

# A Multidimensional Quality Assessment of the United States 2020 Census

Economic Commission for Europe  
Conference of European Statisticians  
Group of Experts on Population and Housing Censuses

Deborah M. Stempowski  
United States Census Bureau

September 21-23, 2022

# Presentation Outline

- Importance of Decennial Census Data
- Concerns about Data Quality
- A Multidimensional Approach to Understanding Data Quality
- Ensuring Data Quality
- Evaluating Data Quality
- A Look to the 2030 Census
- Conclusions

# Importance of Decennial Census Data

**Purpose:** To conduct a census of population and housing and disseminate the results to the President, the States, and the American People



Apportion representation among states as mandated by Article 1, Section 2 of the U.S. Constitution:

**Representatives and direct Taxes shall be apportioned among the several States which may be included within this union, according to their respective Numbers ...**

The actual Enumeration shall be made within three Years after the first Meeting of the Congress of the United States, and **within every subsequent Term of ten years**, in such Manner as they shall by Law direct.

## Primary Uses of Decennial Census Data:

- Apportion representation among states as mandated by Article 1, Section 2 of the U.S. Constitution
- Draw congressional and state legislative districts, school districts, and voting precincts
- Distribute more than \$675 billion federal dollars annually to states
- Inform federal, tribal, state, and local government planning decisions
- Inform business and nonprofit organization decisions (e.g., where to locate, size of the market)

# 2020 Census: Concerns about Data Quality

## COVID-19 Impacts to 2020 Census Data Collection:

- Unexpected population movements
- Stay-at-home orders
- Temporary work stoppage and delays to in-person census activities
- Implementation of safety protocols

## Natural Disaster Impacts to 2020 Census Data Collection:

- Derecho – August 10
- Tropical Storm Marco – landfall August 24
- Hurricane Laura – landfall August 26
- California, Oregon and Washington Fires and Air Quality – September 7
- Hurricane Sally – landfall September 16
- Tropical Storm Beta – landfall September 21



