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Understanding the population size and distribution in New York

May 9, 2024

PHHPC Educational Session

Eli Rosenberg, PhD
Deputy Director for Science
Office of Public Health

Two topics for today

- **How many people live in New York?**
  - **Making *Sense* of the *Census* Estimates for New York State's Population**

- **How do we assign these residents to regions of the state?**
  - ***A New NYS Sub-Regional Schema***

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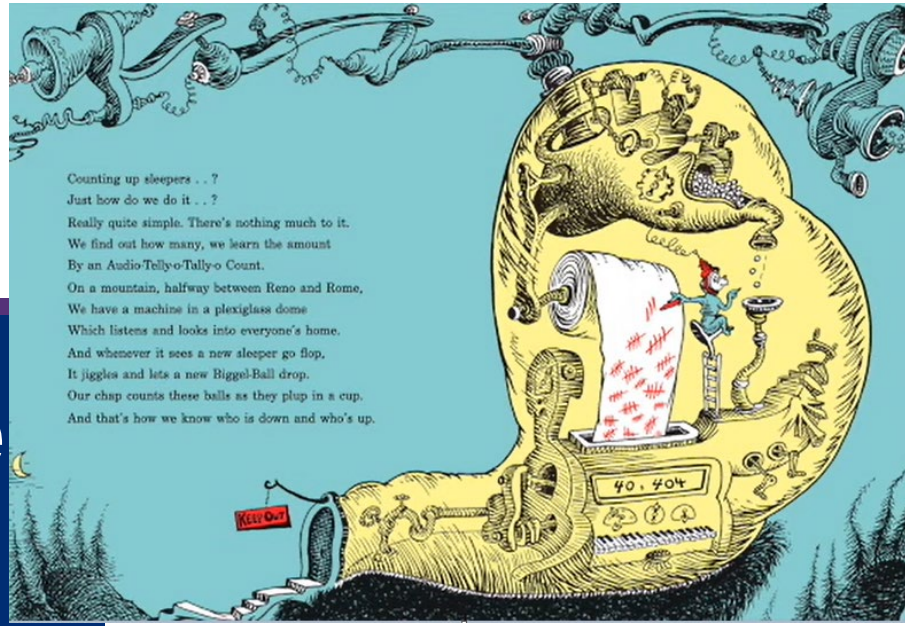
  - ***A New NYS Sub-Regional Schema***

How many people live in New York? And why we care.



Dr. Seuss' *Sleep Book*

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Why we care about population estimates

- Population estimates are used to
  - **Understand our communities:** totals, demographics, geography
  - **Allocate resources**
  - **Track public health events in the population**, accounting for the shifting composition of the population at-risk **using rates**.

- Example: Annual heart disease mortality rates
  - Rate = (Deaths / Population) * 100,000

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Heart disease deaths	53,883	53,010	53,001	52,403	54,288	54,265	54,398	54,751	54,132	59,649
Population	19,499,921	19,574,362	19,626,488	19,653,431	19,657,321	19,636,391	19,593,849	19,544,098	19,544,098	19,544,098
Rate per 100,000	276.3	270.8	270.0	266.6	276.2	276.3	277.6	280.1	277.0	305.2

Drama with US Census Bureau estimates

US Census Bureau estimation in a nutshell

- A full census is done every 10 years → "Decennial Census"

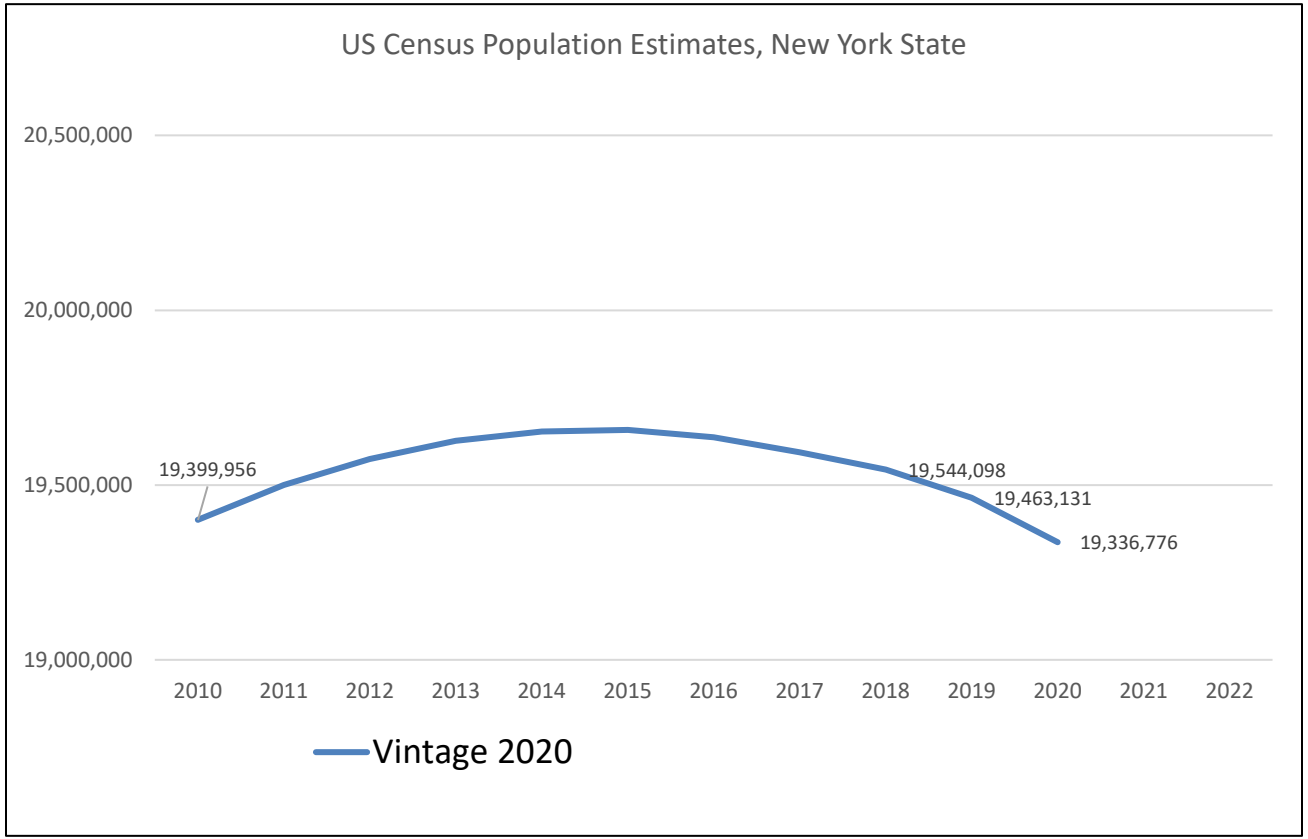
- But the Census Bureau does provide *annual* estimates → "Vintages"
  - Statistical projections forward from last Decennial Census using birth, death, migration data.
  - Vintage files give us estimates of the population for all past years back to the most recent decennial census before the current estimate.
  - Vintage files are issued every year and update previous years

Vintage file examples

- **Vintage 2020** = estimate for 2020 and updated estimate for 2019, 2018, 2017, etc., projected from the **2010 Decennial Census**.

- **Vintage 2022** = estimate for 2022 and updated estimate for 2021 and 2020, projected from the **2020 Decennial Census.**

New York State Population Estimates: Vintage 2020



- Vintage 2020 estimates for New York go down after 2015
- Continuing trends from Vintage 2018, 2019, etc
- All based on Decennial 2010 projection
- Vintage 2020 came out in September 2021, before Decennial 2020 released

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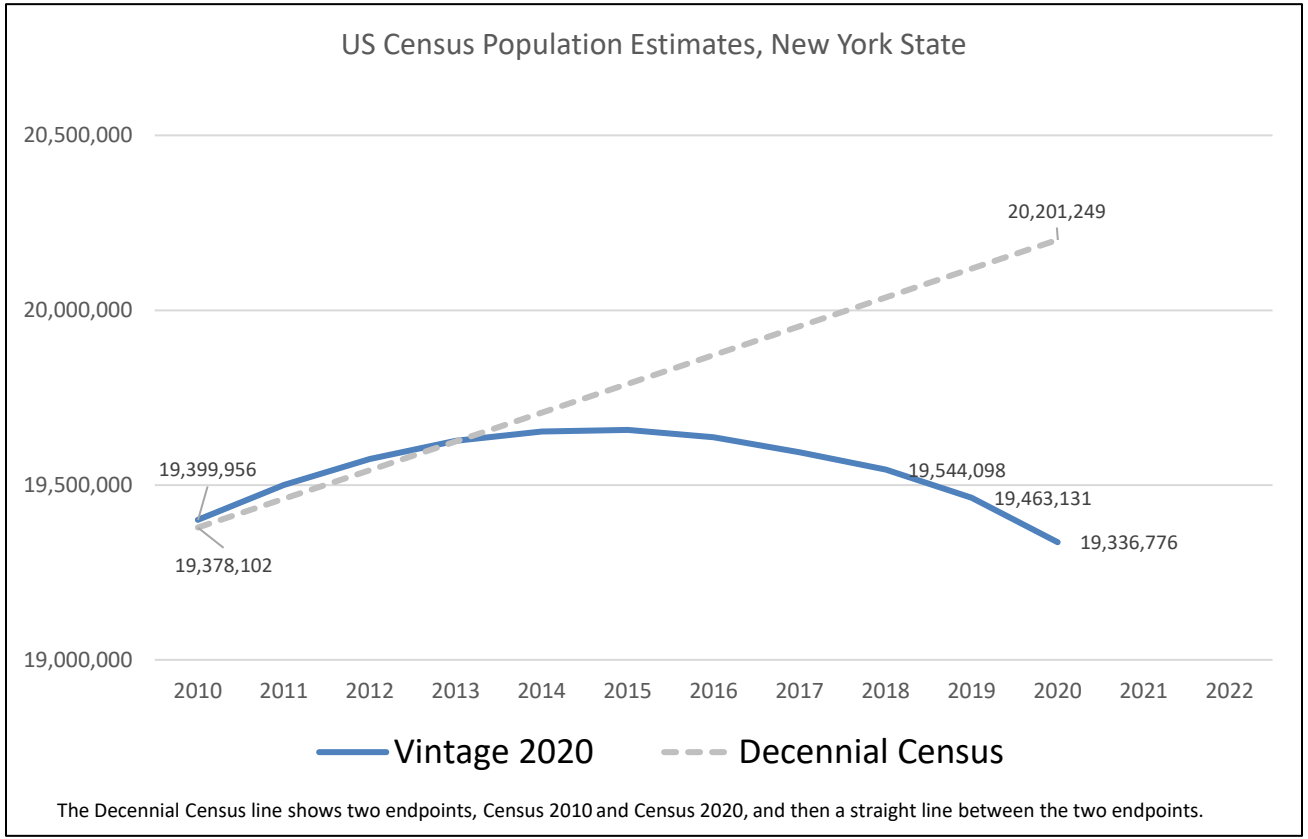
"The Vintage 2020 estimates are based on the 2010 Census and were created without incorporation or consideration of the 2020 [Decennial] Census results."

