Development of Scientific Integrity Policies and Procedures for Government Statistical Agencies

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The views expressed in this presentation are those of the authors and do not represent the policies of the United States Census Bureau.

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Overview:

I. Scientific Integrity Policies in Statistical Agencies

II. Data Quality and Transparency

III. Development of Scientific Integrity Policies and Procedures

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I. Scientific Integrity Policies in Statistical Agencies (1)

A. Purpose: Enhance environment for high-quality scientific work by statistical agencies and all partners
→ enhance stakeholder impact, public confidence

- Address Controversies and Changes in Public Expectations

- Address Changes in the Scientific Landscape
  - Multiple data sources
  - Computationally intensive data capture, integration, dissemination and use

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I. Scientific Integrity Policies in Statistical Agencies (2)

B. Complement - not replace - previously developed policies and procedures, in ways that minimize burden. Examples:

- Scientific Integrity (census.gov) and similarly for other ICSP agencies
- Statistical Quality Standards (census.gov)
- Statistical Programs and Standards | The White House (archives.gov)
- Information Policy | The White House (archives.gov)
- Principles and Practices for a Federal Statistical Agency — New Report | National Academies

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I. Scientific Integrity Policies in Statistical Agencies (3)

C. Current impetus: Recent executive branch mandates per concerns about political interference, and research misconduct (fabrication, falsification, plagiarism), plus the need to enhance transparency

- White House Office of Science and Technology Policy Scientific Integrity Policy - May, 2023
- Memorandum on Restoring Trust in Government Through Scientific Integrity and Evidence-Based Policymaking | The White House – January, 2021
- Many other policy documents; similar developments overseas

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Definition of Scientific Integrity

Established by the National Science and Technology Council 2022 Scientific Integrity Framework Interagency Working Group and the 2021 SI-FTAC:

> *Scientific integrity is the adherence to professional practices, ethical behavior, and the principles of honesty and objectivity when conducting, managing, using the results of, and communicating about science and scientific activities. Inclusivity, transparency, and protection from inappropriate influence are hallmarks of scientific integrity.*

Footnote: Guidance by the Scientific Integrity Framework Interagency Working Group of the National Science and Technology Council. "A Framework for Federal Scientific Integrity Policy and Practice." page 8, January 2023. Available at https://www.whitehouse.gov/wp-content/uploads/2023/01/01-2023-Framework-for-Federal-Scientific-Integrity-Policy-and-Practice.pdf.

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Census Bureau Policy on Scientific Integrity

https://www.census.gov/about/policies/quality/scientific_integrity.html

"a. Guard against inappropriate influence in documenting or reporting scientific findings, and guard against fabrication, falsification, and plagiarism of science or in scientific activities;

b. Establish principles and policy requirements of scientific integrity;

c. Provide for compliance training and maintenance of a Bureau-wide, public-facing Scientific Integrity website; and

d. Establish how procedures will be set and implemented for resolving allegations of scientific misconduct and the consequences for violations of this policy."

II. Data Quality and Transparency (1)

A. Special Focus for Statistical Agencies: Consistency with Quality Standards?

1. Emphasis on:

"practices that ensure the quality of research and other scientific activities such as quality assurance systems."

2. Extensive discussion in *Principles and Practices*, agency documents

Footnote: Guidance by the Scientific Integrity Framework Interagency Working Group of the National Science and Technology Council. "A Framework for Federal Scientific Integrity Policy and Practice." point (8), page 31, January 2023. Available at https://www.whitehouse.gov/wp-content/uploads/2023/01/01-2023-Framework-for-Federal-Scientific-Integrity-Policy-and-Practice.pdf.

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II. Data Quality and Transparency (2)

B. Implementation Challenges: Beyond traditional tabular publications for sample surveys with high response rates

1. Integration of multiple data sources: Characterization, measurement, management and reporting on multiple dimensions of quality?

   Accuracy (e.g., Total Survey Error models, p-hacking issues)
   Relevance, Comparability, Temporal and Cross-Sectional
   Granularity, Interpretability, Accessibility – Brackstone (1999),
   FCSM (2020), others

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II. Data Quality and Transparency (3)

B.2. Transparency, Reproducibility and Replicability

a. For administrative records, other organic data sources?

b. Requires in-depth technical work:

- Transparent reporting on layers of design, implementation, empirical results: Which layers? How much detail?
- Reproducibility and replicability, accounting for multiple sources of variability? Which sources, approximations?

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II. Data Quality and Transparency (4)

B.3. Interpretation of results: “Indications” vs. “Conclusions” (Tukey, 1962)

Highly exploratory, computationally intensive analyses?

Important contextual variables, metadata?

Distinctions on realistic inferential scope:

Description, Association, Prediction, Causality, Outright Control?

