Looking Beyond 2020: The Local Perspective on Census Bureau Methods for Estimating the Population

Data Science for the Public Good Seminar
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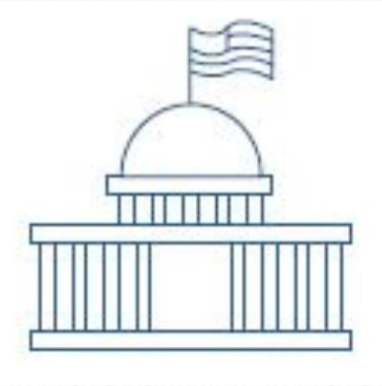
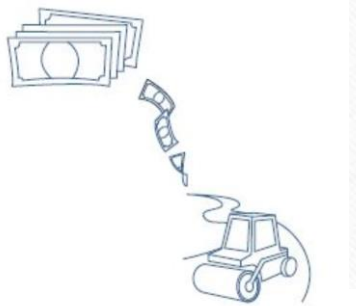
Why Are Population Estimates Important?

Allocating Federal Funds - money for programs and services that contain a population component -- more than 2.8 trillion dollars annually (FY 2021)



Local Planning - foundation for Emergency management, school construction…and our public health response to epidemiological crises



Controls for Surveys – weighting to a universe and post-stratification adjustments to compensate for non-response

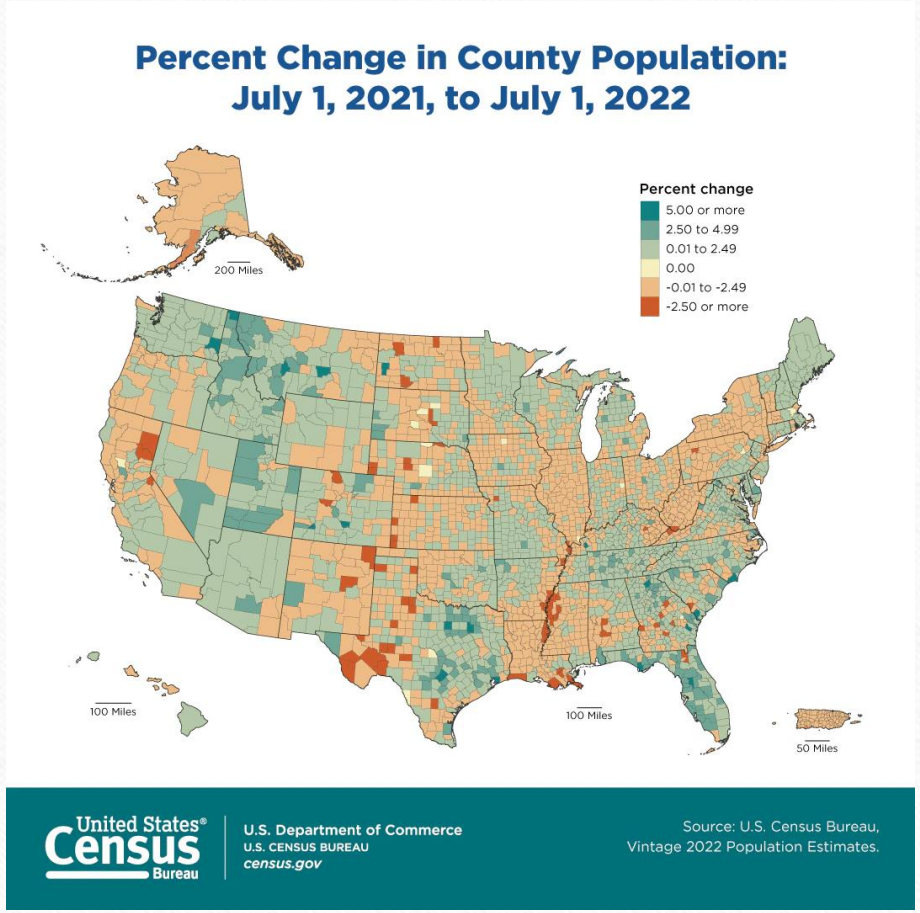
Two Methods Used by the Census Bureau

1. Cohort-Component Method for the Nation, States and Counties

2. Distributive Housing Unit Method for Sub-county Areas

Population Estimates: Counties

- Lowest geographic unit for which this method is employed.
- Regarded as the best method by the Census Bureau.
- All geographic units below the county level must add to county totals.