https://www.census.gov/programs-surveys/popest/technical-documentation/research/evaluation-estimates.html

And then Decennial 2020 was conducted



The Decennial Census line shows two endpoints, Census 2010 and Census 2020, and then a straight line between the two endpoints.

- 4.5% increase in apparent 2020 population
- Decennial 2020 data late, problematic?
  - Conducted **April 2020!**
  - Came out November 2021, 2 months *after* Vintage 2020.
- Began first DOH discussions of what we do about this

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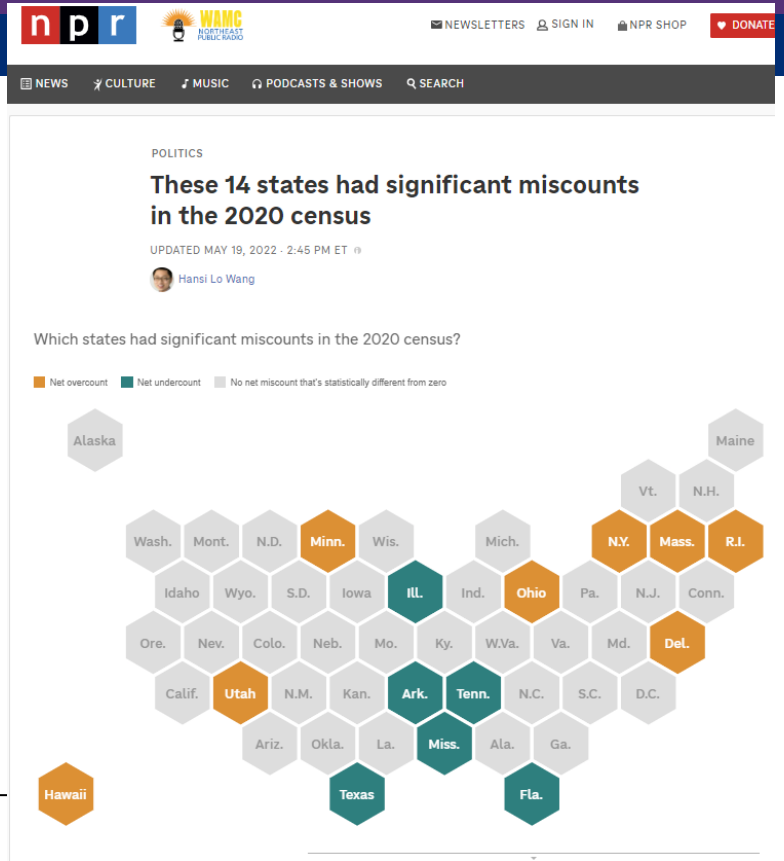
2020 Post-Enumeration Survey

- May, 2022: US Census sample *survey* found the 2020 Decennial Census may have **overcounted** New York population by 3.44%.

  https://www.census.gov/newsroom/press-releases/2022/pes-2020-undercount-overcount-by-state.html
  Thursday, May 19, 2022



These revelations come after the population totals from a census beset by the coronavirus pandemic and years of interference from former President Donald Trump's administration have already been used to divvy up seats in the House of Representatives, as well as votes in the Electoral College, for the next decade.

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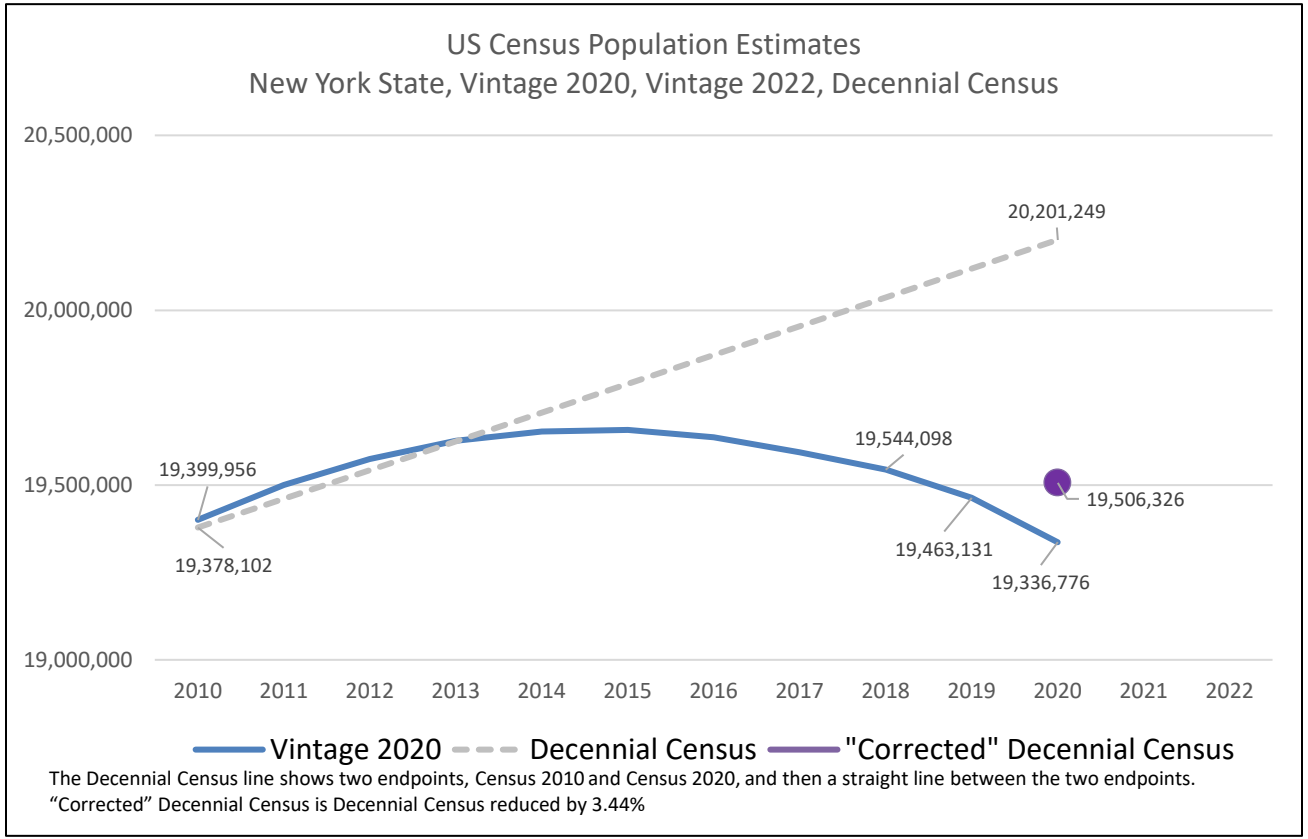
Now with 2020 Post-Enumeration Survey



- Being just a sample survey, it yielded a single adjusted total for NYS
- Does not provide demographic or geographic breakdowns and can't be practically used.
- Census Bureau formally concluded this in Dec. '23

