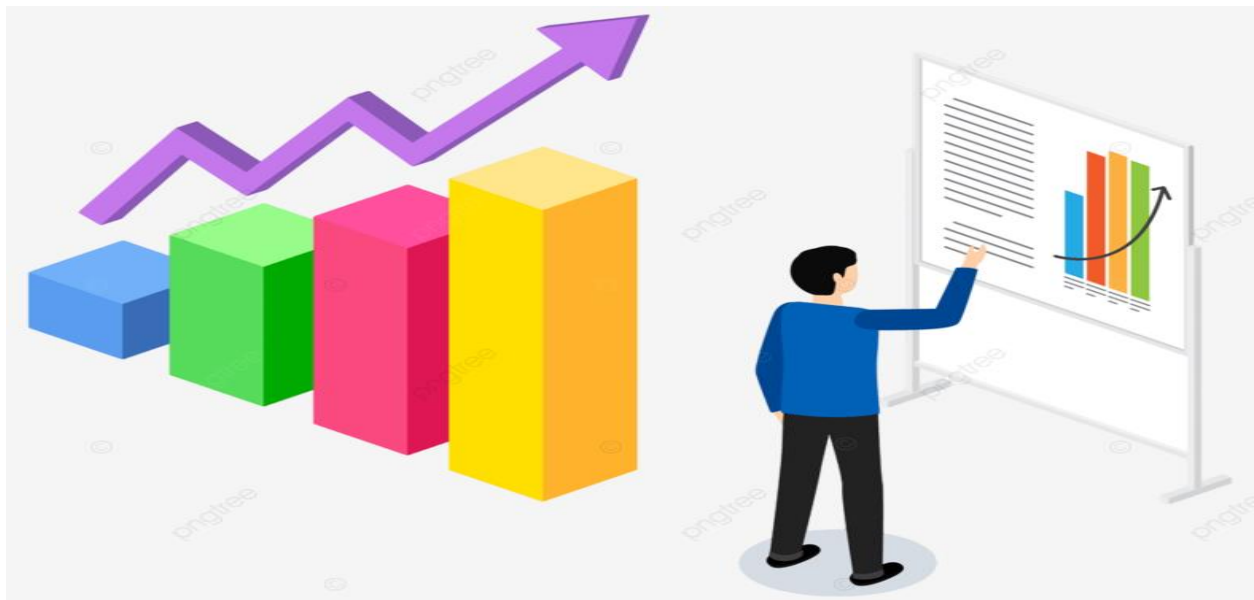
# First lecture

## Define statistics. Data collection methods

### Lecture objective-:

At the end of the lesson, the student will be able to : -

To learn about the importance of statistics and the stages of statistical methods, starting with data collection and statistical analysis.



## **Define statistics:-**

Statistics is the science of collecting, organizing, analyzing, interpreting, and presenting data in order to make informed decisions."

### **Data collection methods:-**

- 1-Data collection stage.
- 2- Data classification and categorization stage.
- 3- Data display stage.
- 4- Statistical indicators calculation stage.
- 5-Interpretation and prediction stage

# Lecture 2

Presentation of statistical data and, as, preparing a form  
(not classified) questionnaire

## Lecture Objective:

At the end of the lesson, the student will be able to:

1. Identify the sources of data collection, how to obtain them, how to record them, create their questionnaires, and how to conduct them.



**The data collection stage, which includes:**

**1- Methods of collecting data. Counters method:** This method is used to collect broad data obtained from people by people who are trained for this purpose and are called enumerators.

**2-Investigation newspaper (questionnaire).**

It is a form containing a set of questions related to the research for which statistical information is to be collected . This newspaper is sent to the people or homes that are the subject of the research by mail or by hand delivery for them to respond to.

A) BEHAVIORAL QUESTIONS

How often do you use each of the following resources to learn about drugs?

	Often	Sometimes	Rarely	Never
Pharmaceutical representative information	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Drug company sources, such as sponsored educational events	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Which of the following have you received in the last six months from drug, device, or other medically related companies?

CHECK YES OR NO FOR EACH	Yes	No
Food or beverage in the workplace	<input type="checkbox"/>	<input type="checkbox"/>
Free drug samples	<input type="checkbox"/>	<input type="checkbox"/>
A meal outside of campus or hospital	<input type="checkbox"/>	<input type="checkbox"/>
Pens, notepads, T-shirts	<input type="checkbox"/>	<input type="checkbox"/>
Any other gift or financial support	<input type="checkbox"/>	<input type="checkbox"/>

Which of the following interactions have you experienced in the past six months?

CHECK YES OR NO FOR EACH	Yes	No
Talked with a pharmaceutical representative about a company's product	<input type="checkbox"/>	<input type="checkbox"/>
Attended a lecture sponsored by a pharmaceutical company	<input type="checkbox"/>	<input type="checkbox"/>
Observed an attending physician or resident interacting with a pharmaceutical representative	<input type="checkbox"/>	<input type="checkbox"/>
Been asked or required by an attending physician or resident to attend an industry-sponsored	<input type="checkbox"/>	<input type="checkbox"/>

ArabForms.com

أ) أسئلة السلوك

ما مدى اعتيادك على استخدام كل من الموردتين التاليين لتعلم المزيد عن الأدوية؟

	أبداً	نادراً	أحياناً	كثيراً
معلومات من مندوب شركة أدوية	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
مصادر شركات الأدوية، مثل المناسبات التعليمية لمؤلة	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

أي من العناصر التالية استلمتها من شركات الأدوية أو شركات الأجهزة الطبية أو الشركات المتعلقة بالمجال الطبي في السنة أشهر الماضية؟

اختر نعم أو لا لكل مما يلي	نعم	لا
أطعمة أو مشروبات في مكان العمل	<input type="checkbox"/>	<input type="checkbox"/>
عينات دوائية مجانية	<input type="checkbox"/>	<input type="checkbox"/>
وجبة طعام خارج الحرم الجامعي أو المستشفى	<input type="checkbox"/>	<input type="checkbox"/>
أقلام، مفكرات، قفصان	<input type="checkbox"/>	<input type="checkbox"/>
أي هدايا أو دعم مالي	<input type="checkbox"/>	<input type="checkbox"/>

أي من المواقف التالية حدثت لك في السنة أشهر الماضية؟

اختر نعم أو لا لكل مما يلي	نعم	لا
تحدثت مع مندوب شركة أدوية عن منتج الشركة	<input type="checkbox"/>	<input type="checkbox"/>
حضرت محاضرة تمولها شركة أدوية	<input type="checkbox"/>	<input type="checkbox"/>
لاحظت طبيب معالج أو مقدم يتعامل مع مندوب شركة الأدوية	<input type="checkbox"/>	<input type="checkbox"/>
سألك أو طلب منك طبيب معالج أو مقدم حضور مناسبة تمولها مؤسسة طبية	<input type="checkbox"/>	<input type="checkbox"/>

## **Data Collection Sources :**

1- Historical Sources

2- Field Sources

## **Data Collection Methods:**

- Enumerators' Method
- Survey Sheet (Questionnaire)
- Recording Method

## **Data Collection Methods:**

- Comprehensive Recording Method
- Sampling Method



# Lecture 3

Frequency distributions of data representation "tabular view" classified "iterative" distributions tables presentation , histogram, frequency curve, frequency polygon

1. In this lecture, the student learns how to display and distribute data in statistical tables and to know the types of tables through which data is unloaded and distributed into these tables. These tables are called frequency distribution tables. There are two types of these tables:

1. Simple frequency distribution table .As shown in the following figure:-

**Example:** Create a frequency distribution table for the following data if the number of categories is equal to (4).

$X_i = 15, 22, 10, 27, 53, 20, 30$

The solution : -

$$R = XL - XS$$

$$R = 53 - 10$$

$$R = 43$$

$$L = \frac{R + 1}{n.c} = \frac{43 + 1}{4} = \frac{44}{4} = 11$$

Class	Signs	F
10-		3
21-		3
32-	---	---
43-54		1
		$\sum f = 7$

2- Double frequency distribution table. As shown in the following figure:

**Example:** Enter the following data in the double frequency distribution table if the number of categories for the phenomenon is (x = 5) and the number of categories for the phenomenon is (y = 4).

