Testing the Impact of Mail Materials on Web Participation in the National Immunization Survey

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Abstract

Declining population coverage of the landline sampling frame, lower response rates on cell phones, and the geographic inaccuracy of cell-phone samples have made address-based sampling an attractive alternative to random digit dialing (RDD) for survey data collection. A web-first design is one method of address-based sampling that shows a great deal of promise. In this design, respondents are invited to complete the survey online via a mailed invitation. The success of this design hinges on the ability to entice respondents to log on to the survey web site.

As part of the National Immunization Survey-Child (NIS-Child) and the National Immunization Survey-Teen (NIS-Teen), surveys used to monitor vaccination coverage rates among children (19-35 months) and teens (13-17 years) in the United States, an evaluation was conducted to determine the mail procedures and materials that would lead to the highest web login rate. The analysis included 169,000 sampled addresses and examined factors such as the use of an advance postcard, the text and image on the advance postcard, the inclusion of a web instructions insert, the type of postage used (first class vs. non-profit), and the use of a "last ditch" postcard.

In this paper, we present the evaluation design, results, and recommendations based on these results.

Key Words: National Immunization Survey-Child, National Immunization Survey-Teen, Web Surveys, Mail Materials

1. Introduction

Over the past two decades, there has been a steady decline in response rates for telephone surveys (de Leeuw and Heer, 2002; de Leeuw, 2008). With telephone data collection, the heavy use of caller ID and voicemail has presented formidable barriers to achieving contact with households and individuals (Groves and Lyberg, 1998). Moreover, the decrease in coverage for the traditional landline telephone sampling frame (Blumberg and Luke, 2016) has necessitated the inclusion of a large and growing cell-phone sample to complement the landline sample in RDD surveys. Because by law cell-phone numbers cannot be auto-dialed for non-federal surveys,[1] and because cell-phone users are less likely to participate, the inclusion of a cell-phone sample has led to increased data collection costs and declining response rates. To combat the declining response rates and growing costs of telephone data collection, researchers are increasingly offering alternative modes for data collection, such as web questionnaires. A web mode can be offered within an RDD survey by matching sampled telephone numbers to addresses and mailing invitations to those addresses inviting the respondents to complete the survey on the web. Alternatively, the RDD sample can be replaced with an address-based sample (ABS), with web invitations mailed to sampled addresses.

In 2016, an evaluation was conducted for the National Immunization Surveys (NIS) wherein a large sample of U.S. households was invited through mailed invitations to complete a survey on the web. While the primary purpose of the evaluation was to test the impact on respondent behavior of different versions of the questionnaire text within the web questionnaire itself, the large sample of addresses presented an opportunity to also test the impact of several aspects of the mail invitations on the rate at which sampled households logged into the survey website to complete the survey.

This paper examines the impact of several factors related to the web invitation materials and mailing protocol on the respondents' web survey login rate. In Section 2, we provide a description of the NIS and the current evaluation; in Section 3, we describe the mail invitation conditions that were tested; in Section 4, we present the results; and in Section 5, we summarize our conclusions.

2. Description of the NIS and the Current Evaluation

The NIS-Child and NIS-Teen are annual surveys to provide national, state, and selected local area estimates of vaccination coverage of children age 19-35 months and adolescents age 13-17 years in the United States. They are sponsored by the Centers for Disease Control and Prevention (CDC), and, since 2005, have been conducted by NORC at the University of Chicago. NIS data are collected in two phases: a dual-frame (landline and cell-phone) RDD telephone survey of parents and guardians of 19-35 month old children (NIS-Child) and 13-17 year old adolescents (NIS-Teen) is conducted, followed by a mail survey sent to the vaccination providers of these children and adolescents to obtain their vaccination histories with consent from a parent or guardian.

[1] In July, 2016, the Federal Communications Commission released a declaratory ruling stating that the federal government and contractors working on behalf of the federal government are not subject to Telephone Consumer Protection Act of 1991 (TCPA) restrictions.

Although the first phase is currently conducted via an RDD sample with data collection by telephone, alternative sampling and data collection options are continually being considered and evaluated. One such option would be to give respondents the opportunity to complete the NIS questionnaire on the web. However, one of the main purposes of conducting the interview with the child's parent or guardian is to gain permission to contact the child's vaccination providers to obtain the child's vaccination history, and our previous studies have suggested the rate at which parents or guardians grant this permission may be lower for a self-administered web questionnaire than it is for an interviewer-administered telephone interview (Ward et al., 2014). The current evaluation was launched to determine whether different versions of the text in the web questionnaire asking the respondent for permission to contact the child's vaccination providers would result in higher rates of consent to do so.

To test the impact of different questionnaire wording on the rate of consent to contact the child's vaccination providers, a large sample of respondents completing the web questionnaire was needed. These respondents were recruited by mailing invitations to a large sample of addresses asking the respondents to log into the NIS survey website and complete the survey on the web. This large sample of addresses afforded us with the opportunity to test different mail materials and mailing protocols.

2.1 Sampling and Mailing Protocol for the Evaluation

A national age-targeted (households with children age 0-17 years) list sample of 169,000 addresses was selected, and sampled addresses received up to five mailings to notify households that they had been selected and to invite them to participate. All mailings were developed specifically for this evaluation and included text in both English and Spanish. The five mailings were as follows:

1. An **advance postcard** informing the household that it had been selected for the NIS and that an invitation to participate would be arriving in a few days. The advance postcard was double-sided and printed in color. Three different designs were tested:

   Version 1: Included a photo collage with the statement "Help Your Community" on the front.

   Version 2: Included a photo collage with the statement "IMPORTANT INFORMATION from the Centers for Disease Control and Prevention" on the front.

   Version 3: Included a large CDC logo with the statement "IMPORTANT INFORMATION from the Centers for Disease Control and Prevention" on the front. A photo collage was not included.

   The three advance postcards can be found in Appendix A.

2. An **initial web invitation** sent a few days after the advance postcard inviting the household to participate in the survey by logging into the survey website. The invitation was in the form of a letter and included the website address and the household's personal identification number (PIN). A $1 token of appreciation was included in the mailing. In addition, half of the initial web invitations included a **cardstock insert** that provided visual instructions on how to log into the web survey. The initial web invitation letter and the cardstock insert can be found in Appendices B and C. The outer envelope used for this mailing is shown in Appendix D.

3. A **reminder folded postcard** sent about a week later prompting the household to log into the web site to complete the survey and thanking the household if it had already participated. The postcard, which was folded and sealed with an adhesive dot, included the survey website address and the household's unique PIN under the fold. The same photo collage used in Advance Postcard Versions 1 and 2 was included on the front of the postcard, with the phrase "Have you completed the National Immunization Survey yet?" See Appendix E for the reminder postcard.

4. A **final web invitation** sent about a week after the reminder postcard notifying the household that the survey was ending soon and again asking the household to participate. The letter included the survey website address and the household's PIN, along with the survey end date. In additional, all final web invitations included the **cardstock web log-in instructions insert** (Appendix C). See Appendix F for the final web invitation letter. The outer envelope used for this mailing is in Appendix D.

