

An Assessment of Medical Expenditure Panel Survey Sampling and Estimation  
Procedures through Benchmarking with the National Health Interview Survey

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# **An Assessment of Medical Expenditure Panel Survey Sampling and Estimation Procedures through Benchmarking with the National Health Interview Survey**

**Sadeq R. Chowdhury**

## **Abstract**

The Medical Expenditure Panel Survey (MEPS) is an ongoing national survey that has been conducted since 1996. A new panel of sample for the MEPS is selected every year from the responding households of the previous year's National Health Interview Survey (NHIS). A frame of households is first created using three-eighths of the NHIS sample and the sample is then selected from the frame. The selected households are followed up for two years with five interview rounds to collect data on all persons within the households. The size of the final responding sample in a MEPS panel is about one-fifth to one-sixth of the NHIS responding sample. This gives an opportunity to benchmark the estimates based on the MEPS sample with that of the NHIS. Since the data collected in the NHIS are available for the cases in both the MEPS frame and the MEPS sample, the estimates from the same variables but based on different subsets can be used to do a controlled evaluation of the effectiveness of the MEPS frame creation, sampling and weighting procedures. Using the estimates based on the same variables but from different samples avoids distortions in comparisons due to differences in data collection and processing between the surveys. By comparing the estimates based on the MEPS frame with the NHIS estimates, the representativeness of the MEPS frame can be assessed and by comparing the estimates based on the MEPS sample at the beginning of the sample draw (i.e., before any attrition due to nonresponse and eligibility loss) with that of the NHIS, the effectiveness of the MEPS sampling procedure can be evaluated. Similarly, the estimates based on the final MEPS responding sample can be compared to that of the NHIS to assess the overall effectiveness of the combined MEPS sampling and weighting procedures. This report presents such comparisons using the MEPS 2009 and 2010 panels. The analysis shows that the estimates based on the MEPS frame and sample are highly consistent with the NHIS estimates. The estimates from the MEPS final responding sample are also mostly consistent with the NHIS but differences are statistically significant for some estimates. However, most of the significant differences are marginal and not practically large.

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## 1. Introduction

The Medical Expenditure Panel Survey (MEPS), conducted by the Agency for Healthcare Research and Quality (AHRQ), provides nationally representative estimates of health care use, expenditures, sources of payment, and health insurance coverage for the U.S. civilian non-institutionalized population. It consists of three survey components with the Household Component (HC) as the core. The MEPS Household Component (generally referred to as MEPS hereafter) also provides estimates of respondents' health status, demographic and socio-economic characteristics, employment, access to care, and satisfaction with health care.

The sample for the MEPS is selected from the National Health Interview Survey (NHIS) and bears the same design features as the NHIS. The NHIS is a large multi-purpose health survey conducted by the National Center for Health Statistics (NCHS) and is a primary source of information on the health of the civilian, non-institutionalized, household population of the United States. It has about 29,000-39,000 households (about 74,000-100,000 persons) in the responding sample every year. The NHIS sample is designed as four panels of area samples - each of which is nationally representative. The NHIS is administered over four quarters covering approximately one-fourth of the sample from each panel. Therefore, the NHIS sample can be divided into sixteen subsamples defined by four panels and four quarters and each of these subsamples can also be considered a nationally representative sample.

For MEPS, every year a new panel<sup>1</sup> of sample (about 9,000-10,000 households) is selected from the responding households of the previous year's NHIS. To select the sample for MEPS, a frame is first created from the two NHIS panels reserved for MEPS and the three quarters of the NHIS sample that are available in time for the MEPS schedule. The MEPS sample of households is then selected from this frame. The selected households and all persons within the households are then followed up for two years through five interview rounds. Of the two consecutive years that the panel contributes to MEPS full-year (FY) estimates, about 75% of the selected households respond for the first FY and about 68% continue to respond for the second FY. Two overlapping panels are combined each year to produce annual estimates from a total

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<sup>1</sup> Note that a MEPS *panel* is a new subsample of respondents to the prior year NHIS while a NHIS *panel* is a subsample of the NHIS frame.

responding sample of about 14,000 households and 30,000 persons (approximately half from each panel).

