Surveying Physicians: An Update on the Art and Science of Physician Survey Research

Tim Beebe
Division of Health Policy and Management
School of Public Health

November 13, 2017
Overview

- Importance of physician surveys
- Challenges of conducting physician surveys
- Are physicians different?
- Design considerations – conceptual framework
- Best practices
- National research agenda from NCI
- Physician Survey Research Program
  - Incentives
  - Mode of administration
- Next steps
Importance of Physician Surveys

- Long history of use, cost-effective
- Significant taxpayer investment – AHRQ (MEPS), CDC (NAMCS), NIH, CMS
- Wide range of topics
  - Career satisfaction
  - Compliance with practice recommendations
  - Substance use
  - Deception in clinical practice
  - Practice costs, physician reimbursement
  - Reactions to healthcare reform
  - Opioid prescribing practices
- Effectively advances our understanding of important issues relating to health and healthcare delivery
Challenges Surveying Physicians

- Response rates are about 10% lower – Asch et al., 1997; 2000
- Response rates are declining
  - 61% of federal surveys had a RR of 60% or more between 1998-2000; 36% between 2005-2008 (McLeod et al., 2013)
  - Average RR for postal surveys was 66% in 2000; 52% in 2008 (Creavin et al., 2011)
  - NAMCS RR: 71% in 2007; 58% in 2013 (BSC, 2016)
- Often used as an indicator of survey quality
- Potential impact on power and inferential value
- Barrier to publication in top journals – e.g., JAMA
  - 90% of surveyed journal editors: response rate at least somewhat important (Carley-Baxter et al., 2009)
NHIS Family, Child, and Adult Response Rates: NHIS 1997-2015
Sources of Nonresponse

- Nonlocation: could not find a sampled respondent
- Noncontact: respondent was not at home/office or not reached after many attempts
- Ineligible: respondent was reached but was not the proper age, gender, etc. for survey purposes
- Refusal to participate: respondent not willing to be interviewed
- Incomplete participation: respondent stopped before the end, answered every question as “don’t know” or sent back an empty survey
Reasons for Nonresponse

- Opportunity cost
- Privacy concerns
- Burden
- Topic interest
- Over-surveying

Characteristics of Nonrespondents

- Males
- Low SES groups
- Unemployed
- Urban residence
- African American and other minority race
- Disabled
- Low health status
Are physicians different?

- Yes and no
- “Reluctant professionals” – Sudman, 1985
  - Concerns over time, value, confidentiality and lack of ability to express complexity of an issue
- Gatekeepers? – VanGeest et al., 2007; Beebe et al., 2007
- Little evidence of nonresponse bias
  - Physicians tend to be rather homogeneous regarding knowledge, training, attitudes and behavior
Bias Example

- Diabetes care management survey in Mayo Health System
  - Providers identified in diabetes registry
  - Web survey (RR=35.5%, n=108)
- Compared responders to non-responders with respect to provider and patient characteristics
- No provider differences (time in practice, panel size, degree, specialty)
- No patient differences (age, gender, D3 or D5 achievement)

Figure 1. Conceptual Model and Organizing Framework for the Study

Emerging Conceptual Framework

Figure 1. Conceptual Model and Organizing Framework for the Study

Emerging Conceptual Framework

Figure 1. Conceptual Model and Organizing Framework for the Study

Influencing the Decision to Participate: Best Practices for Physicians

- Small monetary incentives > nonmonetary incentives
- Postal > telephone > web or fax
- Mixed modes > one mode
- Brief, personalized, and endorsed by professional associations

- Authors noted the lack of methodological work in physician surveys

“While there exists a plethora of articles that report findings from provider surveys, current literature inadequately describes the methods used, the challenges encountered or the best practices implemented when health care surveys are optimally executed.”

