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Self-Reported Interest to Participate in a Health Survey if Different Amounts of Cash or Non-Monetary Incentive Types Were Offered

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Abstract The objective of this study was to assess monetary and non-monetary factors that can influence the decision to participate in a future health survey. A questionnaire was administered to eligible, low-income participants ($n = 1502$) of the 2012 Los Angeles County Health and Nutrition Examination Survey (LAHANES-II). Multivariable regression analyses were performed to describe factors potentially associated with future intent to participate in similar survey designs. The results of the survey suggest that, overall, female participants had a greater interest in participating under a variety of incentive scenarios. Compared to the 25–34 age group, older participants (35–44, 45–84) reported more interest to participate if \$10 cash [prepaid gift/debit card], a coupon for product/travel, or a small item [e.g., granola bar, t-shirt, pen] was offered, whereas younger

participants (18–24) reported greater interest for \$25 cash or a coupon for product/travel. Non-Whites, when compared to Whites/Non-Hispanics, reported greater interest to participate if any of the incentives was offered. High school graduates, when compared to those with some college education, reported greater interest to participate if \$10 cash, a small item, or a lottery ticket was offered. Presence of two or more chronic conditions increased interest while concerns about participation in LAHANES-II was associated with reduced interest to participate in future health-related surveys. The results suggest that both incentives and non-monetary considerations (e.g., personal concerns about participating and individual level characteristics) can influence the decision to participate in health-related surveys and offer insights into strategies that can improve response rates for these

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assessments that are often used to inform community planning.

Keywords Survey incentives · Health survey · Health assessment · Response rates

Introduction

The response rate is an important measure of validity and generalizability of any research study [1, 2]. Incentives are often used to facilitate recruitment, motivate participation, and enroll individuals who might otherwise not respond, thereby affecting the response rate in the positive direction [3]. Incentives are frequently grouped into four categories: (1) prepaid monetary reward [cash or cash via gift/debit card], (2) prepaid non-monetary rewards [coupon, food item, pen, etc.], (3) monetary reward conditional upon completion of a survey, or (4) non-monetary rewards conditional upon completion of a survey [4, 5]. Previous studies have indicated that monetary incentives are more effective than non-monetary incentives. Additionally, larger monetary incentives and prepayment (versus conditional payment) are associated with higher response rates [3, 4, 6, 7].

Incentive types and amounts may differ by study design, with monetary incentives playing a vital role in clinical trials and cohort studies [8–13]. However, the focus of the current study was on incentives for participation in cross-sectional, health-related surveys. Examples of local phone-based health surveys include the 2011 Los Angeles County Health Survey (LACHS) with a \$10–20 post-completion incentive and the 2011–2012 California Health Interview Survey (CHIS) with a \$2 monetary incentive. These two surveys have response rates of 28.4 and 35.1%, respectively (Table 1) [17, 21, 27]. The National Health and Nutrition Examination Survey (NHANES) provides incentives for biometric measurements. However, the amount of the incentive is based on participant's age, the session attended, and the year of the survey (1999–2010 incentives ranged from \$30–\$125) [14, 28]. The 2011–2012 NHANES response rates ranged from 69.5% for biometric measurements to 72.6% for those who were interviewed only, with incentives ranging from \$90 to \$175 [15, 16, 29].

While cash incentives have demonstrated generally favorable effects on response rates in these aforementioned health surveys, how they perform among

lower income populations or the use of non-monetary substitutes in this population remains largely under-characterized.

To address this gap in the survey literature, the present study capitalized on a supplemental questionnaire that was added to a health assessment survey administered in Los Angeles County (LAC) during 2012. The Los Angeles County Health and Nutrition Examination Survey-Phase II (LAHANES-II) was a cross-sectional survey that collected staff-measured anthropomorphic information as well as self-reported demographic and other health and nutritional information on a sample of low-income adults who were clients of five large, multi-purpose public health centers in LAC. Survey participants were given a \$50 gift card for completing biometric measurements (height, weight, blood pressure, and urinalysis) and self-administered questionnaires. The overall participation rate was 69%. Data collection took place during a 2-month period. The objective of the present analysis was to investigate factors that may influence the decision to participate in health-related surveys in the future for various incentive types given as compensation.