$$X_i = 15, 22, 10, 33, 30, 20, 39, 10$$

$$Y_i = 20, 37, 15, 22, 8, 20, 17, 28$$

The solution: -

$$R = XL -$$

XS

$$R_x = 39 - 10 = 29$$

$$L_x = \frac{R_x + 1}{n.c} = \frac{29 + 1}{5} = \frac{30}{5} = 6$$

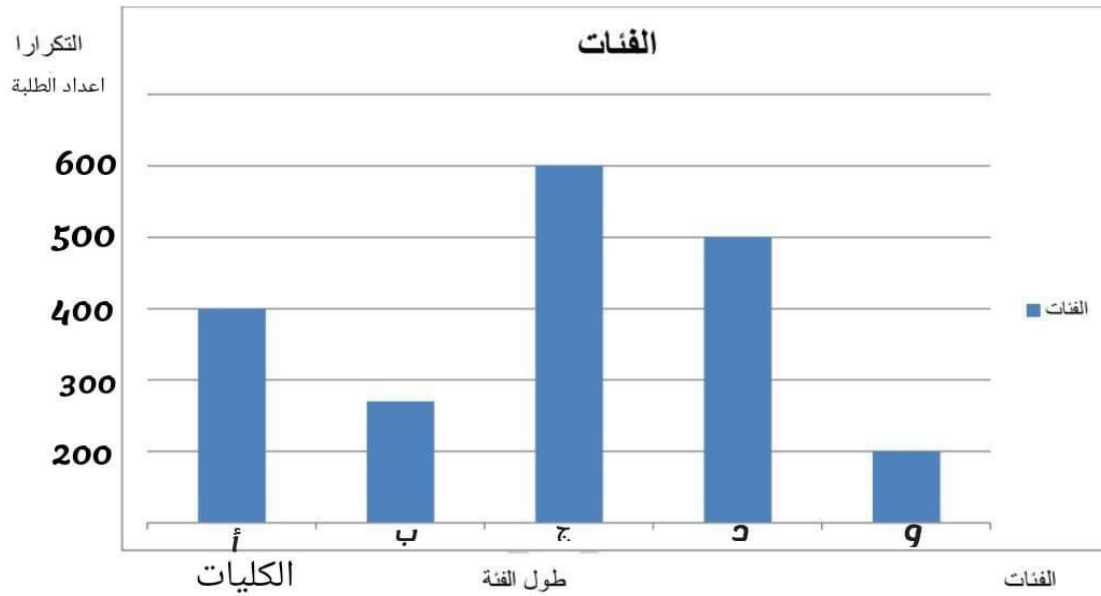
$$R_y = 37 - 8 = 29$$

$$L_y = \frac{R_y + 1}{n.c} = \frac{29 + 1}{4} = \frac{30}{4} = 7.5 \approx 8$$

**Note:** If the class length is a decimal, round it to the nearest integer.

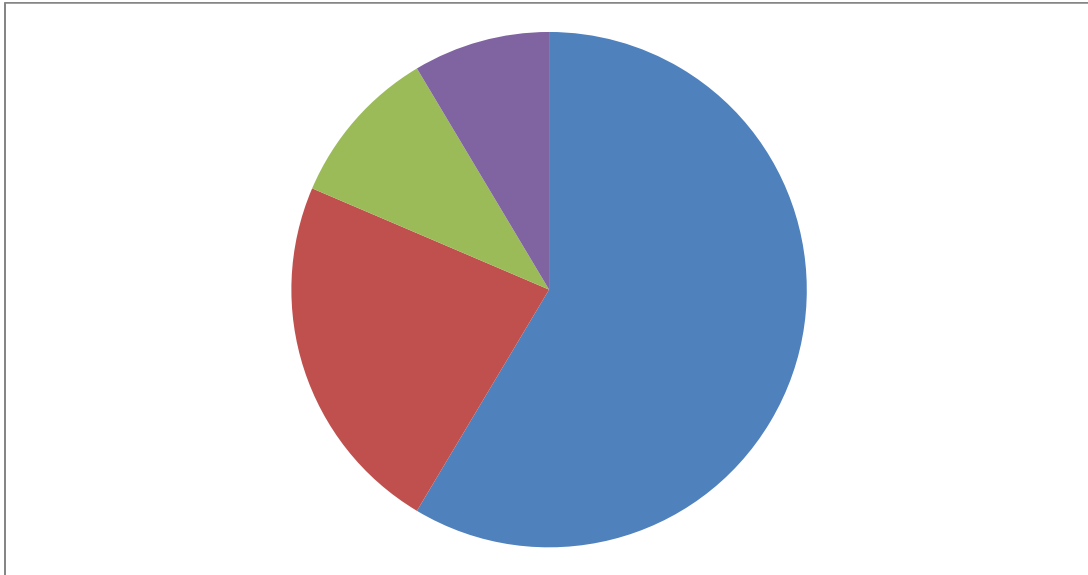
Cy \ Cx	10-16	16-22	22-28	28-34	34-40	Fy
8 -						2
16 -						4
24 -						1
<b>32 - 40</b>						1
fx	3	1	1	2	1	8

And In this lecture, the student learns how to use graphical drawings to implement the phenomena to be studied, such as line graphs and bar graphs, which are used to show the development of a phenomenon over several years.



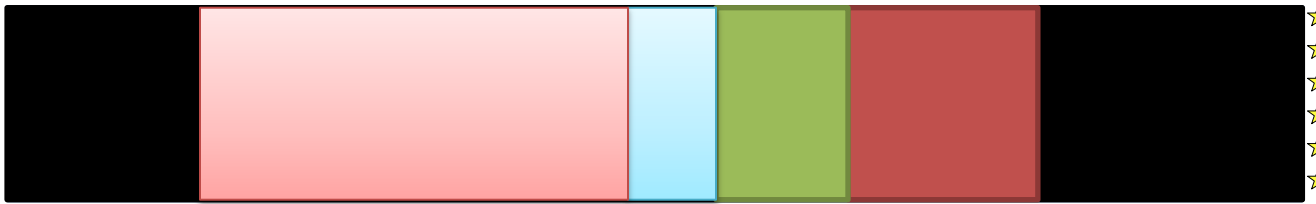
As well as using the graphic circle, where the idea of the graphic circle is summarized by dividing the central angle of the circle into sector angles according to the following law:

$$\text{sector angle} = \frac{(\text{partial data})}{(\text{total data})} \times 360^\circ$$



Another type of graphic representation is the rectangle chart: This type of graphic representation is used to compare parts to the whole, according to the following law:

