Assay Q on L1

1. Define research

Systematic collection, description, analysis, and interpretation *of data to*

1. ***Answer*** *a question.*
2. ***Solve*** *a problem,*
3. ***Generate*** *knowledge.*

2. Mention the 5 Steps in Planning research study

Step 1	✪ ***Formulate*** *a research problem*
Step 2	✪ *Research* ***design***
Step 3	✪ *Construct* ***tools*** *for data collection*
Step 4	✪ *Select* ***a sample*** *(size & method)*
Step 5	✪ *Write research* ***protocol*** *(proposal)*

3. Define protocol and menion its elments

Def; *The written plan of study.*

Elements:

Research ***questions*** *-* ***Significance (Rationale)*** *-* ***Design****:(Time frame& Epidemiologic approach)*

Subjects*:(Selection criteria & Sampling design) -* ***Variables****:(Predictor variables& Confounding& Outcome variables) -* ***Statistical issues:(****Hypotheses& Sample size).*

4. Define Research Question

The ***uncertainty about something*** *in population that investigator wants to resolve by making measurements on his study subjects*

5. Mention Characteristics of a good research question:

FINER Criteria

Feasible	✪ *Adequate* ***technical expertise*** ✪ ***Affordable in time and money*** ✪ ***Manageable in scope***
Interesting	✪ *To the investigator*
Novel	✪ ***Confirms or refuses*** *previous findings* ✪ *Extends* ***previous findings*** ✪ *Provides* ***new findings***
Ethical	✪ *To scientific knowledge*
Relevant	✪ ***To clinical and health policy*** ✪ ***To future research directions***

6. Define aim and Objectives

Aim of the study: *Broad statement describes what you want to do represent your overall intention in the study*

Objectives: *How you are going to achieve aims.*

7. Mention Characteristics of a good research objectives:

Objectives should be SMART:

S Specific.

M Measurable (effect size).

A Applicable, achievable, agreed.

R Relevant (realistic).

T Time-bound (Timely, a time frame & end point

8. Mention uses of Descriptive studies :

1. *It is the first phase in epidemiological investigation.*
2. *Describing pattern, characteristics and distribution of a disease or health problem in the population.*
3. *Give data about*
   - *When the disease occurs (Time),*
   - *Where the disease occurs (Place)*
   - *Who is getting the disease (Person).*
4. *Formulating (not testing) research hypotheses.*

9. Enumerate types descriptive studies :

1) *Case report.*
2) *Case-series.*
3) *Ecological (correlational) studies*
4) *Cross-sectional study*
5) *Longitudinal studies*

10. Define Ecological (correlation) studies and its characters

Def: *Comparing populations in Different places at the same time*

Or In a time series by comparing the same population in one place at different times

Character

- ☒ *Looking for associations (correlation) between exposures & outcomes in population rather than in individuals.*
- ☒ *Use already collected population data (e.g. vital statistics, censuses and national health surveys).*

11. Define Cross-Sectional (Prevalence) studies and its uses

Def : *It is observational study tha carried out once (snapshot of a population) at a single point in time.*

Uses

1. *Used to Study prevalence rates of chronic diseases and disease load in community and its distribution in subgroups.*
2. *Screening for unrecognized cases.*
3. *Detection of association between risk factors & diseases.*

12. Mention 3 advantages and 3 disadvantages Cross-Sectional studies

Advantages	Disadvantages
• **Useful to study conditions** ➲ *that are relatively **frequent with long duration*** ➢ ***(Non-fatal, chronic conditions)***	• **Not useful for studying:** ➲ ***Acute** diseases.* ➲ *Diseases with **seasonal variations**.* ➲ ***Highly fatal** diseases.* ➲ ***Rare** diseases Disease with short duration.*
• ***Good for generating hypotheses*** ➢ *about the cause of disease.*	
• **Can estimate:** ➲ ***Prevalence rates**.* ➲ ***Exposure proportions***	• **Can't** ➲ *Estimate **incidence rate*** ➲ *Determine if **exposure preceded disease or not.***
• ***No follow up**,* ➲ *relatively easy, quick and inexpensive.*	• ***Not differentiate between*** ➲ ***causes of disease & factors** associated with disease.*
• **It is the first step to develop causal association**	• **It gives very little information about natural history of diseases.**

13. Mention 2 advantages and2 disadvantages Longitudinal studies

Advantages	Disadvantages
Used to measure: ***1) Incidence rate.*** *2) **Risk factors** **of disease**.* *3) **Natural history** of dis. & **its final outcome** (case fatality, survival).*	**Follow up and re-examination problems:** *1) **Loss to follow-up**.* *2) **Difficulty in** maintaining standards and stability of clinical and laboratory examination over a long period of time*