Especially important in “Evidence Based Policymaking”

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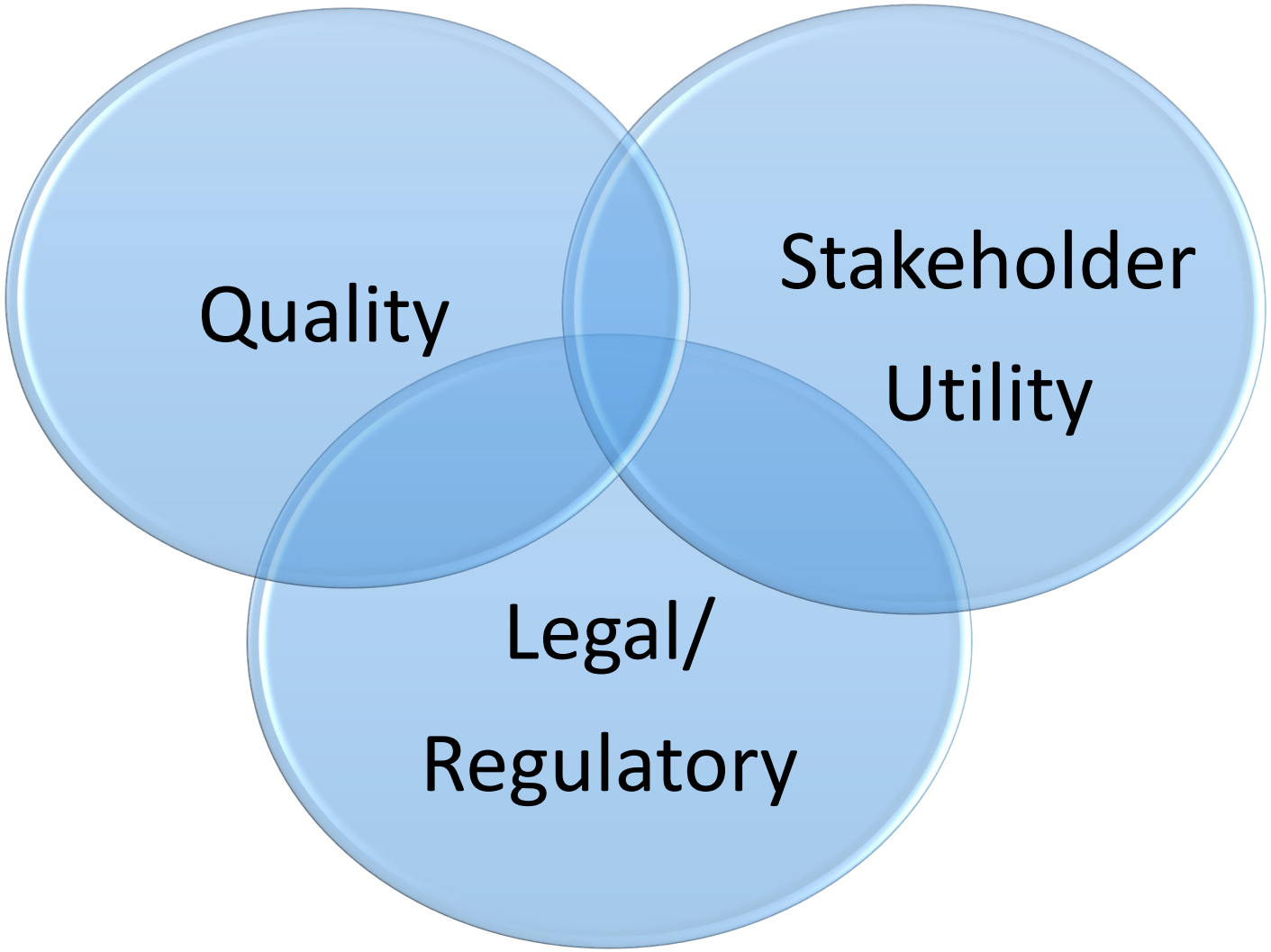

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III. Development of Scientific Integrity Policies and Procedures (1)

A. Translate idealized general statements of scientific integrity policies into *concrete and transparent courses of action*

Change the *distribution of behaviors* by participants:

- Meet thresholds (hard barriers) – plagiarism, falsification

- Improve "equilibrium points" of customary practice, recognizing variability across practitioners, environmental conditions

- Direct data collectors, research analysts, management, others

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III. Development of Scientific Integrity Policies and Procedures (2)

B. Enhance confidence of information users, respondents, others:

Realistic idea of what they can do and expect; concrete use cases

C. Balance *rights and responsibilities* of many participants, plus incentives

- Explicit: via law, regulation, contract, due process, evidence

- Implicit: customary practice, “sweat equity” and intellectual property

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III. Development of Scientific Integrity Policies and Procedures (3)

D. Integration with current policies and procedures for:
    1. Human resources
    2. Acquisitions
    3. Collaborative research (FSRDC system, internal projects, other)
    4. Dissemination and public communication
        - What is said? How, when, to whom, by whom?
    5. Data quality, privacy protection (historical focus)

E. Multiple layers of training, calibrated to specific roles

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IV. Conclusions (1)

A. Summary:

Enhance environment for high-quality scientific work by statistical agencies and their stakeholders

1. Integration of many dimensions of quality, stakeholder information needs, and related rights and responsibilities

2. Build on large body of previous work: OMB, P&P, agencies

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IV. Conclusions (2)

B. Extensions and Open Questions:

1. View initial procedures as “version 1.0”

2. Subsequent natural evolution flowing from:

- Changing features of stakeholder information needs and usage; data sources; methodology; technology; law

- Specific cases and “lessons learned” – feedback to training

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Thanks to All!

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