

## cohort study.

### pros

Time-squence: hypothesized exposure is known to precede disease

Ethical: exposure already there.  
Not assigned

Rare exposure can be studied  
if a suitable exposed cohort can be identified.

Multiple outcomes can be investigated  
for a single exposure

Need not rely on past records or  
recall of past events  
Collect at time of exposure

Exposure-Specific Incidence Rates  
of the disease outcome can be calculated.

Can Ascertain all outcomes in  
a measured cohort

Can minimize bias in exposure  
measurement.

### cons.

Cost: Expensive when large  
# of subjects are followed  
prospectively during a long time.  
Usually not appropriate  
for rare disease  
outcome.

## time-lagging.

Impractical for E-D  
combinations with long  
incubation period.

Loss to follow up reduce  
power

Selective loss to follow  
up can introduce bias

Interpretation can be  
challenging if exposure  
changes during study period  
and introduce time lag short  
or unknown.

## case-control study

### Advantages

Efficient design for rare D.

Multiple exposures

Efficient, use fewer subjects,  
faster less expensive

Ethical.

Good estimate of RR  
 $O.R.$  is good estimate of RR  
when controls are sampled at  
the beginning or during the  
period of case identification.

### Disadvantages

Can't estimate disease freq  
(incidence) in the base pop  
(x incidence rates)

rare exposure. Inefficient.

Very susceptible to selection bias

Temporal Ambiguity.

Information bias.

- Pre-existing records may not complete  
or equivalent for all cases and controls.

More detailed exposure assessment.  
Sometimes not feasible to measure exposure in cohort study since we don't have cases yet.

Specific types of the exposure.  
Cohort study often puts lots of exposure together.

Not good for fatal diseases  
e.g. pancreatic cancer.

- Recall bias.  
Confounding. Distortion of association due to third factor

Generalizability.

When cases available are not representative of all incident cases.

e.g. surviving cases, cases severe enough to be hospitalized  
e.g. ovarian cancer, pancreatic cancer.

### Advantages

Efficiency & Cost.

Efficiency.

(Measurement bias is usually not a problem.)

Generate hypotheses

### Cross-sectional

### Disadvantages

Temporal issue

Prevalence bias  
(Selection bias)

Selection bias Exposure & Disease outcomes influence likelihood of being included (Info bias).

Not useful for studying rare disease or rare outcomes.

### Ecologic Studies

#### Advantage

Efficiency.

Preliminary testing of hypotheses

Wide range of E and D may be available.

Increase chance of observing a relatively weak association

#### Disadvantage

Ecological Fallacy  
not guarantee people with D are the same people who were exposed.

Imprecise measurements prevent accurate quantification of E-D

relationship.

Difficult to control confounding

Difficult to find pop  
of proper size and  
comparability