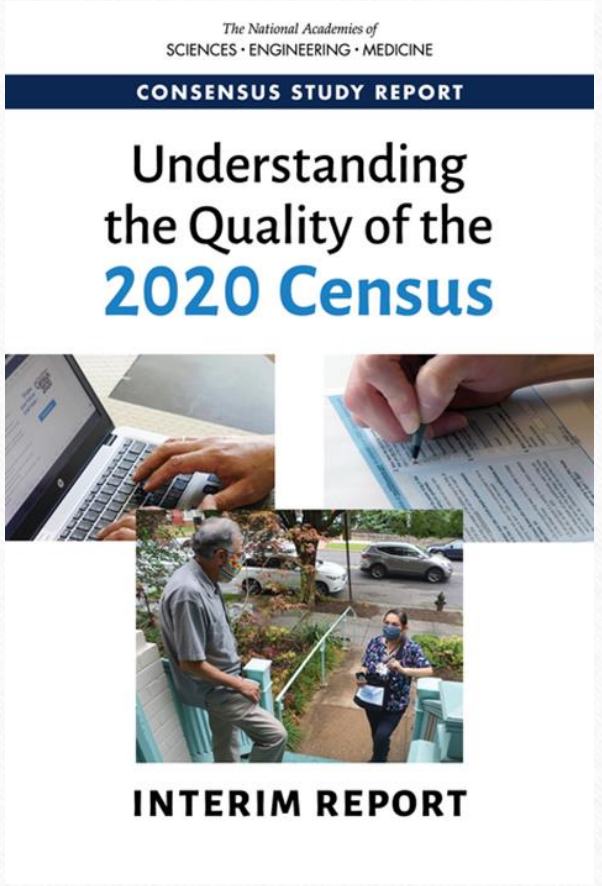
National, State, and County Estimates:
Cohort-Component Method

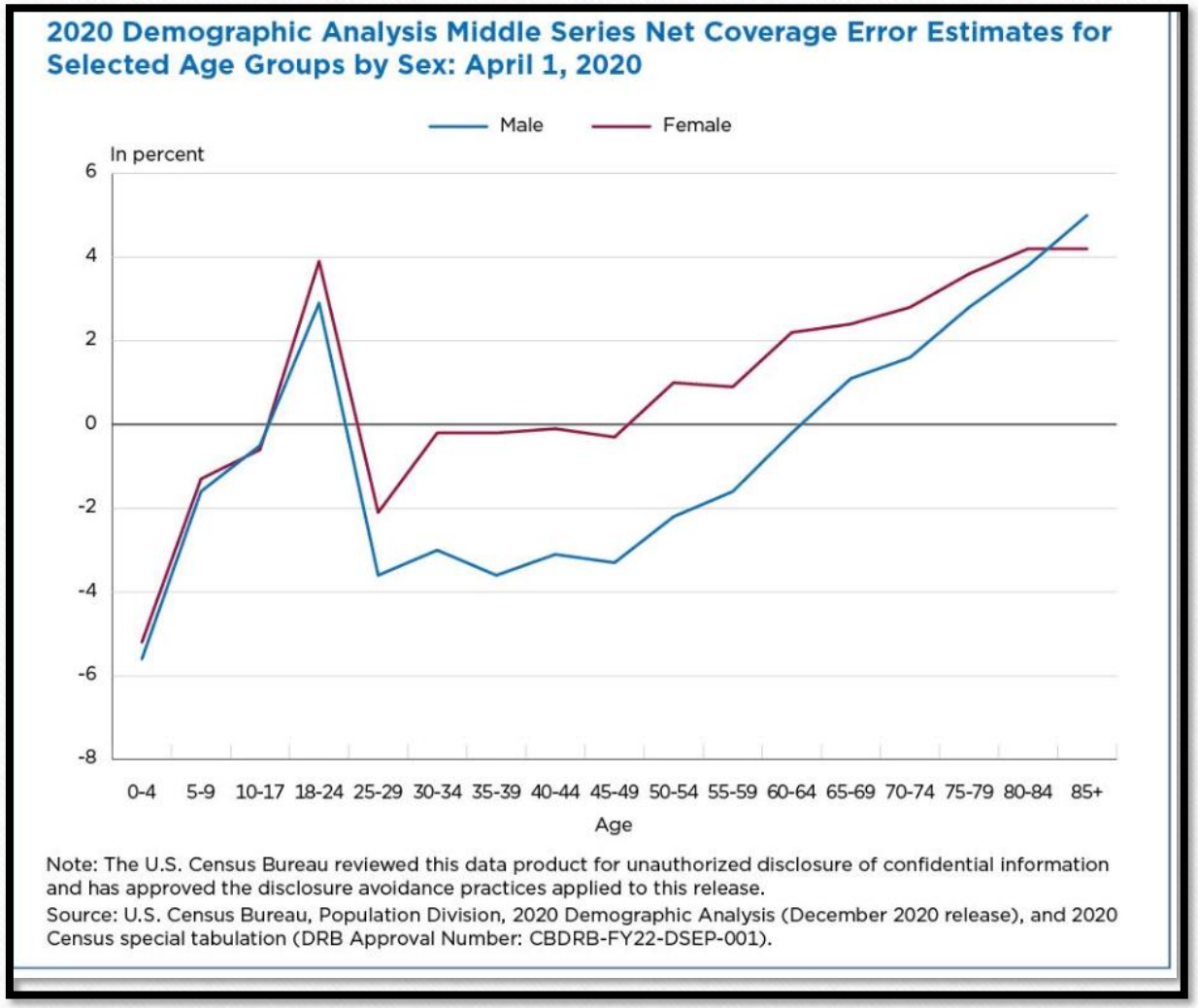
- Cohort-component method measures population change since the last census using the most current administrative records on births, deaths, and migration
- Population base represents the date of the latest decennial census