Since the NHIS sample is much bigger than the final sample in a MEPS panel, the estimates from the MEPS can be benchmarked to those of the NHIS. In this study, to assess the effectiveness of the MEPS sampling and weighting procedures, we compare the estimates produced from the MEPS frame and from the MEPS sample with the same estimates from the NHIS full sample. We also compare the estimates produced from the MEPS final responding sample with those of the NHIS. For these comparisons, we use NHIS data that are available for the cases on the MEPS frame and on the MEPS initial and final samples. Using the same source of data to produce estimates based on different samples allows controlled evaluations of the MEPS sampling and weighting schemes without any noise from differences in data collection and processing between the surveys. The representativeness of the MEPS frame is assessed by comparing the estimates based on the MEPS frame with the NHIS estimates while the representativeness of the MEPS sample is evaluated by comparing the estimates based on the MEPS sample at the beginning of the sample draw (i.e., before any attrition due to nonresponse and eligibility loss) to the NHIS estimates. The overall effectiveness of MEPS sampling and weighting procedures is evaluated by comparing estimates produced (using the nonresponse adjusted weight) from the final MEPS responding sample to the NHIS estimates.

## **2. MEPS Sampling and Weighting Procedures**

As mentioned above, the MEPS sample is selected from a subset of NHIS responding households. Once weighted, the households that participated in the NHIS are a nationally representative sample of the U.S. civilian non-institutionalized population. Also, the NHIS sample is about three to four times bigger than the annual sample size target of the MEPS. Due to the size and representativeness of the NHIS sample, it offers a very cost-effective and convenient way of selecting the MEPS sample. Since the characteristics of the responding households are known from the NHIS, the MEPS sample is selected by targeting the important policy-relevant population subgroups. As mentioned above, the NHIS panels are roughly of equal size and each panel is designed to be a nationally representative sample. The panel design offers an option to use a similar national design but with a smaller sample size. The reason for such a design is to reduce the NHIS sample size if there is a budget constraint or to offer a

smaller sample or sampling frame for other smaller surveys such as the MEPS. Moreover, using two of the four NHIS panels allows for controlling sample overlap with other surveys that rely on the NHIS as a frame. For the purpose of data collection, each panel of NHIS sample is distributed in four quarters of the year. That means each quarter is also a representative subsample and is used to select or use as a smaller sample as required. For creating the sampling frame for MEPS, two panels (panels 1 and 4 have been assigned to MEPS since 2007) and three quarters are used. Ezzati-Rice et al. (2008) provides more details on the sample designs of the MEPS and the NHIS.

The MEPS sample is selected at the household level and all persons within the selected households are included in the sample. The NHIS person-level file provides the details of the persons within a household. These person records and necessary information are carried forward to the MEPS sample to start with. However, the person records and relevant variables are updated at the time of collecting the MEPS data. The households for the MEPS sample are selected for the sample by using a probability proportional to size (PPS) sampling scheme within each of the strata defined using race-ethnicity of persons within the household. The sampling rate varies by major race/ethnicity subgroups, with minorities oversampled. Previously the samples were selected systematically with equal weight for all households, but since 2007 the samples have been selected with PPS, where the initial nonresponse-adjusted NHIS weight of a household is used as the measure of size (MOS). About 70%-80% of the households from the MEPS frame are usually selected for the MEPS sample. The sample of households with all persons in those households is designed to be a representative subsample of households/persons. If the selection weight i.e., the inverse of the selection probability of a household is applied to the households (or persons) in the MEPS sample then unbiased estimates can be produced at the level of MEPS frame. If this weight is multiplied by 8/3 then the estimates can be produced at the NHIS full sample level because only three-eighths of the NHIS sample is usually included in the MEPS frame. Finally, if this weight is multiplied by the NHIS household weight then estimates can be produced at the national level. This weight is used as the base weight for the households selected for the MEPS.

