A Comparison of Mixed-Mode Address-Based Sampling (ABS) Versus Random Digit Dialing (RDD) for General Population Surveys

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1.0 Introduction

Advances in database technologies and the development of large-scale databases have opened the door to a new potential means of identifying and sampling households for general population surveys, one that is based on address-based sample (ABS) designs (Link et al., 2006; Link et al., 2007). Data sources, such as the U.S. Postal Service (USPS) Delivery Sequence File (DSF) offer a means of household address-based sampling (U.S. Postal Service, 2005). Further, these addresses can be reverse-matched to commercially available databases to identify a relatively large proportion of telephone numbers. ABS has, in effect, provided a broad base upon which to develop and conduct mixed-mode surveys.

We provide an overview of a pilot study that used ABS to identify and sample likely residential households and corresponding telephone numbers (where available) to conduct a mixed-mode survey, involving a mail survey with telephone survey follow-up of mail survey nonrespondents. The study was conducted as part of the Behavioral Risk Factor Surveillance System (BRFSS), one of the world's largest ongoing RDD health surveys. We compared coverage and participation rates with those of the ongoing BRFSS RDD telephone survey during the same timeframe.

2.0 Methods

The BRFSS collects uniform, state-specific data on preventive health practices and risk behaviors linked to morbidity and mortality among adults (further details on the BRFSS survey design, methodology, and questionnaire are available at http://www.cdc.gov/brfss). Six states participated in the 2006 Mixed-Mode Pilot Survey (MMPS): California, Florida, Minnesota, Massachusetts, South Carolina, and Texas.

2.1 Sample

The ABS frame was based on residential housing unit addresses and accessed through Marketing Systems Group, a commercial survey sample vendor. The frame included city-style addresses and P.O. boxes and covered single-unit, multi-unit, and other types of housing structures. The frame was first stratified by county within each of the six participating states. Then, with an initial goal of 800 completed interviews per state, separate samples of approximately 1,870 addresses per state were drawn as a systematic random sample, for a total of 11,034 addresses. We verified that the sample was well-distributed within the state by checking the frequencies of the zip codes and the sectional centers (first 3 digits of the zip code). Sampled addresses were matched against two commercially available databases of residential numbers in order to identify cases with accompanying telephone numbers.

2.2 Questionnaire

The MMPS mail questionnaire consisted of questions administered in the core section of the 2006 BRFSS telephone interview and covered the following topics: general health, health practices, demographic information, health problems, diet, activity level, HIV testing, and life satisfaction. Survey question text and response options were modified slightly, as needed, so that they would be comprehensible in a self-administered format. MMPS data collection occurred between June 20 and October 4, 2006.

2.4 Within-Household Respondent Selection

Building on an earlier study (Battaglia et al., 2007), we tested three techniques for within-household respondent selection as part of the MMPS: adults with the most recent birthday (version A), adults with the next birthday (version B), or all adults in the household (version C). Sampled cases were randomly assigned to one of these groups. Version A and B households were sent one questionnaire and one pre-paid reply envelope. Version C households were sent three questionnaires and three pre-paid reply envelopes, to accommodate households with more than one adult. Version C households with more than three adults were asked to call the project's toll free telephone number to request additional materials. The telephone questionnaire used the within-household respondent selection process in place for the ongoing

RDD BRFSS, that is, random selection of one adult in the household based on an implicit household roster

2.5 Follow-up Contacts by Mail
Approximately one week after the first questionnaire mailing, a postcard reminder was sent to all released mail survey cases. In addition, a second questionnaire was mailed to nonresponding households four weeks after the original mailing.

2.6 Follow-up Contacts by Telephone
Telephone follow-up for nonrespondents began approximately four weeks following the second questionnaire mailing. Those addresses in the Version C within-household respondent selection group were considered to be nonrespondent if no questionnaires had been received from a given address. The aim of telephone follow-up was to immediately conduct the interview over the telephone. No mention of the mail survey was made and the interviews followed standard procedures in place for the ongoing BRFSS RDD data collection.

