

# Research Results from Linked Program Participation Administrative Data and American Community Survey Data

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(CARRA)  
U.S. Census Bureau

Maryland State Data Center  
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# Agenda

- Background of Census-USDA Joint Statistical Project
  - Who? Why? How?
- Data, Methods, and Results
  - Data sources and linkage
  - Modeling WIC eligibility
  - Highlights of results
    - Table package
    - Visualizations

# About CARRA

- Acquires and processes federal, state, local, and third party administrative records (ARs)
  - Assesses fitness for use in decennial census and survey operations
  - Conducts demographic, social, and economic research using new or enhanced data products
- Research and develops record linkage techniques

# Foundations of Census-USDA Joint Statistical Project

- 2020 Census Research, Testing and Operations
- Census – USDA Joint Statistical Project
  - Economic Research Service and Food and Nutrition Service
- Program associations
  - National WIC Association Research Needs Assessment: “Examine linkages with other data sources to explore characteristics of eligible non-participants.”

# Benefits to Census

- Better decennial census
  - Improve accuracy: better count of population
  - Improve efficiency: lower costs of data collection
- Better survey products
  - Sampling frames
  - Supplement missing and imputed data
  - Potentially replace questions
- Better research
  - Innovative data products for external and internal researchers

# Benefits to State Programs

- Better statistics and survey data on state population and economy
- Better census of hard-to-count populations (poverty, children)
  - More federal funding
- Better understanding of program and opportunities for outreach
  - Eligibility and participation rates across demographic groups and counties
  - Characteristics of participating and eligible non-participating populations

# Administrative Records Data Transfer Process

- State participation is voluntary
  - Reimbursement for data extraction costs offered
- Data transfer agreement between state and Census Bureau
  - Data protection and privacy ensured
    - Data protected under Title 13 of the U.S. Code

# States with Signed Agreements by Data Type

STATE	SNAP	TANF	WIC
Arizona			*
Colorado	*	*	*
Florida	*	*	
Hawaii	*		
Illinois	*		
Kentucky	*	*	
Maryland	*	*	
Nevada	*	*	*
New Jersey	*	*	
New York	*	*	
Oregon	*		
Tennessee	*	*	
Virginia	*		
Wisconsin		*	

# Data Delivered

STATE	SNAP	TANF	WIC
Colorado	*		*
Hawaii	*		
Illinois	*		
Maryland	*	*	
Nevada			*
New York	*	*	
Oregon	*		
Virginia	*		
Wisconsin		*	

# Administrative Data Requested, Data Linkage, Estimation Methods, and Results

# Administrative Records

## Data Requested

- Participant Personally Identifying Information (PII)
  - Name
  - Date of birth
  - Social Security Number
  - Address history
- Database table match keys
- Eligibility and termination
- Monthly history of benefits received
- Other: race/ethnicity, sex, employment status, income and sources, etc.

# Overview of Data Sources and Method

- American Community Survey (ACS)
  - Annual individual-level data
- Link ACS to administrative records (AR)
- Estimates and profiles
  - Eligibility and participation rates
  - Profiles of participants and eligible non-participants

# The American Community Survey

- Annual sample of 2.3 million US households
  - Sample in every state and county
  - Variety of demographic, social and economic information for each individual residing in a household

# Data Linkage

- Census Bureau's Person Validation System (PVS)
  - Uses PII and probabilistic matching techniques to assign individuals a unique Protected Identification Key (PIK)
  - PII is stripped from records after PIK assignment and before researcher access
  - The PIK is used to match anonymously across data sources

# Concepts

- ***Estimated Eligibility***
  - Use income, family size, household relationships, other program participation from ACS
  
