SURVEY ATTRITION IN A SUPPLEMENT
TO THE 2000 MEDICAL EXPENDITURE PANEL SURVEY (MEPS)

Janet C. Greenblatt, AHRQ, 2101 E. Jefferson Street Suite 500W, Rockville, MD 20852

Key Words: MEPS, NHIS, nonresponse, survey attrition, weight adjustment

1. Introduction

The MEPS Household Component (HC) is an ongoing annual panel survey, with each sample panel collecting data over a 30-month period to obtain information that covers two consecutive calendar years. MEPS collects data on the specific health services that Americans use, how frequently they use them, the cost of these services, and how they are paid for. MEPS also collects data on the cost, scope, and breadth of private health insurance held by and available to the U.S. population. MEPS provides a link between medical expenditures and health insurance data to survey respondents' demographic, employment, economic, health status, utilization of health services, and other characteristics. MEPS also provides a foundation for estimating the impact of changes in sources of payment and insurance coverage on different economic groups and special populations of interest, such as the poor, elderly, families, veterans, the uninsured, and racial and ethnic minorities. The design of the MEPS survey permits both person based and family level estimates. A self-administered questionnaire was given to respondents to the 2000 MEPS HC to provide national measures of health care quality and patient satisfaction.

2. The 2000 MEPS HC Sample Design

The MEPS HC sample design (1) is a stratified multistage area probability design with disproportionate sampling to facilitate the selection of oversamples of populations of interest.   The set of households selected for the 2000 MEPS is a subsample of those participating in the 1999 National Health Interview Survey (NHIS). NHIS is an ongoing annual household survey of approximately 42,000 households (109,000 individuals). In addition to the cost savings achieved by eliminating the need to list and screen households independently, selecting a subsample of NHIS participants for the MEPS has resulted in survey data that can be linked to the NHIS to provide a longitudinal data set spanning 3 years. For the 2000 MEPS 12,232 households were fielded (2). The overall MEPS response rate for a full year, including responses to both the NHIS interview and the MEPS interviews, was 65.5 percent.   All interviews are conducted in person, using a computer-assisted personal interview (CAPI) as the principal data collection mode.

3. Enhancements to the 2000 MEPS

The Department of Health and Human Services (DHHS) and AHRQ recognized the need for national measures of health care quality that would serve to highlight the evolution of the American health care sector, monitor progress towards improved health care quality. It could also provide a measurement tool for monitoring quality for priority populations, examining regional variations in quality, and identifying significant gaps in our ability to measure important components of quality. A set of existing quality measures in national health care surveys were identified as the building blocks of the reporting system, in addition to measures not currently collected that are necessary to inform national progress on quality.

The data currently collected from MEPS support quality of health care research directed to the following broad areas: access to care, patient/customer satisfaction, health insurance coverage, health status, health services utilization and expenditures.   For the access to care measures, national estimates of the population with a usual source of care, and by site of care can be derived from the survey in addition to estimates of the percent of families with members experiencing difficulty or delay in obtaining health care, or not receiving need care. The survey also permits the derivation of national estimates of satisfaction with one's usual source of care and continuity of care. The survey produces national estimates of the uninsured, in addition to the sources of coverage for the insured population and their satisfaction with their plans. Furthermore, the health care utilization and expenditure data collected in the survey facilitate analyses of variation in service utilization, medical expenditures and sources of payment for individuals with the same health conditions and health status, both at the national and regional levels.

A Self Administered Questionnaire (SAQ) was included in the MEPS in calendar year 2000. The SAQ questionnaires were mailed to the respondent in advance of the interviewer's visit in October through December of 2000. A SAQ was to be completed by every adult in the household. The respondent was instructed to mail the questionnaire to the coordinating agent. In a small number of cases, the interviewer retrieved the SAQ questionnaires at the time of the next interview. The respondents were paid five dollars for each completed questionnaire. The overall response rate to the SAQ was 86.7 percent.

Because of time limitations, it was necessary to include in the questionnaires only items that had already been developed, tested, and validated for other surveys.

