

Evaluation of a \$10 vs. \$20 Incentive Promise on the National Immunization Survey-Child (NIS-Child)

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Abstract

The National Immunization Survey-Child (NIS-Child) is a random-digit-dial (RDD) telephone survey used to monitor vaccination coverage among children age 19-35 months in the United States. The protocol includes a household telephone survey of parents/guardians followed by a mail survey to the child's vaccination providers. Each year, over 60,000 household interviews are completed and over 60,000 questionnaires are mailed to vaccination providers. In 2018, the NIS transitioned from a dual-frame landline and cell phone sample design to a single-frame cell phone sample design. As response rates continue to be lower for cell phones than for landlines, it is important to identify methods for increasing response rates for the NIS.

The NIS-Child incentive protocol for cell phones previously consisted of an \$11 promise upon re-contact, for potential respondents with incomplete interviews after reporting at least one possibly-eligible child in the household. In Quarters 3 and 4 of 2018, NORC conducted an experiment to assess the impact of a \$20 incentive promise compared to \$10. Compared to the \$10 incentive promise, the \$20 promise increased key response rates for incentive cases without a refusal in their history. For incentive cases with a refusal, the higher incentive offer did not perform significantly better than the \$10 promise. Overall, the \$20 incentive offer proved cost effective for the NIS-Child. As telephone behavior evolves, the NIS will continue to monitor the key rates of interest to confirm that the increased incentive amount remains cost effective.

Key Words: National Immunization Surveys, Incentives, Cell Phones

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

1. Introduction

Survey researchers employ monetary incentives as a consistent method to increase participation rates in surveys, whether conducted by mail, telephone, web, or in person (Singer and Cong, 2013). In light of a decades long decline in survey response rates in telephone surveys (Lavrakas et al., 2017), improving the efficacy of these methods is of vital interest to a nationwide random-digit-dial (RDD) survey. As the National Immunization Survey – Child (NIS-Child) uses a single-frame cell sample with a low incidence of contact and eligibility, targeting cooperation among households identified as eligible or likely to be eligible is motivated by the thousands of dials necessary to identify each eligible household.

Published research has examined the ability of monetary incentives to provoke significantly increased cooperation in RDD surveys (Holbrook, Krosnick, and Fent, 2008), and attempts to model the effects of incentives have suggested a linear relationship between the value of the incentive and an improvement in cooperation rates (Gelman, Stevens, and Chan, 2003) relative to a treatment where no incentive is offered. Research has also been published in an attempt to optimize the incentive value offered for a survey. Although only mail surveys were included in the study, the findings supported a hypothesis that the optimum incentive amount increases as the cost of conducting the survey increases (Saunders, Jobber, and Mitchell, 2006).

The NIS-Child is a very low incidence survey. Less than 5% of U.S. households contain a child in the eligible age range.¹ Due to the high value of eligible households, it is worthwhile to explore whether, for the particular circumstances presented by this large scale national RDD cell phone survey, the incentive value could be changed in an attempt to optimize cost-effectiveness and to decrease non-response. Accordingly, NORC at the University of Chicago conducted an experiment to determine whether an increase in the offered incentive amount would, as expected, increase rates of cooperation at various points in the survey, and whether the new incentive amount would prove more cost-effective in achieving targets than the current protocol.

2. Design of the Experiment

The NIS-Child, one of the National Immunization Surveys (NIS), is sponsored by the Centers for Disease Control and Prevention (CDC), and conducted by RDD telephone. The survey provides U.S. national, state, and select local area and territorial estimates of vaccination coverage among young children 19-35 months of age. Sampled telephone numbers are dialed and screened to identify households with children in the 19-35 month age range. In households with an eligible child(ren), respondents are asked about some socio-demographic characteristics of the child, mother and household; respondents are asked to identify the child's vaccination providers and to give consent to contact those providers. With the parent/guardian's consent, NORC mails a paper questionnaire to all nominated providers to obtain the vaccination histories of the sampled children. These provider data are the source of the vaccination estimates produced by the NIS-Child.

¹ 2017 American Community Survey

NIS-Child respondents are eligible for an incentive offer if they break off for any reason after they have indicated that at least one child age 19-35 months lives in the household². There are three categories of incentives, based on where in the survey the breakoff occurs: 1) “Nearly Eligible” incentives consist of respondents who have indicated at least one child age 19-35 months lives in the household, but break off before confirming the child(ren)’s date of birth; 2) “Household Partial” incentives occur when a respondent breaks off after confirming an eligible child’s date of birth, but before completing the household demographics portion of the survey; and 3) “Provider Partial” incentives occur when a respondent has completed the household demographics portion of the survey, but breaks off before providing consent to contact the child(ren)’s vaccination providers. For analysis purposes, incentives are also categorized by whether the respondent indicated a refusal to participate (“refusal incentives”), or broke off for any other reason (“non-refusal incentives”). Incentive payments are promised on callback, and the dollar amount is mentioned in the introduction script and the answering machine script, should a message be left. If the respondent completes the interview or breaks off again, NORC collects the mailing address, and the incentive payment is mailed. Payments are mailed in cash, weekly, so most respondents will receive their payment within 10-14 days.