5. A **"last-ditch" folded postcard** informing the household that it was the last chance for survey participation. Like the reminder postcard, the "last-ditch" postcard included the survey website address and the household's PIN under the fold. Similar to the final web invitation, the "last-ditch" postcard also included the survey end date. The design of the postcard was similar to Advance Postcard Version 3: it included the large CDC logo and the "IMPORTANT INFORMATION from the Centers for Disease Control and Prevention" on the front. The "last-ditch" postcard can be found in Appendix G.

For a given sampled address, the PINs included in the initial web invitation, the reminder folded postcard, final web invitation, and last-ditch folded postcard differed by one digit, allowing us to know, for those respondents that logged into the web survey, which mailing prompted them to log in.

Research protocols for the evaluation were reviewed by the CDC's National Center for Health Statistics (NCHS) Research Ethics Review Board (ERB) and by NORC's Institutional Review Board (IRB).

2.2 Mail Schedule

Data collection was conducted in two waves: Wave 1 consisted of 10,000 addresses and began on April 26, 2016, and Wave 2 consisted of the remaining 159,000 addresses and began on June 2, 2016. The purpose of conducting the survey in waves was two-fold. First, the initial wave served as a pilot test; if any unforeseen operational or printing issues with the mail materials or technical problems with the web instrument arose during data collection, these issues could be identified and corrected before the large Wave 2 sample was released. Second, if the Wave 1 response rates differed from expectations, the size of the Wave 2 sample could be adjusted to help ensure that the target number of completed surveys was achieved.

The respondent mailings were spaced out consistently within each wave. Table 1 below presents the mail schedule for Wave 1 and Wave 2. The survey end date included in the final invitation and last-ditch postcard was June 10, 2016, for Wave 1, and July 22, 2016, for Wave 2. Because respondent activity continued beyond July 22 for Wave 2, the survey was kept open until August 1, 2016. This allowed for more questionnaires to be completed and allowed respondent activity following an advertised close date to be assessed.

Table 1: Mail Schedule – Web Response Evaluation, National Immunization Survey, United States, 2016

Wave 1 (10,000 Addresses)	
Mailing	*Date*
Advance postcard	Tuesday, 4/26/2016
Initial invitation	Monday, 5/2/2016
Reminder postcard	Thursday, 5/5/2016
Final invitation	Thursday, 5/12/2016
Last-ditch postcard	Monday, 5/23/2016
Wave 2 (159,000 Addresses)	
Mailing	*Date*
Advance postcard	Monday, 6/6/2016
Initial invitation	Thursday, 6/9/2016
Reminder postcard	Thursday, 6/16/2016
Final invitation	Thursday, 6/23/2016
Last-ditch postcard	Tuesday, 7/5/2016

3. Mail Evaluation Factors

3.1 Advance Postcard

As mentioned above, three different versions of the advance postcard were tested. Mailing a postcard in advance of the initial mail invitation letter may be an inexpensive way to increase response rates (Dillman et al., 2014), but it was unknown whether the increase in response rates would justify the additional cost of mailing the advance postcard. Furthermore, it was unknown which advance postcard design would be most effective. Therefore, each sampled address was randomly assigned to one of four advance postcard groups:

1. **Version 1:** Included a photo collage with the statement "Help Your Community" on the front.
2. **Version 2:** Included a photo collage with the statement "IMPORTANT INFORMATION from the Centers for Disease Control and Prevention" on the front.
3. **Version 3:** Included the CDC logo with the statement "IMPORTANT INFORMATION from the Centers for Disease Control and Prevention" on the front. A photo collage was not included.
4. **No advance postcard**.

3.2 Web Instructions Insert

In a previous NIS study (Ward et al., 2014), letters inviting respondents to participate on the web included a cardstock insert with screenshots showing the respondent how to access the website and log in. While including such an insert may improve log-in rates, the insert adds cost and it was unknown whether the increased log-in rates would justify the additional cost. Therefore each sampled address was randomly assigned to one of two initial invitation letter groups:

1. Web instructions insert **included** with initial web invitation.
2. Web instructions insert **not included** with initial web invitation.

3.3 Postage

As mentioned previously, the 169,000 sampled addresses were divided into two waves for data collection, with Wave 1 consisting of 10,000 addresses and Wave 2 consisting of the remaining 159,000 addresses. In Wave 1, all materials were mailed using the non-profit postage rate. During Wave 1, NORC included a small number of internal staff in the mailings to assess whether each mailing was arriving in the proper order and at the proper intervals. During this wave we observed that although the mailings were sent out a week apart, some staff got up to three separate mailings on the same day. This clearly undermines the effectiveness of the mailing schedule. Non-profit postage is much less costly than first-class postage ($0.19 versus $0.42, respectively, pre-sorted); however the USPS uses different mailing priorities for non-profit mail, which can add to the time that it takes for mail with non-profit postage to arrive, relative to first-class postage.[2] First-class mail has a stated delivery time of up to three business days, whereas non-profit mail has a stated delivery time of up to five business days; however NORC staff observed that it took up to ten days for some of the non-profit mail to arrive.

After Wave 1, it was clear that there was more variability in the timing of the arrival of non-profit mail than was expected, which could impact the effectiveness of the mailings. To estimate the costs and benefits of using first-class vs. non-profit rate postage, an evaluation was conducted in Wave 2 wherein the type of postage was manipulated. For Wave 2, we assigned approximately 1.5% (n=2,368) of sampled addresses to receive first-class postage mail for all of their mailings. The remaining 156,632 Wave 2 sample addresses received non-profit postage for all of their mailings.

3.4 Last-Ditch Postcard

Following the final invitation letter, all cases that had not responded were mailed a final folded postcard containing the web address and PIN. While cases were not randomized into treatment groups, this allowed for an assessment of the impact of the last-ditch postcard, as response rates and costs first excluding and then including the last-ditch postcard could be compared. Because each respondent's PIN differed by one digit depending on the mailing, those responding due to the last-ditch postcard mailing could be included vs. excluded to gauge the impact of mailing the last-ditch postcard.

4. Results of Mail Evaluation

Because the mail materials and postage were expected to have their primary impact on whether or not a respondent logs into the web survey and not on whether or not the survey was subsequently completed after the login, we focused on two outcome measures when examining the impact of the different mail conditions:

- **Web Login Rate**: Out of the sampled addresses, the proportion for which a respondent logged into the web survey.
- **Relative Mailing Cost per Web Login**: The mailing cost per web login is calculated as the sum of all mailing costs—including materials, printing, postage, and pre-paid incentives—divided by the number of sampled addresses for which there was a login to the web survey.

[2] For a detailed explanation of USPS rates, procedures, and eligibility criteria for non-profit and first-class mail see http://pe.usps.gov/DMM300

T-tests were carried out using SAS version 9.2 to test the null hypothesis of no difference in the web login rate between conditions for each factor.

