Demographic Flags and Dual-Language Survey Materials

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Abstract

Identifying and gaining cooperation from households in which the primary language is not English (or Spanish) is a particular barrier to surveys targeting rare nationalities and ethnicities. When surveying these subpopulations, it is critical to collect data not just from individuals who speak English, but also from the non-English speakers since they may be older, less-educated, and recent immigrant populations and thus significantly different from their English-speaking counterparts. In Years 3 and 4 of the Racial and Ethnic Approaches to Community Health Across the U.S. Risk Factor Survey (REACH U.S.), NORC used vendor-provided race/ethnicity flags to identify non-English speaking households. Flagged households without telephone number matches were mailed a dual-language self-administered questionnaire while households fielded by telephone were assigned to a bilingual interviewer prior to the first call. In previous years, dual-language booklets were mailed only to households that requested them and households were not pre-assigned to a bilingual interviewer. We examine the effectiveness of these pre-flagged mailings and initial bilingual interviewer assignments. Comparing Year 2 to Years 3 and 4 data, we examine whether the use of these race/ethnicity flags contributed to increased survey participation among these harder to reach populations. In addition, we examine the characteristics of respondents to bilingual mailings to determine whether those responding in a language other than English significantly differ from those responding in English.

Key Words: Demographic flags, ancillary sample information, bilingual interviews, REACH U.S., address-based sampling, multi-mode survey

1. Introduction

Demographic flags, also called ancillary sample information, are supplemental demographic indicators provided by commercial address vendors. These variables provide *a priori* information about a household or address and its residents, including race/ethnicity, income, etc. These variables have been found to be relatively accurate (DiSgora, Dennis, & Fahimi, 2010). However, their use has been mostly limited to assisting with sampling strategies, including oversampling of hard-to-reach populations (Iannacchione, 2011). These flags hold potential for application beyond sample design, and offer the potential to increase data collection in other ways, particularly among hard-to-reach populations. *A priori* sample information presents an opportunity to take a customized approach to a household based on its characteristics, potentially allowing

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researchers to reduce the cost and burden of re-contact and increase participation among underrepresented groups (Dayton, Link, Pels, & Ivie, 2006; Trussell, 2010).

Demographic flags have been used to create a customized approach to interviewing bilingual or non-English speaking populations on the REACH U.S. Risk Factor Survey, conducted by NORC at the University of Chicago on behalf of the Centers for Disease Control and Prevention (CDC). Starting in Year 3 (2010-2011), the flags were used to target bilingual self-administered questionnaire (SAQ) mailings to households likely to speak a language other than English. In Year 4 (2011-2012) of the survey, the flags were used to assign bilingual interviewers to these households. This paper analyzes the effectiveness of using *a priori* sample information to inform the language of first contact to answer the following research questions:

1) Does the initial assignment of flagged households to bilingual CATI interviewers increase participation or the efficiency of data collection?
2) Do targeted bilingual SAQ booklets increase participation among flagged households?
3) Among respondents mailed a dual-language, booklet, are respondents who choose to respond in English systematically different from those who respond in another language?

2. Data and Methods

2.1 REACH U.S. Risk Factor Survey Design

The Racial and Ethnic Approaches to Community Health Across the U.S. Risk Factor Survey (REACH U.S. RFS) is an annual health behavior survey begun in 2008, sponsored by CDC. As part of the REACH U.S. program to eliminate racial and ethnic health disparities, the RFS monitors progress towards these goals. The survey is conducted with members of hard-to-reach racial and ethnic minority populations in 28 communities across the U.S. Each community has a specific set of racial and ethnic group priority populations, including Hispanic/ Latino and Asian populations with many recent immigrants.

