THE USE OF MONETARY INCENTIVES IN NATIONAL ASSESSMENT HOUSEHOLD SURVEYS

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BACKGROUND

The National Assessment of Educational Progress survey of young adults employs a rather unique monetary incentive procedure to increase the overall response rate and to decrease the cost of data collection. The procedure was adopted as a result of a special quality check study conducted after obtaining poor results in the first year of the assessment program [1].

Monetary incentives or other respondent remunerations are not extensively employed in survey practice, particularly in the case of studies under government sponsorship. Their greatest potential appears to be in surveys that place unusual demands upon the respondent or require continued cooperation over extended periods of time.

Pearl [2] suggests experimental testing of alternative incentive procedures as part of the development of methodology for maintaining cooperation in consumer expenditure surveys.

In a recent paper, Ferber and Sudman [3] review a number of observational and experimental studies which utilized monetary incentives or gifts to respondents. Their review shows that beneficial, neutral, and detrimental results have been reported in different instances. Factors they recognize as affecting the potential success of incentives include the amount of compensation; the required period of cooperation (e.g., single interview, record keeping, or panel participation); the auspices under which the survey is conducted; the socioeconomic status of the respondents; and the nature of the information sought. They conclude that there does not appear to be a need for compensation in one time interviews, but that there is a rationale for using monetary incentives to maintain cooperation in record keeping or panel studies.

In another recent paper, Cannell and Henson [4] consider the effects of incentives on the accuracy of the data obtained as well as on the level of cooperation. They recognize the determination of an appropriate payment as a research effort in itself, since overpayment may in fact have negative effects.

One of the most favorable effects of remuneration was experience in the 1971 Health and Nutrition Examination Survey (HANES) as reported by Miller, Kennedy, and Bryant [5]. In this study, persons age 25-74 were asked to submit to a physical examination. In a designed experimental study, a $10 incentive plan produced a response rate of .82 compared with .70 in the no incentive control group. As a result, the procedure was adopted for subsequent stands in the survey.

The National Assessment experience tends to parallel that of the HANES study. An experimental test of alternative incentive procedures was employed after obtaining poor results in an initial survey. As a result, an incentive plan has been adopted and employed in all subsequent surveys. This paper reports on the initial experimental study and on results obtained since that time.

THE YEAR 01 SURVEY

A national household sample survey was conducted in the summer of 1969 to obtain benchmark estimates of the level of knowledge of young adults in the areas of citizenship, science, and writing. Young adults between the ages of 26 and 35 were asked to respond to a selected set of National Assessment Exercises. Ten different packages or forms were used. Each eligible individual located by a household screening process was asked to respond to only one of these packages (one hour or less of the respondent's time was required to complete one package); therefore, 10 respondents were required to complete the entire set of 10 packages.

The essential features of the Year 01 survey and of subsequent household surveys of young adults are shown in table 1. More detailed descriptions of the sample and survey designs are given in sources listed in the reference list [6-8].

The Year 01 sampling plan is summarized in table 2. The sample was selected in stages. The first stage or primary sample consisted of 208 primary sampling units (PSUs). Fifty-two PSUs were selected in each of the 4 regions-- Northeast, Southeast, Central, and West. Further stratification within regions was based on type of community and income level. Low-income areas were oversampled to attempt to achieve a NAEP objective of effectively measuring the low socioeconomic status (SES) population. The PSUs used for the Year 01 household survey of young adults were also used as the primary sample for the selection of 9-year-olds, 13-year-olds, and 17-year-olds enrolled in school; the secondary sampling frames for the 3 in-school age classes were constructed from school lists.

The second stage or secondary sample consisted of clusters of housing units (or households) which were screened for eligible young adults. Oversampling of low-income areas within the PSU was again employed to attempt to increase the sample size for the low SES population. All eligible young adults identified in the screening process were asked to complete a single package of exercises requiring less than an hour of their time.

