Developing a Survey Instrument Using Qualitative Research Methods:
The Case of the 2012 National Survey On Health Information Exchange in Clinical Laboratories

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Clinical Laboratories Survey

• Background of the Survey
  • Motivation & Objective of the Survey

• Challenges in Questionnaire Design
  • Trade-Offs
  • Survey Design Features Affected by Decisions

• Qualitative Approaches to Inform Decision-Making
  • Expert Interviews
  • Simulation Study
  • Cognitive interviews

• Conclusions
Motivation of the survey

The National Survey on Health Information Exchange in Clinical Laboratories will assess and evaluate the electronic transfer of health information from clinical laboratories to ordering physicians.

Funded by the State Health Information Exchange Cooperative Agreement Program and, by the Office of Economic Analysis, Evaluation and Modeling at the U.S. Department of Health and Human Services’ (HHS) Office of the National Coordinator for Health Information Technology (ONC)
Background

• Anticipated Wave I in January of 2013 to establish baseline with Wave II scheduled for 2014.

• Two survey instruments:
  • Hospital Laboratories
  • Independent Laboratories

• Proposed sample sizes of ~2700 hospital labs and ~1900 independent labs

• Mailed paper survey, using CLIA/OSCAR from CMS as sampling frame
Challenges in Questionnaire Design

Main Trade-offs

• Key concepts to be measured in the survey
  • Proportion of facilities capable of sending e-results
  • Proportion of clinical results sent electronically

• Selection of main respondent
  • Determining the most knowledgeable respondent
  • Tailoring instrument for the most appropriate respondent
  • Yes/No questions & branching questions vs. opened ended

• Level of effort
  • Availability of information
  • Information from records vs. information from memory
  • Accuracy of estimates
Challenges in Questionnaire Design (cont’d)

• Survey Design Features likely to be affected by choices made
  • Response rates
  • Item nonresponse
  • Measurement properties
    – Reporting bias
    – Reliability across all laboratory types and locations
• Survey efficiency
  – Number of “callbacks”
  – Characteristics of non-respondents
Challenges in Questionnaire Design (cont’d)

• Sources of Measurement Error
  • Technical terms
  • Concepts with equivocal meaning
  • No common understanding of new terms in the industry

Structured format, entities ‘inside’ and ‘outside’ the organization, billable tests, methods of exchange, “ordering” practitioner.
Qualitative Approaches to Inform Decision-Making: Expert Interviews

• Three one-hour discussions with experts in the field of clinical laboratories
• Discussion guideline based on conceptual framework of the research
• Participants were at the Laboratory Director or IT Director level with specialized knowledge
• Two respondents were with Hospital-affiliated laboratories, and one was with an independent laboratory
Qualitative Approaches to Inform Decision-Making: Expert Interviews (Cont’d)

Main findings

<table>
<thead>
<tr>
<th>Survey Design Features</th>
<th>Issues Identified</th>
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| Concepts to be measured in the survey | • Variability in respondents’ understanding of terms and concepts  
                                           • Variability may result in double-counting of elements of interest  
                                           • Wording of questions really matter |
| Selection of main respondent | • Differentiated knowledge between Lab Director and IT Director                     |
| Level of effort         | • Cash incentives are problematic for lab respondents due to potential ethical conflicts |
As a consequence of expert interviews, it was clear that measures of exchange volume were misunderstood.

Need to understand the possible consequences of different interpretations on a key survey estimate.

We focused on this question in the instrument:

Please estimate the number of final lab results sent using electronic methods to ambulatory providers. Please answer for each of the methods below and consider only results sent during calendar year 2011.

Assumed 4 scenarios where the “lab result” was interpreted as either a single component of lab test vs. entire panel of tests; and whether “exchange” was interpreted as a single transaction with the ordering physician or with all destinations including specialists and other destinations.
Main findings

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Assumptions*</th>
<th>Results of Simulations [Differences in estimates due to differences in terminology in Time 1 (2011)]</th>
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</table>
| 1        | • Single definition  
          • Single exchange | 3% of billable tests are sent to the ordering physician through electronic methods |
| 2        | • Single definition  
          • Multiple exchanges | 6% of billable tests are sent through electronic methods |
| 3        | • Multiple definitions  
          • Single exchange | 8% of final lab results as a proportion of billable tests are sent to the ordering physician through electronic methods |
| 4        | • Multiple definitions  
          • Multiple exchanges | 6.2% of final lab results as a proportion of billable tests are sent through electronic methods |

*1000 billable tests distributed with different assumptions operating across the scenarios.
Change in proportion of lab results sent by **electronic methods** between 2011 and 2013 by scenario

- **Scenario 1**
- **Scenario 2**
- **Scenario 3**
- **Scenario 4**
Qualitative Approaches to Inform Decision-Making: Cognitive Interviews

- Twelve cognitive interviews
  - 8 multisite & 4 single site participants
  - Respondents recruited using personal contacts and data from the Clinical Laboratory Improvement Amendments (CLIA) database collected by the Centers for Medicare & Medicaid Services

- Semi-structured interviewing protocol
  - Designed to collect both narrative and coded responses

- Objective:
  - How concepts and definitions are used by respondents
  - How respondents retrieve information
  - Find out if survey instruments have appropriate answer choices for respondents to be able to communicate their particular responses
Qualitative Approaches to Inform Decision-Making: Cognitive Interviews (Cont’d)

Theoretical Survey Response Model

Comprehension

Retrieving

Memory-based estimates

Source decision

Judgment

Record look-up

Communication

Main findings

• Admin structure of labs and the health information exchange process are variable and in a state of transition

• Varying understanding of terms (f. ex.: “physicians affiliated with your hospital” and “final billable tests”)

• Uncertainty as to how to respond if lab was affiliated with other laboratories either administratively or technically

• Mutually exclusive response categories may not match respondents’ experiences because they fall into more than one of the categories

• For volume “branching question”, need to include an intermediate range as a response option
Lessons Learned

• Qualitative approaches are valuable resources to identify difficulties and possible solutions
  • The three studies (expert interviews, simulation and cognitive interviews) altogether allowed us to understand both the nature and the depth of the issues
• Insights gathered from subject-matter experts in the field of clinical laboratories, was critical to better understand trade-offs in the survey design
• Recruitment of subject-matter experts as respondents, and training of cognitive interviewers are labor intensive tasks
  • Using semi-structured interviewing instruments helped reduce time during data collection period, training and reporting