A Multidimensional Quality Assessment Approach

Expert Group Meeting
Revision of the Principles and Recommendations for Population and Housing Censuses
May 23 – 25, 2023

Session 3 - Innovations and good practices in census-taking

Deborah M. Stempowski

United States Census Bureau

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.

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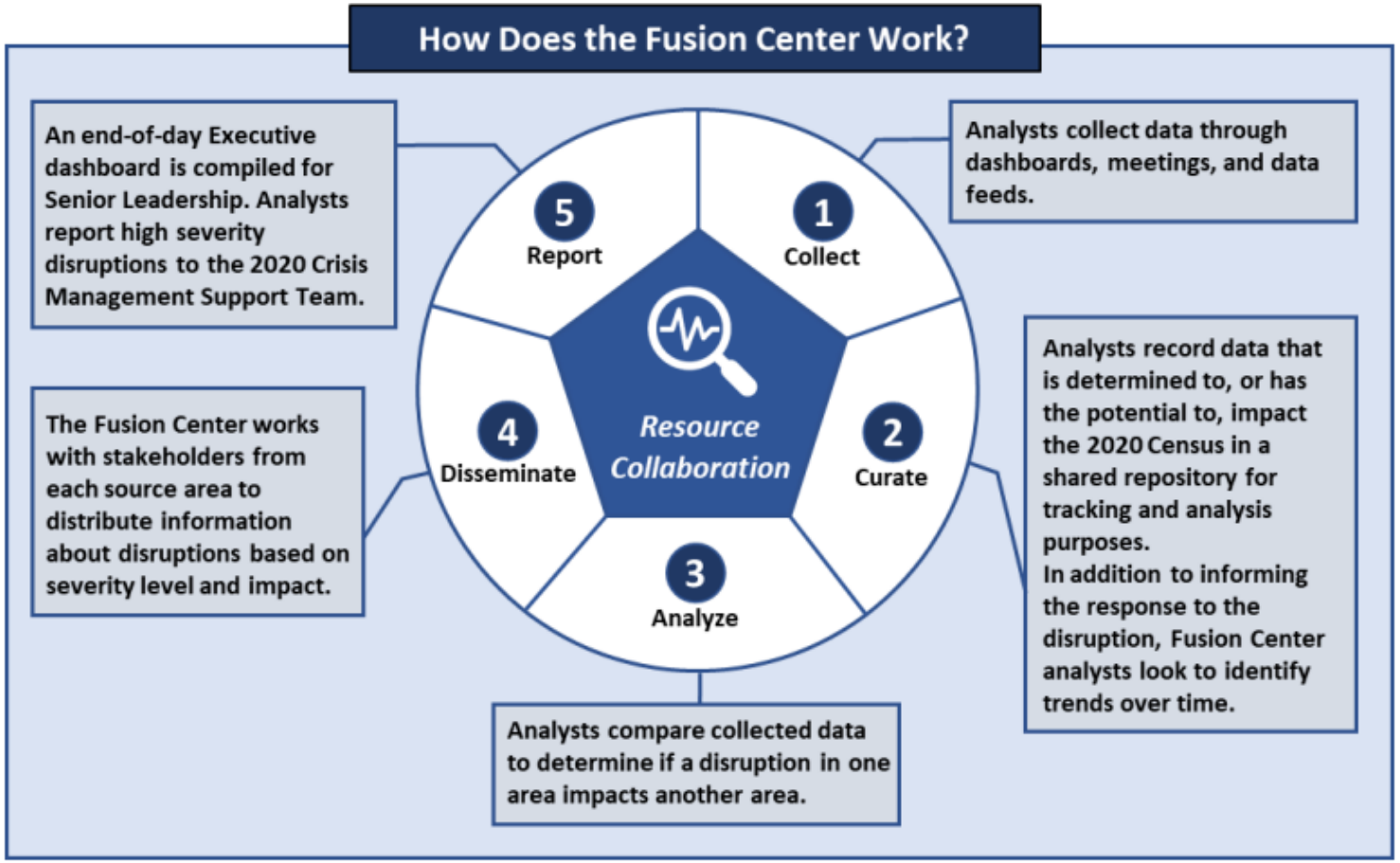
2020 Census: Ensuring Quality
During Data Collection

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

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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.

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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

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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

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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

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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

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A Look to the 2030 Census

- Utilize the newly established Continuous Count Study project to enable the 2030 Census to develop methods and determine where administrative data coverage is high quality and cost effective versus where additional administrative data or data collection may be needed to fill in the gaps.
- Produce on-going estimates and benchmarks to assess quality and coverage of administrative record counts.
- Implement real-time monitoring and analysis of data quality during data collection so corrective action can be taken while the collection period is open.
- Plan and test quality checks earlier in the data collection and processing phases.
- Maintain commitment to quality and transparency by enhancing the publicly available data quality metrics.

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Thank You

Deborah M. Stempowski

Associate Director for Decennial Census Programs

deborah.m.stempowski@census.gov

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