2.7 Weighting and Estimation
A series of steps was employed to produce post-survey adjustments and weights:
(1) *Imputation for item nonresponse*: To facilitate the weight calculations, missing values for the following variables were imputed when no valid response was available: the number of adults in the household, the respondent's age, Hispanic/Latino status, and education level.
(2) *Base sampling weights*: The base sampling weight (BSW) for a state was calculated by dividing the number of residential addresses in the USPS DSF at the time the sample was drawn by the sample size of residential addresses. The total number of residential addresses in the 6 states was 39,560,906, which, divided by 6 (the number of pilot states), equals 6,593,484. For each state, the BSW values for the completed interviews were summed (Z). For the completed interviews in each state, an equalized BSW (BSW_EQUAL) was calculated as BSW x (6,593,484/Z).
(3) *Adjustment for number of adults in the household*: Next, a design weight (BSW_2) was calculated for completed interviews under Versions A (sampling based on last birthday) and B (sampling based on next birthday). BSW_2 = was calculated by multiplying BSW by the imputed number of adults in the household, with the maximum value for number of adults capped at 5. For Version C cases (all adults in household), BSW_2 = BSW.
(4) *Adjustment for number of interviews completed in the household*: A nonresponse adjustment (BSW_3) was made to Version C cases (all adults) and calculated as BSW_2 multiplied by the ratio of the number of adults in the household divided by number of adults in household that completed a questionnaire, with the maximum value for number of adults in a household capped at 5. For Version A and B completed questionnaires, BSW_3 = BSW_2.
(5) *Subgroup adjustments ("raking")*: For all completed questionnaires in a state combined, BSW_3 was "raked" to population control totals (provided by Claritas, a vendor of demographic and population-based data) for twelve age by gender cells (males and females aged 18-35, 25-34, 35-44, 45-54, 55-64, 65-74, and 75+). Race/ethnicity (white vs. all other races) and education (from the 2006 March Current Population Survey Supplement and using four categories: less than high school, high school graduate, some college, and college graduate) were also included as margins in the raking. For the raking convergence criterion, a 0.025 difference in percent was used. The raking was run using the median weight plus five times the interquartile range of the weights as the maximum weight value. The raking output weight was called BSW_4. For the completed interviews in each state, an equalized BSW_4 (BSW_4_EQUAL) was calculated as BSW_4 x (11,427,577/total adult population for the 6 states). BSW_4_EQUAL was used in all analyses, unless otherwise noted.

2.8 Response Rate Calculations
To maximize comparability between the mail and telephone surveys, we used outcome disposition codes and response rate calculations recommended by AAPOR (AAPOR 2006). For the BRFSS RDD telephone survey data, the original BRFSS disposition codes were mapped to the AAPOR-specified codes, and response rates were calculated using AAPOR response rate formula #4. Because the AAPOR mail survey disposition codes apply to surveys in which the respondent's name is known up-front, some modifications were required to handle sampled cases where eligibility was not able to be determined. Survey packets that were returned from the USPS as undeliverable were coded according to the reason given for non-delivery. Cases in which the survey packet could not be delivered due to an address problem, an address that was no longer in service, or a unit vacancy, including packets marked "cannot be delivered" (no reason given), "cannot be delivered as addressed," "insufficient address," "no mail receptacle," "no such number," "PO box closed," and "vacant," were treated as ineligible. Questionnaires which were returned blank (no responses) in the enclosed envelope were categorized as "refusals" and treated accordingly in response rate

calculations. Finally, all cases in which no return (either from the respondent or from USPS) was received were considered to have unknown eligibility, and a percentage of these cases were included in the response rate denominator.

2.9 Cost Calculations

The data collection costs per 1,000 completed interviews were calculated for both the RDD telephone and ABS mixed-mode surveys, using (1) actual unit costs for materials and supplies, based on the pilot study experience, (2) production statistics from the pilot effort, and (3) estimates of industry averages for direct hourly rates and indirect cost rates (e.g., fringe benefits, general and administrative expenses, indirect technical costs, and materials support expenses). Other costs assumed to be nearly equivalent regardless of the survey design, such as overall project management, survey design development, and post-data collection weighting and analysis, were not included.

3.0 Findings

A total of 4,871 interviews were completed: 4,327 by mail survey and 544 by telephone follow-up survey. A breakout of the number of completed interviews by survey design and state is shown in Table 1.

3.1 Response Rates

The ABS mixed-mode design produced significantly higher response rates in 5 of the 6 states examined (Table 1). The largest increase was in Massachusetts, where the response rate for the mixed-mode approach was 16.1 percentage points higher than the RDD response rate. Response rates also increased in California (+10.7 percent), Texas (+6.6 percent), Minnesota (+5.6 percent), and Florida (+4.6 percent). Only in South Carolina was the rate for the mixed mode pilot significantly lower than the RDD rate: 41.8 percent for the ABS design versus 49.1 percent for the RDD design, a -7.3 percentage point difference.