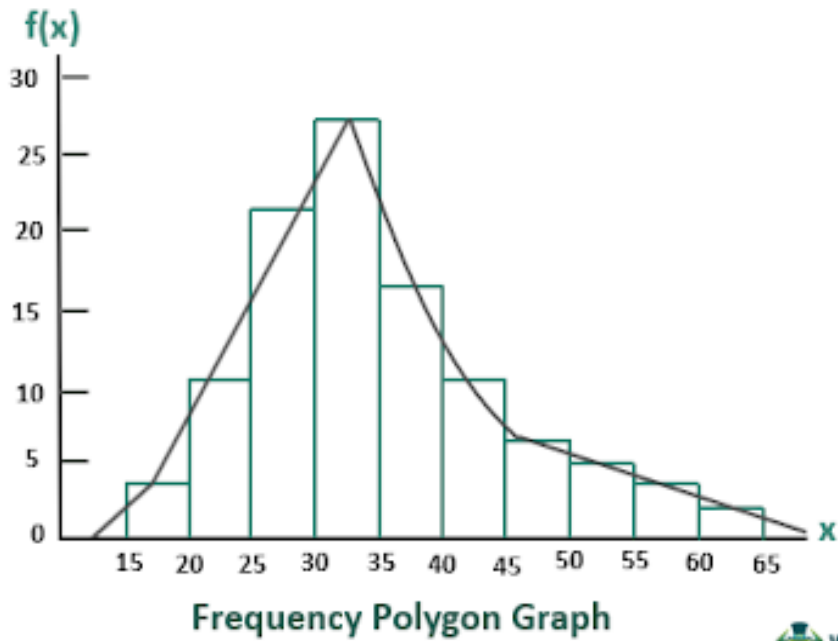
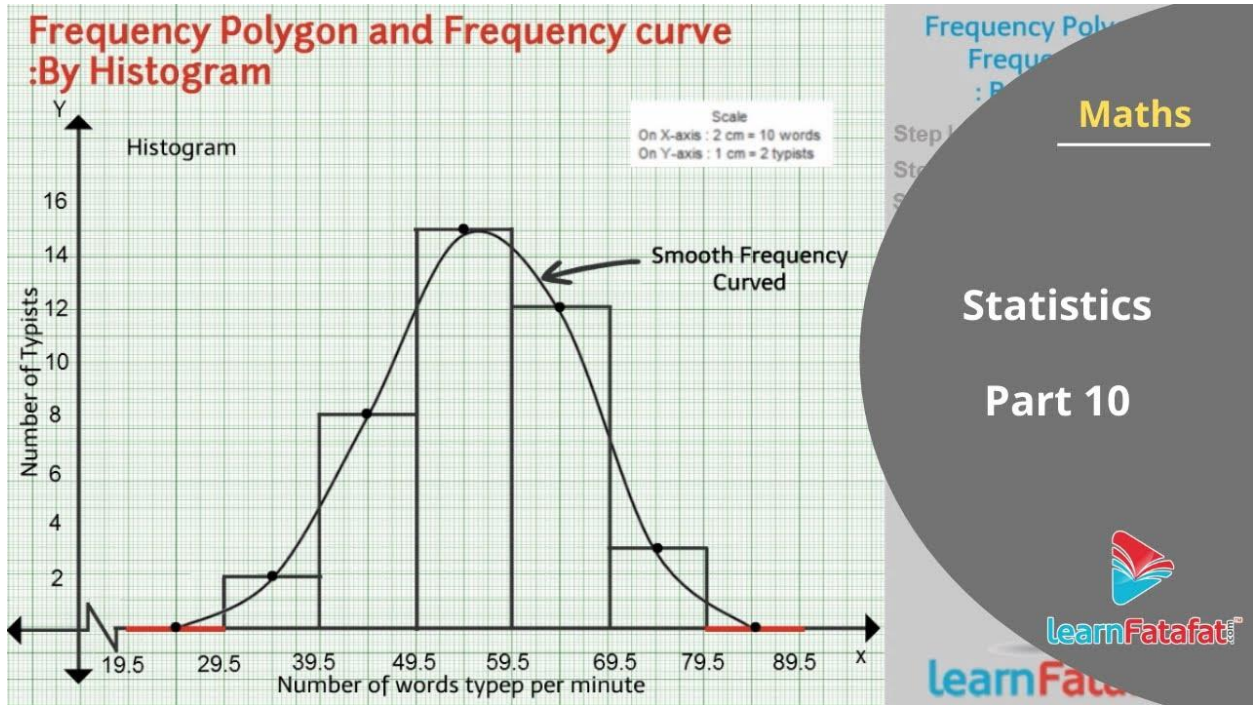
$$\text{small rectangle base} = \frac{(\text{partial data})}{(\text{total data})} \times \text{The length of the base of the large rectangle}$$



If our data represents a continuous quantitative variable that is usually divided into categories, a suitable graphical form is a frequency histogram.



We can use polygons and frequency curves.



# Lecture 4

## Measures of central tendency the arithmetic means, Broker. Mode

Measures of central tendency: When we want to know the centering of the variable's scores, we then resort to one of the measures of central tendency to describe the centering of that data. These measures are the arithmetic mean, median, and mode. Each of them is extracted in two ways depending on the nature of the data (grouped or ungrouped). Among the most important measures of central tendency are:

### 1- Arithmetic Mean .

The arithmetic mean .It is one of the simplest and most widely used measures of central tendency.Its calculation for ungrouped data is according to the following law:

$$\bar{X} = \frac{\sum_{i=1}^n x_i}{n}$$

$\bar{X}$  refers to the arithmetic mean and is read as ( X bar )

$x_i$ : variable values

n = number of values

Sum of values:  $\sum_{i=1}^n x_i$

2-The Median . is the value that is in the middle of a group of values if these values are arranged in descending or ascending order for a specific variable. In other words, it is the value for which there are 50% of the values smaller than it and 50% of the values larger than it if these values are arranged in ascending order or descending order for a phenomenon. It is symbolized by the symbol ( Me.)

First / The median in unclassified data:-

First case: If the number of values for which the median is to be found is odd, the steps are as follows:

1-Arrange the values in ascending or descending order

2- Find the values of the median order according to the following formula:

$$\text{median order} = \frac{n + 1}{2}$$

Case 2: If the number of values for which you want to find the median is even, follow these steps:

1-Sort the values in ascending or descending order.

2-Find the values of the median order according to the following two formulas:-

$$\frac{N}{2} , \frac{N}{2}+1$$

$N$  = Represents the number of values

1- Then find the median value, which represents the average of the two values corresponding to the median order among the ordered values.

### **The median in classified data**

There are several ways to find the median in this type of data :-

Method 1 / How to Use the Ascending Cumulative Frequency Table

#### **Steps of this method:**

1- Create an ascending cumulative frequency table.

2- Find the order of the median according to the following formula:

$$\frac{\sum fi}{2}$$

3-Determine the median class by relying on the value of the median order. If this value is present in the ascending curve, the class corresponding to it is the median class. If it is not present, the class corresponding to the value that follows it directly is the median class.

4- Find the value of the median according to the following law

$$\text{Me} = \text{A} + \frac{\frac{\sum f_i}{2} - \hat{f}}{\text{F}} * \text{L}$$

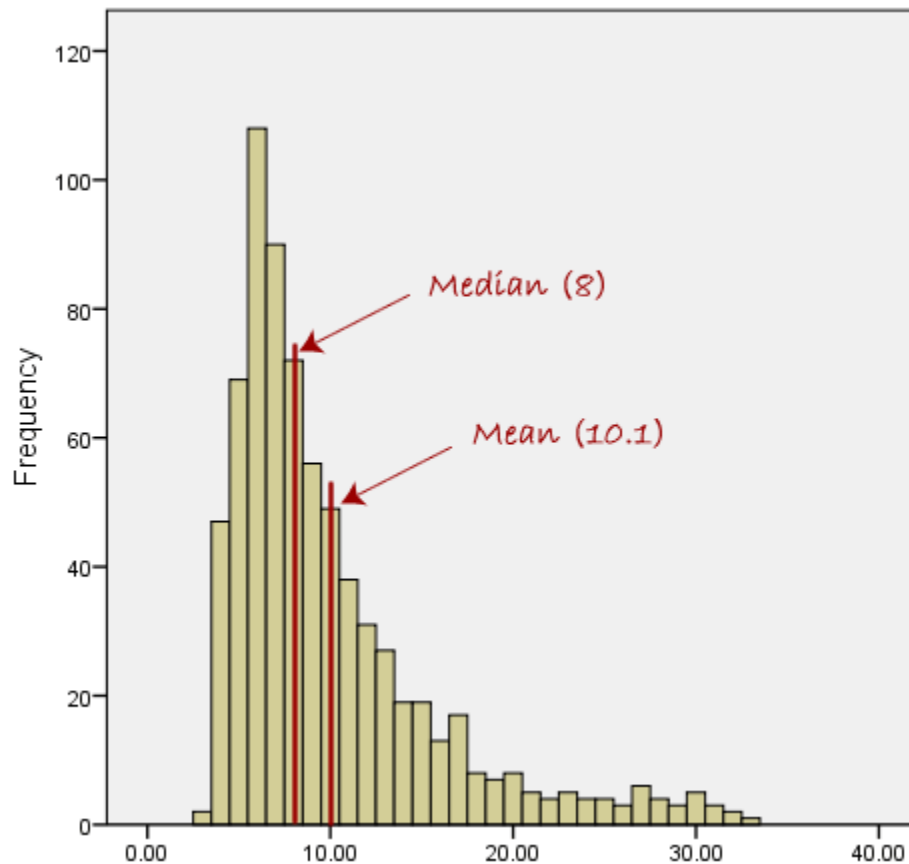
Whereas:-

**A:** Represents the lower limit of the median class

$\hat{f}$  :Represents the ascending clustered repetition that immediately precedes the intermediate class repetition.

