2023 National Population Projections

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This presentation is released to inform interested parties of ongoing research and to encourage discussion of work in progress. Any opinions and conclusions expressed herein are those of the author(s) and do not reflect the views of the U.S. Census Bureau.

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2023 National Projections

- Released November 2023
  - First Census projections to include 2020 Census data
- Includes a main series and three alternative immigration scenarios
  - Low, High and Zero
- Covers 2023-2100
  - Age, sex, race, Hispanic origin and nativity through 2060
  - Limited to age, sex and nativity for 2061-2100
- Contains updated data for the base and components of change
- Produced using the same methodology as the 2017 projections with some minor changes

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Methods and Assumptions

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The Cohort-Component Method

$$P_t = P_{t-1} + B_{t-1,t} - D_{t-1,t} + M_{t-1,t}$$

Where:

$P_t = Population\ at\ time\ t$

$P_{t-1} = Population\ at\ time\ t-1$

$B_{t-1,t} = Births\ in\ the\ interval\ t-1\ to\ t$

$D_{t-1,t} = Deaths\ in\ the\ interval\ t-1\ to\ t$

$M_{t-1,t} = Net\ Migration\ in\ the\ interval\ t-1\ to\ t$

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Base Population

- U.S. Census Bureau's Vintage 2022 Population Estimates
  - National population by age, sex, race, and Hispanic origin on July 1, 2016
- American Community Survey (ACS) data used to add nativity to the file

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Mortality - Data

- Micro-level death data from the National Center for Health Statistics (NCHS)
- Collected by individual states based on death certificate data
- Variations in content by state and year
  - Hispanic origin universally included starting in 1990
  - All states did not report deaths using the 1997 race categories until 2018
- Two-year lag in data availability
- 2023 Projections included death data for 1990-2019 as inputs
  - By age, sex, race (White, Black, AIAN, and Asian or Pacific Islander(API)), Hispanic origin, and nativity

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Mortality - Methods

- Data processed in three race/origin groups
  - Non-Hispanic White and API, non-Hispanic Black and AIAN, and Hispanic
- Project life expectancy at birth (e0) by sex to the year 2123 to determine which model life tables will be used to project mortality rates.
- Project mortality rates to the year 2100.
- Create life tables for the years 2023 through 2100 using the projected mortality rates
- Apply survivorship ratios to the population to project deaths

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Fertility - Data

- Micro-level birth data from the NCHS
- Many issues like those presented for deaths
  - Two-year lag
  - Race recorded in 1977 OMB categories
- Contains information on the parents and the child
  - Does not include race or ethnicity of the child, only of the parents
- Used data from 1990-2020 as inputs with the following detail
  - Sex of child
  - Age, race, nativity and Hispanic origin of mother

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Fertility - Method

- Calculate age-specific fertility rates
  - For women aged 14-54 by single year of age
  - By six nativity, race and ethnicity groups
    - Foreign-born Hispanic
    - Foreign-born Non-Hispanic API
    - Foreign-born Non-Hispanic Other Races
    - Native API
    - Native White
    - Native Other Races
- Project rates using a convergence approach
  - Assumes that all groups converge on the average of the native white population in 2123
- Apply rates to the female population by age, race, origin and nativity to produce the projected number of births in each year

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International migration

- Net international migration is made up of four separate components
  - Native emigration – We used the estimates of the native net emigration from the Vintage 2022 National Estimates by age, sex, race, and Hispanic origin for 2022 as the native net migration estimates and held them constant for all years of the projections.
  - Puerto Rico migration – Puerto Rico net migration by age and sex was obtained from the Census Bureau's International Database projections for 2020 through 2100.
  - Foreign-born immigration
  - Foreign-born emigration

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Foreign-Born Immigration - Data

- Projected based on rates of emigration from sending countries organized by region
  - 1.) Sub-Saharan Africa, 2.) Mexico, 3.) Latin America, Caribbean, and South America, 4.) Europe, Canada and Oceania, 5.) Asia, and 6.) Near East and North Africa
- The numerator is estimates of immigration developed from the 1990 and 2000 Censuses and the 2001-2019 American Community Survey
- The denominator comes from population estimates in the sending regions produced by the Census Bureau's International Programs Area for 1980-2019

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Foreign-Born Immigration - Method

- Emigration rates for each of the sending regions were projected into the future using a power function
- Projected rates are applied to the projected population of the sending regions from the Census International Programs Area
- Foreign-born immigration projections were distributed by characteristics using distributions from the 2015-2019 American Community Survey
  - These were held constant in all projected years

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Foreign-Born Immigration: Alternatives

- **Zero immigration scenario –** Assumes that foreign-born immigration falls to zero (the theoretical minimum). This offers the most dramatic picture of demographic change

- **High immigration scenario –** Assumes foreign-born immigration increases by 50 percent

- **Low immigration scenario –** Assumes that foreign-born immigration is roughly cut in half compared. This scenario is not strictly 50 percent less, but is log symmetrical to the values for the high immigration series. As a result, the projected immigration rates vary between 40 and 50 percent less than those projected for the main series in any given year

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Foreign-Born Emigration Data and Methods