The response to the Year 01 young adult survey was extremely disappointing. As shown in tables 3 and 4, 77.4 percent of the occupied housing units were successfully screened for young adults, and 57.4 percent of the eligible young adults agreed to participate by completing a package of exercises. The overall response rate, considering both household screening and package completion, was 44.4 percent.

A number of factors were believed to be responsible for the poor Year 01 response. The staff conducting the field work had been employed primarily for use in the school assessment, and

TABLE 1 - OVERVIEW OF THE NATIONAL ASSESSMENT YOUNG ADULT SAMPLE SURVEYS

Item	Year 01	Year 02	Year 03	Year 04	Year 05
Subject areas assessed	Citizenship Science Writing	Literature Reading	Music Social Studies	Mathematics Science	Writing, COD (Career and Occupational Development)
Age eligibility based on data of birth	July 1933– June 1943	April 1935– March 1945	April 1936– March 1946	January 1937– December 1946	January 1938– December 1974
Data collection period Dates: Length (approximate)	June–August 1969 3 months	February– August 1971 7 months	January– June 1972 6 months	October 1972– May 1973 8 months	April– August 1974 5 months
Data collection instruments; Background questionnaire (BQ) Number of packages	Attached to each package 10	Short separate questionnaire 6	Short separate questionnaire 8	Short separate questionnaire 8	Expanded separate questionnaire 3
Use of stimulus tapes	None	Nonpaced for Literature	Nonpaced	Nonpaced	Nonpaced
Concurrent assessment of out-of-school 17-year-olds	Yes	Yes	Yes	Yes	No
Incentive offered to adult respondents.	None. Each respondent responded to one package only.	None for 1 pkg. $10 for 2 pkgs. $15 for 3 pkgs. $20 for 4 pkgs.	None for 1 pkg. $10 for 2 pkgs. $15 for 3 pkgs. $20 for 4 pkgs.	$5 for 1 pkg. $10 for 2 pkgs. $15 for 3 pkgs. $20 for 4 pkgs.	$10 for BQ and 1 pkg., $15 for BQ and 2 pkgs. $20 for BQ and 3 pkgs.
Distinct primary sampling unit areas	171	47	94	94	100
Number of area segments	2,087	520	936	1,059	970
Field staff: Regional supervisors Field supervisors Interviewers	4 27 624 (approx.)	– 5 57	2 12 110	2 11 113	2 10 120
Interviewer training	3 days	3 days	5 days	4 days	4 days

Source: Taken in part from Vern Acherman, Operations Documentation Report: Adult Assessment (Years 01-04), National Assessment of Educational Progress, March 1974.

most had no experience in household interviewing. The period allotted for completion of the survey was too short to allow for establishment of good control procedures with adequate time for corrective action. The magnitude of the household screening operation made it difficult to manage effectively over a short period of time. The nature of the assessment exercise packages may have had an adverse effect on voluntary cooperation. As a result of this poor response experience, plans were developed to conduct a quality check study. Specific objectives of the study were:

TABLE 2 - YEAR 01 PLANNED SAMPLE COUNTS

Item	Per area segment	Per PSU	Entire sample
Primary sampling units	—	1	280
Area segments	1	10	2,080
Housing units	33	330	69,000
Persons screened	108.7	1,087	226,096
Eligible adults (26–35)	12.5	125	26,000
Responding adults (approximate 80% response rate)	10	100	20,800

TABLE 3 - YEAR 01 HOUSEHOLD SCREENING EXPERIENCE

Item	Number	Percent of occupied housing units
Sample housing units listed	64,506	
Less Vacant	3,602	
Usual residence elsewhere	864	
Other unoccupied	775	
Occupied housing units	59,265	100.0
Not at home after 4 calls	4,667	7.9
Temporarily away	1,255	2.1
Refusal	5,478	9.2
Illness	124	0.2
No reliable respondent	184	0.3
No English spoken	357	0.6
Incomplete or missing questionnaire	460	0.8
Refused access by ordinance, apartment manager, etc.	700	1.2
Other	191	0.3
Respondents	45,849	77.4