3.2 Demographic Characteristics

Table 2 provides the weighted demographic characteristics of the mixed-mode survey respondents and selected subgroups of these respondents: mail survey only, telephone survey only, mail survey respondents chosen using either the last birthday or next birthday method, and mail survey respondents from households where all adults were asked to complete the survey). These are compared to the weighted demographic characteristics from the ongoing RDD BRFSS survey, with statistically significant differences noted in the table. Population estimates from the 2005 Current Population Survey (CPS), which serve as a benchmark for comparison, are also provided; however, we did not make statistical comparisons. (For more information on the CPS see http://www.census.gov/cps/.)

Looking first at the impact of the alternative within-household selection methods for the mail survey component and applying only the six state "equalized" base/design weight (with no adjustment for sex, age, race, or education), we find that when the "last birthday" and "next birthday" groups are combined, the demographic characteristics do not differ significantly from those where all adults were asked to complete the survey in terms of sex, age, race, education, having children in the household, and living in a metropolitan statistical area. However, the two selection methods did produce different proportions of respondents with regards to the percentage of separated, widowed, or divorced respondents, as well as household size, with the birthday selection method resulting in a higher percentage of one adult households and the all adult method producing a higher proportion of households with three or more adults.

Next, we compared the weighted total mixed-mode respondent demographics and mail survey and telephone follow-up survey subgroups with the RDD telephone survey and BRFSS. The final "equalized" weight was used in this analysis, which includes adjustment for the survey design as well as sex, age, race, and education. Given these components of the weighting procedures, it is not surprising that we found few differences between the RDD and ABS surveys overall (the percentage of white, non-Hispanics being the exception) and that each is in line with the CPS estimates. Looking at the two components of the mixed-mode survey, however, we found significant variation in terms of race/ethnicity and education level. A higher percentage of the telephone follow-up respondents were Hispanic, as compared to the mail survey respondents. Conversely, the percentage of white non-Hispanics was lower among the telephone follow-up group. In terms of education, the telephone follow-up respondents were more likely than mail survey respondents to report that a high school diploma was the highest level of education they had attained, while higher percentages of mail survey respondents indicated they had some college experience or a college degree.

Looking at some of the other demographic characteristics, no significant differences were found across any of the groups with respect to living in a metropolitan area or a more rural area, nor were there differences in marital status. The RDD and ABS surveys did differ significantly in terms of number of adults in the household, with the ABS survey

yielding a lower percentage of one-adult households and a higher percentage of two-person households. There was no difference across these surveys in terms of the percentage of households with three or more adults. When compared to the CPS, the mixed-mode survey was closer to the population estimate for one-adult households, while the RDD survey was closer for the two-adult households. Both, however, appear to underrepresent households with three or more adults, when compared to the CPS estimates. Differences were also noted within the mixed-mode approach in terms of the presence or absence of children in the household, with mail survey respondents being more likely to say there were no children in the house than were those interviewed in the telephone follow-up.

3.3 Household Telephone Access

Use of address-based sampling and a mail survey also allowed us to examine the type of telephone access within responding households. Because telephone matching to sampled addresses is limited to landlines, we limited this analysis to the mail survey respondents only and excluded the telephone follow-up respondents. As shown on Table 3, 10.5 percent of those surveyed reported living in a household with cell phone access only and no landline. This percentage compares favorably with the percentage of households reported to be cell phone-only by the National Health Interview Survey (NHIS) conducted during the first 6 months of 2006 (Blumberg and Luke, 2007). Additionally, 1.1 percent of the mail survey respondents reported having no telephone, compared to 2.0 percent of households as reported by the NHIS.

3.4 Health and Risk Factor Estimates

Next, we examined prevalence estimates for 8 key health conditions and risk behaviors (Table 4). Significant differences were noted in terms of obesity and binge drinking. A higher percentage of mixed-mode survey respondents were obese as compared to respondents to the RDD survey. Likewise, respondents to the mixed-mode survey were more likely than RDD respondents to have engaged in binge drinking. No significant differences were seen in terms of access to health coverage, asthma, diabetes, cardiovascular disease, being a current smoker, or ever being tested for HIV.

Among the mixed-mode survey respondents, those who responded by mail were more likely than those interviewed in the telephone follow-up to say they had some form of health coverage. Conversely, a higher percentage of those interviewed by telephone reported being a current smoker. No significant differences were seen across the other 6 variables examined.

