



AGENCY FOR HEALTHCARE RESEARCH AND QUALITY



# MEPS – HC

## Sample Design

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# Features of MEPS Sample

- **MEPS sample is a sub-sample of National Health Interview Survey (NHIS)**
- **Each year a new panel of sample is selected from responding households to the previous year's NHIS**
- **Each Panel is followed for 2 years using 5 interview rounds (exception COVID years)**
- **MEPS full sample for each year is an overlap of 2 panels (exception COVID years)**
- **Subpopulations of interest are oversampled**

# MEPS Sample Design – Inherited from NHIS

- **NHIS sample is based on complex stratified area sample design**
- **Hence MEPS is based on the same complex design**
- **Complexity of the sample design affects the accuracy of a survey estimate**
- **Complex multistage design is more cost-effective than single-stage or simple design**

# Simple Vs. Complex Design

- **Single Stage Simple Random Sampling**
  - List of all sampling units available
  - One stage selection
  - Equal Probability
  - Sample from all areas

**Example: A sample of 10,000 persons selected directly from a list of all persons in the U.S.**

- Efficient design i.e., estimates are more accurate
- Expensive to create frame and collect data

# NHIS Stratified Multistage Area Sample Design up to 2015 (MEPS 2016)



- **First Stage or Primary Sampling Units (PSUs)**
  - ▶ Whole U.S. was partitioned into many PSUs
  - ▶ A PSU was a county or group of adjacent counties
  - ▶ A sample of PSUs was selected
- **Second Stage Units (SSUs)**
  - ▶ Each sampled PSU was divided into SSUs
  - ▶ An SSU was a cluster of housing units (Census blocks or tracts)
  - ▶ A sample of SSUs selected from each selected PSU

# NHIS Stratified Multistage Area Sample Design up to 2015 (MEPS 2016)



- **Final Stage Units**
  - ▶ Sample of households from each selected SSUs
  - ▶ All families and persons within selected households were included
- **Same PSUs and SSUs but different HHs**
  - ▶ Every year the sample was selected from the same PSUs and SSUs but different households (hence different families and persons), unless a redesign of NHIS (roughly every 10 years)

# NHIS Sample Redesign 2016 (MEPS 2017)



- **A new design was introduced in 2016**
- **Stratification by State for State-level estimation**
- **PSUs formed and selected as before**
- **But households selected directly from USPS list of addresses within PSUs**
  - ▶ **USPS list available for most of the country**
  - ▶ **No need for listing of households**
- **Roughly 100 addresses (equal 1 cluster) selected from each PSU**