• Goals of the workshop:
  - Review the state of the art on physician surveys
  - Identify gaps in understanding
  - Lay out a research agenda for the future
NCI Research Agenda

• Need to gather information on how physicians interpret incentives of various amounts and whether a fair standard can be developed
• Improve mechanisms to enhance contact with the physician, especially optimizing the use of mixed-mode surveys and follow-up approaches
• Better understand the factors that motivate and impede the participation of physicians in surveys
• Better understand the office environment as a barrier or facilitator of physician access, particularly the role of “gatekeepers.”

NCI Research Agenda

• Need to gather information on how physicians interpret incentives of various amounts and whether a fair standard can be developed
• Improve mechanisms to enhance contact with the physician, especially optimizing the use of mixed-mode surveys and follow-up approaches
• Better understand the factors that motivate and impede the participation of physicians in surveys
• Better understand the office environment as a barrier or facilitator of physician access, particularly the role of “gatekeepers.”
Physician Survey Research Program
Physician Survey Research Program

- **Areas of research**
  - Incentives
  - Mode of administration

- **Beloved collaborators**
  - Jeanette Ziegenfuss, PhD – HealthPartners Institute
  - Ann Harris – Mayo Clinic Survey Research Center
  - David Cook, MD – Mayo Clinic
  - Lila Rutten, PhD – Mayo Clinic
  - Jon Tilburt, MD – Mayo Clinic
  - Timothy Johnson, PhD – U of Illinois at Chicago Survey Research Lab
  - Jonathan VanGeest, PhD – Kent State College of Public Health
  - Michael Davern, PhD – NORC at the University of Chicago
  - Todd Rockwood, PhD – University of Minnesota
Use of Incentives: Example 1

- 8-page self-administered questionnaire
  - Moral beliefs & ethical practices
  - 2000 U.S. physicians
  - Randomly selected from AMA Physician Masterfile
  - Ages 65 and under
  - All specialties

- 3 serial mailings

3rd mailing (N=1154)

Immediate Remuneration (n = 578)

Immediate $25 cash (n = 289)

Immediate $25 check (n = 289)

Promised Remuneration (n = 576)

Promised $25 check, no SSN (n = 288)

Promised $25 check, SSN (n = 288)
Response Rate in 3rd mailing

- Immediate $25 cash: 34%
- Immediate $25 check: 20%
- Promised $25 check, no SSN: 10%
- Promised $25 check, SSN: 10%

P = 0.47
Response Rate in 3rd mailing

Immediate $25 cash: 34%
Immediate $25 check: 20%
Promised $25 check, no SSN: 10%
Promised $25 check, SSN: 10%

P = 0.47
Response Rate in 3rd mailing

Immediate $25 cash  34%
Immediate $25 check  20%
Promised $25 check, no SSN  10%
Promised $25 check, SSN  10%

P = 0.47
Response Rate in 3rd mailing

- Immediate $25 cash: 34%
- Immediate $25 check: 20%
- Promised $25 check, no SSN: 10%
- Promised $25 check, SSN: 10%

P = 0.47
No evidence of nonresponse bias except for older (>50) physicians overrepresented in condition requiring SSN

Conducted in 3rd wave (most stubborn non-responders?)

Did not vary incentive amount

No cost analysis

Use of Incentives: Example 2

- 3,000 Urologists and Radiation Oncologists survey of treatment practices for localized prostate cancer
- Compared $5, $10 and $20 incentive
- Data quality
  - Item nonresponse
  - Item-level response distribution
  - Unit nonresponse (response rate)
  - Response bias
- Marginal cost per completed survey
Use of Incentives: Example 2 (cont.)

- **Response rates:**
  - $5 = 26%$
  - $10 = 31%$
  - $20 = 32%$

- **Cost per completion**
  - $5 = $18.95$
  - $10 = $32.33$
  - $20 = $63.31$

- **No differences in item nonresponse or bias**
- **Recommend $10 incentive in terms of tradeoff between quality and cost**

Ziegenfuss, J.Y., Tilburt, J.C., Beebe, T.J., Han, L.C., & Kim, S.P. In terms of data quality and cost, a $10 bill represents the optimal non-contingent token incentive amount in a survey of specialist physicians. Manuscript submitted for publication.
Use of Incentives: Example 2 (cont.)