Due to the specific populations targeted and the added constraints of geography, racial/ethnic density, and language barriers, NORC uses sample and survey designs customized by community. To allow for this flexibility, the RFS primarily employed a multi-mode address based sampling design (ABS). The ABS frame was enhanced with demographic flags that identify addresses that have a high probability of containing an individual in the priority race/ethnicity populations. Although the algorithms for deriving the flags are proprietary, in the case of Hispanic/Latino and Asian groups, the most commonly-used indicators are group-specific surnames and first names, in addition to U.S. Census ethnic group density information. The demographic flags used in this analysis indicate whether the household residents are likely to be Hispanic/Latino, Chinese, Korean, or Vietnamese. These subgroups form the priority population in several of the communities in which the survey is conducted.

Samples of addresses were drawn in each of the 28 REACH communities. A telephone number for the sampled addresses was identified where possible and contacted through a computer-assisted telephone interview system (CATI). Addresses that could not be matched to telephone numbers were sent a self-administered questionnaire (SAQ) booklet.

Two REACH U.S. RFS instruments are used for data collection: a Household Screening Interview and a Household Member Interview. The screening interview determines which members of the households are eligible for participation. A maximum of two members per household can be selected. Once the eligible members are selected, the Household Member Interview is conducted. Both instruments were programmed into the computer-assisted interviewing system. For the mailed SAQ survey, each survey packet contained two SAQ booklets, and instructions for all adults age 18 and over to complete the survey (additional booklets could be requested). The screening interview was modified into written question forms so that household screening data could be extracted from the completed SAQ.

2.2 *A Priori* Use of Demographic Flags

Beginning in Year 2 of the REACH project, demographic information was obtained from a vendor and appended to the addresses in the sample file. As described above, each community has at least one targeted racial or ethnic group from which NORC collects data, and eligibility is determined using a screening interview. Sampled addresses were flagged as likely to have at least one household member in a specific priority group. For example, if an address had demographic information suggesting that someone of Hispanic ethnicity lived in the household, the address was flagged as "Hispanic." If an address had no demographic information available, it remained unflagged. The vendor was able to provide demographic information for a number of ethnicities; for this paper, households flagged as Hispanic/Latino, Vietnamese, Chinese, and Korean ethnicities were studied.

Demographic flags were appended at the telephone matching stage; all addresses with demographic information were flagged, and telephone numbers were appended where available. After this process was completed, the sample consisted of flagged addresses with telephone numbers, flagged addresses without telephone numbers, and unflagged addresses both with and without telephone numbers.

In Year 2, flags were appended to the sample file, but the flags were used after data collection closed for analytic purposes only. The analyses were conducted to determine whether it would be worthwhile to use the flags in Year 3 for data collection enhancement. The flags proved to be quite accurate with respect to self-reported race/ethnicity, so it was decided that they would be used further in the next year.

In Year 3, the demographic flags were used to determine the second language included in bilingual SAQ mailings. Specifically, flagged addresses without telephone numbers in 3

communities with Asian priority groups received double-sided bilingual mailed SAQs, printed in both English and the flagged language, to allow the household members to respond in the language most comfortable for them. Unflagged addresses without phone numbers were sent English-only SAQs, with a double-sided cover letter containing information about the survey in five languages.

In Year 4, sample information was used to assign bilingual interviewers to households flagged as likely Hispanic, Vietnamese, Chinese or Korean in 17 communities with these priority populations, prior to the first call attempt. The bilingual interviewers are certified to conduct the interview in either English or the target language. It was hypothesized that using the *a priori* sample information could help lower respondent burden and reduce the need for call backs by connecting the household with an interviewer able to conduct the interview in one of the two most likely languages needed for that household. A similar design was used for the households contacted by mail: households flagged as likely to be Vietnamese, Chinese, or Korean were mailed survey materials in both English and the likely target language. Bilingual material included a double-sided cover letter and SAQ booklets with the entire questionnaire in both languages.

2.3 Methods
To assess the effectiveness of using sample information to customize the initial contact with respondents who may speak a language other than English, we compare data from flagged sample from Years 2, 3 and 4 of the REACH U.S. RFS.