3.5 Cost Comparisons

One critical component in the decision to use a mixed-mode approach is cost. The cost for the mixed-mode approach is approximately 21 percent less than that of the RDD survey to obtain the same number of completed interviews ($63,724 versus $79,578). Although the materials and supplies costs for the mixed-mode approach were far greater than those for the RDD survey ($36,594 versus $3,938 for direct and indirect costs), the labor costs were much lower ($27,130 versus $75,640 for direct and indirect costs).

4.0 Conclusions

The primary goal of using a mixed-mode approach should be to reduce total survey error for a fixed cost. By this we mean that the sum of the potential bias in survey estimates resulting from errors in coverage, nonresponse, measurement, and sampling variability should be reduced when compared to current methodologies while not increasing the overall cost of a data collection effort. In this study, we examined the effectiveness of address-based sampling as a design for conducting a mixed-mode survey of the general public and found the approach to have strengths in some areas and weaknesses in others.

Use of an ABS mixed-mode approach led to higher overall response rates in 5 of the 6 states examined. The increases were highest among the states with the lowest RDD response rates (Massachusetts and California), with increases of 16.1 and 10.7 percentage points respectively. In the two states with the highest RDD response rates (South Carolina and Minnesota), however, the comparison with the ABS mixed-mode approach was less clear cut as response rates were 5.6 percentage points higher than the RDD survey in Minnesota, but 7.3 percentage points lower than the RDD survey in South Carolina. These findings are similar to those we reported in a 2005 ABS survey conducted in a slightly different set of states, which used a mail survey only with no telephone follow-up (Link et al., 2007). The implication is that the ABS mixed-mode approach may be a viable alternative to RDD for areas with traditionally very low participation rates, but may not be suitable in areas where rates are still relatively high.

Improvement in overall response alone, however, is an insufficient reason for moving from an RDD approach to an ABS mixed-mode approach. Response rates alone have been shown to be poor proxies for potential bias in survey results (Groves, 2006). What is important is improving participation

among subgroups of the sample that are currently underrepresented. While the specific underrepresented groups can vary across populations of interest and survey designs, in most RDD surveys, underrepresented groups tend to be younger adults (those 18 to 34), men, and racial/ethnic minorities. Unfortunately, use of a mixed-mode approach did not appear to substantially improve response among these particular subgroups. Use of a telephone follow-up of mail survey nonrespondents was important for adjusting the balance of the sample on several key demographic characteristics. Hispanics were significantly underrepresented in the mail survey component. This is not unexpected given that the questionnaires were mailed out only in English. Respondents requiring a Spanish language version were instructed in the cover letter to call a toll-free number to request a Spanish language questionnaire. Few respondents took advantage of this service. As a result, a far larger percentage of Hispanic speakers were interviewed in the telephone follow-up. The telephone follow-up was also important for improving response among households with children, which were underrepresented in the mail survey.

The ABS mixed-mode approach also allowed us to improve coverage over the RDD approach by reaching cell phone-only households and households with no telephone access. Moreover, the percentage of households reporting that their only telephone access was by cell phone was identical to the percentage reported by the NHIS (a face-to-face survey) for a similar time period. The findings also mirror those from the 2005 ABS mail survey study (Link et al., 2007). The close tracking of the 2005 and 2006 ABS survey results to the NHIS estimates for similar time periods is very encouraging, indicating that address-based sampling is an effective means of reaching this population being missed by RDD surveys. A similar pattern holds for houses with no telephone access; however the number of completed interviews in these households was so small as to make generalizations problematic.

The ABS mixed-mode approach also compared favorably to both the RDD survey and the CPS population estimates in terms of the percentage of individuals living in non-metropolitan (i.e., more rural) areas. One of the primary concerns in using the Delivery Sequence File as a sampling frame is the potential for under-coverage in rural areas (Link et al., 2006; Iannachione, Staab, and Redden 2003; Staab and Iannachione, 2004) In the present study, we found little evidence of significant under-coverage of more rural areas when we compared the weighted demographic characteristics of the sample to the RDD survey and CPS estimates.

