

# Demographic Surveys Redesign Program: Evidence-Based, Participatory Decision-Making

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*Disclaimer: Any opinions and conclusions expressed herein are mine  
and do not reflect the views of the U.S. Census Bureau*

# Topics

- What is Redesign?
- Governance structure
- Evidence-based decision-making (background)
- Use of evidence and buy-in: Case study
- Takeaways
- Future directions

# Demographic Surveys Redesign Program

- A research and development program
- Directly funded by Congress to fund the coordinated drawing of new samples for major demographic surveys
- More recently focuses on both sampling AND nonsampling innovations which have applications across surveys

# Surveys in scope

- American Housing Survey (AHS)
- Consumer Expenditures Survey (Diary (CED) and Quarterly (CEQ))
- Current Population Survey / State Children's Health Insurance Program (CPS / SCHIP)
- National Crime Victimization Survey (NCVS)
- National Health Interview Survey (NHIS)
- Survey of Income and Program Participation (SIPP)

# Sample Redesign: Multistage sample design

- Country is divided into primary sampling units (PSUs)
  - Counties or groups of counties
  - Most populous PSUs selected with certainty
- Remaining PSUs are stratified by variables of interest
- Sample of remaining PSUs selected
- Secondary sampling units (usually housing units) are selected within the sampled PSUs
- Design helps minimize field cost while compiling estimates with desired level of precision

# Governance structure

- Project leads for standalone research projects
- Workgroups carry out various phases or aspects of the sample design
- Redesign Advisory Group provides oversight to the program, makes recommendations based on MERIT
  - Expert membership: Sample Design and Estimation – Survey Quality – Survey Methodology – Survey Management – Information Technology
- Division leadership provides final decisions based on merit and budgetary considerations

# Business Environment: Foundations for Evidence- Based Policymaking Act of 2018

Requires agencies to use statistical data to determine policy

Agency plans should include policy questions, data to be used, and proposed methods

- Source: Public Law No: 115-435

# Participatory Decision-Making and Evidence-Based Policy in Action

A case study





# Background: Building a Vision for the 2020 Redesign

- Meeting with diverse program stakeholders and bureau experts
- Ideas coalesced around five areas of interest:
  - Sample design and methods
  - Supplemental data (Big Data, administrative records)
  - Adaptive design / data monitoring and intervention
  - Nonsampling innovations (e.g., measuring and reducing nonsampling error)
  - Business process improvement

# Brainstorming meetings to identify specific topics

- In sessions on sample design, staff raised issue whether we needed to select a new sample of PSUs
  - Staffing challenges
  - Data anomalies with new sample, new staff or measuring actual change?
- Retaining prior PSUs (as feasible) would reduce these risks
  - However, possible threat to representativity

# Steps for analysis

1.

Assessing  
impact

2.

Identify pros  
and cons of  
various  
options

3.

Measure  
costs of  
options

# First step: Assessing impact

- Staff researched various related items:
  - Would we run out of sample in various primary sampling units if we sampled without replacement?
  - How long do PSUs remain representative over time?
  - How efficient (roughly speaking, homogenous) do PSU strata remain over time?

# Research findings

- Running out of sample, not a major concern
- PSUs, over time, became less representative on key estimates (a few surveys and specific states)
- Between-PSU variance increasing, strata were becoming less homogenous over time. More pronounced in specific states and specific surveys
- Authors of report recommended selecting new PSUs (maximizing overlap between 2010 and 2020 samples)

Source: Chesnut, T.J., Murphy, P., Park, Y., and Baker, S. (2018)

# Second step: Identify pros and cons of various sampling options (template)

Issue category	Issue subcategory	Keep PSUS, don't reselect (minor adjustments)	Select new PSUs using prior geography (minor adjustments)	Select new PSUs using 2020 area definitions
Statistical	Design Effect			
Statistical	Variance			
Budget	Phase-in / phase-out			
Operational				
Geography				

# Third step: Measure costs of options

If don't select new PSUs, save one-time costs in selecting new PSUs and training new workers

However, costs associated with increased sample sizes needed over time to maintain low variances outweigh one-time savings

THUS: Recommend selecting new PSUs (as applicable) with maximum overlap between designs

Source: Chesnut, Levy & Murphy (2019) (National Crime Victimization Survey used as test case.)