Demographic flags were used to inform *a priori* bilingual CATI interviewer assignments beginning in Year 4. To assess the effects of assigning bilingual telephone interviewers on response, we compare screener completion rates and eligibility rates for flagged households in Year 3 (which did *not* receive *a priori* bilingual interviewers) to flagged households in Year 4 (which did). We perform *t*-tests (not adjusted for multiple comparisons) to compare screener completion rates (proportion of contacted households that complete the screening interview) and eligibility rates (proportion of screened households that are eligible based on race/ethnicity of household members). To determine whether *a priori* bilingual interviewer assignment increases the efficiency of data collection, we also compare the average number of telephone calls needed to complete the interview in Year 3 and Year 4.

The flags were also used to target bilingual survey questionnaire mailings beginning in Year 3. To evaluate this strategy, the analysis compares Year 2 flagged households, which were mailed English-only materials to Year 3 flagged sample, which received bilingual materials. A *t*-test comparison of return rates (percentage of households returning at least one completed questionnaire booklet) will help determine whether the use of targeted bilingual mailings improves participation among these households. In addition, comparisons of eligibility rates will explore whether the bilingual materials differentially affected eligible households.

Finally, we analyze questionnaire data from the Year 3 flagged SAQ sample to compare demographic and key health indicators among respondents who choose to answer in English and those who choose to respond in the target language. This preliminary analysis will help determine whether those responding in a language other than English are systematically different than those responding in English.

3. Results

3.1 Bilingual Telephone Interviewers

To determine whether the initial assignment of flagged households to bilingual interviewers increases participation or efficiency, we compared sample flagged with race/ethnicity information in Year 3, when no household received *a priori* bilingual interviewer assignment to Year 4, when all flagged households received the treatment. As seen in **Figure 1**, there is a significant increase in the screener completion rate for households flagged as Vietnamese, but not for other groups.

Figure 1: Screener Completion Rates by Language of First Dial
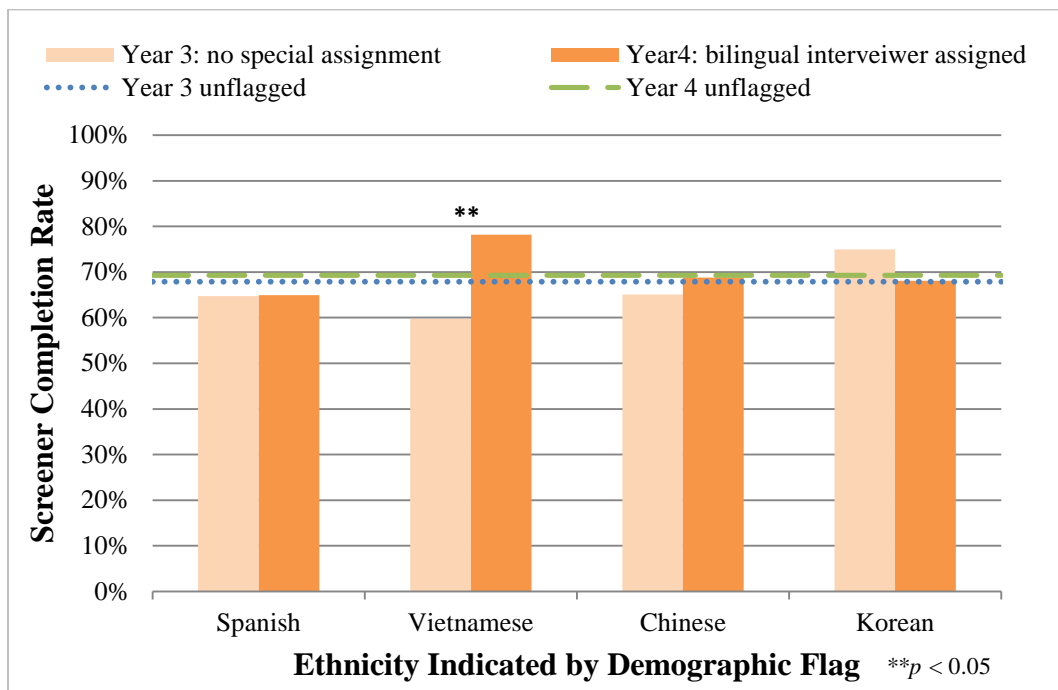
Although the rate of screener completion does not appear to be consistently improved by the assignment of bilingual interviewers, there is evidence that the strategy does significantly improve the efficiency of data collection, as measured by the average number of telephone call attempts needed to complete the screener (see **Figure 2**). For all languages, there was a significant decrease in the number of call attempts needed to complete the screener. The results for households flagged as likely Korean and Latino are particularly remarkable: likely Latino households assigned a Spanish-speaking interviewer prior to the first dial required 3.6 fewer calls on average (a decrease of 38%