The contents of the SAQ include:
CAHPS: Patient satisfaction and accountability measures selected from the Consumer Assessment of Health Plans

Survey (CAHPS. CAHPS also includes items measuring domains of health plan performance (getting care you need, getting care without long wait, communication of doctors, doctors spending enough time with their patients, prevention, office staff, customer service, reasonable paperwork, finding a personal doctor, referrals to specialists) (3) .

SF-12 The SF-12 is a 12-item short form consisting of items from the Medical Outcomes Study 36-item Short-Form Health Survey. The SF-12 estimates scale scores for the following health concepts: Physical and social functioning, general and mental health, bodily pain, and vitality (4).

EQ-5D The EQ-5D is an instrument developed to generate a generic cardinal index of health. Questions concern mobility, self-care, problems performing usual activities, pain or discomfort experienced, and anxiety or depression. The EQ-5D also includes a visual analogue scale (resembling a thermometer) that allows the respondent to give a value for their health state (5).

Attitudes These items are a subset of a questionnaire developed for the 1987 National Medical Expenditures Survey (NMES) that measure attitudes toward health care and health insurance that have been used in understanding employee take-up rates.

4. Measures Examined Relating to MEPS SAQ Survey Response Status

Because of the complex design of the MEPS HC, the MEPS sample data must be appropriately weighted to obtain approximately unbiased national estimates for the U.S. civilian noninstitutionalized population. The sampling weights developed for this purpose reflect the disproportionate sampling adopted in NHIS to oversample minority populations. They also reflect adjustments for nonresponse of eligible sample units.

This analysis was conducted to ascertain the characteristics associated with differential nonresponse in the SAQ and identified the most important measures to use in developing a nonresponse adjustment (6, 7). To facilitate these comparisons, the demographic, socioeconomic, health-related, and interview-specific profiles of respondents and nonrespondents were examined, based on available data for both groups taken from the 2000 Point in Time file (HC-22).

The estimated population distributions that characterize the MEPS responding and nonresponding persons are shown in columns 1 and 2 of Table 1, respectively. Overall tests for association between survey response status and socio-economic and demographic profiles were conducted using chi square tests of significance at the alpha = .05 level., using statistical software that adjusted for survey design complexities (8). Ninety-five percent confidence intervals are presented in table 1 and were derived using Taylor series linearization methods to account for survey design complexities. Based

on the results of these analyses, weighting classes were to be specified for the MEPS dwelling unit nonresponse adjustments. They were defined by cross-classifications of the following measures:

- Number of persons in the household (one; two; three or more).
- MSA size (MSA, non- MSA).
- Region (Northeast; Midwest; South; West).
- Employment status (employed, not employed).
- Educational attainment (less than high school, high school graduate, some college, college graduate).
- Age (18-24, 25-44, 45-64, and 65 and older).
- Health status (excellent, very good, good, fair, poor)
- Mental health status (excellent, very good, good, fair, poor).
- Health insurance coverage (yes, no).
- Limitation in social functioning (yes, no).
- Limitation in work/school functioning (yes, no).
- Race/ethnicity (Hispanic; black non-Hispanic, white, non-Hispanic, and Asian).
- Gender (male, female).
- Marital status (married, widowed, divorced, never married).

In order to ascertain the primary factors that differentiate the responding household members from those who did not respond, a weighted logistic regression analysis was also conducted. (8) This analysis allowed for a determination of the factors that retain their significant association, after controlling for the demographic, socio-economic and health-related measures under study.

5. Results

The results of the chi-square analysis are shown in Table 1. The socio-demographic variables that showed a statistically significant difference between responders and non-responders in a chi-square analysis were: region ($p=.0000$), metropolitan statistical area ($p=.0000$), number of persons in the household ($p=.0002$), gender ($p=.0000$), age ($p=.0000$), health status ($p=.0132$), race/ethnicity ($p=.0056$), Hispanicity ($p=.0456$), marital status ($p=.0000$), educational attainment ($p=.0072$), and health insurance coverage ($p=.0001$). Within broad categories, the following results were found:

- People living in the Northeast were more likely than those living in the Midwest or the South to be non-respondents (18.2, 11.7 and 10.5 percent respectively);
- Those living in Metropolitan areas were more likely than those living in non-metropolitan areas to be non-respondents (14.3% and 8.6%);