**F** :Represents the original frequency of the intermediate class.

**L** :Represents the length of the median class.



3-The Mode . It is symbolized by the symbol (  $m_0$  ). It can be found in unclassified data. The mode in this type of data represents the more frequently occurring value. There are groups of values that have a single mode, as in the following example:

$$X_i = 13 \quad 7 \quad 10 \quad 13 \quad 7 \quad 20 \quad 15 \quad 13$$

**Solution:**

$$m_0 = 13$$

There is a group of values that has more than one mode, as in the following example:

$X_i = 13, 7, 10, 13, 7, 20, 15, 13, 7$

**Solution:**

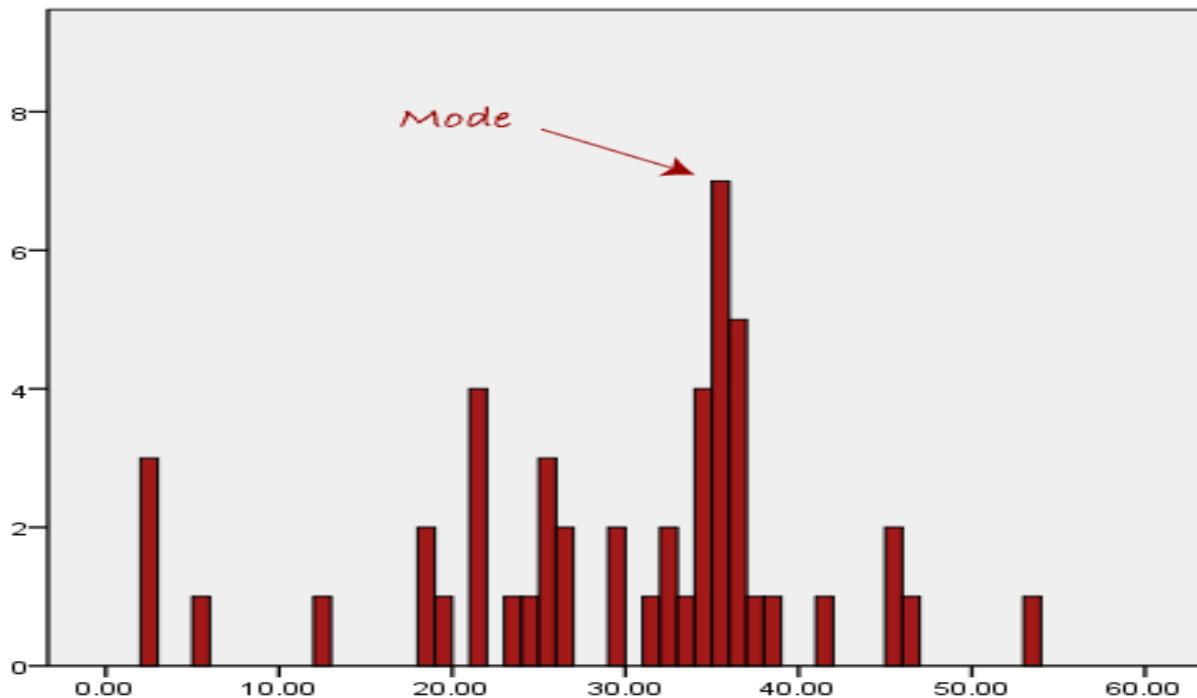
$mo = 7, 13$

\*There is a group of values that have no mode, as in the following example:

$X_i = 13, 7, 10, 15, 8, 20, 25$

**Solution:**

no mode



# Lecture 5

## **Introduction to sampling theory "meaning and causes of their ".choice**

- 1- In this lecture, the student learns to the concept of sample and population a fundamental and important issue in statistics, especially inferential statistics. Statistics is divided into two main sections: statistical inference and descriptive statistics.
- 2- He also learns about data collection methods. There are two methods for data collection:
  - 1- Comprehensive enumeration (CENSUS)
  - 2- Sampling method.





# Lecture 6

## Life, for statistics, the average, mortality statistics

In this lecture, at the end of the lesson, the student will be able to understand:

### **Life, for statistics:**

It is the field that is concerned with studying human life from birth until death by processing data related to life events (deaths, fertility, diseases) and all other statistics that branch off from them, as well as life tables to evaluate the health status of the country during a specific period of time.



## **The average( Rate):-**

The rate is defined as the amount achieved as a result of dividing the frequency of an event during a specific period of time by the number of individuals that could have been exposed to that event during the same period of time.

The rate is a fraction given by the following formula:

$$\text{The average(Rate)} = \left( \frac{a}{a \div b} \right) k$$

## **Mortality statistics**

Death registration is an important issue in vital statistics.

### **1- ANNUAL CRUDE DEATH RATE:-**

It is known as the number of deaths during the year per thousand of the population, usually in the middle of that year, and is extracted according to the following formula:

$$M = \frac{D}{P} (1000)$$

Where:

M: refers to the annual crude death rate.

D: the number of deaths during the year.

P: the total population at midyear.

## **2-THE STANDARDIZED DEATH RATE:**

It is incorrect to compare the rates of two regions or countries if there are differences arising from the age or gender composition of each region. Therefore, it is necessary to adjust crude death rates by finding the expected number of deaths in each region or country. In other words, it is necessary to eliminate the effects that may result from the presence of a variable that affects these rates. One method used to avoid the effects arising from differences in age composition between regions relevant to the comparison is the population calibration method (age adjustment).

## **3-SPECIFIC DEATH RATES:**

which we call specific death rates, as these rates are related to a number of characteristics or factors within specific subsets of the statistical population. A specific rate is called a detailed

rate if it is related to the age factor, in order to distinguish it from other specific rates.

$$D_C = \frac{D_C}{P_C} (1000)$$

Where (C) refers to the specific age group.

#### **4-CAUSE- SPECIFIC DEATH RATES:**

Mortality rates are classified by cause under the following conditions:

- 1- Diseases of the blood and blood-forming organs.
- 2- Diseases of the nervous system
- 3- Diseases of the circulatory system
- 4- Diseases of the respiratory system
- 5- Diseases of the digestive system
- 6- Diseases of the reproductive and urinary systems
- 7- Births and complications of pregnancy and childbirth
- 8- Congenital anomalies
- 9- Certain diseases of early childhood
- 10- Old age and other conditions

11- Accidents, poisoning, and death by violent means according to their external causes.

When calculating mortality rates by cause, it is preferable to multiply the result by a constant (100000), as these rates represent relatively small incidents relative to the total population in the middle of the year.

### **5- PROPORTIONAL DEATH RATE:**

Sometimes the situation may require calculating the proportion of deaths by cause to total deaths during a given year by dividing the number of deaths by cause by the total deaths in that year and multiplying the result by (100).

### **6 - INFANT MORTALITY RATE:**

This rate is calculated by dividing the number of infant deaths (under one year) during year (d) by the number of live births during the same year (b) and multiplying the result by (1000), i.e. :