United States Census Bureau

New for the 2020 Census

Given a number of issues with the 2020 Census, including delays in the release of data, the Census Bureau created the "blended base" as the starting point for post-2020 population estimates.



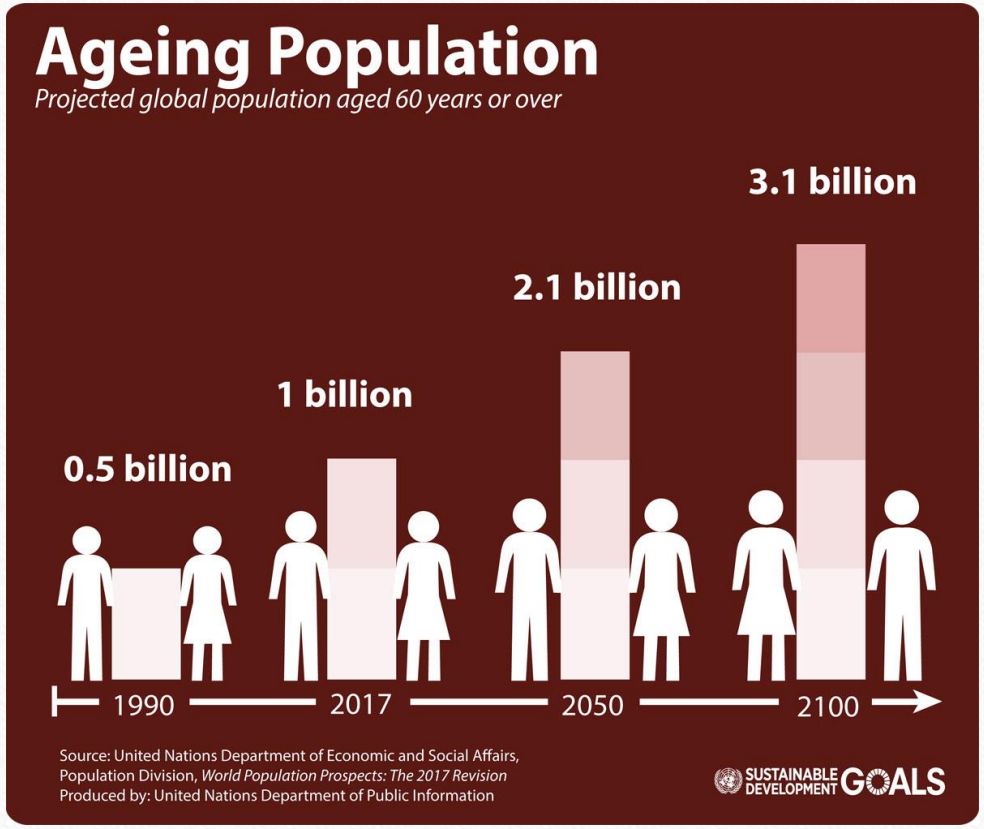


- If the census count exactly matched the DA count, all points on the line would be at zero, indicating no difference.
- **Net undercounts in the census fall below the line**, as is the case with those 0-4 years of age
- **Net overcounts in the census are above the line,** as with those 18-24 years and those in the oldest ages.