Table 2: Initial Invitation Web Login Rate and Relative Cost per Initial Invitation Web Login by Advance Postcard Condition – Web Response Evaluation, National Immunization Survey, United States, 2016

	Advance Postcard Condition			
	No Advance Postcard	*Advance Postcard #1: Text 1 w/Photo*	*Advance Postcard #2: Text 2 w/Photo*	*Advance Postcard #3: Text 2 w/o Photo*
Counts				
Sampled Addresses	42,250	42,250	42,250	42,250
Initial Invitation Web Logins	3,142	3,447	3,752	3,882
Rates				
Initial Invitation Web Login Rate	7.4% †,§,¶	8.2% *,§,¶	8.9% *,†	9.2% *,†
Costs				
Relative Mailing Cost per Initial Invitation Web Login	1.00	1.11	1.02	0.98

NOTE: Table includes all sampled addresses, including Wave 1 (non-profit postage), Wave 2 (first-class postage), and Wave 2 (non-profit postage).
* Statistically significant difference from No Advance Postcard at the α=0.05 level.
† Statistically significant difference from Advance Postcard #1 at the α=0.05 level.
§ Statistically significant difference from Advance Postcard #2 at the α=0.05 level.
¶ Statistically significant difference from Advance Postcard #3 at the α=0.05 level.

4.1 Advance Postcard

Table 2 presents the web login rate and the relative mailing cost per web login for each of the four advance postcard conditions. Because the use of the advance postcard was expected to have the most impact on whether or not the respondent logged into the web survey based on the initial invitation letter (i.e., the first mailing that follows the advance postcard), the logins included here are only those that used the PIN included on the initial invitation letter; that is, logins in response to subsequent mailings are not included. Similarly, the mailing costs here are the costs associated with the advance postcard and the costs associated with the initial invitation; the costs associated with subsequent mailings are excluded.

As shown in Table 2, all three advance postcards resulted in a significantly higher initial invitation web login rate compared to the no advance postcard condition. However, only the advance postcard with the "IMPORTANT INFORMATION from the Centers for Disease Control and Prevention" text without a photo (i.e., postcard #3) resulted in a lower cost per initial invitation web login than the no advance postcard condition. The web login rate for those receiving postcard #3 was significantly higher than the web login rate for those receiving no advance postcard and those receiving postcard #1; it was not significantly different than for those receiving postcard #2 at the α=0.05 level.

4.2 Web Instructions Insert

Table 3 presents the web login rate and relative mailing cost per web login for sampled addresses whose first invitation letter excluded versus included an insert giving instructions on how to log into the NIS website. As with the advance postcard analysis, the web logins included in this analysis are limited to those that used the PIN included in the initial invitation letter, and the mailing costs are limited to those for the advance letter and the initial invitation; web logins based on subsequent mailings and the cost of subsequent mailings are excluded. That is, here we are examining the impact of the web instructions insert on whether or not the respondent logged in response to receiving the initial invitation.

Looking at Table 3, the initial invitation web login rate was 0.4 percentage points higher when the web instructions insert was included, and the mailing costs per initial invitation web login were 4 percent lower when the web instructions insert was included.

Table 3: Initial Invitation Web Login Rate and Relative Cost per Initial Invitation Web Login by Web Instructions Condition – Web Response Evaluation, National Immunization Survey, United States, 2016

	Web Instructions Condition		
	No Web Instructions Insert w/ First Invitation Letter	*Web Instructions Insert w/ First Invitation Letter*	
Counts			
Sampled Addresses	84,500	84,500	
Initial Invitation Web Logins	6,928	7,295	
Rates			
Initial Invitation Web Login Rate*	8.2%	8.6%	*
Costs			
Relative Mailing Cost per Initial Invitation Web Login	1.00	0.96	

NOTE: Table includes all sampled addresses, including Wave 1 (non-profit postage), Wave 2 (first-class postage), and Wave 2 (non-profit postage).
* Statistically significantly different from the No Web Instructions Insert group at the α=0.05 level.

4.3 Non-Profit vs. First-Class Postage

Table 4 presents the web login rate and relative mailing cost per web login for sampled addresses whose mailings were sent with non-profit postage (all Wave 1 and a subset of Wave 2) and those whose mailings were sent with first-class postage (subset of Wave 2). Because each sampled address received either non-profit or first-class postage throughout all of the mailings, the web login rates and costs in Table 4 are cumulative over all of the mailings.

Compared to the Wave 1 non-profit postage group, the Wave 2 web login rate for those receiving first-class postage mailings was significantly higher (12.4% vs. 14.7%); compared to the Wave 2 non-profit group, the web login rates for those receiving first-class mailings were similar (14.0% vs. 14.7%). While the non-profit postage resulted in a lower web login rate, the cost per web login was 16% to 25% lower for those receiving non-profit mailings compared to those receiving first-class mailings, because non-profit postage is less expensive than first-class postage.

Note, however, that there was a large difference in the web-login rate for those receiving non-profit mailings in Wave 1 vs. Wave 2, suggesting that while non-profit postage can result in login rates that approach those resulting from first-class postage (as seen in Wave 2), there can be variation in the performance of non-profit mailings.

Table 4: Web Login Rate and Relative Cost per Web Login by Postage Condition – Web Response Evaluation, National Immunization Survey, United States, 2016

	Postage Condition			
	Wave 1	***Wave 2***		
	Non-Profit Postage	*Non-Profit Postage*	*First-Class Postage*	
Counts				
Sampled Addresses	10,000	156,632	2,368	
Web Logins	1,242	21,944	347	
Rates				
Web Login Rate	12.4%	14.0%	14.7%	*
Costs				
Relative Mailing Cost per Web Login	0.84	0.75	1.00	

* Statistically significant difference from Wave 1 Non-Profit at the α=0.05 level, but not significantly different from Wave 2 Non-Profit at the α=0.05 level (*p=0.379*).

4.4 Last-Ditch Postcard

Table 5 presents the web login rate and relative mailing costs per web login, cumulatively over all of the mailings, first including and then excluding the last-ditch postcard mailings and the logins from those mailings. The last-ditch postcard mailings raised the overall web login rate by 1.6 percentage points, resulting in an additional 2,681 web logins. The last-ditch postcard mailings also raised the overall mailing costs, but because the postcard resulted in more web logins, the mailing cost per web login was the same with and without the last-ditch postcard mailings.

Table 5: Web Login Rate and Relative Cost per Web Login Including vs. Excluding Last-Ditch Postcard – Web Response Evaluation, National Immunization Survey, United States, 2016

	Including Last-Ditch Postcard Mailing and Logins	*Excluding Last-Ditch Postcard Mailing and Logins*	*Difference*	
Counts				
Sampled Addresses	169,000	169,000		
Web Logins	23,533	20,852	2,681	
Rates				
Web Login Rate	13.9%	12.3%	1.6	*
Costs				
Relative Mailing Cost per Web Login	1.00	1.00		

NOTE: Table includes all released cases, including Wave 1 (non-profit postage), Wave 2 (first-class postage), and Wave 2 (non-profit postage).

* Statistically significant difference in web login rate at the α=0.05 level compared to the login rate when the last-ditch postcard logins are included.

5. Summary and Conclusions

An NIS evaluation was conducted wherein invitations were mailed to a large sample of U.S. addresses inviting respondents to log into a survey web site to complete the survey. Four factors regarding the mailing materials and protocol were tested in the data collection effort: (1) the use of an advance postcard, and the text and photo on that postcard; (2) the inclusion with the first invitation letter of a cardstock insert instructing respondents how to log into the survey website; (3) the use of first-class vs. non-profit postage; and (4) the inclusion of a final "last-ditch" postcard inviting respondents to participate. We evaluated the impact of the conditions for these factors on the rate at which respondents logged into the website and the mailing costs per web login.

