

# Playing in Everyone Else's Backyard

Charles Day

Center for Behavioral Health Statistics and Quality  
Substance Abuse and Mental Health Services Administration  
Department of Health and Human Services

November 2013

*“The best thing about being a statistician is that you get to play in everyone else’s backyard.”*

*—John W. Tukey*

# Overview

- A few examples from my career illustrating what you can do as a Federal Government statistician?
- What is the Center for Behavioral Health Statistics and Quality (CBHSQ), what do we do, what it's like to work there, and what we're looking for?
- Challenges for the coming decades
- Conclusion

# You Can Work on Many Kinds of Data

- Business and individual tax data
- Agricultural data
- Satellite remote sensing data
- Hospital emergency department data

# Many Different Statistical Methods

- Sampling
  - Stratified
  - Bernoulli
  - Systematic
  - Probability Minimum Replacement
  - Two stage cluster
  - List sampling frames
  - Area sampling frames
  - Multiple frames
  - Permanent random number
  - Panel (longitudinal)

# Many Methods

- Estimation
  - H-T estimator
  - Regression estimator
  - Synthetic estimator
  - Composite estimator
  - Post-stratification estimator

# Many Methods

- Probabilistic exact matching
- Contingency table analysis
- Automated data editing
- Optimal sample design
  - Evolutionary algorithms (original research)
- Questionnaire design

# Many Methods

- Clustering and classification
  - “Unlabelled exemplars” (original research)
  - K-modes clustering
  - Decision trees
  - Quadratic discriminant analysis
  - Latent class analysis
- Linear models
- Experimental design

# Many Methods

- Mixed models
- Survival analysis
- Logistic regression
- Creation of synthetic data
- Longitudinal analysis
- Time series

# What Is CBHSQ?

- Congress established the Substance Abuse and Mental Health Services Administration (SAMHSA) in 1992 to make substance use and mental disorder information, services, and research more accessible.
- CBHSQ is a center within the Substance Abuse and Mental Health Services Administration (SAMHSA).

# What Does CBHSQ Do?

- The Center for Behavioral Health and Statistics and Quality (CBHSQ):
  - Provides national leadership in behavioral health statistics and epidemiology
  - Promotes basic and applied research in behavioral health data systems and statistical methodology
  - Designs and carries out special data collection and analytic projects to examine issues for SAMHSA and other federal agencies
  - Participates with other federal agencies in developing national health statistics policy
  - Consults and advises SAMHSA's Administrator and the Department of Health and Human Services' Secretary on statistical matters

# What is CBHSQ

- Two Divisions
  - Division of Surveillance and Data Collection
    - National Survey on Drug Use and Health
    - Drug Abuse Warning Network
    - Behavioral Health Service Information System
  - Division of Evaluation, Analysis, and Quality
    - Health Services Research—Analysis of cost, accessibility, and other issues in the provision of care for substance abuse and mental health issues.
    - Evaluation of Program Effectiveness—Assessing how effective SAMHSA grants and programs are at addressing the needs they fill.

# How Do Statisticians Contribute

- Survey design
- Estimation and development of improved estimation methods
- Analysis of data from complex survey designs
- Construction of statistical and econometric models
- Authoring and co-authoring reports and journal articles

# Collegial Atmosphere

- Colleagues who respect statisticians' contributions
- Colleagues who are highly accomplished in their own fields and dedicated to serving America's taxpayers
- Opportunities to learn and grow
- Diverse workplace
- Family friendly

# Abilities We Look For

- Ability to understand the practical (public health) benefit of a survey or project, and not to lose sight of that benefit to the public we serve.
- Ability to clearly state the goal of a project, and to choose statistical methods that answer the relevant question(s) and are appropriate to the data.
- Ability to cogently, clearly, and concisely explain what you've done to a lay audience (in both spoken and written form)

# Challenges in the Next Decade or Two

- Budget
  - Change is coming in the way federal statistical agencies do business
    - New Census methodology
    - Increased use of administrative records
    - Continued interest in statistical methods to protect privacy
    - Consolidation of surveys (sometimes across agencies)
  - The opportunities to be creative and to make a difference have never been greater.

# Conclusion

- Many different subject areas to work in—even within a single agency.
- Many different statistical methods
- Outstanding colleagues, both statisticians and subject matter
- Change is coming, and that's a chance to make a difference and be creative