Melanoma of the skin: Statistics at a glance in Canada

	Males		Females	
	Estimates*	Actual numbers†	Estimates*	Actual numbers†
Incidence				
Number of new cases	3,500	2,965	3,000	2,535
Incidence rate (per 100,000)‡	15.9	14.7	13.0	11.9
% of all cancers	3.6%	3.4%	3.2%	3.0%
Mortality				
Number of deaths	660	634	400	385
Death rate (per 100,000)‡	2.9	3.2	1.5	1.6
% of all cancers	1.6%	1.7%	1.1%	1.1%
Survival				
Five-year relative survival ratio (estimates for 2004–2008)	85%	—	92%	—
Prevalence				
10-year person-based prevalence (Jan. 1, 2009)	—	19,895	—	19,600
Potential years of life lost (for 2009)	—	11,800	—	8,000

— Not applicable.

* For 2014.

† 2010 for incidence and 2009 for mortality.

‡ Age-standardized to the 1991 Canadian Standard population.

LINK

Review Article LINK

Melanoma prevention: are we doing enough? A Canadian perspective

A.M. Joshua , BSc (Med) MBBS PhD

ABSTRACT

Melanoma is the most dangerous form of skin cancer, and its incidence is increasing significantly among Canadians. In parallel with the rising incidence and morbidity, the financial burden caused by this disease will continue to increase dramatically for the government and for individuals alike. More concerted effort to raise awareness of melanoma in Canada is therefore needed.

Risk factors—such as family history, childhood sunburn exposure, and age—play a significant role in an individual's likelihood to develop melanoma. Ultraviolet radiation exposure is the most modifiable variable in melanoma causation. It is therefore important for the general public, in particular the country's youth, to understand the consequences of lifestyle choices—especially tanning bed use and "sun worshipping." Many of these issues are not being addressed fully at either the national or the provincial level, with Canadian efforts trailing those of other nations facing similar challenges. Canada also has workforce issues, with an inadequate distribution and number of physicians who can detect and treat melanoma at an early curative stage. With proper education and public awareness, melanoma prevention can be an achievable goal in Canada.

THE BIGBURN

LINK

CLASS 6:

EPIDEMIOLOGIC STUDY DESIGN:

- Case Reports, Case Series
- Ecological Studies
- Migrant Studies
- Cross sectional studies
- Case-control studies

HLSC 2003
Faculty of Health Sciences
University of Lethbridge

Class 9 Learning Objectives

1. Understand the purpose and the differences between the various epidemiologic study designs

2. Learn the details of cross sectional and case-control studies designs and their strengths/limitations

3. Learn to calculate and interpret Odds Ratios to determine the measure of effect and strength of association in cross-sectional and case control studies

Epi Terms

Epidemiologic studies aim to determine the relationship between variables

- Exposure Variable (X) – potential risk factor
- Outcome Variable (Y) – disease or health phenomenon being studied

What is the relationship between exposure and outcome, and how can we intervene on exposures to reduce outcomes?

Epidemiology in the NEWs (sort of)

Mark Zuckerberg takes his two month old daughter swimming! What is the right age for babies to go swimming?

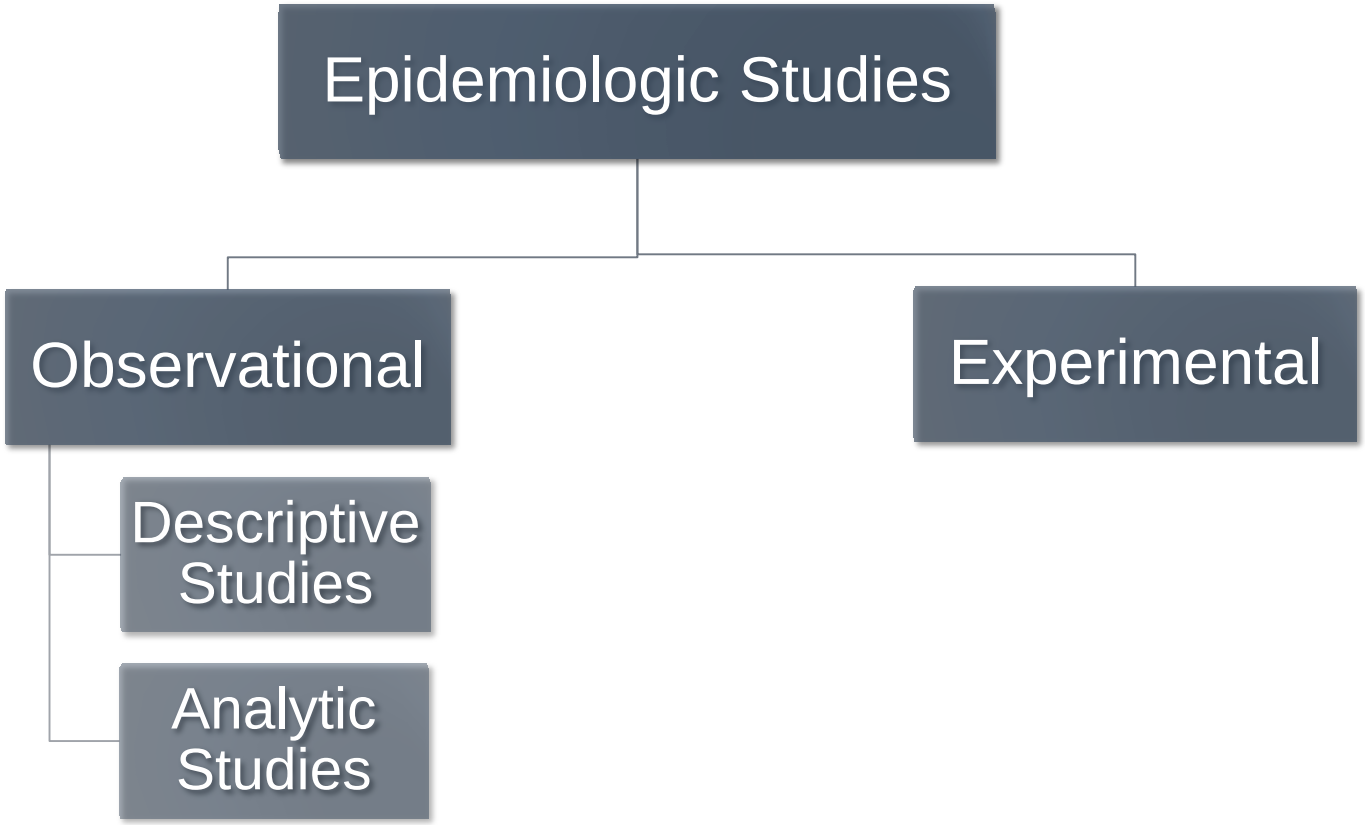
Swimming can be a great bonding activity for the father and child but you need to know when is the right time to take your child to the pool.

Debjani Arora Jan 25, 2016 at 02:25 pm

695 SHARES | Facebook | Twitter | Google+ | Comments

LINK

Classification of Epidemiological Studies



Observational Studies: Descriptive and Analytic

- Observational studies draw inferences about the relationship between exposure and outcome variables

- Investigators simply observe – based on how the subjects naturally divide themselves by variables. They do not intervene or manipulate

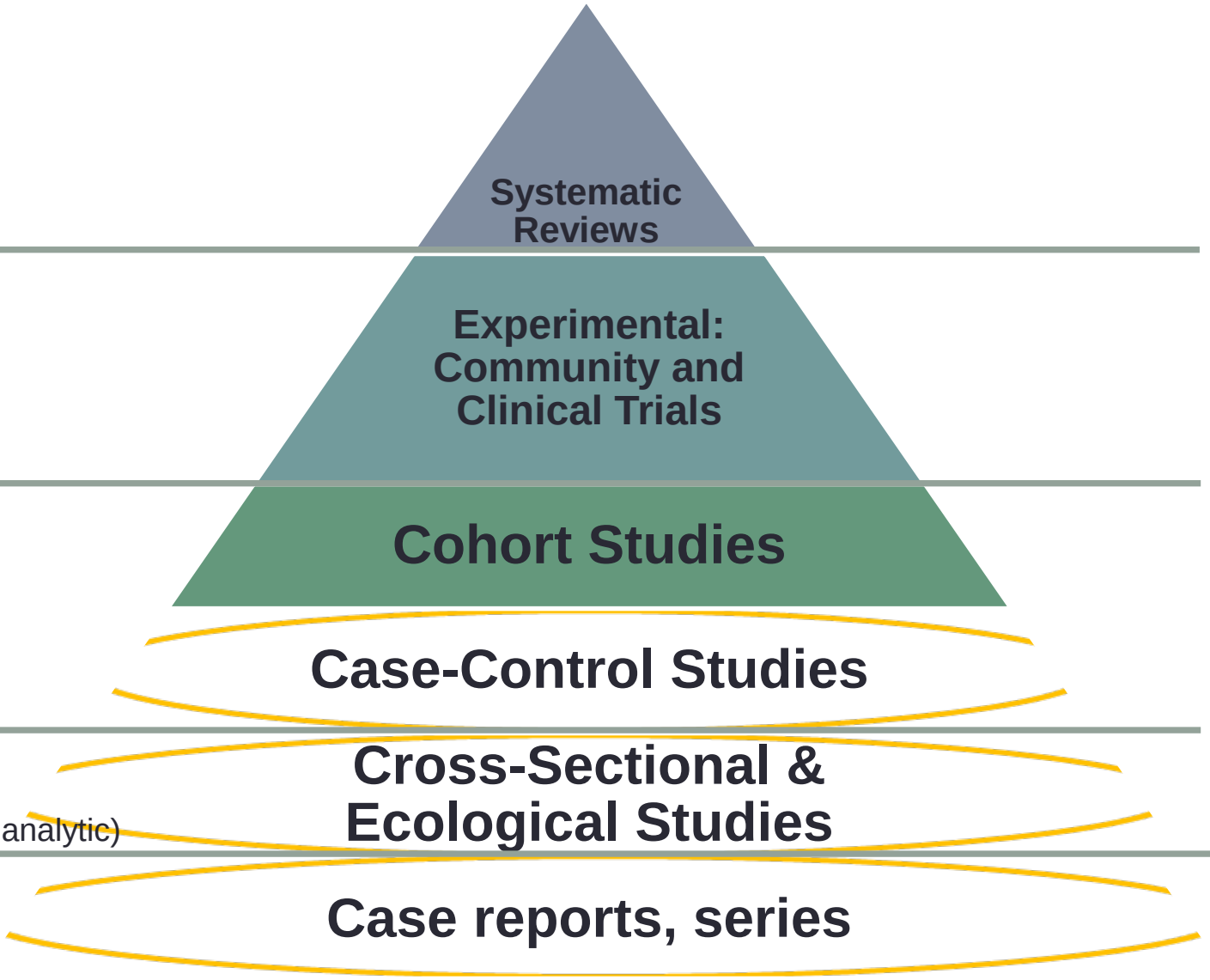
Classifications

Experimental

Observational:
Analytic

Observational
Descriptive (can be analytic)