These Coverage Estimates Were Used to Adjust the 2020 Census Base for Population Estimates

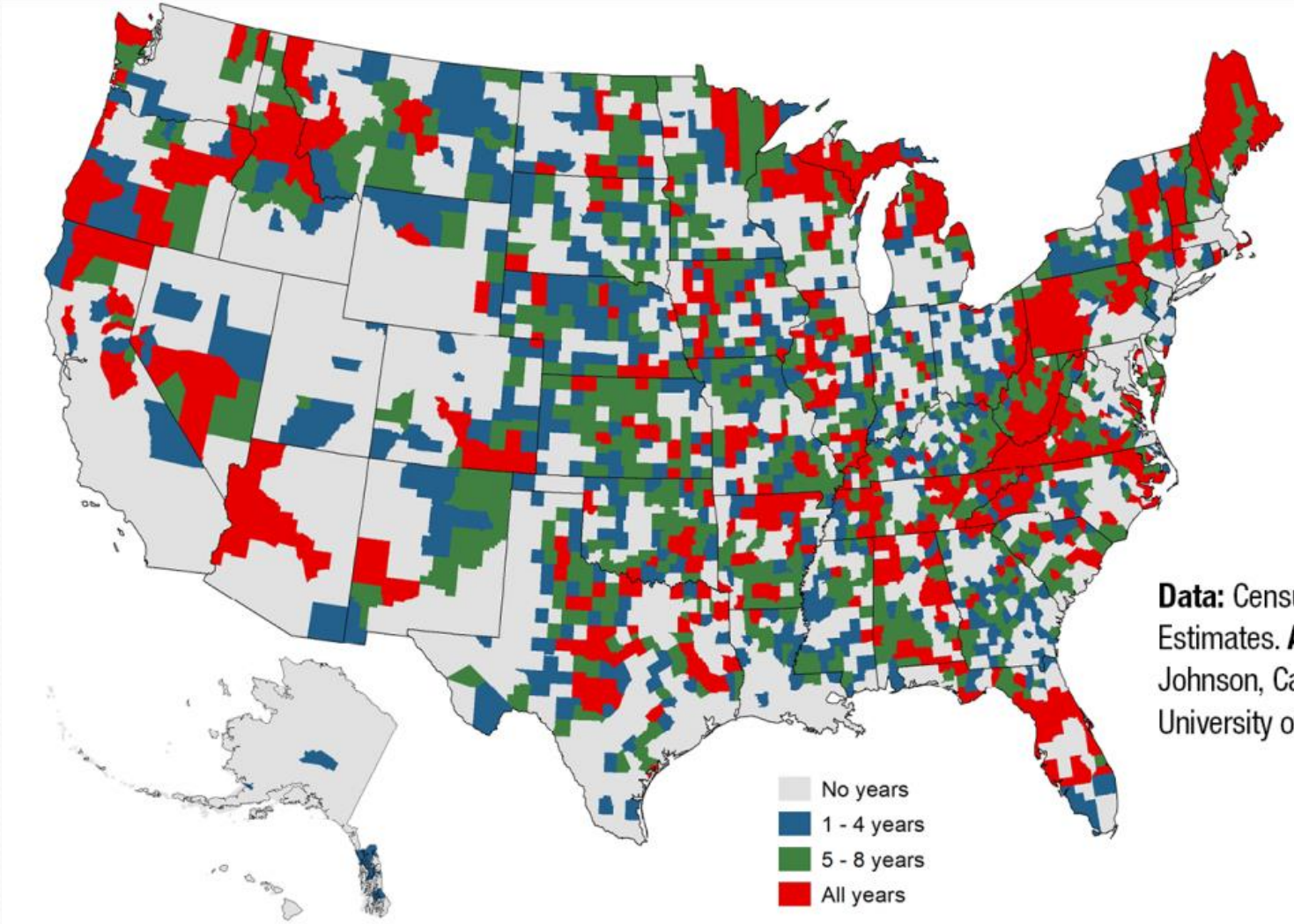
Primary Sources: Natural Increase

- **Births and Deaths** from NCHS* with input from the FSCPE**
- Data are time-lagged, with adjustments using provisional data where available.
- Missing information on the characteristics of births and deaths is a problem, as is the reporting of deaths for persons 70+ years of age.