Methods

LAHANES-II Recruitment

Participants of the LAHANES-II were recruited by trained survey coordinators at five designated Los Angeles County Department of Public Health (DPH) health centers. All clients of these multi-purpose centers who attended the tuberculosis (TB), sexually transmitted disease (STD), and immunization clinics were sequentially approached in waiting rooms of the health centers and screened for eligibility. Inclusion criteria included the following: aged 18 years or above, spoke English or Spanish, Los Angeles County resident, not currently pregnant, and able to attend a clinic for the survey on a Saturday during the data collection period. Eligible adults who agreed to participate were scheduled for an appointment on one of seven data collection Saturdays from February 25–April 14, 2012.

Survey Procedures

The LAHANES-II comprised two main survey components—(1) a self-administered survey that was

Table 1 Response rates and cash incentives provided in local, state, and national surveys in the USA

Study/survey	Type of study	Study/survey timeline	Duration of survey administration	Sample size	Response rate ^a	Cash Incentive	Location
Los Angeles County Health and Nutrition Examination Survey (LAHANES-II) 2012	Rapid assessment, biometrics	2 months	45–60 min	1502	69.0%	\$50	Los Angeles County
National Health and Nutrition Examination Survey (NHANES) 2011–2012 [14–16]	Rapid assessment, interview, biometrics	1 year	30–40 min	9338	69.5%	\$90–\$175	US Nationwide
Los Angeles County Health Survey (LACHS) [17, 18]	Random Digit Dialing (RDD)	1 year	30 min	8036	28.4%	\$10–\$20	Los Angeles County
Women, Infants and Children (WIC), 2011 [19]	RDD	1 year	20–25 min	5080	54.0%	\$10	Los Angeles County
Los Angeles Family and Neighborhood Survey (LA FANS) [20]	Personal interview	2 years	N/A	3090	85.0%	\$25–\$50	Los Angeles County
California Health Interview Survey (CHIS) 2011–2012 [21]	RDD	1 year	35 min	42,935	35.1%	\$2	California
Los Angeles Mommy and Baby Survey 2010–2012 [22, 23]	Mailed questionnaire or interview	2 years	30–45 min	10,758	57.0–62.0%	\$20	Los Angeles County
Behavioral Risk Factors Surveillance System (BRFSS) 2011 California [24]	RDD	1 year	20–30 min	18,004	35.4%	None	California
Hepatitis B and Blood Pressure Screening Survey (2012–2013) [25]	Rapid assessment, biometrics	6 months	20–30 min	1499	87.5–87.9%	None	Los Angeles County
A Survey Study of Beach Use and Perceptions [26]	RDD	3 months	10–15 min	403	8.7%	None	Los Angeles County

N/A not available (personal communication)

^a Response rates are reported from the available resources and may have been calculated using different methodologies

completed by each participant and (2) biometric (anthropometric) measurements taken by the survey's clinical staff. Information collected from the self-administered survey included socio-demographics, i.e., gender, age, race/ethnicity, nativity, education, and employment status; health behaviors such as smoking, eating habits, and exercise; and chronic conditions.

At the conclusion of the main survey, participants were administered an exit interview (supplemental questionnaire) to gauge their study experiences which included questions about potential survey incentives.

Participants were asked about their interest to participate in a similar survey as LAHANES-II if different monetary amounts or non-monetary incentive types were offered. The incentive options included cash/prepaid gift/debit card of \$10 or \$25 and non-monetary incentives such as a coupon for product/travel, a lottery ticket, or a small item (e.g., granola bar, t-shirt, pen). The responses to these incentive questions were categorized on a scale from 1 ("I would definitely participate") to 4 ("I would definitely NOT participate"). Additionally, participants were asked questions concerning their

satisfaction with wait time and the general attitude of the staff they interacted with throughout the LAHANES-II. Responses for the statements associated with these topics ranged from 1 (“strongly disagree”) to 10 (“strongly agree”). Lastly, participants were asked about concerns, if any, regarding their participation or content in the LAHANES-II.

During LAHANES-II, all participants signed a consent form and were given a prepaid \$50 VISA or MasterCard gift card for the time spent while completing the two components of the survey. The amount and type of incentive was determined by considering several factors including (1) the amount of effort required of the participants to travel to the health center and to participate in a low-risk health survey; (2) fair compensation for participants without it being coercive; (3) the available budget of the survey; (4) the ability to transport, track, and distribute gift cards in a secure manner by study personnel; (5) the utility of the gift card incentive for participants; and (6) a realistic goal to achieve a reasonable survey response rate. The present analysis of existing LAHANES-II data was approved by the Los Angeles County Department of Public Health Institutional Review Board on January 5, 2011 (IRB No. 2010-12-302).