- **Response rates:**
  - $5 = 26%$
  - $10 = 31%$
  - $20 = 32%$

- **Cost per completion**
  - $5 = $18.95
  - $10 = $32.33
  - $20 = $63.31

- No differences in item nonresponse or bias
- Recommend $10 incentive in terms of tradeoff between quality and cost

Ziegenfuss, J.Y., Tilburt, J.C., Beebe, T.J., Han, L.C., & Kim, S.P. In terms of data quality and cost, a $10 bill represents the optimal non-contingent token incentive amount in a survey of specialist physicians. Manuscript submitted for publication.
Use of Incentives: Example 3 - Interplay with Survey Length

• Web survey of radiology staff, fellows, and residents at select AMCs in the U.S. – total of 254 responses
• Compared three options:
  – 10 minute survey with chance to win an iPad
  – 10 minute survey with guaranteed nominal incentive ($5 Amazon gift card)
  – 5 minute survey with no incentive
• Individuals chose longer survey with incentive over shorter survey with no incentive (85% vs. 15%)
• Among those opting for an incentive, the majority chose the chance to win an iPad over the guaranteed gift card (56% vs. 44%)

Mixing modes: Example 1

- 500 Mayo Clinic physicians randomly assigned to either an initial mailed survey with a web survey follow-up to non-respondents, or an initial web survey followed by a mailed survey to non-respondents.
- Primary care physicians and specialists (allergists, cardiologists, gastroenterologists, hematologists, nephrologists, pulmonologists, rheumatologists) were included.

Table 1. Response rates by data collection condition (web/mail vs. mail/web) and data collection phase.

<table>
<thead>
<tr>
<th>Data Collection Condition</th>
<th>Data Collection Phase</th>
<th>Web/Mail</th>
<th>Mail/Web</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Data Collection Phase</td>
<td>(n=245)</td>
<td>(n=244)</td>
<td></td>
</tr>
<tr>
<td>Before Reminder</td>
<td>Surveys Completed</td>
<td>93</td>
<td>90</td>
<td>0.81</td>
</tr>
<tr>
<td></td>
<td>Cum. Response Rate</td>
<td>38.0 %</td>
<td>36.9 %</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Before Mode Switch</td>
<td>Surveys Completed</td>
<td>22</td>
<td>50</td>
<td>0.02</td>
</tr>
<tr>
<td></td>
<td>Cum. Surveys Completed</td>
<td>115</td>
<td>140</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cum. Response Rate</td>
<td>46.9 %</td>
<td>57.4 %</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>End of Data Collection</td>
<td>Surveys Completed</td>
<td>39</td>
<td>32</td>
<td>0.07</td>
</tr>
<tr>
<td></td>
<td>Cum. Surveys Completed</td>
<td>154</td>
<td>172</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total Response Rate</td>
<td>62.9 %</td>
<td>70.5 %</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overall Response Rate</td>
<td></td>
<td>66.7 % (326/489)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 1. Response rates by data collection condition (web/mail vs. mail/web) and data collection phase.

<table>
<thead>
<tr>
<th>Data Collection Phase</th>
<th>Data Collection Condition</th>
<th>Web/Mail (n=245)</th>
<th>Mail/Web (n=244)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before Reminder</td>
<td>Surveys Completed</td>
<td>93</td>
<td>90</td>
</tr>
<tr>
<td></td>
<td>Cum. Response Rate</td>
<td><strong>38.0 %</strong></td>
<td><strong>36.9 %</strong></td>
</tr>
<tr>
<td></td>
<td>p = 0.81</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Before Mode Switch</td>
<td>Surveys Completed</td>
<td>22</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>Cum. Surveys Completed</td>
<td>115</td>
<td>140</td>
</tr>
<tr>
<td></td>
<td>Cum. Response Rate</td>
<td><strong>46.9 %</strong></td>
<td><strong>57.4 %</strong></td>
</tr>
<tr>
<td></td>
<td>p = .02</td>
<td></td>
<td></td>
</tr>
<tr>
<td>End of Data Collection</td>
<td>Surveys Completed</td>
<td>39</td>
<td>32</td>
</tr>
<tr>
<td></td>
<td>Cum. Surveys Completed</td>
<td>154</td>
<td>172</td>
</tr>
<tr>
<td></td>
<td>Total Response Rate</td>
<td><strong>62.9 %</strong></td>
<td><strong>70.5 %</strong></td>
</tr>
<tr>
<td></td>
<td>p = 0.07</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Overall Response Rate 66.7 % (326/489)
Table 1. Response rates by data collection condition (web/mail vs. mail/web) and data collection phase.