*NCHS – National Center for Health Statistics
** Federal-State Cooperative on Population Estimates

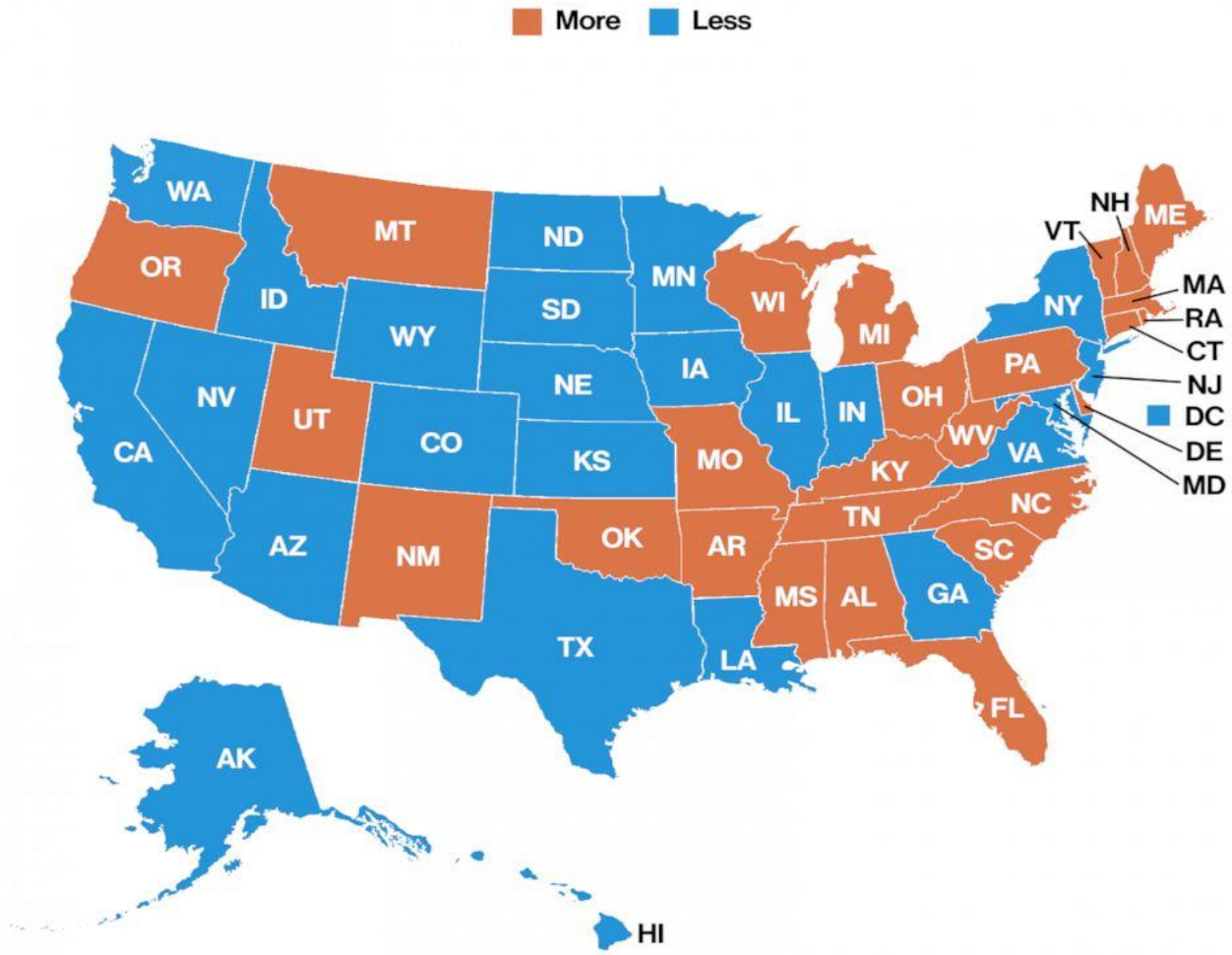
NUMBER OF YEARS IN WHICH COUNTY DEATHS EXCEEDED BIRTHS, 2010 TO 2019



Data: Census Bureau Population Estimates. **Analysis:** K.M. Johnson, Carsey School, University of New Hampshire.

