Finding Credible Program Impacts

June 23, 2011
Webinar for OAH & ACYF Teenage Pregnancy Prevention Grantees
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Striving for the “Gold Standard”

- Studies based on **RANDOM ASSIGNMENT** can produce highly credible, persuasive evidence of a program’s effectiveness

- Not automatic – both **program** implementation and **evaluation** implementation are keys to success, and both types of implementation rely on program staff

- Two key objectives:
  - **Program** implementation: maintain the contrast between the treatment and control groups
  - **Evaluation** implementation: preserve the integrity of random assignment
Maintaining the Contrast
Where Impacts Come From

- An impact is the difference in average outcome between the treatment and control groups
- A difference in outcomes results from a difference in experiences
- No difference in experiences, no impact
Impacts Example

Sexual Initiation Rates
(percentage)

Program Group

Program 1

Program 2

Program 3
Impacts Example: +Control Group

Sexual Initiation Rates (percentage)

Program Group  | Control Group
---              | ---
Program 1       | Program 2
Program 2       | Program 3
Maintaining the Contrast

- Program must be implemented as intended
- Students in the treatment group must actually participate
- Students in the control group must NOT participate in the program being studied
Once Randomized, Always Analyzed

- Students in the treatment group who do not participate ("no-shows") cannot just be "thrown out"
- Same for students in the control group who do participate ("cross-overs")
Preserving the Integrity of Random Assignment
Perspective of a Skeptic

- Important research will be carefully scrutinized
- Must convince the “reasonable skeptic”
- The burden of proof rests with the evaluator, not the skeptic
Threats to Integrity

- **Assignment** becomes purposeful, not random
- Missing data, for non-random reasons
Assignment Must be Random

- If assignment to treatment is not random, then we do not know that the treatment and control groups are identical.

- Anything that changes who is in the treatment and control groups could introduce bias.

- HOWEVER – selection for the study does not have to be random.
Purposeful Assignment: Example

- Schools are selected for the study
- Schools are randomly assigned to treatment and control groups
- Principals select one section of a health class in each school to participate in the study
Limit changes in teacher/student assignments after randomization (as feasible)
- Conduct random assignment as late as possible

Understand special issues before randomization
- example, some teachers might be excluded from the study

Monitor changes in teaching assignments and student rosters between random assignment and follow-up data collection
Fixing the Example

- Schools are selected for the study
- Principals select one section of a health class in each school to participate in the study
- Schools are **RANDOMLY ASSIGNED** to treatment and control groups
Missing Data Bias

- Equivalence of the treatment and control groups is the key advantage of random assignment.
- This equivalence can be lost if outcome data are not available for all individuals in the study.
- Analogous to purposeful assignment – individuals are selectively removing themselves from the study.
Nonrandom Missing Data: Example

- Random assignment of schools
- Some schools, teachers, or students dislike the program, stop using/attending
- Researchers halt data collection
  - in the schools or classrooms that stopped using the program, OR
  - for students who stopped using/attending the program
Avoiding Missing Data

- Once Randomized, Always Analyzed
- Data needed for all schools, teachers, or students that were randomly assigned
- Analyze data using original treatment assignment
Fixing the Example

- Random assignment of schools
- Some schools, teachers, or students dislike the program, stop using/attending
- Researchers **continue** data collection for all schools, classrooms, and students **regardless of their program use/attendance**
- Calculate intent-to-treat (ITT) impact
Finding Credible Program Impacts

- There must be an impact to find
  - Implement program as intended
  - High participation rate for the treatment group
  - Low program exposure for the control group

- That impact must be credible
  - Random, not purposeful, assignment/selection
  - Once randomized, always analyzed
For More Information

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