Epidemiologic studies

Training in Research in Reproductive Health/Sexual Health 2005

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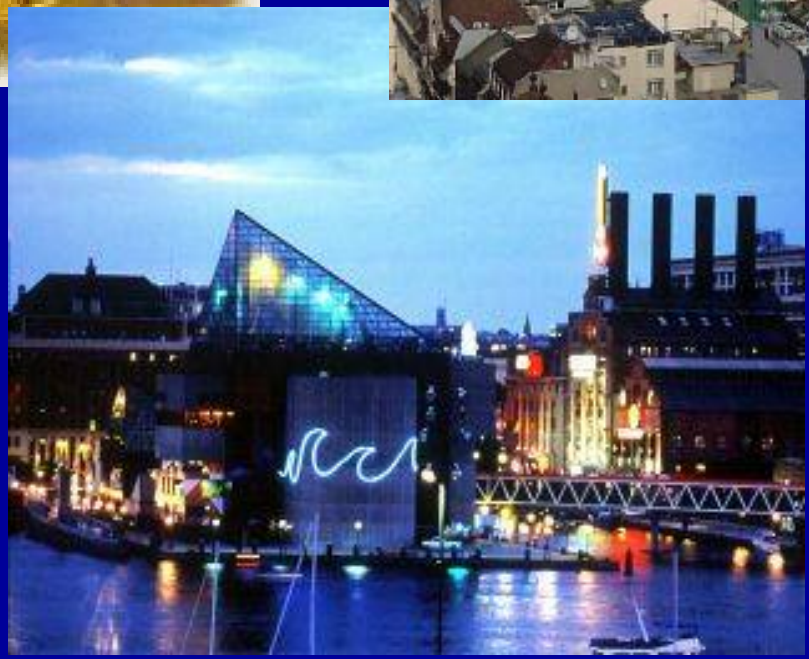

Association

- Is a disease or a condition more often present in persons with the characteristic of interest?
- The characteristic could be:
  - A risk factor (smoking)
  - A protective factor (healthy diet, treatment)

Two main types of studies

- Observational: the epidemiologist observes the association between exposure and outcome (e.g. smoking and lung disease)
- Experimental: the epidemiologist performs an experiment, he/she controls the conditions under which the study is conducted (he/she is able to assign subjects to a treatment or comparison group and then follow them up to see if there are differences in the occurrence of disease between the two groups; e.g. calcium supplementation and pre-eclampsia)

Two types of observational studies

- Cohort study: one begins with a group of persons exposed to a factor of interest and a group of persons not exposed. The persons are then followed for the development of the disease of interest.
- Case-control study: one assemble a group of persons with a disease (cases) and a group of persons with no disease (controls). The history of past exposure to the factor of interest in then compared between the cases and controls.

Two types of experimental studies

- Randomized clinical trial: similar persons are allocated by the epidemiologist to the treatment and control groups.
- Community trial: similar communities (villages, clinics) are allocated by the epidemiologist to the treatment and control groups.

Summary

Controlled a

EXPERIM
STU

Community assignment

COMMUNITY TRIAL

CLINICAL TRIAL

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Sampling with regard to exposure

CASE-CONTROL STUDY

COHORT STUDY

Your enemy

NON CAUSAL ASSOCIATIONS

Artifactual (spurious) associations

- Biased methods of selecting cases and controls (estrogens and endometrial cancer)
- Biased method of recording information (automobile driving and herniated vertebral discs)
- Errors in the design or conduct of the study (nonrepresentative study groups, misclassification of exposure or disease, measurements errors, lost to follow up, observer bias)

Confounding

- The association between exposure to a factor and the consequent development of disease is distorted by an additional variable that is itself associated both with the factor and with the disease (coffee, smoking, lung cancer)

You win!

CAUSAL ASSOCIATION

Assessing causality

- Strength of the association
- Consistency of the observed association
- Specificity of the association
- Temporal sequence of events
- Dose response relationship
- Biological plausibility
- Experimental evidence

It is a strategy game!