# A Multidimensional Approach to Understanding 2020 Census Data Quality

## Examining 2020 Census Quality from multiple perspectives:

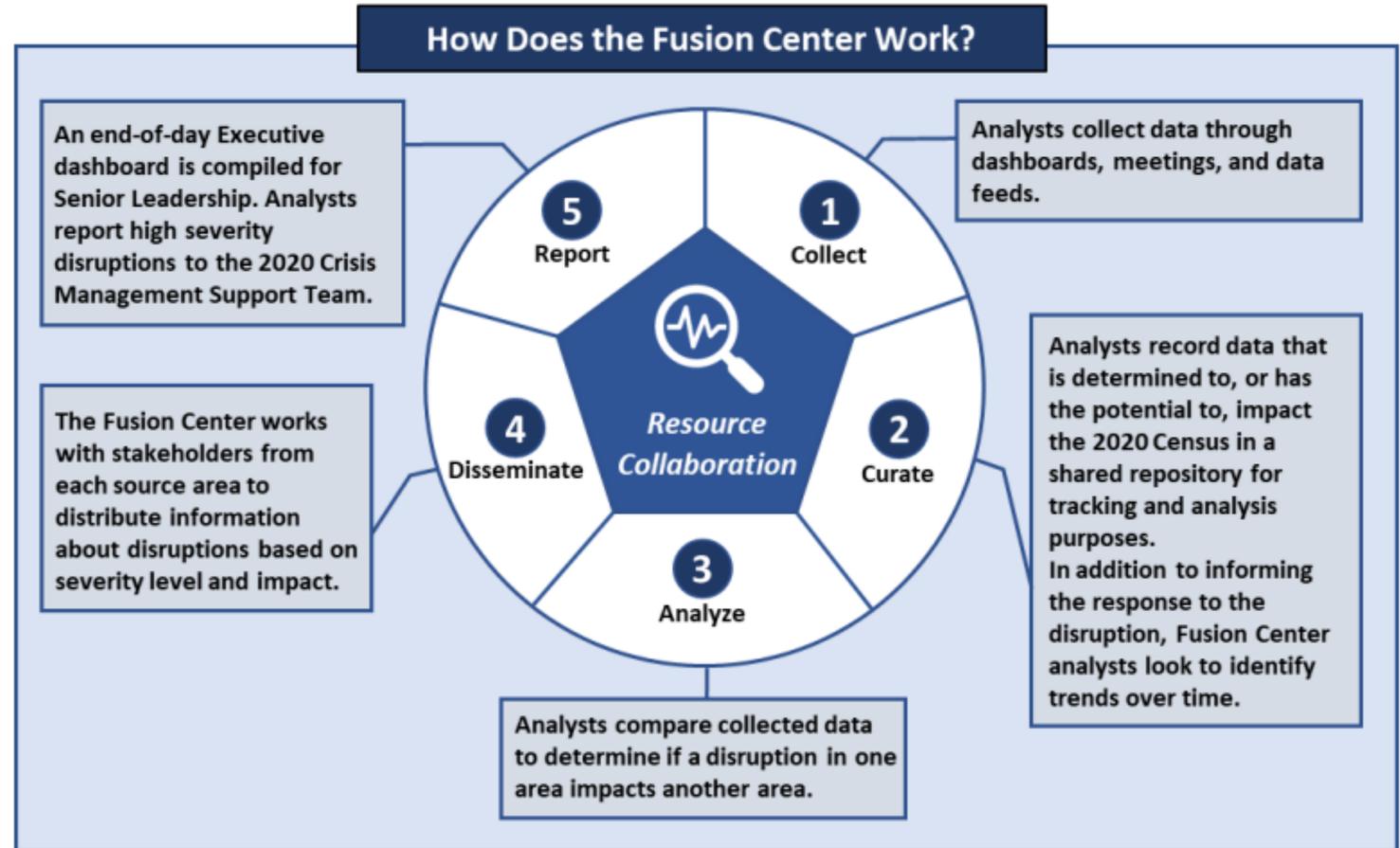
- Real-time monitoring during data collection.
- Analysis of quality indicators in the form of operational metrics and preliminary response data.
- Conducting a series of planned [assessments and evaluations](#) of 2020 Census operations.
- Independent assessments by respected members of the [scientific and statistical community](#).
- Comparisons of 2020 Census results to established benchmarks:
  - Demographic Analysis
  - Population Estimates
- Conducting a [Post-Enumeration Survey](#) to measure how many people and housing units were missed or counted erroneously in the census.

# 2020 Census: Ensuring Quality

# 2020 Census: Ensuring Quality During Data Collection

## Fusion Center

- Facilitated Information Sharing
- Ensured situational awareness of issues
- Synthesized information to identify potential issues
- Enabled strategic decisions
- Leveraged data from multiple federal, state, and local sources



# 2020 Census: Ensuring Quality During Data Collection (continued)

## **Decennial Field Quality Management (DFQM)**

- Allowed for early identification and resolution of issues during in-person field data collection operations.
- Enabled quick root cause analysis, identification of strategies for remediation, and determination of corrective action
- Leveraged outlier analysis, use of dashboards, operational control system reports, and ad hoc reporting capabilities
- Enabled verification that field staff followed procedures and data were collected appropriately

## **Real-Time Analysis of Data (RTAD)**

- Monitored select indicators throughout 2020 Census data collection
- Focused on indicators providing insight into progress as well as data quality
- Facilitated by the availability of data made possible by use of technology
- Daily release of select metrics, promoted transparency internally and externally

# 2020 Census: Ensuring Quality

## Post Data Collection Data Review

### Primary purposes of data review were:

1. To **identify data processing errors** and verify that edits and other processing steps had been properly applied.
2. To **assess data quality** by looking at item nonresponse/missing rates, population count only responses, proxy responses, and other early indicators of possible data quality issues.
3. To **evaluate demographic reasonableness** by looking at census responses and subsequent data files at multiple levels of geography compared to benchmarks, i.e., 2010 Census, American Community Survey data, and Population Estimates.

### Data were reviewed in a variety of ways:

- **Micro** level data reviews ensured processing of individual records was done correctly.
- **Macro** level data reviews ensured aggregate results appeared to be reasonable when compared to benchmark data.

# 2020 Census: Evaluating Quality

# 2020 Census: Evaluating Quality

## Internal Census Bureau Efforts

### **Operational Quality Metrics:**

- Publicly released data points related to the results of 2020 Census data collection.
- Offered insight into how responses were collected.
- Enabled comparison of data across geographies and with past census results.
- Data released in multiple formats: data visualizations and downloadable spreadsheets.

