Analysis of RDD Interviews by the Number of Call Attempts: The National Immunization Survey

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Research Questions

- General call attempt statistical properties
- Understanding call attempt variation
- Relationship between call attempts and--
  - reduction in non-response bias
  - data quality
  - response rates
  - accuracy and precision of vaccination coverage estimates
Design of the NIS

- 78 Geographic Areas (50 States, 28 Metropolitan Areas)
- 1.9 Million Fielded RDD Phone Lines Per Year
- Over 9 million call attempts per year
- Over 900,000 screens and 35,000 RDD Interviews per Year
- About 1,000 High-Attempt Interviews a Year (More than 24 dial attempts)
- Provider Record Check Study
Means: 4.95 calls per fielded case; 3.1 calls to contact a household; 3.4 calls to complete a screen; 5.6 calls to obtain an interview

By the 5th dial attempt, 69% of interviews are completed; by 10th dial, 86%; by 25th, 97.6%.
Cumulative Percent of Obtained Household Contacts, Completed Screens and Interviews
Comparison of Mean Call Attempts for Failures and Successes: Screen and Interview

Mean Call Attempts

<table>
<thead>
<tr>
<th></th>
<th>Screen HH</th>
<th>Interview HH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Success</td>
<td>3.4</td>
<td>5.6</td>
</tr>
<tr>
<td>Failure</td>
<td>13.1</td>
<td>16.6</td>
</tr>
</tbody>
</table>
Ratio of All Dial Attempts to Completed Screens and Interviews (Includes Dials Made on All Other Cases)

Ratio of Dials to Screens

Ratio of Dials to Interviews

Call Attempt Ranges

Ratio on Log Scale
Mean Number of Call Attempts by Metropolitan Statistical Area (MSA) Type

<table>
<thead>
<tr>
<th>Type</th>
<th>Contact HH</th>
<th>Screen</th>
<th>Interview</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central City</td>
<td>6.1</td>
<td>5.4</td>
<td>5.5</td>
</tr>
<tr>
<td>Balance of CMSA</td>
<td>5.5</td>
<td>5.5</td>
<td>4.7</td>
</tr>
<tr>
<td>Other MSA</td>
<td>5.5</td>
<td>5.5</td>
<td>5.6</td>
</tr>
<tr>
<td>Non-MSA</td>
<td>4.7</td>
<td>5.5</td>
<td>5.6</td>
</tr>
<tr>
<td>Total</td>
<td>5.5</td>
<td>5.5</td>
<td>5.6</td>
</tr>
</tbody>
</table>
Mean Number of Call Attempts for Completed Interviews in 9 Census Regions

Mean Call Attempts
- 5.7 to 6.2 (19)
- 5.4 to 5.7 (2)
- 5.3 to 5.4 (9)
- 5.1 to 5.3 (6)
- 4.5 to 5.1 (15)
Eligibility Rate by Number of Call Attempt: By Group and Cumulative

Eligibility Rate

2.00% 2.50% 3.00% 3.50% 4.00% 4.50%

Number of Call Attempts

1 2-3 4-6 7- 11- > 10 24 24

Group Eligibility
Cumulative Eligibility
Data Quality Indicators by Number of Call Attempt for Completing Interview

- Consents to Contact Provider
- Interview with Provider Data
- Uses Shot Card
Selected Item Non-Response Rates by Call Attempt Number

Call Attempt Ranges

- Hispanic Ethnicity
- Race of Child
- Race of Mother
- Family Income

0% 5% 10% 15% 20% 25%
Response Rates by Ranges of Call Attempts: Resolution, Screener Completion, Interview Completion, and CASRO Rates

- Resolution
- Screener Completion
- Interview Completion
- CASRO

1-10 Attempts
1-17 Attempts
1-24 Attempts
All Attempts

Response Rates:
- 60%
- 65%
- 70%
- 75%
- 80%
- 85%
- 90%
- 95%
- 100%
### Demographics by Call Attempt Number

<table>
<thead>
<tr>
<th></th>
<th>ALL CASES</th>
<th>NUMBER OF CALL ATTEMPTS TO COMPLETE THE IMMUNIZATION INTERVIEW</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2-3</td>
</tr>
<tr>
<td><strong>N Cases</strong></td>
<td>32,795</td>
<td>7,646</td>
</tr>
<tr>
<td><strong>Hispanic Status of Child (%)</strong></td>
<td>14.8%</td>
<td>9.4%</td>
</tr>
<tr>
<td><strong>Race of Child - Black (%)</strong></td>
<td>18.7%</td>
<td>14.45</td>
</tr>
<tr>
<td><strong>No. of People Living in HH (Mean)</strong></td>
<td>4.3</td>
<td>4.28</td>
</tr>
<tr>
<td><strong>Age of Mother (Mean Years)</strong></td>
<td>29.8</td>
<td>29.71</td>
</tr>
<tr>
<td><strong>Marital Status of Mother (% Married)</strong></td>
<td>72.1%</td>
<td>75.7%</td>
</tr>
<tr>
<td><strong>Education Level of Mother (% High School Graduate or Higher)</strong></td>
<td>87.2%</td>
<td>90.3%</td>
</tr>
<tr>
<td><strong>Family Income (% less than 15K)</strong></td>
<td>18.7%</td>
<td>16.3%</td>
</tr>
<tr>
<td><strong>Presence of Two Telephone Numbers (%)</strong></td>
<td>11.0%</td>
<td>9.9%</td>
</tr>
</tbody>
</table>
Demographics When Excluding Interviews Completed After the 10th Dial Attempt

<table>
<thead>
<tr>
<th>Study Question</th>
<th>Percent Change By Excluding Interviews Completed after 10 Dial Attempts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Presence of Second Phone Line</td>
<td>-2.3%</td>
</tr>
<tr>
<td>Race of Child -- Black</td>
<td>-1.5%</td>
</tr>
<tr>
<td>Hispanic Ethnicity of Child</td>
<td>0.33%</td>
</tr>
<tr>
<td>Marital Status of Mother - Married</td>
<td>1.2%</td>
</tr>
</tbody>
</table>

Note: 86% of interviews were completed on one of the first 10 dial attempts.
## National Immunization Estimates: Using All Cases and Excluding High-Attempt Cases

<table>
<thead>
<tr>
<th>N (Percent of Cases)</th>
<th>ALL CASES (ROW %)</th>
<th>EXCLUDING CASES COMPLETED ON 18TH OR LATER CALL ATTEMPT (ROW %)</th>
</tr>
</thead>
<tbody>
<tr>
<td>N (Percent of Cases)</td>
<td>32,795 (100%)</td>
<td>30,951 (94.4%)</td>
</tr>
<tr>
<td>Total Children with Provider Data (Percent of Cases)</td>
<td>22,075 (100%)</td>
<td>21,079 (95.5%)</td>
</tr>
<tr>
<td>National Estimate of Up-to-Date Status on Major Immunizations (4:3:1:3)</td>
<td>76.4%</td>
<td>76.8%</td>
</tr>
<tr>
<td>Standard Error of the Estimate</td>
<td>0.4%</td>
<td>0.4%</td>
</tr>
</tbody>
</table>
Subjective Assessments: The Value of High-Account Cases Completes

- High Attempt Cases Are Expensive: Over 10 times as many dials to get a complete
- Don’t Change National Estimates or Demographics Much, But Do Change Local Estimates
- Improve CASRO Rates by 3 Percentage Points
- Further Study Required on Cost--Error Tradeoff
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