

EPIDEMIOLOGY III

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Experimental Epidemiology

Aim:

- (a) to provide "scientific proof" of aetiological {or risk} factors which may permit the modification or control of those diseases
- (b) to provide a method of measuring the effectiveness and efficiency of health services for the prevention, control and treatment of disease and improve the health of the community
- ❖ all the advantages and disadvantages of the usual prospective cohort studies plus three additional problems
 - ❖ cost, ethics and feasibility

Types

Animal Studies

Human Experiments

Experimental studies are of two types :

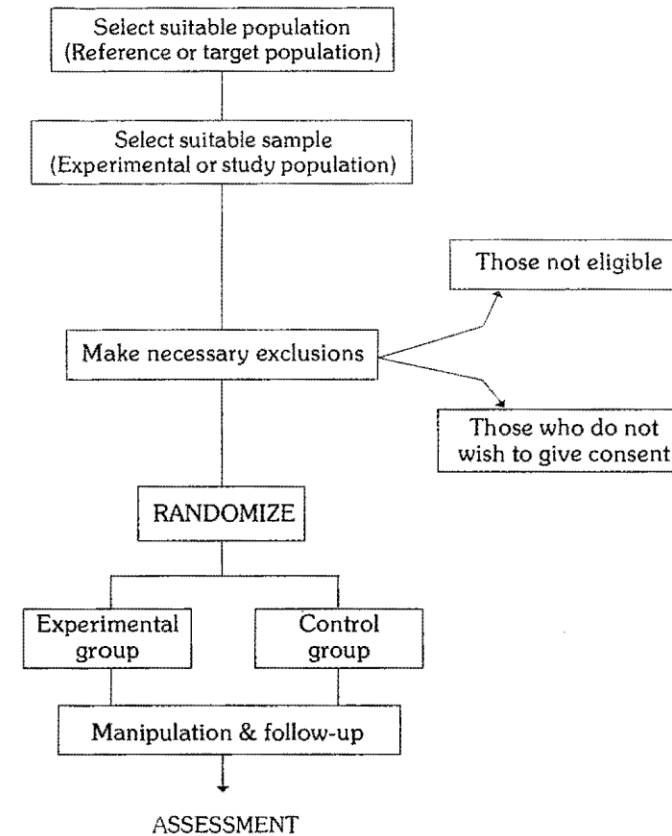
- a. Randomized controlled trials (i.e., those involving a process of random allocation); and
- b. Non-randomized or "non-experimental" trials (i.e., those departing from strict randomization for practical purposes, but in such a manner that nonrandomization does not seriously affect the theoretical basis of conclusions).

Answer to the above questions may provide clues to disease aetiology, and help the epidemiologist to guide planning and evaluation

Randomized Control Trial

STEPS

1. Drawing up a protocol.
2. Selecting reference and experimental populations.
3. Randomization.
4. Manipulation or intervention.
5. Follow-up.
6. Assessment of outcome



Blinding

(A) *SINGLE BLIND TRIAL* : The trial is so planned that the participant is not aware whether he belongs to the study group or control group.

