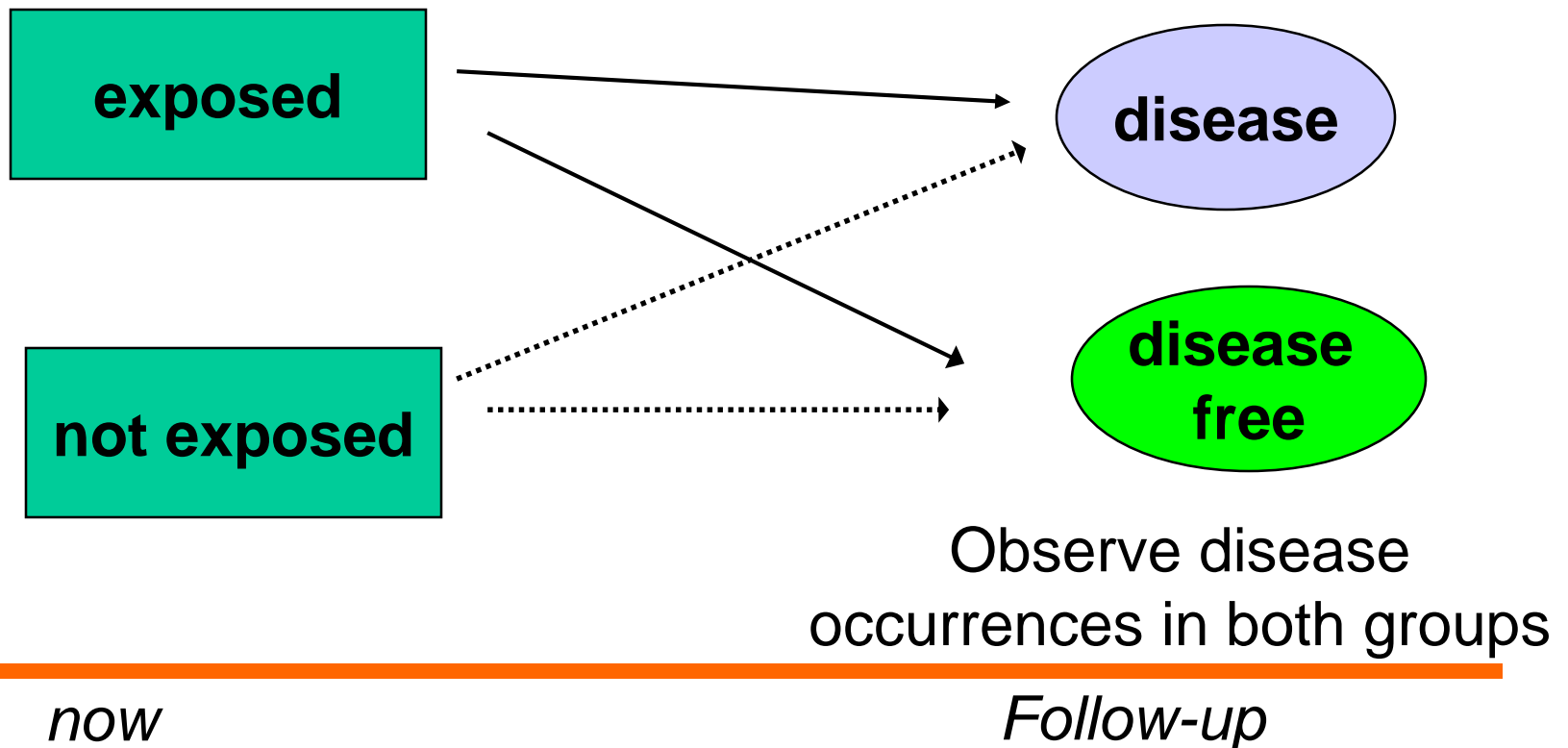


Cohort Studies

- Participants selection based on exposure status: exposed or unexposed to a risk factor
- Follow-up participants in time to determine who develops the disease
- Provides more direct evidence for disease causation
- Cohort Studies may be Prospective or Retrospective