U.S. States with More Deaths than Births

JULY 1, 2020 – JUNE 30, 2021

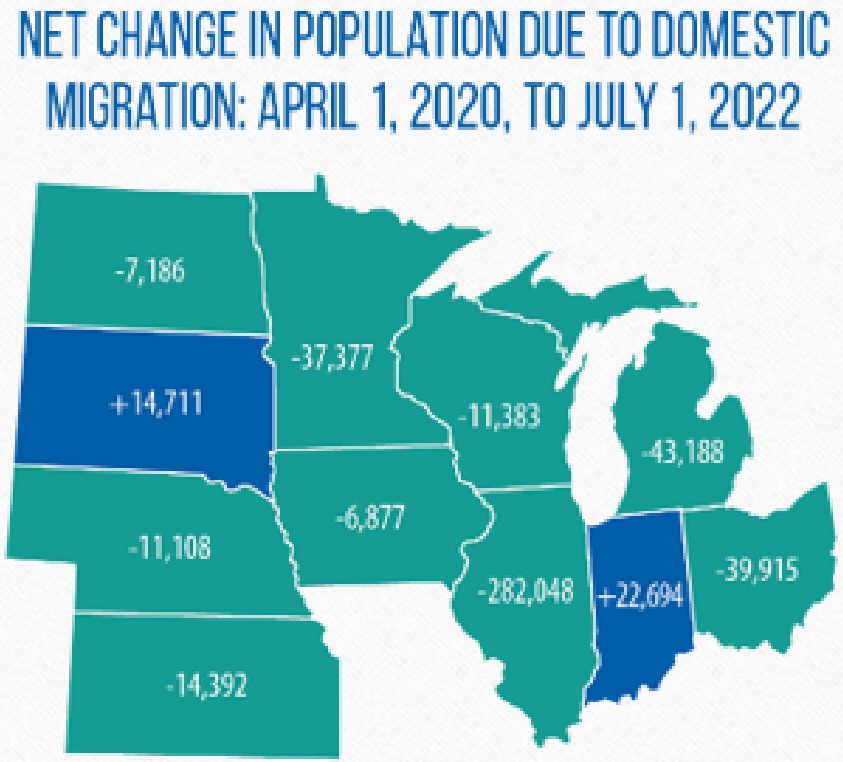


SOURCE: U.S. CENSUS BUREAU, VINTAGE 2020 AND VINTAGE 2021 ESTIMATES

abc NEWS

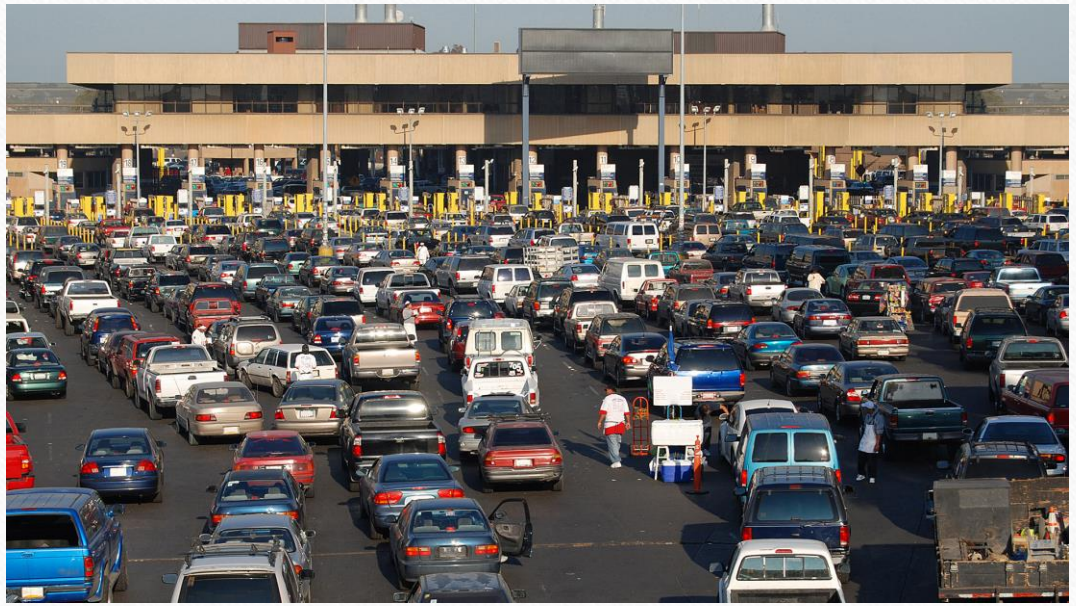
Primary Sources: Net Domestic Migration

- Internal Revenue Service (IRS) Tax Returns matched from year to year
- Medicare enrollment from the Center for Medicare and Medicaid Services (CMS) for persons 65 and Over
- Social Security Administration's Numerical Identification File – a list of all Social Security numbers ever assigned, updated annually