In Quarters 3 and 4 of 2018, the sample was randomized to receive a \$10 or \$20 cash offer upon becoming incentive-eligible. Three key outcomes were examined:

- Age screener completion rate among Nearly Eligible incentive cases
- Interview completion rate among Nearly Eligible and Household Partial incentive cases
- Yield of consented³ cases among Nearly Eligible, Household Partial, and Provider partial incentive cases

Outcomes were assessed for all incentive types combined, and separated by criteria (Nearly Eligible, Household Partial, or Provider Partial) and breakoff type (Non-Refusal or Refusal).

3. Results

During the experimental period, a total of 39,342 cases were eligible to receive the incentive cash promise and received at least one call attempt after they became incentive-eligible. Of these, 49.7% were flagged to receive the \$10 offer, and 50.3% were flagged to receive the \$20 offer. Table 1 shows the results for all incentive cases, regardless of breakoff type. Highlighted cells indicate a statistically significant difference found by two-sample z-test ($p < 0.05$). Among the Nearly Eligible incentives, the age screener completion rate was 1.6 percentage points higher for the \$20 promise group than for the \$10 group, and among those who completed the age screener, respondents offered \$20 were more likely to report an age-eligible child than those offered \$10. Consent to contact vaccination providers was also slightly higher in the \$20 group than the \$10 for Nearly Eligible cases, but there was no significant difference in the interview completion rate between the two groups. Among the Household Partial incentives, the interview completion and provider consent rates were significantly higher in the \$20 group compared to \$10. However, among

² There are three exceptions—respondents who are hostile, request to be removed from the calling list, or require third-party language translation are not offered an incentive. The hostile and removed-from-list cases are not called again.

³ Consented cases are those for which consent to contact vaccination providers was granted

the Provider Partial incentives, the \$20 offer had no discernible impact on the rate of provider consent compared to \$10. For all incentive types combined, the \$20 incentive promise resulted in a higher yield of provider consent among incentive cases than the \$10 promise.

Table 1. Outcomes by Incentive Type and Incentive Amount, NIS-Child, Quarters 3-4, 2018⁴

Rates	Overall (n=39,342)			Nearly Eligible (n=28,643)			Partial (n=6,249)			Provider Partial (n=4,450)		
	\$10	\$20	Diff	\$10	\$20	Diff	\$10	\$20	Diff	\$10	\$20	Diff
Contact rate				74.8%	75.0%	0.1%	78.4%	79.1%	0.7%	78.8%	77.2%	-1.6%
Age-screener completion rate among contacts				23.7%	25.3%	1.6%						
Age-eligibility rate among age-screener completes				29.8%	33.1%	3.3%						
Interview completion rate among age-eligibles				83.0%	81.4%	-1.6%	22.9%	25.4%	2.5%			
Consent rate among interview completes	37.2%	40.6%	3.4%	68.9%	69.4%	0.5%	73.8%	75.3%	1.5%	16.7%	18.5%	1.8%
Consent yield rate among incentive elig w/ a callback	6.8%	7.7%	1.0%	3.0%	3.6%	0.5%	16.9%	19.1%	2.2%	16.7%	18.5%	1.8%

Tables 2 and 3 show the outcomes of interest separately by breakoff type. Table 2 shows that for Non-Refusal incentives, the pattern of outcomes matches that for incentives overall—the \$20 group achieves higher age screener completion and age eligibility rates for Nearly Eligible incentives, higher interview completion and provider consent for Household Partials, and no significant difference in rates for Provider Partials, compared to the \$10 group.

Table 2. Outcomes by Incentive Type and Incentive Amount among Non-Refusals, NIS-Child, Quarters 3-4, 2018⁴

Rates	Overall (n=26,598)			Nearly Eligible (n=19,663)			Partial (n=5,277)			Provider Partial (n=1,658)		
	\$10	\$20	Diff	\$10	\$20	Diff	\$10	\$20	Diff	\$10	\$20	Diff
Contact rate				70.5%	70.3%	-0.2%	77.1%	78.0%	0.9%	76.4%	76.4%	0.0%
Age-screener completion rate among contacts				27.1%	29.0%	1.9%						
Age-eligibility rate among age-screener completes				29.3%	34.0%	4.7%						
Interview completion rate among age-eligibles				84.5%	82.1%	-2.4%	24.4%	27.2%	2.9%			
Consent rate among interview completes	52.3%	56.1%	3.8%	71.7%	71.6%	-0.1%	75.4%	77.0%	1.5%	23.8%	27.4%	3.6%
Consent yield rate among incentive elig w/ a callback	7.7%	8.8%	1.2%	3.4%	4.1%	0.7%	18.4%	20.9%	2.5%	23.8%	27.4%	3.6%