$$M_o = \frac{D_o}{B} (1000)$$

### **7- MEASURES OF PREGNANCY WASTAGE:**

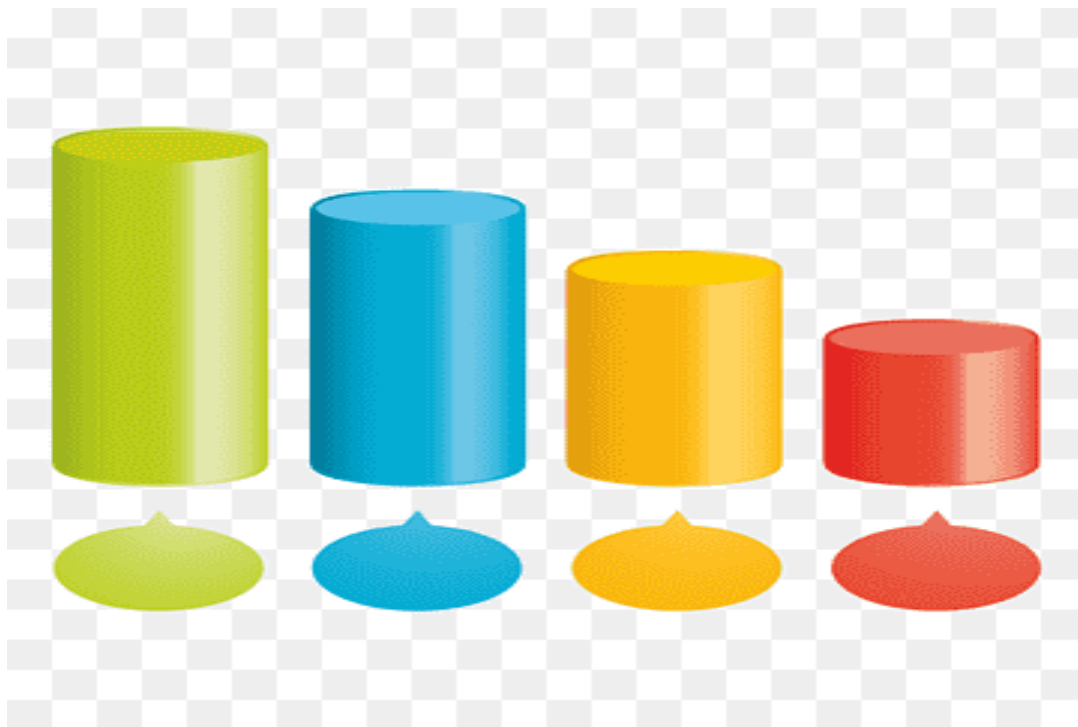
$$F_{ratio} = \frac{\text{Number of miscarriages per year}}{\text{Number of live births per year}} (1000)$$

Miscarriage is a type of death that is commonly known as the miscarriage mortality rate.

## 8- MATERNAL MORTALITY RATE- MM:

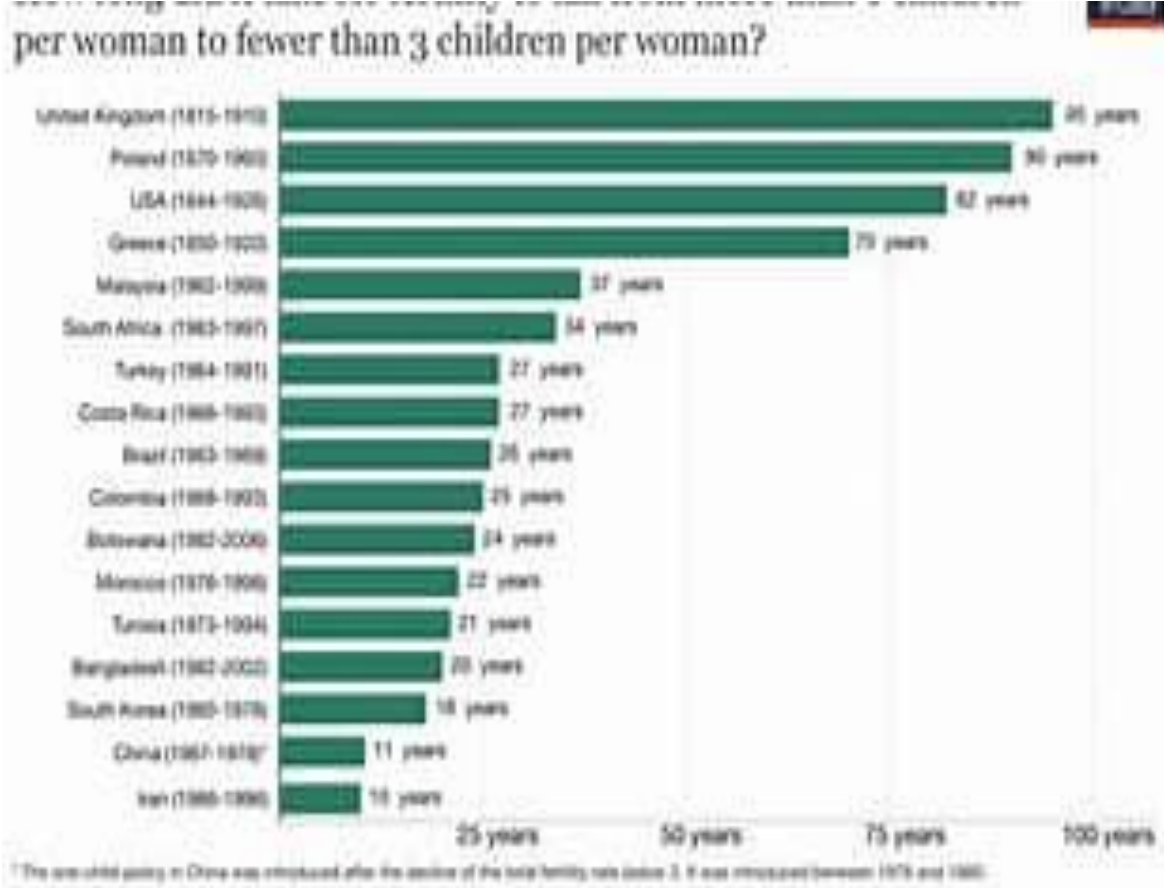
It is one of the most important mortality rates by cause, as it expresses the death of the mother as a result of complications of pregnancy and childbirth.

$$M_m = \frac{\text{Number of maternal deaths due to complications of pregnancy and childbirth}}{\text{Total number of live births during the year}} (10000)$$



# Lecture 7

## Fertility statistics



In this lecture, at the end of the lesson, the student will be able to understand:

## FERTILITY STATISTICS

Calculating fertility rates in a country is an important issue for health workers. Fertility is widely affected by gender and the age of the mother, and is also strongly affected by the marital structure of the society.

### FERTILITY MEASURES:-

The following are the most important measures of fertility statistics:

#### 1- CRUDE BIRTH RATE- CBR.

$$(C B R) = \frac{\text{NUMBER OF LIVE BIRTHS DURING THE YEAR}}{\text{Mid-year population}} (1000)$$

#### 2- GENERAL FERTILITY RATE- (G. F. R):

$$(GFR) = \frac{\text{NUMBER OF LIVE BIRTHS DURING THE YEAR}}{\text{The number of females of pregnancy age at the middle of the year.}} (1000)$$

#### 3-AGE- SPECIFIC FERTILITY RATE- (ASFR):

$$(A S F R)_x = \frac{\text{Number of live births for females during the year}(x)}{\text{Number of women of age } (x) \text{ at mid - year}}$$

In symbolic form, the rate is written as:

$$(A S F R)_x = \frac{B_x}{P_x^f}(1000)$$

#### 4-Total fertility rate:-

$$GRR = \frac{B^f}{B^T} (T.F.R)$$

Where: -

$B^f$  :- Number of live births of females during the year .

$B^T$  :- Number of live births of both sexes during the year.

#### 5-Average age at childbirth:

$$M = \frac{\sum_1^7 A_j F_j}{\sum_1^7 F_j} \quad J=(1,2,3,\dots,7)$$

Where:

$M$  : Average age at childbirth

$A_j$ : Represents the centers of the classes

$F_j$ : Represents the birth rate in class (1)

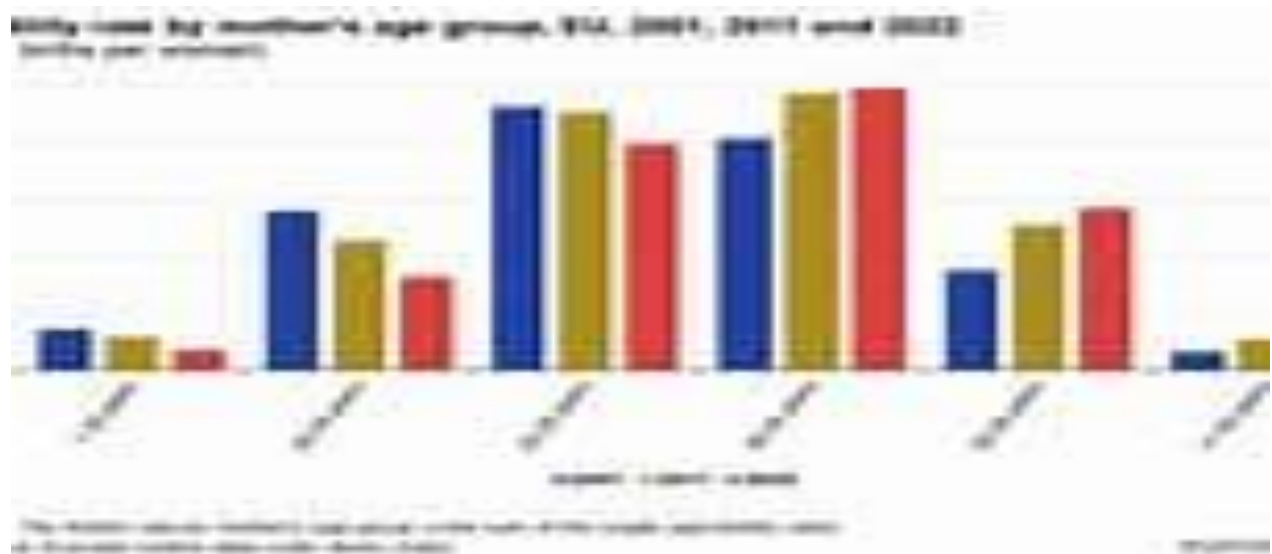
## 6- Age-adjusted birth rate by sex:-

$$S = \frac{\sum F_j}{\sum F_j W_j} (1000)$$

Where:

$F_j$ : is the number of live births during the year.