Assay Q on L2-3

1- MENTION the importance of Analytical Studies

These studies are used to test the validity of (i.e., to agree or disagree) an etiologic hypothesis

2- Define case control study

An "observational" design comparing

- *Exposures in disease cases versus healthy controls from same population*
- *Exposure data collected retrospectively.*
- *It is the most feasible design where disease outcomes are rare.*

3- Define case control study

An "observational prospective" (longitudinal or follow up) study

In which we compare between:

- *Exposed group (individuals with a risk factor)*
- *Non-exposed group. (others without the risk factor)*

As regards the incidence of a disease over time

4- Compare between case control and cohort study as regard advantages and disadvantages اهم سؤال

	Case-control studies	Cohort studies
Advantages	1) **Cheap &quickly** done. 2) **Does not require large sample.** 3) **Useful in studying rare diseases.** 4) **Can study several risk factors.** 5) **Can estimate risk (odds ratio)**	1) **Less bias in selection of control.** 2) Methods **can be standardized.** 3) **Study several outcomes.** 4) **Valuable in rare exposure.** **5) incidence rate and relative risk can be calculated**
Drawbacks	1) **Liable to bias..** 2) **Not useful in rare exposures.** 3) **Uncertain data** due to incomplete records of past events& unstandardized observation. 4) **Difficulty to be sure that the association is causal or not**	1) **Expensive and time consuming.** 2) **Needs a very large sample** even with common diseases. 3) **Delayed results if latent period is long.** 4) **Prolonged follow up can cause drop out of cases and loss of standardization.**

طبعا اهم حاجة في المحاضرتين دول المسائل هيجلك مسالة أساسية من الاتنين دول + واحدة من ال screening

مهم حاجة لازم انبه عليها المسالة ب 4 درجات مضمونة لو حافظ القوانين بش فيه حاجات بتنسوها بتضيع درجات

حتي لو الحل صح وهي لو جايبلك براحراف ومطلوب ترسم الجدول وتملاه عليها درجات وتكتب القوانين اللي بالحروف

واخر حاجة اللي معظمكم بينساها كتاب الكومنت اللي هو يبقي سطر بعد الحل

Assay Q on L4

1. Define Screening

Screening is the investigation of apparently healthy individuals to

- *detect unrecognized cases*
- *detect individuals with high risk of developing a disease.*

Therefore, intervention can be done to

1. *Prevent occurrence of the disease*
2. *Improve its prognosis when it develops*

OR: Presumptive identification of unrecognized cases by

- *application of tests, examinations or other procedures which can be rapidly applied"*

2. Mention nature OR types of screening test

Screening tests may be:

1) *A clinical step (e.g., breast palpation),*
2) *A laboratory (e.g., glucose tolerance test for diabetes mellitus)*
3) *Other investigation (e.g., mammography).*

3. Define Screening test

A simple test applied on large number to

1. *To exclude those free from disease*
2. *To pick up those possibly suffering from disease & subjected to detailed investigation*

To prove or disprove the diagnosis (i.e. reference test).

4. Mention Objectives of a screening test

Immediate objective:	Ultimate objective
✪ ***Simple test applied on large number*** ➢ ***To exclude*** *those free from the disease* ➢ ***To pick up*** *those possibly suffering of the disease and subjected to detailed investigation to prove or disprove the diagnosis*	✪ ***To reduce mortality and morbidity***

5. Compare between screening test & diagnostic test:

Screening test	Diagnostic test
• *Done on* ***apparently healthy***	• *Done on those* ***with disease indication.***
• *Used* ***on groups.***	• *Used on* ***an individual basis.***
• ***Less*** *accurate.*	• ***More*** *accurate.*
• ***Less*** *expensive.*	• ***More*** *expensive.*
• ***Not a basis for treatment.***	• ***Used as*** ***a basis for treatment.***

6. Enumerate 2 types of Sceening And define them

Types of Screening:	
Mass Screening	✪ Offered to all individuals ➲ irrespective of **presence of particular risk** to the disease in question. ✪ This is not a useful preventive measure unless it is backed-up by treatment & follow-up facilities for positive screening. ▪ e.g **congenital hypothyroidism**
High Risk Screening	✪ Offered to those with special risk ▪ Eg : screening of close relative of known diabetics (a greater number of cases can be identified at less cost).
Opportunistic screening:	✪ To detect diseases in individuals seeking healthcare for some other reasons. ▪ e.g., a patient admitted for a surgical operation and is **tested for HIV.**
Multiphase screening	✪ For a variety of diseases at one time. ✪ This is a well-established procedure in ▪ **Antenatal care & school examinations** ▪ **Pre-employment and biochemical profile** for hosp.patients.