- Persons living in families with 3 or more persons were more likely to be non-respondents than those living in one-person households (14.6% and 10.3%);
- Those who had never married were more likely to be non-respondents than married persons (16.7% and 12.4%);
- Those age 18-24 were more likely than those age 45-64 and 65 and older to be non-respondents (16.8%, 12.6% and 9.8%, respectively);
- Asians were more likely than Hispanics or white, non-Hispanics to be non-respondents (22.2% and 12.3%);
- Those without health coverage were more likely to be non-respondents than those with health insurance (16.7% and 12.5%);

Logistic regression analysis was conducted using a weighted maximum likelihood estimation method implemented by SUDAAN (8). The multivariate models were applied to estimate relative likelihood or odds ratios for the independent variable, being a non-respondents to the SAQ survey. The socio-demographic variables that showed significant differences in the categorical analysis were entered into the model. After controlling for region, MSA, household size, gender, race/ethnicity, education, insurance coverage , perceived heath and mental health status, and marital status, the factors that retained their significance in distinguishing survey respondents from non-respondents were: region, MSA, gender, race/ethnicity, marital status, education, insurance coverage, and size of household (see Table 2). Specifically, persons most likely to be nonrespondents were:

- Those living in the Northeast compared to those living in the West (OR=1.3).
- Those living in MSAs compared to those not in MSAs (OR=1.5),
- Males as compared to females (OR=1.2),
- Never married as compared to married (OR=1.5)
- Blacks and Asians as compared to whites (OR=1.3)
- Those with some college or less compared to those with a college degree (OR>1.2)
- Those with no insurance coverage compared to those with insurance coverage (OR=1.4)
- Those in households of 2 or more persons compared to households of 1 person (OR>1.6)

6. Conclusions

Based on the analyses described in this report, we were able to determine factors that differentiated respondents from non-respondents. This analysis will inform the non-response adjustments to SAQ that will permit national estimates to be made. The analysis will also inform field efforts to be more vigilant when approaching populations at risk. Further, the stability of these results will be examined with the 2001 SAQ responses.

7. References

1. Cohen SB, DiGaetano R, Goksel H. Estimation procedures in the 1996 Medical Expenditure Panel Survey Household Component. Rockville (MD): Agency for Health Care Policy and Research: 1999. MEPS Methodology Report No. 5. AHCPR Pub. No. 99-002

2. MEPS HC-022: 2000 P4R3/P5/R1 Population Characteristics. Rockville (MD): Agency for Healthcare Research and Quality. AHRQ Clearinghouse Number 01-DP06.

3. CAHPS 2.0 Survey and Reporting Kit. Rockville (MD): Agency for Health Care Policy and Research: 1999. AHCPR Pub. No. 99-0039A.

4. Ware JE, Kosinski M, Keller SD. SF-12: How to Score the SF-12 Physical and Mental Health Summary Scales. Lincoln, RI: QualityMetric Incorporated, Third Edition, 1998.

5. Paul Dolan. *Modeling Valuations for EuroQol Health States.* Medical Care, 1977, 35: 1095-1108.

6. Cohen SB, Machlin SR. *Nonresponse Adjustment Strategy in the Household Component of the 1996 Medical Expenditure Panel Survey.* Journal of Economic and Social Measurement 25 (1998) 15-33.

7. DiGaetano R, Goksel H, Internal Report on Factors Associated with MEPS Round 1 Dwelling Unit Nonresponse, Westat, Inc. 1996.

8. Shah BV, Barnwell BG, Bieler GS (1997). SUDAAN User's Manual, Release 7.5. Research Triangle Park, NC: Research Triangle Institute.

Table 1: Comparison of Demographic, Socio-Economic and Health Specific Profiles of Respondents and Non-Respondents to a Self-Administered Questionnaire (SAQ), 2000 MEPS Household Survey, U.S.