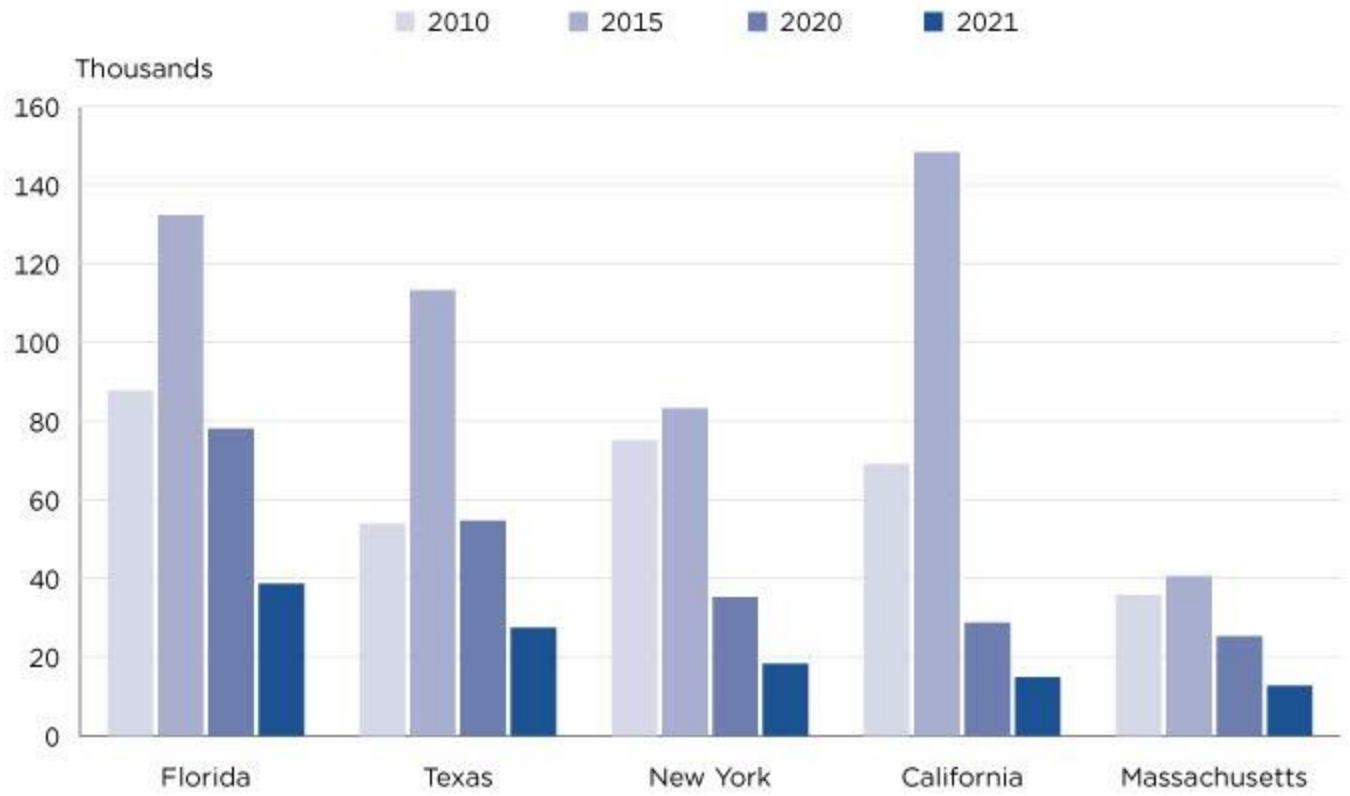


Primary Sources: Net International Migration

- Residence one year ago – Abroad (ACS)
- Birthplace and year of arrival (ACS)
- Estimates of emigration from the U.S. using death data from NCHS
- NUMIDENT database of all Social Security Numbers ever assigned



International Migration of Select High-Immigration States: 2010, 2015, 2020, and 2021



Source: U.S. Census Bureau, Vintage 2021 Population Estimates, July 1 to June 30.

		Total Population Change	Natural Increase			Net Migration		
			Total	Births	Deaths	Total	Net Domestic Migration	Net International Migration
April 2020 to July 2022	**New York City**	**-468,293**	**48,464**	**217,278**	**168,814**	**-502,601**	**-577,886**	**75,285**
	Bronx	-92,708	7,860	40,112	32,252	-100,160	-115,707	15,547
	Brooklyn	-145,558	26,693	77,186	50,493	-168,175	-187,453	19,278
	Manhattan	-97,978	4,398	33,291	28,893	-94,209	-109,327	15,118
	Queens	-127,435	8,774	55,466	46,692	-134,470	-158,356	23,886
	Staten Island	-4,614	739	11,223	10,484	-5,587	-7,043	1,456

Note: Population change was calculated using the 2020 Census, July 1, 2020, 2021 and 2022 population estimates. The estimated components of population change will not equal the numerical population change because of a small residual after controlling to the national totals.