from Year 3). The average number of calls needed for Korean households decreased by over 50% from 10.7 in Year 3 to 5.6 in Year 4.

Figure 2: Assigning Bilingual Interviewers Reduces Dials per Completed Screener
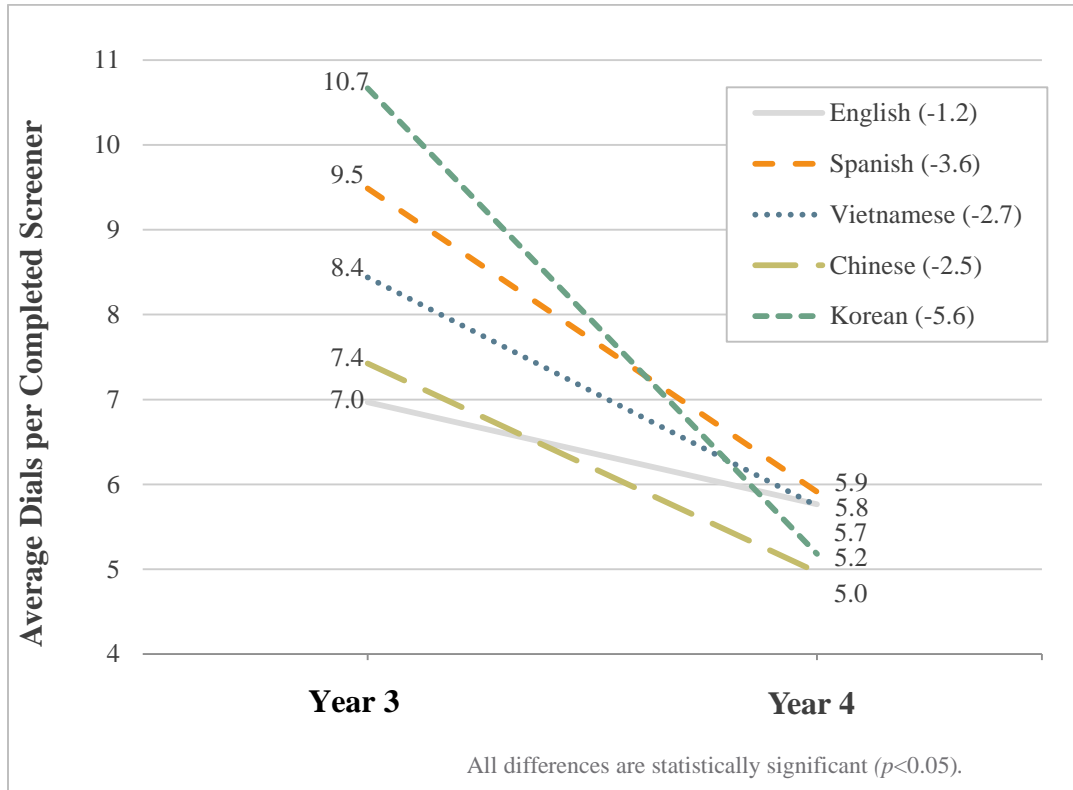
Finally, we compared the eligibility rates for flagged sample in both years to determine whether the assignment of bilingual interviewers differentially increases participation among eligible households. As seen in **Figure 3**, there is a significant increase in the proportion of eligible households among households flagged as likely Latino, Vietnamese and Chinese when bilingual interviewers are assigned in Year 4 compared to when all households receive no special interviewer assignment in Year 3. This suggests that *a priori* assignment of bilingual interviewers based on the ethnicity indicated by the demographic flag aids in gaining participation from members of the priority ethnic group. One unexpected finding was that decrease in eligibility rate for the households flagged as Korean from Year 3 to Year 4. Although the difference is significant, the sample size for that group is quite small.