- Rates are estimated using a residual method, which assumes that the difference in foreign-born population between two surveys after accounting for immigration and mortality is due to emigration
- Uses data from the 2015-2019 ACS 5-year file for the foreign-born population and survival ratios from our internally produced mortality component
- Final values are an average of six rates calculated using different survey years to minimize bias from sampling and non-sampling error in the ACS: 2015-2017, 2016-2018, 2017-2019, 2015-2018, 2016-2019 and 2015-2019
- Evaluation of the initial rates raised concerns that they were too high to inform our long-term assumption. To mitigate this, we averaged these rates with those from the 2017 Projections which were calculated using the same method and ACS data for 2011-2015
- Emigration rates are calculated in 5-year age groups by Hispanic origin, sex, and recency of arrival (less than 10 years, 10 or more years)
- The same rates are used in all years of the projections

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Results

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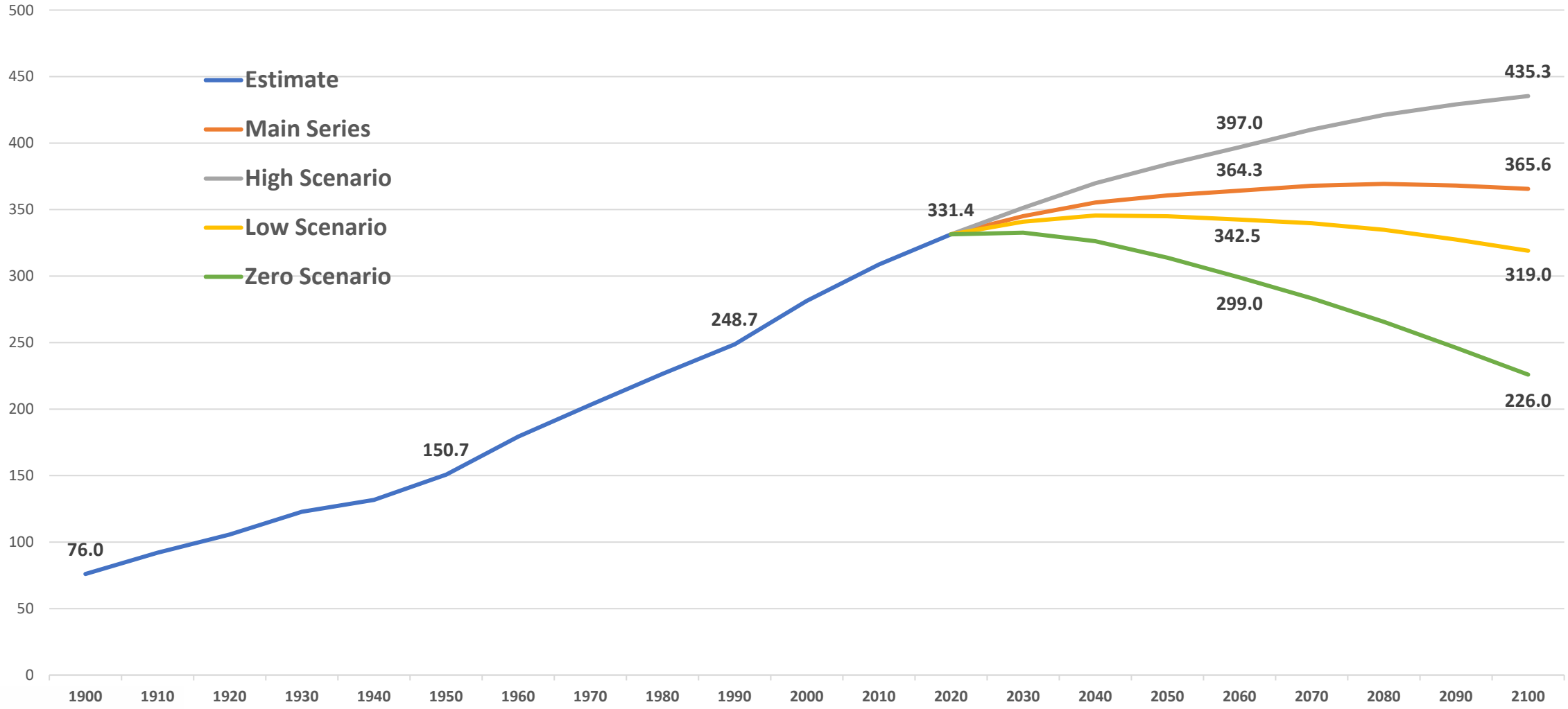
Population Estimates and Projections for the United States: 1990 to 2100