TABLE 4 - YEAR 01 PACKAGE ADMINISTRATION EXPERIENCE

Item	Number	Percent of eligible young adults
Total eligible by age definition	14,676	
Less		
Physically or mentally handicapped	98	
English not understood	203	
Eligible young adults	14,375	100.0
Temporarily away	431	3.0
Refusal	3,834	26.7
Appointment not kept	1,001	7.0
Misclassified by interviewer	295	2.1
Unresolved	393	2.7
Other	164	1.1
Respondents	8,257	57.4

(1) To determine the extent to which coverage might have been improved through the use of better field staff and better methods;

(2) To determine the effect of monetary incentives on participation by eligible respondents;

(3) To determine the magnitude of the bias in estimates derived from the initial survey data;

(4) To collect the data needed to compute estimates adjusted for any bias due to nonresponse.

SAMPLE DESIGN

Since this study had mixed objectives, a sample design adaptive to these several objectives was required.

An implicit assumption was made that improved procedures could only improve response; as a result, it was decided to meet objective 1 by conducting the study in a subsample of the same area segments that were used in the initial study. Persons who had participated in this initial study were identified and not asked to take any additional exercise packages. The field evaluation was therefore aimed at the non-respondent portion of the population from the initial study. This approach also served to meet objectives 3 and 4 most effectively. The experimental part of the study involving the effects of alternative monetary incentive procedures under this plan was also applied only to persons who had not participated (voluntarily for no monetary incentive) in the initial study. It was assumed that a monetary incentive would have no adverse effect upon the cooperation of those persons who had cooperated previously without the incentive.

A probability subsample of the area segments used in the initial study was selected to allow the development of bias adjustment procedures, if necessary (objective 4), which would be applicable to all area segments in the initial sample.

The sampling frame for the quality check study consisted of the PSUs and the area segments (secondary sampling units) which were included in the initial household survey PSUs.

The quality check sample was drawn in two stages. The first stage units were PSUs from the initial study or clusters of these PSUs within a compact area. Second stage units were the area segments in the initial study. In most cases, a sample of 4 segments was selected in each sampled cluster of PSUs for the incentives experiment.

The metropolitan areas of New York-Newark, Philadelphia, Chicago, Los Angeles-Long Beach, and San Francisco were treated somewhat differently than the remaining clusters. The PSUs selected from each of these areas were considered as a single cluster and included in the quality check sample with probability one; first-stage units selected in this are said to be self-representing. The number of quality check segments selected from each area was not restricted to 4, but to a multiple of 4, depending upon the size of the area. These areas coincide with some of the worst experiences in obtaining response in the initial household survey.

The remaining areas in the sampling frame were first stratified by region into 4 regions: (1) Northeast; (2) Southeast; (3) Central; and (4) West. Within each region further stratification was carried out based on type of community (TOC) strata used in the initial sample of PSUs. These TOC strata are:

(1) Central cities with a 1960 population of 180,000 or more;

(2) The remainder of the Standard Metropolitan Statistical Area (SMSA) for each of the TOC 1 cities;

(3) Remaining metropolitan counties belonging to an SMSA and counties with a city of 25,000 or more;

(4) All areas not included in TOC 1, 2, and 3.

These strata were collapsed into 2 new strata consisting of a combined TOC 1 and TOC 2 stratum and a combined TOC 3 and TOC 4 stratum within each region.

The allocation of the quality check sample to these strata is shown in table 5. The overall segment sampling rate is shown in the last column. This rate was computed as the ratio of quality check segments to total segments available in the sampling frame (10 times the number of PSUs).

Thirteen clusters or areas were drawn, one from each of the strata shown in table 5. The sample areas were selected with probability proportional to estimated size. The size estimate used was an approximation of the number of potential nonrespondents in each cluster based on an expectation of 100 adults per PSU less some preliminary tabulations of packages administered.

