

Welcome

Understanding Research & Critical Appraisal

Part 3: Bias

*For everyone's sake, please be quiet!
Keep your phone on mute
until you are ready to ask questions.*

How?

- Press the "mute" button on your phone
- If your phone does not have a mute button, then press *6 to mute your phone, and *6 to un-mute.



SENIORS HEALTH RESEARCH TRANSFER NETWORK

Linking Caregivers, Researchers & Policy Makers

Bias

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The Essence of Research:

Reduce Bias!

Eliminate Alternative
Hypotheses!

What We'll Discuss

- The types of biases that can occur
- To learn how they may threaten the validity of a study

What Do We Mean By “Bias”?

Anything that distorts the “true” relationship between variables:

- Who the participants are
- How they got into the study
- How they ended up in one group or another
- How the study was designed

Sources of Bias:

1. Where *did* those people come from?
 - a. Special groups

True or False?

Women who drink bottled water have healthier babies.

It's True – But Why?

Hypothesis:

Bottled water is good for fetuses.

It's True – But Why?

Alternative Hypothesis:

- Drinking bottled water is a *marker* for socio-economic status.
- Higher SES women have healthier babies.

True or False?

A larger proportion of people who have had MIs die in teaching hospitals than in community hospitals.

It's True – But Why?

Hypothesis:

Teaching hospitals are bad for your health (e.g., too many inexperienced students caring for patients).

It's True – But Why?

Alternative Hypothesis:

The more serious cases are transferred from community hospitals to teaching hospitals.

True or False?

Orchestra leaders live longer than the average person.

It's True – But Why?

Hypothesis:

Waving your arms around is good exercise for the heart.

It's True – But Why?

Alternative Hypothesis:

By the time people become conductors, they have already survived childhood and adolescence, and they can't be compared to the original birth cohort.

Sources of Bias:

1. Where *did* those people come from?
 - a. **Special groups**
 - b. Volunteer bias

Volunteer Bias:

Compliance
<80% >80%

5-Year Mortality Rate

28.2% 15.1%

What was the drug?

Volunteer Bias

- People who volunteer or are compliant are different from others:
 - Age
 - Marital status
 - Religion
 - Concern about health

Sources of Bias:

1. Where *did* those people come from?
 - a. **Special groups**
 - b. **Volunteer bias**
 - c. Healthy worker bias

Healthy Worker Bias:

- Lower mortality rate among those discharged from the Army than those of similar age in the population.
- Effect seen even 23 years later.

Sources of Bias:

1. Where *did* those people come from?
 - a. **Special groups**
 - b. **Volunteer bias**
 - c. **Healthy worker bias**
 - d. **Sampling**

Sampling

- Convenience
- Haphazard
- Because of some special attribute
- Random

Sources of Bias:

1. Where *did* those people come from?
 - a. **Special groups**
 - b. **Volunteer bias**
 - c. **Healthy worker bias**
 - d. **Sampling**
 - e. Who publishes?

Who Publishes

- Where they are
 - Academic centres
 - Tertiary care centres
- Who are the patients?
 - Most severe
 - Failed on other treatments
- What they find
 - Publication bias

Sources of Bias:

1. Where *did* those people come from?
2. How did they end up in *that* group?

True or False?

Women who have uterine bleeding are seven times more likely to have endometrial cancer.

It's False

- Why was it thought to be true?
- Women who bled were more likely to have had a biopsy. Many women with endometrial CA don't bleed, so CA not discovered.

Can Both Be True?

- Piroxicam is less likely to cause GI bleeds than other NSAIDs.
- A higher proportion of patients on Piroxicam have GI bleeds than on other NSAIDs.

Both Are True

- Why?
- Because of its reputation, physicians prescribe NSAID X for patients who are more likely to develop GI bleeds.

Sources of Bias:

1. Where *did* those people come from?
2. How did they end up in *that* group?
3. And *what* did they measure?

The Finnish Trial:

- Aim - to reduce the risk of cardiovascular disease
- Subjects - 3,490 business executives
- Intervention - Diet, hypolipidemic agents, antihypertensives

The Outcomes:

- 46% reduction in total coronary heart disease risk in intervention group at the end of 15 years.
- But ...

The Outcomes:

	Dead	Alive	Total
Treatment Group	67	545	612
Placebo Group	46	564	610
Total	113	1109	1222

RR = 1.46

The C.A.S.T. Trial

- Aim - to reduce arrhythmias
- Subjects - 1,727 patients with asymptomatic or mildly symptomatic ventricular arrhythmias after an MI
- Intervention - Antiarrhythmic therapy (encainide or flecainide)

The Outcomes:

- Initial suppression of ventricular arrhythmias,

- But ...

The Outcomes:

	Cardiac Deaths	Alive	Total
Treatment Groups	33	697	730
Placebo Group	9	716	725
Total	42	1413	1455

RR = 3.64

The Bottom Line:

Beware the surrogate end point. It ain't what we're interested in.

Thank you

Please complete an evaluation of today's session. Open the following URL in your browser.

https://www.surveymonkey.com/s.aspx?sm=bqvJDmvr_2f4HiEHDK3sMOIw_3d_3d

And don't forget, next session:

Part 4: Making Sense of Risk

Dec. 11, 2007 1-2 pm *(note new time!)*



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