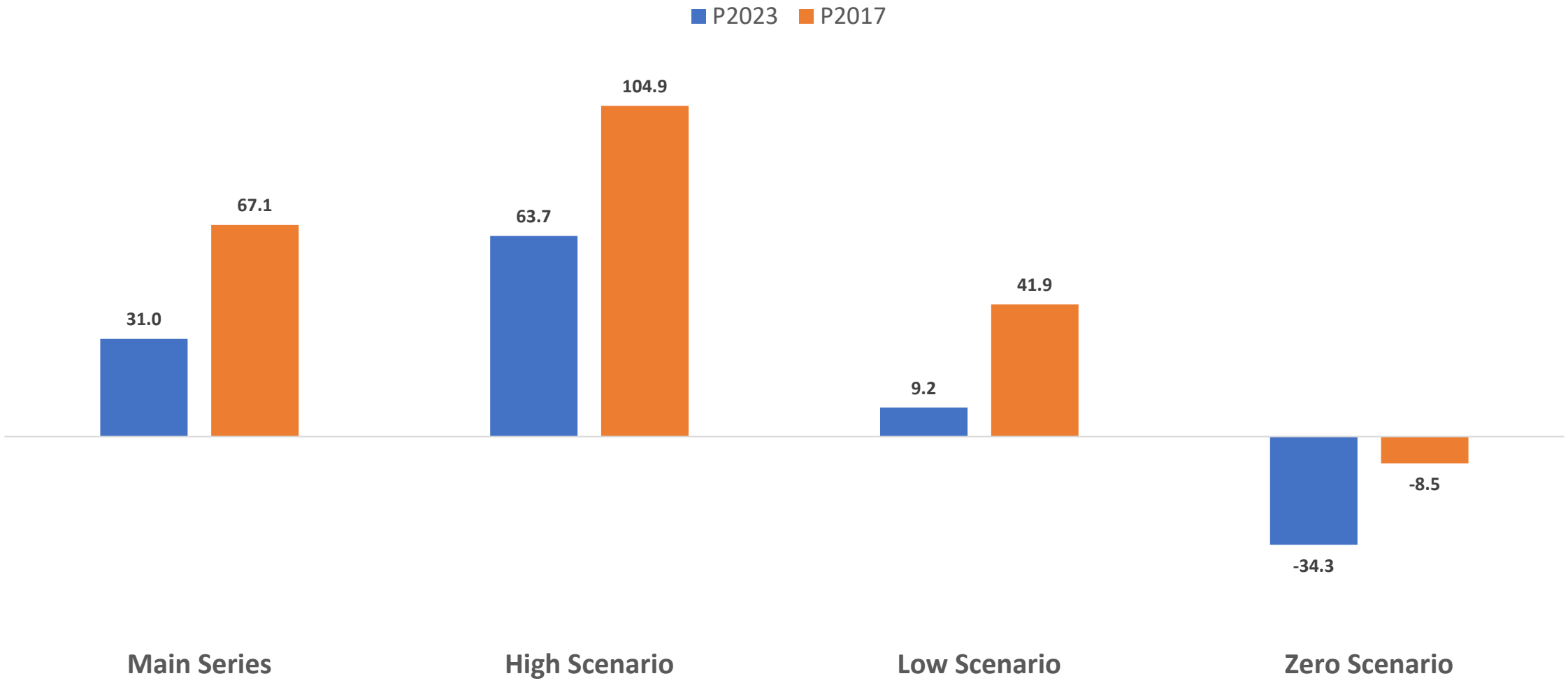
In millions



Source: U.S. Census Bureau, Intercensal Estimates (1900-2009), Vintage 2020 Estimates (2010-2019), Vintage 2022 Estimates (2020-2022), 2023 National Population Projections (2023-2100)

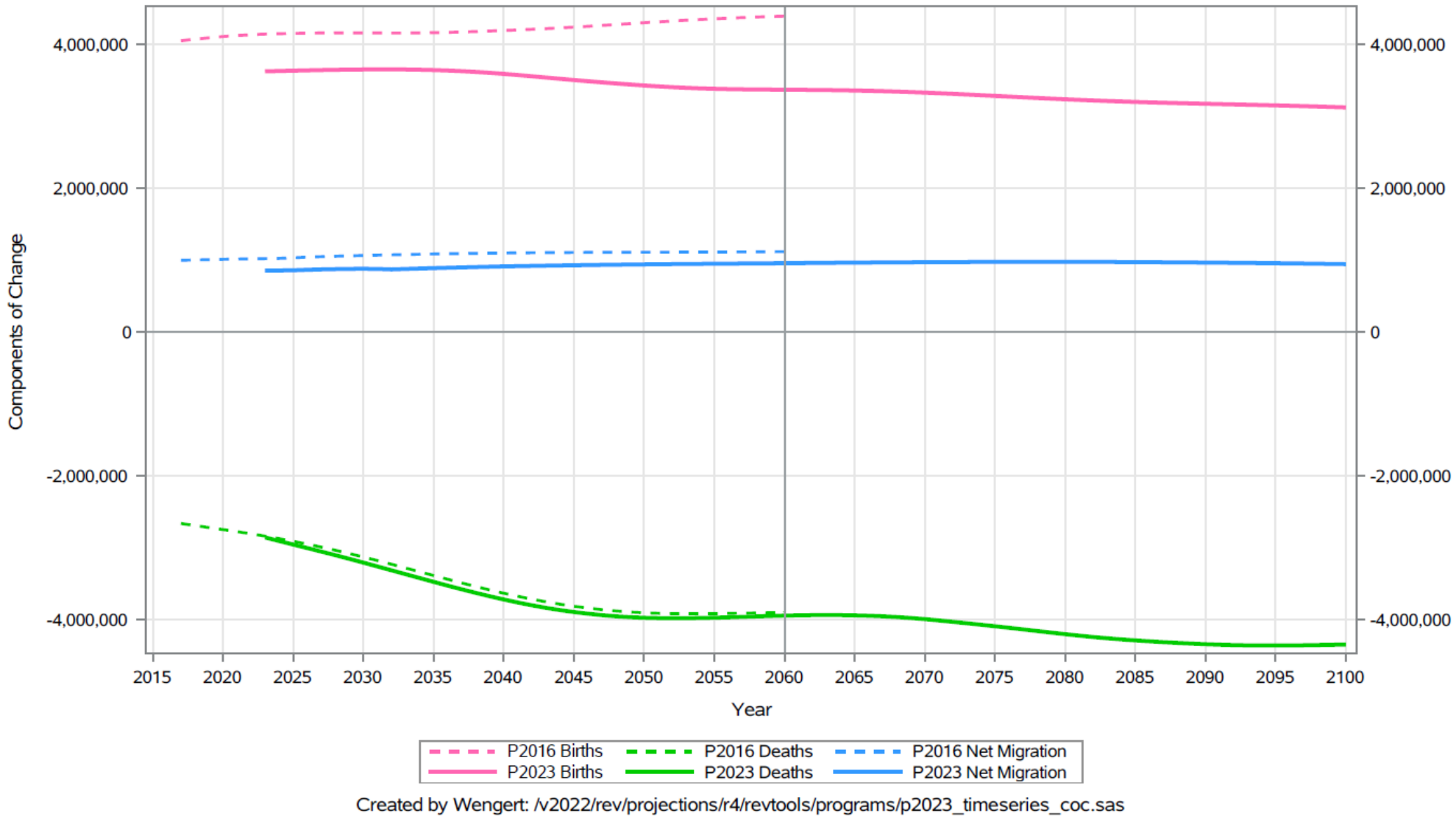
Numeric Population Change by Projections Release and Immigration Scenario: 2022 to 2060