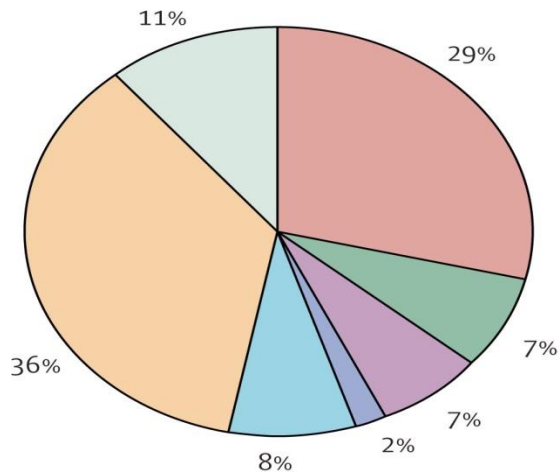
$W_j$ : is the weighting.



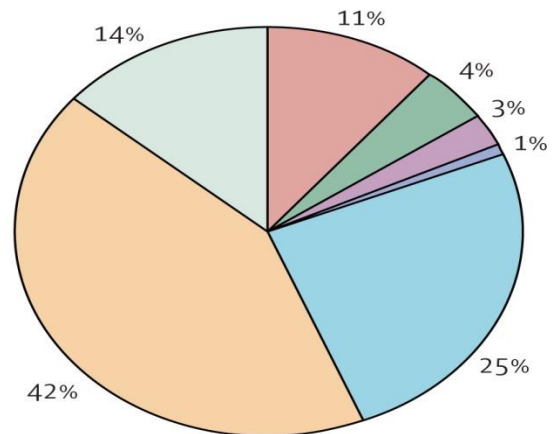
# Lecture 8

## Disease statistics life tables:

Deaths (total 10.3 million)



DALYS (total 291 million)



- Cardiovascular diseases
- Cancer
- Chronic respiratory diseases
- Diabetes
- Other chronic diseases

- Communicable diseases, perinatal and maternal conditions, and nutritional deficiencies
- Injuries

In this lecture, at the end of the lesson, the student will be able to understand:

A life table is the life history of a hypothetical group (or cohort) of people who gradually decrease with death. The record begins at the birth of each person and continues until everyone dies.

### Types of Life Tables

There are two commonly used types of life tables:

- 1- Life tables for a specific generation or cohort.
- 2- Current, ongoing or current life tables.

# Life Table Components

Life tables consist of several columns, and we will illustrate each one through the following numerical example:

Example: The following table represents the life table of a type of laboratory animal. At the start of the experiment, the number of animals was (200), and they were monitored until they all died.

(1) (x) Age in years for the period from (x) to (x+n)	(2) (ndx) Number of deaths at ages between (x, x+1)	(3) (Lx) Number of people alive at age	(4) (nqx) Probability of death between ages (x) and (x+1) $nqx = (ndx)/(Lx)$	(5) (nLx) Number of years lived by the cohort from (x) to (x+n) $ndx$ $nLx = Lx + \frac{ndx}{2}$	(6) (Tx) Number of years lived by the cohort after the set age (x) and all subsequent periods $Tx = \sum nLy$	(7) (e) Life expectancy is the average number of years an individual is expected to live. $TX$ $e = \frac{Tx}{Lx}$
0	30	200	0.15	$170 + \frac{30}{2} = 185$	530	$\frac{530}{200} = 2.65$
1	45	170	0.26	$125 + \frac{45}{2} = 147.5$	$530 - 185 = 345$	$\frac{345}{170} = 2.03$
2	55	125	0.44	$70 + \frac{55}{2} = 97.5$	$345 - 147.5 = 177.5$	1.58
3	30	70	0.43	$40 + \frac{30}{2} = 55$	100	1.43
4	20	40	0.50	$20 + \frac{20}{2} = 30$	45	0.89
5	15	20	0.75	$5 + \frac{15}{2} = 12.5$	15	0.75
6	5	5	1.00	$0 + \frac{5}{2} = 2.5$	5	0.5

The symbols contained in the columns of the table each indicate the following: -

Column (1): It represents the period of time (x, x+n) whose length is n, as it always begins with zero and ends with the last age reached by the last member of the group.

Column (2): It is the number of deaths between the ages of x and x+1 at each age reached by the surviving members of the group.

Column (3): indicates the number of people remaining alive at age (x) exactly and is symbolized by the symbol  $L_x$ .

Column (4): indicates the probability of death between age x and age x+1. It is considered the basic column in life tables and is extracted according to the following formula:

$$nq_x = (nd_x) / (L_x)$$

Column (5): indicates the number of years the cohort lived between age (x) and age (x+n), i.e. during the period the cohort lived, i.e.:

$$nL_x = L_{x+n} + \frac{nd_x}{2}$$

Or in the form:

Number of survivors this year + Number of survivors the following year

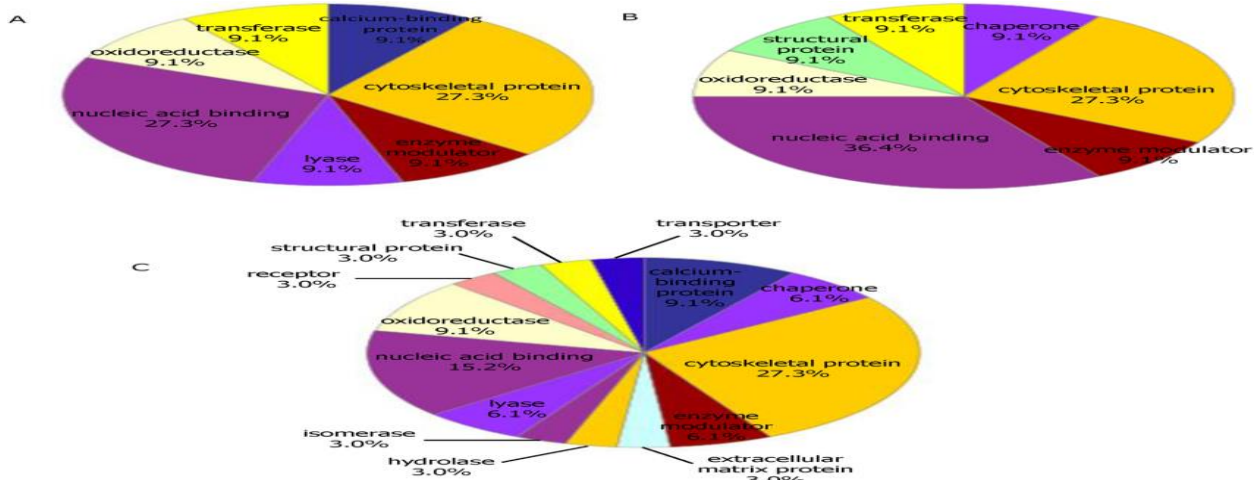
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Column (6): It indicates the total number of years lived by the cohort after age x, or it is the number of years of life occurring during period x and all subsequent periods.