We found that the use of an advance postcard increased the web login rate in response to the initial web invitation by 0.6 to 1.8 percentage points. We also found that the versions containing the text "IMPORTANT INFORMATION from the Centers for Disease Control and Prevention" resulted in higher login rates than the version containing the text "Help Your Community." Perhaps these versions resulted in higher login rates because of a sponsorship effect (Heberlein and Baumgarnter, 1978; Yammarino et al., 1991) combined with a more urgent message; the Centers for Disease Control and Prevention is a well-known U.S. federal agency, and the prominent statement that the postcard contained important information from this agency may have helped to better distinguish the postcard from a marketing mailing than the version that used the text "Help Your Community." In addition, the version with "IMPORTANT INFORMATION from the Centers for Disease Control and Prevention" and the prominent CDC logo instead of a photo resulted in a lower mailing cost per web login than when a postcard was not used; that is, despite the additional mailing cost resulting from the use of an advance postcard, the mailing cost per web login was lower when this advance postcard was used than when no advance postcard was mailed.

We found that the inclusion of the web instructions insert with the first invitation letter significantly increased the web login rate in response to the first web invitation by 0.4 percentage points, and that it also resulted in a 4 percent lower cost per initial invitation web login; that is, inclusion of the web instructions insert paid for itself in the form of additional logins in response to the initial invitation.

We found that the use of first-class postage resulted in a significantly higher web login rate compared with the Wave 1 non-profit postage group and a similar web login rate compared with the Wave 2 non-profit postage group. However, even when compared to the lower non-profit web login rate in Wave 1, the first-class web login rate in Wave 2 was not high enough to make using first-class postage the most cost-effective option. The mailing cost per web login was about 19% higher in the first-class group than in the non-profit group in Wave 1 and about 33% higher in the first-class group than in the non-profit group in Wave 2. This might suggest that if an organization is able to mail at the non-profit rate, it should do so. However, there were large differences in the effectiveness of non-profit mailings between Wave 1 and Wave 2. The web login rate for respondents receiving non-profit mailings was 1.6 percentage points lower in Wave 1 than in Wave 2. Project staff who were seeded within the mail batches reported that in some instances Wave 1 mailings took a very long time to arrive, and in a few cases multiple Wave 1 mailings arrived on the same day; these problems were not reported for Wave 2 non-profit mailings. This difference in delivery times and spacing between the deliveries of successive mailings between Wave 1 and Wave 2 non-profit likely explains the difference in the web login rates for respondents

receiving non-profit mail between the two waves; this also suggests that there may be some inconsistency in the delivery of non-profit mail at different times of the year.

Overall, we recommend using non-profit postage for mail materials whenever possible if cost is the primary concern. The cost savings outweigh the limitations surrounding slower, and potentially inconsistent, mail delivery times. If the primary concern is achieving the highest response rate, our results suggest first-class postage should be used to guard against the possibility of erratic mail delivery when non-profit postage is used and the lower response rates that can result.

The last-ditch postcard served as a final prompt for respondents, with the goal of reaching respondents who were potentially interested in participating after seeing earlier mailings, but either did not have time or had forgotten to participate. The last-ditch postcard raised the overall web login rate by 1.6 percentage points, and because of this, did not add to the cost of data collection on a per-login basis. If the data collection schedule allows it, a last-ditch postcard is an inexpensive way to boost participation.

These conclusions are subject to at least three limitations. First, the web login rates reported here resulted from the particular mailing protocol, mailing materials, subject matter (immunization), and sponsorship (Centers for Disease Control and Prevention) for this evaluation; web login rates may differ for surveys with a different mailing protocol, materials, subject matter, or sponsorship. Second, the cost analysis was based on the unit printing and mailing costs paid in this evaluation, and other surveys may be subject to different printing and mailing costs, as these costs can vary by vendor and by volume. Finally, we found evidence of slower non-profit mail delivery in Wave 1 than in Wave 2 and concluded that non-profit mail may have inconsistent delivery times throughout the year; however, we were unable to evaluate whether first-class mail delivery would likewise have been slower in Wave 1, as first-class mailings were used only in Wave 2. More research is needed on the reliability of first-class and non-profit mail delivery and on the factors affecting this reliability.

In summary, the mail material factors that we tested did impact the web login rate and mailing cost per web login. However, these aspects of our evaluation are only a small part of a larger question to assess the viability of the web as a mode for administering the NIS. We recommend future evaluations to supplement these findings to further assess the cost, data quality, and response rates for web administration as we continue to examine ways to enhance the efficiency and effectiveness of the NIS data collection procedures.

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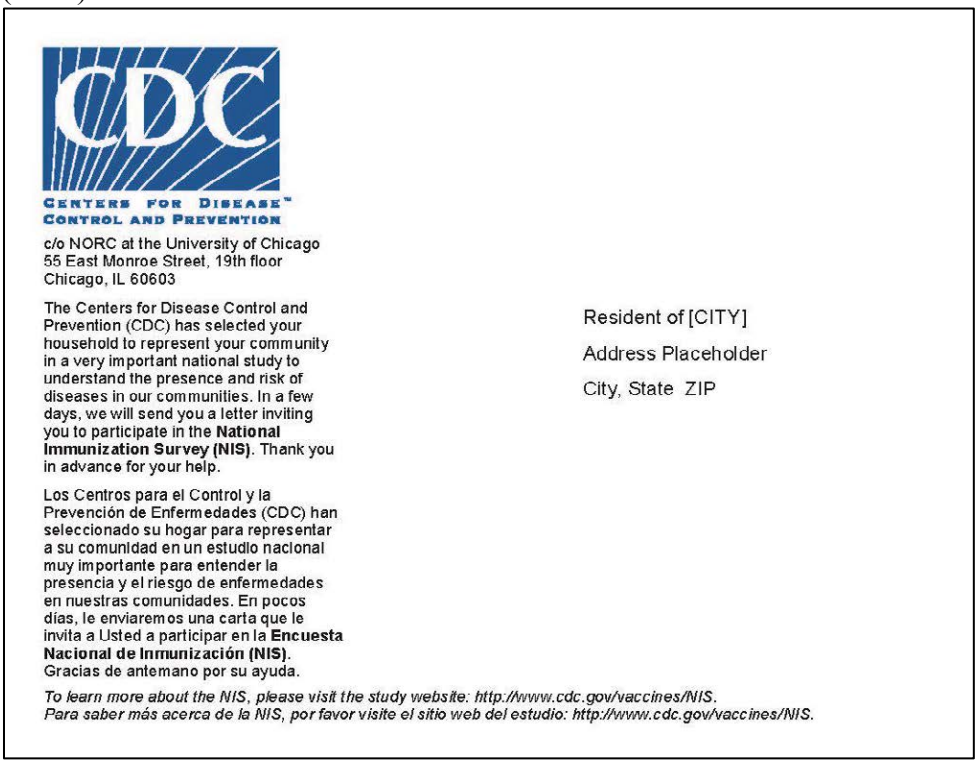
Appendix A: Advance Postcards

Version 1
(Front)

(Back)



Version 2
(Front)

(Back)

CENTERS FOR DISEASE™ CONTROL AND PREVENTION

c/o NORC at the University of Chicago
55 East Monroe Street, 19th floor
Chicago, IL 60603

The Centers for Disease Control and Prevention (CDC) has selected your household to represent your community in a very important national study to understand the presence and risk of diseases in our communities. In a few days, we will send you a letter inviting you to participate in the **National Immunization Survey (NIS)**. Thank you in advance for your help.