Within each sample area, 4 segments were selected for the quality check study. (Two exceptions to this rule are area 1, New York City-Newark, and area 2, Los Angeles County, which had 8 and 12 quality check segments,

TABLE 5 - ALLOCATION OF QUALITY CHECK SAMPLE
TO THE ORIGINAL SAMPLE STRATA

Description	Sampling Frame		QC Sample		
	No. of PSUs	No. of clust.	No. of clust.	No. of segment QC segs.	Overall sampling rate
Self-representing areas					
NYC–Newark	11	1	1	8	.075
Philadelphia	5	1	1	4	.080
Chicago	5	1	1	4	.080
San Francisco	8	1	1	4	.050
Los Angeles	12	1	1	12	.100
Subtotal	41	5	5	32	.078
Remainder					
Region TOC					
NE 1 & 2	15	8	1	4	.027
3 & 4	21	17	1	4	.019
SE 1 & 2	14	7	1	4	.029
3 & 4	38	34	1	4	.010
Central 1 & 2	19	12	1	4	.021
3 & 4	28	25	1	4	.014
West 1 & 2	11	7	1	4	.036
3 & 4	21	21	1	4	.019
Subtotal	167	131	8	32	.019
Total	208	136	13	64	.031

respectively.) Additional data on the number of eligible respondents by segment and the number of adult packages administered by segment were examined for the sample areas. An estimated number of potential additional respondents was computed for each segment by adding those who refused to take a package and an estimate of eligible adults in the housing units not screened. Stratification of the segments within an area was then carried out by classifying the segments into the following six strata:

(1) The 10 percent of the segments having the largest number of potential additional respondents per segment.

(2) The next 20 percent;

(3) The next 30 percent;

(4) The remaining segments that had at least one potential respondent or one housing unit which had not been screened;

(5) Segments with zero potential additional respondents;

(6) Segments not received or lacking screening questionnaires as of the date of selecting the sample.

One segment from each of the first four strata (2 per stratum in area 1 and 3 per stratum in area 5) was selected at random for the quality check sample. An additional segment was selected from the fifth stratum in each cluster. Field procedures for these "zero" segments were limited to a check of the listing and a check of the screening in a subsample of those "zero" segments which contained some housing units.

The few segments in stratum 6 were omitted from the study completely. Table 6 shows the stratum size in number of segments by area.

The range of estimated potential additional respondents for the first 4 strata is given in the right half of table 6. A pre-survey estimate of the potential additional respondents for the quality check study is given in the bottom line of table 6 by secondary stratum. The total over the 4 strata is 596 potential additional respondents.

EXPERIMENTAL DESIGN

The purpose of the experimental part of the quality check study was to test 4 different monetary incentive procedures in conjunction with first-quality field procedures. The 4 procedures were:

(A) No monetary incentive;

(B) Five dollar incentive to take a package;

(C) Ten dollar incentive to take a package;

(D) A variable incentive procedure.

The variable incentive procedure assumed a different tradeoff between time and money for different persons. Adult respondents were asked to take one package for no reimbursement, 2 packages for 10 dollars, 3 packages for fifteen dollars or 4 packages for twenty dollars.

If an 80% response could not be obtained using procedure A with 4 callbacks, 2 additional callbacks along with a monetary incentive were used to bring the response rate up as high as possible. For purposes of determining the effectiveness of procedure A, the response rates were calculated on the basis of packages and interviews completed prior to offering the incentive.

All 4 procedures were assigned in each area or cluster. To balance the administration of different incentive procedures across the secondary strata, the procedures were assigned to the quality check segments by random selection of 4 x 4 Latin Square experimental designs. The particular assignments made are shown in table 7.

Since not all 10 packages could be administered in every segment, different package start numbers were assigned to each of the segments within an area. The random assignment scheme used produced an approximate balance in the number of different packages administered within area, within Latin Square, and within the entire sample.

FIELD PROCEDURES

A number of intensive field interviewing procedures were employed or attempted for this study in addition to the use of monetary incentives to obtain cooperation from eligible adults.

Newspaper releases were prepared for local newspapers and for distribution by the interviewers. Although newspapers did not publish the releases, they were used effectively by the interviewers. Police departments and Better Business Bureaus were advised of the study.