⁴ Highlighted cells indicate statistically significant difference found by two-sample z-test ($p < 0.05$)

Table 3 shows the outcomes for Refusal incentives, which is limited to cases where the respondent broke off after indicating a child 19-35 months lives in the household, and indicated that they did not wish to participate in the survey. For this group, there is no statistically significant difference between the \$20 offer and the \$10 offer on any outcome of interest, though the point estimates for interview completion rate and provider consent rate are slightly higher for the \$20 group among Household Partials.

Table 3. Outcomes by Incentive Type and Incentive Amount among Refusals, NIS-Child, Quarters 3-4, 2018⁴

<i>Rates</i>	Overall (n=12,744)			Nearly Eligible (n=8,980)			Partial (n=972)			Provider Partial (n=2,792)		
	\$10	\$20	Diff	\$10	\$20	Diff	\$10	\$20	Diff	\$10	\$20	Diff
Contact rate				84.2%	85.5%	1.3%	85.6%	84.4%	-1.2%	80.2%	77.7%	-2.5%
Age-screener completion rate among contacts				17.7%	18.5%	0.8%						
Age-eligibility rate among age-screener completes				31.4%	30.6%	-0.7%						
Interview completion rate among age-eligibles				79.2%	79.1%	-0.2%	14.6%	15.8%	1.2%			
Consent rate among interview completes	19.4%	20.6%	1.3%	61.3%	62.4%	1.0%	58.2%	60.5%	2.3%	12.5%	13.3%	0.8%
Consent yield rate among incentive elig w/ a callback	4.9%	5.4%	0.4%	2.3%	2.4%	0.1%	8.5%	9.5%	1.0%	12.5%	13.3%	0.8%

4. Discussion

Compared to the \$10 incentive promise, the \$20 promise increased the screener completion rate, interview completion rate, and consent to contact vaccination providers among the Non-Refusal incentive cases as a whole. However, there were no significant benefits of the \$20 promise over \$10 for incentive cases where the respondent previously refused to participate in the survey (Refusal Incentives). In addition, NORC did not find Provider Partial cases, in which respondents completed the survey through the household demographic section, but broke off without granting consent to contact their child(ren)'s vaccination providers, to be more likely to grant provider consent if offered the higher incentive amount. This was true whether or not the Provider Partial case broke off as a refusal, or for some other reason. The lack of effect of the higher incentive amount on Provider Partials and all Refusal incentives may be partially the result of small sample sizes; however there could also be a behavioral component; respondents who feel strongly enough to refuse outright when they break off may be less likely to be swayed by additional money than those who broke off without refusing explicitly. Likewise, the reasons for declining to provide information about one's child's vaccination providers might be less easily overcome by a monetary incentive than the reasons for breaking off in other parts of the survey.

Finally, NORC compared the cost per completed interview with consent in the \$10 group to the cost per completed interview with consent in the \$20 group, and the \$20 group was less expensive, even accounting for the cost of the increased incentive. On a very low incidence survey like the NIS-Child, it is costly to replace a household with known eligible children with fresh sample of unknown eligibility.

5. Limitations

The NIS-Child is a topical survey of children's immunizations, and benefits from CDC sponsorship. The effect of an increased incentive offer shown in this experiment may differ for surveys with different target populations, subject matter, or sponsorship. The NIS is also collected by RDD telephone, and the results of this experiment may not translate to other data collection modes. Additionally, and perhaps most importantly, the NIS-Child is a very low-incidence survey. A \$20 incentive offer may not be cost effective for a general population, or otherwise higher-incidence survey.

6. Future Research

As a result of the experiment, all NIS-Child incentive cases were offered \$20 beginning in Quarter 1 of 2019. As telephone behavior evolves, the NIS will continue to monitor the key rates of interest to confirm that the increased incentive amount remains cost effective. In addition, future studies may be conducted to test differential incentive treatments for the Non-Refusal and Refusal incentive types, to determine whether an even greater incentive promise, or, conversely, a lower offer, is more cost effective for cases that refuse outright. Similarly, NORC may also consider a different incentive amount for the Provider Partial incentives compared to the Nearly Eligible and Household Partial groups. Finally, in future quarters, the NIS will test the feasibility of alternatives to mailed cash incentive payments, which could include texting or emailing payments by digital gift codes or store credits.

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