Los Centros para el Control y la Prevención de Enfermedades (CDC) han seleccionado su hogar para representar a su comunidad en un estudio nacional muy importante para entender la presencia y el riesgo de enfermedades en nuestras comunidades. En pocos días, le enviaremos una carta que le invita a Usted a participar en la **Encuesta Nacional de Inmunización (NIS)**. Gracias de antemano por su ayuda.

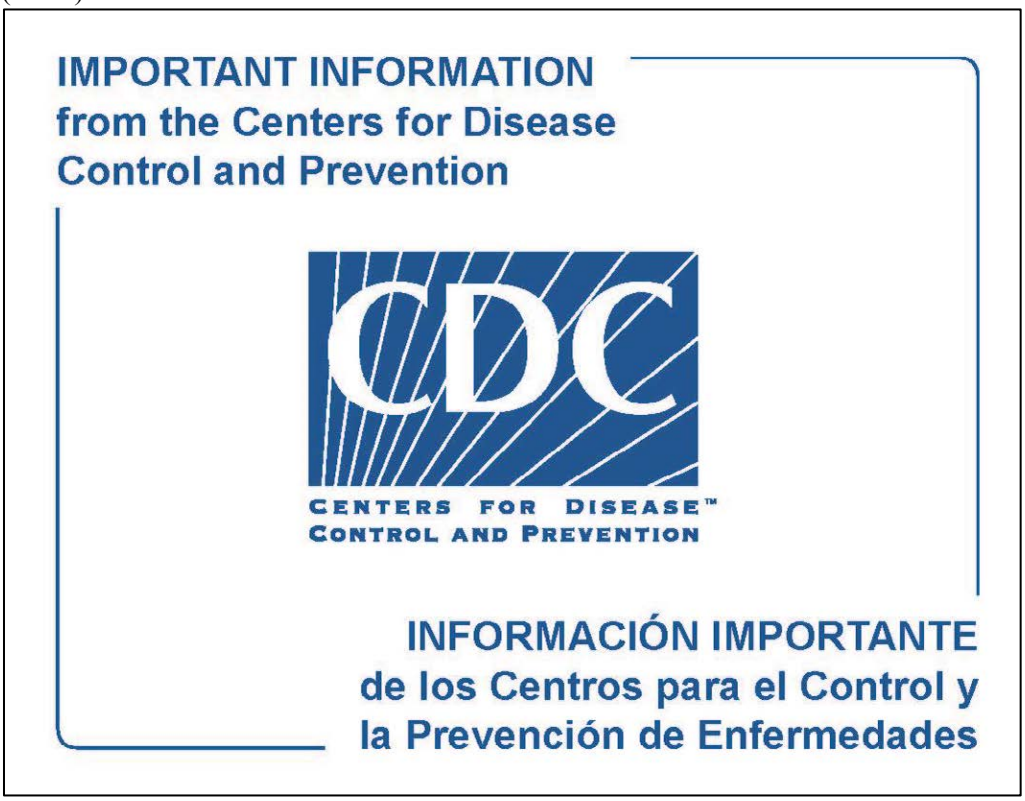
Resident of [CITY]

Address Placeholder

City, State ZIP

To learn more about the NIS, please visit the study website: http://www.cdc.gov/vaccines/NIS.
Para saber más acerca de la NIS, por favor visite el sitio web del estudio: http://www.cdc.gov/vaccines/NIS.

Version 3
(Front)



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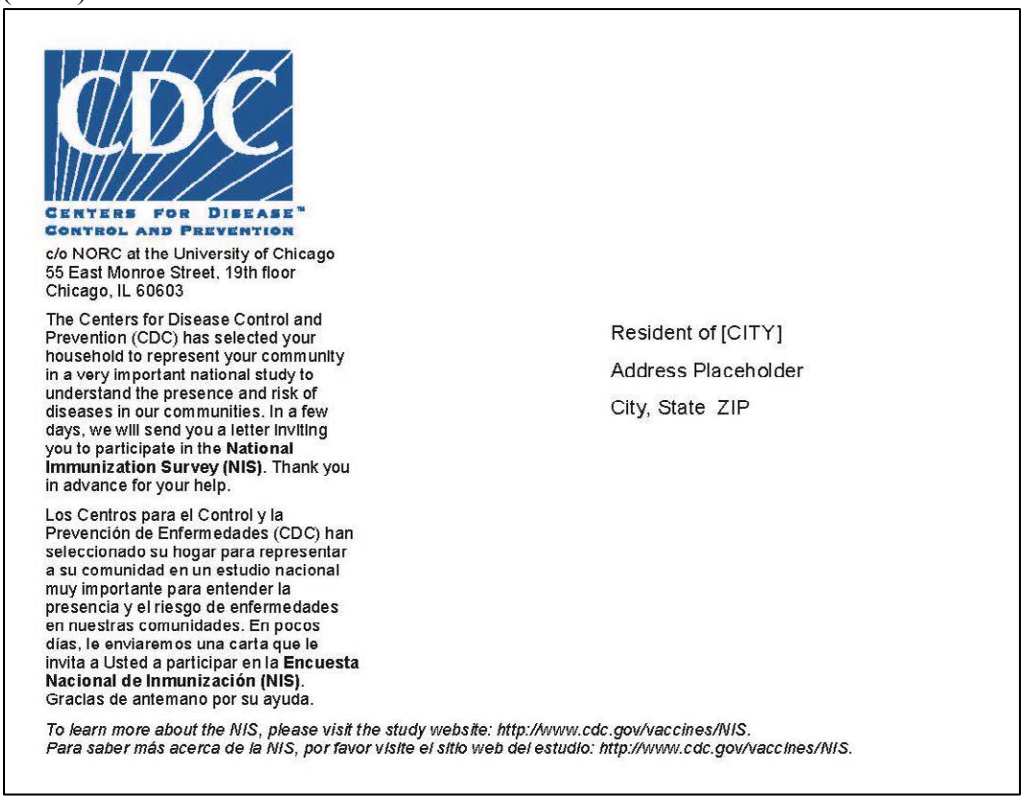


Appendix B: Initial Web Invitation Letter

(Front)

CDC
CENTERS FOR DISEASE CONTROL AND PREVENTION

The Centers for Disease Control and Prevention has selected your household to be part of a very important study called the **National Immunization Survey**.

I am writing to ask for your help to improve our nation's understanding of children's health and vaccinations. The **National Immunization Survey**, or NIS, collects vital health information that is not available anywhere else. This study provides policy-makers and researchers with crucial information about the presence and risk of diseases in our communities. Your participation is critical to make this study a success, even if you do not have children.