The base weight of the sample goes through a series of adjustments to account for nonresponse and coverage of the target population in different data collection rounds. The first round of adjustments is applied to produce household-level, then family-level, and finally

person-level weights for Round 1. Then another round of adjustments is applied to account for nonresponse up to the end of the first year to produce the panel-specific FY person-level weight for the first year. This weight is adjusted further for nonresponse in the second year to derive the panel-specific FY weight for the second year. The panel-specific weights of the two panels in a year are composited<sup>2</sup> to produce the combined panels FY weight. The details of the MEPS weighting procedures can be found in Machlin, Chowdhury, et al. (2010).

### **3. Methodology**

To evaluate the effectiveness of the MEPS design and the weighting procedures, we compare the estimates at the person level using the variables collected in the NHIS and available for all persons in the MEPS frame and in the initial MEPS sample. These variables are also available for most of the cases in the first year of MEPS full year (FY1) file except for about 4-5% persons who are newly in-scope (mainly births and persons who returned home from the military or an institution). We compare the estimates produced from the same variables but using the MEPS frame, the MEPS sample and the NHIS full sample with appropriate weights. The estimates from the MEPS sample are compared at two different steps in the sampling-estimation process. The first comparison is done at the sample draw where the estimates based on the MEPS initial sample (before fielding) and the estimates based on the MEPS frame are compared with the estimates produced from the NHIS full sample. The second comparison is done using the final responding sample where the panel-specific MEPS FY1 estimates are compared with the NHIS estimates. In the first comparison, the MEPS household base weight is applied to all persons within the household to produce the estimates. Since the MEPS sample before fielding has no sample loss due to nonresponse and ineligibility or no change in household compositions, there is no need for any weighting adjustment to the household base weight. Use of this weight makes sense as the MEPS sample is selected at the household level and all persons in a household have the same selection probability. Since the estimates are not affected due to any weighting adjustment used in the MEPS, this comparison evaluates the representativeness of the MEPS sample. To see if the frame created from the NHIS sample is representative enough, the estimates produced from the MEPS frame are also compared with the NHIS estimates. For producing estimates from the frame, the household base weight at the frame level is used for all

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<sup>2</sup> Composite weight is a linear combination of the two weights with appropriate combination factors.

persons in the household. For producing estimates from the NHIS sample, although the NHIS person-level weight is available, the household-level weight is used for all persons in the household for producing estimates comparable to those produced from the MEPS frame or the sample. Since the NHIS final person weight is raked/poststratified to the external control totals while the MEPS frame and sample base weights are not, use of the final NHIS person weight would not allow a fair comparison.

The MEPS estimates for the second comparison are based only on the eligible and responding persons in the MEPS final FY1 sample. The estimates are produced based on the panel-specific FY1 weight<sup>3</sup> which is non-response adjusted and raked/poststratified at the panel level to represent the full target population by a single panel. On the other hand, the NHIS final person-level weight is used for producing the comparative estimates from the NHIS. The comparison of these estimates from MEPS with those of the NHIS evaluates the combined effectiveness of the MEPS sample selection and the weighting procedures used up to the FY1 weight for the panel. For producing estimates from the MEPS for this comparison, the newly in-scope persons who joined the MEPS households later are not included as these cases could not be linked with the NHIS and therefore the NHIS variables used in the comparison are not available for them. Ideally, an adjustment for exclusion of the non-linked cases should be made, but since the proportion of such cases is very small this should not influence the comparison considerably. The impact of excluding such cases on the estimates of means and percentages are generally negligible (see Chowdhury et al., 2012). For the first set of comparisons, although the NHIS initial household weight (WTIA\_HH) is used for MEPS PPS sample selection, the NHIS final household weight (WTFA\_HH) is used to derive the weights to produce the estimates. The final weight WTFA\_HH was not available at the time of sample selection but now it is available and considered to be more appropriate to produce estimates for this comparison. Therefore, the weights used for different samples for the first comparison can be expressed as follows:

$$\begin{aligned}
 \text{FULLWT} &= \text{WTFA\_HH} && \text{for NHIS full sample} \\
 \text{FRAMEWT} &= \text{WTFA\_HH} * (1/f) && \text{for MEPS Frame} \\
 \text{SAMPBWT} &= \text{WTFA\_HH} * (1/f) * (1/\text{MEPS selection probability}) && \text{for MEPS sample}
 \end{aligned}$$

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<sup>3</sup> This weight is a panel-specific final poverty adjusted weight and is not available on the public use files.