When compared in terms of the survey estimates, the RDD and ABS approaches produced similar estimates for six of the eight health and risk factors examined, but produced higher estimates of obesity and binge drinking. This is similar to results from the 2005 ABS mail survey, which found significant differences between the mail survey estimates and RDD survey estimates, with higher reports of obesity and binge drinking, (as well as high blood pressure and engaging in HIV risk behaviors, topics which not covered in the 2006 questionnaire) and lower rates of ever being tested for HIV (Link et al., 2006). Previous research has shown that self-administered modes (such as mail surveys) can produce higher estimates of sensitive behaviors and obesity and binge drinking could both be considered moderately sensitive items. In the present study, the self-administered mail survey did produce higher rates of binge drinking than the interviewer-administered telephone follow-up survey. However, the mail and telephone estimates for obesity were nearly identical.

Finally, the ABS mixed-mode approach proved to be more cost effective than the RDD telephone survey for obtaining the same number of completed interviews. Based on cost and production data from the pilot study, the mixed-mode approach was approximately one-fifth less expensive. It is important to recognize that these cost savings could quickly be subsumed by data infrastructure costs, depending on the level of complexity and integration of the mailing, data entry, and computer-assisted interviewing programs that are used for this approach. Because there is wide variation in system design, we chose not to consider those costs in our analysis here, but these costs should be critical components in the decision of whether or not to adopt a mixed-mode over a single-mode approach.

Address-based sample designs appear to offer fertile ground for the growth of mixed-mode surveys. Such designs are not limited to mail and telephone surveys, but could also include face-to-face and/or web components in the mix (Link and Mokdad, 2006). The particular ABS mixed-mode design tested here offered response rate improvements (in areas with low RDD rates) and cost advantages over traditional RDD methods. Perhaps most importantly, the approach offers an effective means of reaching cell phone-only households and, to a lesser degree, households without telephones. Although it is too early to say if ABS approaches will supersede RDD approaches as the dominant methodology for sampling households, it does seem clear that ABS designs will certainly find their niche within the survey industry.

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Table 1. Comparison of Response Rates and Completed Interviews by Survey Design and State

		ABS Multi-Mode Survey		
State	RDD Telephone Survey % (Completes)	ABS Multimode Survey % (Completes)	*Mail Survey (Only) % (Completes)*	*Telephone Survey (Only) % (Completes)*
California	25.4 (2,338)	36.1*** (721)	*33.1 (662)*	*3.0 (61)*
Florida	32.8 (5,563)	37.4*** (712)	*33.4 (635)*	*4.0 (77)*
Massachusetts	26.3 (5,581)	42.4*** (830)	*36.5 (713)*	*5.9 (116)*
Minnesota	48.5 (1,795)	54.1*** (1,750)	*48.5 (963)*	*5.6 (111)*
South Carolina	49.1 (3,856)	41.8*** (853)	*37.3 (761)*	*4.5 (91)*
Texas	28.7 (2,610)	35.3*** (682)	*30.8 (593)*	*4.5 (88)*
State mean Response rate	*35.1*	*41.2*	*36.6*	*4.6*
Total completed interviews	21,743	4,871	4,327	544

RDD = random-digit dialed; ABS = address-based sample (n) = number of completes interviews
***Significance based on comparisons with RDD telephone survey: = p<.001
[1] Response rate calculated using AAPOR Response Rate Formula #4 (AAPOR 2006).

Table 2. Comparison of Weighted Demographic Characteristics by Survey Design

	CPS Population Estimates	RDD Telephone Survey	ABS Multimode Survey				
			Total[1]	*Mail Survey (Only)*	*Telephone Survey (Only)*[2]	*Birthday Selection (Mail Only)*[3]	*All Adults (Mail Only)*[3,4]
Demographic Characteristics	%	%	%	*%*	*%*	*%*	*%*
Race							
Hispanic	16.2	17.2	14.8*	*13.1*	*23.5****	*7.0*	*8.7*
White, non-Hispanic	66.7	65.4	69.2*	*71.3*	*60.5****	*81.6*	*80.4*
Black, non-Hispanic	11.3	11.5	9.9	*9.5*	*11.9*	*7.5*	*6.4*
Other, non-Hispanic	5.8	5.9	5.8	*6.1*	*4.3*	*3.9*	*4.5*
Education							
Less than high school	16.2	16.2	16.3	*15.9*	*18.3*	*8.0*	*9.8*
High school diploma	29.1	28.8	29.1	*27.2*	*39.4****	*21.9*	*23.2*
Some college or more	28.2	28.4	28.1	*29.3*	*21.7****	*31.9*	*31.0*
College degree	26.5	26.7	26.5	*27.6*	*20.6****	*38.2*	*36.0*
Marital status							
Married	55.8	57.6	57.8	*58.6*	*53.7*	*57.7*	*60.2*
Separated/divorced	18.6	18.5	18.3	*17.9*	*20.4*	*26.1*	*22.3**
Not married/single	25.6	23.9	23.9	*23.5*	*25.9*	*16.2*	*17.5*
Number of children							
None	59.6	56.6	59.1	*61.3*	*47.4****	*68.2*	*71.1*
One or more	40.4	43.4	40.9	*38.7*	*52.6****	*31.8*	*28.9*
Number of adults							
One	15.7	19.3	15.9	*15.7*	*17.4*	*28.6*	*22.0***
Two	52.3	54.1	57.5	*58.3*	*53.1*	*57.5*	*60.1*
Three	32.6	26.6	26.6	*26.1*	*29.5*	*13.9*	*17.9**
Metropolitan statistical area (MSA)							
In MSA	86.2	84.5	84.8	*85.0*	*83.9*	*85.0*	*85.0*
Not in MSA	13.8	15.5	15.2	*15.0*	*16.1*	*15.0*	*15.0*
[n]	[32,963]	[21,743]	[4,871]	[4,327]	[544]	[1,830]	[2,497]