- ***Participation***
  - ACS respondent links to ARs

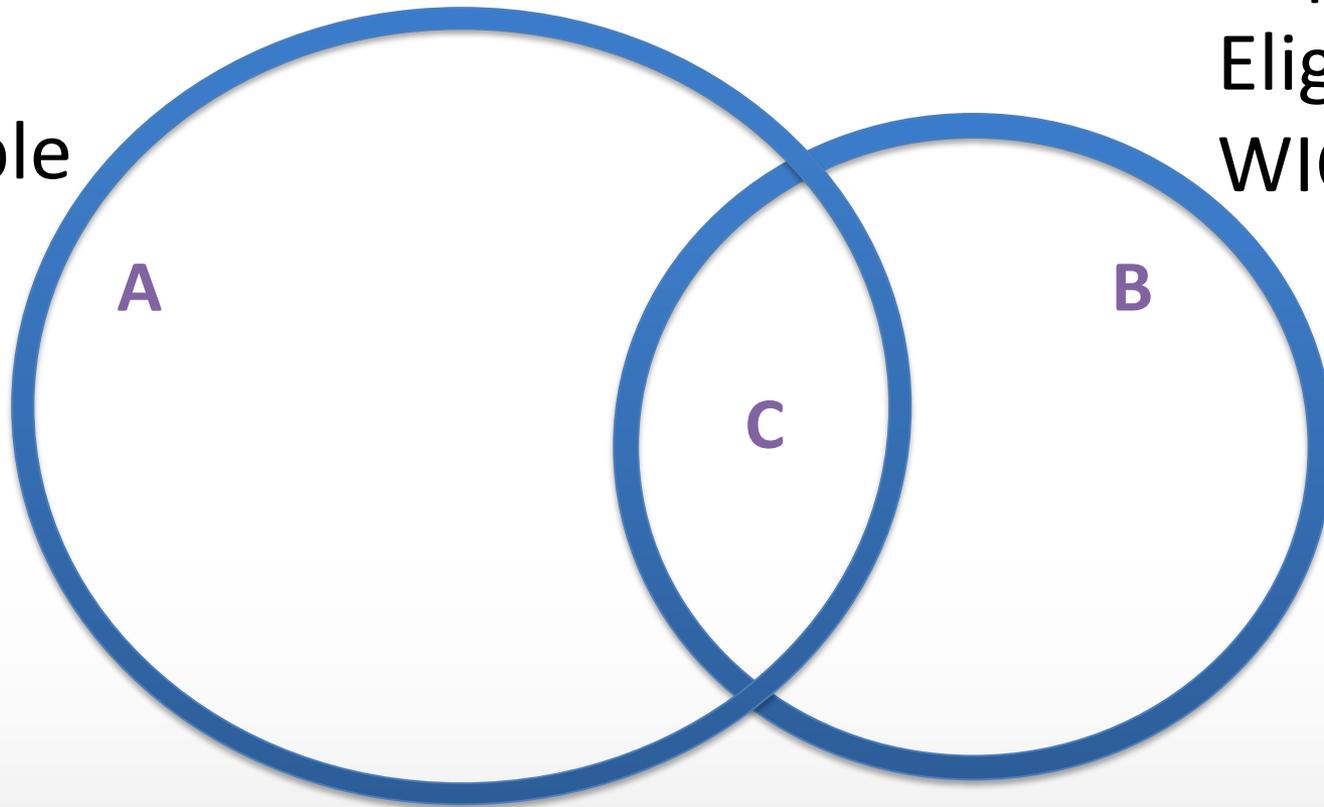
# State Population

State  
Population

ACS  
Sample

ACS  
Sample

Population  
Eligible for  
WIC

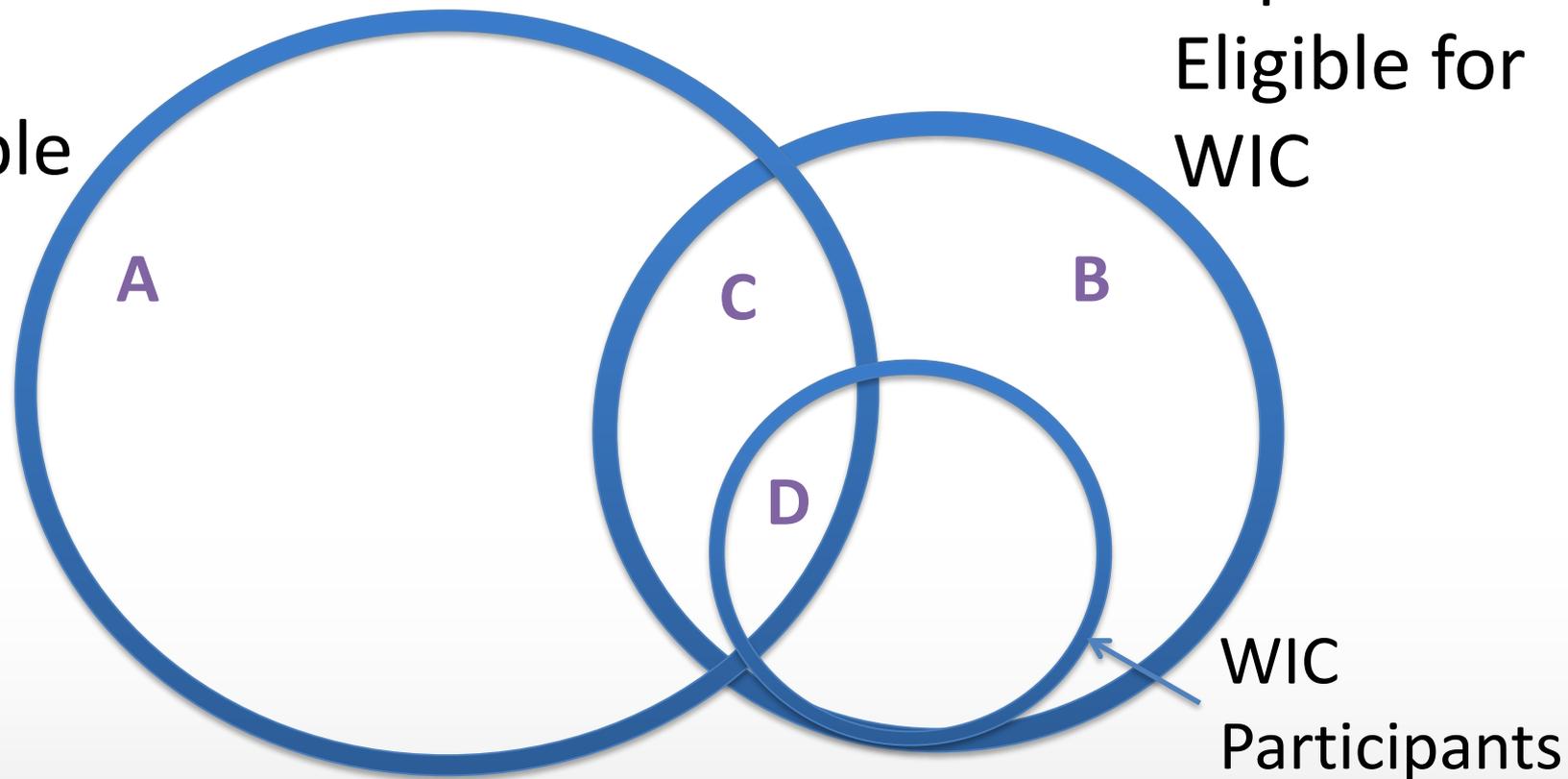


**C: Estimate of Eligible Population**

$$\textit{Eligibility Rate} = 100 * \frac{C}{A}$$

ACS  
Sample

Population  
Eligible for  
WIC



**D: Estimate of WIC Participants**

**C-D: Estimate of Eligible Non-Participants**

$$\textit{Participation Rate} = 100 * \frac{D}{C}$$

# Some Limitations of Linked ACS-AR Data

- Estimating Eligibility
  - SNAP: do not know household members that share food costs (SNAP “unit”)
  - WIC: no information on pregnancy or breastfeeding
  - TANF: different rules and programs in each state

# Challenges of Linked ACS-AR Data

- ACS sample
  - WIC: children ages 0-4
  - TANF: families with children, difficult to qualify
  - Small population counties

# Table Package Product

- ***Modeled eligibility and participation rates***
  - State
  - By demographic, social and economic groups
  - By county
    - If aggregate sample size for years of ARs allow
- ***Distribution Profiles***
  - Modeled eligible population
  - Participants
  - Modeled eligible non-participants

