More than the question-response process: Cognitive interviewing as a method to examine how process and structure impact the collection of survey data

Stephanie Willson
Office of Research and Methodology
National Center for Health Statistics

2011 Workshop on Questionnaire Evaluation Standards (QUEST)
Granada, Spain
April 27-29, 2011
Health Related Administrative Records

Examples include:

- Hospital records
  - Medical records
  - Billing records

- State vital records
  - Birth certificates
  - Death certificates
Administrative Records as Data

- **Sometimes used as ‘gold standard’ for surveys**
  - Validation studies: Comparing self-reported survey estimates against administrative records
    - Blumberg & Cynamon, 1999 (validating public health insurance coverage survey estimates)
    - Davern et al., 2008 (validating private health insurance coverage survey estimates)

- **Sometimes used to link to survey data**
  - Augment analytical power – longitudinal data
    - NHIS links to mortality data

- **Administrative records are, themselves, the data**
Administrative Records as Data Source

- Administrative records are modified and adapted to serve research purposes – source of data, not used directly as data
  - Extract information
  - Abstract information
- Focus of this talk is on administrative records as a source of data
Administrative Data vs. Survey Data

- **Surveys:**
  - the respondent is the source of data

- **Administrative data:**
  - the record is the source of data
Administrative Data vs. Survey Data

- **Data quality – a consideration in both**
  - Surveys: measurement error
  - Administrative records: often assumed to be self evident; more reliable than survey data; but accuracy & completeness are potential problems

- **Assessing data quality**
  - Survey example: Cognitive interviewing
  - Administrative records example:
    - Repeat the process
    - Observe the process
    - Range and logic checks
Evaluating Data Quality in Surveys: Cognitive Interviewing

- Model of how data are collected in surveys = question/response process (respondent provides an answer to a standardized question)
- Tourangeau’s model defines the process
  - Comprehension, Retrieval, Judgment, Response
- Cognitive interviewing taps into this process to
  - Determine where things can go wrong
  - To evaluate and describe construct validity
Adapting the Question-Response Model

- The question-response model can be adapted and applied to administrative data
- Similar to Willimack & Nichols (2001; 2010) who modify the cognitive response model for establishment surveys
Willimack & Nichols Adapt Question-Response Model for Establishment Surveys

- Record formation
- Selection and identification of the respondent
- Assessment of priorities
- Comprehension of the data request
- Retrieval of relevant information (from memory or company records)
- Judgment of adequate response
- Communication of the response
- Release of the data
Adapting the Question-Response Model to Administrative Data

- Multidimensional adaptation of the model: The process of obtaining administrative data occurs at different levels
  - Administrative record
  - Worksheet
  - Process of abstraction
  - Structure of the job (significant modification to the model – adds sociological insight, not just additional steps in the 4-step process)
Adapting the Question-Response Model to Administrative Data
Using Cognitive Interviewing to Evaluate Data

A person is involved in each process!
Using Cognitive Interviewing to Evaluate Data Obtained from Administrative Records

Example: vital statistics birth certificate study

Information from medical records is used to create information for the birth certificate
BACKGROUND OF BIRTH CERTIFICATE STUDY
2003 Birth Certificate Revision

- A primary goal of the 2003 revision of the birth certificate was to improve data quality
- Recommendations to do this included (but were not limited to)...
  - Having separate worksheets for mothers and hospital staff
  - Having the birth clerk collect medical & health information from the medical records (as suggested by clinicians)
  - Providing birth clerks with detailed, standardized definitions and instructions
  - Providing a guidebook with preferred sources and key words
- Our job was to evaluate how & to what extent these recommendations have been implemented
STUDY OVERVIEW
Recruitment /Sample

- Purposive sample
  - Interview Birth Information Specialists (BIS) in states with experience with the 2003 revision
    - Birth certificate info must be their primary duty
    - Must be in current job for 6 months or longer
  - States identified hospitals (with at least 1 full time BIS and a requisite number of births)
  - NCHS sent advance letters to all eligible hospitals
  - Telephone screening of BIS (confirm eligibility)
- Total of 54 Birth Information Specialists interviewed, representing 54 hospitals in 4 different states
How Data Were Collected: Semi-Structured Interview

- **Overview of how birth certificate information is gathered**
  - “Standard” procedure for each hospital
  - Modifications/adaptations to the standard procedure (and why)

- **Item-by-item discussion of medical/health information**
  - Targeted discussion of selected items
  - Review who is responsible for obtaining information on each item
  - Review of sources used to complete each item

- **Use of guidebook**
SELECT RESULTS
General Findings:
Structure of the Task Impacts Data Quality

- Great variability among hospitals in the collection process (not standardized, so not comparable)
  - Variability in interpretation of worksheet items
  - Variability among states in worksheet design (separate sheets or all on one page)
  - Variability in who is responsible for getting medical & health from medical records (birth clerk vs. clinicians)
  - Variability in how certain items were collected (e.g., pregnancy history items vs. other medical & health information)
General Findings: Missing Data

- Where the clinician is primarily responsible for completing the medical/health information, items are sometimes left blank.
- Prenatal records usually available, but not always updated with most recent dates and visits (sent to hospital weeks before delivery).
General Findings: Issues with Specific Items

- Details needed for the worksheet may be lacking in the medical records
  - Other previous poor pregnancy outcomes
  - Type of diabetes and hypertension
  - Assisted ventilation (length of time used not given)
  - Antibiotics & steroids (reason treatment given may not be noted)
  - Precipitous and prolonged labor (time not given)
- Interpretation of some items on the worksheet varied
  - Breastfeeding (pumping; mix of formula & breast milk)
General Findings: Birth Clerk Strategies for Missing Data

- Get information from mothers or nurses
- Call OB office for updated prenatal record
- “Logical estimation” sometimes used for...
  - Trial of labor (not directly stated; reference L&D log book)
  - Infertility treatment
  - Obstetric estimate of gestation
  - Fetal intolerance of labor
  - Date of 1\textsuperscript{st}/last prenatal visit
  - # of prenatal visits
  - Date of LMP
Conclusions About the Utility of the Methodology

- Cognitive interviewing method was very good at helping us understand
  - the patterns of different processes by which the collection of birth certificate data take place
  - where the process deviates from the federally recommended standards
  - the possible causes of any error in birth certificates

- Findings informed changes in the recommended procedures