Statistical Analysis

Descriptive statistics for survey participants were reported as frequencies and percentages. For comparison, applicable health data and demographic information from the population-based 2011 Los Angeles County Health Survey (LACHS) were included as part of the descriptive profile for the LAHANES-II.

Multivariable logistic regression analyses were conducted to estimate the odds of participating in a similar type of health-related survey as LAHANES-II if different incentives were offered. The main regression model with the outcome “I would definitely or likely participate” versus “I would maybe participate or definitely not participate” was selected based on prior knowledge, precision of estimates, and the Hosmer-Lemeshow Goodness-of-Fit Test [30]. Independent variables entered into all models included potential predictors, such as age, gender, educational attainment, and race/ethnicity, as well as other factors (covariates) that could impact the interest to participate, including being born in the USA, wait time in the health center, number of chronic conditions, smoking status, and concerns

about survey participation/content. Age was entered into the models as a categorical variable with 10-year age categories (with an exception of the first category of 18–24 years old); however, participants aged 45 and older were collapsed into one category (45–84) because the distribution of responses for the outcome was consistent within the group. The categorization method for race/ethnicity and educational attainment was similar to those used by the LACHS and by other health surveys [17, 31, 32]. Based on groupings used in these and other survey studies, and on the distribution of the data, the number of chronic health conditions were categorized into three categories: no condition, one condition, and two or more conditions (> 2) [33].

Sensitivity analyses using the same variables were performed but with the outcomes slightly altered. For example, in model A, the outcome was classified as “I would definitely participate” versus “I would likely participate, maybe participate, or definitely not participate”. In model C, the outcome was dichotomized as “I would definitely, likely, or maybe participate” versus “definitely not participate”. These variables were simultaneously entered into the logistic regression model in all analyses. All analyses were performed using SAS 9.4 (SAS Institute, Inc., Cary, North Carolina) [34].

Results

Socio-Demographics and Health Characteristics

The main LAHANES-II survey and exit interview were distributed to all eligible participants at the public health centers ($n = 1502$). Table 2 displays the socio-demographics and health characteristics from the main LAHANES-II survey and comparison information from the 2011 Los Angeles County Health Survey (LACHS) [17]. Overall, there were more females (53.7%) than males (46.0%) in the sample. The mean age of the participants was slightly younger than those in the LACHS (36.0 years versus 43.5, respectively). African Americans were overrepresented in LAHANES-II (48.3%), but Hispanics (29.1%), Whites (11.6%), and Asians (5.3%) were underrepresented in comparison to the population-based LACHS sample. Over half of the participants had attended at least some college (59.1%). Many were unemployed (45.4%), followed by those with part-time (19.9%) and full-time employment (15.9%) (data not shown). Most of the

Table 2 Socio-demographics and health characteristics of participants of the Los Angeles County Health and Nutrition Examination Survey-Phase II (LAHANES-II), February–April, 2012 ($n = 1502$)

Characteristics	LAHANES-II ^{a,b}		Los Angeles County Health Survey (LACHS) ^{c,d}	
	<i>n</i>	%	<i>n</i>	%
Gender				
Female	807	53.7	3,734,000	51.5
Male	691	46.0	3,518,000	48.5
Age group				
18–24	332	22.1	1,003,000	14.1
25–34	460	30.6	1,449,000	20.4
35–44	317	21.1	1,394,000	19.6
45–84	393	26.2	3,273,000	46.0
Mean (SD)	36.0	(12.7)	43.5	(16.7)
Race/ethnicity^e				
African American/Black	725	48.3	620,000	8.6
Asian/Pacific Islander	79	5.3	1,127,000	15.6
Hispanic/Latino	437	29.1	3,159,000	43.7
White/Non-Hispanic	174	11.6	2,295,000	31.7
Native American/Alaskan	< 5	< 1	–	0.4
Mixed/Multiethnic	78	5.2	–	–
Educational attainment				
Completed less than high school	261	17.4	1,672,000	23.2
High school graduate or GED	338	22.5	1,607,000	22.3
Some college, trade school	564	37.5	2,008,000	27.9
College/postgraduate/professional degree	325	21.6	1,914,000	26.6
Born in the USA				
Yes	1074	71.5	3,314,000	45.9
No	426	28.4	3,909,000	54.1
Time spent at the health center				
0–30 min	238	15.8	–	–
31–60 min	778	51.8	–	–
1–2 h	377	25.1	–	–
2–3 h	32	2.1	–	–
3 h or more	5	< 1	–	–
Smoking status (self-reported)^f				
Smoker	521	34.7	1,052,000	14.5
Non-smoker	981	65.3	6,182,000	85.5
Chronic health conditions^g				
Arthritis	136	9.1	1,257,000	17.4
Depression	205	13.6	879,000	12.2
Diabetes	93	6.2	685,000	9.5
Hypertension	211	14.0	1,738,000	24.0
Asthma	204	13.6	–	–
Hepatitis C	30	2.0	–	–
Hepatitis B	26	1.7	–	–
Cancer	25	1.7	–	–