Observational:
Descriptive



Descriptive Studies:

- Attempts to address the Who, What, Where, & When
- No prior hypothesis
- Describes was exists
- Helps to generate ideas about causation (e.g. Zika Virus and Microcephaly) and stimulates hypothesis for further investigation using analytical or experimental study designs
- Descriptive studies often use secondary data, which comes from routinely collected health data (e.g. mortality data – death certificates, morbidity data – disease registries/hospital records)

Analytic Studies:

- Tools for identifying cause of disease and evaluating health interventions (how and why)
- Compare people with and without disease and those exposed or not exposed to determine why some people develop disease and others do not
- Test hypothesis about the association between variables

Descriptive: (these are not truly epidemiological "studies")

Case reports, case series

- Detailed explanation of patient(s)
- Bring attention to unusual conditions/treatments
- 1960s – Unusual cluster of birth defects among women – linked to morning sickness drug link
- 1980s – strange cluster of symptoms among gay men - link

- Examples of Case Reports:

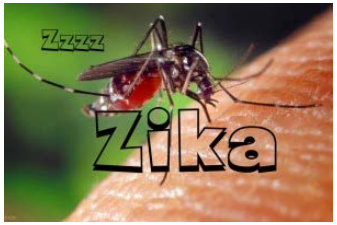
  October 2015 – Digital Hoarding

  Sept 2015 – Giant Lipoma

Descriptive: Migrant studies

- Genetics vs. Environment
- Japanese less likely to die from heart disease and more likely to have stomach cancer? Is this because they are Japanese, or because of life-style and environmental variables associated with living in Japan?
- Compare migrant rates with persons who did not migrate, and with life-long residents of the host country

Descriptive or Analytic: Ecological Studies



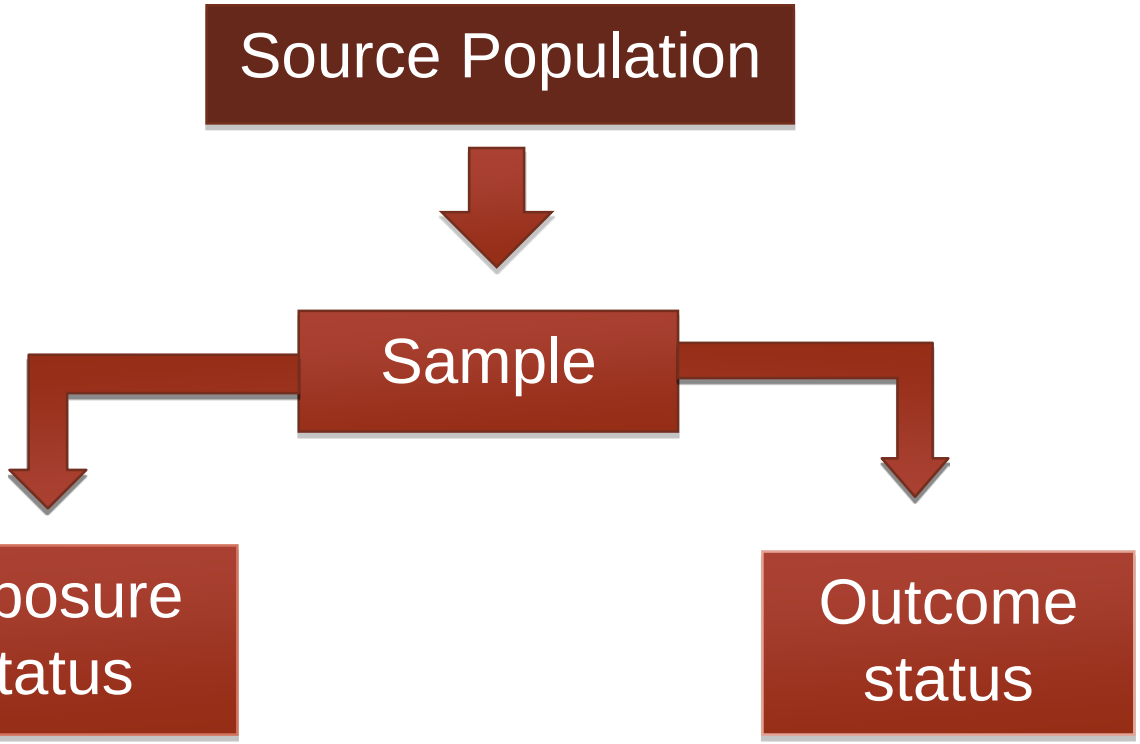
- The units of analysis are populations, not individuals
- Compare prevalence and exposures between groups of people
- Easy to do (based on routine data), but difficult to interpret
- Help develop hypothesis, but do not determine causation

Descriptive or Analytic : CROSS-SECTIONAL STUDIES

Also known as prevalence studies

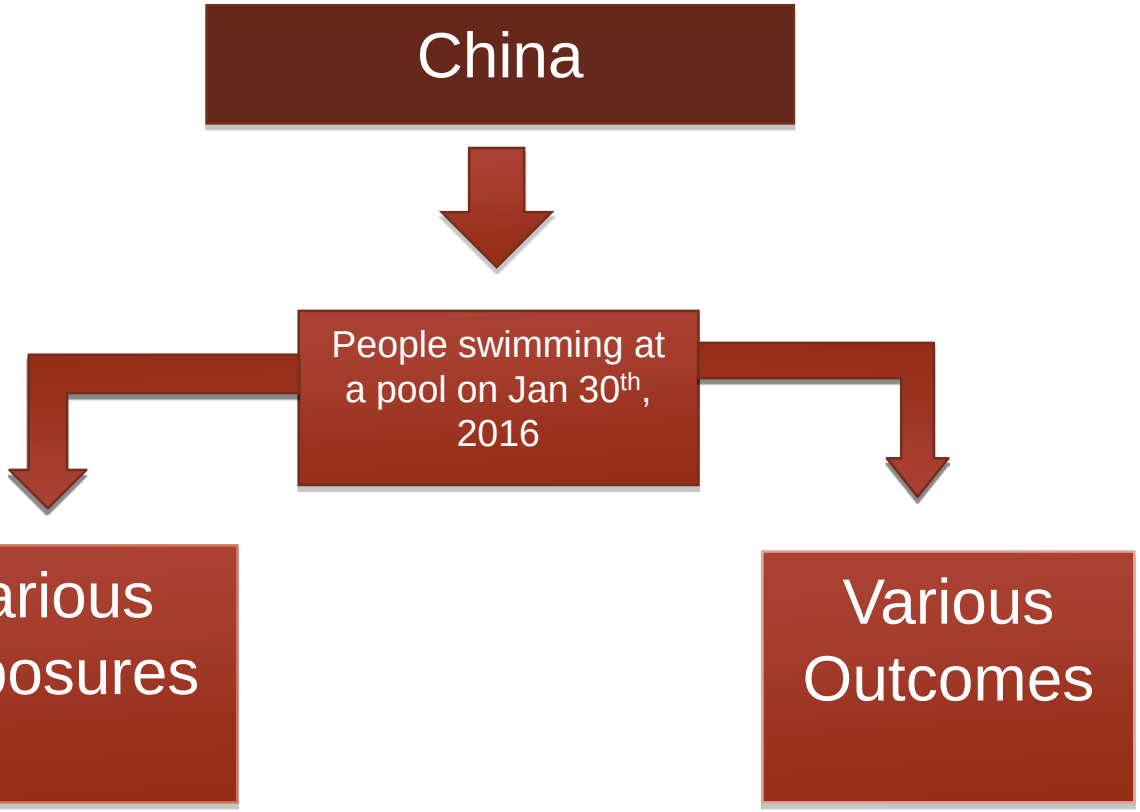

Prevalence
spot check!

Cross-Sectional Design



Single time point

Cross-Sectional Design



Single time point

Cross-Sectional Studies

- Can only measure **prevalence**
- Used when need information not collected by routine data
- Exposure and outcome status is measured at the **individual level** and at the **same time.**
- Can look at multiple exposures and multiple diseases at the same time
- May be a random sample (preferred) or a non random sample (convenience sample)
  - Beware of the snowball sample!