7. Mention 5 requirements Of Screening Program regarding (The disease):

1) Importance of the disease
   - The disease should be an important health problem, i.e., high frequency and/or bad sequelae, e.g., congenital hypothyroidism
2) Adequate understanding of natural history of the disease To identify points at which disease can be detected
3) A recognized latent period or asymptomatic stage.
4) Can be detected before onset of symptoms and signs
5) At risk individuals can be identified and screened
6) Available facilities for diagnosis and treatment.
7) Agreed policy on whom to treat as patients
8) An effective treatment, available , effective and acceptable
9) Benefits of early detection exceeds risks and costs.(money , manpower and equipment).

8. Mention 4 requirements Of Screening Program regarding screening test:

General requirements	Special requirements
1) **Simple** • not too many steps involved to avoid errors. 2) **Inexpensive for mass application.** 3) **Least time consuming.** 4) **Not painful.** 5) **Objective rather than subjective.** 6) **Acceptable by the population**	1) **Precise & reliable** ✪ **Gives the same results when repeated under standard conditions.** 2) **Valid (sensitive & specific):** ✪ **Test is accurate giving true, not false reading (+ve or -ve)**

9. Define Validity and mention an example

The capacity of a test to give true results.

Therefore, a valid test is test which correctly detects presence or absence of a condition,

- *e.g., glucosuria as a test to detect diabetes mellitus has poor validity compared to glucose tolerance test*

10. Define Reliability (Repeatability):

It is level of agreement between repeated measurements.

Therefore, a technique will give same values on repeated application on same individual.

11. Mention the disadvantages of screening test

A false positive test	A false negative test
✪ *Test positive **without disease.***	✪ *Test negative **with disease.** **(Missed cases)***
✪ *Can lead to **needless anxiety.***	✪ *Could have **disastrous consequences.***
✪ *Exposes individuals to **costs and risks of further investigation.***	✪ *If persons suffering from **early cancer are incorrectly reassured** that there is nothing wrong with them*
✪ *Perhaps **unnecessary treatment***	
✪ ***Imposes economic burdens** on health-care system that would better be avoided.*	

12. Define

1) ***Sensitivity:***
   - ☑ *Probability of a **positive test in people with the disease** = **A/ (A+C)***
2) ***Specificity:***
   - ☑ *Probability of a **negative test in people without the disease** = **D/ (B+D)***
3) ***Positive predictive value:***
   - ☑ *Probability of the person **having the disease when the test is positive** = **A /(A+B)***
4) ***Negative predictive value:***
   - ☑ *Probability of the person **not having the disease when the test is negative** = **D/ (C+D).***

طبعا عندنا مسالة أساسية في الامتحان لازم تشوف فيديو ازاي نحط البيانات في الجدول عشان غالبا بيجي الجدول فاضي وانت تملاه

برده مننساش نكتب القنوانين والكومنت زي ما عملت في الفيديو

Assay Q on L5

1. Define medical statistics

It is the study of methods of

- *Collecting, presenting (descriptive statistics)*
- *Analyzing and evaluating conclusions from data (inferential statistics).*

2. Define Sample and mention its importance

A subset of population that is used to gain information about entire population.

A good sample : Representative- Adequate- Unbiased

Importance

1) *Lower cost*
2) *Saves time.*
3) *Provides more intensive & accurate investigations and information*

3. What happens when there is no sampling ?

Selection Bias : *systematic difference between the characteristics of the people selected for a study and those who are not.*

4. Define Probability

Every unit in the population has chance (greater than zero) of being selected in sample

5. Enumerate types of Non-Probability sampling and define one of them

1- Convenience	✪ **Sample selected** *because* ***it is conveniently available***
2- Purposive sample	✪ **Sample selected** ***based on opinion of experts or judgment.***
3- Quota	✪ ***Proportion for inclusion of particular group*** ➲ ***is determined by some criteria within this group***
4- Snow ball	✪ ***The first participant*** *refers to* ➲ ***a friend who refers to another person or friend.***