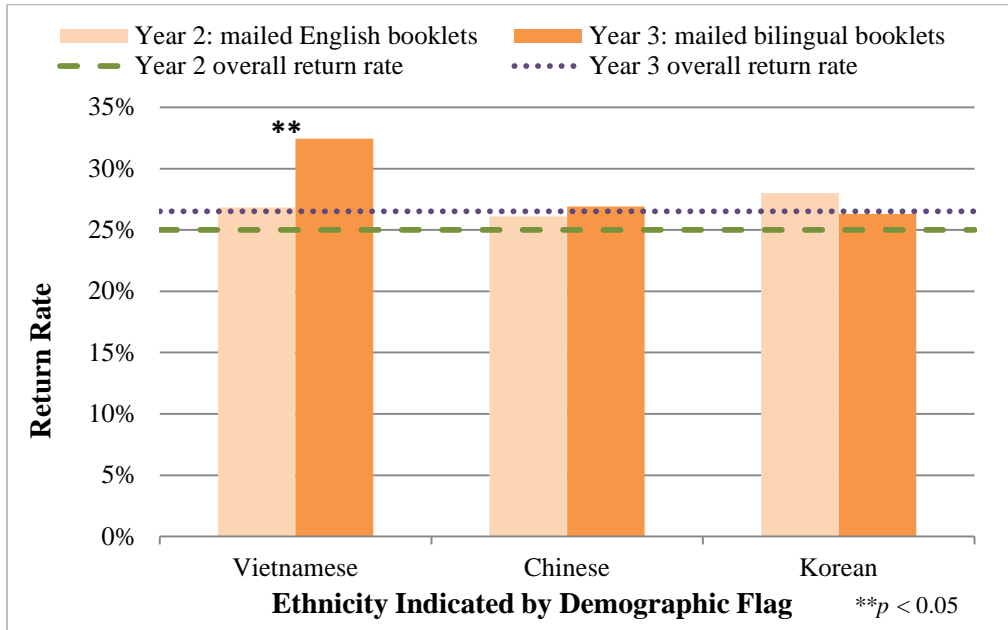**Figure 3: CATI Eligibility Rates for Flagged Sample**
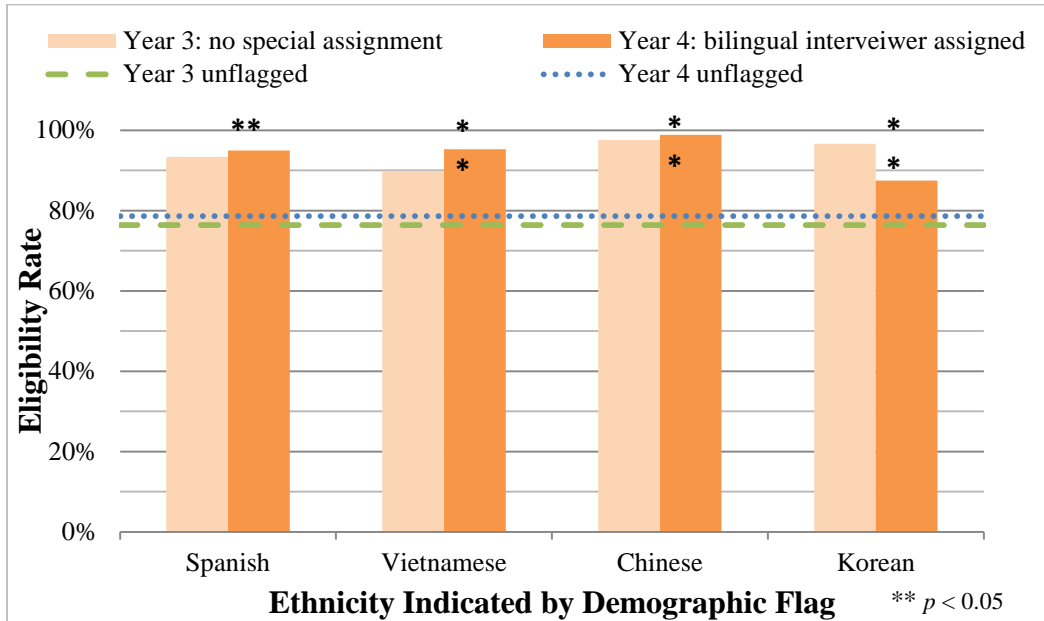