The factor  $f$  represents the proportion of the NHIS final sample in the MEPS frame and the inverse of the MEPS sample selection probability from the frame accounts for weighting the MEPS sample to the MEPS frame. Usually,  $f=3/8$  as 6/16 of the NHIS panel-quarters are used as the MEPS frame but it can vary due to NHIS sample reductions from the MEPS non-frame parts in some years. The value of  $f$  was 3/8 for the MEPS 2008 sample panel and was 4/8 for the MEPS 2009 sample panel.

For the second comparison, since the MEPS FY1 responding sample in the panel is used for comparison, the MEPS panel specific person-level weight is used because this is the proper weight for the responding sample in a single panel and is available. Similarly, the NHIS final person-level weight (WTFA) is used for the NHIS sample. Therefore, the weights used for the second comparison are as follows:

WTFA	for NHIS full sample
WTP14P09F	for MEPS FY1 responding sample for Panel 15
ORIG_WTP15P10	for MEPS FY1 responding sample for Panel 14

The comparisons are done using two MEPS panels 2009 (Panel 14) and 2010 (Panel 15) with corresponding 2008 and 2009 NHIS samples. The same comparison is repeated for two NHIS-MEPS years to see if there is any variation across years. Table 1 below summarizes the two comparisons done in this study.



**Table 1. Summary of the comparisons of estimates produced from NHIS and MEPS**

<b>First Comparisons</b>	
Purpose	To assess the effectiveness of the MEPS frame creation and sampling procedures by checking if the estimates from the MEPS frame and the sample are consistent with the NHIS full sample.
Datasets	NHIS full sample, MEPS frame, MEPS initial sample
Years	2008 NHIS/2009 MEPS and 2009 NHIS/2010 MEPS
Sample Composition	All three datasets include the same persons within households and all MEPS persons are part of the NHIS sample. That means all households and persons on the MEPS frame and the sample are linked with the NHIS.
Weight	NHIS initial household weight (WTIA_HH) for NHIS WTFA_HH*1/f for MEPS Frame { $f=3/8$ in 2008 & $f=4/8$ in 2009} WTFA_HH*1/f*(1/MEPS Sampling Probability) for MEPS sample
Variables/estimates	The estimates using the same NHIS variables are used for comparison. Estimates of both selected socio-demographic and survey target variables are compared.
<b>Second Comparison</b>	
Purpose	To assess the overall effectiveness of the MEPS sampling/weighting/non-response adjustment procedures by checking if the estimates from the MEPS responding sample are consistent with that of the NHIS.
Datasets	NHIS full sample, MEPS responding sample in a panel
Years	2008 NHIS/2009 MEPS and 2009 NHIS/2010 MEPS
Sample Composition	Household composition between MEPS and NHIS will be slightly different due to newly in-scope persons who joined the MEPS household after the sample was selected (primarily births and persons who returned home from the military or an institution). Consequently about 4-5% persons in the MEPS sample could not be linked with NHIS and are excluded from the analysis.
Weight	NHIS final person weight (WTFA) for NHIS MEPS Panel-specific FY weight (ORIG_WTP15P10F and WTP14P09F) for 2010 and 2009 MEPS sample.
Variables/Estimates	The estimates using the same NHIS variables are used for comparison. Estimates of mainly survey target variables are compared as the final weight is already adjusted by selected socio-demographic characteristics using external control totals.