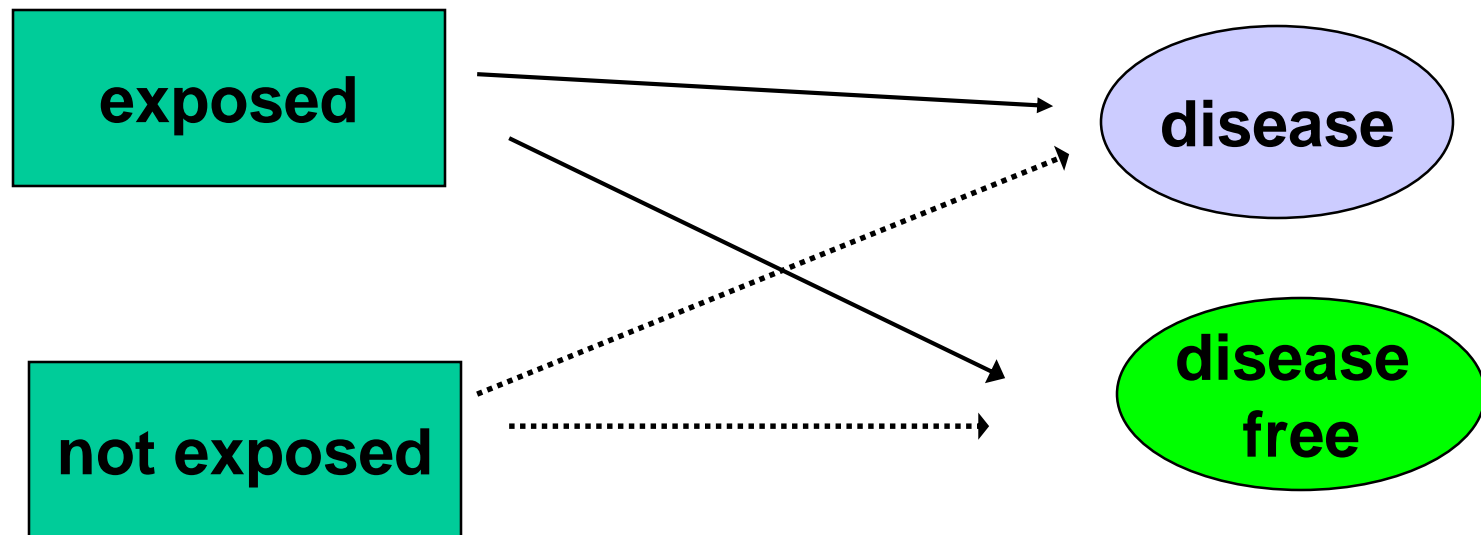
Prospective Assessment

Start by classifying participants on exposure status at baseline



Retrospective Assessment

Start by classifying participants on exposure status at baseline



Information from medical records: diagnosis

Look in the past

Now

Cohort Study: Population Selection and Follow-Up

- Define the cohort of interest and collect baseline data on exposures
- Decide on the endpoints of interest and duration of follow-up
- Example: *in 1991, a group of 1,000 nurses from 2 hospitals in Montreal was enrolled in a 10-year study of the association accidental needle sticks with acquiring the HIV viral infection. At baseline each worker had either no needle sticks, one incident, or two+ incidents. In 2001 the incidence rate of HIV was determined for each of these groups.*

Analysis of Cohort Studies

	exposed	not exposed
disease	A	B
disease free	C	D

Relative Risk =

Risk of disease among
exposed group $A/(A+C)$

divided by

Risk of disease among
unexposed $B/(B+D)$

Example: Twenty years prospective study of lung cancer among uranium miners vs. other workers

	Exposed workers	Unexposed workers
Cancer	10	9
No cancer	100	456
<i>total</i>	<i>110</i>	<i>465</i>

$$\text{Relative Risk} = [A/(A+C)] / [B/(B+D)] = (10/110) / (9/465) = 4.70$$

$$95\% \text{ CI: } e \{ \ln (RR) \pm 1.96 * \text{sqrt} [1/A - 1/(A+C) + 1/B - 1/(B+D)] \}$$

$$e \{ \ln (RR) \pm 1.96 * \text{sqrt} [1/10 - 1/110 + 1/9 - 1/465] \}$$

95% CI for the RR: (1.96 ; 11.28)

Note that the CI formula for RR differs from that for the OR

Null Hypothesis for RR

- The null hypothesis is $RR=1$
- Reject the null hypothesis if the 95% CI excludes the value 1.0
- Same assumptions as for the odds ratio

csi - Cohort studies

	Exposed	Unexposed
Cases	10	9
Noncases	100	456

☐ Report odds ratio

☐ Woolf approximation

☐ Test-based confidence intervals

☐ Fisher's exact p

95 ▼ Confidence level

? ⓘ 📄 OK Cancel Submit

Stata/IC 12.1 - [Results]

File Edit Data Graphics Statistics User Window Help

Review

#	Command	_rc
1	csi 25 75 10 90	
2	csi 25 75 10 90	
3	csi 25 10 75 90	
4	csi 10 9 100 456	

Risk difference .15 .0467525 .2532475
Risk ratio 2.5 1.267871 4.929523
Attr. frac. ex. .6 .2112764 .7971406
Attr. frac. pop .4285714

chi2(1) = 7.79 Pr>chi2 = 0.0052

. csi 10 9 100 456

	Exposed	Unexposed	Total
Cases	10	9	19
Noncases	100	456	556
Total	110	465	575
Risk	.0909091	.0193548	.0330435

Point estimate [95% Conf. Interval]

Risk difference	.0715543	.0163914	.1267171
Risk ratio	4.69697	1.955568	11.28139
Attr. frac. ex.	.7870968	.4886396	.9113584
Attr. frac. pop	.4142615		

chi2(1) = 14.25 Pr>chi2 = 0.0002

Variables

Variable Label

There are no items to show.


Properties

Variables

Name	Label	Type	Format	Value Label	Notes

Data

Filename	Label	Notes



Advantages and Disadvantages of the Cohort Design

Advantages

- Temporality clear
- Can cope with rare exposures
- Multiple outcomes can be studied
- Disease incidence is measured

Disadvantages

- High costs
- Long time period
- Losses to follow-up
- Detection of disease can be related to the knowledge of exposure status
- Causality not proven