CPS = Current Population Survey; RDD = random-digit dialed; ABS = address-based sampling; n = unweighted number of respondents Significance: * = p<.05, **= p<.01, ***= p<.001

Note: Data are weighted to adjust for sample design, post-stratified by sex and age and race, and ratio adjusted to make state sample sizes equivalent.

[1] Significance test compares "Total" ABS mixed-mode survey estimate to "RDD telephone survey" estimate.

[2] Significance test compares "Telephone survey" to "Mail survey" estimate.

[3] Estimates are weighted by equalized design weight (BSW3_EQUAL), which does not include "raking" to sociodemographic characteristics.

[4] Significance test compares "Birthday selection" to "All adult" within household selection methods using mail survey respondents only.

Table 3. Comparison of Household Telephone Access Among Mail Survey Respondents to National Health Interview Survey Estimates

Household Telephone Access	National Health Interview Survey[1] %	BRFSS ABS Mail Survey[1] %
Cell phone only	10.5	10.5
Land-line	87.5	88.4
--Land-line only	____	*14.5*
--Land-line and cell phone	____	*73.9*
No telephone	2.0	1.1

Note: Based on NHIS interviews conducted during January–June 2006. Source: Blumberg, Stephen J., and Julian V. Luke. 2006. "Wireless Substitution: Preliminary Data from the January-June 2006 National Health Interview Survey." *National Center for Health Statistics Health E-Stats*. Available at: http://www.cdc.gov/nchs/products/pubs/pubd/hestats/wireless2006/wireless2006.htm.
CI = confidence interval; n = estimated number of households.
[1] Estimates are for ABS mail survey respondents only.

Table 4. Comparison of weighted prevalence estimates for key health conditions by survey design

Health Condition / Risk Factor	RDD Telephone Survey %	ABS Multimode Survey Total[1] %	ABS Multimode Survey Mail Survey (Only) %	ABS Multimode Survey Telephone Survey (Only)[2] %
Health care coverage[3]	81.9	81.3	82.4	75.5**
Asthma	12.4	13.4	13.6	12.6
Diabetes	9.3	10.8	10.3	13.8
Cardiovascular disease[4]	8.3	8.7	8.9	8.0
Obesity (BMI > 30)	22.9	26.7***	26.7	26.6
Current smoker	20.1	19.9	18.1	29.5***
Binge drinking	15.1	18.1***	18.9	13.7*
Tested for HIV[5]	36.7	36.1	35.3	40.2
[n]	[21,743]	[4,871]	[4,327]	[544]

RDD = random-digit dial; ABS = address-based sample; n = unweighted number of respondents.
Significance based on differences between telephone survey and mail survey data: * p<.05, ** p<.01, *** p < .001
Note: Data are weighted to account for sample design and post-stratified to sex-age, race, and education totals for each state. The final weights were ratio adjusted to equalize the number of cases across states.
[1] Significance test compares "Total" ABS mixed-mode survey estimate to "RDD telephone survey" estimate.
[2] Significance test compares "Telephone survey" to "Mail survey" estimate.
[3] Health care coverage includes health insurance, prepaid plans such as health maintenance organizations (HMOs), or government plans such as Medicare.
[4] Respondent had one or more of the following: heart attack (myocardial infarction), angina or coronary heart disease, or stroke.
[5] Questions not asked of respondents age 65 years or older