Please have an adult who is knowledgeable about the health of members of your household complete the questionnaire online using this log-in information:

www.nis2016.norc.org
PIN: XXXXX

Why participate?	Your answers will provide information to help improve the nation's health now and in the years ahead. Although your participation is voluntary, we need your help and hope you will complete this short survey. Every type of household in America needs to be included in the study for the results to be accurate and useful.
How long will this take?	We value your time. Completing the questionnaire may take as little as one minute and should take no more than 15 minutes.
Your privacy	Your answers will be kept secure and private and will be used for health research purposes only. We conduct this study under the Public Health Service Act and the Privacy Act. These laws require that we protect your family's information and keep it confidential. They are described in detail at www.cdc.gov/vaccines/imz-managers/nis/confidentiality.html.
Our appreciation	We have included a small token of appreciation as a way of saying thank you for completing the survey.

If you would like to learn more about the National Immunization Survey, please visit the study website http://www.cdc.gov/vaccines/NIS. If you have any questions or experience technical difficulties, please send an email to nis2016@norc.org or call 1-866-816-2377.

Thank you in advance for your participation in this very important study.

Nancy Messonnier, M.D.

Director, National Center for Immunization and Respiratory Diseases
Captain, United States Public Health Service
Centers for Disease Control and Prevention

Para español, voltee la página →

(Back)

CDC
CENTERS FOR DISEASE CONTROL AND PREVENTION

Los Centros para el Control y la Prevención de Enfermedades han seleccionado su hogar para ser parte de un estudio muy importante llamado la **Encuesta Nacional de Inmunización**.

Le escribo para pedir su ayuda para que nuestra nación comprenda como mejorar la salud y las vacunas de los niños. La **Encuesta Nacional de Inmunización**, o NIS, recopila información de salud vital que no está disponible en ningún otro lugar. Este estudio les proporciona a los legisladores e investigadores información crucial acerca de la presencia y el riesgo de enfermedades en nuestras comunidades. Su participación es fundamental para hacer de este estudio un éxito, aunque usted no tenga hijos.

Por favor pida a un adulto que tenga conocimientos sobre la salud de los miembros de su hogar que complete el cuestionario por Internet utilizando esta información para acceder al sistema:

www.nis2016.norc.org
PIN: XXXXX

¿Por qué participar?	Sus respuestas proporcionarán información para ayudar a mejorar la salud de la nación, ahora y en los próximos años. Aunque su participación es voluntaria, necesitamos su ayuda y esperamos que usted complete esta breve encuesta. Cada tipo de hogar en América debe ser incluido en el estudio para que los resultados sean precisos y útiles.
¿Cuánto tiempo tomará?	Valoramos su tiempo. Completando el cuestionario puede tomarle tan poco como un minuto y no debe tardar más de 15 minutos.
Su Privacidad	Sus respuestas se mantendrán seguras y privadas y se utilizarán únicamente con fines de investigación de salud. Llevamos a cabo este estudio bajo la Ley de Servicio de Salud Pública y la Ley de Privacidad. Estas leyes requieren que protejamos la información de su familia y que la mantengamos confidencial. Estas se describen en detalle en www.cdc.gov/vaccines/imz-managers/nis/confidentiality.html.
Nuestro agradecimiento	Hemos incluido una pequeña muestra de agradecimiento como una manera de decir gracias por completar la encuesta.

Si usted desea obtener más información sobre la Encuesta Nacional de Inmunización, por favor visite el sitio web del estudio en http://www.cdc.gov/vaccines/NIS. Si usted tiene alguna pregunta o experimenta dificultades técnicas, por favor envíe un correo electrónico a nis2016@norc.org o llame al 1-866-816-2377.

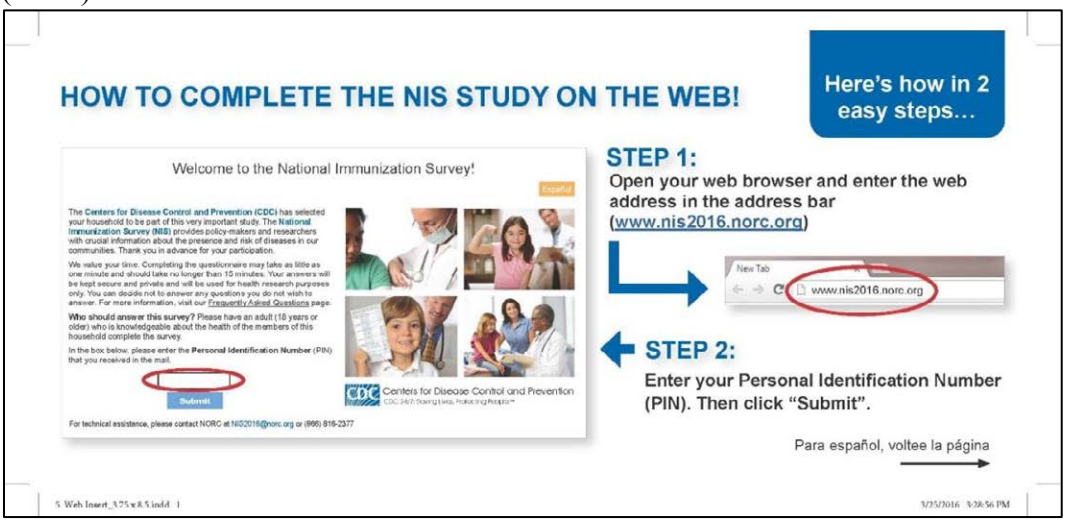
Gracias de antemano por su participación en este importante estudio.

Nancy Messonnier, Doctora

Directora, Centro Nacional de Vacunas y Enfermedades Respiratorias
Capitán, Servicio de Salud Pública de los Estados Unidos
Centros para el Control y Prevención de Enfermedades

Appendix C: Web Instructions Insert

(Front)