Measure	Percent Distribution (95% CI)		Percent Nonresponse
	Respondents	**Nonrespondents**	**Percent Nonresponse**
Region	*Chi-Square = 25.05 (1df), p=.0000*		
Northeast	18.2 (16.0-20.6)	26.5 (22.1-31.4)	18.2 (15.4-21.3)
Midwest	23.3 (20.9-25.9)	20.3 (17.5-23.5)	11.7 (10.4-13.2)
South	36.6 (32.8-40.6)	28.3 (24.5-32.4)	10.5 (9.2-12.1)
West	21.9 (17.2-27.4	24.9 (19.9-30.6)	14.8 (12.8-16.9)
Metropolitan Status	*Chi-Square = 23.82 (1df), p=.0000*		
MSA	79.8 (76.7-82.6)	87.5 (84.5-90.0)	14.3 (13.2-15.5)
Non-MSA	20.2 (17.4-23.3)	12.5 (10.0-15.5)	8.6 (7.0-10.6)
Persons in Household	*Chi-Square = 18.14 (2df), p=.0002*		
1	19.5 (18.5-20.5)	14.7 (12.7-16.9)	10.3 (9.0-11.8)
2	32.4 (31.2-33.6)	31.3 (28.5-34.2)	12.8 (11.7-14.1)
3 or more	48.1 (46.6-49.5)	54.0 (50.7-57.3)	14.6 (13.2-16.2)
Gender	*Chi-Square = 20.37 (1df), p=.0000*		
Male	47.1 (46.4-47.8)	51.5 (49.8-53.5)	14.3 (13.2-15.5)
Female	52.9 (52.2-53.6)	48.5 (46.8-50.2)	12.3 (11.3-13.3)
Age	*Chi-Square = 33.84 (3df), p= .0000*		
18-24	12.8 (12.0-13.5)	16.9 (14.8-19.1)	16.8 (14.6-19.1)
25-44	40.5 (39.4-41.7)	42.9 (40.5-45.3)	13.9 (12.6-15.3)
45-64	30.1 (29.2-31.0)	28.4 (26.3-30.7)	12.6 (11.3-14.0)
65 and older	16.6 (15.5-17.7)	11.8 (10.3-13.6)	9.8 (8.5-11.2)
Race/Ethnicity	*Chi-Square = 12.98 (3df), p=.0056*		
Hispanic	10.2 (8.6-12.2)	10.9 (9.1-12.9)	13.9 (11.9-16.2)
Black, non-Hispanic	11.1 (9.4-13.2)	14.0 (11.1-17.4)	16.1 (13.3-19.3)
Asian, non-Hispanic	3.2 (2.7-3.8)	6. 0 (4.2-8.5)	22.2 (16.3-29.5)
White/other, non-Hispanic	75.4 (73.2-77.5)	69.2 (65.2-72.8)	12.3 (11.2-13.5)
Education	*Chi-Square = 14.47 (3 df), p=.0072*		
Less than high school grad	20.6 (19.4-21.8)	16.7 (14.8-18.7)	10.9 (9.6-12.3)
High school grad	33.3 (32.2-34.5)	32.7 (30.1-35.3)	12.9 (11.6-14.3)
Some college	38.6 (37.2-40.0)	42.0 (39.3-44.8)	14.1 (12.8-15.6)
College graduate	7.5 (6.8-8.2)	8.6 (6.9-10.7)	14.8 (12.0-18.0)
Hispanicity	*Chi-Square = 0.56 (1df), p=.0456*		
Hispanic	10.4 (8.7-12.3)	11.1 (9.3-13.2)	14.0 (12.0-16.3)
Non-Hispanic	89.6 (87.7-91.3)	88.9 (86.8-90.7)	13.1 (12.1-14.2)
Health insurance	*Chi-Square = 16.03 (1df), p=.0001*		
Yes	83.8 (82.7-84.80	78.7 (76.4-80.9)	12.5 (11.5-13.6)
No	16.2 (15.2-17.30	21.3 (19.1-23.6)	16.7 (14.8-18.70

Table 1: (continued)