Only experienced, highly qualified interviewers were used. A total of 27 interviewers, 26 females and 1 male, were recruited. A male escort was also used in one inner city area. Interviewers were trained and closely supervised by 6 team leaders. The team

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TABLE 6 – SECONDARY STRATIFICATION BY AREA

Area	Sample* segments per stratum	Number of segments per stratum						Range of potential additional respondents per segment**			
		1	2	3	4	5	6	1	2	3	4
1	2	10	20	30	31	7	2	19-26	14-19	6-14	0.4-6
2	1	5	10	15	18	2	0	18-55	10-18	6-10	0.4-5
3	1	5	10	14	15	6	0	15-20	8-13	5-8	0.4-5
4	1	8	16	24	27	1	4	19-32	13-19	6-12	0.4-6
5	3	10	20	30	34	4	2	17-33	10-17	6-10	0.4-6
6	1	3	6	9	11	0	1	16-25	9-15	6-8	1-5
7	1	1	2	3	3	1	0	10	7-8	4-5	2-4
8	1	2	4	6	7	1	0	10-12	5-10	3-5	0.4-2
9	1	1	2	3	3	1	0	7	6-7	4-6	0.4-3
10	1	2	4	6	7	1	0	20-29	9-17	6-9	1-6
11	1	1	2	2	3	2	0	6	2-3	1-2	0.4-1
12	1	2	4	6	6	2	0	6-22	5-6	1-5	0.4-1
13	1	1	2	3	4	0	0	5	3-4	1-2	0.4-1
Total———————————————————	51	102	151	169	28	9					
Midrange of potential additional respondents—————————————————							297	158	102	39	

*Applies to first 4 strata.
**The corresponding value for stratum 5 is always 0. No information was available for stratum 6.

leaders were either central staff or senior field supervisory personnel.

The listings of housing units in sample segments were checked for completeness and proper designation of sampling housing units. Housing units omitted in the initial listings were added and special procedures were applied to determine if these housing units were to be included in the sample.

The household screening questionnaire was used to obtain a roster of all household members. Eligible adults were then identified according to birth date. Up to four calls were made to contact households for household screening. Neighbors were contacted after the first call to determine, if possible, the best time for a followup call. If neighbors, did not specify a time, the second call was made between 6:30 and 9:00 p.m.; a letter of explanation indicating that further efforts would be made to contact household members was left under the door. If no household member could be contacted after four calls, a neighbor questionnaire was completed if possible.

All refusals at the household screening level were referred to the team leaders for possible followup. Table 8 shows that almost a third of the initial refusals were converted

TABLE 7 – ASSIGNMENTS OF INCENTIVE PROCEDURES TO QUALITY CHECK SEGMENTS

Latin square number	Area	Secondary Stratification							
		Stratum 1		Stratum 2		Stratum 3		Stratum 4	
		Sample number	Incentive* procedures	Sample number	Incentive procedure	Sample number	Incentive procedure	Sample number	Incentive procedure
1	1	111	C	121	B	131	A	141	D
	1	112	A	122	D	132	C	142	B
	2	211	B	221	C	231	D	241	A
	3	311	D	321	A	331	B	341	C
2	4	411	D	421	B	431	A	441	C
	5	511	B	521	D	531	C	541	A
	5	512	A	522	C	532	B	542	D
	5	513	C	523	A	533	D	543	B
3	6	611	B	621	D	631	C	641	A
	7	711	A	721	C	731	D	741	B
	8	811	C	821	B	831	A	841	D
	9	911	D	921	A	931	B	941	C
4	10	1011	A	1021	C	1031	D	1041	B
	11	1111	B	1121	D	1131	C	1141	A
	12	1211	D	1221	A	1231	B	1241	C
	13	1311	C	1321	B	1331	A	1341	D

*Incentive procedures are indicated as: A–No incentive; B–$5 to complete a single package; C–10 to complete a single package; and D–The variable incentive procedure which offers no incentive for 1 package, $10 for 2 packages, $15 for 3 packages, and $20 for 4 packages.