Cross-Sectional Design

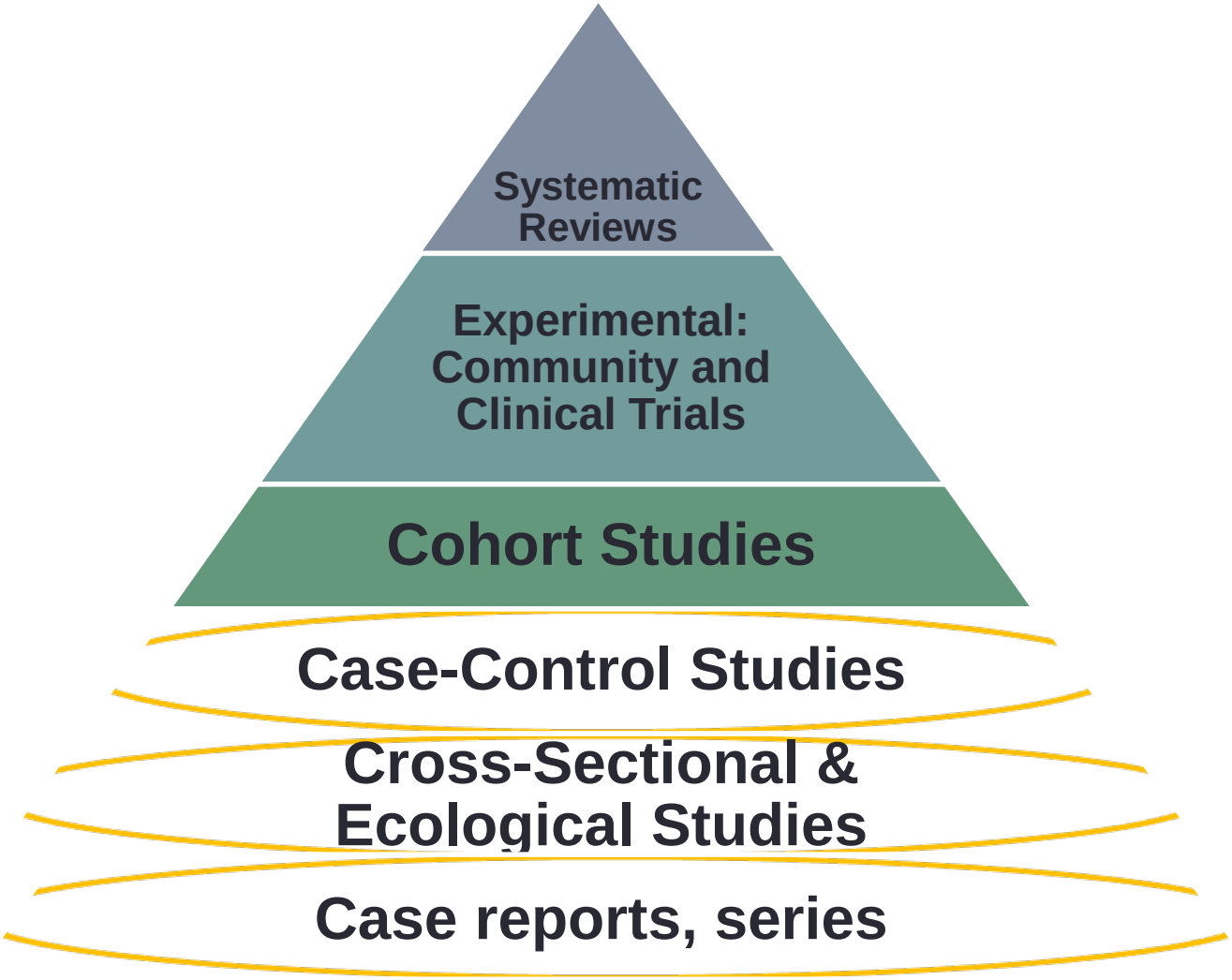
Limitations

- Subject to Selection Bias
- Cannot determine temporal sequence (i.e. which came first, exposure or outcome?) and, thus, cannot prove causation
- Over represent long-term illness and under represent illness of short durations
- Difficult to find and study rare outcomes

Strengths

- Inexpensive, simple, no follow up
- May be more representative of the target population
- Short term
- Can gather information on many outcomes and exposures simultaneously
- Can show relationships between prevalence of outcomes and exposures
- Can have descriptive and analytic value

CASE-CONTROL STUDIES


Systematic Reviews
Experimental: Community and Clinical Trials
Cohort Studies
Case-Control Studies
Cross-Sectional & Ecological Studies
Case reports, series

Case Control Studies *(analytic)*

Start with Two Groups -

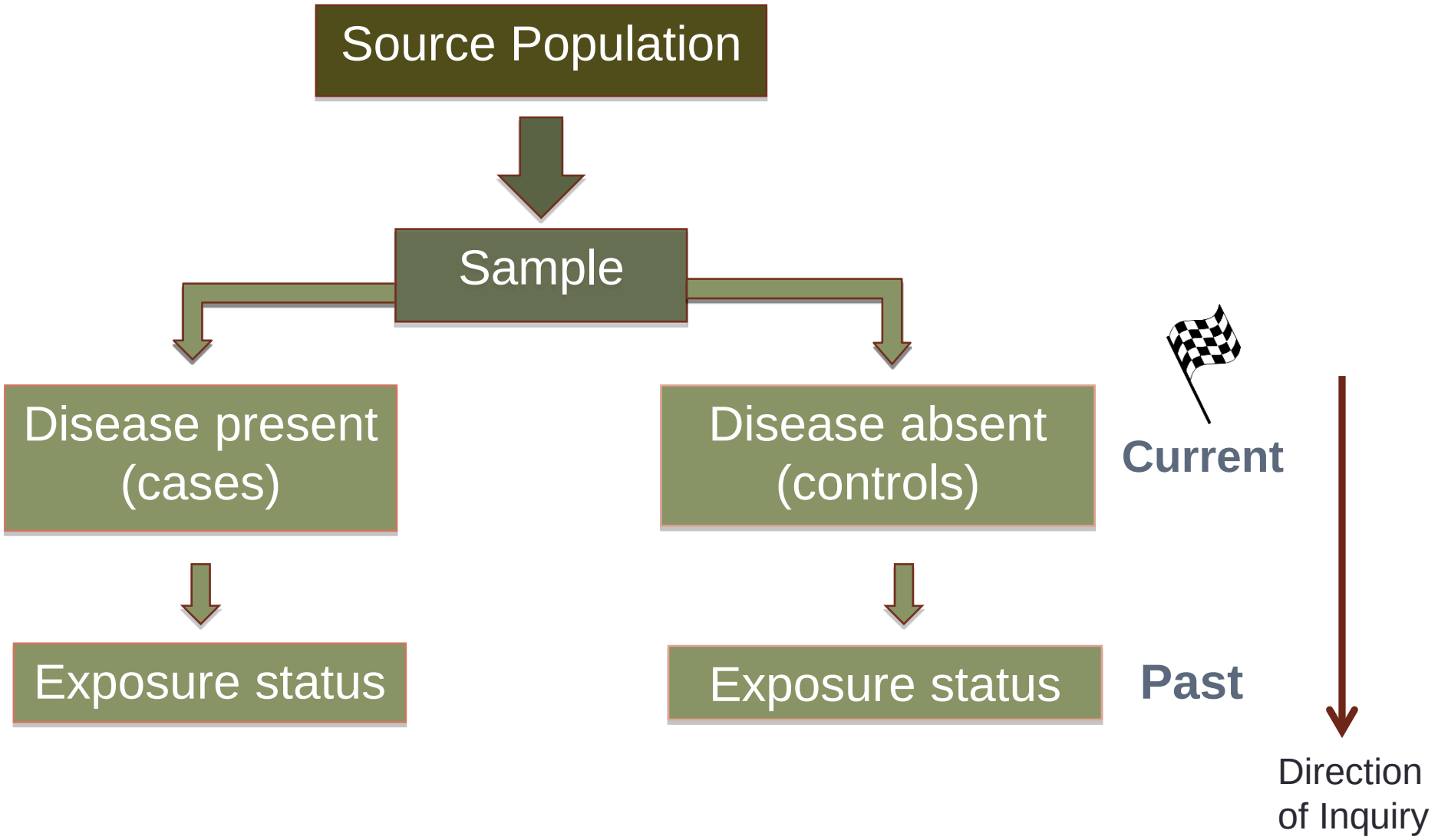
- **Group 1**: Everyone has the disease (called “cases”)
- **Group 2**: Everyone is free of the disease (called “controls” or “reference group”)

- ASSUMPTION: Disease does not occur randomly in a population – therefore, the cases must have been exposed to certain **determinants** that contributed to the development of disease.