3.2 Bilingual Survey Booklets

The second research question was whether use of demographic flags to target bilingual survey mailings increases participation among these flagged households. To evaluate this, we compare SAQ response rates in three communities with Asian subgroup priority populations (Vietnamese, Chinese, and Korean). In all three communities, vendor flags were available starting in Year 2, and were used to inform bilingual mailings in Year 3. A comparison of return rates among these flagged households in Year 2 (when all received English-only material) and Year 3 (when all received bilingual materials) shows mixed results.

As **Figure 4** shows, SAQ return rates increased significantly for sample flagged as Vietnamese when the bilingual booklets were mailed. However, there are no significant differences for Chinese or Korean-flagged sample. Eligibility rates were also compared to determine whether the bilingual mailings have a differential effect on the priority population. There is some evidence for this (see **Figure 5**), as the eligibility rate among households flagged as Chinese increases when bilingual materials are sent, even though there was not a significant increase in return rate among those households. However, the eligibility rate among Vietnamese-flagged households decreased from Year 2 to Year 3. Preliminary investigation of this decline suggests it is likely due to operational changes in the sampling design made in Year 3 unrelated to the language of the survey booklet.

Figure 4: SAQ Return Rates for Flagged Sample

Figure 5: SAQ Eligibility Rates for Flagged Sample
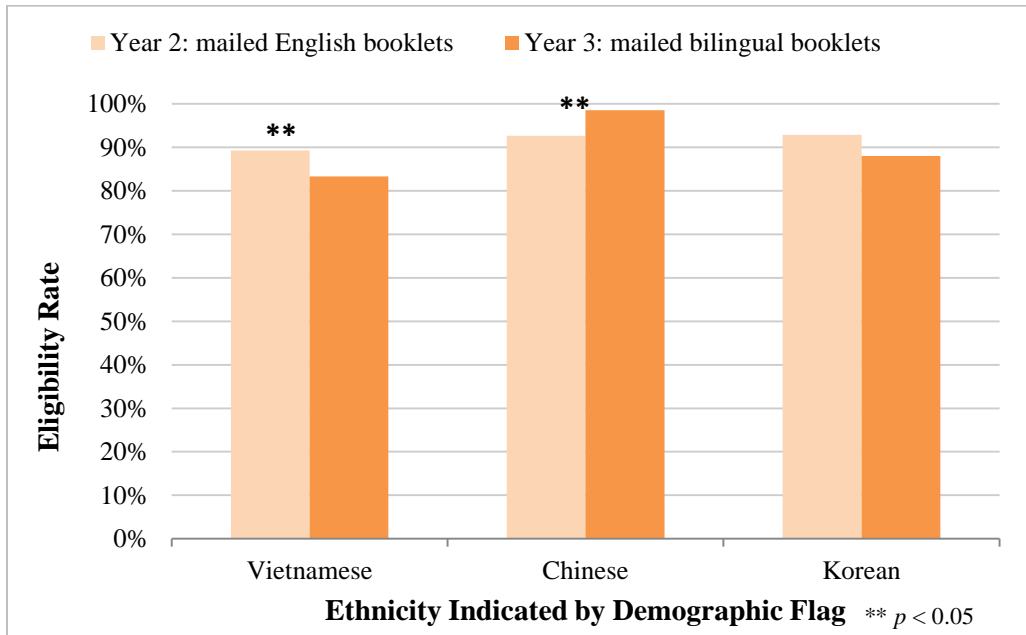
3.3 Demographic and Health Indicators

Finally, to begin to determine whether the use of bilingual survey materials helps in gaining participation from a different segment of the population, and therefore reduces coverage bias, we examined the distribution of several key health indicators by the language of response. This analysis is limited to SAQ response in Year 3—all sampled households received bilingual survey materials, and respondents therefore had a choice of

the language of response. **Table 1** shows that the percentage of respondents selecting the target language varies from 40% of those flagged as Vietnamese to 60% of those flagged as Korean.