# The Figures: Three Sampling Options (Final)

- **In course of doing analysis, options changed**
- Option 3 had the combination of smallest sample and lowest start-up costs
- Source: Chesnut, Levy, & Murphy (2019)

Costs	Option 1 (No new PSUs)	Option 2 (New PSUs, no attempt at maximum overlap)	Option 3 (New PSUs, maximum overlap with prior design)
Start-up costs	\$135,477	\$1,020,232	\$618,584
Long-term sample needed	193,000	175,000	175,000



# Third-step: Communicating results through governance structure

- Memo written with recommendation
- Gave deadline for objections

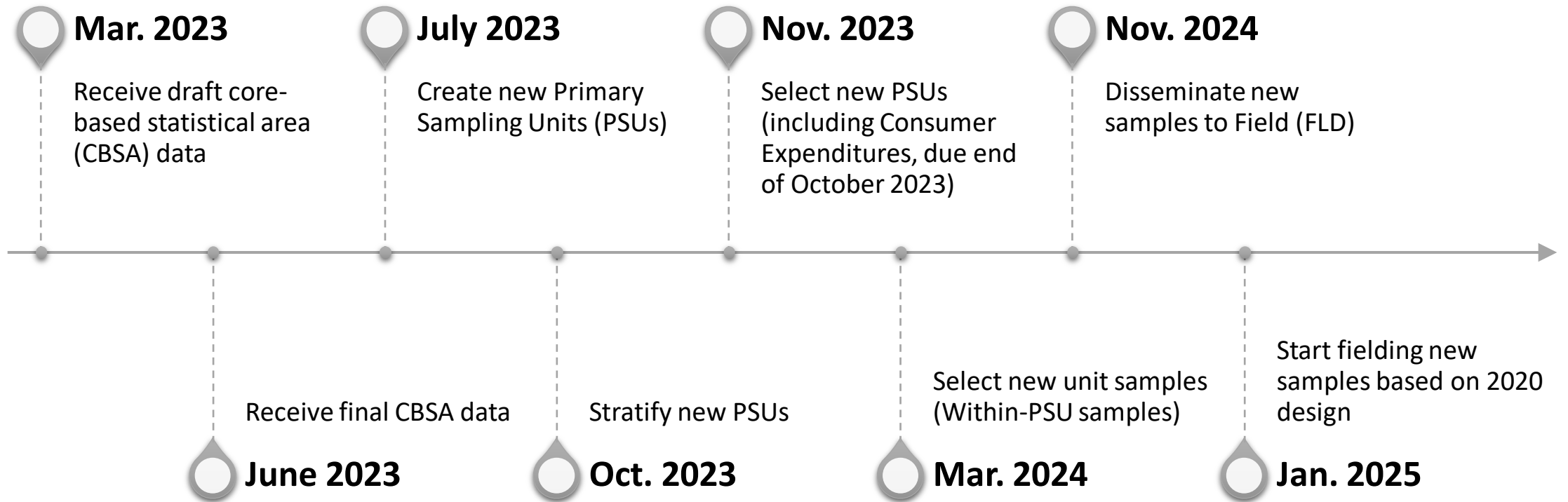
# Takeaways

- Decision-making structure in place BEFORE decisions need to be made
- Determine strategy for obtaining buy-in from diverse stakeholders
- Ensure institutional support / internal consensus
  - If differing opinion, make sure they have a voice
- Have data repository available for decision-making purposes
  - Demographic and administrative data
- Have staff capable of high-level analysis of various data

# Sample Redesign — current status

- Nine workgroups each focused on different phase or aspect of Sample Redesign
- Innovations:
  - Modifications to the program which stratifies the primary sampling units
  - Updates to our sample database
  - Integration of National Health Interview Survey into Redesign apparatus

# Overall timing of Sample Redesign



# References

Chesnut, T.J., Murphy, P., Park, Y., and Baker, S. (2018). Evaluation of 2010 Sample Redesign Primary Sampling Units. Washington, DC: US Census Bureau.

Chesnut, T.J., Levy, R., Murphy, P. (2019). Recommendation to Select New Sample of Primary Sampling Units for Household Surveys after the 2020 Census. Washington, DC: US Census Bureau.

Public Law No: 115-435

# Questions / Contact

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