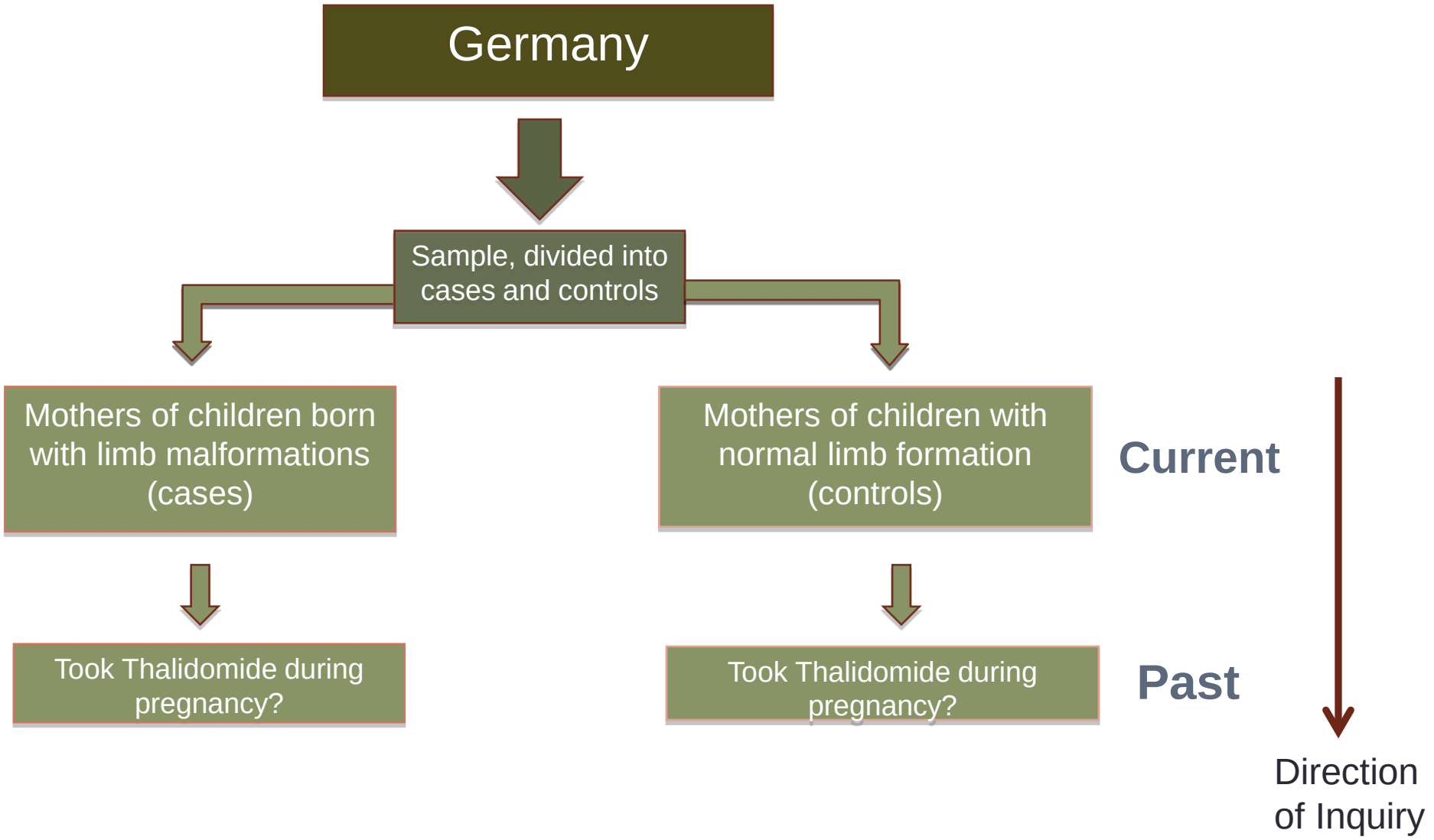
- **Goal of a Case Control Study**: to Determine how the disease and non-disease groups differ based on past exposures (determinants).

- Tests hypothesis between exposure and outcome

Case-Control Studies

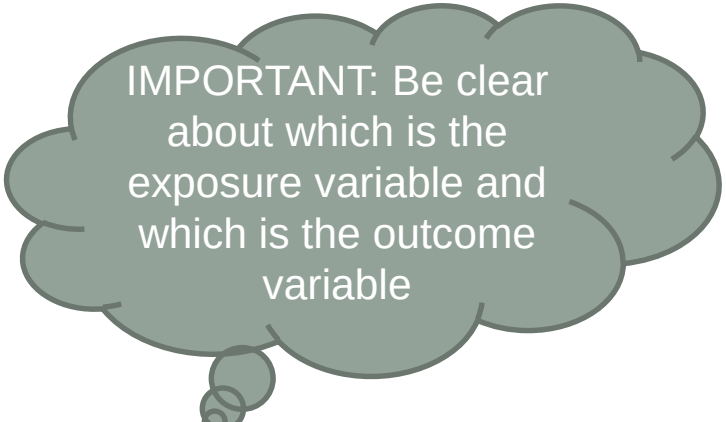


Case-Control Studies



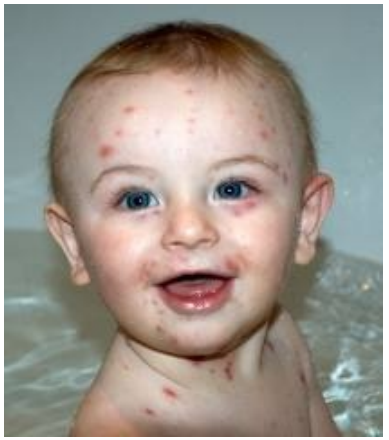
Step 1:
Name the Exposure (X) & Disease (Y)

- Cancer & green tea consumption
- Anesthesia given to pregnant mothers during childbirth & fetal birth defects
- Child allergies & second-hand smoke in home
- Amount of antibiotic use & incidence of antibiotic-resistant infection



Step 2: Select Cases *(people with the outcome variable of interest – i.e. diseased)*

- Define what it means to be a case – easy for some diseases, difficult for others.
- In general, the diagnosis of a disease is based on a combination of:
  - **Symptoms** - reported by patient
  - **Signs** - objective indicators of disease apparent to a physician
  - **Tests** – Blood tests, MRIs for example



Selecting Cases

- **Clinical facilities** - Hospitals, walk-in clinics, nursing homes, rehabilitation centres, oncology units, or other predefined groups which include medical records (i.e. work, school, insurance groups)

- **Disease registries**
  - Canadian hospitals injury reporting and prevention program
  - Canadian Cancer Registry
  - Neuromuscular disease registry

Step 3: Select Controls

*Without controls there can be no case-control studies, but **with the wrong controls** there can only be regrettable case-control studies.

- The control group must be selected very **carefully**
- **KEY RULE**: The control group must come from **the same source population** that generated the cases.
- The control group must provide a basis for comparison by representing what is normal or expected in a population.

Selecting Controls

- Suitable controls should have the potential to be cases.

The "would" criterion

- Question to ask when selecting cases: **If a person you are considering for the control group had developed the disease, *would* they be in your case group?** If yes - that is a suitable control participant.

  - Controls are often randomly sampled from the general population in an area (random digit dialing), same clinic or hospital, or from the family of cases in your study.

  - May used "matched" controls

Benzodiazepine use and risk of Alzheimer's disease: case-control study

OPEN ACCESS

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Abstract

Objectives To investigate the relation between the risk of Alzheimer's disease and exposure to benzodiazepines started at least five years before, considering both the dose-response relation and prodromes (anxiety, depression, insomnia) possibly linked with treatment.

Design Case-control study.

Setting The Quebec health insurance program database (RAMQ).

Participants 1796 people with a first diagnosis of Alzheimer's disease and followed up for at least six years before were matched with 7184 controls on sex, age group, and duration of follow-up. Both groups were randomly sampled from older people (age >66) living in the community in 2000-09.

Main outcome measure The association between Alzheimer's disease and benzodiazepine use started at least five years before diagnosis was assessed by using multivariable conditional logistic regression. Ever exposure to benzodiazepines was first considered and then categorised according to the cumulative dose expressed as prescribed daily doses (1-90, 91-180, >180) and the drug elimination half life.

Results Benzodiazepine ever use was associated with an increased risk of Alzheimer's disease (adjusted odds ratio 1.51, 95% confidence interval 1.36 to 1.69; further adjustment on anxiety, depression, and insomnia did not markedly alter this result: 1.43, 1.28 to 1.60). No association was found for a cumulative dose <91 prescribed daily doses. The strength of association increased with exposure density (1.32 (1.01 to 1.74) for 91-180 prescribed daily doses and 1.84 (1.62 to 2.08) for >180 prescribed daily doses) and with the drug half life (1.43 (1.27 to 1.61) for short acting drugs and 1.70 (1.46 to 1.98) for long acting ones).

Conclusion Benzodiazepine use is associated with an increased risk of Alzheimer's disease. The stronger association observed for long term exposures reinforces the suspicion of a possible direct association, even if benzodiazepine use might also be an early marker of a condition associated with an increased risk of dementia. Unwarranted long term use of these drugs should be considered as a public health concern.

Introduction

Dementia is currently the main cause of dependency in older people and a major public health concern affecting about 36 million people worldwide.[1] Because of population growth and demographic ageing, this number is expected to double every 20 years and to reach 115 million in 2050,[1] resulting in tragic human consequences and social costs.[2-4] As there are no effective treatments, the search for putative modifying factors remains a priority. Several studies have shown that benzodiazepine use could be one of these.[5-9] This class of drugs is mainly used to treat anxiety or insomnia.[10] Prevalence of use among elderly patients is consistently high in developed countries and ranges from 7% to 43%.[11-14] International guidelines[10] recommend short term use, mainly because of withdrawal symptoms that make discontinuation problematic. Although the long term effectiveness of benzodiazepines remains unproved for insomnia[15-18] and questionable for anxiety,[15] their use is predominantly chronic in older people.[19 20]

While the acute deleterious effects of benzodiazepines on memory and cognition are well documented,[21-24] the possibility of an increased risk of dementia is still a matter of debate. The frequency of symptoms highly correlated with prescription of benzodiazepines (anxiety, insomnia, and depressive disorders) increases in the years before a diagnosis of dementia.[25-28] Hence, benzodiazepines might not cause the disease but rather be prescribed to treat its prodromes. Adjustment for such a reverse causality bias is not easy in observational studies as prodromes are often not recorded as such. It might consist in the demonstration of a delayed risk[9] or in the censoring of

LINK to article

Your Good Health: Study on Alzheimer's, drugs needs more work

DR. KEITH ROACH / .
JANUARY 19, 2015 01:09 PM

Email Print

Dr. Keith Roach writes a medical question-and-answer column weekdays. Photograph By Handout

Dear Dr. Roach: I read recently that if Valium is taken by older folks for more than 90 days, it ups their risk for Alzheimer's disease by 32 per cent and if taken for more than 180 days, the risk goes up 84 per cent. Have you heard anything like this? Why would this be prescribed if this is true?

