

Epidemiological reasoning in research :

First step

When there is a suspicious state that happened from clinical practice or examining disease pattern or from laboratory observation.

Second step

Formulation a hypothesis trying to explain this suspicious .

Third step

To construct an epidemiological design to test the validity of the hypothesis.

Fourth step

Find the statistical measures of association between suspected factors and certain outcome .

Fifth step

Test the validity of the statistical association ,exclude the role of chance , bias or systemic error ,and confounder (factors that effect to the outcome)

The last step :

To find if this association is of cause and effect type .

Design and strategies of epidemiological studies

This depends on :

1. Distribution of disease ----- descriptive studies
2. Clarify determinant of disease ----- analytic studies

Epidemiological design strategies

A) Descriptive studies

1. Population (correlational studies)
2. Individuals
 - a. Case reports

- b. Case series
- c. Cross-sectional

These study rise the question of association rather than proving

B) Analytic study

1. Observational studies

- a. case control studies
- b. cohort studies
 - Retrospective
 - Prospective

2 .Intervention studies called clinical trials

- a. Observational studies ----- descriptive
Analytic
- b. Experimental.

Case report : describe the experience of a single patient . it document un usual medical occurrence and can represent the first clues in the identification of new diseases or adverse effect of exposure which may be benefit use in formulating hypothesis .

Case series : are collection of individual cases report occurring with fairly short period of time . case series design has historical importance in epidemiology as an early means to identify the beginning or presence of an epidemic .

Limitation

- Can not be used to test the presence of valid statistical association
- They don't have comparison group which either obscure relationship or suggest an association where none actually exist .

Correlational studies

Measure that represent characteristic of entire population are used to describe disease in relation to some factors of interest such as age, calendar time , utilization of health services or consumption of food , medicine or other products.

Strength of study

- They can be done quickly and inexpensively .
- Using only available information .

Limitation

- Inability to link exposure with disease in particular individual because we have data on groups not an exposure and outcome of disease for each individual .
- Lack the ability to control for the effect of potential confounder factors
- Correlation data represent average exposure levels rather than actual individual values .

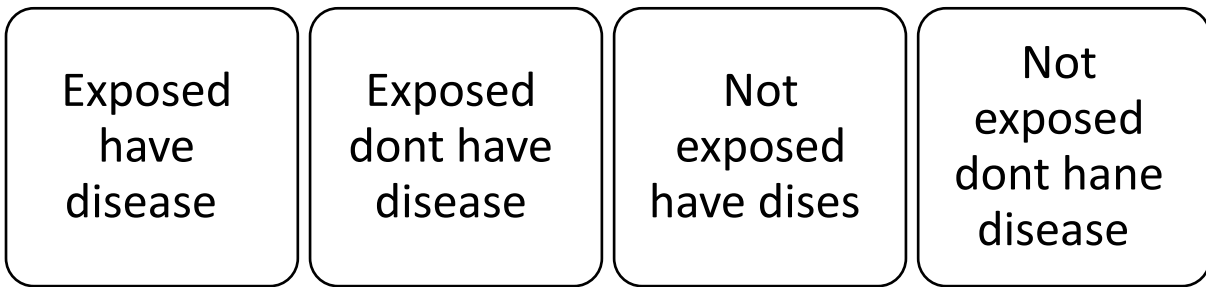
Cross- sectional surveys

Type of descriptive study in which exposure and disease status are assessed at the same time among individual in well defined population .

The general design is :we defined a population and determine the presence or absence of exposure and presence or absence of disease .

Defined population .

Gather information data



	Disease	No disease
Exposed	A	B

Not exposed	C	D
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To determine whether there is an association between exposure and disease :

1. By calculating the prevalence of disease in person with exposure $a/a+b$ without the exposure $c/c+d$
2. By comparing the prevalence of exposure in person with disease $a/a+c$ without disease $b/b+d$

If we determine such a study association between exposure and the disease there are several problems in that :

1. We identify prevalent rather than incident (new cases) these may be not representative of all cases in this population ,identify only prevalent cases would exclude those who died before the study .So association with survival rather than with the risk development .
2. Not possible to identify temporal relationship between exposure and the disease .

Cross sectional studies are relatively easy . in sudden outbreaks of disease across sectional studies involving measurement of several exposure is often the most convenient first step in an investigation into the cause .Data from cross sectional study also are helpful in the assessing the health care needs of population .