TABLE 8 - FOLLOWUP PROCEDURES FOR HOUSEHOLD SCREENING REFUSALS

Procedure	Times attempted	Times successful	Percent successful
Telephone follow-up by team leader	5	0	0
Personal follow-up by second interviewer	21	9	42.9
Personal follow-up by team leader	35	10	28.6
Total*	61	19	31.1
Total personal followup only	56	19	33.9

*Refusals initially occurred in 64 households; due to timing or other circumstances, not all of these were followed up.

TABLE 9 - FOLLOWUP PROCEDURES FOR PACKAGE REFUSALS

Procedure	Times attempted	Times successful	Percent successful
Telephone followup by team leader	21	0	0
Personal follow-up by second interviewer	43	8	18.6
Personal follow-up by team leader	44	6	13.6
Total*	108	14	13.0
Total personal followup only	87	14	16.1

*Refusals initially occurred in 111 cases.

to respondents as a result of these followup procedures.

If monetary incentives were assigned to a segment, the interviewer was instructed to make the following statement as part of the introduction to the screening questionnaire:

"Anyone in your home who is eligible to participate in this study will be paid for his time."

A list of respondents from the initial study was provided to each interviewer and after verification with the respondent, those who had previously participated were not eligible to participate in the quality check study.

If package administration with the eligible young adults could not be completed during the screening interviews, an appointment was made for a return visit. Interviewers were instructed to make up to three calls to complete package administration. Team leaders were informed of all refusals at the package administration level. Table 9 shows the action taken and the results achieved. As in the case of the screening followup procedures, telephone procedures were not effective. Of 87 initial refusals contacted personally by a different interviewer or a team leader, 14 were converted.

Since the study was designed to evaluate bias in the estimates as well as the relative effectiveness of alternate monetary incentive procedures, it was necessary to obtain high response in all areas including the no incentive segments. To accommodate these two study requirements, the no incentive segments were first treated according to the experimental design. All response information was recorded at that point and if the overall response (screening rate time package completion rate) was less than 80 percent, further attempts were to be made to achieve, at least, an 80 percent response. These further attempts were to employ the $10 per package incentive (monetary incentive procedure C). Table 10 shows that in these particular areas, over half of the refusals were converted by the use of the monetary incentive.

EXPERIMENTAL COMPARISONS

The results of the experimental study are shown in tables 11 through 14. Data from one sampling unit was not useable because the interviewer inadvertently applied the wrong incentive procedure. The data for incentive procedure A, (no incentive) excludes responses obtained after invoking incentive procedure C to obtain response rates of at least 80 percent.

Table 15 shows the response rates achieved using each of the 4 incentive procedures. To determine the significance of any observed differences in response rates among the 4 incentive plans, a linear model was fitted to the segment data. The model adjusted for area (13 areas in the sample) and for the secondary strata. Three dependent variables were analyzed:

(1) The ratio of initial survey respondents plus quality check survey respondents to quality check eligibles plus initial survey respondents;

(2) The ratio of quality check eligibles plus initial survey respondents to housing units screened;

(3) The ratio of housing units screened to total occupied housing units.

The variability of each of the dependent variables can be expected to depend upon the value of the denominator of the ratio. For the purposes of fitting the model, the variances were assumed to be inversely proportional to the denominators of the dependent variable ratios.

Three contrasts were considered to be of special interest and were estimated for each of the dependent variables. These three contrasts were:

(1) Incentive versus no incentive $[(B+C+D)/3 - A]$;

(2) Variable incentive versus fixed incentives $[D - (B+C)/2]$;

(3) $10 incentive versus $5 incentive.