<table>
<thead>
<tr>
<th>Data Collection Condition</th>
<th>Data Collection Phase</th>
<th>Web/Mail (n=245)</th>
<th>Mail/Web (n=244)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data Collection Phase</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Before Reminder</td>
<td>Surveys Completed</td>
<td>93</td>
<td>90</td>
</tr>
<tr>
<td></td>
<td>Cum. Response Rate</td>
<td>38.0 %</td>
<td>36.9 %</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>p = 0.81</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Before Mode Switch</td>
<td>Surveys Completed</td>
<td>22</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>Cum. Surveys Completed</td>
<td>115</td>
<td>140</td>
</tr>
<tr>
<td></td>
<td>Cum. Response Rate</td>
<td><strong>46.9 %</strong></td>
<td><strong>57.4 %</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>p = .02</td>
<td></td>
<td></td>
</tr>
<tr>
<td>End of Data Collection</td>
<td>Surveys Completed</td>
<td>39</td>
<td>32</td>
</tr>
<tr>
<td></td>
<td>Cum. Surveys Completed</td>
<td>154</td>
<td>172</td>
</tr>
<tr>
<td></td>
<td>Total Response Rate</td>
<td>62.9 %</td>
<td>70.5 %</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>p = 0.07</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overall Response Rate</td>
<td></td>
<td><strong>66.7 % (326/489)</strong></td>
<td></td>
</tr>
</tbody>
</table>
Table 1. Response rates by data collection condition (web/mail vs. mail/web) and data collection phase.

<table>
<thead>
<tr>
<th>Data Collection Phase</th>
<th>Web/Mail (n=245)</th>
<th>Mail/Web (n=244)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before Reminder</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Surveys Completed</td>
<td>93</td>
<td>90</td>
</tr>
<tr>
<td>Cum. Response Rate</td>
<td>38.0 %</td>
<td>36.9 %</td>
</tr>
<tr>
<td>p = 0.81</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Before Mode Switch</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Surveys Completed</td>
<td>22</td>
<td>50</td>
</tr>
<tr>
<td>Cum. Surveys Completed</td>
<td>115</td>
<td>140</td>
</tr>
<tr>
<td>Cum. Response Rate</td>
<td>46.9 %</td>
<td>57.4 %</td>
</tr>
<tr>
<td>p = 0.02</td>
<td></td>
<td></td>
</tr>
<tr>
<td>End of Data Collection</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Surveys Completed</td>
<td>39</td>
<td>32</td>
</tr>
<tr>
<td>Cum. Surveys Completed</td>
<td>154</td>
<td>172</td>
</tr>
<tr>
<td>Total Response Rate</td>
<td>62.9 %</td>
<td>70.5 %</td>
</tr>
<tr>
<td>p = 0.07</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overall Response Rate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>66.7 % (326/489)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Mixing modes: Example 1 (cont.)

Figure 1. Cumulative Response by Date and Experimental Condition

Figure 1. Cumulative Response by Date and Experimental Condition

Mixing modes: Example 1 (cont.)

Figure 1. Cumulative Response by Date and Experimental Condition

Mixing modes: Example 1 (cont.)

Figure 1. Cumulative Response by Date and Experimental Condition

Overall, response rates in this physician sample were quite high (67%).

The mail/web mixed-mode method obtained higher response rates more quickly and overall.

