



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)**
- **Every year a new panel of sample (about 10,000 households) is selected from households responded to the previous year's NHIS**
- **Each Panel is followed for 2 years using 5 interview rounds (exception COVID years)**
- **MEPS full sample for a year is an overlap of 2 panels (exception COVID years)**
- **Subpopulations of interest are oversampled**

MEPS Sample Size

Annual File Includes Two Panels

	Old Panel Selected Last Year	New Panel Selected Current Year
Households Selected (from NHIS respondents)	10,000	10,000
Households Responds 1 st Year	6,900	6,900
Households Responds 2nd Year	6,400	
Current Year Responding Households	6,400	6,900
Annual Total Responding Households	13,300	
Annual Total Responding Persons	28,000	

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**

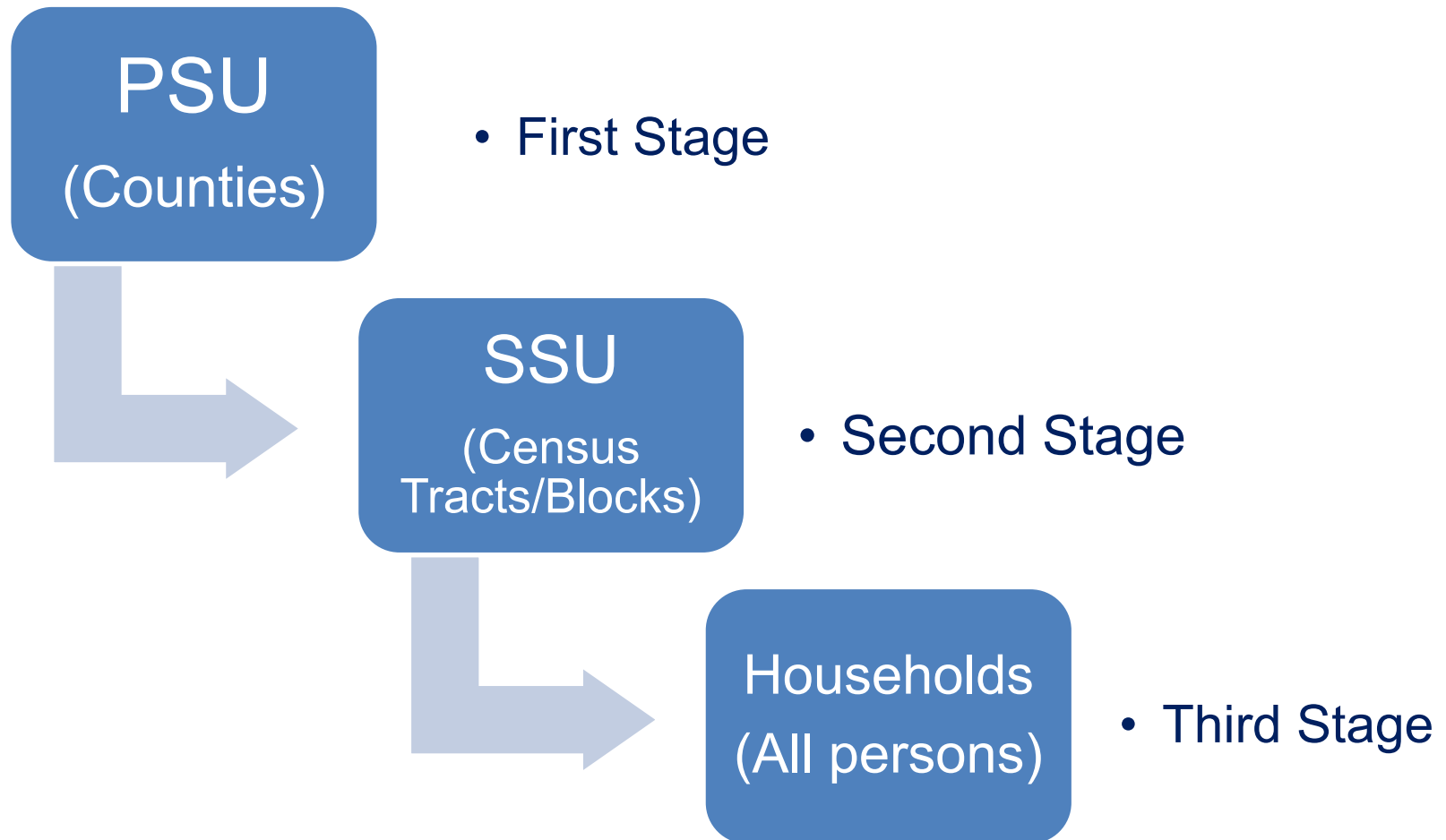
Simple Vs. Complex Design

- **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.