#### **4. Results - Comparison of Estimates**

##### *Comparison at the sample draw*

Table 2 presents the comparison of estimates produced from the 2009 MEPS sampling frame and the MEPS sample with the estimates from the corresponding 2008 NHIS sample. The comparison is done using both socio-demographic characteristic and selected target variables. The characteristics of the individuals such as distributions by age, sex, region, race/ethnicity, level of education, etc. estimated from the MEPS frame and the sample are very similar with that of the NHIS. The estimates of selected target variables produced from the MEPS frame and the sample are also highly consistent with the NHIS estimates. None of the estimates are found to be significantly different. For example, for the 2009 MEPS (Table 2), the proportion of individuals with private insurance is estimated as 63.7% from the MEPS sample, 63.8% from the MEPS frame, and 63.7% from the NHIS sample; the proportion of persons whose self reported health status is 'excellent' is estimated as 35.2% from the MEPS sample, 35.3% from the MEPS frame, and 35.4% from the NHIS sample; and the proportion with 0-12 grade education is estimated as 28.7% from the MEPS sample, 28.5% from the MEPS frame, and 28.7% from the NHIS sample. Table 3 presents the same comparison for the 2010 MEPS and all differences are again not significant. Tables A1 to A3 in the appendix present the comparisons by different age groups for the 2010 MEPS and the differences in estimates do not appear to be significant even at that level. The estimates by age category are also compared for the 2009 MEPS and the differences in estimates are again not significant (tables are not included).

##### *Comparison using the responding sample*

Tables 4 and 5 present similar comparison of estimates from the 2009 and 2010 MEPS responding sample for FY1 with that of the NHIS. This time the comparisons are mainly restricted to selected target variables and the socio-demographic characteristics are excluded because the weight of the MEPS responding sample is already adjusted to the external control totals and should be consistent with that of the NHIS. The comparison shows that many of the estimates produced from the MEPS responding sample and the NHIS are consistent with no significant difference. For example, for the 2009 MEPS (Table 4), the number of times individuals visited health professionals during the two weeks prior to the interview is estimated as 0.25/person from the MEPS and 0.23/person from the NHIS; the proportion who needed but did not get medical care for cost reasons is estimated as 6.7% from the MEPS and 6.5% from the

NHIS and the proportion who had activity limited in any way is estimated as 12.8% from the MEPS and 12.9% from the NHIS. However, in some cases the MEPS estimates are significantly different ( $p < .05$ ) from the NHIS estimates. For example, the proportion who had no health insurance of any type is estimated as 13.4% from the MEPS but 14.6% from the NHIS; the proportion who had private health insurance was estimated as 66.2% from the MEPS and 63.7% from the NHIS; and the proportion who paid nothing out-of-pocket for medical care is 7.7% from the MEPS compared with 9.0% from the NHIS. Also, the estimated distributions by education, reported health status and the out-of-pocket medical expenses of the family are different between the MEPS and the NHIS.

Table 5 presents the comparison of estimates between the 2010 MEPS and the 2009 NHIS. The pattern of differences in estimates is very similar to that of the 2009 MEPS and the 2008 NHIS. However, some of the differences in estimates that were not significant for the 2009 MEPS are significant for the 2010 MEPS. For example, the differences in proportions with Medicaid and proportions who delayed medical care for costs are significant.

The MEPS sample used for comparison only includes the cases that are linked with NHIS and a large portion of the non-linked cases are newborn babies who may have a higher insurance rate and different health needs or expenses. To check if that has any impact on any of the differences that appeared significant, a comparison of the same estimates is made for 18-64 years and 65+ year persons and presented in the appendix for the 2010 MEPS (Tables A4 & A5). The pattern of differences appears the same. So there is no indication of any distortion of the comparison due to the exclusion of non-linked cases. Comparisons also show that the pattern of differences in estimates is similar by major age sub categories.