The two conditions yielded similar samples socio-demographically and similar substantive results (e.g., computer comfort).

Final samples for both conditions tended to under-represent younger physicians, less tenured physicians, and specialists.

Suggestive evidence that inclusion of the mail mode lead to better representation of specialists.

Knowledge and attitudes regarding HPV vaccination. Data collection started October 2015 and ended January 2016.

687 Mayo Clinic primary care clinicians randomly assigned to one of two mixed-mode (mail/web or web/mail) or single-mode designs (mail-only/web-only).

Primary care physicians, nurse practitioners, and physicians assistants were included.

Beebe TJ, Jacobson RM, Jenkins SM, Lackore KA, Finney Rutten LJ. Testing the impact of mixed mode designs (mail and web) and multiple contact attempts within mode (mail or web) on clinician survey response. Manuscript submitted for publication.
### Mixing modes: Example 2 (cont.)

<table>
<thead>
<tr>
<th></th>
<th>Mail Only (N=172)</th>
<th>Mail → Web (N=171)</th>
<th>Web Only (N=170)</th>
<th>Web → Mail (N=171)</th>
<th>Overall (N=684)</th>
<th>Overall p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before 2nd contact</td>
<td>18 (10.5%)</td>
<td>25 (14.6%)</td>
<td>33 (19.4%)</td>
<td>42 (24.6%)</td>
<td>118 (17.3%)</td>
<td>0.004</td>
</tr>
<tr>
<td></td>
<td>A</td>
<td>AB</td>
<td>AB</td>
<td>B</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Before 3rd contact</td>
<td>35 (20.3%)</td>
<td>56 (32.7%)</td>
<td>54 (31.8%)</td>
<td>54 (31.6%)</td>
<td>199 (29.1%)</td>
<td>0.035</td>
</tr>
<tr>
<td></td>
<td>A</td>
<td>B</td>
<td>AB</td>
<td>AB</td>
<td></td>
<td></td>
</tr>
<tr>
<td>End of study</td>
<td>57 (32.1%)</td>
<td>71 (41.5%)</td>
<td>65 (38.2%)</td>
<td>82 (48.0%)</td>
<td>275 (40.2%)</td>
<td>0.041</td>
</tr>
<tr>
<td></td>
<td>A</td>
<td>AB</td>
<td>AB</td>
<td>B</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

A “complete responder” is someone who answered at least 50% of survey items. Groups sharing the same letter are not significantly different (p>=0.01). Groups without letters in common are significantly different (p<0.01).
Mixing modes: Example 2 (cont.)

<table>
<thead>
<tr>
<th></th>
<th>Mail Only (N=172)</th>
<th>Mail → Web (N=171)</th>
<th>Web Only (N=170)</th>
<th>Web → Mail (N=171)</th>
<th>Overall (N=684)</th>
<th>Overall p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before 2nd contact</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18 (10.5%)</td>
<td>25 (14.6%)</td>
<td>33 (19.4%)</td>
<td>42 (24.6%)</td>
<td>118 (17.3%)</td>
<td></td>
<td>0.004</td>
</tr>
<tr>
<td>A</td>
<td>AB</td>
<td>AB</td>
<td>B</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Before 3rd contact</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>35 (20.3%)</td>
<td>56 (32.7%)</td>
<td>54 (31.8%)</td>
<td>54 (31.6%)</td>
<td>199 (29.1%)</td>
<td></td>
<td>0.035</td>
</tr>
<tr>
<td>A</td>
<td>B</td>
<td>AB</td>
<td>AB</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>End of study</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>57 (32.1%)</td>
<td>71 (41.5%)</td>
<td>65 (38.2%)</td>
<td>82 (48.0%)</td>
<td>275 (40.2%)</td>
<td></td>
<td>0.041</td>
</tr>
<tr>
<td>A</td>
<td>AB</td>
<td>AB</td>
<td>B</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

A “complete responder” is someone who answered at least 50% of survey items. Groups sharing the same letter are not significantly different (p>=0.01). Groups without letters in common are significantly different (p<0.01).
Mixing modes: Example 2 (cont.)