In millions



Source: U.S. Census Bureau, 2017 National Population Projections and 2023 National Population Projections

FIGURE 55



Created by Wengert: /v2022/rev/projections/r4/revtools/programs/p2023_timeseries_coc.sas

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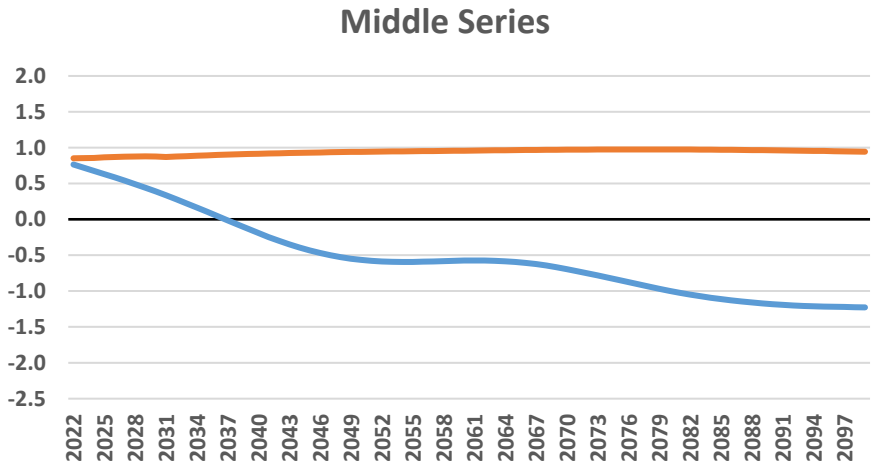
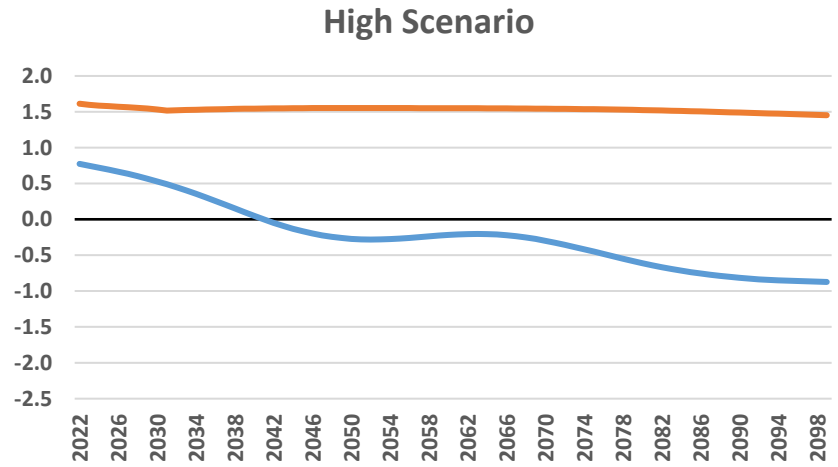
Projected Natural Increase and Net International Migration by Immigration Scenario: 2022 to 2100