### **Assessments and Evaluations:**

- Designed to document and evaluate the 2020 Census and facilitate planning efforts for the 2030 Census
- **Operational Assessments** – Provide data on workload volumes, production rates, and costs related to operations, processes, and systems
- **Evaluations** – Determine effectiveness of census components and impacts on data quality and coverage using data collected from census operations, processes, systems, and auxiliary data collections

# 2020 Census: Evaluating Quality

## Engagement with Experts in the Statistical Community

- External and independent assessments
- Assess the U.S. Census Bureau's work from different perspectives
- Underscores commitment to quality and transparency
- **2020 Census Engagements:**
  - **JASON:** Assessed strengths and weaknesses in plans for data quality assessments and metrics
  - **American Statistical Association:** Assessed operational and response data to understand accuracy and coverage of 2020 Census enumeration
  - **National Academy of Sciences Committee on National Statistics:** Assessing internal operational and response data to inform research and planning for the 2030 Census

# 2020 Census: Evaluating Quality

## Post-Enumeration Survey

- An alternative statistical estimate of the number of people in the United States
- Independent survey of a sample of the population
- Case by case matching of individuals in the post-enumeration survey with individuals in the 2020 Census
- Calculations of the net proportion of people in the estimated population who may have been missed, duplicated, or counted by mistake in the 2020 Census
- Results provide two types of results:
  - Net coverage error
  - Components of coverage
- Survey results help estimate how well the 2020 Census covered and counted the population

# 2020 Census: Evaluating Quality

## Comparisons to Other Measures of the Population

### **Demographic Analysis:**

- An independent method used to evaluate the quality of the decennial census.
- National estimates of the population on April 1, 2020 by age, sex, select race categories, and Hispanic origin.
- Estimates are developed using current and historical vital records, data on international migration, and Medicare records.
- Estimates are used to develop estimates of net coverage error at the national level by demographic detail.

### **Population Estimates:**

- Official estimates of population for many levels of geography
- Estimates of demographic characteristic: age, sex, race, and Hispanic Origin

# A Look to the 2030 Census

- Increased access to data
- Increased real-time monitoring
- Quality checks earlier in the data collection and processing phases
- Availability of accurate information about data quality, respondent characteristics, and data anomalies
- Maintain commitment to quality and transparency
- A complete and accurate census – counting everyone once, only once, and in the right place

# Conclusions

## **Despite challenges faced conducting the 2020 Census, the Census Bureau:**

- Remained flexible, practical, and persistent in completing an accurate count of its population
- Leveraged robust access to data and use of technology to inform real-time decision making
- Implemented extensive post-data collection analysis within the Census Bureau and with external experts in the statistical community
- Went to unprecedented lengths to communicate with the American public about the quality of the 2020 Census

## **No singular number can definitively quantify the quality of the 2020 Census**

**A multidimensional quality assessment enabled the public to draw conclusions about the accuracy and fitness for use of 2020 Census counts, for making decisions, and for painting a portrait of the U.S. population**

## Connect with Us



Sign up for and manage alerts at:  
<https://public.govdelivery.com/accounts/USCENSUS/subscriber/new>



More information on the 2020 Census:  
<http://www.census.gov/2020Census>



More information on the 2020 Census Data Quality:  
<https://www.census.gov/programs-surveys/decennial-census/decade/2020/planning-management/process/data-quality.html>



More information on the 2030 Census:  
<https://www.census.gov/programs-surveys/decennial-census/decade/2030/2030-census-main.html>



[facebook.com/uscensusbureau](https://facebook.com/uscensusbureau)



[twitter.com/uscensusbureau](https://twitter.com/uscensusbureau)



[youtube.com/user/uscensusbureau](https://youtube.com/user/uscensusbureau)



[instagram.com/uscensusbureau](https://instagram.com/uscensusbureau)

# Thank You

**Deborah M. Stempowski**

**Assistant Director for Decennial Census Programs**

U.S. Department of Commerce  
U.S. Census Bureau  
4600 Silver Hill Rd.  
Suitland, Maryland 20746

Office: 301-763-1417  
[deborah.m.stempowski@census.gov](mailto:deborah.m.stempowski@census.gov)