What is safe for seniors, or anyone, to take for anxiety? We all go through rough spots in life that need some internal quieting. I know lots of people take a drink, but that is not something I do.

C.P.

A study published just a few months ago in BMJ, a prestigious medical journal, showed a clear association between benzodiazepines — a class of medications that includes diazepam (Valium), clonazepam (Klonopin), alprazolam (Xanax) and lorazepam (Ativan), among many others — and Alzheimer's disease. The association was stronger for long-term use than for short, as you correctly point out. Further, the risk was higher for long-acting drugs (such as Valium or Librium) than for short (such as Xanax).

Methods

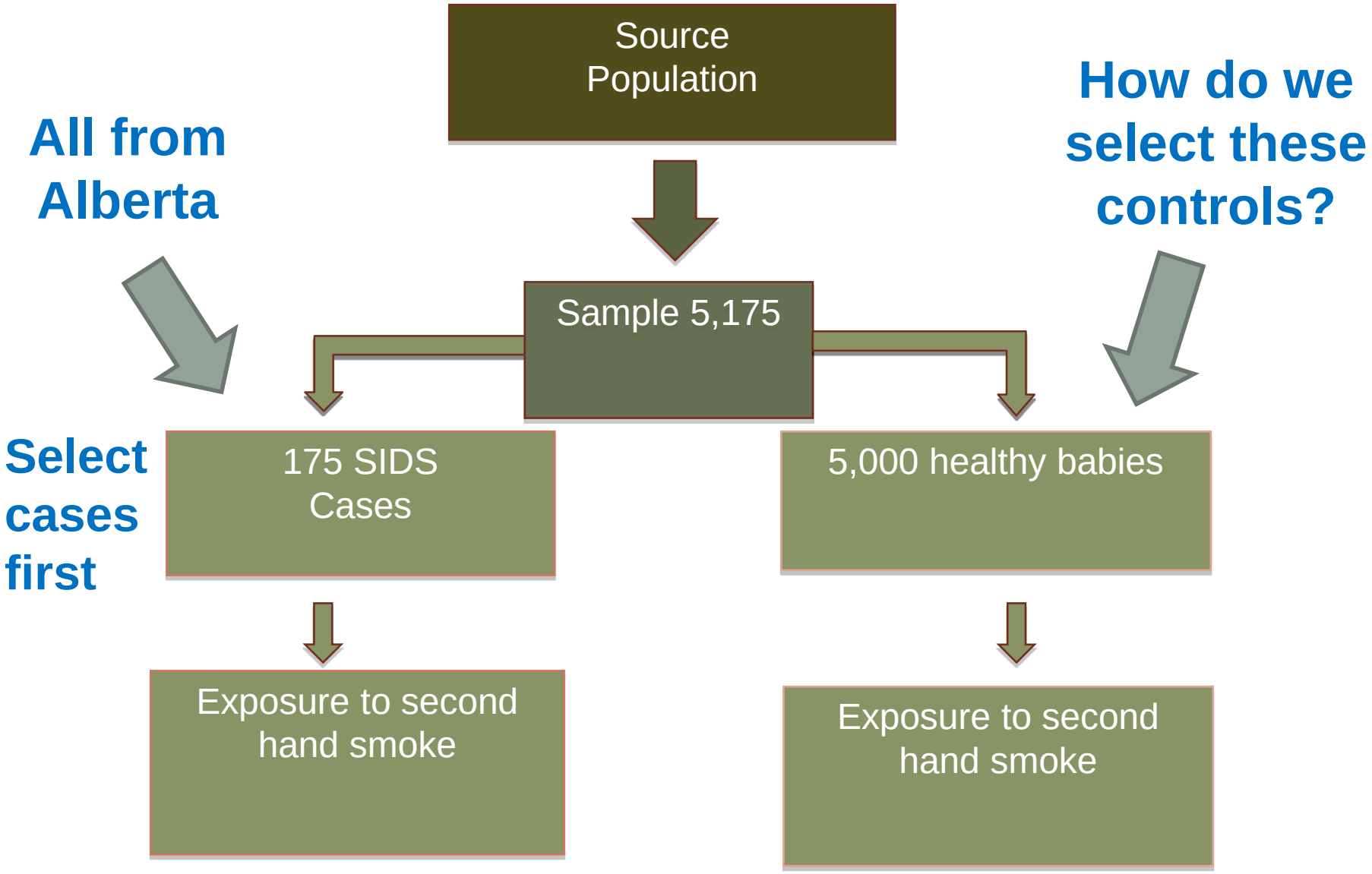
Study design and setting

We carried out a case-control study among older people (age >66) living in the community in the province of Quebec (Canada) and who were members of the public drug plan from 1 January 2000 to 31 December 2009. In Quebec, nearly all older people (about 98%) are covered by the drug plan. Data sources for the study consisted of the prescription and medical services recorded in an administrative claims database (RAMQ). The source population included random samples of 38 741 people with a diagnosis or treatment (such as cholinesterase inhibitors or memantine) related to dementia for cases and 86 259 people without these conditions for controls.

Selection of cases and controls

People were eligible for inclusion as cases for the study if they met the following criteria: a first diagnosis (index date) of Alzheimer's disease (ICD-9 (international classification of disease, ninth revision) 331.0) recorded during the study period without any record of another type of dementia at the index date or before; absence of any anti-dementia treatment before index date; and at least six years of follow-up before the index date. Each person with dementia (case) was matched on sex, age group (70-74, 75-79, 80-84, or ≥85), and duration of follow-up (6, 7, 8, 9, or 10 years) at the index date with four controls by using an incidence density sampling strategy.

Case-Control Study



Step 4: Selecting Exposures

- Case-control studies allow the investigator to examine only **1 outcome**, but **several risk factors** can be examined in the same study.
- Look to the research literature to identify risks to test.
- What risk factors would you examine for these forms for disease:
  - Antibiotic resistant pneumococcal infection
  - Childhood cancer
  - Gastric ulcers
  - Outer ear infections (also called swimmer`s ear)

Selection Bias

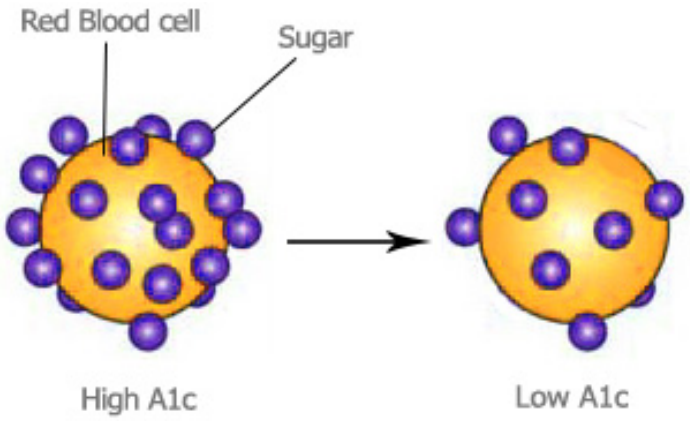
- Study participants are not representative of the group that produced the cases
- Knowledge of the exposure status of individuals prior to enrollemtn (recruitment bias)
- Results if the selection of participants leads to a different association than if you had enrolled the entire target population.

Interviewer Bias

- Interviewer knows hypothesis & does not interview cases and controls in exactly the same way
- Or they make judgements about participants (stereotyping, first impressions) and these judgements alter how they ask questions or record responses.
- Avoid this by **training** interviewers well and **blinding** them to study hypotheses.

Recall Bias

- Cases often remember past exposures **better** than controls.
- Better to measure exposures in ways that do not depend on a person`s memory
- Use of **Biomarkers** – Use of cellular or molecular indicators of exposure are an excellent way to avoid recall bias. Examples:
  - Cotinine is a metabolite of nicotine found in the blood
  - Hemoglobin A1c – tells us levels were



UICC
global cancer control

Plasma cotinine levels and pancreatic cancer in the EPIC cohort study

Smoking is an established risk factor for pancreatic cancer, previously investigated by the means of questionnaires. Using cotinine as a biomarker for tobacco exposure allows more accurate quantitative analyses to be performed. This study on pancreatic cancer, nested within the European Prospective Investigation into Cancer and Nutrition (EPIC cohort), included 146 cases and 146 matched controls. Using liquid chromatography-mass spectrometry, plasma cotinine levels were analyzed on average 8.0 years before cancer onset (5–95% range: 2.8–12.0 years). The relation between plasma cotinine levels and pancreatic cancer was analyzed with conditional logistic regression for different levels of cotinine in a population of never and current smokers. This was also done for the self-reported number of smoked cigarettes per day at baseline. Every increase of 350 nmol/L of plasma cotinine was found to significantly elevate risk of pancreatic cancer [odds ratio (OR): 1.33, 95% confidence interval (CI): 1.11–1.60]. People with a cotinine level over 1187.8 nmol/L, a level comparable to smoking 17 cigarettes per day, have an elevated risk of pancreatic cancer, compared to people with cotinine levels below 55 nmol/L (OR: 3.66, 95% CI: 1.44–9.26). The results for self-reported smoking at baseline also show an increased risk of pancreatic cancer from cigarette smoking based on questionnaire information. People who smoke more than 30 cigarettes per day showed the highest risk compared to never smokers (OR: 4.15, 95% CI: 1.02–16.42). This study is the first to show that plasma cotinine levels are strongly related to pancreatic cancer.