Table 2 (continued)

Characteristics	LAHANES-II ^{a,b}		Los Angeles County Health Survey (LACHS) ^{c,d}	
	<i>n</i>	%	<i>n</i>	%
Heart disease	25	1.7	–	–
Kidney disease	21	1.4	–	–
Emphysema/COPD	18	1.2	–	–
Number of chronic conditions				
None	841	56.0	–	–
One	406	27.0	–	–
More than one	255	17.0	–	–

^aTotals and percentages may exceed 100% due to rounding and/or the multiple-choice format

^bExcludes missing values

^cSource: 2011 Los Angeles County Health Survey (LACHS), Office of Health Assessment and Epidemiology, Los Angeles County Department of Public Health

^dNote: Estimates are based on self-reported data from a random sample of 8036 Los Angeles County households, representative of the adult population in Los Angeles County

^eClassification of race/ethnicity was slightly different for Los Angeles County Health Survey (LACHS); there was no multiethnic/mixed race category in the LACHS

^fIn the Los Angeles County Health Survey (LACHS), current cigarette smokers were defined as those who reported currently smoking cigarettes “every day” or “some days” vs “Are you currently smoking” in LAHANES-II

^gChronic conditions in both LAHANES-II and LACHS included arthritis, depression, diabetes, and hypertension; other conditions documented differed between the two surveys

LAHANES-II participants indicated they were born in the USA (71.5%).

The majority of participants spent 31–60 min (51.8%) completing the LAHANES-II assessment, followed by 1–2 h (25.1%) and 0–30 min (15.8%). Approximately 65% of the participants indicated they were non-smokers. Forty-four percent had been informed by a healthcare provider that they have a chronic condition (27% had at least one condition, 17% had more than one). The most common chronic conditions were hypertension (14.0%), depression (13.6%), and asthma (13.6%).

Satisfaction and Concerns about LAHANES-II

Overall, participants were satisfied with their experiences during LAHANES-II (mean rating = 9.5, median rating = 10), with 91.7% of participants stating that they would participate in a future project like LAHANES-II and 93.5% that they would recommend to friends’ projects like LAHANES-II (data not shown).

Table 3 shows data from the exit interview (supplemental questionnaire). The vast majority reported being comfortable with their participation (92.0%), with a

large percentage indicating they had no concerns about participating (69.6%). When participants were asked to provide specific concerns regarding their privacy was the most frequently stated protecting their privacy was the most important reason (16.0%), followed by how the collected information would be used (11.7%), the length of time it would take to complete the survey (9.0%), and concerns with receiving further unwanted solicitation by e-mail, telephone, or junk mail (6.5%).

Participants’ Opinions Toward Monetary and Non-Monetary Incentives

During the exit interview, participants were asked to give the main reason they decided to participate in LAHANES-II. Many participants stated they wanted to contribute to public health’s mission to prevent disease and protect people’s health (36.4%); another 28.9% indicated they were motivated by the \$50 incentive; the rest indicated other reasons, an interest in the survey’s subject matter, or no reasons (data not shown).

When asked how likely they were to participate in a similar study given a range of possible incentive types that could be offered, almost a half of the participants

Table 3 Concerns that participants had about the Los Angeles County Health and Nutrition Examination Survey - Phase II (LAHANES-II), February – April, 2012

Question	Number	Percent ^{a,b}
How comfortable were you in taking part in the various components of the project?		
Very comfortable, somewhat comfortable	1381	92.0
Neither comfortable nor uncomfortable	44	2.9
Somewhat uncomfortable, very uncomfortable	39	2.6
How concerned were you about participating in the survey?		
No concerns	1046	69.6
Few concerns	266	17.7
Some concerns	98	6.5
Serious concerns	37	2.5
What types of concerns did you have about participating in the survey?		
Protecting privacy	241	16.0
How the information collected might be used	176	11.7
Length of time it would take to complete the survey	135	9.0
Solicitation because of participating in the survey	97	6.5
Other concerns about participating in the survey	40	2.7