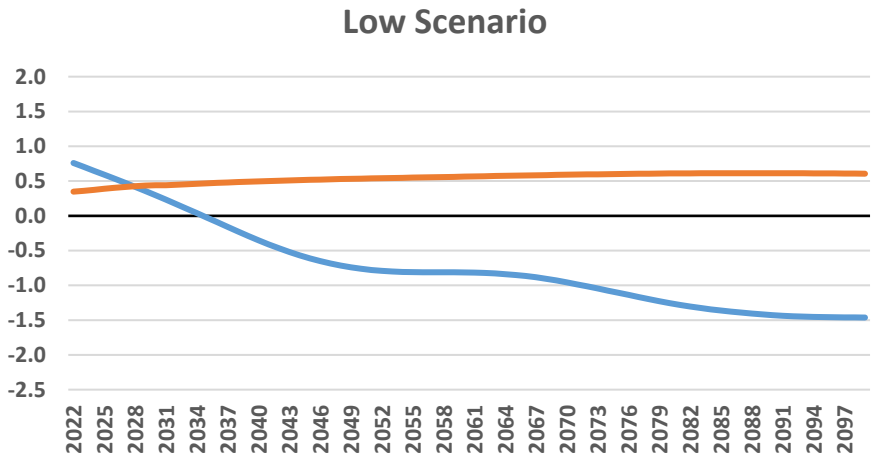
In millions

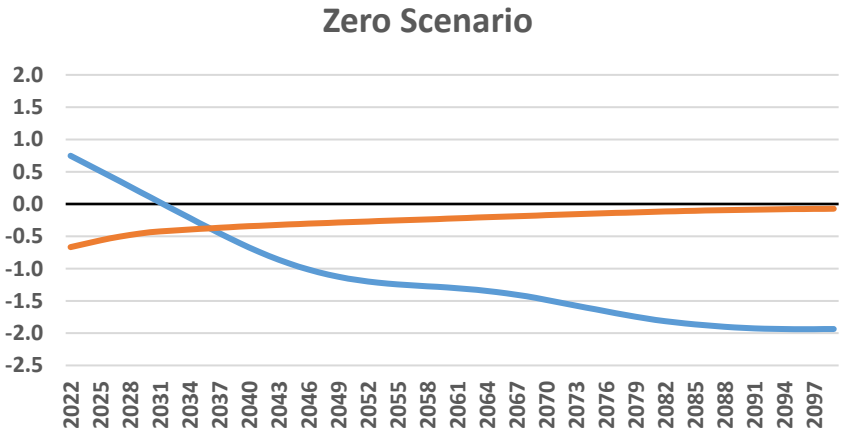
Natural Increase

Net Migration



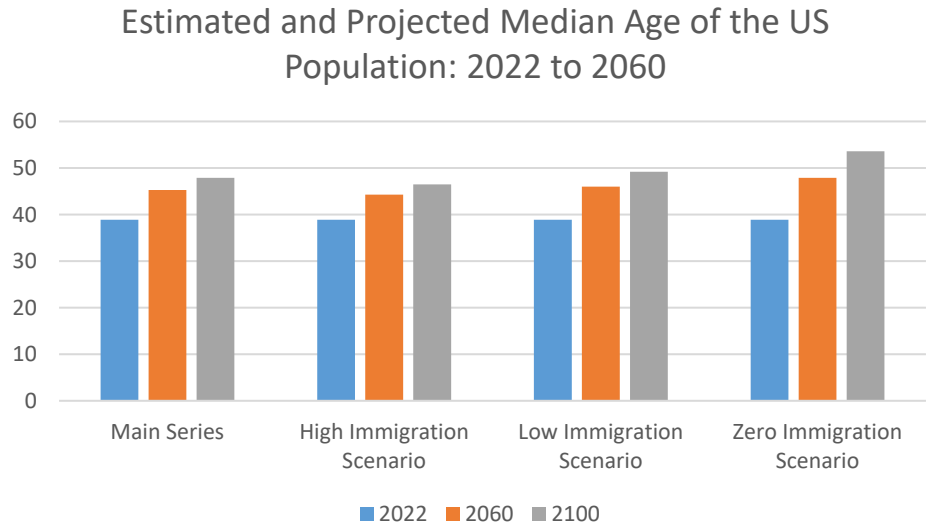






Source: U.S. Census Bureau, 2023 National Population Projections

Projected Age Composition of the US Population through 2100



Estimated and Projected Share of the Population Under 18 and Over 65 by Immigration Scenario: 2022 to 2100

	Percent Under 18			Percent 65 and Over			Crossover Year
	2022	2060	2100	2022	2060	2100	
Main Series	21.7	17.7	16.4	17.3	24.4	29.1	2029
High Immigration Scenario	21.7	18.3	17.0	17.3	23.3	27.4	2030
Low Immigration Scenario	21.7	17.2	15.8	17.3	25.2	30.6	2029
Zero Immigration Scenario	21.7	16.0	14.0	17.3	27.3	35.6	2028