Table 1: Language of Response for SAQ

Booklet Language	Target Language Responses		English Responses	
	n	*%*	*n*	*%*
Vietnamese	195	39.6%	298	60.4%
Chinese	100	51.3%	95	48.7%
Korean	22	61.1%	14	38.9%

Year 3 SAQ responses. Flagged sample only.

Table 2: Demographic and Health Indicators by Language of Response

Indicator	English	Target Language
Demographic	*n=407*	*n=317*
Mean Age **	43.5	52.6
Less than High School Education ***	6.5%	30.3%
Employed **	61.3%	50.0%
Income Less than $25,000 ***	19.7%	54.0%
Foreign Born ***	75.5%	98.7%
Health Behavior		
No Health Care Coverage **	14.3%	24.1%
Tested for Hepatitis B **	51.7%	60.4%
Tested for Hepatitis C **	23.7%	33.3%
Flu Vaccination (past 12 months) **	48.7%	61.6%

Weighted percentages for Year 3 SAQ responses. Flagged sample only. Target language responses are those that were completed in the non-English language. ***p<0.05, ***p<0.0001*

Comparing respondents who selected English as the language of response to those who selected Chinese, Vietnamese, or Korean (**Table 2**), it is clear that those who respond in the target language are significantly older, less well educated, less likely to be employed, lower income, and almost exclusively foreign born. This suggests that bilingual materials do encourage participation from a different group of individuals (namely older immigrants) who also report differences on some of the key health indicators of interest.

Looking at selected health behavior indicators, respondents who select the target language are significantly more likely to be uninsured than those selecting English. Somewhat unexpectedly, however, the target language respondents are significantly more likely to indicate some preventive care measures, including testing for hepatitis B and C and influenza vaccination. There are several possible reasons for this. If the target language respondents are indeed recent immigrants, they may be served by free health clinics, which routinely administer hepatitis tests and vaccinations. Secondly, it is possible that some of those responding in English speak English as a second language and may not understand the technical English terms, potentially leading to underreporting.

4. Summary and Conclusions

In this analysis, we have evaluated the effectiveness of using ancillary sample information, or demographic flags, to create a customized approach for hard-to-reach racial and ethnic minority populations in a study of health risk factors and behaviors. The analysis suggests that assigning bilingual interviewers to households based on *a priori* sample information (likely race/ethnicity of the household members) significantly increases efficiency of telephone data collection by eliminating the need for callbacks with a bilingual interviewer. It may also encourage more participation from members of the priority ethnic group. Targeted mailing of bilingual questionnaire booklets did not unilaterally increase participation, but may help response rates among members of some populations, and appears to gain participation from older, less well educated, and foreign born individuals, who demonstrate differences in key health behaviors. The use of ancillary sample data allows for a customized approach for members of hard-to-reach populations, extending its application beyond sample design. In particular, this may help increase the efficiency of data collection and lower burden on respondents, while helping to increase coverage among immigrant populations.

This analysis is limited in several ways. As mentioned previously, the algorithms used to create the demographic flags are proprietary and may vary across years and racial/ethnic groups. Research into the accuracy of the demographic flags for these particular groups is underway and may shed more light on the results found here. Furthermore, the *a priori* information was applied to the entire design, rather than as a controlled experiment, requiring comparison across years of the survey. Differences found, may therefore be a complicated by other sources of variation. Finally, small sample sizes limit the analytic power. Additional research is needed as to the accuracy of the demographic flags available from sample vendors as well as into other measures that could improve operational efficiency.

References

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