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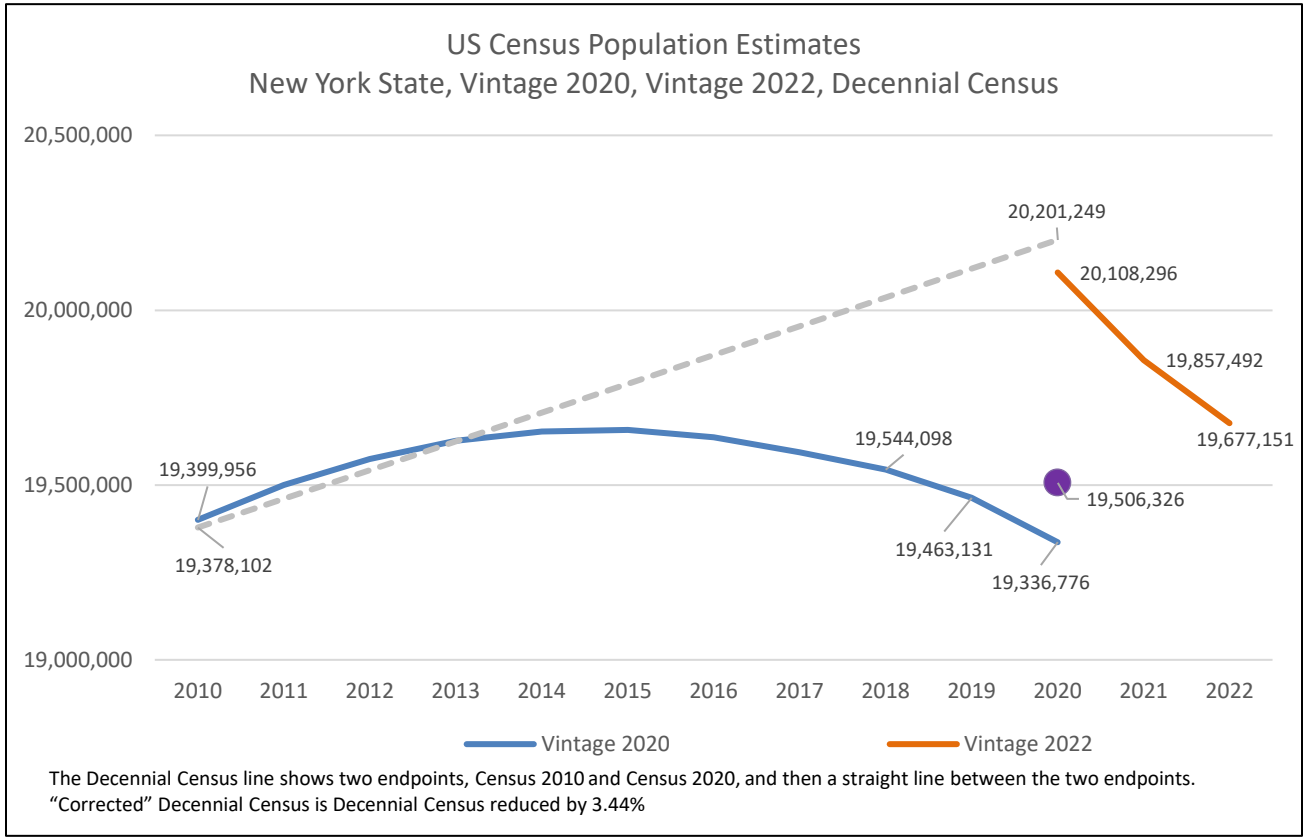
And then we received Vintage 2021, 2022



The Decennial Census line shows two endpoints, Census 2010 and Census 2020, and then a straight line between the two endpoints.
"Corrected" Decennial Census is Decennial Census reduced by 3.44%

- These are projections based on Decennial 2020!
- Use a new "blended base" using Decennial 2020 and other sources ("2020 demographic analysis"
- May however be "correcting" downwards in subsequent years.

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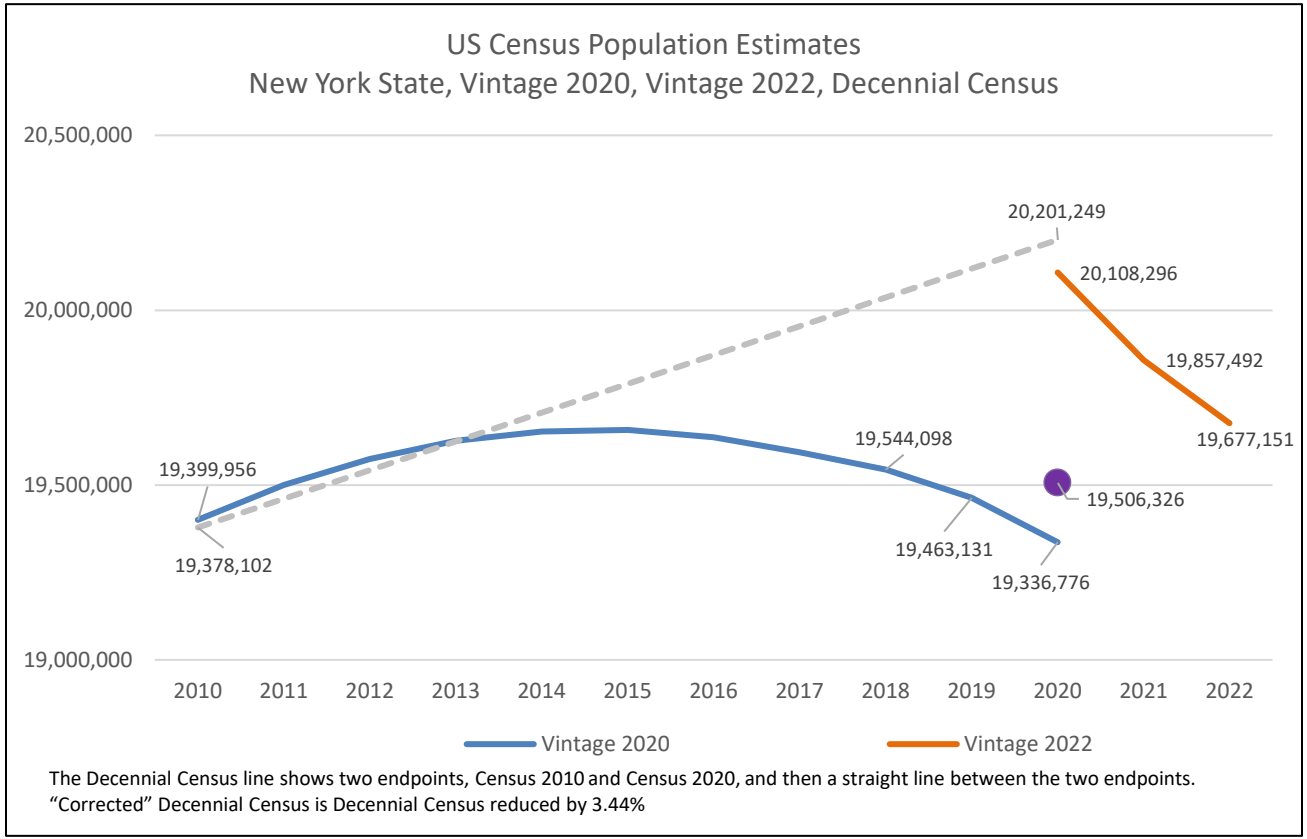
Summary of the different NYS population estimates



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"Corrected" Decennial Census is Decennial Census reduced by 3.44%

Summary of key problems:

1. Vintage 2020 estimates go down after 2015
2. Vintage 2020 is different from Decennial 2020 **and** from Vintage 2022.
3. Decennial Census may have been over-estimated by 3.44%
4. We have 4 estimates for 2020!

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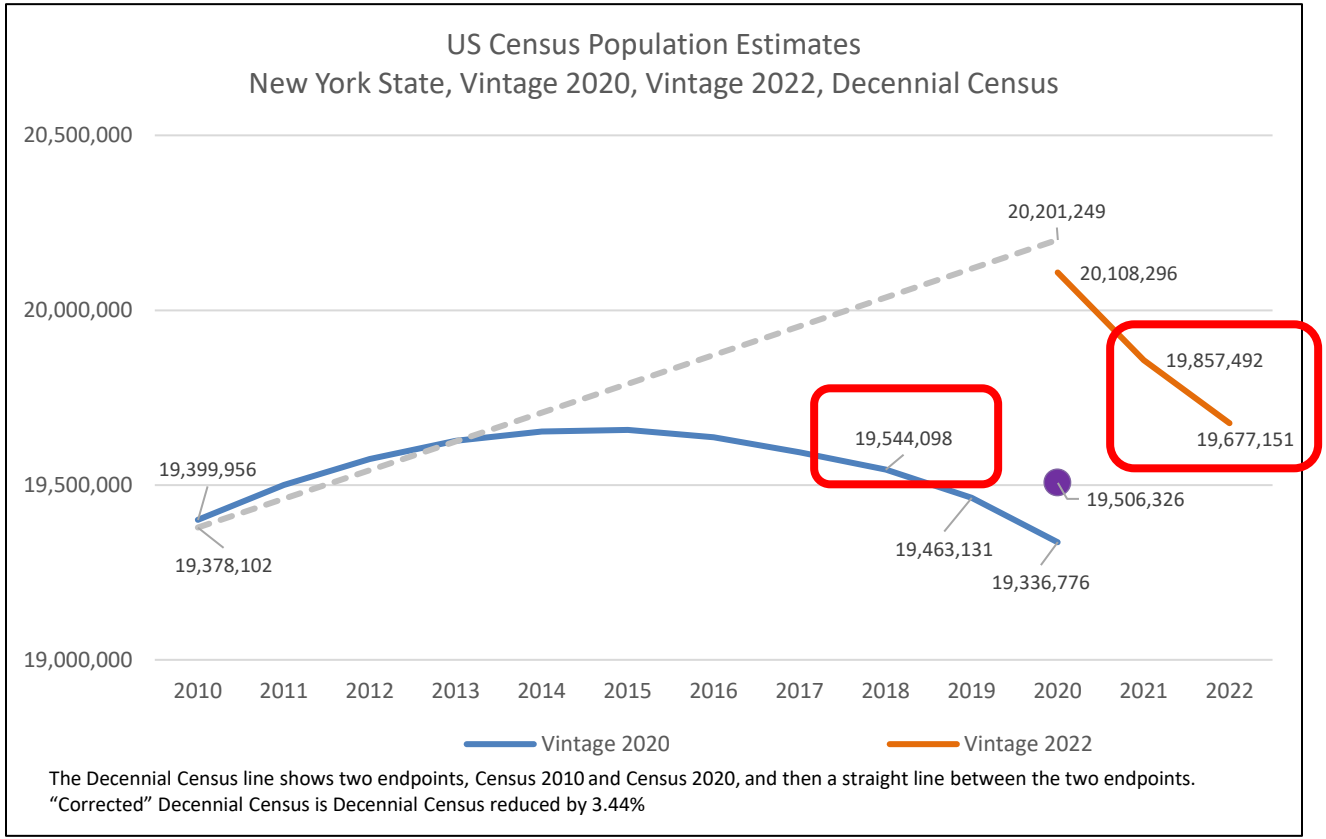
Recommendations of a working group