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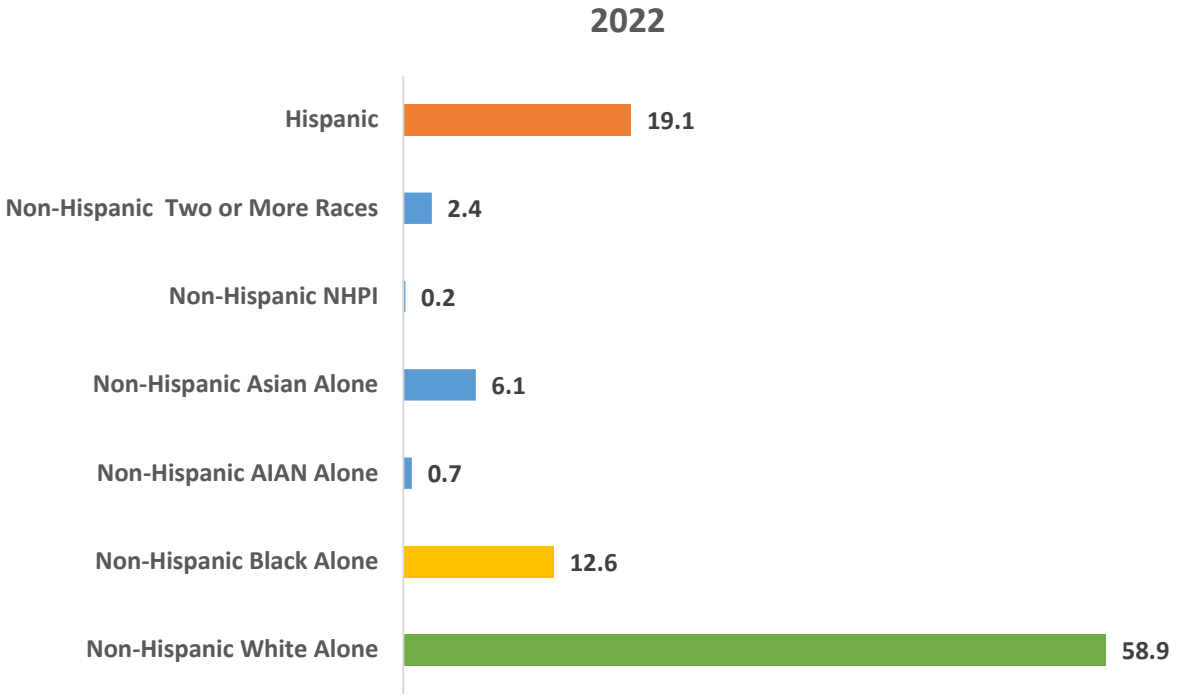
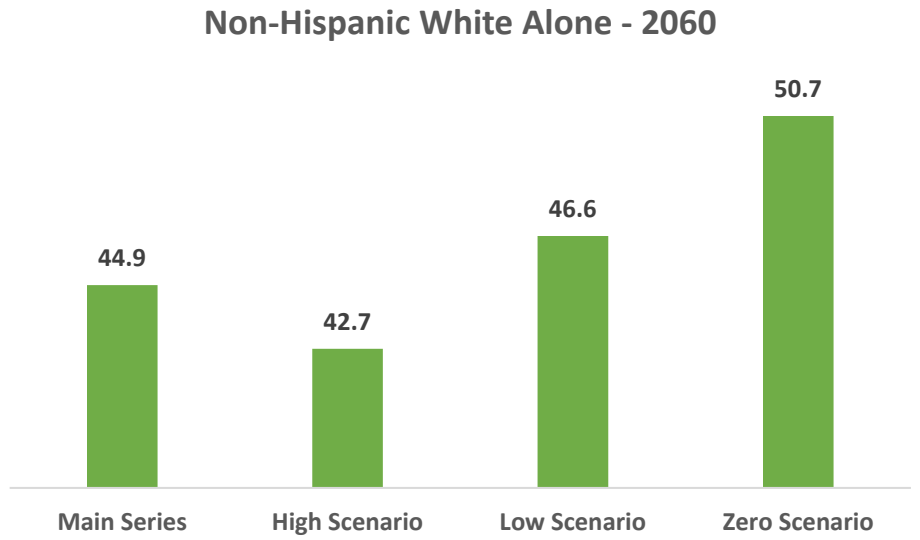
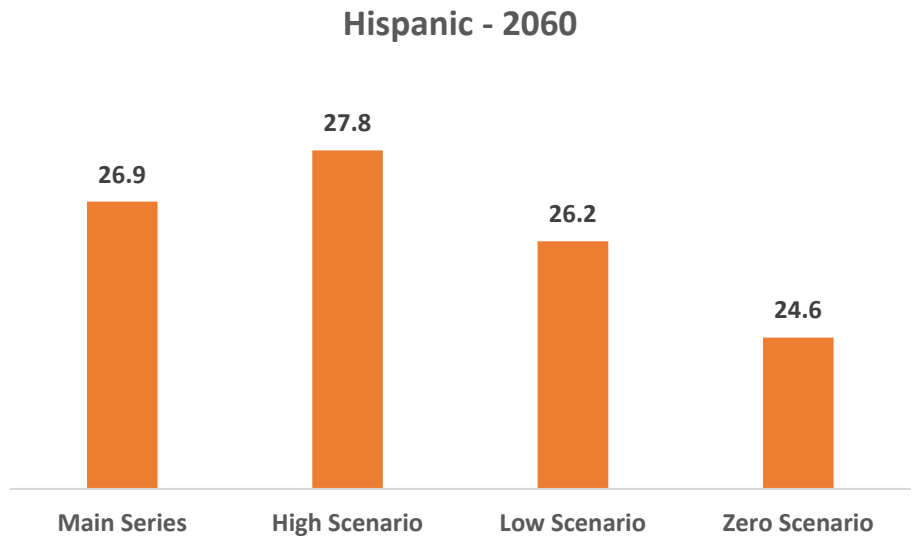
Source: U.S. Census Bureau, 2023 National Population Projections

Racial and Ethnic Distribution of the US Population by Immigration Scenario: 2022 and 2060







Note: NHPI is Native Hawaiian or Other Pacific Islander, AIAN is American Indian or Alaska Native