# Example Table 1. WIC Eligibility and Participation Rates, Infants and Children, State X, 2014

	Eligibility		Participation	
	Estimate	SE	Estimate	SE
<b>Total</b>	53.5	(1.0)	55.1	(1.4)
<b>Age</b>				
0	54.9	(1.8)	67.6	(2.5)
1	52.9	(2.2)	62.2	(2.8)
2	53.7	(1.8)	57.2	(2.8)
3	53.8	(2.0)	47.7	(2.7)
4	52.5	(1.8)	41.3	(3.3)
<b>Race / Hispanic Origin</b>				
Non-Hispanic White alone	38.2	(1.4)	45.5	(2.3)
Non-Hispanic Black alone	81.7	(4.0)	72.8	(5.4)
Non-Hispanic AIAN* alone	83.3	(10.0)	46.6	(11.0)
Non-Hispanic Asian alone	43.0	(7.3)	40.0	(8.0)
Other Non-Hispanic	46.4	(4.2)	60.1	(6.2)
Hispanic	78.8	(1.7)	61.4	(2.1)

## Example Table 2. **Distributions** of WIC Participants and Eligible Non-Participants, Infants and Children, State X, 2014

	Eligible		Participants		Non-Participants	
	Estimate	SE	Estimate	SE	Estimate	SE
<b>Total</b>	100.0	-	100.0	-	100.0	-
<b>Race / Hispanic Origin</b>						
Non-Hispanic White alone	39.9	(1.1)	33.0	(1.5)	48.5	(2.1)
Non-Hispanic Black alone	6.5	(0.6)	8.6	(1.1)	4.0	(0.7)
Non-Hispanic AIAN* alone	1.0	(0.2)	0.8	(0.3)	1.2	(0.4)
Non-Hispanic Asian alone	2.2	(0.4)	1.6	(0.4)	2.9	(0.7)
Other Non-Hispanic	4.6	(0.6)	5.0	(0.8)	4.1	(0.8)
Hispanic	45.8	(1.0)	51.0	(1.7)	39.3	(2.0)

## Example Table 3. WIC Eligibility and Participation, Parents of Infants and Children, State X, 2014

	Eligibility		Participation	
	Estimate	SE	Estimate	SE
<b>Total</b>	53.5	(1.0)	55.1	(1.4)
<b>Marital Status</b>				
Married	42.4	(1.1)	51.5	(1.9)
Widowed, Divorced, Separated	83.0	(2.8)	53.2	(3.8)
Never Married	85.5	(1.6)	63.4	(2.8)
<b>Education</b>				
Less Than HS Diploma	94.8	(1.3)	63.7	(3.7)
High School Diploma	79.1	(1.9)	59.4	(2.8)
Some College	63.9	(1.7)	54.4	(2.5)
Bachelor Degree or Higher	21.3	(1.4)	38.7	(3.3)
<b>Nativity / Citizenship</b>				
Native Born	48.9	(1.2)	53.8	(1.7)
Foreign Born, Citizen	62.3	(4.3)	58.8	(6.0)
Foreign Born, Not Citizen	85.5	(1.8)	59.4	(3.8)
<b>English Language Skills</b>				
Speaks Only English or Well	51.8	(1.1)	53.8	(1.4)
Does Not Speak English or Not Well	96.2	(1.6)	72.3	(5.3)

## Example Table 3. WIC Eligibility and Participation, Households of Infants and Children, State X, 2014

	Eligibility		Participation	
	Estimate	SE	Estimate	SE
<b>Total</b>	53.5	(1.0)	55.1	(1.4)
<b>Household Income below Federal Poverty Line</b>				
<=100% Poverty Line	98.6	(0.6)	60.6	(3.1)
100<-145% Poverty Line	98.9	(0.5)	58.4	(2.9)
145<-185% Poverty Line	92.9	(2.2)	43.8	(3.9)
>185% Poverty Line	26.2	(1.1)	53.3	(2.7)
<b>Size</b>				
2-3 persons	46.7	(1.8)	55.4	(2.8)
4 persons	44.0	(1.8)	53.3	(2.8)
5 persons	60.9	(2.8)	51.9	(3.3)
6+ persons	73.7	(2.4)	60.2	(3.2)
<b>Locale Type</b>				
Urban	53.8	(1.0)	56.4	(1.5)
Rural	51.4	(2.9)	44.5	(5.1)
<b>Military / Veteran Status of Occupants</b>				
Not Active Military or Veteran	53.8	(1.1)	54.0	(1.6)
Active Military or Veteran	51.7	(2.9)	62.2	(3.4)