Column (7): Indicates life expectancy and is indicated by the symbol (e). In other words, it indicates the average number of years an individual is expected to live after age x. Its formula is:

$$e = \frac{Tx}{Lx}$$



# Lecture 9

## Definition of health statistics and confiscation



In this lecture, at the end of the lesson, the student will be able to understand:

### **Definition of health statistics and confiscation.**

It is the subject that represents data related to the medical and mental status of individuals and their social capabilities, by which the health status of a population group can be described and evaluated, as required by health administration.

### **Confiscation-:**

Health data collection confiscation can be divided into:

- 1-National confiscation.
- 2- Health institutes and institutions.
- 3- Research and investigations into the epidemics of various diseases.
- 4- doctors' records.
- 5- police accident reports.
- 6- information on social and economic factors that affect health status

# Lecture 10

## Fields of statistics



In this lecture, at the end of the lesson, the student will be able to understand:

### **Fields of statistics**

The most important fields include:

1. The economic field.
2. The sports field.
3. The medical field.
4. The engineering field.
5. The youth and sports field.
6. The field related to mental health.
7. The educational field.

# Lecture 11

**The causes of death  
statistics (medical  
certificate, the cause, death,  
death certificate)**



In this lecture, at the end of the lesson, the student will be able to understand:

Cause of death: (The disease, injury, or poisoning that directly or indirectly leads to death). Symptoms and methods of death, such as heart failure or weakness, are not considered causes of death.

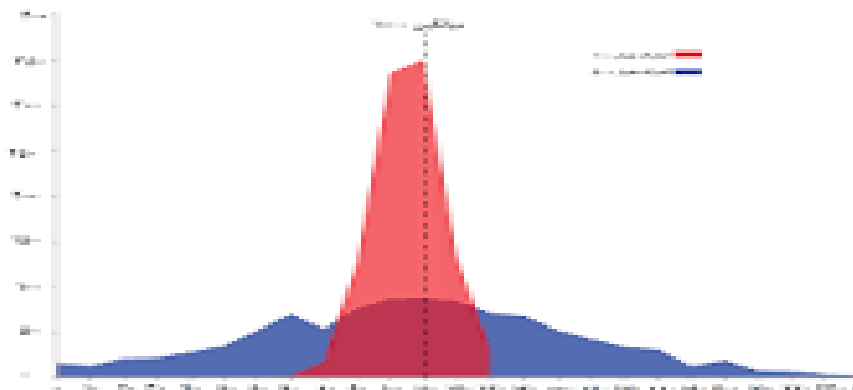
Death certificate:- This certificate is issued in three copies pursuant to Birth and Death Registration Law No. 148, its first amendment No. 47 of 1979, and its second amendment No. 110 of 1982.

Death notification must be completed within 24 hours of its occurrence. The body may not be buried unless a death certificate is issued by an authorized authority.



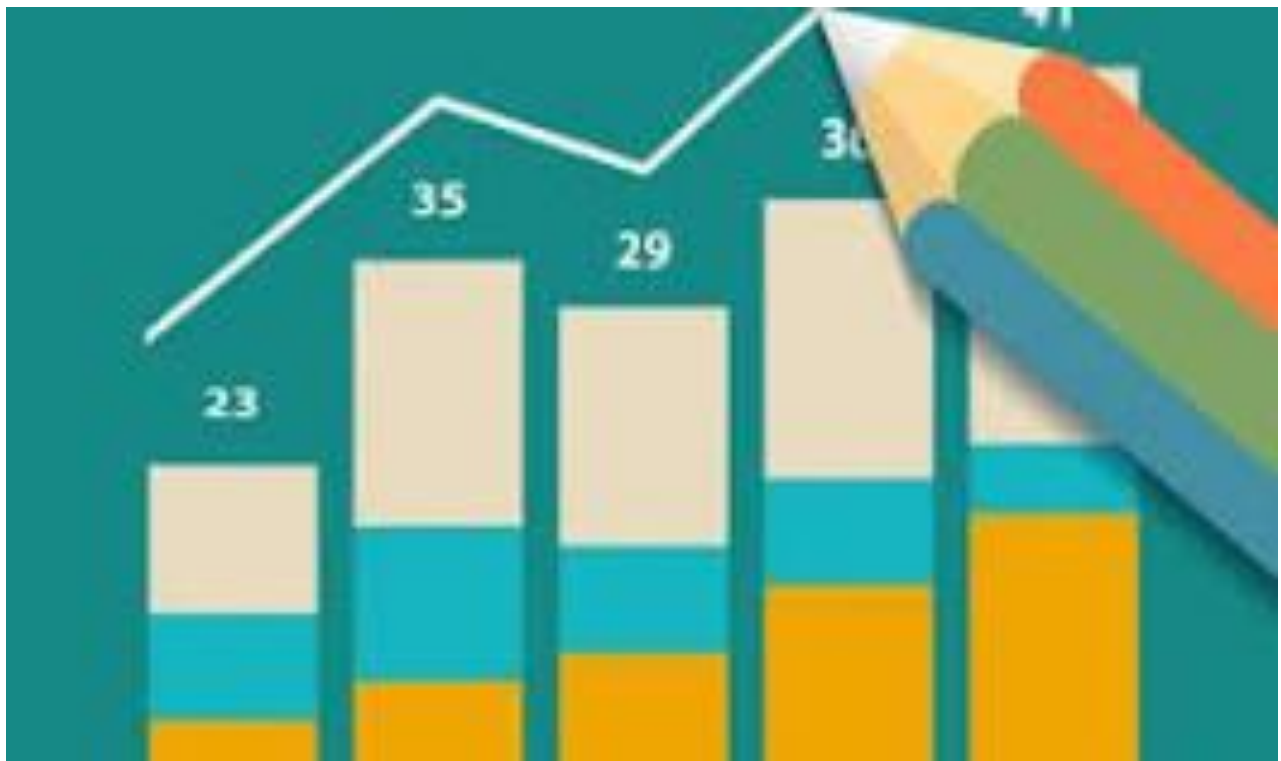
## **The importance of registering a death certificate:**

1. To bury the deceased and register their registration with the Civil Status Registry and other relevant departments.
2. To enable the deceased's family to receive pension, inheritance, or insurance premiums.
3. To be used to calculate the natural population increase.
4. To prove support.
5. To determine the quality and quantity of health services provided by the Ministry of Health to citizens and the extent to which they own them.
6. To create life tables.



# Lecture 12

## Health Organization statistics



In this lecture, at the end of the lesson, the student will be able to understand:

### Health Organization statistics

Health statistics are numbers that summarize information about health. Some types of statistics include:

- \* How many people in a country have a disease during a given period of time

- \*How many people in a particular group have a disease

- \*How many people are born and die. These are known as vital statistics

- \*How many people have access to and use healthcare

The quality and efficiency of our healthcare system

Healthcare costs, including the amount paid by the government, employers, and individuals for healthcare

Risk factors for various diseases. An example would be how air pollution can increase your risk of lung disease

Ways to reduce your risk of disease, such as exercising and losing weight to reduce your risk of diseases like diabetes.

# Lecture 13

**Rates and most suitable for hospitals and patients. Days of treatment. Period of stay (days)**



In this lecture, at the end of the lesson, the student will be able to understand:

Rates and most suitable for hospitals and patients. Days of treatment. Period of stay (days)

The main measure of admitted patient activity is the number of hospitalisations. However, as hospitalisations can vary in length from 'same day' to many days or weeks, another useful measure of hospital activity is patient days – which is a measure of activity that accounts for variations in the length of stay.

A hospitalisation is an episode of hospital care that starts with a formal admission process and ends with a formal separation process. A hospitalisation ends when a patient is discharged, is transferred to another hospital or care facility, dies, or when a change in the type of care provided occurs .

A patient day is the number of full or partial days of stay for patients who were admitted to hospital for an episode of care and who underwent separation during the reporting period.