^aTotals and percentages may exceed 100% due to rounding or the selection of multiple responses

^bExcludes missing values

indicated they would definitely participate if offered \$25 cash or prepaid gift/debit card (49.3%); approximately one third indicated they would accept a coupon for product or travel (37.3%), \$10 cash or prepaid gift/debit card (36.2%), or a lottery ticket (33.4%); and about one quarter of participants would participate if offered a small item such as a granola bar, t-shirt, or pen (27.2%), or some other unspecified item (25%) (Fig. 1).

Factors Influencing Interest to Participate in a Similar Survey like LAHANES-II

Results of the multivariable regression models on factors associated with an interest to participate in a health-related study (similar to LAHANES-II) if different cash amounts or non-monetary incentive types are offered are presented in Table 4.

Female participants were significantly more likely to participate—regardless of the type of incentive—with

adjusted odds ratio (AOR) ranging from 1.42 (95% CI 1.11, 1.81) for small item to AOR = 1.77 (95% CI 1.35, 2.32) for a \$25 cash incentive.

Compared to the 25–34 age group, participants of all age groups were more likely to agree to participate in a similar survey if offered cash incentives. Younger participants aged 18–24 years were more likely to report interest to participate given a \$25 cash incentive (AOR = 1.52, 95% CI 1.06, 2.20), while older participants would agree to participate for a \$10 cash incentive with AOR = 1.48, 95% CI 1.05, 2.09 for participants aged 35–44 years and AOR = 1.61, 95% CI 1.14, 2.27 for participants over 45 years old. Additionally, participants aged 18–24 and 35–44 years were more likely to report interest to participate given a coupon for product/travel (AOR = 1.53, 1.10, 2.12 and AOR = 1.52, 95% CI 1.08, 2.14, respectively), while participants over 45 years old would accept a small item (AOR = 1.68, 95% CI 1.19, 2.37) as an incentive for participation.

Other sociodemographic factors yielded variable but statistically significant results. Compared to Whites/Non-Hispanics, participants from the other racial/ethnic groups were more likely to express an interest in participation with the listed incentives, except for the \$25 cash incentive, which was found to be significant only for African American/Black participants. Participants with a high school education reported greater interest in a similar survey if they were given a small item or lottery ticket as incentive (AOR = 1.46, 95% CI 1.06, 2.00 and AOR = 1.57, 95% CI 1.14, 2.16, respectively), as compared to those with some college background. Interestingly, participants with college or postgraduate degrees were less likely to participate regardless of the incentive type offered.

Participants' health was also a strong predictor—those with more than one chronic condition were more likely than those with no conditions to report interest to participate if offered a \$25 cash incentive (AOR = 1.74, 95% CI 1.13, 2.66).

Lastly, time spent participating and concerns about LAHANES-II were both predictors of future participation by incentive types. Spending the least amount of time at a health center during the main survey was associated with being more likely to participate when given a coupon for product/travel or a lottery ticket (AOR = 1.42, 95% CI 1.01, 2.01 and AOR = 1.48, 95% CI 1.06, 2.07, respectively). Not surprisingly, participants who had concerns about participating in

