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Assignment,

Teaching Methodology and Community Medicine

Submitted To,

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Question No 1 :-

How will you conduct "Case Control study" Explain it with Example.

A Case-Control study is a type of observational study in which two existing groups differing in outcome are identified and compared on the basis of some supposed causal attribute. Case Control studies are often used to identify factors that may contribute to a medical condition by comparing subjects who have that condition / disease (the cases) with patients who do not have the condition / disease but are otherwise similar (controls).

Conducting a Case Control Study

There are five steps in conducting a Case Control Study

1) Define a study population (source of cases and controls)

Controls must have as similar a background as possible to the cases, except that they do not have the outcome

in question. They should come from the same population as the cases. Their selection should be independent of the exposures of interest. Objective measures of the presence of risk factors are best, ideally carried out in a 'blind' assessment or before the cases and controls are identified. (i.e. they do not know who is a control or not).

2) Define and Select Cases

Identification of cases can be made from the general population using health register and data or from a particular medical setting. The criteria for diagnosis of a case should be defined as well as the eligibility criteria used for selection. The diagnostic criteria should be sensitive and specific i.e (strict).

Information on diseases can be got from death certificates, disease registers, medical records or population survey. For rare diseases, cases may have to sought from large areas or over many years.

3) Define and select controls:-
This is a very important step. Get this wrong and you introduce bias into the study. Controls should represent the population that the cases come from (i.e they should be at risk of becoming new cases). Ratio to cases is usually 1:1 If cases are limited, you can have up to 4 controls : 1 case. Some time will be needed in considering the way in which the cases and controls, which make up the study will be chosen! More heterogeneity in the cases, less likelihood of being able to link a specific risk factor to the disease causation. But narrower the category of disease for inclusion as cases. less general applicability the findings will have.

Source of Controls: Hospital people have taken controls from a hospital population because they maintain that the controls are in some way matched to the hospital cases. However, they are people with other risk factors, for

example, you could be comparing people with lung cancer with people with broken legs, people who break their legs are not the same as all those who develop lung cancer. The controls may have different diseases to the cases, which may have an effect on the results.

Source of controls : General population :-

Controls can be taken from the community the cases are from or from a different population. The controls may be healthy or may have other diseases.

4) Measure Exposure :-

The measurment of exposures must be collected in a comparable way for cases and controls, it is worth 'blinding' the data gatherers to case or control status of participants or at least blind them to the main hypothesis of the study. This should help prevent measurment or researcher bias. Exposure information can come from records or can be via an interview or questionnaire

5) Estimate disease risk associated with exposure

Traditionally, data from case control studies are set in a 2 by 2 or fourfold table. it is unlike cohort studies (where study population is denominator and incidence rate can be calculated for the disease as people are affected and relative risk can be calculated).

Because there is no population based data in case control studies, results are best expressed as odds ratio (the ratio of exposed to non-exposed in the case group divided by the same ratio in the control group) When the number with disease is small compared with the number unaffected, the odds ratio is closer in value to the relative risk, which is a population based estimate derived from Cohort studies.

Example :-

In 1940's Sir Norman Gregg, an Australian

opthalmologist, observed a number of infants and young children in his opthalmology practice who presented with an unusual form of cataract.

Gregg noted that these children had been in utero during the time of a rubella (German measles) outbreak. He suggested that there was an association between prenatal rubella exposure and the development of the unusual cataracts.

Keep in mind that at that time there was no knowledge that a virus could be teratogenic.

Thus, he proposed his hypothesis solely on the basis of observational data, the equivalent of data from ambulatory or beside practice today.

Question 2

How will you conduct 'Cohort study'. Explain it with Example

Cohort studies are a type of medical research used to investigate the causes of disease and to establish links between risk factors and health outcomes.

Conducting a Cohort Study

There are five main steps in conducting a Cohort Study

1) Select Cohort population

All participants (both exposed and unexposed) in a cohort study must be at risk of developing the outcome. Controls should be similar to the the exposed in all important aspects, except for the lack of exposure, This will reveal the background rate of the outcome in the community. For common exposures (e.g smoking), a general population cohort is good

as it enables internal comparisons of exposure status and the population can be motivated and easy to follow up. For rare exposures, the cohort may be defined by or geography / environmental exposure cohort could be defined by occupation e.g asbestos workers!

2) Measure exposure to risk factors

Cohort studies should have a clear, unambiguous definiton of the exposure at the outset. Measurement can consist of records, environmental monitoring, lifestyle questionnaire or a clinical / biochemical / molecular measurement.

3) Follow up

This is a challenge. Drop outs affect the study's validity. Drop outs are not random events. If the likelihood of droping out is related to the exposure and outcome, then bias can result, for example, if people are

suffering side effects from a particular drug, they may drop out and so the drug may look better than it actually is. To optimise follow up, try to get a stable population, motivate them and do regular contacting and tracing.

4) Measure disease outcome

Outcomes must be defined in advance and should be clear, specific and measurable. Outcome can be measured with records, interview or examination.

5) Estimate disease risk associated with exposure

Risk can be measured with relative risk (a measure of the extent to which those exposed to a risk factor are likely to get the disease compared with the non-exposed group) absolute risk (this is the incidence rate for a group exposed to a risk factor) attributable risk (this is the difference in the incidence of a disease between the exposed and the non-exposed groups)

Example :-

1. One famous example of a cohort study is the Nurses' Health Study, a large, long-running analysis of women's health, originally set up in consequences of the use of oral contraceptives.