Cohort Study design

Dr. Sana Bilal

Assistant Professor

FCPS.MBBS

Recall

I. What is usual outcome of descriptive study?

II. What are two basic features of case-control studies?

III. What do you mean by matching and how it is performed.

IV. What are analytical outcomes of a case-control study.

V. What are short comings of C-C study

Cohort

A group of people who have something in common or remain part of the group over an extended period of time. .Birth cohort, Occupational cohort, ,Exposure cohort/ Post atomic bombing . Suicide-survivor cohort. Women using IUD- cohort

Cohort study
(Prospective-, Follow-up-, Longitudinal-, Incidence- & Forward looking studies)

- Observational study.
- Analyze hypothesized association, ...better than C-C study.
- Most reliable epidemiological / observational study method to test an etiological Hypothesis
- Close to a true experiment

When Cohort study is undertaken?

- When sufficient evidence about disease causation is available.
- Stable & manageable cohorts are available.
- Exposure in general is rare but disease is common in those who are exposed (certain occupational groups)
- Risk of attrition is minimal
- Enough resources are available

2019

Basic features of Cohort studies

1. Two comparable cohorts of individuals are identified from the population

2. Both groups are free from disease.

3. Persons belonging to one cohort are exposed to the suspected risk factor Exposed Cohort (like smoking)
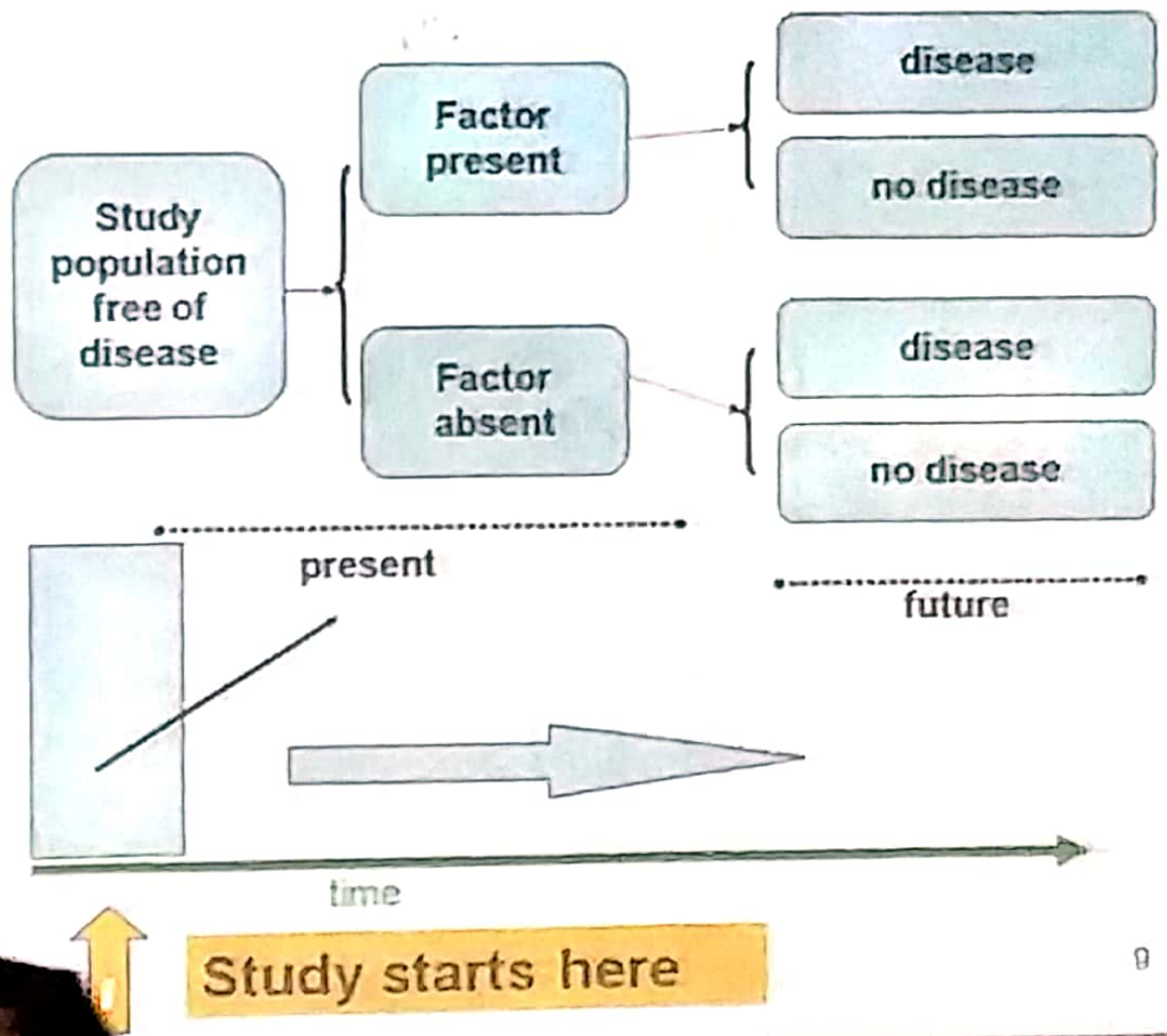
4. 2nd group is not exposed to that factor Non-Exposed .

   Both groups are otherwise equally susceptible to diseases.