- **OPH**
  - Office of Science
  - Center for Community Health
  - Center for Environmental Health
- **OQPS**
  - Vital Statistics

Recommendations



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Current recommendation:

1. Use **2018** estimate for **2019** and **2020**.

2. Start from **2021** from Vintages after Vintage 2020, and then use each year after that.

Implemented on most Office of Science dashboards

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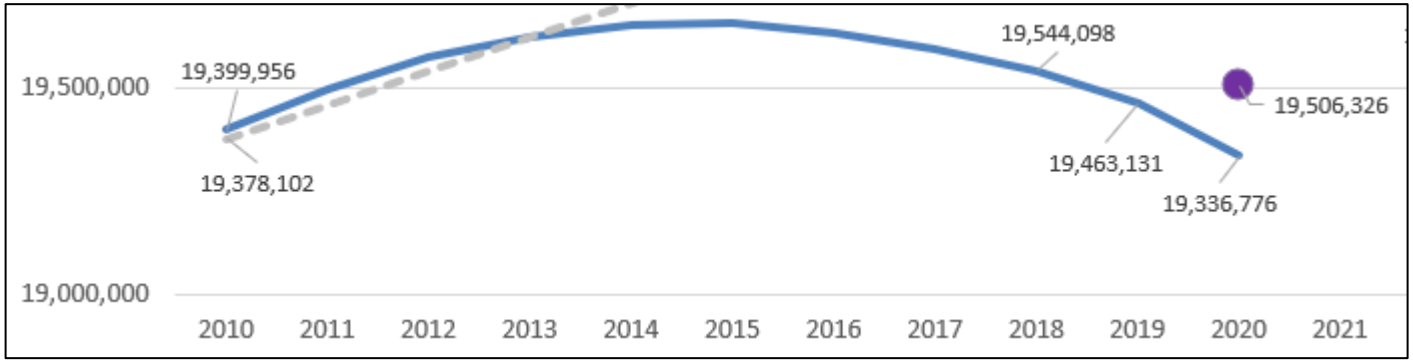
Recommendations for estimates 2020 and before

1. Use **2018** estimate for 2019 and 2020.

- What was available in March 2020 and has been used for COVID dashboards
- Continued to be used given *delays* in US Census files for Vintage 2020 and Decennial 2020.
- **Close to 2020 post-census survey estimate**
  - Decline in 2019 and 2020 unrealistic
  - Flat line for 2 years more realistic



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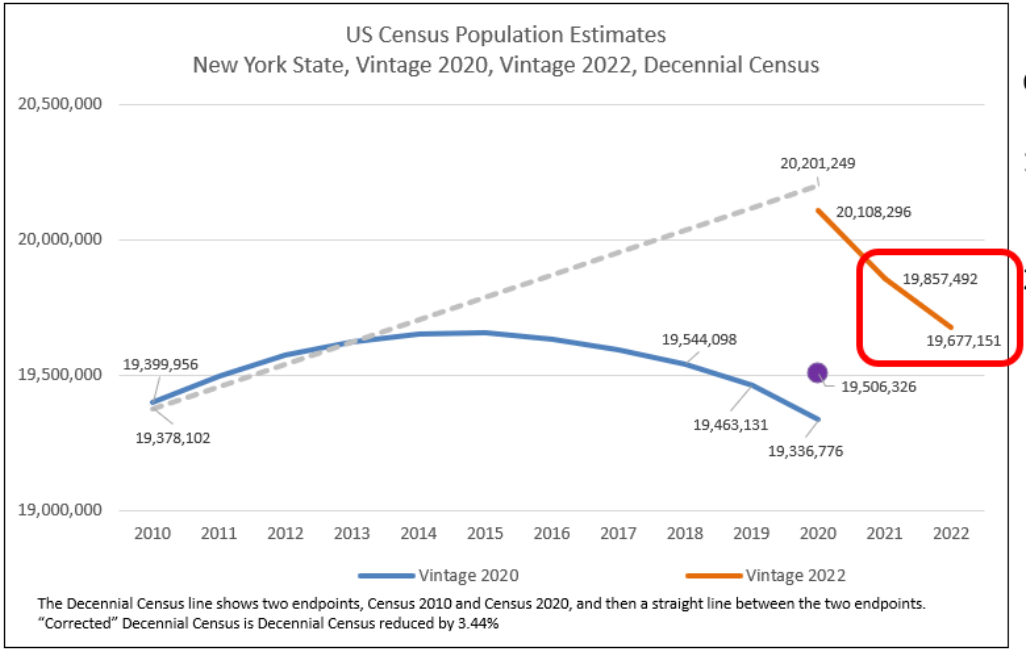
Recommendations for estimates 2021 and after

2. Starting from **2021** from Vintages after Vintage 2020, and then use each year after that.

We have no other choice!!



Outputs from our process

- Memo to staff explaining the issues and non-binding recommendations
- Website language for the public, to footnote dashboards
- Other issues discussed, resolved by workgroup and in memo:
  - Race/ethnicity category shifts across files
  - Availability of single-year age groups
- Datasets available upon program request
- Transitioning COVID and influenza dashboards to *annual* population changes

It keeps on coming

For Immediate Release: Thursday, April 11, 2024

Census Bureau Releases Experimental Estimates of State and County Undercounts and Overcounts of Young Children in the 2020 Census

April 11, 2024

Press Release Number CB24-CN.12

Census Bureau Initiatives to Address Persistent Undercount of Children

APRIL 11, 2024 – The U.S. Census Bureau today released new experimental estimates showing children ages 0 to 4 were undercounted in the 2020 Census in every state. Additionally, there were undercounts of children ages 0 to 4 in more than 4 out of 5 counties included in this release. The experimental estimates are available only for counties with a population of 1,000 or more children ages 0 to 4, and are based on the Census Bureau's Demographic Analysis (DA) estimates.

The number of U.S. children ages 0 to 4 counted in the 2020 Census was previously found to be about 1 million lower than the benchmark population estimate — an undercount of 5.46%. This was a larger undercount than any other

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Contact

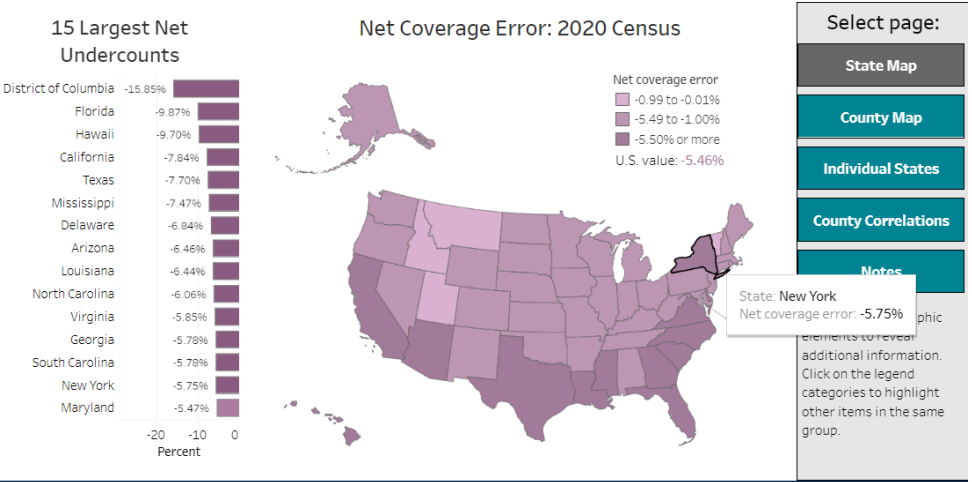
Public Information Office
301-763-3030 or
877-861-2010 (U.S. and Canada only)
pio@census.gov

Error in counting children < 5 years in Census 2020

Net Coverage Error for Young Children (Aged 0–4) in the 2020 Census

The **net coverage error** is the difference between the census count of a population and an external benchmark. In this case, the external benchmark is Demographic Analysis (DA)—a U.S. Census Bureau method that uses data on births, deaths, domestic migration, and international migration to produce state and county estimates of the population aged 0 to 4 on Census Day (April 1, 2020).

Throughout this visualization, **negative** net coverage errors indicate undercounts in the 2020 Census and **positive** net coverage errors indicate overcounts in the 2020 Census.