Case-control Studies

Limitations

- Incidence cannot be determined (temporal sequence unknown)
- Selection bias
- Recruitment bias (exposure status is known)
- Interviewer bias
- *Recall bias

Strengths

- Quick and economical
- Appropriate for studying **rare** outcomes
- Can consider multiple exposures
- Can help in establishing a cause-effect relationship

Step 5: Calculate, Analyze & Interpret

Calculate and analyze measures of association to determine if there is an association (and the strength of that association) between exposures and outcomes.

2X2 TABLES

Disease (outcome of interest): YES OR NO

Exposure of interest: YES OR NO	Yes	No
Yes	a	b
No	c	d

ODDS RATIO: A ratio between two odds

ODDS – what you get when you divide the proportion of individuals with an attribute, by the proportion of individuals without the attribute. Can be interpreted as the probability of an event occurring, compared with the probability of an event not occurring within that population.

ODDS RATIO – A ratio of odds. Measures association between a potential risk or protective factor (exposure) and an outcome (disease). It is a measure of the relative magnitude of the odds of exposure among individual who have the disease and the odds of exposure among individuals who do not have the disease

-Kaelin and Bayona (2004)

ODDS RATIO:

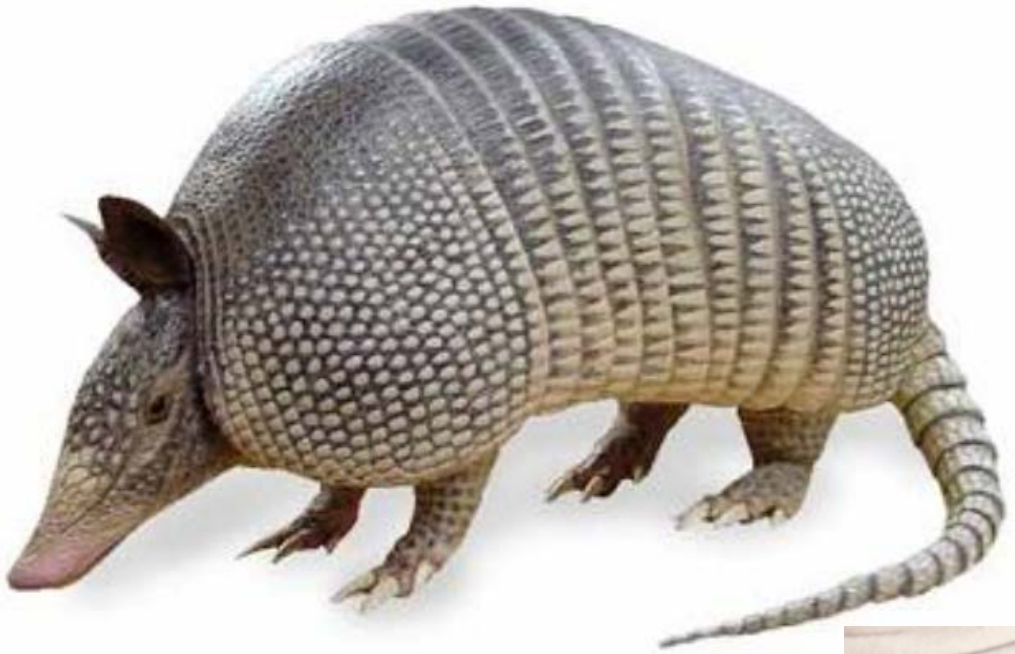
- Measures the association between exposure and disease outcome
- Tells us about the strength of that association
- Can be used in case-control and cross sectional study designs (calculated the same way using the 2X2 table)

Odds of those with outcome being exposed = a/c

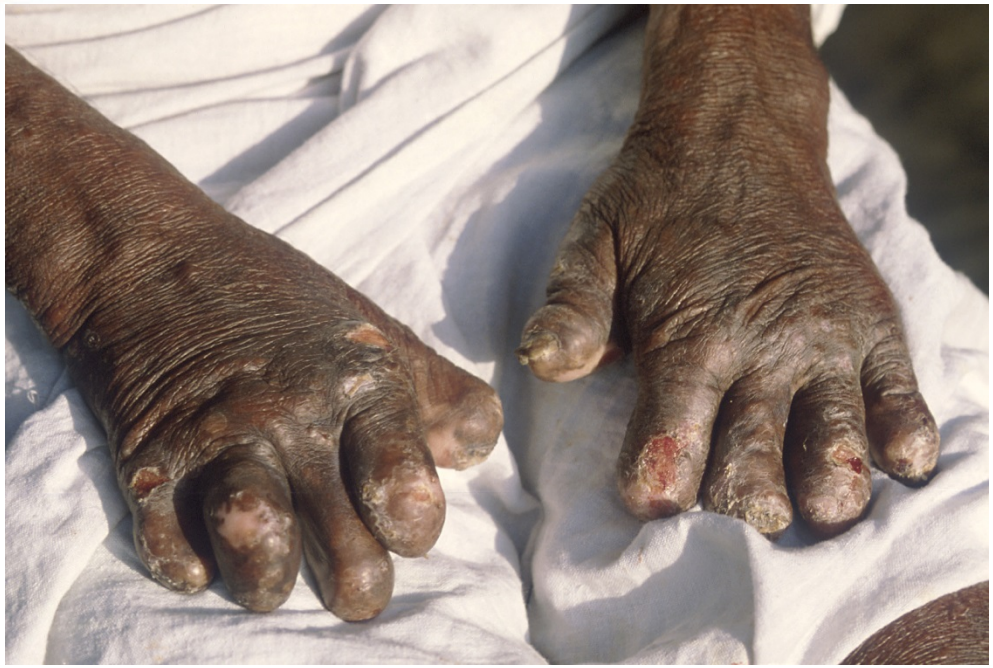
Odds of those without outcome being exposed = b/d