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TABLE 10 – EFFECTS OF FOLLOWUP WITH INCENTIVE IN NO INCENTIVE SEGMENTS

Sampling unit number	Screening Initial refusals	Screening Successful followup	Pkg. Admin. Initial refusals	Pkg. Admin. Successful followups
321	0	0	1	1
541	0	0	2	1
921	3	1	10	5
1011	1	0	9	3
1221	3	0	5	2
1331	6	6	7	5
Total	13	7	34	17

It appears appropriate to test the hypothesis that each of these contrasts is zero against the one-sided alternative that it is greater than zero. Table 16 shows the estimated values of these contrasts and the value of the t-statistic for each contrast. Only the contrast which compared package response rates for the incentive procedures and the no incentive plan was shown to be statistically significant.

COST COMPARISONS

In light of the small differences in response rates observed among the the 3 incentive plans, one basis for selecting a plan for future surveys was the cost per unit of data obtained. Cost comparisons at the time of the study clearly favored plan D.

An updated variable field cost model based on subsequent experience with plan D is shown in table 17. This model reflects Year 03

TABLE 11 – STUDY RESULTS FOR PROCEDURE A

Sampling unit number	Occupied HUs Sample	Occupied HUs Screened*	Elig. adults Total**	Elig. adults Respdnts	Initial survey respdnts
112	(Data not useable)				
131	37	32	22	11	3
241	21	20	8	8	0
321	41	36	4	3	4
431	38	37	12	7	14
512	44	36	9	8	0
523	37	34	21	21	1
541	14	14	6	4	0
641	35	33	8	2	3
711	59	54	10	10	1
831	32	32	6	4	1
921	39	36	17	7	4
1011	46	45	15	6	4
1141	19	19	0	0	2
1221	28	22	7	2	7
1331	21	15	9	2	2
Total	511	465	154	95	46

*Excludes 7 additional housing units screening using incentive procedure C and shown in table 10.

**Includes eligible respondents identified in 7 additional housing units shown in table 10.

TABLE 12 – STUDY RESULTS FOR PROCEDURE B

Sampling unit number	Occupied HUs Sample	Occupied HUs Screened	Elig. adults Total	Elig. adults Respdnts	Initial survey respdnts
121	47	36	10	6	2
142	20	11	9	5	1
211	56	53	22	20	7
331	28	25	2	1	2
421	53	51	21	18	3
511	41	31	19	7	1
532	27	22	9	6	1
543	23	23	4	1	0
611	23	23	16	12	1
741	36	34	12	12	0
821	25	25	15	14	10
931	40	38	5	5	1
1041	14	13	3	2	2
1111	40	38	7	6	5
1231	26	24	3	3	3
1321	30	30	4	1	14
Total	529	477	161	119	53

response experience and current costs. The cost per package and cost per respondent based on the table 17 model are shown in table 18. The cost per package for plan D is less than half that obtained for any of the other plans. Cost per respondent is, of course, highest for plan D.

ADDITIONAL EXPERIENCE

Plan D was adopted in the surveys conducted in Years 02 through 05. The package response experience for Years 01 through 04 are shown in table 19. The Year 05 experience has not yet been tabulated.

TABLE 13 – STUDY RESULTS FOR PROCEDURE C

Sampling unit number	Occupied HUs Sample	Occupied HUs Screened	Elig. adults Total	Elig. adults Respdnts	Initial survey respdnts
111	65	49	19	14	1
132	21	21	10	4	0
221	27	25	9	6	5
341	19	18	5	4	5
441	14	14	4	4	1
513	34	23	4	4	0
522	31	29	8	6	8
531	20	19	9	5	0
631	47	44	13	10	4
721	56	50	6	6	5
811	48	45	13	12	12
941	20	19	3	2	4
1021	31	26	7	6	4
1131	20	17	3	3	4
1241	32	31	2	1	1
1311	70	68	6	6	16
Total	555	498	121	93	70

TABLE 14 - STUDY RESULTS FOR PROCEDURE D

Sampling unit number	Quality check survey				Initial survey respdnts
	Occupied HUs		Elig. adults		
	Sample	Screened	Total	Respdnts	
122	44	35	24	18	4
141	21	18	3	2	2
231	34	32	2	1	1
311	58	45	12	9	10
411	56	49	16	10	2
521	49	49	3	3	3
533	50	47	18	15	6
542	20	20	1	0	1
621	24	22	18	18	0
731	44	43	3	3	0
841	8	8	1	1	5
911	44	44	8	4	12
1031	26	25	7	5	4
1121	19	19	3	3	4
1211	17	17	6	3	2
1341	29	29	1	0	4
Total	543	502	126	95	60