United States Census Bureau | U.S. Department of Commerce | U.S. CENSUS BUREAU | census.gov

Source: 2020 Demographic Analysis (April 2024 release) and 2020 Census special tabulation (CBDRB-FY24-0218)

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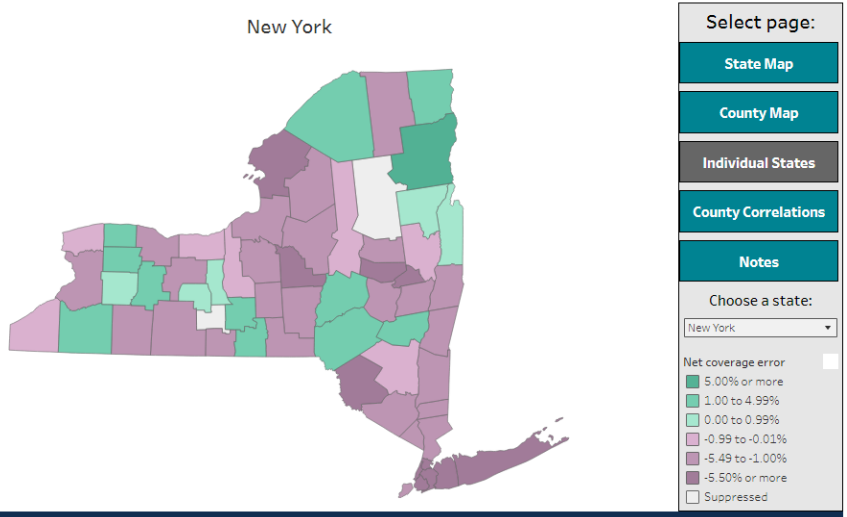

United States Census Bureau | U.S. Department of Commerce | U.S. CENSUS BUREAU | census.gov

Source: 2020 Demographic Analysis (April 2024 release), 2020 Planning Database Special Release State and County Data, and 2020 Census special tabulation (CBDRB-FY24-0218)

- Top 3 undercounted: Queens (-11.6%), Suffolk (-9.15%), Bronx (-8.91%)
- Top 3 overcounted: Essex (8.66%), Tioga (4.29%), Livingston (3.56%)

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Thanks to the great team!

Office of Science
- ***Gene Shackman***
- Trang Nguyen
- Stephanie Mack
- Changning Xu
- Christopher Davis
- Wei Fan

Center for Community Health
- Vajeera Dorabawila

Center for Environmental Health
- Michael Bauer
- Emilia Pawlowski

Vital Statistics
- Tatiana Ledneva
- Stephen Goins
- Mingzeng Sun
- Sylvia quick

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  - Making *Sense* of the *Census* Estimates for New York State's Population

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  - ***A New NYS Sub-Regional Schema***

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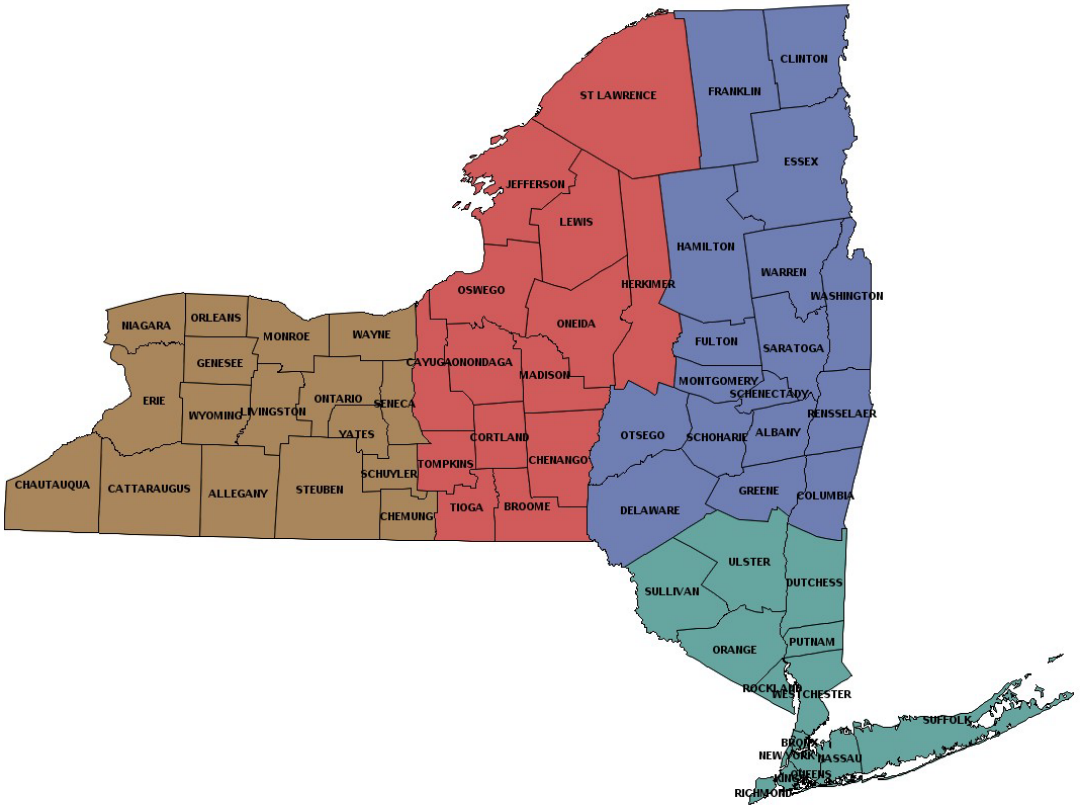
Purpose

NYS DOH Regions



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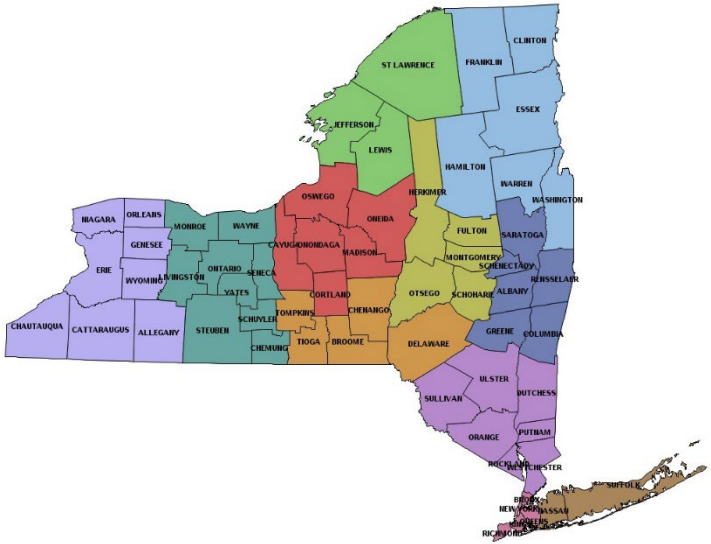
How to get more granular? Two of many schemes…



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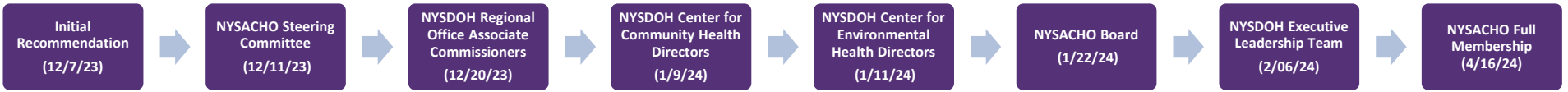
Move away from Regional Economic Development Council Regions (REDC)

- Used for COVID-19 data and reporting
- Offered more granular view of data
- Designed for state economic development
- Not particularly epidemiologically focused
- Does not maintain integrity of DOH Regional Office boundaries

Define a Sub-Regional Schema for data that:

- Maintains integrity of DOH Regional Office boundaries
- Considers economic and social interaction between counties/communities
- Offers a more granular and intermediate view of data
- Informed by DOH programs and Local Health Departments



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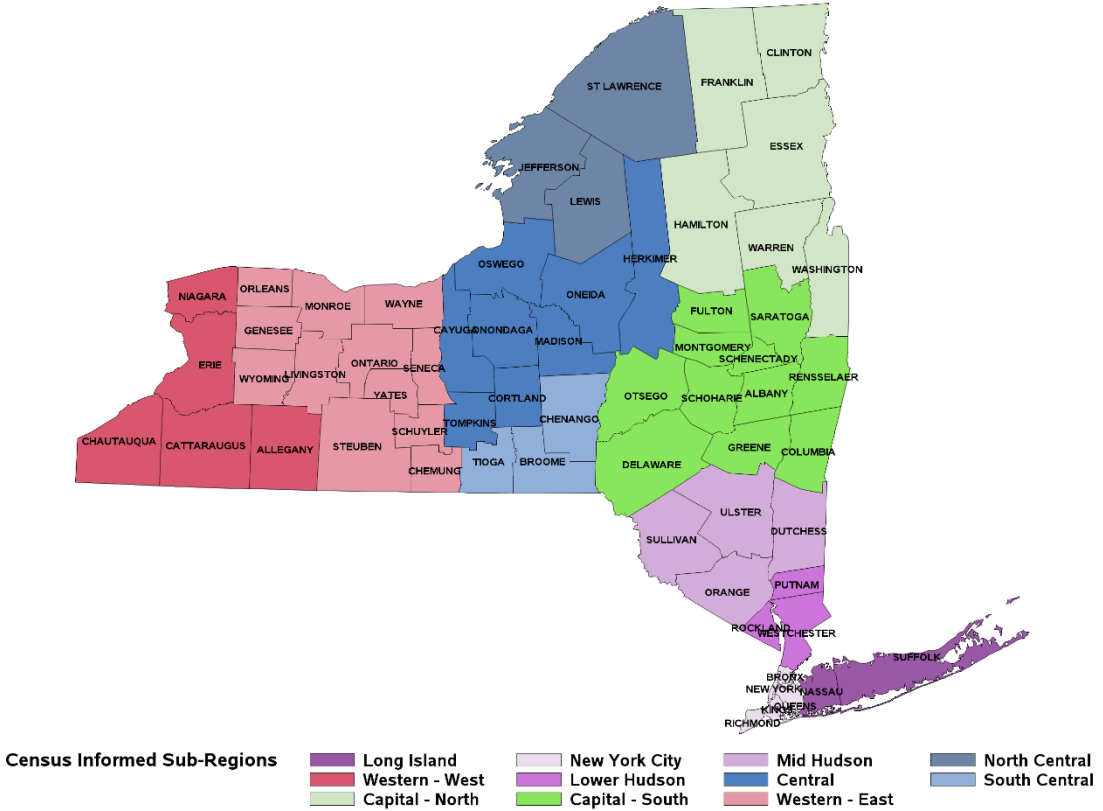
Office of Science Recommendation