$$\text{ODDS RATIO (OR)} = \frac{a/c}{b/d} = \frac{ad}{bc}$$

Exposure: YES OR NO	Disease (health outcome): YES OR NO: Yes	No
Yes	a	b
No	c	d



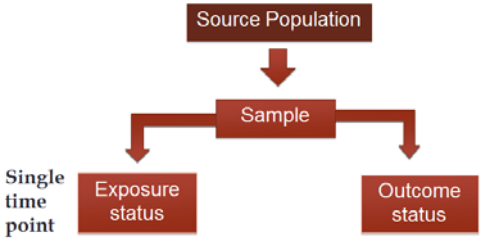
NEWS STORY

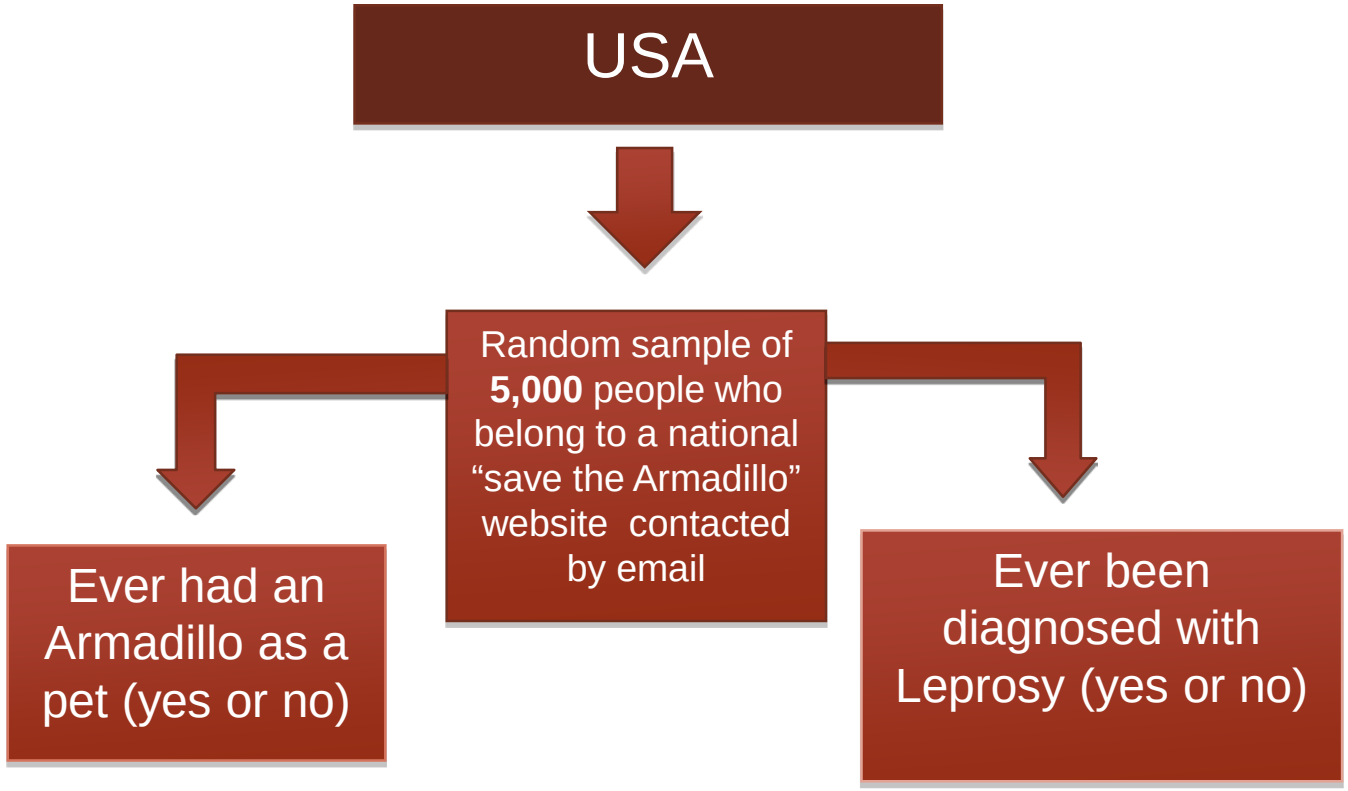


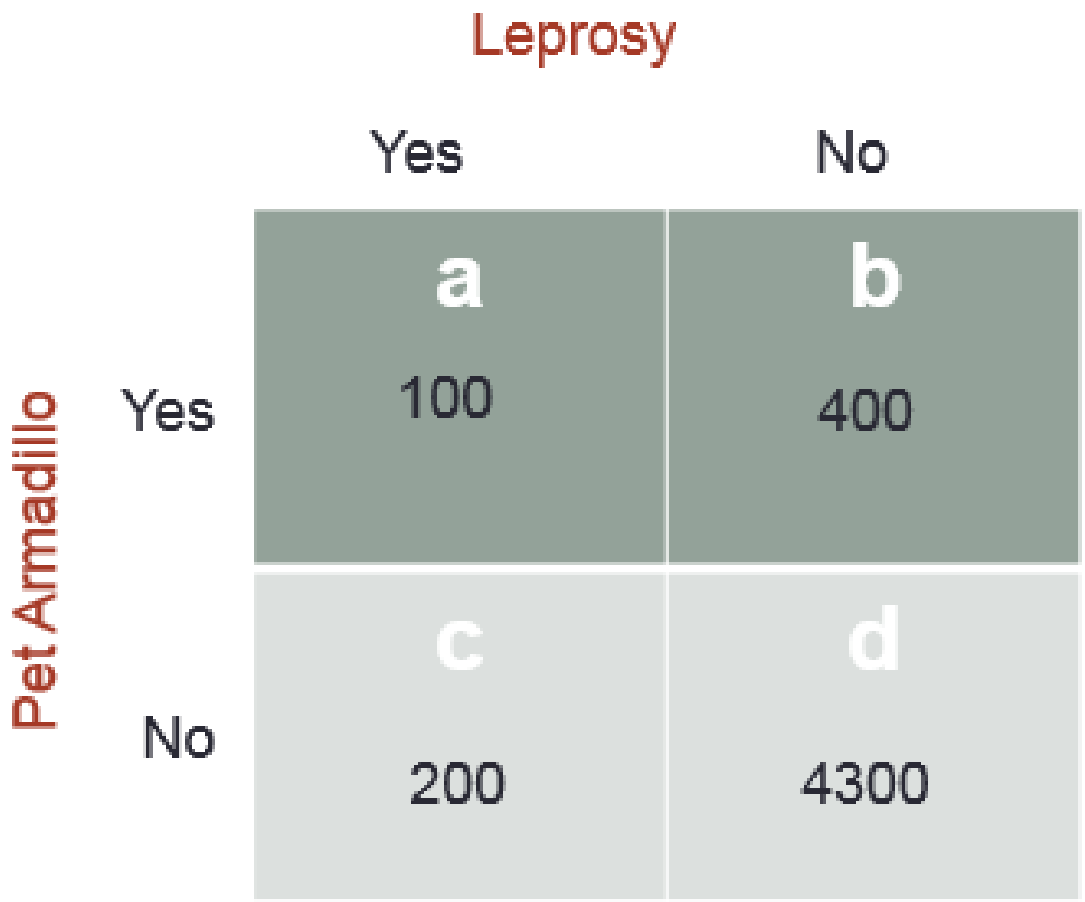
Is there an association?

Two different approaches…

1. Dillon the Dillo ***Cross sectional study***:






Leprosy
Yes
No
Pet Armadillo
Yes
No
a
100
b
400
c
200
d
4300

Cross-Sectional Armadillo Study

Determining Prevalence:

Exposed Group: 500 had a pet armadillo

Unexposed Group: 4500 had not

Exposed group: 100/500 had leprosy

Prevalence = _____

Unexposed group: 200/4500 had leprosy

Prevalence = _____

Dillon the Dillo Cross sectional study: Prevalence Odds Ratio

Had a pet armadillo (exposed):

Yes: 500
No: 4500

Leprosy (outcome of interest):

- 100 of those who had pet armadillo

(prevalence 100/500 = 20%)

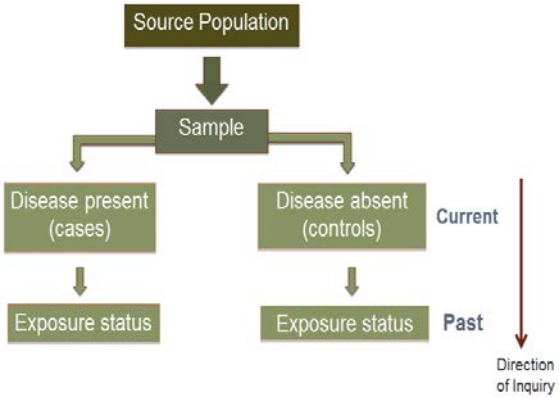
- 200 of those who did not have a pet armadillo

(prevalence 200/4500 = 4.4%)

Pet Armadillo	Leprosy: Yes	Leprosy: No
Yes	a: 100	b: 400
No	c: 200	d: 4300

$$\text{ODDS RATIO} = \frac{ad}{bc} = \frac{100*4300}{400*200} = \frac{430{,}000}{80{,}000} = 5.4$$

2. Dillon the Dillo *Case Control Study*:



USA

Sample 23,000

Current

Have Leprosy (National Hansen's Disease Clinical Center)
48

Do not have Leprosy (random digit dialing from US population
8,000

Past

Had a pet Armadillo
38

Had a pet Armadillo
320

Dillon the Dillo Case control study: 2x2 Table

Leprosy:

Yes (cases)=48

No (controls)=8,000

Had an armadillo for a pet (exposed):

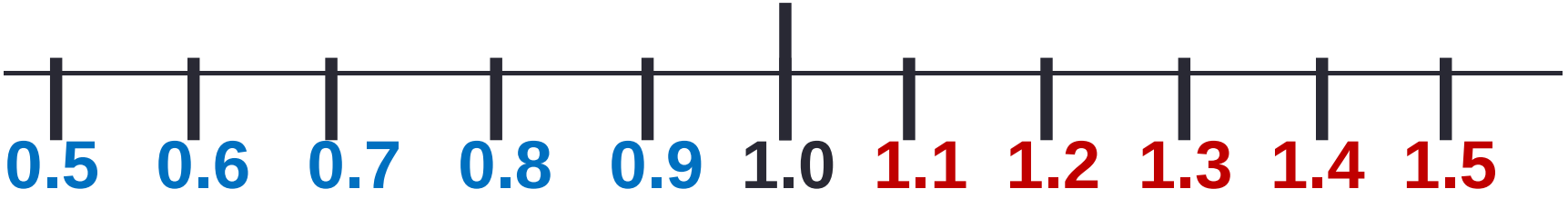
Cases: 10

Controls: 320

Had a pet Armadillo	Leprosy: Yes	Leprosy: No
Yes	**a** 10	**b** 320
No	**c** 38	**d** 7,680

$$\text{ODDS RATIO} = \frac{ad}{bc} = \frac{10*7{,}680}{320*38} = \frac{76{,}800}{12{,}160} = 6.3$$

Odds Ratio Interpretation



Those exposed are **40% <u>LESS</u>** likely to get disease

Exposure has no effect on disease. Exposed and unexposed have same odds of disease

Those exposed are **1.4 times** or **40% <u>MORE</u>** likely to get disease

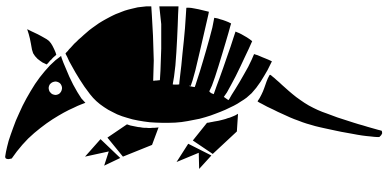
Odds Ratio *Interpretation*

OR above 1	OR below 1	Interpretation
5.0 and up	0.3 and lower	Strong association
2.0 – 4.0	0.6 – 0.4	Moderate association
Under 2.0	0.7 and up	Weak association

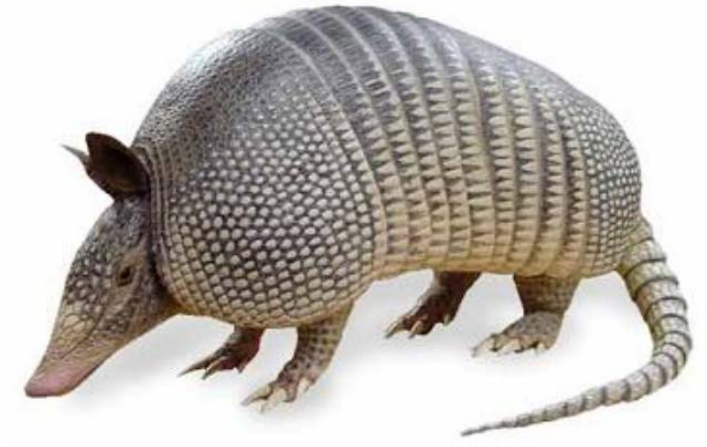
Odds Ratio *Interpretation*

- Those who are exposed to (risk factor) are **X times** more likely to have had (disease of interest) compared to those who were not exposed.

- Individuals who have been exposed to armadillos as pets are **6.3 times more likely** to get leprosy then those who have not had armadillos as a pet.



Can we conclude that Armadillos ***CAUSE*** Leprosy?



No Link Between Autism and Celiac Disease

Fran Lowry
Sep 26, 2013

EDITORS' RECOMMENDATIONS

Gluten Sensitivity Linked to Autism

Autism Spectrum Disorders News & Perspectives

A case-control epidemiologic study from Sweden reports no association between celiac disease, an immune disorder with gastrointestinal symptoms triggered by exposure to gluten, and autism spectrum disorders (ASDs).

But the new study did find an increased risk for ASD in people with normal mucosa in their gastrointestinal tract but a positive antibody test result commonly seen with celiac disease.