Days of treatment. Period of stay (days)

Days of Treatment. Length of Stay (in days):

The length of a hospital stay can vary greatly depending on the individual's medical condition and the treatment required. It can

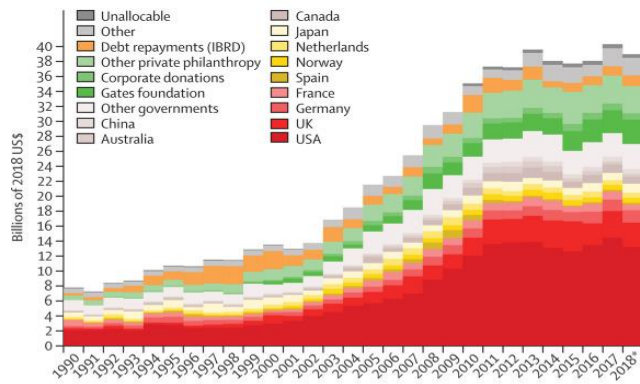
range from a few hours to several weeks or even months. For example, a person admitted for routine surgery may have a hospital stay of a few days, while a person being treated for a serious illness or injury may remain in the hospital for much longer. The medical team, including doctors and nurses, will determine the length of hospital stay based on the patient's needs and progress.



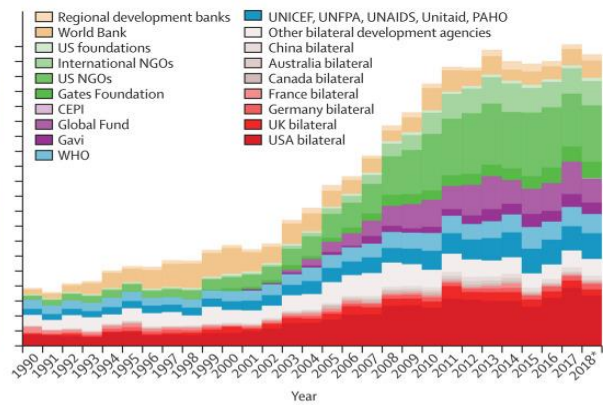
# Lecture 14 & 15

## The rate of family concern, Rate entry

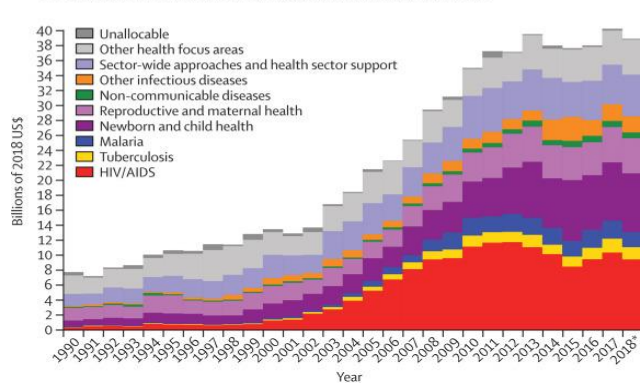
**A** Development assistance for health by source of funding, 1990-2018



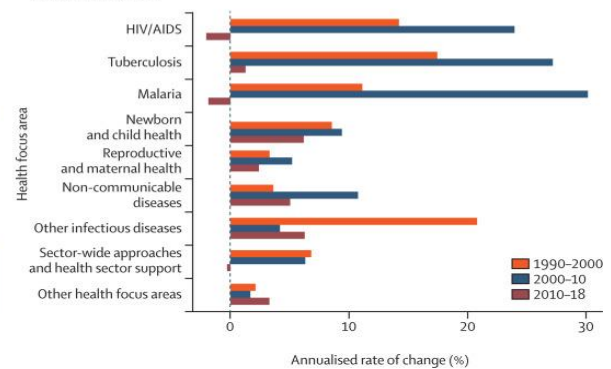
**B** Development assistance for health by channel of assistance, 1990-2018



**C** Development assistance for health by health focus area, 1990-2018



**D** Annualised rate of change of development assistance for health disbursed by health focus area



In this lecture, at the end of the lesson, the student will be able to understand:

The rate of family concern, Rate entry: Family concern and stress can occur when stressors in the lives of family members increase to a point where they cannot cope.

It can also be caused by multiple stressful events or by a single, highly stressful circumstance.

These events can occur either within or outside the family.

Family stress can manifest in the form of arguments, unfulfilled obligations, or illness.

Stress can play a significant role in various conditions that affect mental and physical health, especially if the stress is severe and prolonged.

Other consequences of untreated Family concern and stress include:

1-Fighting:

2-Health problems

3-Substance abuse:

4-Family disputes:

5-Difficulties outside the home:

Rate entry:

There is no universal measure specifically called the "family concern scale." However, in psychological and social research, concern within families is usually measured using questionnaires or psychological scales administered to individuals, and then a score is calculated for the family as a whole.

◆ Common Method:

Choose an appropriate measuring instrument (such as the Family concern Scale, the Generalized concern Disorder (GAD-7), or questionnaires specific to family relationships).

2-Administer the questionnaire to each family member (father, mother, children).

3-Add up the scores obtained by each individual.

4-Calculating the Arithmetic Mean:

$$\text{Family concern rate} = \frac{\text{Sum of concern Scores for All Individuals}}{\text{Number of Family Members}}$$

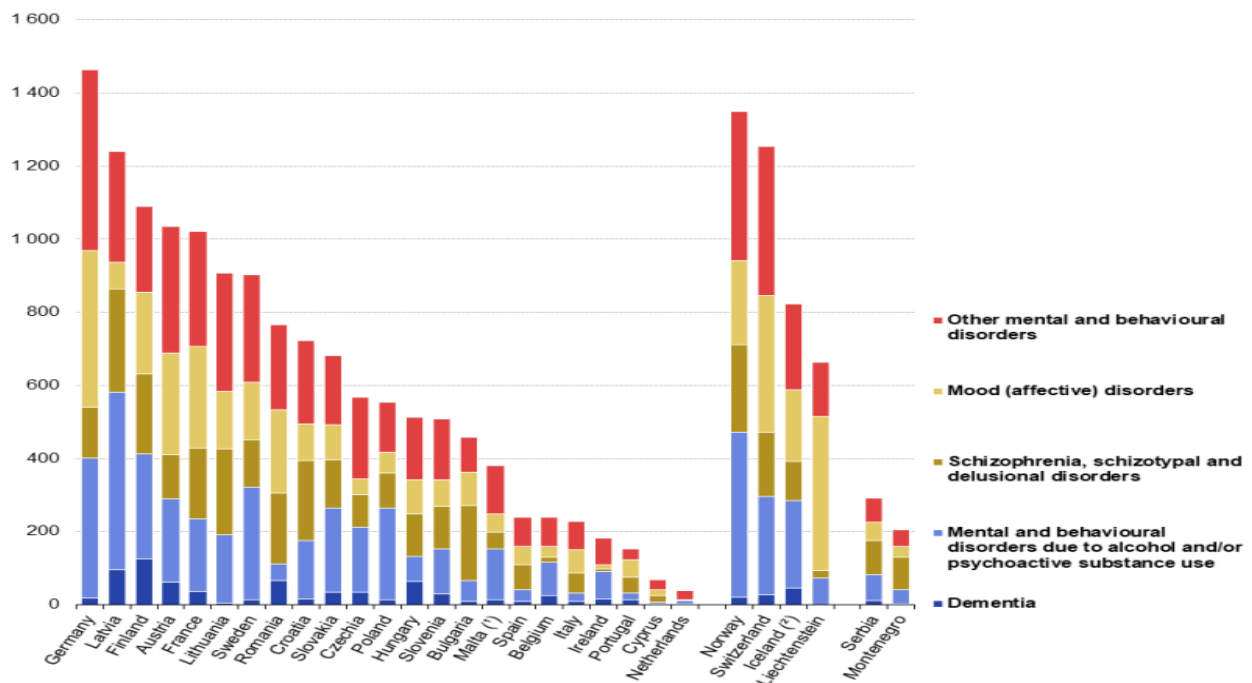
## Important Notes:

The measurement tool must be scientifically validated and not random.

Sometimes the standard deviation is calculated alongside the mean to determine the extent of variation among family members.

Some studies focus on the highest score among individuals because it may reflect the primary source of stress for the family.

**Hospital discharge rates for in-patients with mental and behavioural disorders, 2021**  
(per 100 000 inhabitants)



Note: ranked on the discharge rate for all mental and behavioural disorders. Denmark, Greece and Luxembourg not available. Estonia: 847.8 discharges for all mental and behavioural disorders per 100 000 inhabitants; breakdown not available.

(\*) 2020.

(\*) 2019.

Source: Eurostat (online data code: hlth\_co\_disch2)