

This work is licensed under a [Creative Commons Attribution-NonCommercial-ShareAlike License](https://creativecommons.org/licenses/by-nc-sa/4.0/). Your use of this material constitutes acceptance of that license and the conditions of use of materials on this site.



Copyright 2008, The Johns Hopkins University and Gerard Anderson. All rights reserved. Use of these materials permitted only in accordance with license rights granted. Materials provided "AS IS"; no representations or warranties provided. User assumes all responsibility for use, and all liability related thereto, and must independently review all materials for accuracy and efficacy. May contain materials owned by others. User is responsible for obtaining permissions for use from third parties as needed.



JOHNS HOPKINS  
BLOOMBERG  
SCHOOL *of* PUBLIC HEALTH

## *Evaluation and Assessment of Health Policy*

---

Gerard F. Anderson, PhD  
Johns Hopkins University



JOHNS HOPKINS  
BLOOMBERG  
SCHOOL *of* PUBLIC HEALTH

## *Section A*

---

Evaluation and Assessment

- Did the intervention make a difference?

- Specify the
  - Topic
  - Assumptions
  - Domain of study
  - Who is effected
  - Major concepts/variables
    - ▶ Dependent variables
    - ▶ Independent variables
  - Hypotheses
    - ▶ Nature of relationship

- Specify the
  - Topic
  - Assumptions
  - Domain of study
  - Who is effected
  - Major concepts/variables
    - ▶ Dependent variables
    - ▶ Independent variables
  - Hypotheses
    - ▶ Nature of relationship

# *Relationships among Variables*

- Positive
- Inverse
- Statistically significant/not statistically significant

# *Relationships among Variables*

- Positive
- Inverse
- Statistically significant/not statistically significant
- Strong/weak
- Symmetrical (both directions)
- Asymmetrical (only one direction)
- Linear/nonlinear
- Spurious

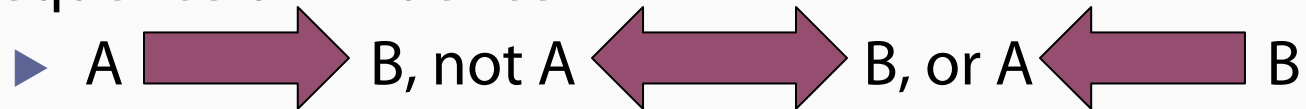


# Causation vs. Association

- Causation requirements

- Statistical association

- Sequence of influence



- Nonspurious

- ▶ Really causes, not just associative

# *Two Basic Methodologic Approaches to Data Analysis*

- Observational
- Experimental

# *Observational Design*

- Involves observation of naturally occurring events
- Noninterventional

# *Experimental or Quasi-experimental Design*

- Involves an intervention, the effects of which are the main focus of the project
- Prospective

# *Study Design Concerns*

- Internal validity
- External validity

# *Internal Validity*

- Basic minimum that makes the experiment interpretable
- Did the intervention actually make a difference?

# *Threats to Internal Validity: I*

## 1) History

- An event unrelated to the intervention occurs during the study period

## 2) Maturation

- Systematic changes occur naturally among the study population due to the passage of time (e.g., participants get older)

### 3) Testing

- An effect among study participants due to the application of a test, interview, or some other measurement technique (e.g., subjects become “test savvy”)

### 4) Instrumentation

- The test, interview, or measurement technique used changes between consecutive applications (e.g., changes in interviewer)



### 5) Statistical regression

- If study population is selected because of qualities that are above or below the population as a whole, then these “outliers” are likely to “regress” back toward the mean of their own accord (e.g., patients with high cholesterol values will be more likely to become average, than vice versa)

### 6) Selection bias

- When a comparison group is selected on a nonrandom basis, this group may differ from the intervention group in a way that affects the study outcome (e.g., a comparison group is intrinsically healthier than the study group)

## 7) Attrition or experimental mortality

- People in one group or another (i.e. intervention or comparison) are more likely to drop out of the study or program during its course (e.g., healthier people may drop out of an intervention program only because they feel it doesn't apply to them)

## 8) Selection interactions

- Selection-maturation
- Selection-history
- Although a comparison group at the start of a study doesn't differ from the intervention group, some characteristics of the members of one group or the other interact to make it more receptive to maturation or history effects (e.g., comparison group is more likely than the other group to participate in a competing program)

# *External Validity*

- Can the results be generalized?

# *Threats to External Validity: I*

## 1) Testing-treatment interaction

- When a measure is given repeatedly, this has an impact on whether or not the intervention works (e.g., patients actually learned from the questionnaire or interviewer and not from the program)

### 2) Selection-treatment interaction

- The outcomes are relevant only to populations from which study groups were selected (e.g., works only in Baltimore, not nationally)

### 3) Reactive effects or situational effects

- Multiple factors that affect outcome may be associated with the study itself (e.g., if subjects are aware that they are in an experiment, they may try harder [the “Hawthorne Effect”])



- Health services research is a multidisciplinary field of inquiry that examines...

access to care, utilization, costs, quality, delivery,  
organization, financing, outcomes

...of health care services to produce new knowledge about the structure, processes, and outcomes of health services for individuals and populations

—Institute of Medicine

# *Disciplines Involved in HSR Studies*

- Health management
- Economics
- Operations research
- Epidemiology
- Demography
- Medicine
- Biostatistics
- Sociology
- Computer sciences
- Law
- Political science



JOHNS HOPKINS  
BLOOMBERG  
SCHOOL *of* PUBLIC HEALTH

## *Section B*

---

Application:  
Smoking Cessation Program

## *Use the Eightfold Path*

- Use the eightfold path to evaluate an intervention

# 1. *Define the Problem*

- Are mothers who receive smoking cessation information about the environmental hazards of secondhand smoke more likely to quit?

## 2. Assemble Some Evidence

- Conduct a randomized controlled trial in a large urban children's hospital involving 479 mothers

### *3. Constrain the Alternatives*

- Some mothers receive smoking cessation advice
- Control group—did not receive information

## 4. *Select the Evaluation Criterion*

- Smoking status
- Cigarettes per day



## 4. *Select the Evaluation Criterion*

- Smoking status
- Cigarettes per day
- Did mothers smoke around children?
- Knowledge of health effects

## 5. *Project the Outcomes*

- Here is where service research methods become critical
  - How do you measure the outcomes?
  - How do you ask the question?

# *Collect Baseline Information*

- Demographics
- Smoking status
- Questionnaire assessing nicotine dependence
- Knowledge of effects of secondhand smoke
- Willingness to stop smoking

## *Conduct Information*

- Randomized mothers into experimental and control groups
- Women in experimental group given 10- to 15-minute counseling session by a trained nurse about the effects of secondhand smoke on children
- Mothers in control group not told about effects of secondhand smoke on children

# *Sample Size*

- Calculation of how many mothers are needed in experimental and control groups to determine if differences are statistically significant

## 6. *Confront the Trade-offs*

- What did the results show about the intervention?

# *Participation Rates*

- Most eligible mothers agreed to participate
  - 479 out of 517 eligible mothers
- Randomization successful
  - No differences in baseline variables

- No significant differences between control and experimental groups on most outcomes



## 7. *Decide*

- Did the intervention work?
- What is the appropriate next step?

## 8. *Tell Your Story*

- A single intervention with postcard follow-up not likely to change maternal smoking behavior