Source: U.S. Census Bureau, Population Estimates Program (Vintage 2022)

Population Estimates: Subcounty areas

- *Distributive housing unit method* - distribute household population change at the county level based on local change in housing units.
- Create ratio of persons per housing unit to create an “uncontrolled” household population.
- The “uncontrolled” calculation is done for each subcounty area and then “controlled” to the total for a county.

Housing Unit Estimates:
Components of Change Method

- Components of change method measures changes to the housing stock since the last census using a variety of survey and administrative data
- Housing unit base is created from invariant 2020 Census housing unit counts

United States® Census Bureau

HOUSEHOLD POPULATION ESTIMATES: HOUSING-UNIT METHOD

Using updated housing units, Census creates an "uncontrolled" household population for each Town.

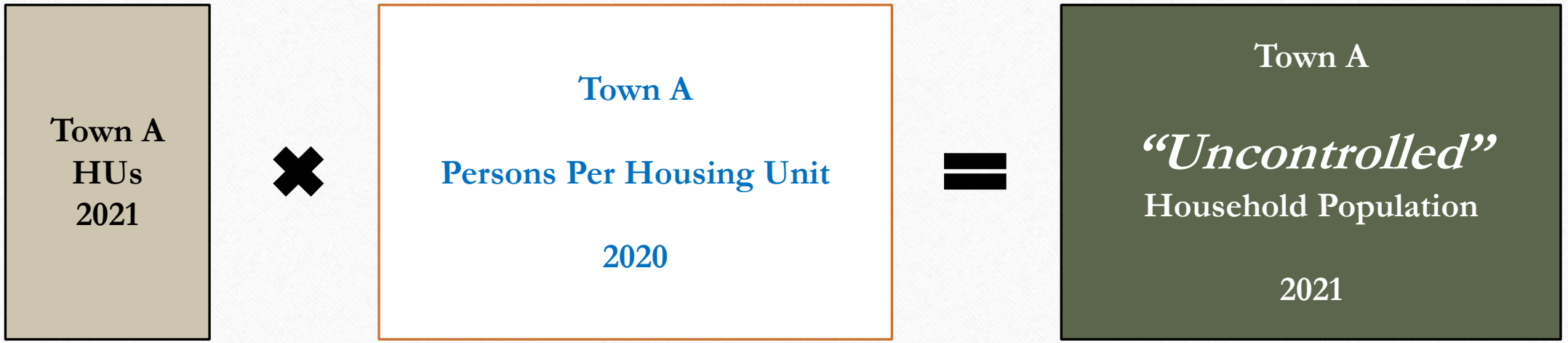
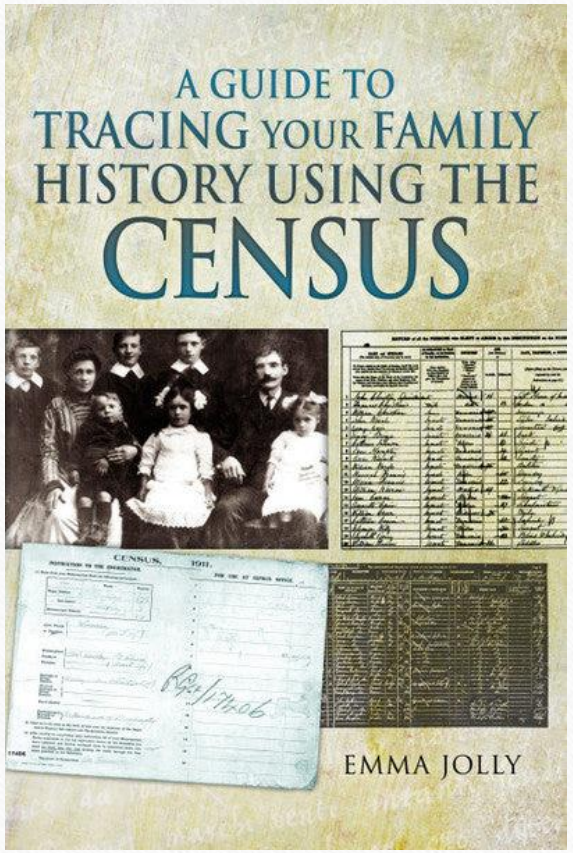


Chart Courtesy of the Donahue Institute, UMassAmherst

A Look into The Future

- The intercensal population estimates will continue to be important because they drive funding and local decision-making
- There is increasing pressure on the Census Bureau to consider alternate methods, using more locally-relevant data

Thank you!



United States Census 2020 Historical Population Data

1910 1920 1930 1940 1950 1960 1970 1980 1990 2000 2010 2020

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