Measure	Percent Distribution (95% CI)		Percent Nonresponse
	Respondents	**Nonrespondents**	
Marital Status	*Chi-Square = 51.75 (3df), p=.0000*		
Married	55.8 (54.4-57.2)	52.0 (49.2-54.8)	12.4 (11.3-13.7)
Widowed	7.1 (6.5-7.7)	4.9 (3.9-6.2)	9.6 (7.8-11.7)
Divorced/Separated	12.9 (12.2-13.7)	11.1 (9.4-13.1)	11.6 (10.0-13.5)
Never married	24.2 (23.0-25.4)	31.9 (29.6-34.4)	16.7 (15.2-18.4)
Limitation in Physical Function	*Chi-Square = 2.09 (1df), p=.1503*		
Yes	10.8 (10.1-11.6)	9.4 (7.6-11.6)	11.7 (9.6-14.2)
No	89.2 (88.4-89.9)	90.6 (88.4-92.4)	13.4 (12.4-14.50
Limitation in work/school function	*Chi-Square = 0.25 (1df), p=.6201*		
Yes	7.6 (6.9-8.3)	8.1 (6.4-10.2)	13.9 (11.3-16.9)
No	92.4 (91.7-93.1)	91.9 (89.8-93.6)	13.2 (12.1-14.2)
Employment Status	*Chi-Square = 2.30 (3df), p=.5159*		
Currently employed	67.1 (65.9-68.3)	68.6 (66.1-71.0)	13.4 (12.3-14.5)
Has job to return to	0.5 (0.4-0.6)	0.4 (0.2-0.9)	11.9 (6.0-22.1)
Employed in reference period	2.1 (1.8-2.3)	2.3 (1.7-3.1)	14.2 (10.6-18.7)
Not employed	30.3 (29.2-31.5)	28.7 (26.4-31.1)	12.5 (11.3-13.8)
Health status	*Chi-Square = 11.02 (3df), p=.0132*		
Excellent	28.6 (27.5-29.7)	33.6 (30.1-37.2)	15.2 (13.5-17.0)
Very Good	32.6 (31.6 -33.6)	30.5 (28.2-32.9)	12.5 (11.2-13.8)
Good	26.2 (25.1-27.3)	23.4 (21.0-26.0)	12.0 (10.6-13.5)
Fair/poor	12.6 (12.0-13.3)	12.5 (10.7-14.6)	13.1 (11.5-15.0)
Mental health status	*Chi-Square = 5.67 (3df), p=.1328*		
Excellent	41.4 (39.9-42.8)	44.9 (41.3-48.7)	14.2 (12.9-15.7)
Very Good	31.0 (29.8-32.1)	28.5 (25.9-31.4)	12.3 (10.8-14.0)
Good	22.0 (20.8-23.2)	20.4 (17.8-23.3)	12.4 (10.9-14.0)
Fair/poor	5.7 (5.3-6.2)	6.1 (5.0-7.6)	14.0 (11.6-16.9)

Note: CI= Confidence Interval

Source: Agency for Healthcare Policy and Research, 2000 Medical Expenditure Panel Survey: Household Component (1999 R3, 2000 R1) and Self-administered Questionnaire (1999 R4, 2000 R2)

Table 2: **Results of Logistic Regression showing Odds Ratios for Those with Increased Risk of Being Non-respondents to SAQ Questionnaire, with 95% Lower and Upper Confidence limits**

Variable	Odds Ratio	95% lower and upper limits
Region		
Northeast	1.30	1.00-1.69
Midwest	. 85	0.69-1.04
South	.72	0.58-.090
West	1.00	1.00-1.70
Living in a MSA		
Yes	1.50	1.2-1.9
No	1.00	1.00
Gender		
Males	1.20	1.10-1.30
Females	1.00	1.00
Marital Status		
Married	1.00	1.00
Widowed	1.13	.86-1.48
Divorced	1.10	.90-1.36
Never married	1.49	1.29-1.71
Race/Ethnicity		
Hispanic	.99	.82-1.21
Black, non-Hispanics	1.3	1.00-1.61
Asian	1.3	1.1-1.6
White,other non-Hispanic	1.00	1.00
Education		
Less than high school degree	1.54	1.16-2.05
High school degree or more	1.23	1.04-1.45
Some college	1.39	1.18-1.64
College degree	1.00	1.00
Insurance Coverage		
Yes	1.00	1.00
No	1.35	1.16-1.57
Households size		
1	1.00	1.00
2	1.63	1.34 - 1.97
3 or more	1.74	1.44-2.11

Source: Agency for Healthcare Policy and Research, 2000 Medical Expenditure Panel Survey: HouseholdComponent (1999 R3, 2000 R1) and Self-administered Questionnaire (1999 R4, 2000 R2)