<table>
<thead>
<tr>
<th></th>
<th>Mail Only (N=172)</th>
<th>Mail → Web (N=171)</th>
<th>Web Only (N=170)</th>
<th>Web → Mail (N=171)</th>
<th>Overall (N=684)</th>
<th>Overall p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before 2nd contact</td>
<td>18 (10.5%)</td>
<td>25 (14.6%)</td>
<td>33 (19.4%)</td>
<td>42 (24.6%)</td>
<td>118 (17.3%)</td>
<td>0.004</td>
</tr>
<tr>
<td></td>
<td>A</td>
<td>AB</td>
<td>AB</td>
<td>B</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Before 3rd contact</td>
<td>35 (20.3%)</td>
<td>56 (32.7%)</td>
<td>54 (31.8%)</td>
<td>54 (31.6%)</td>
<td>199 (29.1%)</td>
<td>0.035</td>
</tr>
<tr>
<td></td>
<td>A</td>
<td>B</td>
<td>AB</td>
<td>AB</td>
<td></td>
<td></td>
</tr>
<tr>
<td>End of study</td>
<td>57 (32.1%)</td>
<td>71 (41.5%)</td>
<td>65 (38.2%)</td>
<td>82 (48.0%)</td>
<td>275 (40.2%)</td>
<td>0.041</td>
</tr>
<tr>
<td></td>
<td>A</td>
<td>AB</td>
<td>AB</td>
<td>B</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

A “complete responder” is someone who answered at least 50% of survey items. Groups sharing the same letter are not significantly different (p>=0.01). Groups without letters in common are significantly different (p<0.01).
## Mixing modes: Example 2 (cont.)

<table>
<thead>
<tr>
<th></th>
<th>Mail Only (N=172)</th>
<th>Mail → Web (N=171)</th>
<th>Web Only (N=170)</th>
<th>Web → Mail (N=171)</th>
<th>Overall (N=684)</th>
<th>Overall p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before 2nd contact</td>
<td>18 (10.5%)</td>
<td>25 (14.6%)</td>
<td>33 (19.4%)</td>
<td>42 (24.6%)</td>
<td>118 (17.3%)</td>
<td>0.004</td>
</tr>
<tr>
<td></td>
<td>A</td>
<td>AB</td>
<td>AB</td>
<td>B</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Before 3rd contact</td>
<td>35 (20.3%)</td>
<td>56 (32.7%)</td>
<td>54 (31.8%)</td>
<td>54 (31.6%)</td>
<td>199 (29.1%)</td>
<td>0.035</td>
</tr>
<tr>
<td></td>
<td>A</td>
<td>B</td>
<td>AB</td>
<td>AB</td>
<td></td>
<td></td>
</tr>
<tr>
<td>End of study</td>
<td>57 (32.1%)</td>
<td>71 (41.5%)</td>
<td>65 (38.2%)</td>
<td>82 (48.0%)</td>
<td>275 (40.2%)</td>
<td>0.041</td>
</tr>
<tr>
<td></td>
<td>A</td>
<td>AB</td>
<td>AB</td>
<td>B</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

A “complete responder” is someone who answered at least 50% of survey items. Groups sharing the same letter are not significantly different (p>=0.01). Groups without letters in common are significantly different (p<0.01).
Mixing modes: Example 2 (cont.)