**Table 2. Comparison of estimates of selected NHIS variables produced from the 2009 MEPS frame and the sample with the 2008 NHIS estimates**

Variable Level	2008 NHIS		2009 MEPS Frame		2009 MEPS Sample	
	Estimate (%)	SE	Estimate (%)	SE	Estimate (%)	SE
Sample size	N=73,973		N=31,022		N=24,932	
Age categories						
0-17	24.8	0.24	24.8	0.36	24.8	0.39
18-64	62.2	0.24	62.3	0.36	62.3	0.38
65+	13.0	0.23	12.8	0.36	12.9	0.39
Sex						
1 Male	48.4	0.16	48.4	0.25	48.6	0.30
2 Female	51.6	0.16	51.6	0.25	51.4	0.30
Census region						
1 Northeast	17.7	0.47	16.9	1.30	16.7	1.28
2 Midwest	23.3	0.64	23.6	1.64	23.8	1.62
3 South	35.9	0.73	36.7	1.78	37.0	1.78
4 West	23.1	0.62	22.8	1.39	22.6	1.39
Education level						
0-12: Up to 12th grade, no diploma	28.7	0.28	28.5	0.44	28.7	0.45
13, 14: GED or HS grad	21.4	0.26	21.0	0.42	20.7	0.44
15-17: Some college no degree	21.3	0.24	21.4	0.38	21.6	0.42
18: 4-Yr college degree	13.0	0.23	13.3	0.34	13.3	0.35
19-21: MS/PhD/PD	6.5	0.17	6.5	0.25	6.4	0.25
Race/ethnicity						
1 Hispanic	14.3	0.33	14.2	0.61	14.2	0.62
2 Non-Hispanic White	68.6	0.47	68.6	0.93	68.6	0.94
3 Non-Hispanic Black	11.3	0.32	11.5	0.62	11.5	0.62
4 Non-Hispanic Asian	4.8	0.15	5.0	0.26	4.9	0.26
Marital status						
1 Married	42.7	0.32	42.3	0.48	42.4	0.52
2 Widowed/Divorced/Separated	12.4	0.20	12.8	0.30	12.8	0.33
3 Never married	20.3	0.24	20.1	0.37	20.2	0.38
4 Living with partner	5.0	0.15	5.1	0.24	4.9	0.25
Private health insurance	63.7	0.42	63.8	0.67	63.7	0.71
Medicare coverage	14.3	0.25	14.2	0.37	14.2	0.41
Medicaid coverage	10.6	0.25	10.6	0.40	10.7	0.42
Not born in the United States	13.0	0.25	13.2	0.45	13.1	0.47
Not US citizen	6.4	0.18	6.6	0.30	6.5	0.30
No insurance coverage of any type	14.0	0.25	13.7	0.35	13.5	0.38
Health insurance offered at workplace	31.6	0.26	31.7	0.41	31.8	0.43

**Table 2. Comparison of estimates of selected NHIS variables produced from the 2009 MEPS frame and the sample with the 2008 NHIS estimates**

Variable Level	2008 NHIS		2009 MEPS Frame		2009 MEPS Sample	
	Estimate (%)	SE	Estimate (%)	SE	Estimate (%)	SE
Reported health status						
1 Excellent	35.4	0.35	35.3	0.52	35.2	0.59
2 Very good	30.5	0.31	30.9	0.45	31.2	0.51
3 Good	23.9	0.29	23.6	0.39	23.6	0.45
4 Fair	7.5	0.15	7.4	0.25	7.3	0.26
5 Poor	2.5	0.08	2.5	0.13	2.5	0.16
Activity limited in any way	13.2	0.22	13.1	0.33	13.3	0.36
Medical care delayed for cost	9.1	0.18	8.9	0.26	9.1	0.30
In a hospital overnight, 12 months	8.0	0.14	8.1	0.20	8.1	0.22
Received care 10+ times, 12 months	10.0	0.16	9.9	0.24	10.0	0.28
No health insurance past 12 months	3.9	0.13	3.9	0.18	3.9	0.21
No health insurance coverage	14.1	0.25	14.0	0.36	13.9	0.38
Amount family spent for medical care						
0 Zero	8.8	0.24	8.5	0.39	8.4	0.40
1 Less than \$500	34.2	0.39	34.2	0.58	34.2	0.66
2 \$500 - \$1,999	31.1	0.38	31.2	0.58	31.6	0.68
3 \$2,000 - \$2,999	9.4	0.25	9.6	0.35	9.9	0.42
4 \$3,000 - \$4,999	6.2	0.19	6.1	0.31	5.8	0.33
5 \$5,000 or more	5.7	0.19	5.5	0.31	5.3	0.35
Total earnings last year						
0	48.6	0.27	48.6	0.41	48.6	0.43
1 \$1-\$24,999	13.8	0.22	13.7	0.32	13.8	0.34
2 \$25,000-\$44,999	10.4	0.16	10.7	0.28	10.9	0.33
3 \$45,000-\$74,999	7.7	0.15	7.5	0.22	7.6	0.23
4 \$75,000 and over	4.9	0.13	4.7	0.20	4.7	0.20

