# Descriptive Studies

# Case Reports

- Detailed presentation of a single case or handful of cases
- Generally report a new or unique finding
    - e.g. previous undescribed disease
    - e.g. unexpected link between diseases
    - e.g. unexpected new therapeutic effect
    - e.g. adverse events

2

# Case Series

- Experience of a group of patients with a similar diagnosis
- Assesses prevalent disease
- Cases may be identified from a single or multiple sources
- Generally report on new/unique condition
- May be only realistic design for rare disorders

3

# Case Series

- ## Advantages
  - Useful for hypothesis generation
  - Informative for very rare disease with few established risk factors
  - Characterizes averages for disorder

- ## Disadvantages
  - Cannot study cause and effect relationships
  - Cannot assess disease frequency

4

# Descriptive Studies

**Case Report** → **One case of unusual findings**

**Case Series** → **Multiple cases of findings**

**Descriptive Epidemiology Study** → **Population-based cases with denominator**

# Study Designs -
# Analytic Epidemiology

- **Experimental Studies**
  - **Randomized Controlled Clinical Trials (RCT)**
  - **Community trials**
- **Observational Studies**
  - **Group data** (i.e. we don't have subject level info)
    - **Ecologic**
  - **Individual data**
    - **Cross-sectional**
    - **Cohort**
    - **Case-control**
    - **Case-crossover**

An Introduction to Epidemiology (CDC)
http://www.cdc.gov/excite/classroom/intro_epi.htm
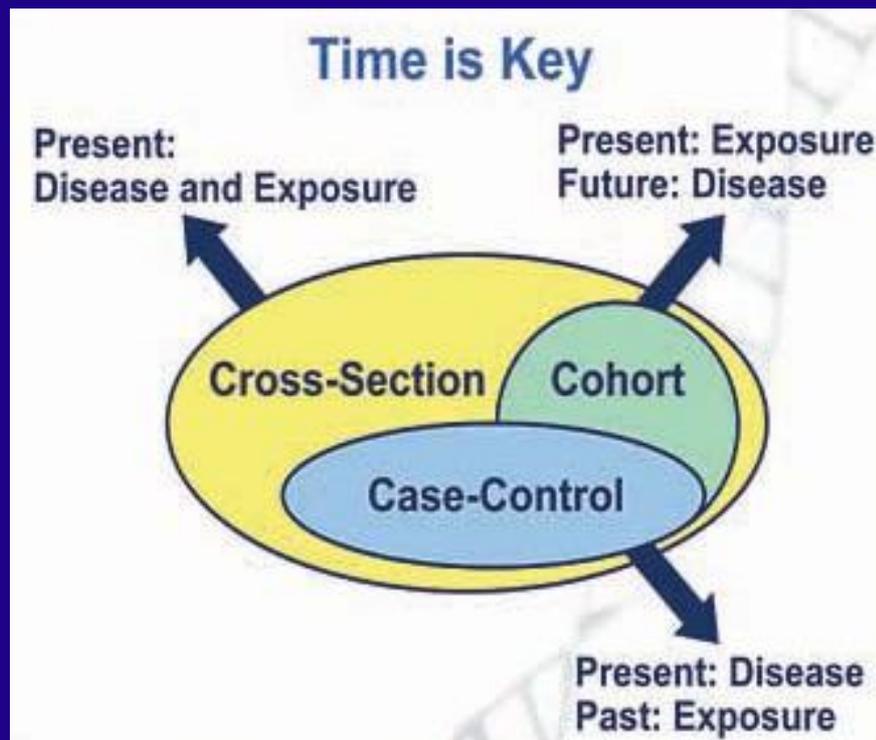
6