Source: U.S. Census Bureau, 2023 National Population Projections

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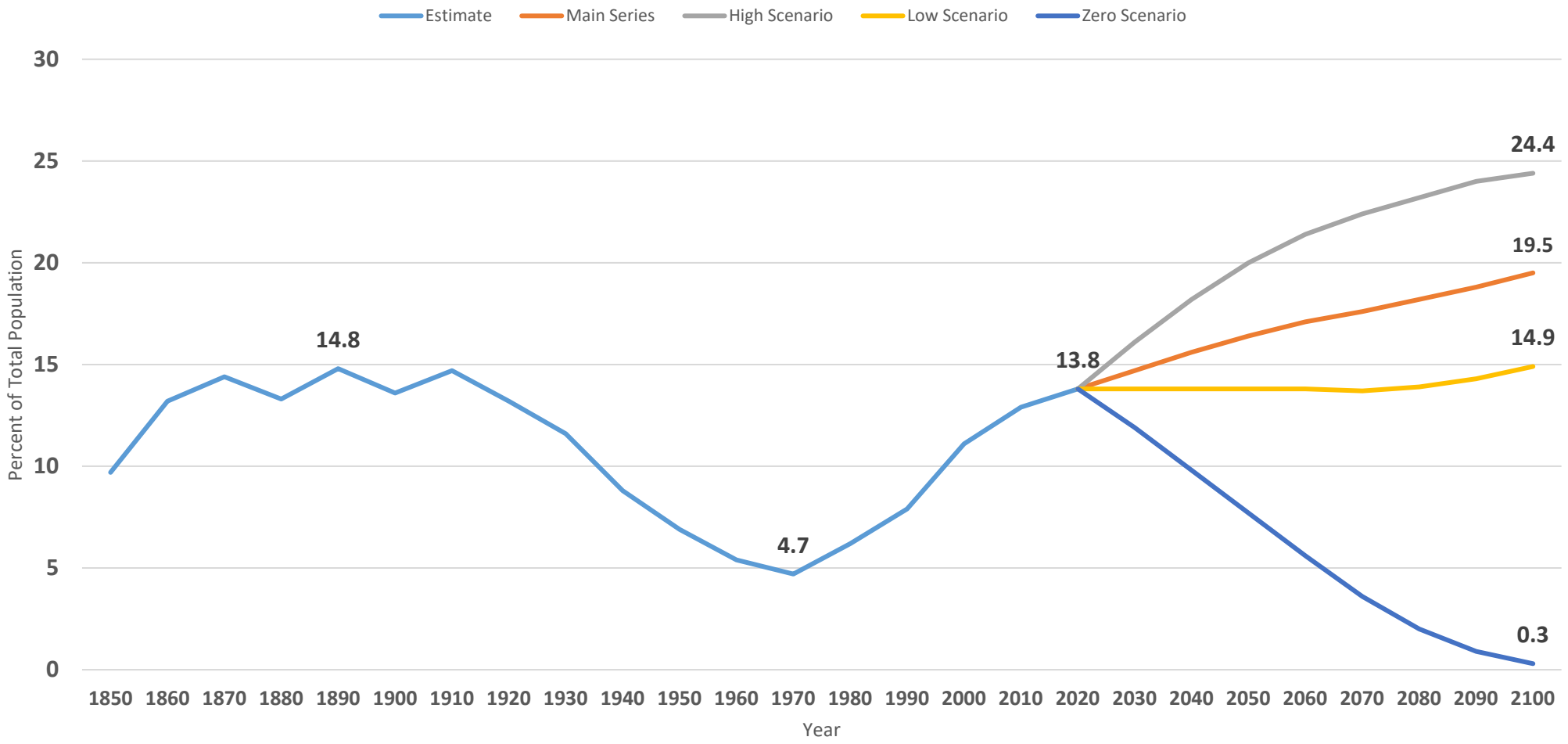
Estimated and Projected Percent Foreign Born in the US Population by Immigration Scenario: 1850 to 2100



Source: U.S. Census Bureau, Population Division Working Paper POP-WP029, 2023 National Population Projections

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Summary and Conclusions

- 2023 Projections were released November 2023
  - One main series and three alternative immigration scenarios
  - Full detail through 2060, age and sex only for 2061 to 2100
  - Similar methods as the 2017 series with updated input data
- Results include
  - Slower projected growth compared to the 2017 projections
  - Immigration is expected to be the main source of population growth while natural change is projected to be negative
  - The population is projected to age and become more racially and ethnically diverse over time