# Example Table 4. WIC Eligibility and Participation by County, State X, 2014

	Eligibility		Participation	
	Estimate	SE	Estimate	SE
<b>State Total</b>	53.5	(1.0)	55.1	(1.4)
<b>County</b>				
Adams	63.0	(2.0)	64.9	(2.7)
Alamosa	69.1	(9.0)	49.8	(13.0)
Arapahoe	54.7	(1.8)	56.3	(3.1)
Archuleta	90.6	(6.1)	.	.
Baca	.	.	.	.
Bent	81.2	(7.0)	.	.

# Data Visualization Product

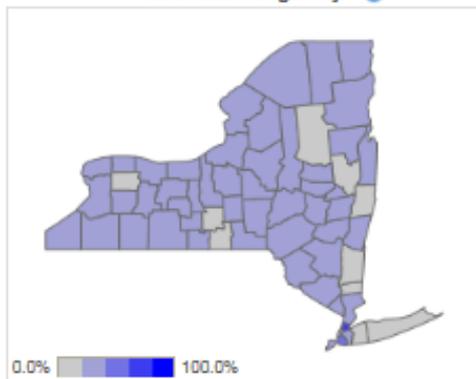
- A user-friendly complement to information provided in Table Package
- Allows us to deliver additional information not easily communicated in tables
  - Maps and trends

# 2012 New York SNAP Profile

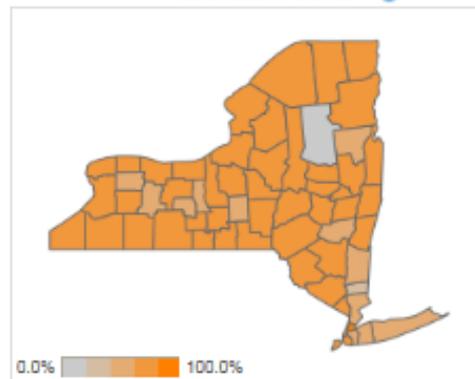
Hover over the apple for instructions:



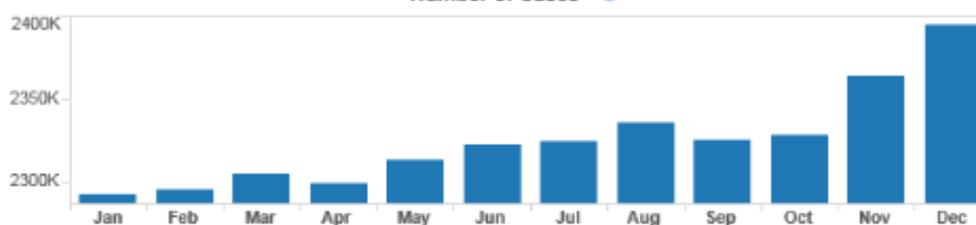
Estimated Eligibility ⓘ



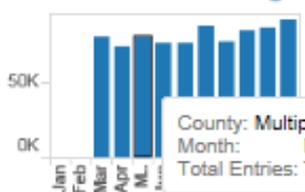
Estimated Access ⓘ



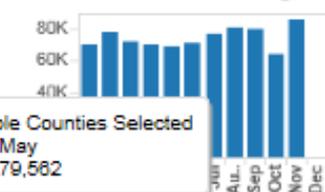
Number of Cases ⓘ



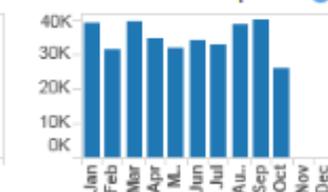
Number of Entries ⓘ



Number of Exits ⓘ



Number of Lapses ⓘ



County: Multiple Counties Selected  
 Month: May  
 Total Entries: 79,562

Source: Maps are generated using 2011-2012 New York SNAP AR linked to the 2012 1-year ACS. Charts are generated using 2012 New York SNAP AR. Note: Counties that do not meet minimum sample size requirements have missing values.