<table>
<thead>
<tr>
<th></th>
<th>Mail Only (N=172)</th>
<th>Mail → Web (N=171)</th>
<th>Web Only (N=170)</th>
<th>Web → Mail (N=171)</th>
<th>Overall (N=684)</th>
<th>Overall p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before 2nd contact</td>
<td>18 (10.5%)</td>
<td>25 (14.6%)</td>
<td>33 (19.4%)</td>
<td>42 (24.6%)</td>
<td>118 (17.3%)</td>
<td>0.004</td>
</tr>
<tr>
<td></td>
<td>A</td>
<td>AB</td>
<td>AB</td>
<td>B</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Before 3rd contact</td>
<td>35 (20.3%)</td>
<td>56 (32.7%)</td>
<td>54 (31.8%)</td>
<td>54 (31.6%)</td>
<td>199 (29.1%)</td>
<td>0.035</td>
</tr>
<tr>
<td></td>
<td>A</td>
<td>B</td>
<td>AB</td>
<td>AB</td>
<td></td>
<td></td>
</tr>
<tr>
<td>End of study</td>
<td>57 (32.1%)</td>
<td>71 (41.5%)</td>
<td>65 (38.2%)</td>
<td>82 (48.0%)</td>
<td>275 (40.2%)</td>
<td>0.041</td>
</tr>
<tr>
<td></td>
<td>A</td>
<td>AB</td>
<td>AB</td>
<td>B</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

A “complete responder” is someone who answered at least 50% of survey items. Groups sharing the same letter are not significantly different (p>0.01). Groups without letters in common are significantly different (p<0.01).
### Mixing modes: Example 2 (cont.)

<table>
<thead>
<tr>
<th></th>
<th>Mail Only (N=172)</th>
<th>Mail → Web (N=171)</th>
<th>Web Only (N=170)</th>
<th>Web → Mail (N=171)</th>
<th>Overall (N=684)</th>
<th>Overall p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before 2nd contact</td>
<td>18 (10.5%)</td>
<td>25 (14.6%)</td>
<td>33 (19.4%)</td>
<td>42 (24.6%)</td>
<td>118 (17.3%)</td>
<td>0.004</td>
</tr>
<tr>
<td>Before 3rd contact</td>
<td>35 (20.3%)</td>
<td>56 (32.7%)</td>
<td>54 (31.8%)</td>
<td>54 (31.6%)</td>
<td>199 (29.1%)</td>
<td>0.035</td>
</tr>
<tr>
<td>End of study</td>
<td><strong>57 (32.1%)</strong></td>
<td>71 (41.5%)</td>
<td><strong>65 (38.2%)</strong></td>
<td>82 (48.0%)</td>
<td>275 (40.2%)</td>
<td>0.041</td>
</tr>
</tbody>
</table>

A “complete responder” is someone who answered at least 50% of survey items. Groups sharing the same letter are not significantly different (p>=0.01). Groups without letters in common are significantly different (p<0.01).
### Mixing modes: Example 2 (cont.)

A "complete responder" is someone who answered at least 50% of survey items. Groups sharing the same letter are not significantly different (p>=0.01). Groups without letters in common are significantly different (p<0.01).

<table>
<thead>
<tr>
<th></th>
<th>Mail Only (N=172)</th>
<th>Mail → Web (N=171)</th>
<th>Web Only (N=170)</th>
<th>Web → Mail (N=171)</th>
<th>Overall (N=684)</th>
<th>Overall p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Before 2nd contact</strong></td>
<td>18 (10.5%)</td>
<td>25 (14.6%)</td>
<td>33 (19.4%)</td>
<td>42 (24.6%)</td>
<td>118 (17.3%)</td>
<td>0.004</td>
</tr>
<tr>
<td></td>
<td>A</td>
<td>AB</td>
<td>AB</td>
<td>B</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Before 3rd contact</strong></td>
<td>35 (20.3%)</td>
<td>56 (32.7%)</td>
<td>54 (31.8%)</td>
<td>54 (31.6%)</td>
<td>199 (29.1%)</td>
<td>0.035</td>
</tr>
<tr>
<td></td>
<td>A</td>
<td>B</td>
<td>AB</td>
<td>AB</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>End of study</strong></td>
<td>57 (32.1%)</td>
<td>74 (41.5%)</td>
<td>65 (38.2%)</td>
<td>82 (48.0%)</td>
<td>275 (40.2%)</td>
<td>0.041</td>
</tr>
<tr>
<td></td>
<td>A</td>
<td>AB</td>
<td>AB</td>
<td>B</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Mixing modes: Example 2 Summary

• Using a multiple contact protocol increased response.
• Sending a web survey first provided the more rapid response.
• Mixing modes might be better than single modes
• The final response rate in the web/mail condition (48%) was higher than the mail-only condition (32%).
• Observed differences did not result in nonresponse bias.