6. Enumerate types of Probability sampling and mention the condition required to use it يتجي كيس ويقولك نوع العينة ()

Probability (randomized sampling) include:	
Appropriate sampling technique	**Population characteristics**
• Simple Random Sample	✪ *Population* ***is a homogeneous mass of individuals***
• Stratified Random Sample	✪ *Population* ***is heterogeneous,*** ☑ *consists of* ***definite strata*** *each of which is different, characteristi*
• Systematic Random Sample	✪ *Population is a* ***confined community***
• Multi-stage Random Sample	✪ *Population is* ***distributed over a large geographical area*** ☑ ***as in national surveys***
• Cluster Sample	✪ ***Sample unit is a group not an individual*** ☑ *They are selected randomly from all groups of same type* ☑ *All members of selected group will be included in the study*

7. Mention 4 sources for data collection

1) Census
2) Registration of vital events e.g. Births, deaths, marriage
3) Notification of diseases (Disease Registers)
4) Hospital Records
5) Epidemiological surveillance
6) Health Service records
7) Environmental Health data
8) Health Surveys (100 million seha)
9) Published articles and reports

8. Mention type of each variable ممكن يجي متغيرات ويقولك النوع مهم نظري و عملي راجع الجدول

Types of data				
Variable	Nominal	Ordinal	Discrete	Continuous
Definition	Categories are **mutually exclusive and unordered**	Categories are **Mutually exclusive & ordered**	Integer **values Typically counts**	Takes any **value in a range of values**
Examples	• Sex • (male/female) • Blood group (A/B/AB/O)	• Disease stage (mild, moderate, severe)	• Days sick per year	• Weight in Kg • Height in cm

9. Enumerate types of Measures of Central tendency

Mean – Median -Mode

10 Mention the advantages and disadvantages of mean

Advantages	Disadvantages
✪ Used in **quantitative continuous** data **(normally distributed)**	✪ **Affected by extreme values** ✪ **it should not be used** for **non-parametric or skewed data**

11. Mention the advantages and disadvantages of Median

Advantages	Disadvantages
✪ **It can be used with quantitative & qualitative ordinal variables** ➢ (e.g. median number of patients in cancer stages) ✪ **It is useful for summarizing data with extreme values as it is not affected by extreme values.**	✪ **It cannot be used with qualitative nominal variables** ✪ **It is not easy to be used in statistical analysis**

11. Mention the advantages and disadvantages of mode

Advantages	Disadvantages
✪ ***It can be used in all types of variables*** ✪ ***It is not affected by extremes or out-lying observation***	✪ ***Sometimes the mode cannot be determined,*** ➢ *this happens when all observation* ***have the same frequency (i.e. uniform distribution).*** ✪ ***Sometimes we may obtain two modes (bimodal) or more (multimodal)*** *from the same group of data.* ➢ e.g. 22, 24,26, 28, 24, 26 Mode= 24 &26

12. Enumerate types of Measures of dispersion (Spread)

1) *Range*
2) *Mean deviation*
3) *Variance*
4) *Standard deviation*

Assay Q on L6

1. Define Probability value (p-value) and mention its interpretion

The p-value is the probability of obtaining effect observed in the study (or one stronger) If the null hypothesis of no effect is actually true.
OR The p value gives probability of any observed difference have happened by chance.

Interpretation

P value less than 0.05	P value more than 0.05
Reject *null hypothesis*	***Accept*** *null hypothesis*
Accept *alternative hypothesis*	***Reject*** *alternative hypothesis*

2. Mention 3 characters of the normal distribution curve

- *It is bell shaped and symmetric curve.*
- *The curve rises to its peak at the mean where mean = median = mode and it is located at the midpoint of the base*
- *The area under normal curve unity = 100%, each half = 50%*
- *The area starts from –ve to +ve and the two edges of curve do not meet X line except at infinity.*

3. Enumerate 3 types graphs for presentation Quantitative continuous data

1- *Histogram,*
2- *Frequency polygon*
3- *Smooth curves*
4- *Scatter diagram*
5- *Line graph*

4. Enumerate 3 types graphs for presentation qualitative and discrete data

1. *Bar chart*
2. *Pie chart*
3. *Map diagram*

5. Compare between quantitative and qualitative data as regard how to test significance

Quantitative	Qualitative
T- test	***Chi square test***
✪ *To compare* ***between different means***	✪ *To compare* ***frequencies of categorical variable in different group***

Assay Q on L7

1- Define intervention study and mention its importance

Prospective study comparing effect and value of intervention (s) against a control in human being.

Importance

- *Confirm etiological hypothesis*
- *Assess effectiveness of preventive measures new therapies.*

2- Enumerate characters of intervention study

Manipulation	*The researcher **does something** to **one group** of subjects in the study*
Control	*The researcher **introduce one or more control group*** → ***to compare with the experimental group.***
Randomization	*Researcher takes care to randomly **assign subjects to control & experimental groups.*** (Each subject is given an equal chance of being assign in either group)

3- Define Clinical trials and enumerate 4 types

Experimental studies that involve administration of preventive or curative regimen to humans to evaluate its safety and efficacy. They are the best epidemiological study design.