# Observational Studies

1.  Non-experimental

2.  Observational because there is no individual intervention

3.  Treatment and/or exposures occur in a "non-controlled" environment

4.  Individuals can be observed prospectively, retrospectively, or currently (i.e. cross-sectional)
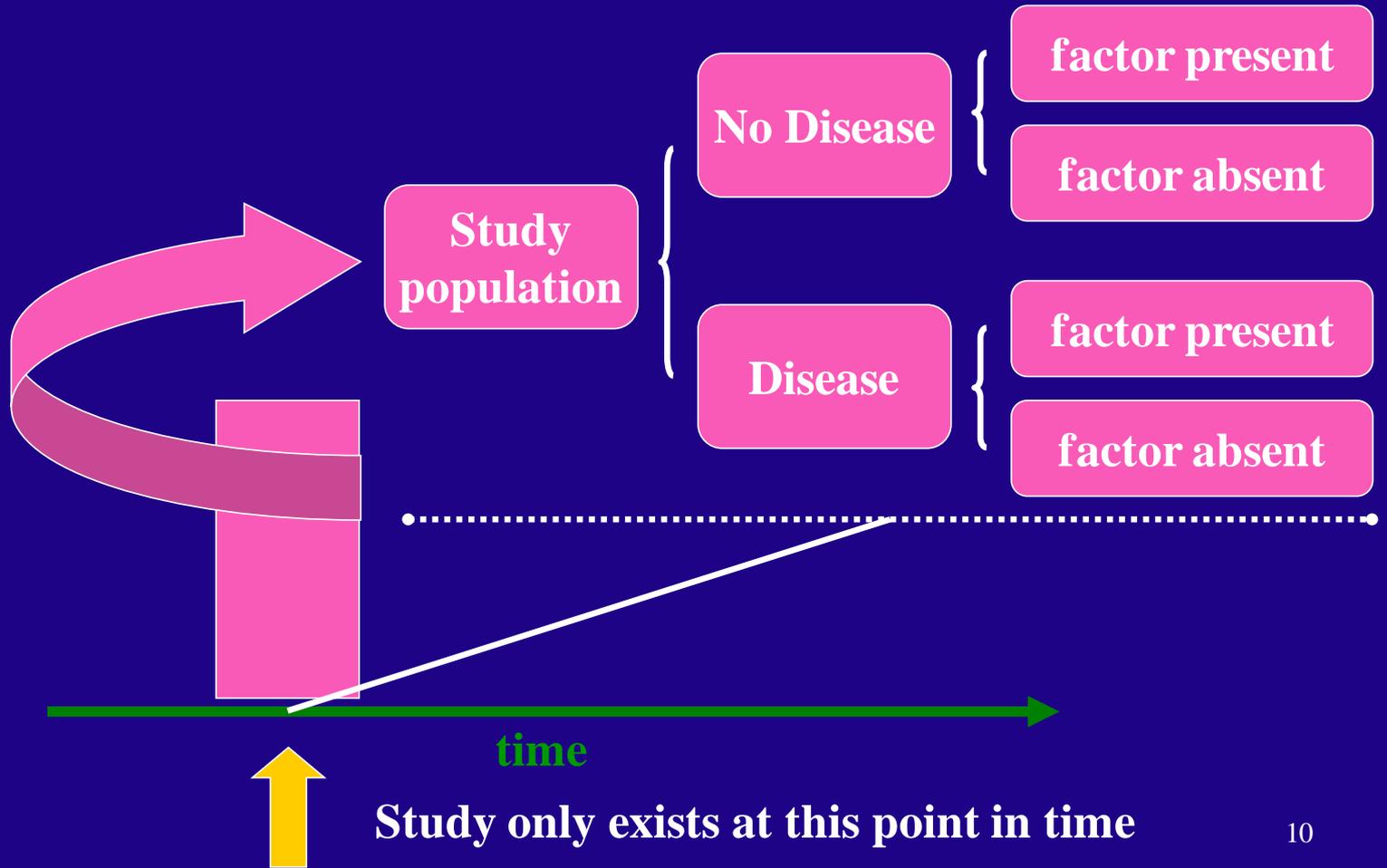
# Cross-sectional studies

- An "observational" design that surveys exposures and disease status at a single point in time (a cross-section of the population)
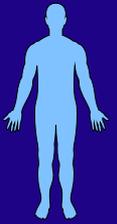
time

Study only exists at this point in time

# Observational Studies and Timeframe

# Cross-sectional Design



Study population

No Disease
- factor present
- factor absent

Disease
- factor present
- factor absent

time

Study only exists at this point in time

10

# Cross-sectional Studies

- **Often used to study conditions that <u>are relatively frequent with long duration of expression</u>** (nonfatal, chronic conditions)

- **It measures *prevalence*, not *incidence* of disease**

- **Example: community surveys**

- **Not suitable for studying rare or highly fatal diseases or a disease with short duration of expression**

# Cross-sectional studies
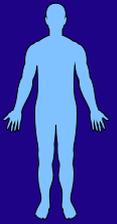
- **Disadvantages**
    - **Weakest observational design,** (it measures prevalence, not incidence of disease). Prevalent cases are survivors
    - The <u>Temporal Sequence</u> of exposure and effect may be difficult or impossible to determine
    - Usually don't know when disease occurred
    - Rare events a problem. Quickly emerging diseases are also problem.

12

# Analysis of cross-sectional studies

✓In a cross-sectional study, to calculate prevalence, multiple parameters are measured simultaneously – questions, observations, and answers.

✓Prevalence = No of cases at a given time / No of people at the same given time

# Cross-Sectional Studies Advantages and Disadvantages

**Advantages of cross-sectional studies**
1. **Relatively quick to conduct**
2. **All variables are collected at one go**
3. **Multiple outcomes can be researched at once**
4. **Prevalence for all factors can be measured**
5. **Good for descriptive analysis**
6. **Can be used as a springboard for further research**

**Disadvantages of cross-sectional studies**
1. **Cannot be used to get timeline based research**
2. **Tough to find people that fall under the exact same variables**
3. **Associations are tough to interpret**
4. **When strong feelings are involved, there could be a case of a bias**
5. **Does not help to determine cause**

# Experimental Studies

- **Treatment and/or exposures occur in a "controlled" environment**

- **Planned research designs**

- **Clinical trials are the most well known experimental design. Clinical trials use randomly assigned data.**