

# Issues in Sampling



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# Topics...

- Sampling methodology– overview
- Issues and lessons from the states– group discussion
- Planning for consultation: what do you need?



# Survey Research

- The goal of survey research: to get information
- The goal of sampling: to get better information



# Issues Identified by States

- How to expand stratification (e.g. from program to provider or state level)
- How to determine sample size (power), with stratification
- How to randomize, especially with stratification
- How to calculate confidence intervals
- How to simplify process (cost-effectiveness)
- How to increase response rates (cost-effectively)



# Non-probability sampling

- Convenience: Cases that are available
- Typical: Cases known to be useful or representative
- Critical: Cases representing some important characteristic
- Quota: Cases selected to represent groups within the population



# Random Sampling

- Each member of population has equal chance of selection
- Example--all people receiving services from the SMHA



# Stratified Sampling

- Population differentiated by groups e.g. provider organizations, ethnic categories.
- Each member of group has equal chance of selection



# Cluster Sampling

- Population differentiated by groups (clusters), as in stratified e.g. providers
- Random sample of clusters (rather than individuals) is selected
- All members of the selected clusters are selected



# Multi-stage Sampling

- Groups are randomly selected as in cluster sampling
- Members of selected cluster are randomly sampled
- May be more than one cluster level (e.g. counties & providers).



# Total Error

- Non-sampling bias—differences between the true target population value and the value that would be obtained, even if the entire population were surveyed
- Sampling bias—differences that result from over-representation of some group(s) in the overall sample
- Sampling variability—chance differences between randomly selected samples and population means



# Non-Sampling Bias

- Differences between definitions of study and target populations
- Non-response
- Measurement error
- Field operations (coding errors, etc.)



# Sampling Bias

- Selection bias—unequal probability for selection
- Estimation (statistical) bias—mean of the sampling distribution not equal to population mean



# Sampling Variability

- Chance differences between means of randomly selected samples and population means
- Confidence interval determined by variation in the variable and size of the sample



# Limiting Total Error: Asking the Right Questions at the Right Time

- Before (Planning Phase): Limiting non-sampling bias
- During (Sampling Phase): Limiting non-sampling and sampling bias, and sampling variability
- After (Analysis Phase): Identifying and adjusting for total error



# Planning Phase

- What is the purpose of the study (descriptive, analytical, etc.)?
- What are important characteristics of the population?
- Are there important subpopulations?



# Data Collection Phase

- What is the sampling frame (e.g. listing of target population vs. e.g. random digit dialing)?
- What is an acceptable effect size?
- What sampling technique (probability of selection equal or unequal)?
- How many subjects required required (power)?



# Analysis Phase

- What are the confidence intervals (precision)?
- What kind of weighting (adjusting for unequal probabilities)?
- Who are the non-respondents?



# Analyzing and Adjusting for Non-response

- Plan initially to reduce non-response (intensive follow-up vs. larger sample may be cost-effective)
- Random sampling of non-respondents
- Compare early and late respondents
- Determine non-respondent scores that would reverse study findings



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# Topics...

- Sampling methodology– overview
- Equivalence analysis– special topic
- Issues and lessons from the states– group discussion
- Planning for consultation: what do you need?



# Resources

The Evaluation Center@HSRI

[www.tecathsri.org](http://www.tecathsri.org)

Survey Methodology journal

<http://www.statcan.ca/english/ads/12-001-XPB/>

Online Proceedings of the ASA Survey Research Methods Section

<http://www.amstat.org/sections/srms/Proceedings/>

Center for Survey Research—UMASS Boston

[http://www.csr.umb.edu/projects/survey\\_meth.htm](http://www.csr.umb.edu/projects/survey_meth.htm)

Web survey—new issues in sampling:

Center for Methodology and Informatics at the Faculty of Social Science  
[University of Ljubljana, Slovenia.](http://www.websm.org/aboutus.html)

<http://websm.org/aboutus.html>

Resources on Internet Survey Methodology

<http://www.ai.mit.edu/projects/iip/conferences/survey96/resources.html>