Census Informed Sub-Regional Schema (N=11)

Population by Census Informed Sub-Regions, NYS, 2022			
Sub-Region	**Counties (N)**	**Population (N)**	**Percent (%)**
New York City	5	8,335,897	42.4%
Long Island	2	2,909,191	14.8%
Lower Hudson	3	1,427,494	7.3%
Western - West	5	1,410,352	7.2%
Western - East	12	1,402,910	7.1%
Capital - South	11	1,221,632	6.2%
Central	8	1,168,202	5.9%
Mid Hudson	4	965,463	4.9%
South Central	3	291,347	1.5%
Capital - North	6	293,594	1.5%
North Central	3	251,069	1.3%
Total	**62**	**19,677,151**	**100.0%**

Table Notes: 1) Population Data Source: CDC WONDER Single-Race Population Estimates, United States, Vintage 2022.

- Recommended sub-regional schema
- Maintains integrity of DOH Regional Office boundaries
- Aligns with all MSAs
- Product of many rounds of feedback

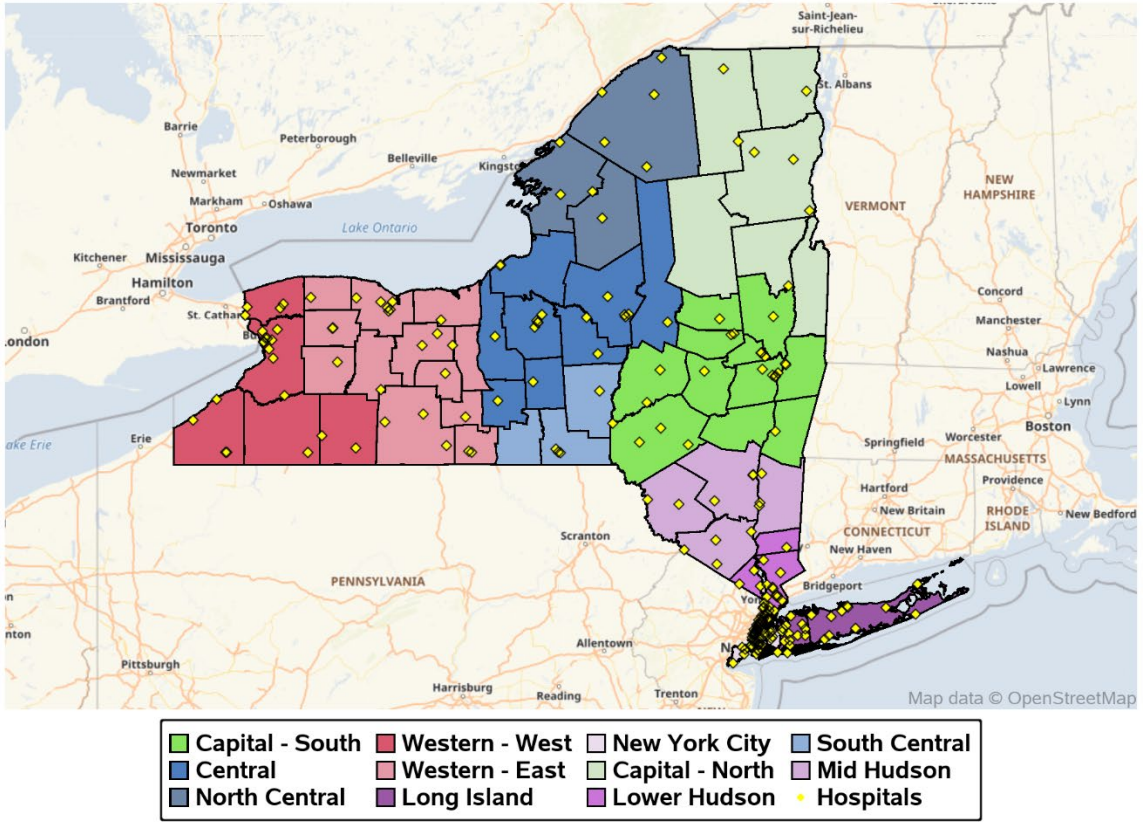


Census Informed Sub-Regional Schema (N=11)

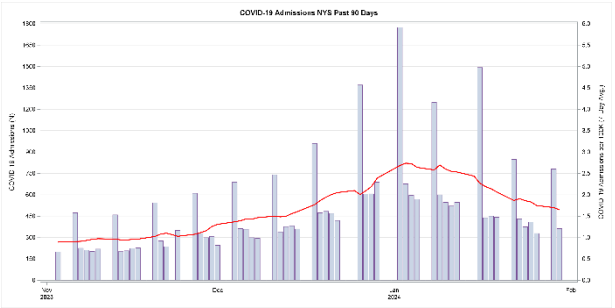
Hospital Distribution by Census Informed Sub-Regions, NYS, 2023		
Sub-Region	**Hospitals (N)**	**Percent (%)**
New York City	63	28.5%
Long Island	23	10.4%
Capital - South	22	10.0%
Western - West	22	10.0%
Western - East	22	10.0%
Lower Hudson	20	9.0%
Central	17	7.7%
Mid Hudson	12	5.4%
North Central	9	4.1%
Capital - North	7	3.2%
South Central	4	1.8%
Total	**221**	**100.0%**

Hospital Data Source: New York State Department of Health. (2023). Health Facility General Information [Data file]. Retrieved from https://health.data.ny.gov/d/vn5v-hh5r?category=Health&view_name=Health-Facility-General-Information.

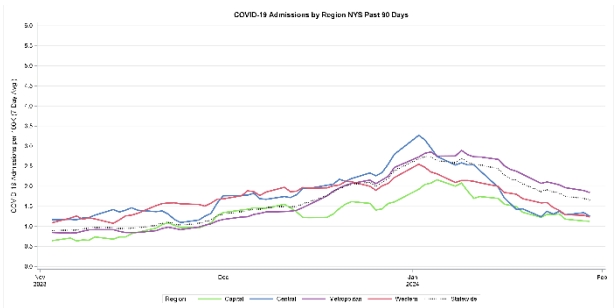
- Recommended sub-regional schema
- All sub-regions contain ≥4 hospitals



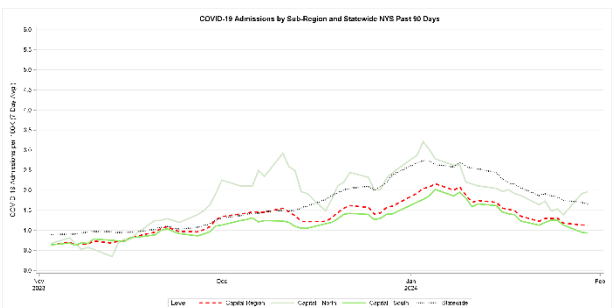
Sub-Regional Data Breakdown – COVID-19 Hospitalization Rates