TABLE 15 - INCENTIVE PROCEDURE COMPARISONS

Incentive procedure	Percent HUs screened	Percent completing packages	
		Quality check eligibles only	Including initial survey respdnts*
A	91.0	61.7	70.5
B	90.2	73.9	80.4
C	89.7	76.8	85.3
D	92.4	75.4	83.3

*Initial survey respondents are added to both the numerator and denominator used in computing package completion rates for the quality check survey.

TABLE 16 - EXPERIMENTAL COMPARISONS

Estimated contrasts	Value	t-statistics
Respondents/eligibles		
(B+C+D)/3 - A	.1034	2.097*
D - (B+C)/2	.0467	0.869
C - B	.0749	1.281
Eligibles/HUs screened		
(B+C+D)/3 - A	-.0397	-0.660
D - (B+C)/2	-.0271	-0.433
C - B	-.0780	-1.065
HUs screened/OHUs		
(B+C+D)/3 - A	.0059	0.251
D - (B+C)/2	.0290	1.187
C - B	.0021	0.073

TABLE 17 - COST MODEL FOR SCREENING
AND PACKAGE ADMINISTRATION*

Paramater	Assumed value
Calls required to complete screening at 99.7 percent of occupied housing units (OHUs)	1.809
Eligible young adults per OHU	.338
Calls per eligible in addition to screening calls to obtain cooperation and administer at least one package	.920
Additional calls per respondent taking 2 or more packages (Plan D only)	.118
Response rate	R
Proportion of respondents willing to complete	
1 package	.019
2 packages	.022
3 packages	.007
4 packages	.952
Average packages administered per respondent (Plan D)	3.892
Average incentive cost per package (Plan D)	$4.91
Other unit costs:	
Package administration (1 hour)	$3.50
Cost per call (.571 hours + 8.57 miles)	$3.11

*Based in part on NAEP Year 03 experience.

As shown in table 19, the response rates obtained in the experimental study compare favorably with results obtained for plan D in the full scale surveys.

A large majority of respondents have chosen to take all 4 packages. In Year 04, the policy for incentive payment was modified to include a $5 incentive for one package. As a result, the number of respondents opting to take only one package increased. A small increase in the percent agreeing to take any package at all was also experienced.

TABLE 18 - HYPOTHETICAL COST PER PACKAGE
BY INCENTIVE PLAN

Plan	Assumed response rate (R)	Cost per package	Cost per respondent
A	.70	$31.16	$31.16
B	.80	$32.69	$32.69
C	.80	$37.69	$37.69
D	.80	$14.72	$57.29

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TABLE 19 - ADDITIONAL PACKAGE RESPONSE EXPERIENCE

	Year 01 Number	Year 01 Percent of total	Year 02 Number	Year 02 Percent of total	Year 03 Number	Year 03 Percent of total	Year 04 Number	Year 04 Percent of total
Refusals	3,834	26.7	517	20.0	892	15.4	733	14.7
Other/not at home	2,28	15.9	125	4.8	68	1.2	57	1.1
Respondents:	8,257	57.4	1,938	75.2	4,822	83.4	4,211	84.2
1 package	8,257	57.4	40	1.6	93	1.6	168	3.4
2 packages	—	—	72	2.8	108	1.9	96	1.9
3 packages	—	—	58	2.3	33	.6	36	.7
4 packages	—	—	1,768	68.5	4,588	79.3	3,911	78.2
Total eligible	14,375	100.0	2,580	100.0	5,782	100.0	5,001	100.0
Total packages	8,257	—	7,072	—	18,760	—	16,112	—
Packages/eligible	.57	—	2.74	—	3.24	—	3.22	—
Packages per respondent	1.00	—	3.65	—	3.89	—	3.83	—

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