Types

Prophylactic trials	*Immunization*
Therapeutic trials	*Drug*
Safety trials	***Side effects** of oral contraceptives in comparison to injectables*
Risk factor trials	***Proving disease etiology** by **adding the assumed agent in animals or withdrawing the agents (smoking) through cessation***

4- Mention 4 uses of Clinical trials

Clinical trials are useful for evaluating New:

1- *Drugs, other treatments for disease.*
2- *Medical, health care technology.*
3- *Programs for screening & diagnosis.*
4- *Methods of prevention.*
5- *Methods of providing health care.*
6- *Health care policies.*

5- Mention the aim of Stage 1 (phase 0) of clinical trials

To provide knowledge about safety and biologic activity of drug to allow it to be administered to patients.

We look for 5 things:

1) *Pharmaco-kinetics.*
2) *Pharmaco-dynamics.*
3) *Drug metabolism.*
4) *Lethal dose (LD50).*
5) *Teratogenic effects*

6- Mention the objective of phase 1 of clinical trials

To assess

1) *Pharmacokinetics*
2) *Metabolic fate*
3) *Safety and tolerance of treatment*

7- Mention the objective of phase 2 of clinical trials

- *To set & test dose necessary for pharmacodynamic effects*
- *To evaluate potential effectiveness*
- *To determine optimal method of administration*

8- Mention the objective of phase 3 of clinical trials

Provide decision makers with scientific evidence about relative effectiveness and safety of competing treatments.

9- Mention the objective of phase 3 of clinical trials

- *Drug safety: long term effects, surveillance for rare SE.*
- *Drug interactions with other drugs or diets.*
- *Pharmaco-epidemiology: distribution & determinant of drug use.*
- *Pharmaco-economics: cost-effectiveness of drug.*
- *Benefits & harms in presence of comorbidity*

10- Define Masking or blindness and mention it types

It is hiding knowledge of treatment assignment to reduce bias.

Types

1- Single blinded study:	2- Double blinded study:	3- Triple blinded study:
✪ ***Subjects** are **unaware weather they are in experimental or control group.***	✪ ***The subjects and observer are unaware of the subject's group allocation***	✪ ***The subjects, observer and data analyst are unaware of the subject's group allocation***

11- Define Placebo

Pharmacologically inert but identical in appearance to the active drug.

12- Compare between Efficacy and NNT

Efficacy	NNT
✪ ***Proportion of individuals in control group*** ➢ *Who experience an **unfavorable outcome*** ➢ *Who could have been **expected to have a favorable outcome** had they been in **active group instead of control.*** **A high efficacy is an indicator that an intervention is successful**	✪ ***Number needed to treat (NNT)**:* ▪ ***expected number of people who would have to receive a treatment to prevent an unfavorable outcome in one person** (or, alternately stated, to achieve a favorable outcome in one person)* **A small NNT indicates a more effective intervention**

Assay Q on L8

1- Define Maternal Mortality

Means death among mothers due to causes related to and/or aggravated by pregnancy, labor & puerperium.

2- Mention causes of Maternal Mortality

- *Hemorrhage: May occur during pregnancy, labor, or puerperium.*
- *Hypertensive disease of pregnancy (eclampsia & preeclampsia).*
- *Puerperal sepsis: most preventable cause.*
- *Pre-existing diseases aggravated by pregnancy, labor & puerperium e.g. Rheumatic heart disease.*
- *Chronic glomerulonephritis complicated by renal failure.*
- *Uncontrolled D.M*

3- Mention causes of Neonatal mortality

- *Prematurity (preterm & LBW)*
- *Congenital malformations & Rh incompatibility*
- *Birth injuries*

4- Mention causes of Post-neonatal mortality

- *Infections in the form of: ARD, Infective diarrheal diseases*
- *Other infections e.g. tetanus neonatorum, pertussis & measles*
- *Severe nutritional deficiency e.g. PEM.*
- *Accidents.*

5- Mention causes of Child (1-4 years) mortality

- *Infectious diseases as acute respiratory diseases, diarrhea, pertussis, measles & meningitis.*
- *Accidents.*
- *Severe nutritional deficiency.*
- ***Rheumatic heart disease.***

6- Mention the essential elements to measure mortality rate

Three essential elements:

1. *A defined population at risk.*
2. *A time period.*
3. *The number of deaths occurring in that population during the time period.*