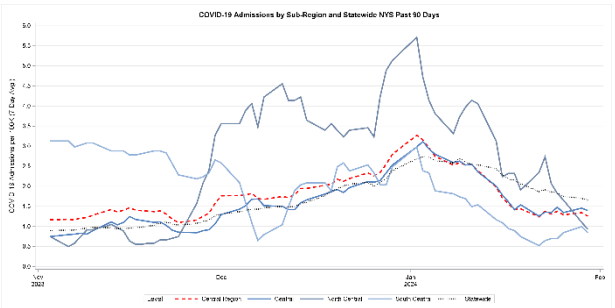
Statewide



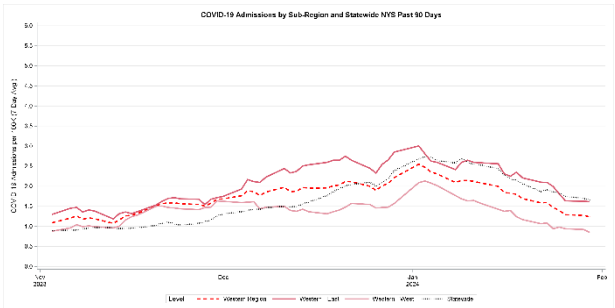
Regional



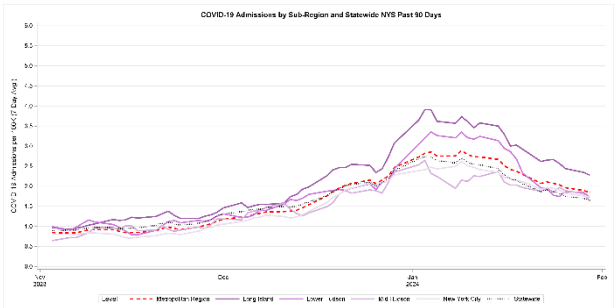
Capital Region & Sub-Regions



Central Region & Sub-Regions



Western Region & Sub-Regions



Metro. Region & Sub-Regions

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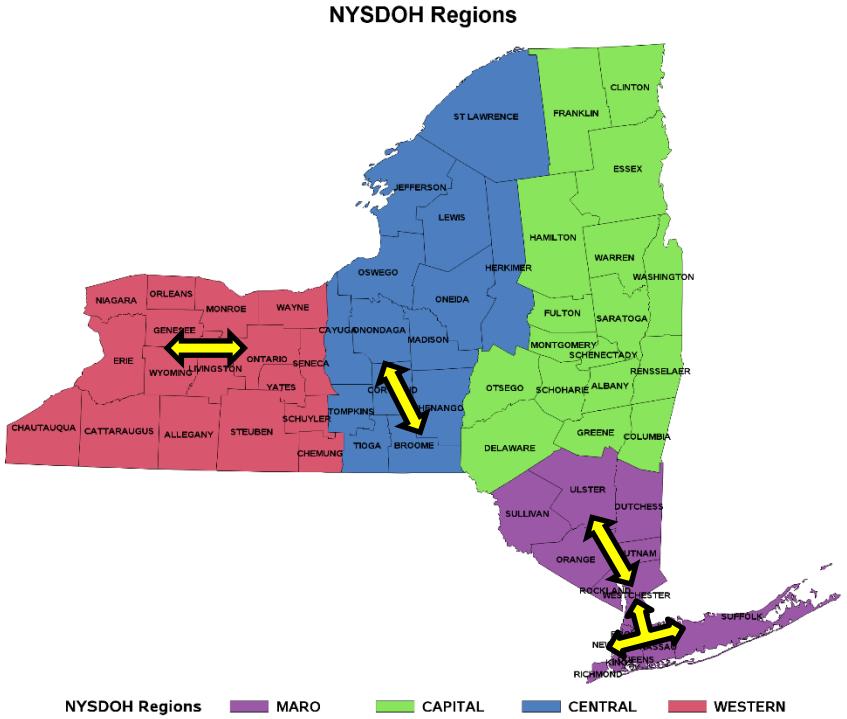
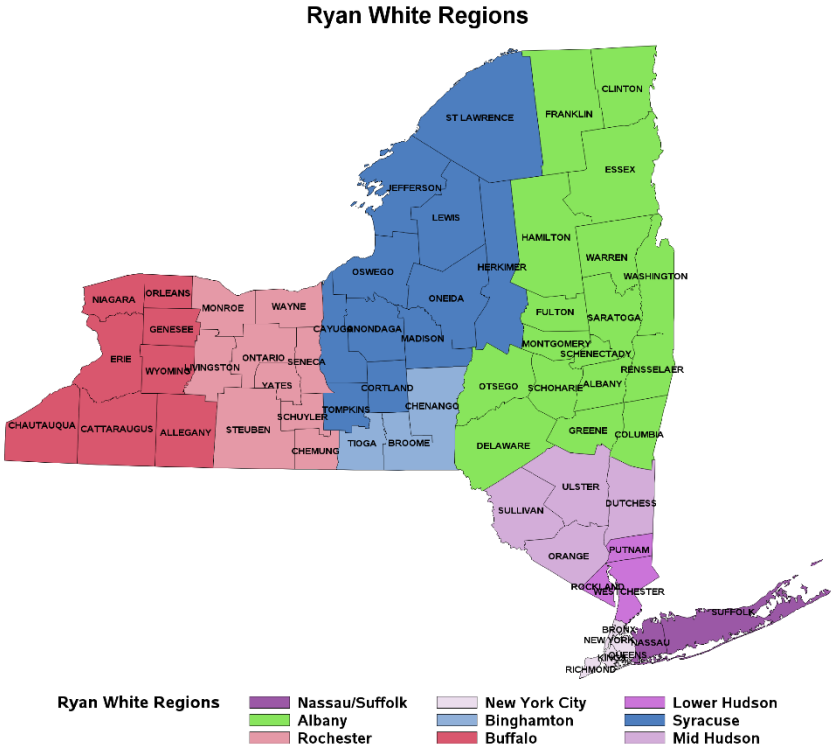
Data as of January 30, 2024

Rationale

DOH Regional Offices (N=4) to Ryan White Regions (N=9)





Core Based Statistical Areas

Core

- Urbanized area or urban cluster of ≥10,000 population

Core Based Statistical Area (CBSA)

- Statistical geographic entity
- Consists of the core county + adjacent counties with a high degree of social and economic integration with the core

Standards Set and Applied to Census Bureau Data

- 2020 Census and 2016-2020 American Community Survey Data
- “Census Informed”
- Updated by Office of Management and Budget (OMB) every 10 years

Core Based Statistical Areas, Cont.

Metropolitan Statistical Area (MSA)

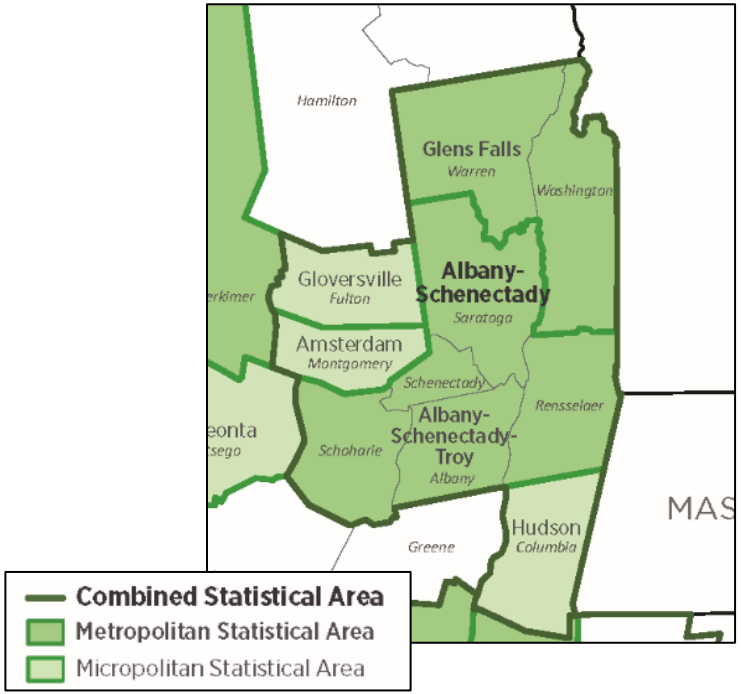
- CBSA associated with ≥1 core and with ≥50,000 population

Micropolitan Statistical Area (μSA)

- CBSA associated with ≥1 core and with 10,000 – less than 50,000 population

Combined Statistical Area (CSA)

- Combination of adjacent MSAs and μSAs demonstrating economic or social linkage measured by commuting ties



