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Balancing Sample Size and Cost

An innovative solution in the absence of sampling mechanisms for IVR surveys

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Introductions

Kristen Flaherty

- Senior Research Data Analyst
- 5 years at ICF
- 7 years in the field of survey research

- **Assist with project management**
- **Ad-hoc data requests**
- **Data management**
- **Monthly data prep**

Kelli Keith

- Project Manager, Survey Research
- 9 Years at ICF
- 9 Years in the field of survey research

- **Client communication**
- **Contract management**
- **Subcontract management**
- **Oversee monthly data prep**

Project Background

- **Four contractors hired to operate call centers**

- **Interactive Voice Response (IVR) satisfaction surveys offered to customers**

- **ICF conducts the IVR survey**

- **ICF delivers monthly data files to client**

ICF

SURVEY

Client
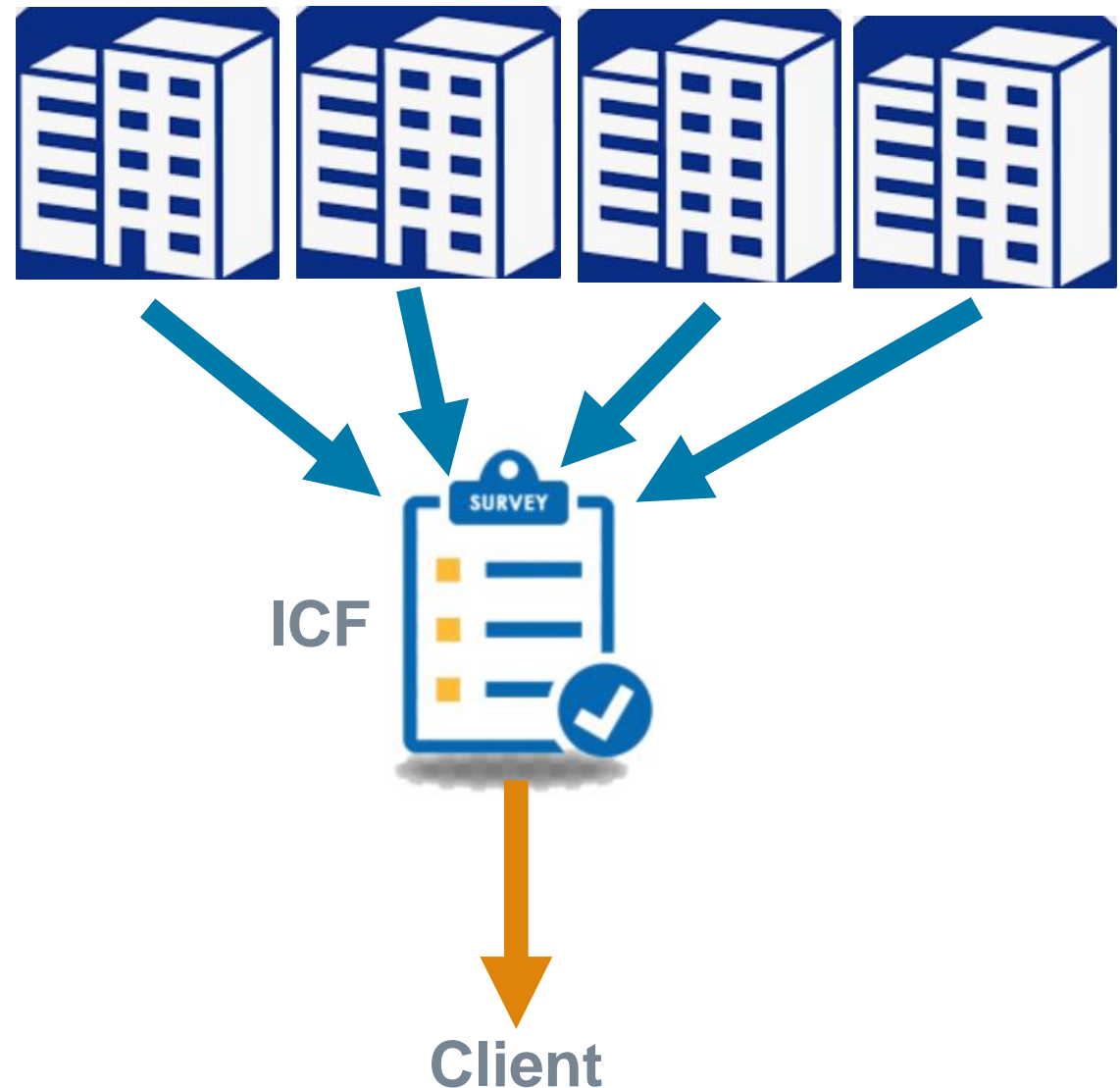
The Problem

- **Estimated target = 400 completed surveys per month**

- **The estimate was low to begin with**

- **Informed of increase in call volume starting in October 2018**

- **Processing increased number of surveys per month**
  - Outside scope of work
  - Unbudgeted costs

Alternative Solutions

- **Quotas**
  - Call centers stop offering the survey after a quota is reached
- **Alternating weeks for call centers to send calls**
- **Have call agents follow a protocol**
  - Offer every X^{th} call a survey
- **Phone lines "Turning Off" on set weeks for over performing sites**
  - Client attempted this method for a few months

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Unfortunately, these solutions are….