Beebe TJ, Jacobson RM, Jenkins SM, Lackore KA, Finney Rutten LJ. Testing the impact of mixed mode designs (mail and web) and multiple contact attempts within mode (mail or web) on clinician survey response. Manuscript submitted for publication.
Next Steps: NCI Research Agenda

- Need to gather information on how physicians interpret incentives of various amounts and whether a fair standard can be developed
- Improve mechanisms to enhance contact with the physician, especially optimizing the use of mixed-mode surveys and follow-up approaches
- Better understand the factors that motivate and impede the participation of physicians in surveys
- Better understand the office environment as a barrier or facilitator of physician access, particularly the role of “gatekeepers.”

Next Steps: NCI Research Agenda

- Need to gather information on how physicians interpret incentives of various amounts and whether a fair standard can be developed
- Improve mechanisms to enhance contact with the physician, especially optimizing the use of mixed-mode surveys and follow-up approaches
- Better understand the factors that motivate and impede the participation of physicians in surveys
- Better understand the office environment as a barrier or facilitator of physician access, particularly the role of “gatekeepers.”

Next Steps: NCI Research Agenda

- Need to gather information on how physicians interpret incentives of various amounts and whether a fair standard can be developed
- Improve mechanisms to enhance contact with the physician, especially optimizing the use of mixed-mode surveys and follow-up approaches
- Better understand the factors that motivate and impede the participation of physicians in surveys
- Better understand the office environment as a barrier or facilitator of physician access, particularly the role of “gatekeepers.”

Emerging Conceptual Framework

Figure 1. Conceptual Model and Organizing Framework for the Study

Sampling and Accessibility | Survey and Instrument Design, Topic/Relevance, Incentives, Mode

Perceived Burden

Decision to Participate

Successful Participation

Health Care Context

MD Accessibility/Gatekeeper

Survey Design

Perceived Benefit

Contact Information Correct

Gatekeeper Present/Barrier

Physician Processes the Information

Decision to Begin Questionnaire

Complete and Return Questionnaire

Initial Decision to Participate

Non-Participation

Non-Participation

Non-Participation

Non-Participation

Non-Participation

Non-Participation

Non-Participation

Non-Participation

Non-Participation

Non-Participation

Non-Participation

Non-Participation

Non-Participation

Emerging Conceptual Framework

Figure 1. Conceptual Model and Organizing Framework for the Study

- Sampling and Accessibility
- Survey and Instrument Design, Topic/Relevance, Incentives, Mode

- Perceived Burden
- Decision to Participate
- Successful Participation

- Health Care Context → MD Accessibility/Gatekeeper → Survey Design

- Perceived Benefit
- Decision to Begin Questionnaire

- Initial Decision to Participate
- Complete and Return Questionnaire

- Contact Information Correct → yes, Non-Participation
- Gatekeeper Present/Barrier → yes, Non-Participation
- Physician Processes the Information → no, Non-Participation

Initial Work Related to Gatekeeping

- Physicians and nurses randomized to padded envelope or priority mail envelope
- Laser pen incentive inside envelope
- No difference in item or unit nonresponse
- Nurses more likely to respond overall (59.6% compared to 48.3% of physicians, p < 0.001)
- 63.5% of nurses with priority mail responded compared to 55.8% of those with padded envelope (p=0.03)

Next Steps

- To conduct formative research to assess structures, processes, and information flows within health care settings that facilitate or impede physician survey participation.
  - Interviews of practice administrators at various health care settings
  - Assess issues such as the process for handling postal mail, whether electronic surveys that are addressed to providers are forwarded on to the provider, and general policies for physician survey participation in order to better understand and document the role of gatekeepers in physician survey research.
Thank you! Questions?