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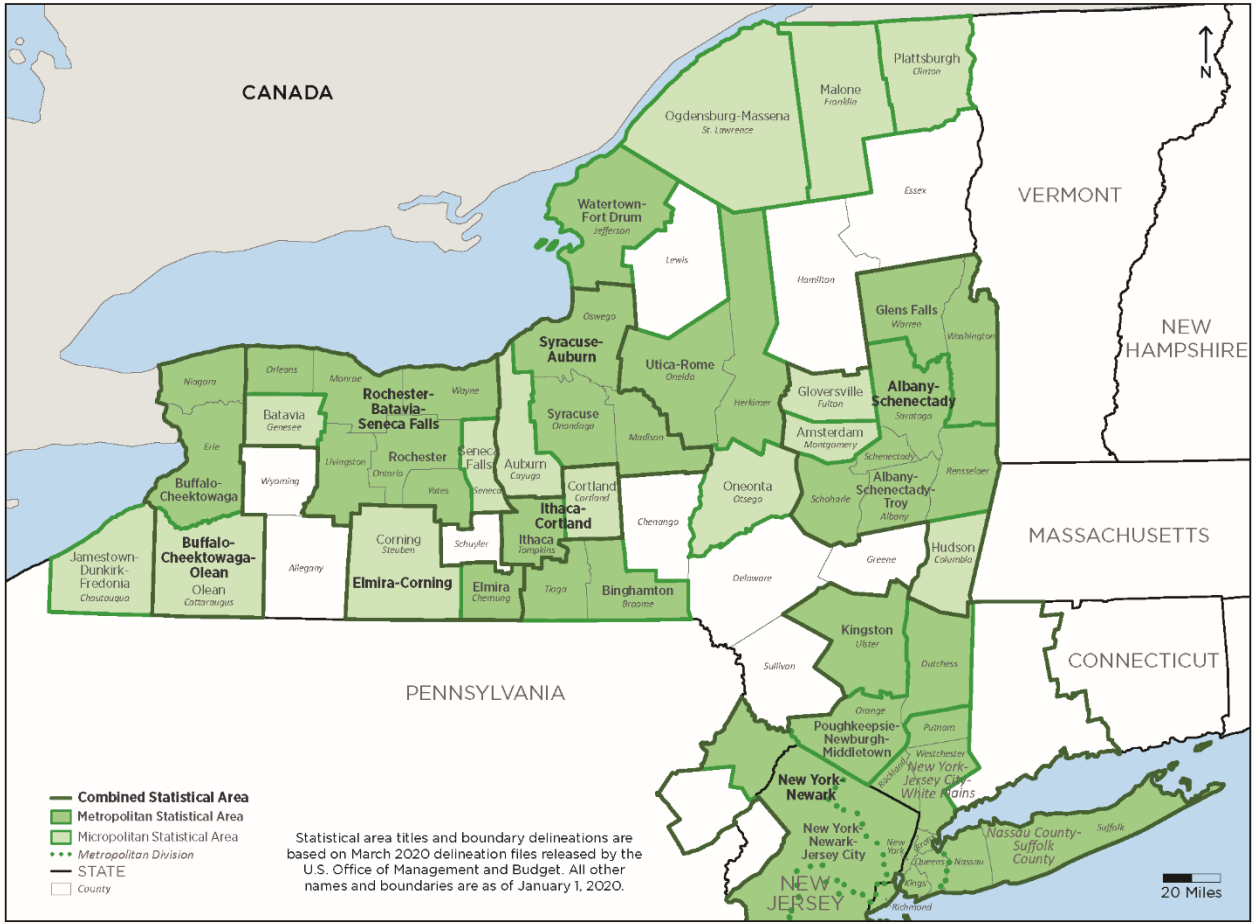
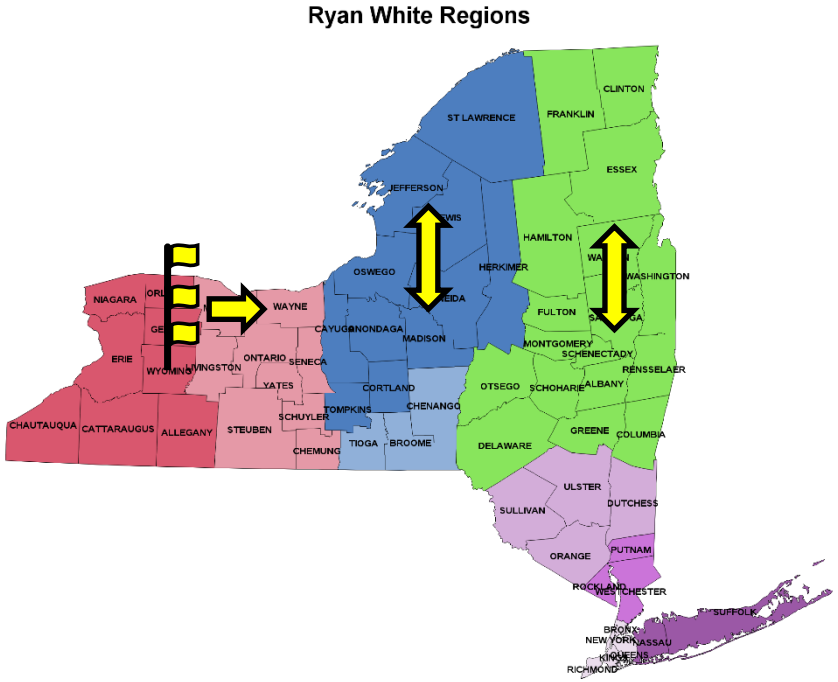
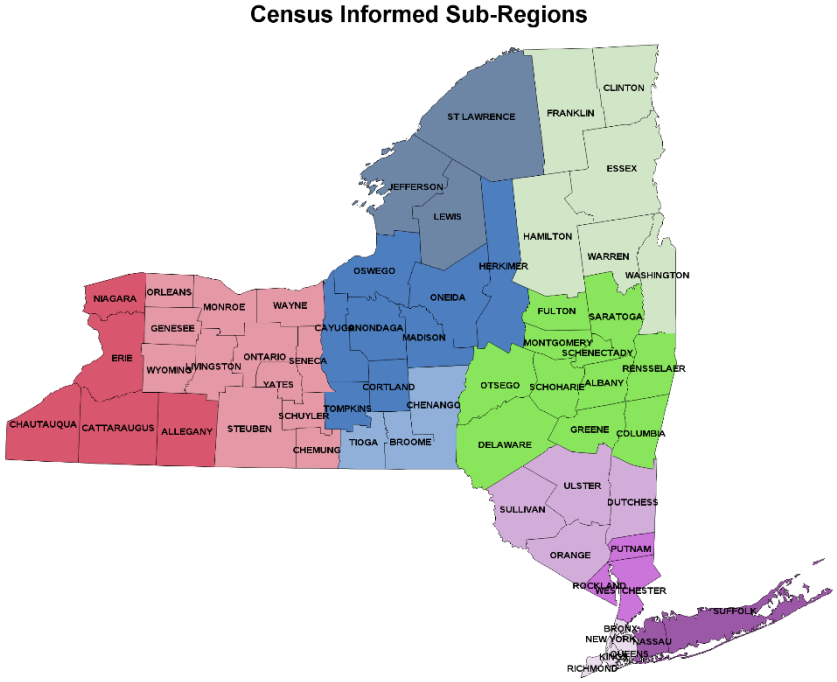


U.S. Census Bureau, Population Division

Ryan White (N=9) to Census Informed Regions (N=11)





Ryan White Regions

- Nassau/Suffolk
- Albany
- Rochester
- New York City
- Binghamton
- Buffalo
- Lower Hudson
- Syracuse
- Mid Hudson

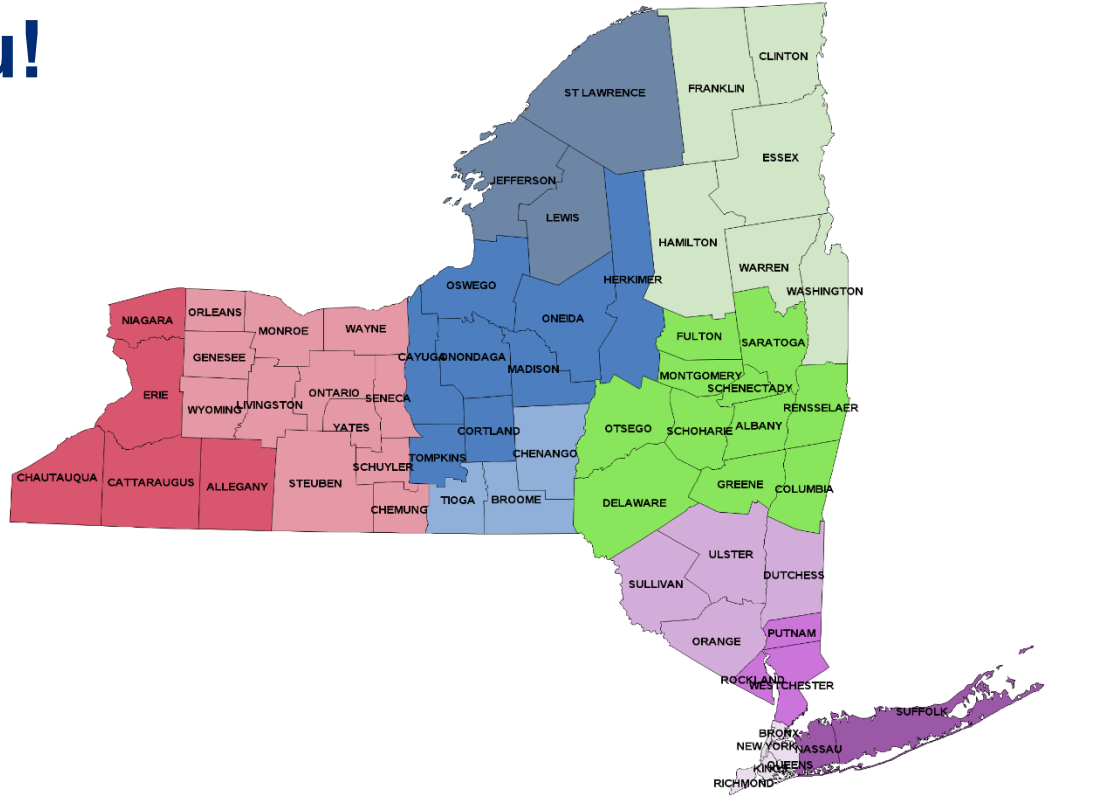
Census Informed Sub-Regions

- Long Island
- Western - West
- Capital - North
- New York City
- Lower Hudson
- Capital - South
- Mid Hudson
- Central
- Western - East
- North Central
- South Central

Other Schemas Examined

NYS Regional Schema	Regions	CBSA Violations	Comments
Regional Economic Development Councils (REDC)/Labor Market Regions	10	3	Violates a few CBSAs, regions do not maintain integrity of DOH Regional Office boundaries, & not epidemiologically focused
NYS Health Service Areas/SPARCS Hospital Service Areas	8	2	Areas 3 (Central NY) and 5 (Capital Region) can be further stratified, essentially Ryan White regional schema
DSRIP/BRFSS Regions (PHIP)	11	6	Violates **many** CBSAs
DSRIP/BRFSS Regions (DOH)	8	5	Violates **many** CBSAs & regions do not maintain integrity of DOH Regional Office boundaries
Regional Emergency Medical Service Councils	18	8	Violates **many** CBSAs
Office of Mental Health Field Offices	5	2	Larger number of regions preferred for more granular data view
Office of Mental Health Regional Planning Consortium	11	6	Violates **many** CBSAs
Vital Statistics Electronic Death Registration System	7	1	Larger number of regions preferred for more granular data view
eQUARR/Managed Medicaid Regions	6	0	Larger number of regions preferred for more granular data view, essentially NYS Health Service Areas if Central and Western Regions stratified
CDC Health Service Areas	21	0	Too many regions & regions cross state lines

Thank you!



Questions, comments, and general feedback can be emailed to ethan.mitchell@health.ny.gov

Thank you!

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