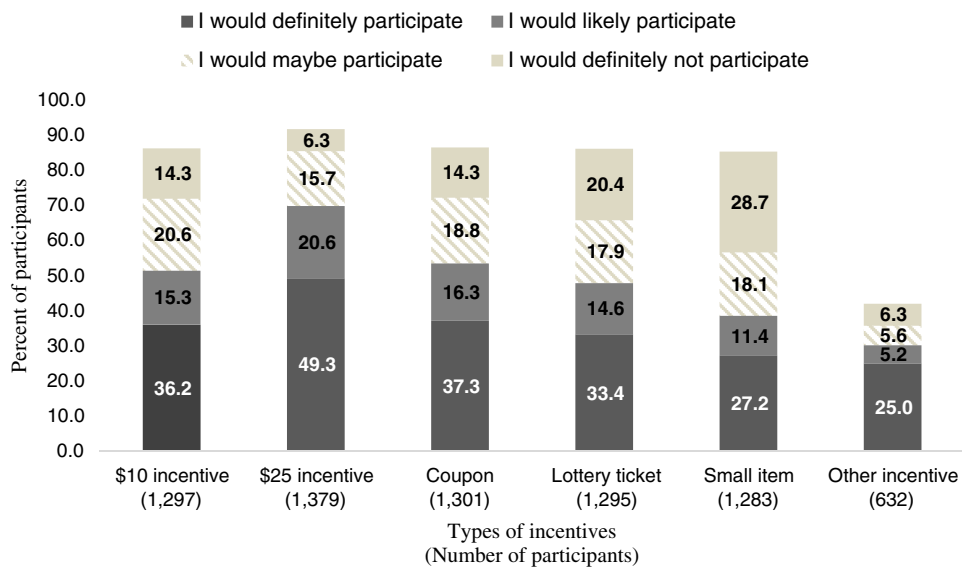


Fig. 1 Participants' opinions regarding the receipt of different amounts of cash and various types of non-monetary incentives, Los Angeles County Health and Nutrition Examination Survey-Phase II (LAHANES-II), February–April 2012

LAHANES-II were less likely to report an interest to participate if offered any type of incentive (Table 4).

Sensitivity analyses using the same variables but different categorization of the outcomes (i.e., self-reported level of interest to participate in future studies) yielded results that were similar to those from the main analysis (Table 5). The estimates suggest associations in the same direction as the main model; these estimates, however, were less precise for some of the participation variables examined.

Discussion

Within the USA, California generally has low response rates for health surveys as compared to other states [24]. The response rate for the LAHANES-II was relatively high by comparison, particularly if the short study duration (seven data collection days during a 2-month span) was taken into consideration. The response rate was similar to the NHANES (69.5%), on which the survey was based, and higher than most other health surveys completed within Los Angeles County or in the state of California [16, 18–27, 29]. The high response rate may have been due to the cash incentive of \$50 or because it was a clinic-based study in which the participants may have had a vested interest in the subject matter.

Overall, the results from the LAHANES-II exit interview were consistent with previous studies showing that the larger the value (amount) of the monetary incentive, the higher the response rate [3, 4, 6, 7]. Although all participants were given a prepaid \$50 gift card for their participation in the main survey, as many as 70% in the exit interview stated they would “definitely” or “likely” participate in a similar survey for \$25; 52% indicated they would do the same for \$10. This is both an encouraging and an important consideration when trying to balance the budget of any study and the goal for a high response rate. On the other hand, providing an overly generous incentive could promote undue inducement or coercion of participants and is potentially unethical from a human research subject's perspective [35]. Both the evaluator and the Institutional Review Board carry the responsibility of determining what constitutes an appropriate incentive for a given study and ensuring that coercion does not occur.

Various factors were associated with an interest to participate when different cash amounts and/or non-monetary incentive types were offered as options. Female participants, for example, were more likely to report an interest to participate across all types of incentives. This finding is consistent with several studies which have shown higher survey response rates among females [14, 36–39]. A possible

Table 4 Factors (individual characteristics) influencing or that may have influenced interest to participate in a similar survey as LAHANES-II if offered different cash amounts or various non-monetary incentive types, Los Angeles County Health and Nutrition Examination Survey-Phase II (LAHANES-II), February–April 2012

