

# MA50259: Statistical Design of Investigations

Dr. Sandipan Roy

Lecture 7 (extra part) : Confounding

## Ex 1. Comparability

We have two treatments , A (new) and B (standard) and we want to know weather the new treatment is more effective than the standard treatment.

**\*Method 1** Compare the results of the new treatment on patients in one clinic with results of patients under the standard treatment in a different clinic (at the same time)

**Method 2** Compare the results of the new treatment on historic patients with results of the same patients under the standard treatment in the past

**Method 3** Compare the results of the new treatment on new patients with records of previous results using the standard treatment (different patients)

## Ex 2. Comparability

In a trial of a new vaccine, children were assigned at random to a vaccine or a control group. The vaccine group were offered vaccination, which two-thirds accepted. The control group were offered nothing

- ▶ The group which should be compared to the controls is all children who accepted vaccination (T/F)
- ▶ Those refusing vaccination should be excluded (T/F)
- ▶ The trial is useless because not all treated group were vaccinated (T/F)

## Confounding

	Exposed	Non-exposed
Asthma cases	1000	800
Non-cases	2000	2200
Total	3000	3000
Risk/100	33.3	26.7
Risk ratio	1.25	

## Confounding (cont'd)

	Smokers Exposed	Non- exposed	Non- smoker Exposed	Non- exposed	Total Exposed	Non- exposed
Asthma cases	800	400	200	400	1000	800
Non-cases	1200	600	800	1600	2000	2200
Total	2000	1000	1000	2000	3000	3000
Risk/100	40	40	20	20	33.3	26.7
Risk ratio	1		1		1.25	

# Confounding

- ▶ The exposed and non-exposed groups are **not comparable**, because of differences in background disease risk
- ▶ As a result, the effect **estimate will usually change** when we adjust for the risk factors that differ between the exposed and non-exposed
- ▶ **Confounding** can also be introduced into a study through other ways!

# Criteria for Confounding

A risk factor is a **confounder** if it is:

1. A risk factor for disease (response/outcome) among the **non-exposed**
  2. Associated with exposure in the **source population**
  3. Not an intermediate step in the **causal pathway** between the exposure and disease
- ▶ These three criteria are necessary but not sufficient criteria for confounding
  - ▶ P-values will not be enough