# NHIS Sample Redesign 2016 (MEPS 2017)

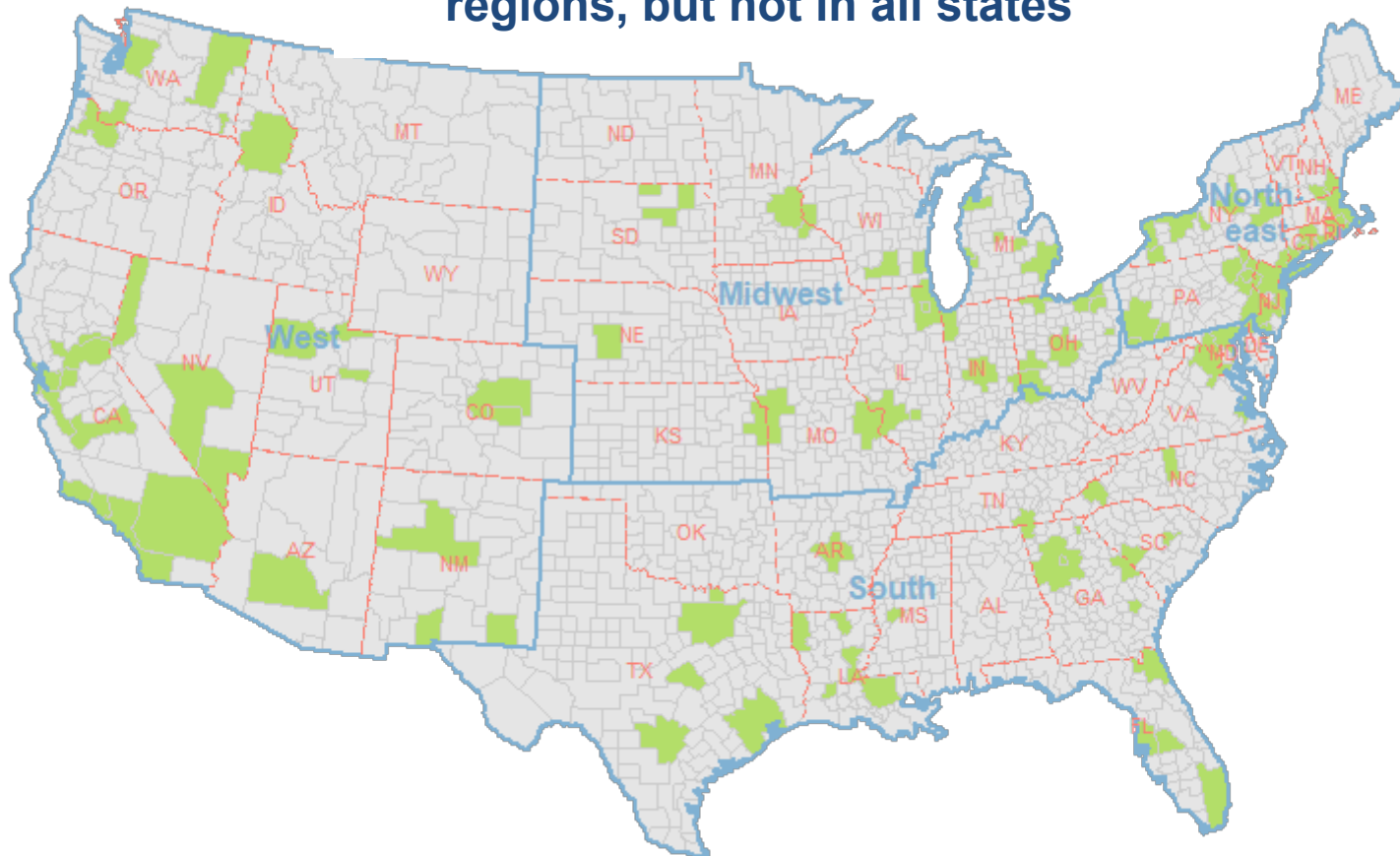


- **Multiple clusters were selected from large PSUs**
- **A cluster includes many sub-clusters of 4 addresses**
- **Sub-clusters selected systematically from the PSU-wide list of addresses**
- **Traditional multistage design not needed anymore**
- **MEPS Panel 2017 based on the new design**
- **Same PSUs used for 10 years but different clusters every year**



# Illustration of Hypothetical 100 PSU Sample

**Sample sufficient in all  
regions, but not in all states**



# Oversampling in MEPS

- To produce reliable estimates for subpopulations of interest
- Oversampled subpopulations
  - ▶ Asians
  - ▶ Blacks
  - ▶ Hispanics
  - ▶ Veterans (2018 panel)
- Increases variation in selection probabilities and sampling weights

# MEPS Overlapping Panel Design

		2019			2020			2021		
Panel 24		R1	R2	R3	R4	R5				
					R1	R2	R3	R4	R5	
Panel 25					R1	R2	R3	R4	R5	

**FY 2020**

**Panel 24: R3, R4, R5**

**Panel 25: R1, R2, R3**

# MEPS Annual Files – Combination of Two Panels

Panel	Year		
	2019	2020	2021
23	Yr2		
24	Yr1	Yr2	
25		Yr1	Yr2
26			Yr1

# Panels Overlap in MEPS Exception in COVID Years



- Due to COVID, response and completion of interviews were lower in 2020
- To compensate, the outgoing Panel 23 was extended initially for one year to 2020 and then for another year to 2021
- Panel 24 was also extended another year to 2022
- So there are 3 panels in 2020, 4 panels in 2021 and 3 panels in 2022.

# MEPS Annual Files – Combination Panels

Panel	Year		
	2019	2020	2021
23	Yr2	Yr3	Yr4
24	Yr1	Yr2	Yr3
25		Yr1	Yr2
26			Yr1

# Thank you!



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