- Not Representative
- Not Random Selection
- Introduce Call Agent Biases
- Unreliable

Two-Survey Solution

- **Proposal of two-survey approach: one short and one full-length survey**

- **Short survey consists of three key questions**

- **Survey type selected by a computerized random selection**

- **Lowers costs and allows client to keep collecting data without interruption**

Developing Our Solution

1. Received average number of calls to be handled by call centers per month
2. Determined connection rate based on past years data to calculate estimated total connects per month

$$173,333 \times 4.63\% = 8,025$$

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$$\textcolor{red}{3,199 - 400 = 2,799}$$

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5. Divided goal for each survey type by estimated total expected completes

$$173,333 \times 4.63\% = 8,025$$

$$8,025 \times 39.87\% = 3,199$$

$$3,199 - 400 = 2,799$$

$$\frac{400}{3199} = .125 = 13\%$$

$$\frac{2799}{3199} = .874 = 87\%$$

Cost Savings

- **Average time for full-length
  7 minutes**

- **Average time for short
  1.75 minutes**

- **If the caller gets routed to the short survey, the average savings is 93% of the cost of a full-length survey**

Implementation and Monitoring

- **Our initial calculations suggested we should recommend a sampling distribution of 13% of phone connects being offered the full-length survey and 87% being offered the new short version**

- **To be conservative, we decided to recommend that 20% be offered the full-length and 80% offered the short version**

- **We've monitored call counts weekly and monthly to ensure the sampling distribution is working as planned**

- **We've monitored whether respondents answer questions similarly between the short and long survey**

Comparing Questions between Surveys

- **Q1. Everything considered, please rate your overall satisfaction with the service you received during the call today…**
  - Same question
  - Same order

- **Q3. Rate your satisfaction with the professionalism of the representative who handled your call…**
  - Same question
  - Slightly different order

- **Q16. Rate your level of satisfaction with the clarity of the notice, bill, or letter…**
  - Modified question and skip logic
  - Very different order

- **Q1 responses show no statistically significant difference between the full-length and short survey**
- **Expected**
- **Can be interpreted as evidence that the two-survey methodology works**

Do respondents answer similarly?

Q1. Everything considered, please rate your overall satisfaction with the service you received during the call today… (5-point Scale)						
Mean		**Standard Deviation**		**Diff.**	**p-value**	**Effect Size**
Long	**Short**	**Long**	**Short**	**(F – S)**	**(t-test)**	**(Hedge's G)**
4.74	4.74	0.83	0.82	-0.002	.896	-0.002

Do respondents answer similarly?

Only asked on the full-length

Q1. Everything considered, please rate your overall satisfaction with the service you received during the call today.

Q2. Rate your satisfaction with the **courtesy** of the representative who handled your call.

Q3. Rate your satisfaction with the **professionalism** of the representative who handled your call…

- **Q3 shows a statistically significant difference, though the mean difference is very small, and the effect size is also very small.**
  - May be a priming/question order effect, where previous questions seem to influence the rating of the next question.
  - Q2 (Courtesy of Representative) appears to lower Q3 (Professionalism of Representative).

Do respondents answer similarly?

Q3. Rate your satisfaction with the professionalism of the representative who handled your call… (5-point Scale)						
Mean		Standard Deviation		Diff.	p-value	Effect Size
Long	Short	Long	Short	(F – S)	(t-test)	(Hedge's G)
4.84	4.80	0.70	0.77	0.042	.002	0.056

Do respondents answer similarly?

**Short Survey
(No Screener Question)**

**Full-Length Survey
(Screener Question)**

Q16. You may have received a notice, bill, or letter. Rate your level of satisfaction with the clarity of the notice, bill, or letter. If you did not receive a notice, bill, or letter, press 6.

Q15. Did this call relate to a notice, bill, or letter you received recently {from the call center}?

Q16. Rate your level of satisfaction with the clarity of the notice, bill, or letter.

Balancing Sample Size and Cost

- **Q16 show a statistically significant difference as well, with a small effect size.**
  - Q16 on the full-length survey, is preceded by Q15, a screening question.
  - The results of the screening seem to have impact on how level of satisfaction is rated.

Do respondents answer similarly?

Q16. Rate your level of satisfaction with the clarity of the notice, bill, or letter… (5-point Scale)						
Mean		Standard Deviation		Diff.	p-value	Effect Size
Long	Short	Long	Short	(F – S)	(t-test)	(Hedge's G)
4.13	4.33	1.39	1.12	-0.194	.000	-0.166

More about Q16

- **Given a screener question, more people self-select out of this question. When given the Not Applicable option ONLY (short survey version), fewer self-select out of this question.**

Long Form (Q15 No/Not Sure)	Short Form (Q16 NA)	Diff. (F - S)	P Value
11%	8%	3%	<0.001

Final Thoughts

- **Two-survey approach is well-liked**
- **If call volume fluctuates, ICF has the ability to change the percentage being offered the full-length survey at any time**
- **Interesting priming effects are observed across questions between surveys, though differences are minute to small.**

- **Participants do not consistently self select out of questions, when compared to a two staged screener questions/follow-up question.**
- **Do questions in the last half of the full-length survey show higher dissatisfaction?**

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Thank you!