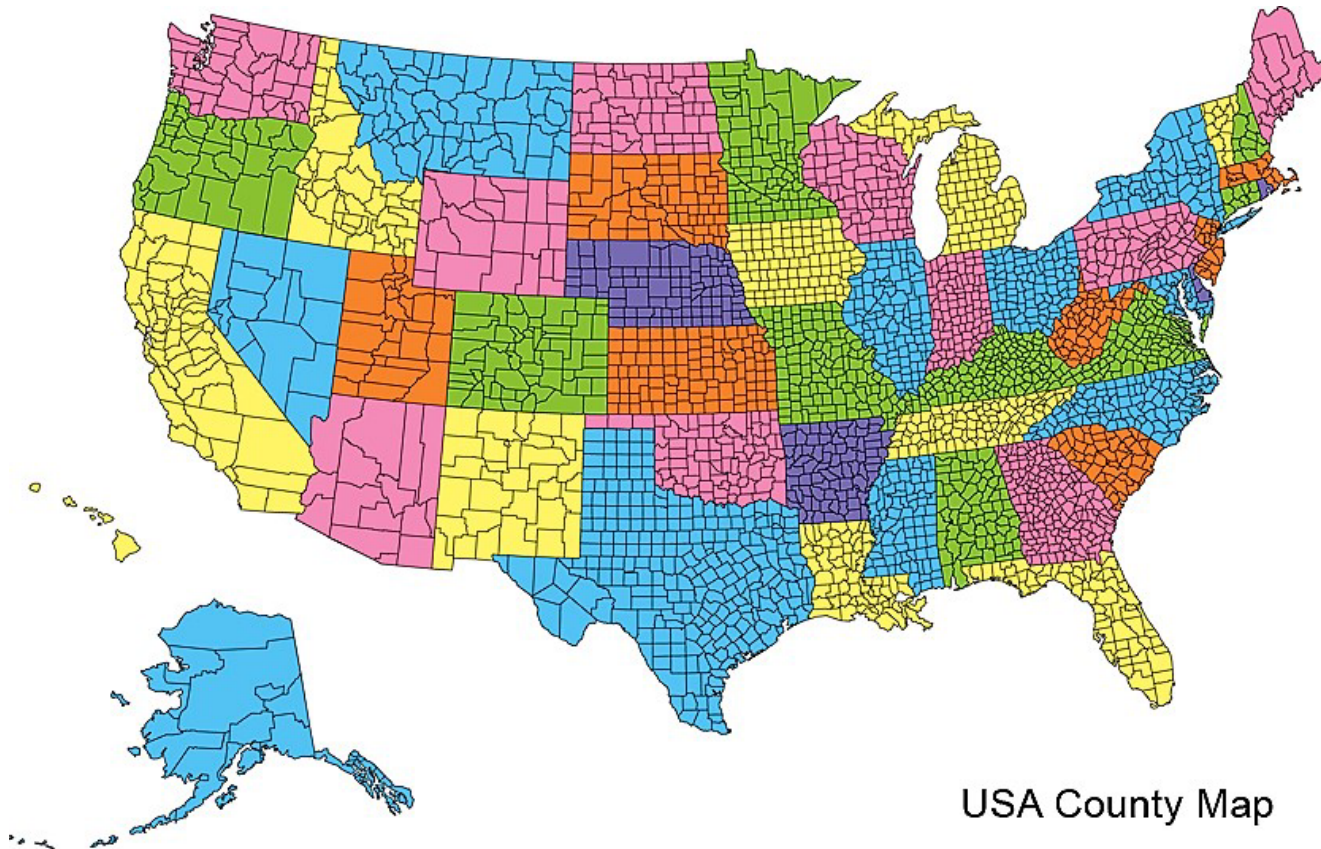
- Efficient design i.e., estimates are more accurate
- Expensive to create frame and collect data

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



PSUs Formed from Counties

(3,147 counties => 1900 PSUs)



USA County Map

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



- **First Stage or Primary Sampling Units (PSUs)**
 - ▶ Whole U.S. is partitioned into many PSUs
 - ▶ A PSU is a county or group of adjacent counties
 - ▶ 3,147 counties collapsed into about 1,900 PSUs
 - ▶ A sample of almost 400 PSUs is selected
 - ▶ Roughly half (about 200) PSUs used in MEPS