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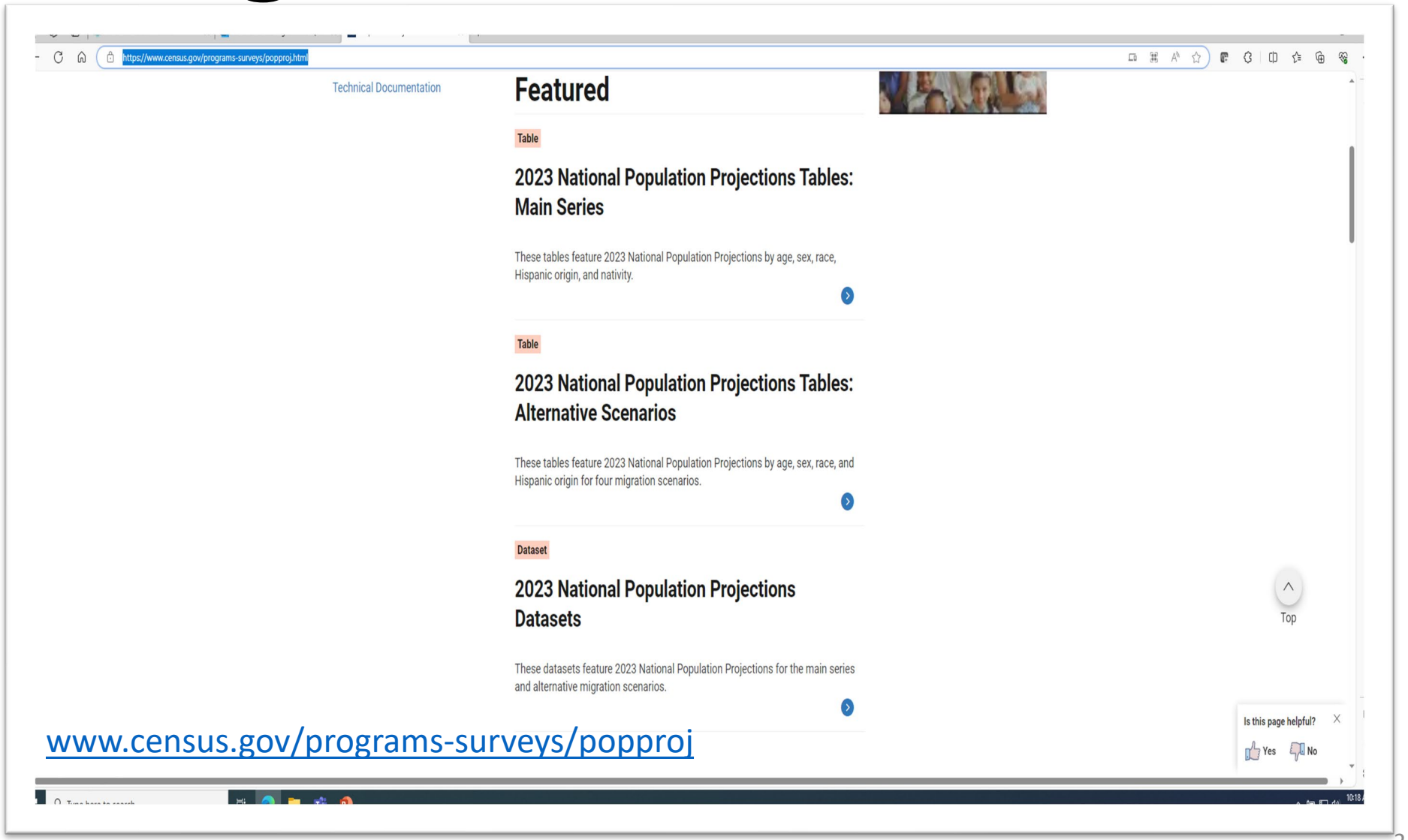
Accessing the Data



www.census.gov/programs-surveys/popproj

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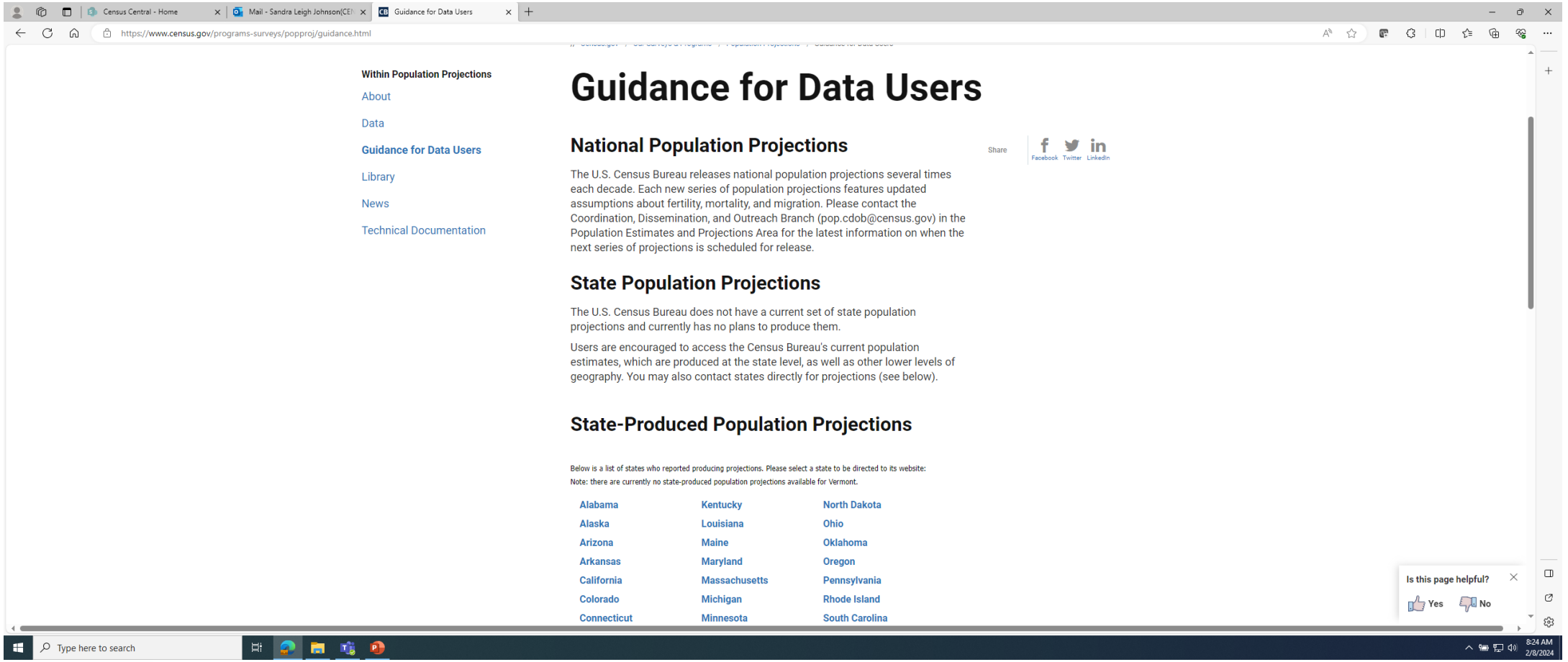
Additional Resources



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