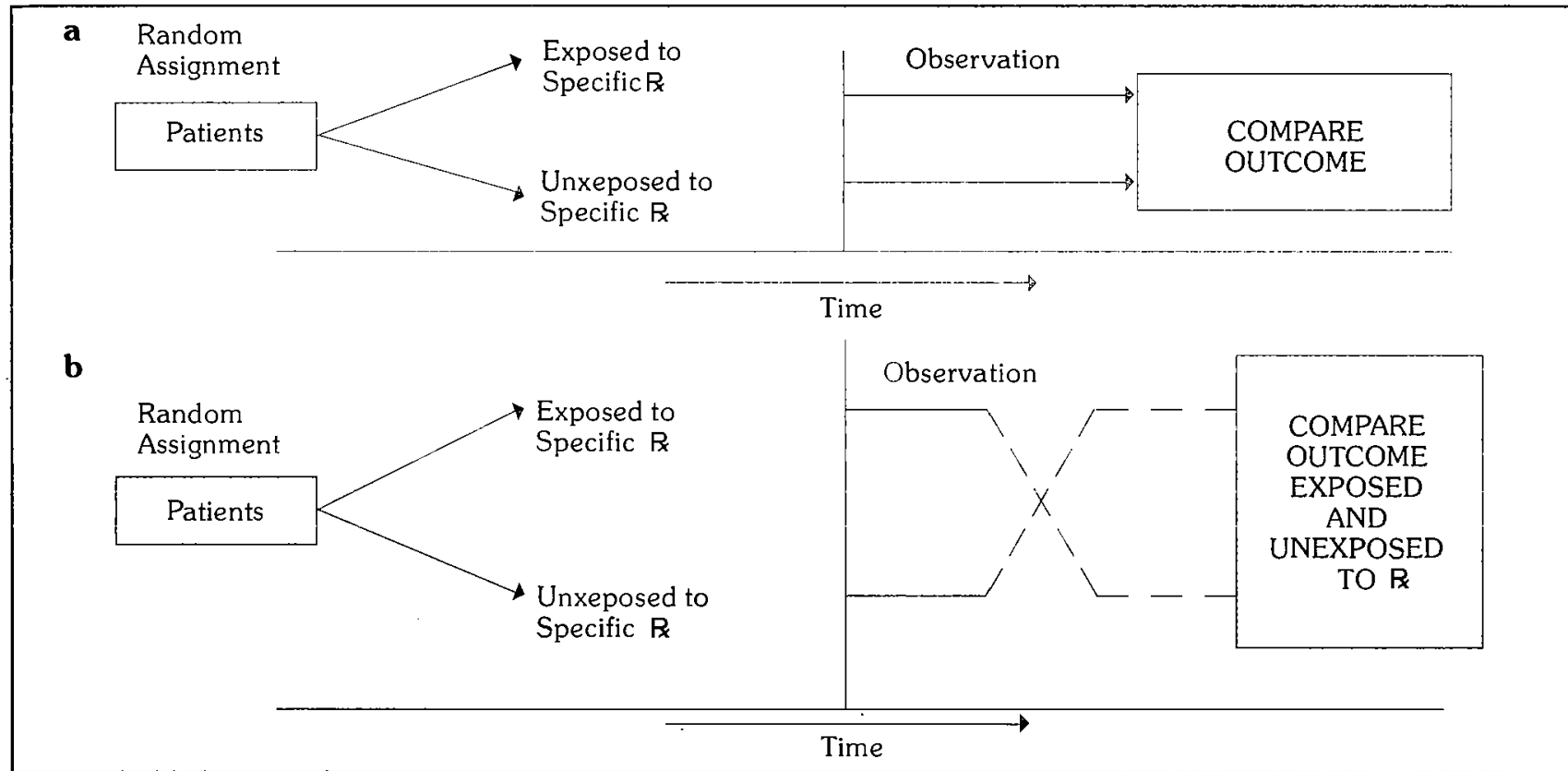
(B) *DOUBLE BLIND TRIAL* : The trial is so planned that neither the doctor nor the participant is aware of the group allocation and the treatment received.

(C) *TRIPLE BLIND TRIAL* : This goes one step further. The participant, the investigator and the person analysing the data are all "blind".

Ideally, of course, triple blinding should be used; but the double blinding is the most frequently used method when a blind trial is conducted.

When an outcome such as death is being measured, blinding is not so essential.

Concurrent Vs Cross Over Design



Types of R C T

- a. Clinical Trials
- b. Preventive Trials
- c. Risk Factor Trials
- d. Cessation Experiments
- e. Trial of aetiological agents
- f. Evaluation of Health Services

Types of Non-R C T

a. Uncontrolled Trials

b. Natural Experiments

c. Before & After Comparison Studies

Natural Experiment

Deaths from cholera per 10,000 houses and sources of water supply of these houses, London 1853

Sources of water supply	Number of houses	Deaths from cholera	Deaths in each 10,000 houses
Southwark & Vauxhall Co.	40,046	1263	315
Lambeth Co.	26,107	98	37

Before & After Comparison – Without Control

Effect of adoption of compulsory seat-belt legislation in
Victoria, Australia- 1971

	1970	1971	% change
Deaths	564	464	- 17.7
Injuries	14620	12454	- 14.8

Before & After Comparison – With Control

Effect of adoption of compulsory seat-belt legislation in Victoria, 1971 compared with other states where similar legislation was not introduced

	1970	1971	% change
Deaths			
Victoria	564	464	– 17.7
Other states	1,426	1,429	0.2
Injuries			
Victoria	14,620	12,454	– 14.8
Other states	39,980	40,396	1.0