# 2012 New York SNAP Profile

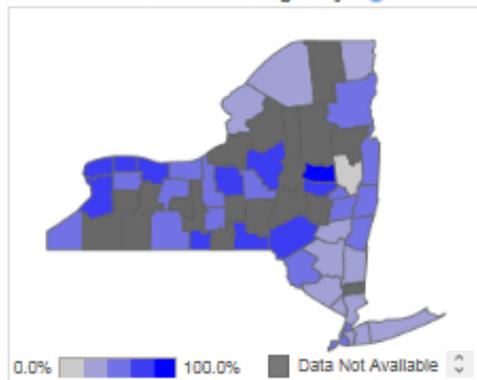
5

< (4) **Race of 11** (5) Hispanic Origin (6 of 11) Household Type (7 of 11) Preser (7 of 1) >

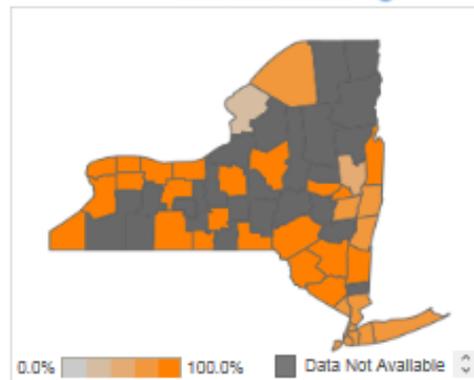


Select a Race Category:

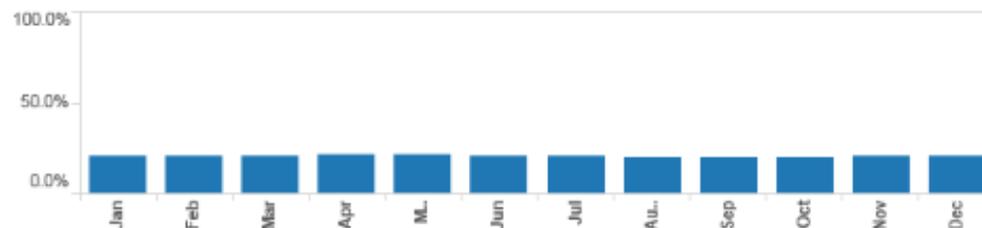
Estimated Eligibility ⓘ



Estimated Access ⓘ



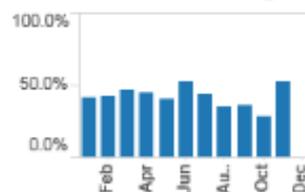
Percent of Cases ⓘ



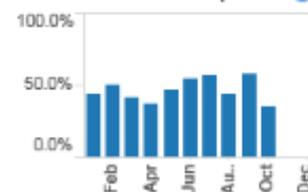
Percent of Entries ⓘ



Percent of Exits ⓘ



Percent of Lapses ⓘ

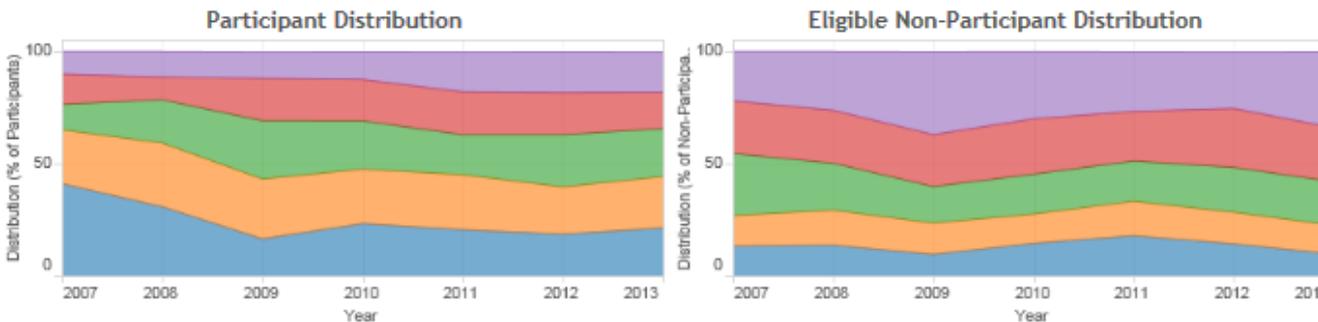
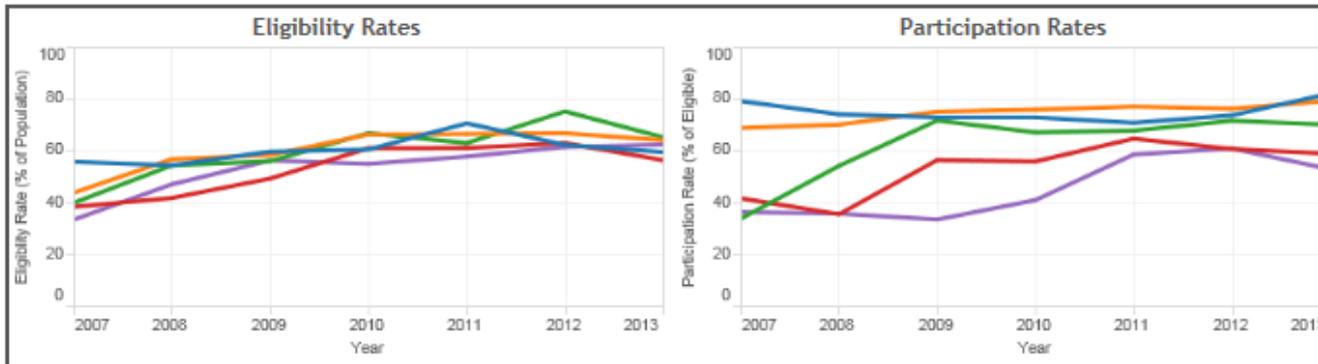
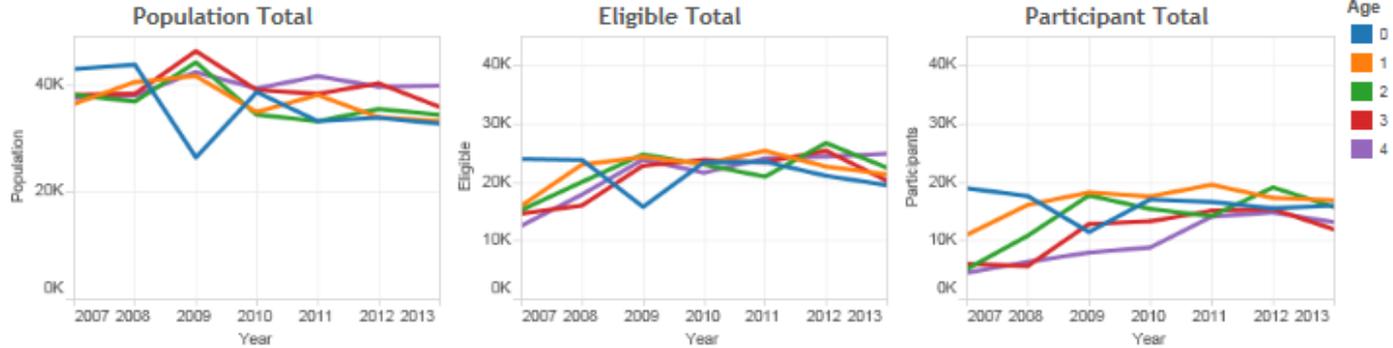


Source: Maps are generated using 2011-2012 New York SNAP AR linked to the 2012 1-year ACS. Charts are generated using 2012 New York SNAP AR linked to the 2012 1-year ACS.  
 Note: Counties that do not meet minimum sample size requirements have missing values.