"This is good news for patients with celiac disease," lead author Jonas F. Ludvigsson, MD, PhD, professor of clinical epidemiology at the Karolinska Institutet, Stockholm, Sweden, told *Medscape Medical News*.

"Celiac disease occurs in about 1% of the US population, and these patients were at no increased risk of autism," Dr. Ludvigsson said.

The study was published online September 25 in *JAMA Psychiatry*.

Response to Gluten-Free Diet

The investigators decided to do this study because previous reports indicated an association between celiac disease and autism and that some autism patients reportedly responded to a gluten- free diet.

They collected data through 28 Swedish biopsy registers on 26,995 individuals with celiac disease, 12,304 patients with inflammation of the small bowel, and 3719 individuals with normal mucosa but positive celiac disease serologic test results.

The investigators then compared these individuals with 213,208 age- and sex-matched control participants and estimated the odds ratios (ORs) for having a prior diagnosis of an ASD according to the Swedish National Patient Register. They also estimated hazard ratios (HRs) for future ASDs in individuals undergoing small intestinal biopsy.

The analysis showed that having a prior diagnosis of an ASD was not associated with celiac disease (OR, 0.93; 95% confidence interval [CI], 0.51 - 1.68) or intestinal inflammation (OR, 1.03; 95% CI, 0.40 - 2.64).

However, a prior diagnosis of ASD was associated with a markedly increased risk of having a normal mucosa but a positive celiac disease serologic test result (OR, 4.57; 95% CI, 1.58 - 13.22).

When they analyzed just these individuals without a diagnosis of an ASD at the time of biopsy, celiac disease

JAMA Psychiatry

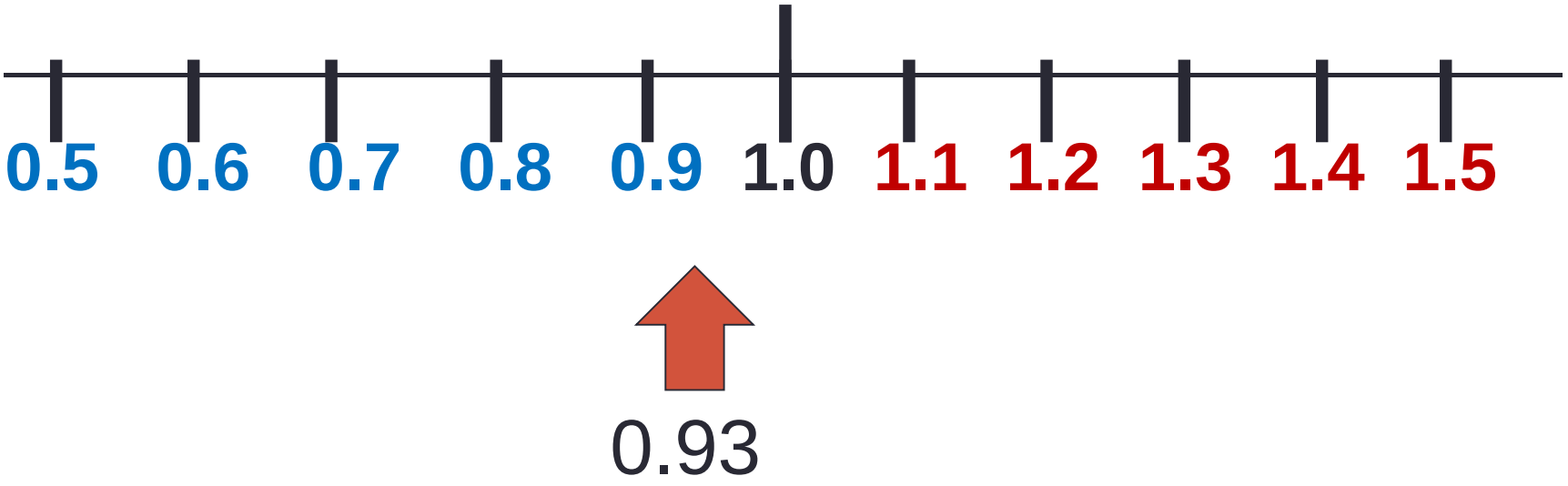
Original Investigation | September 25, 2013

A Nationwide Study of the Association Between Celiac Disease and the Risk of Autistic Spectrum Disorders

Results A prior ASD was not associated with CD (OR, 0.93; 95% CI, 0.51-1.68) or inflammation (OR 1.03; 95% CI, 0.40-2.64) but was associated with a markedly increased risk of having a normal mucosa but a positive CD serologic test result (OR, 4.57; 95% CI, 1.58-13.22). Restricting our data to individuals without a diagnosis of an ASD at the time of biopsy, CD (HR, 1.39; 95% CI, 1.13-1.71) and inflammation (HR, 2.01; 95% CI, 1.29-3.13) were both associated with moderate excess risks of later ASDs, whereas the HR for later ASDs in individuals with normal mucosa but positive CD serologic test results was 3.09 (95% CI, 1.99-4.80).

Conclusions and Relevance Although this study found no association between CD or inflammation and earlier ASDs, there was a markedly increased risk of ASDs in individuals with normal mucosa but a positive CD serologic test result.

Odd Ratio Interpretation



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Conclusions and Relevance Although this study found no association between CD or inflammation and earlier ASDs, there was a markedly increased risk of ASDs in individuals with normal mucosa but a positive CD serologic test result.

Odds Ratio Practice Question:

In light of the increasing prevalence of obesity in Alberta, researchers want to find out if vegetable consumption affects obesity.

STEP 1: Name the exposure and the disease

STEP 2: Select your cases

STEP 3: Select your controls

STEP 4: Identify your exposure

Create a 2X2 table:

Cases (obese) – 250

Controls (not obese) – 250

Cases who ate vegetables – 121

Controls who ate vegetables - 171

a

	Obese people (cases)	Non-obese People (controls
Eat vegetables	171	121
Do not eat vegetables	79	129

b

	Obese people (cases)	Non-obese People (controls)
Eat vegetables	121	171
Do not eat vegetables	129	79

c

	Obese people (cases)	Non-obese People (controls
Eat vegetables	250	250
Do not eat vegetables	121	171

d

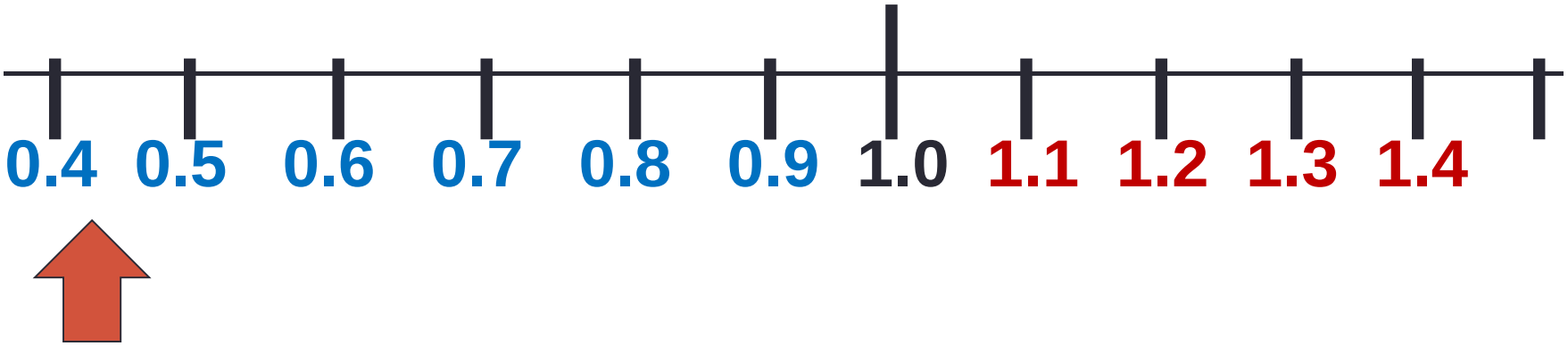
	Obese people (cases)	Non-obese People (controls
Eat vegetables	121	250
Do not eat vegetables	171	250

2X2 table for Case Control study of obesity and vegetable consumption:

	Obese people (cases)	Non-obese people (controls)
Eat Vegetables	a 121	b 171
Do not eat Vegetables	c 129	d 79
TOTAL	250	250

$$\text{Odds Ratio} = \frac{ad}{bc} = \frac{121(79)}{171(129)} = 0.43$$

Odd Ratio Interpretation



0.43

1-0.43=0.57(100)= 57%

Those who eat vegetables are 57% less likely to be obese

LINK

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Association Between Swimming Lessons and Drowning in Childhood:

A Case-Control Study

Ruth A. Brenner, MD, MPH, **Gitanjali Saluja Taneja, PhD**, **Denise L. Haynie, PhD**, **Ann C. Trumble, PhD**, **Cong Qian, MS**, **Ron M. Klinger, MBA**, and **Mark A. Klebanoff, MD, MPH**
Eunice Kennedy Shriver National Institute of Child Health and Human Development, National Institutes of Health, Department of Health and Human Services, Bethesda (Drs Brenner, Taneja, Haynie, Trumble, and Klebanoff), and Westat, Inc (Dr Taneja and Mr Klinger) and Allied Technology Group, Inc (Mr Qian), Rockville, Maryland

Abstract

Objective—To estimate the association between swimming lessons and the risk of drowning among children aged 1 to 19 years.

Design—Case-control study.

Setting—Cases were identified from medical examiners'/ coroners' offices between mid-2003 and mid-2005. Jurisdictions included the states of Maryland and North Carolina, 14 districts (33 counties) in Florida, 3 counties in California, 1 county in Texas, and 1 county in New York.