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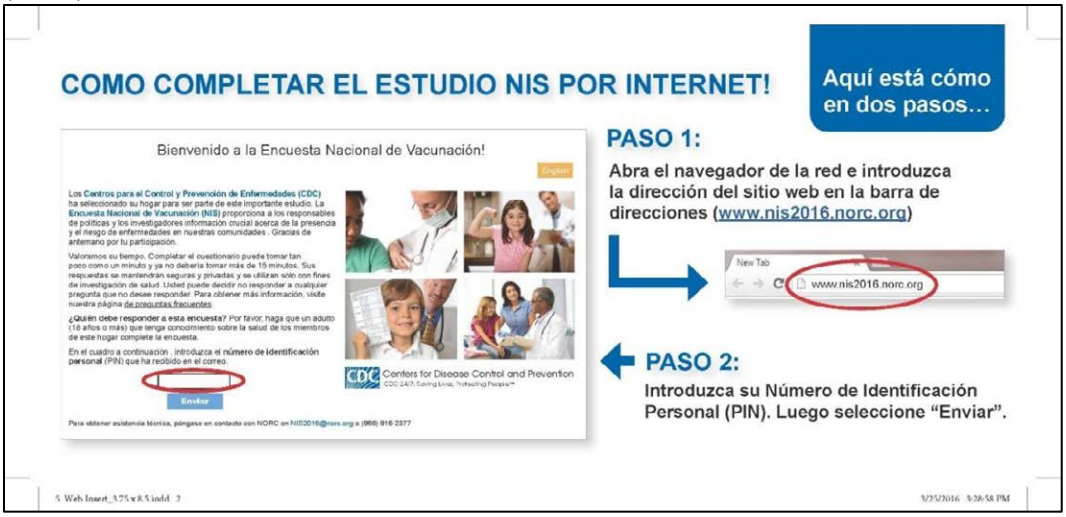
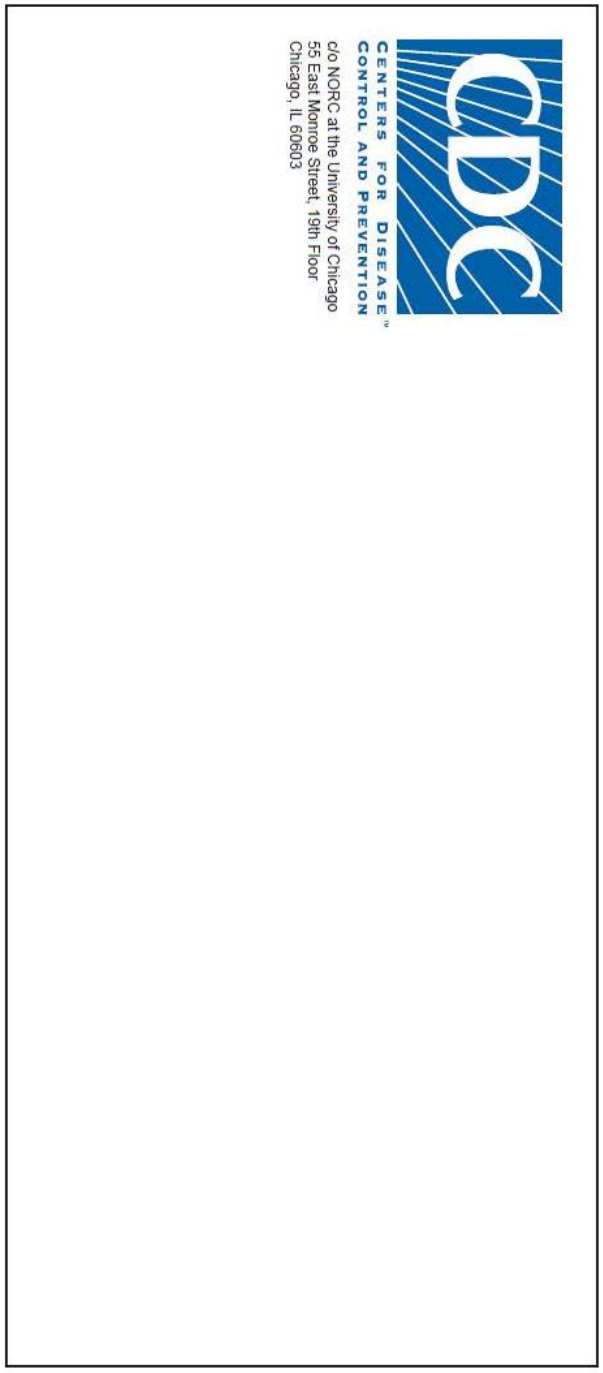


Appendix D: Outer Envelope



Appendix E: Reminder Folded Postcard

(Outside Front)

(Inside Top)

Hola,

Recientemente, los Centros para el Control y la Prevención de Enfermedades le invitaron a usted a participar en la **Encuesta Nacional de Inmunización (NIS)**, un importante estudio que recopila información vital sobre la salud infantil y las vacunas en nuestras comunidades. Si usted ya ha participado - ¡gracias! Si usted no ha participado, por favor pida a un adulto que tenga conocimientos sobre la salud de los miembros de su hogar que complete el cuestionario por Internet tan pronto como le sea posible utilizando la información de acceso a continuación. Su participación es fundamental, aunque usted no tenga hijos.

www.nis2016.norc.org

PIN: XXXXX

Si a usted le gustaría saber más acerca de la NIS, por favor visite el sitio web de NIS http://www.cdc.gov/vaccines/NIS. Si usted tiene algunas preguntas o dificultades técnicas, por favor envíe un correo electrónico a nis2016@norc.org o llame al 1-866-816-2377.

(Inside Bottom)

Hello,

Recently the Centers for Disease Control and Prevention invited you to participate in the **National Immunization Survey (NIS)**, an important study that collects vital information about childhood health and vaccinations in our communities. If you have already participated – thank you! If you have not participated, please have an adult who is knowledgeable about the health of members of your household complete the questionnaire online as soon as possible using the log-in information below. Your participation is critical, even if you do not have children.

www.nis2016.norc.org

PIN: XXXXX

If you would like to learn more about the NIS, please visit the NIS website http://www.cdc.gov/vaccines/NIS. If you have any questions or technical difficulties, please send an email to nis2016@norc.org or call 1-866-816-2377.

(Outside Back)

CDC
CENTERS FOR DISEASE CONTROL AND PREVENTION

c/o NORC at the University of Chicago
55 East Monroe Street, 19th floor
Chicago, IL 60603

Resident of [CITY]
Address Placeholder
City, State ZIP

Appendix F: Final Web Invitation Letter

(Front)

CDC
CENTERS FOR DISEASE CONTROL AND PREVENTION

Dear Resident of [CITY],

In recent weeks, I asked you to participate in the **National Immunization Survey (NIS)**, a study conducted by the Centers for Disease Control and Prevention. The NIS collects vital information about childhood health and the presence and risk of diseases in our communities. This study provides policy-makers and researchers with crucial information about children's health and vaccinations that is not available anywhere else. To the best of our knowledge, we have not yet received your responses. The study is ending this month, so we hope that all questionnaires will be completed by then. Your participation is critical to make this study a success, even if you do not have children.

If you have already participated – thank you! If you have not yet participated, please have an adult who is knowledgeable about the health of members of your household complete the questionnaire online as soon as possible using this log-in information:

www.nis2016.norc.org
PIN: XXXXX

Why participate?	Your answers will provide information to help improve the nation's health now and in the years ahead. Although your participation is voluntary, we need your help and hope you will complete this short survey. Every type of household in America needs to be included in the study for the results to be accurate and useful.
How long will this take?	We value your time. Completing the questionnaire may take as little as one minute and should take no more than 15 minutes.
Your privacy	Your answers will be kept secure and private and will be used for health research purposes only. We conduct this study under the Public Health Service Act and the Privacy Act. These laws require that we protect your family's information and keep it confidential. They are described in detail at www.cdc.gov/vaccines/imz-managers/nis/confidentiality.html.
Due date	The study is ending soon. Please log in and complete this questionnaire by [MM/DD/YYYY].

If you would like to learn more about the National Immunization Survey, please visit the study website http://www.cdc.gov/vaccines/NIS. If you have any questions or experience technical difficulties, please send an email to nis2016@norc.org or call 1-866-816-2377.

Thank you in advance for your participation in this very important study.

Nancy Messonnier, M.D.

Director, National Center for Immunization and Respiratory Diseases
Captain, United States Public Health Service
Centers for Disease Control and Prevention

Para español, voltee la página →

(Back)

CDC
CENTERS FOR DISEASE CONTROL AND PREVENTION

Estimado/a Residente de [CITY],

En las últimas semanas, le he pedido a usted que participe en la **Encuesta Nacional de Inmunización (NIS)**, un estudio realizado por los Centros para el Control y la Prevención de Enfermedades. El NIS recopila información vital sobre la salud de los niños y la presencia y el riesgo de enfermedades en nuestras comunidades. Este estudio les proporciona a los legisladores e investigadores información crucial acerca de la salud y las vacunas que no está disponible en ningún otro lugar. Dentro de lo que sabemos, aún no hemos recibido sus respuestas. El estudio finaliza este mes, así que esperamos que todos los cuestionarios sean completados para entonces. Su participación es fundamental para hacer de este estudio un éxito, aunque usted no tenga hijos.