Factors/characteristics	\$10 cash		\$25 cash		Coupon for product/travel		Small Incentive (granola/shirt/pen)		Lottery ticket for prizes	
	AOR ^a	95% CL	AOR ^a	95% CL	AOR ^a	95% CL	AOR ^a	95% CL	AOR ^a	95% CL
Gender (ref: male)										
Female	1.68	1.32, 2.15*	1.77	1.35, 2.32*	1.56	1.22, 1.99*	1.42	1.11, 1.81*	1.48	1.16, 1.89*
Age group (years) (ref: 25–34 years old)										
18–24	1.17	0.84, 1.62	1.52	1.06, 2.20*	1.53	1.10, 2.12*	1.12	0.81, 1.55	1.12	0.81, 1.55
35–44	1.48	1.05, 2.09*	1.39	0.96, 2.01	1.52	1.08, 2.14*	1.13	0.81, 1.59	1.22	0.87, 1.71
45–84	1.61	1.14, 2.27*	1.31	0.90, 1.89	1.35	0.96, 1.90	1.68	1.19, 2.37*	1.15	0.82, 1.62
Race/ethnicity (ref: White/Non-Hispanic)										
African American/Black	2.94	1.96, 4.39*	1.56	1.03, 2.36*	2.89	1.94, 4.28*	3.20	2.02, 5.09*	3.33	2.18, 5.09*
Asian/Pacific Islander	2.50	1.27, 4.91*	1.55	0.77, 3.11	1.40	0.72, 2.71	2.35	1.15, 4.84*	2.77	1.39, 5.52*
Hispanic/Latino	2.77	1.74, 4.42*	1.61	0.99, 2.62	2.29	1.45, 3.61*	3.28	1.96, 5.49*	2.47	1.53, 4.01*
Mixed/Multiethnic	2.75	1.50, 5.06*	1.43	0.74, 2.79	2.35	1.28, 4.32*	3.33	1.76, 6.32*	3.14	1.68, 5.86*
USA born (ref: yes)										
No	1.20	0.84, 1.71	1.05	0.71, 1.53	1.23	0.86, 1.75	1.42	0.99, 2.02	1.15	0.81, 1.63
Educational attainment (ref: some college or trade school)										
Completed less than high school	1.15	0.78, 1.69	0.72	0.48, 1.08	1.10	0.75, 1.61	1.26	0.88, 1.82	1.38	0.95, 2.01
High school graduate or GED	1.39	1.00, 1.94	1.31	0.90, 1.90	1.39	0.99, 1.94	1.46	1.06, 2.00*	1.57	1.14, 2.16*
College/postgraduate/professional	0.61	0.44, 0.85*	0.65	0.46, 0.93*	0.64	0.46, 0.88*	0.59	0.42, 0.83*	0.56	0.40, 0.78*
Chronic condition (ref: no conditions)										
One condition	0.82	0.61, 1.09	1.13	0.83, 1.53	0.99	0.74, 1.31	0.91	0.68, 1.21	0.90	0.68, 1.20
More than one condition	1.13	0.78, 1.62	1.74	1.13, 2.66*	1.32	0.92, 1.91	1.06	0.74, 1.51	1.27	0.89, 1.82
Self-reported smoking status (ref: non-smokers)										
Smokers	0.98	0.75, 1.28	1.11	0.83, 1.48	1.15	0.88, 1.50	1.20	0.92, 1.55	1.44	1.11, 1.88*
Type of concerns about participating in the survey (ref: no concerns)										
Few concerns	0.46	0.34, 0.63*	0.52	0.38, 0.72*	0.74	0.54, 1.00	0.66	0.48, 0.91*	0.67	0.50, 0.92*
Some concerns	0.38	0.23, 0.62*	0.36	0.22, 0.59*	0.59	0.36, 0.97*	0.70	0.43, 1.15	0.56	0.34, 0.93*
Serious concerns	0.69	0.29, 1.68	0.36	0.16, 0.83*	0.57	0.25, 1.33	0.75	0.31, 1.80	0.52	0.22, 1.22
Time spent at health center (ref: 31–60 min)										
0–30 min	1.37	0.98, 1.93	1.36	0.93, 2.00	1.42	1.01, 2.01*	1.40	1.00, 1.94	1.48	1.06, 2.07*
1–2 h	1.17	0.87, 1.58	0.99	0.72, 1.36	0.92	0.69, 1.24	1.04	0.78, 1.39	0.90	0.67, 1.21
More than 2 h	0.87	0.37, 2.06	1.54	0.57, 4.15	1.20	0.50, 2.88	1.49	0.65, 3.42	1.44	0.59, 3.50

* $p < 0.05$ ^a Modeled on participation variable: “I would definitely/likely participate” versus “I would maybe participate/definitely not participate”. Adjusted Odds Ratio (AOR) values were generated by the simultaneous entry of covariates into a logistic regression model

explanation for this observation may be that more females than males typically stay at home and are thus more readily available to participate. LAHANES-II data did show that more females (women) were unemployed (results not shown).

There was a positive direction for the association between older age and interest to participate, particularly if participants were offered \$10 cash, a coupon for product/travel, or a small item incentive. This finding is also in line with results from other studies [37, 38].