# Infants and Children

<
Age
Race and Ethnicity
Poverty Status
Migration
>

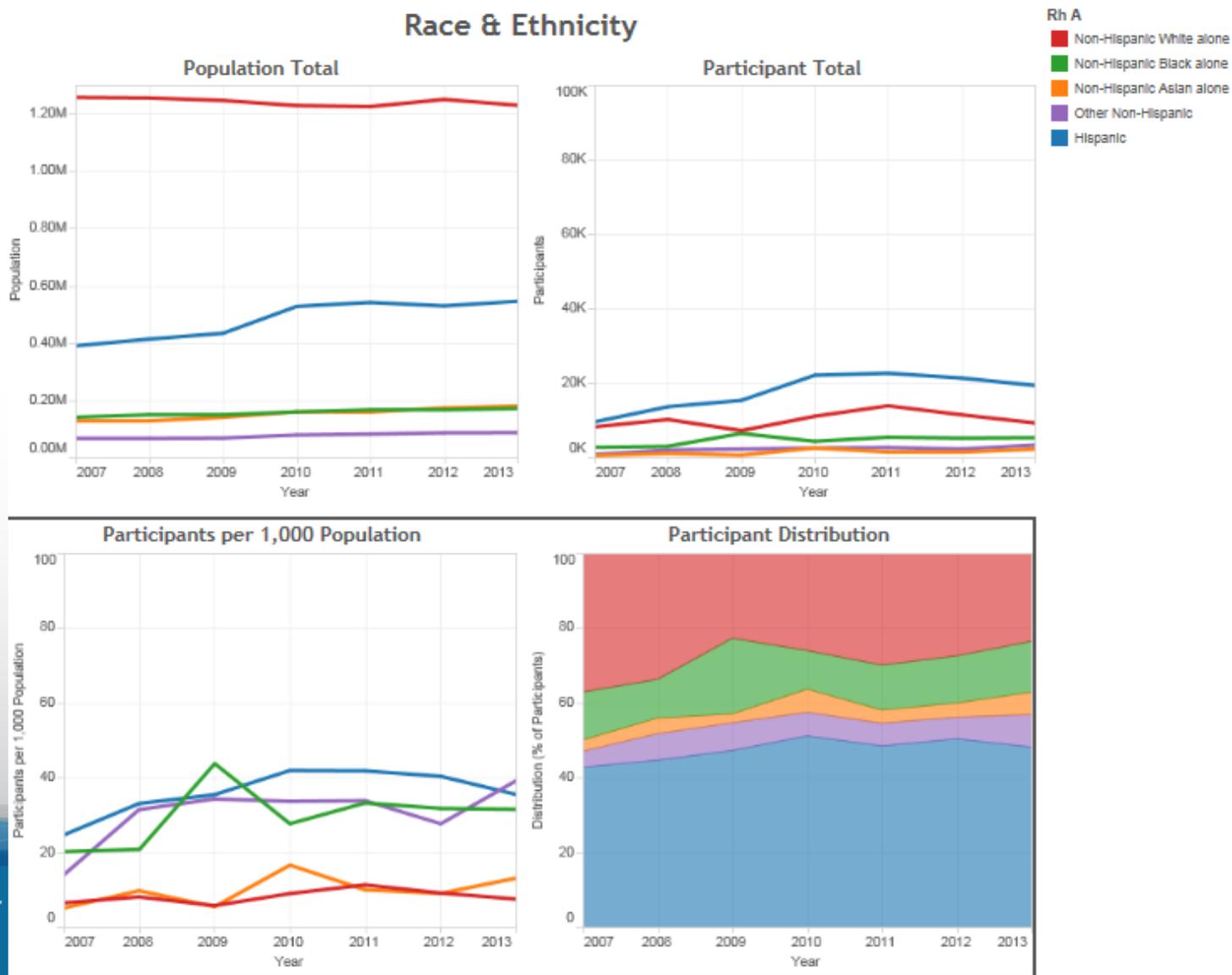
## Age



# Women, Ages 15+

<
Age
Race & Ethnicity
Marital Status
Education
English Skills
>

## Race & Ethnicity



# Summary

- Partnership between state programs and Census is mutually beneficial
  - An improved census benefits both state programs and the Census Bureau
  - Table package provides state program with information not otherwise available

# Contact Information

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