- **Second Stage Units (SSUs)**
 - ▶ Each sampled PSU is divided into SSUs
 - ▶ An SSU is 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 up to 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**

- ▶ For each 10-year design, every year the sample was selected from the same PSUs and SSUs but different households (hence different families and persons)
- ▶ In a redesign of NHIS (every 10 years), PSUs and SSUs are reselected but large PSUs (large MSAs) are always in the sample

NHIS Sample Redesign 2016-2025 (MEPS 2017-2026)



- **A new NHIS 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 2016-2025 (MEPS 2017-2026)



- 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 and later are based on the new design
- Same PSUs used for 10 years but different clusters every year
- Almost 400 PSUs are selected for NHIS and half of those included in MEPS from NHIS Panels 1 & 3

NHIS Sample Redesign 2016-2025 (MEPS 2017-2026)

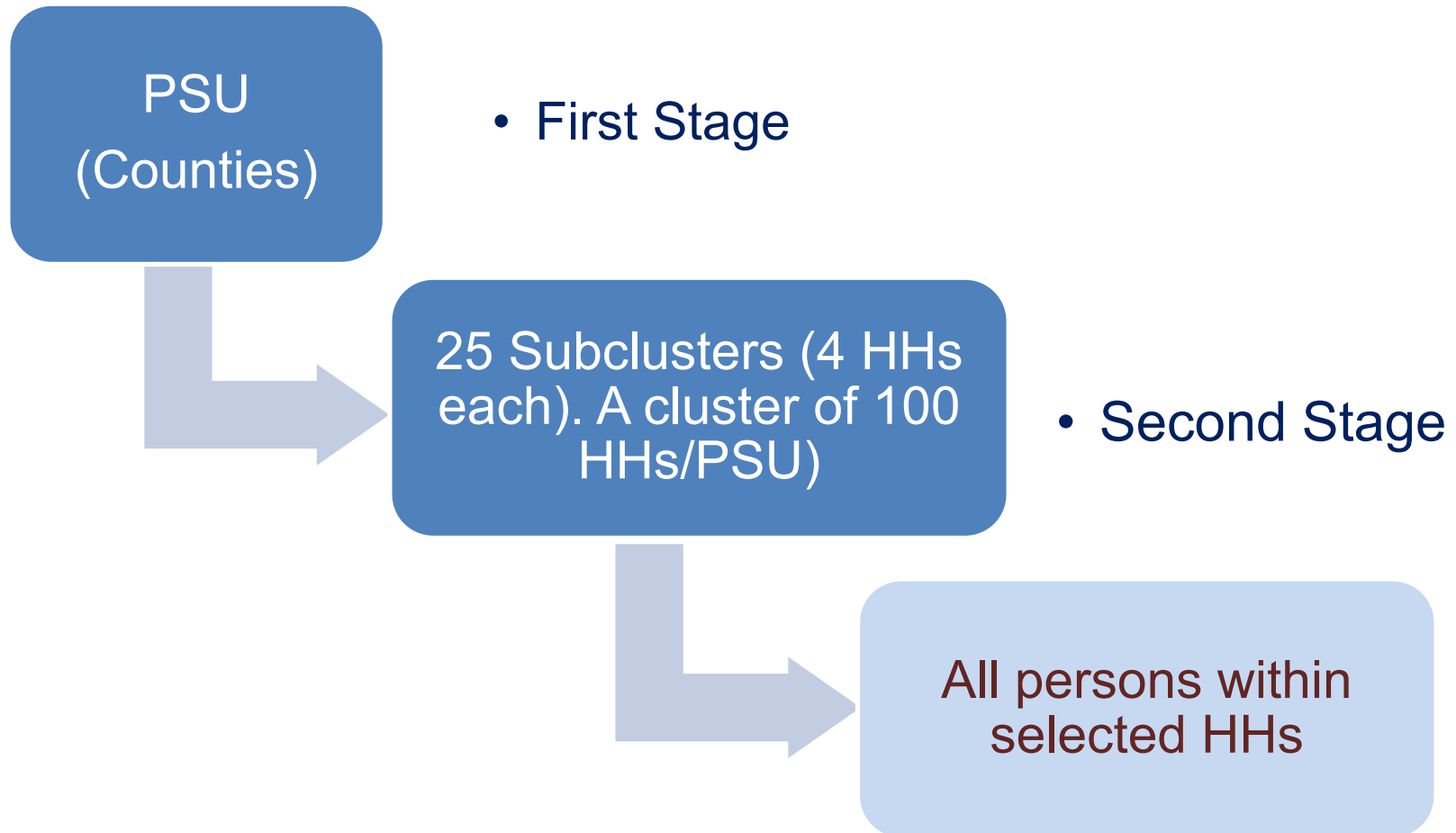
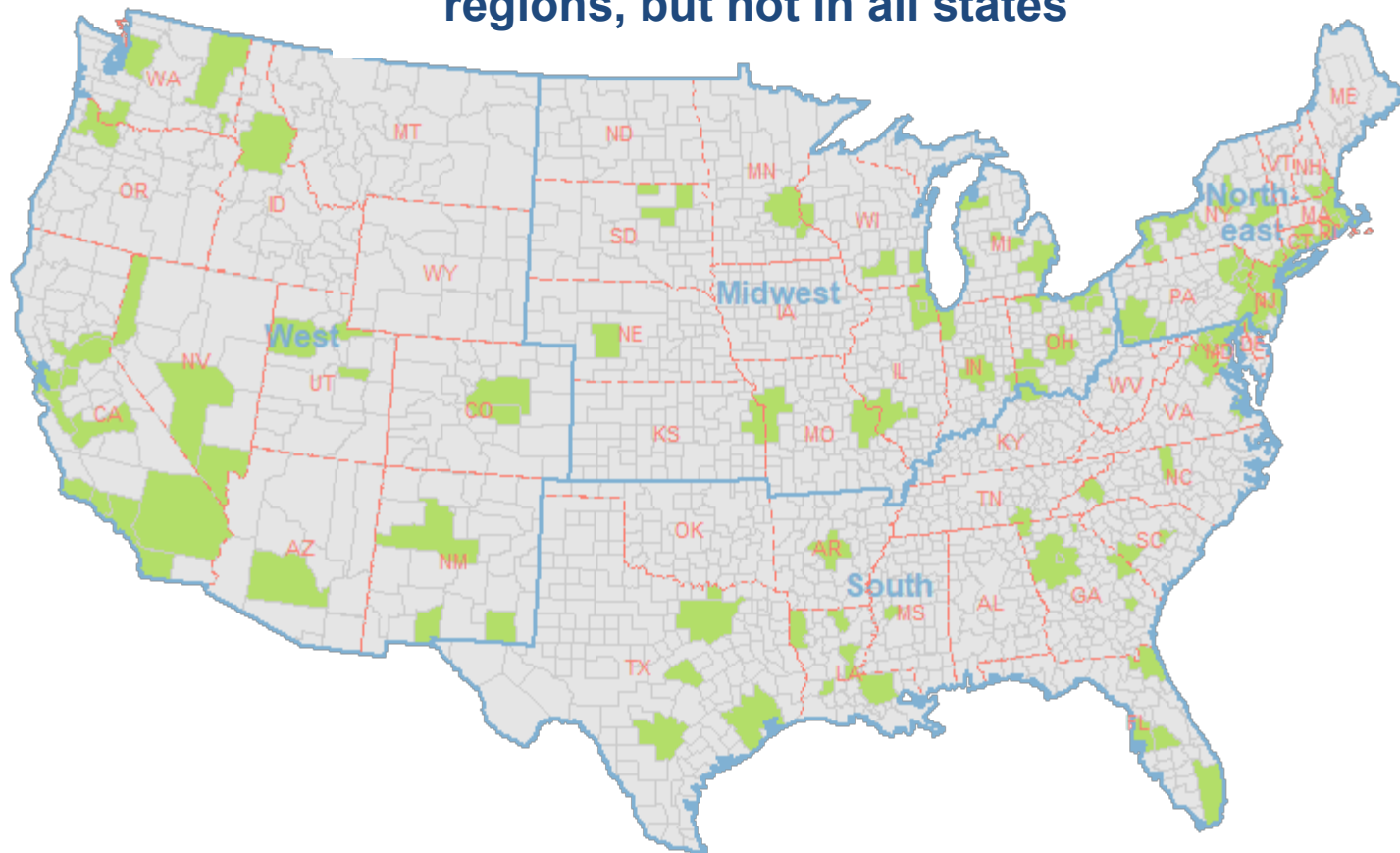


Illustration of Hypothetical 100 PSU Sample

**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				
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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