Table 5 Participant likelihood of participating in a similar survey as the LAHANES-II by incentive type and categorical definitions of the participation variable, Los Angeles County Health and Nutrition Examination Survey-Phase II (LAHANES-II), February–April 2012

	Type of incentive														
	\$10 cash			\$25 cash			Coupon for product/travel			Small Incentive (granola/shirt/pen)			Lottery ticket for prizes		
Model ^a	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
Gender (ref: male)															
Female	+	+	+	+	+	+	+	+		+	+	+		+	+
Age group (ref: 25-34 years old)															
18–24					+		+	+							
35–44	+	+					+	+							
45–84	+	+		+			+			+	+	+			
Race/ethnicity (ref: White/Non-Hispanic)															
African American/Black	+	+	+	+	+		+	+		+	+	+	+	+	+
Asian/Pacific Islander			+	+							+	+		+	+
Hispanic/Latino	+	+	+	+			+	+		+	+	+	+	+	+
Mixed/Multiethnic	+	+		+			+	+		+	+	+	+	+	+
US born (ref: yes)															
No										+				+	
Educational attainment (ref: some college or trade school)															
Completed less than high school															
High school graduate or GED	+	+		+			+				+		+	+	
College/postgraduate/professional	–	–	–	–	–		–	–		–	–	–	–	–	–
Time spent at health center (ref: 31–60 min)															
0–30 min				+	+			+			+			+	
1–2 h															
More than 2 h															
Chronic condition (ref: no conditions)															
One condition															
More than one condition						+	+								
Self-reported smoking status (ref: non-smokers)															
Smokers														+	+
Concerns about participating in the survey (ref: no concerns)															
Few concerns	–	–		–	–		–	–		–	–	–	–	–	–
Some concerns	–	–	–	–	–		–	–					–	–	
Serious concerns						–	–								

A Model included participation variable: “I would definitely participate” versus “I would likely/maybe participate or definitely not participate,” B Model included participation variable: “I would definitely/likely participate” versus “I would maybe participate, or definitely not participate,” C Model included participation variable: “I would definitely/likely/maybe participate” versus “I would definitely not participate,” + Participants with the characteristics would be more likely to participate in a similar survey as LAHANES-II, – Participants with the characteristics would be less likely to participate in a similar survey as LAHANES-II

^a Variables were simultaneously entered into a logistic regression model

Among younger participants, it appears that only monetary incentives played or could play an important role in their decision to participate. Interestingly, self-identification as White/Non-Hispanic and having higher

educational attainment such as college or a postgraduate degree were both inversely associated with an interest to participate regardless of monetary and non-monetary incentive types. The latter findings differed from the

results of a previous survey [40]; however, LAHANES-II participants, by comparison, were generally lower in educational attainment and socio-economic status and predominantly African American/Black and Hispanic/Latino.

A majority of LAHANES-II participants indicated they were comfortable and had no or few concerns about their involvement. Perhaps not surprisingly, participants who did have concerns were less likely to report that they would participate, regardless of incentive types.

Lastly, participants with > 2 chronic conditions were more likely to report an interest to participate in similar surveys that offer a \$25 incentive as opposed to none. This observation may be due to participants' vested interest in the subject matter of the health survey [41].

LAHANES-II may contain project limitations that should be mentioned. For example, a majority of the database was collected via self-report. As such, social response bias could have occurred, even unconsciously, to provide more "desirable" or socially acceptable answers to the questions (e.g., number of chronic conditions, reasons for participation, or amount of incentive necessary for participation), which could have had an impact on the outcomes of interest. The design of the survey was cross-sectional; therefore, the data could not be used to explain causality or temporality. Additionally, participants were asked about their hypothetical behavior and preferences that may not accurately reflect their intentions in the future. Finally, persons that chose to participate in the survey may have different responses than those that were eligible and refused to participate. Several socio-demographics of the sample differed from those observed in the general population of Los Angeles County. This is evident in the comparisons to the population-based LACHS (Table 2). However, the demographics of the LAHANES-II sample were largely similar to other clinic-based surveys completed at these health center (data collection) sites. It should be noted that these listed limitations are not unique to this survey and are present in many other self-reported, cross-sectional surveys.

The results of the present study are not intended to suggest a variable incentive structure for different participants due to ethical considerations. Rather, this study aimed to explore what types or amounts of incentive are acceptable to potential participants and what could be used to recruit and enroll participants more efficiently and effectively. Lastly, while incentives are a crucial component in the implementation of health-related

surveys, there are other factors that may assist in increasing response rates including letters, phone calls, advertisement, or the use of social media. Use of these methods, and particularly, the use of social media, could be a subject for future research.

Conclusions

This study highlights that both monetary incentives and non-monetary considerations are important factors in the recruitment of participants in health-related, cross-sectional surveys. Although self-reported, many of these factors are vital in achieving a high response rate and should be considered when designing and planning health surveys for low-income, underserved communities across the United States.

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