Thoughts on the Importance of Metadata for Integrated Data

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This presentation is intended to promote ideas. The views expressed do not necessarily reflect the position of the U.S. Department of Education.

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Going forward

- Federal statistics based on integrated data, regardless of the source, must be **communicated transparently** and understood to ensure that the nation is provided the best available statistical information and that the statistics can be used wisely.
- Metadata is an essential element to these efforts.

European Statistical System Data Quality Framework: Accessibility and Clarity

- "Statistics should be presented in a clear and understandable form . . . with supporting metadata and guidance."
- Metadata should be:
  - Preserved and properly archived
  - Standardized according to systems

One Potential Element of a Quality Framework from the FCSM Working Group

- **"Clarity** is the extent to which easily comprehensible metadata are available, where these metadata are necessary to give a full understanding of statistical data."

Next Steps Toward a Documentation Standard for Integrated Standard

- Standardization of metadata for output microdata files.
  - ➢ **Metadata Content**
  - – Metadata Format

Next Steps Toward a Documentation Standard: Getting Started

- How are data sources for integration identified?
- What is the original intended use of each source?
- When were they collected?
- Where are the source data located?
- Are the source data sample or universe?
- Are the source data structured or unstructured?

Next Steps Toward a Documentation Standard: Getting Started

- What steps are taken to harmonize data from multiple sources?
- How are items drawn from different sources selected (were quality control metrics applied)?
- What controlled classifications (e.g. NAICS, SOC, MSA, Agency glossary) are followed?

Next Steps Toward a Documentation Standard: Modelling

- What data are produced by the model?
- What data sources are used?
- Which variables are used from each source ?
- What analytic techniques are used in the model?
- What statistics are used to evaluate the modelling effort?

Next Steps Toward a Documentation Standard: Matching/Linking

- What data sources are used?
- Which variables are used from each source?
- Which variables are used for matching or linking?
- What software/analytic approaches are used?
- What statistics are used to evaluate the success and quality of the resulting data set (e.g., what is the match or link rate)?

Next Steps Toward a Documentation Standard: Processing and Quality

- What editing or imputation techniques were applied by the original data stewards?
- How is data quality evaluated in source data?
- Are data elements edited by source or after integration?
- Are the data cleaned and edited?
- What edits and cleaning procedures are used conducted?
- How is data quality evaluated in the integrated data?

Next Steps Toward a Documentation Standard: Microdata files

- How were data from external sources identified?
- How are modelled data identified?
- Are metadata about data integration processes, outcomes, and assessments of data quality included?
- How are metadata accessed/ disseminated? (e.g. API's, JSON requests)

Thank you!

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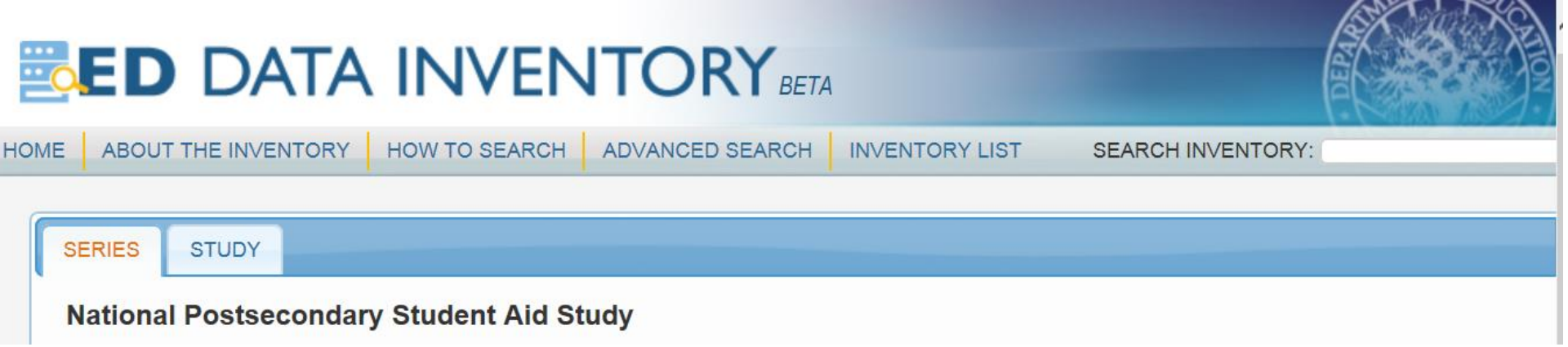
- Supplemental slides with an example of the content of documentation for one micro data file with integrated data from multiple sources.



- **NPSAS:1989–90—NPSAS:2016**
- Cross-sectional survey based on student-level records of students enrolled in a postsecondary institution
- Uses data from multiple sources
  - institutional records,
  - government databases, and
  - student interviews
- Provides reliable national estimates of characteristics related to financial aid for postsecondary students.

2015–16 National Postsecondary Student Aid Study (NPSAS:16) Data File Documentation

Student Lists from Institutions

- Counts from lists obtained for sampling were compared to counts from IPEDS (universe)
- Lists transmitted to VBA for matching to identify veterans for oversampling

2015–16 National Postsecondary Student Aid Study (NPSAS:16) Data File Documentation

Student Records from Institutions

- Description of collection procedures
- Outcomes:
  - # and % of institutions providing records by mode
  - # and % of institutions and students by control, level, and student types
- Quality: Student records reviewed for completeness

2015–16 National Postsecondary Student Aid Study (NPSAS:16) Data File Documentation

Student Administrative Data from ED and Data from External Sources

- FAFSA data from federal loan applications (ED Central Processing System)
- Data on loans and Pell Grants (National Student Loan Data System)
- Student enrollment in all institutions attended (National Student Clearinghouse)
- SAT/ACT admissions data–scores and survey
- VBA identified veterans and VA education benefits

2015–16 National Postsecondary Student Aid Study (NPSAS:16) Data File Documentation

Student Administrative Data from ED and Data from External Sources

Documentation included details on:

- Matching procedures for each sources
- Outcomes from matching for each source
- Editing described at the item level