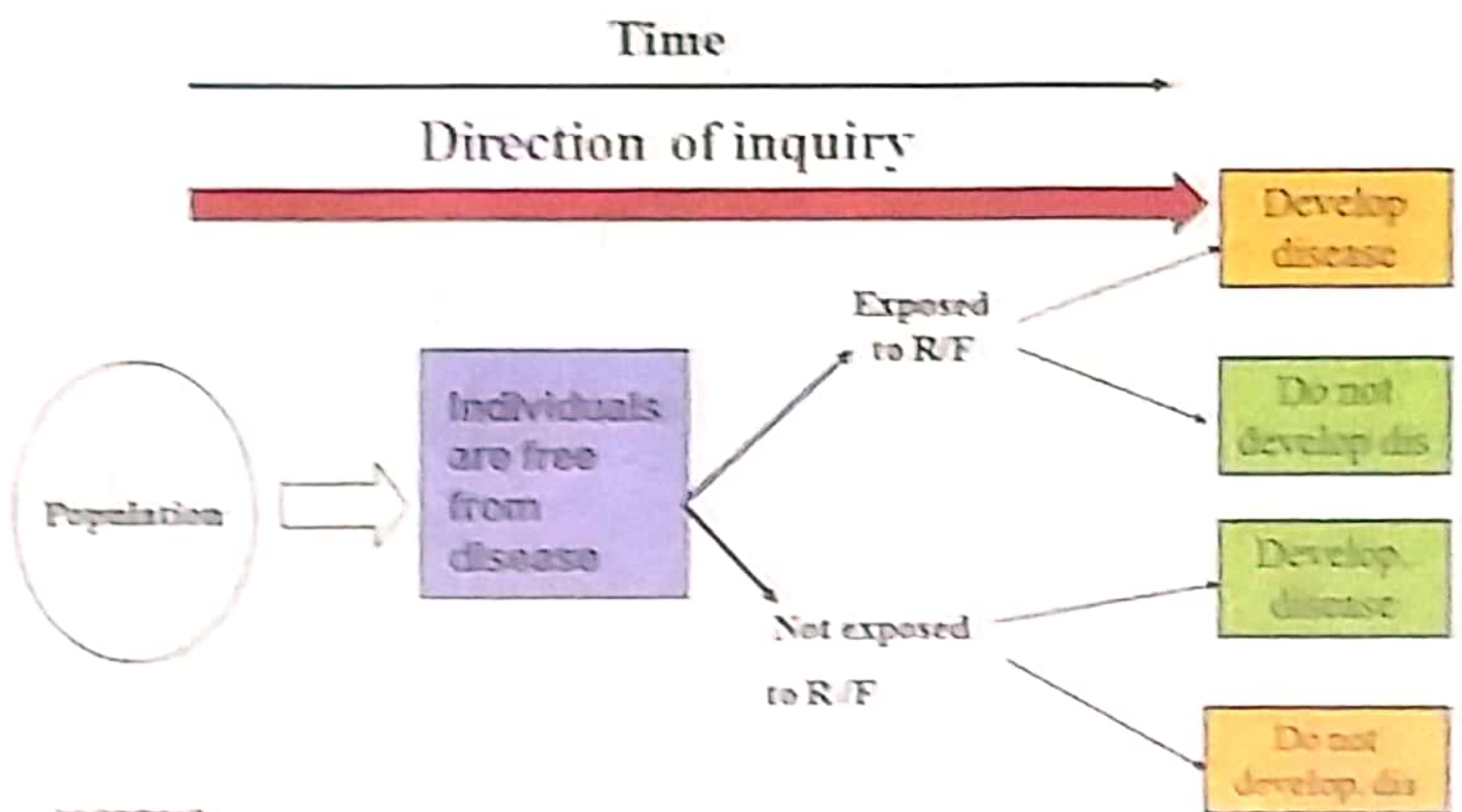   Study proceed from cause to effect.

Basic features of Cohort studies

6. <u>Exposed</u> & <u>non-Exposed</u> groups are observed over extended period of time and compared for occurrence (frequency) of disease / death.

7. Incidence rate of the disease in both groups can be directly calculated

8. Time & dose relationship between exposure and the outcome may be established.

9. More than one, outcomes may be studied at the same time.

Cohort Design

Study population free of disease

Factor present → disease / no disease

Factor absent → disease / no disease

present

future

time

Study starts here

Cohort Study design

Steps for undertaking a cohort study

1. Selection of Cohort

    a. Exposed group.
    - Gen. population
    - Select group (occupational gp)

    b. Non-exposed group
    - Gen. population
    - Internal comparison
    - External comparison

2. Collection of relevant information

    a. About exposure
    b. Basic variables

Steps...

3. Follow up for development of disease in both
   groups

   - Periodic medical examination
   - Review of medical records
   - Routine surveillance for morb. & mort.

   ISSUE OF ATTRITION

4. Analysis concept.

   i. Is there any difference in occurrence of
      disease b/w the two groups ? if yes! Then,
      is it significant ?
      Determined by P-value, SE of diff b/w two props.

   ii. Relative risk

Analytical framework of Cohort study

Cohorts status	Disease development	
	Yes	No
Exposed to suspected etiological factor	a	b
Not exposed to suspected etiological factor	c	d

Analysis use of "HF" and "early hearing loss"

	Developed disease	Not developed disease	
Exposed to R/F	a (30)	b (70)	a + b (100)
Not Exposed to R/F	c (10)	d (90)	c + d (100)
	a+c	b+d	n = 200

I. Incidence rate in Exposed = a / a + b x 100 (30%)
   Incidence rate in Not-Exposed = c / c+ d x 100 (10%).

II. Relative Risk:

$$\frac{\text{Incidence in Exposed}}{\text{Incidence in not-Exposed}} = \frac{a/a+b \times 100}{c/c+d \times 100} = \frac{30}{10} = 3/1 = 3$$

RR or Risk Ratio = 3

Interpretation: those who exposed, are 03 (300%) times at higher chances of developing the disease as compare to those who are not exposed.