Si usted ya ha participado - ¡gracias! Si usted todavía no ha participado, por favor pida a un adulto que tenga conocimientos sobre la salud de los miembros de su hogar que complete el cuestionario por Internet tan pronto como le sea posible usando esta información de acceso:

www.nis2016.norc.org
PIN: XXXXX

¿Por qué participar?	Sus respuestas proporcionarán información para ayudar a mejorar la salud de la nación, ahora y en los próximos años. Aunque su participación es voluntaria, necesitamos su ayuda y esperamos que usted complete esta breve encuesta. Cada tipo de hogar en América debe ser incluido en el estudio para que los resultados sean precisos y útiles.
¿Cuánto tiempo tomará?	Valoramos su tiempo. Completando el cuestionario puede tomarle tan poco como un minuto y no debe tardar más de 15 minutos.
Su Privacidad	Sus respuestas se mantendrán seguras y privadas y se utilizarán únicamente con fines de investigación de salud. Llevamos a cabo este estudio bajo la Ley de Servicio de Salud Pública y la Ley de Privacidad. Estas leyes requieren que protejamos la información de su familia y que la mantengamos confidencial. Estas se describen en detalle en www.cdc.gov/vaccines/imz-managers/nis/confidentiality.html.
Fecha límite	El estudio está por terminar pronto. Por favor, acceda y complete este cuestionario por [MM/DD/YYYY].

Si usted desea obtener más información sobre la Encuesta Nacional de Inmunización, por favor visite el sitio web del estudio en http://www.cdc.gov/vaccines/NIS. Si usted tiene alguna pregunta o experimenta dificultades técnicas, por favor envíe un correo electrónico a nis2016@norc.org o llame al 1-866-816-2377.

Gracias de antemano por su participación en este importante estudio.

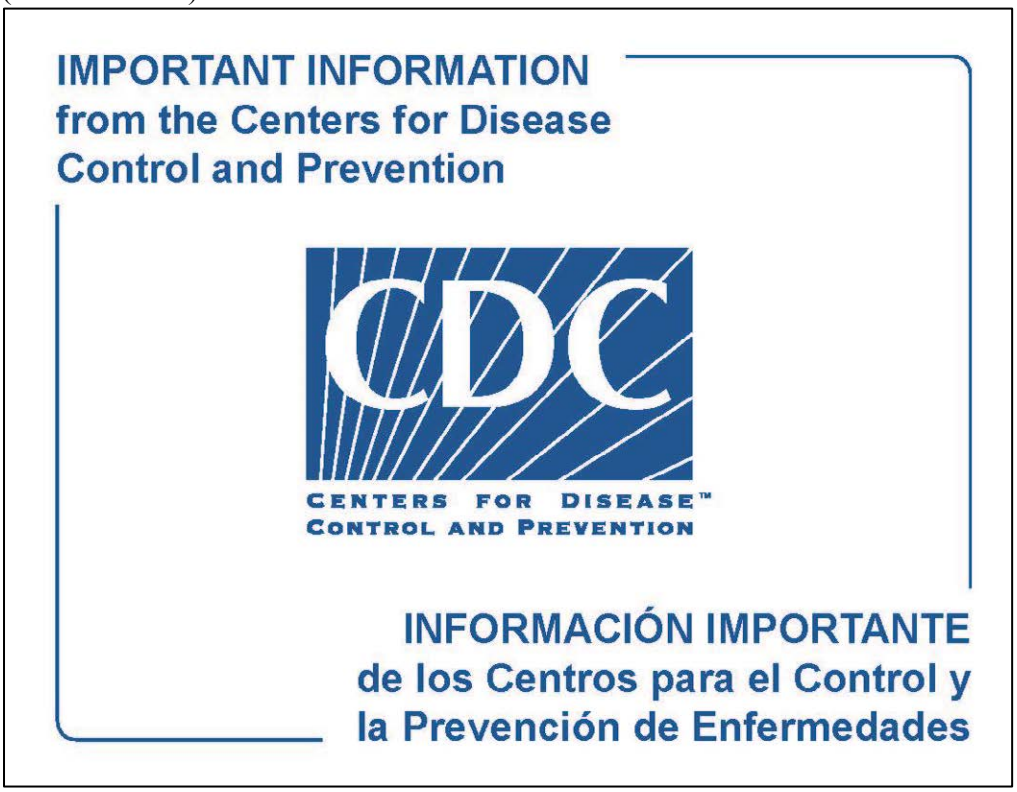
Nancy Messonnier

Nancy Messonnier, Doctora

Directora, Centro Nacional de Vacunas y Enfermedades Respiratorias
Capitán, Servicio de Salud Pública de los Estados Unidos
Centros para el Control y Prevención de Enfermedades

Appendix G: Last-Ditch Folded Postcard

(Outside Front)



(Inside Top)

Hola,

Durante las últimas semanas, los Centros para el Control y la Prevención de Enfermedades le pidieron a usted que completara la **Encuesta Nacional de Inmunización (NIS)**, un importante estudio sobre la presencia y el riesgo de enfermedades en nuestras comunidades. El estudio está a punto de terminar, por lo que esperamos contar con todos los cuestionarios completados tan pronto como sea posible. Si usted ya ha participado - ¡gracias! Si usted no ha participado, por favor hágalo para XX / XX / XXXX. Por favor pida a un adulto que tenga conocimientos sobre la salud de los miembros de su hogar que complete el cuestionario por Internet utilizando la información de acceso a continuación. Su participación es fundamental, aunque usted no tenga hijos.

www.nis2016.norc.org

PIN: XXXXX

Si a usted le gustaría saber más acerca de la NIS, por favor visite el sitio web de NIS http://www.cdc.gov/vaccines/NIS. Si usted tiene algunas preguntas o dificultades técnicas, por favor envíe un correo electrónico a nis2016@norc.org o llame al 1-866-816-2377.

(Inside Bottom)

Hello,

Over the past few weeks, the Centers for Disease Control and Prevention asked you to complete the **National Immunization Survey (NIS)**, an important study about the presence and risk of diseases in our communities. The study is about to end, so we hope to have all questionnaires completed as soon as possible. If you have already participated – thank you! If you have not participated, please do so by XX/XX/XXXX. Please have an adult who is knowledgeable about the health of members of your household complete the questionnaire online using the log-in information below. Your participation is critical, even if you do not have children.

www.nis2016.norc.org

PIN: XXXXX

If you would like to learn more about the NIS, please visit the NIS website http://www.cdc.gov/vaccines/NIS. If you have any questions or technical difficulties, please send an email to nis2016@norc.org or call 1-866-816-2377.

(Outside Back)

CENTERS FOR DISEASE CONTROL AND PREVENTION

c/o NORC at the University of Chicago
55 East Monroe Street, 19th floor
Chicago, IL 60603

Resident of [CITY]
Address Placeholder
City, State ZIP