\*Significant at p<0.05

**Table 3. Comparison of estimates of selected NHIS variables produced from the 2010 MEPS frame and the sample with the 2009 NHIS estimates**

Variable Level	2009 NHIS		2010 MEPS Frame		2010 MEPS Sample	
	Estimate (%)	SE	Estimate (%)	SE	Estimate (%)	SE
Sample size	N=88,129		N=32,171		N=22,906	
Age categories						
0-17	25.0	0.23	25.2	0.38	25.4	0.44
18-64	62.0	0.24	62.1	0.42	61.6	0.48
65+	13.0	0.25	12.8	0.41	13.0	0.46
Sex						
1 Male	48.6	0.16	48.6	0.25	48.6	0.29
2 Female	51.4	0.16	51.4	0.25	51.4	0.29
Census region						
1 Northeast	17.7	0.44	17.2	1.27	17.3	1.29
2 Midwest	23.2	0.54	23.7	1.67	23.8	1.70
3 South	35.8	0.64	36.3	1.83	36.3	1.82
4 West	23.2	0.52	22.8	1.42	22.7	1.41
Education level						
0-12: Up to 12th grade, no diploma	28.8	0.27	28.7	0.47	29.0	0.48
13, 14: GED or HS grad	21.1	0.26	20.7	0.42	20.7	0.47
15-17: Some college no degree	22.0	0.21	22.1	0.38	21.9	0.41
18: 4-Yr college degree	13.1	0.21	13.4	0.37	13.4	0.41
19-21: MS/PhD/PD	6.8	0.17	6.9	0.30	7.0	0.33
Race/ethnicity						
1 Hispanic	15.6	0.33	15.5	0.65	15.6	0.67
2 Non-Hispanic White	66.9	0.46	67.0	0.95	66.8	1.00
3 Non-Hispanic Black	11.6	0.29	11.6	0.59	11.7	0.61
4 Non-Hispanic Asian	4.9	0.17	4.9	0.30	4.9	0.30
Marital status						
1 Married	42.2	0.290	42.2	0.487	42.2	0.539
2 Widowed/Divorced/Separated	12.5	0.187	12.2	0.310	12.0	0.333
3 Never married	20.8	0.222	20.9	0.383	20.8	0.410
4 Living with partner	5.1	0.130	5.1	0.226	5.1	0.259
Private health insurance	61.5	0.46	62.4	0.80	62.5	0.81
Medicare coverage	14.2	0.26	13.9	0.43	14.2	0.49
Medicaid coverage	11.6	0.27	11.4	0.46	11.4	0.49
Not born in the United States	13.4	0.26	13.4	0.48	13.3	0.51
Not US citizen	6.7	0.19	6.8	0.34	6.7	0.34
No insurance coverage of any type	14.9	0.26	14.6	0.43	14.5	0.46
Health insurance offered at workplace	30.3	0.27	31.0	0.47	31.0	0.51

**Table 3. Comparison of estimates of selected NHIS variables produced from the 2010 MEPS frame and the sample with the 2009 NHIS estimates**

Variable Level	2009 NHIS		2010 MEPS Frame		2010 MEPS Sample	
	Estimate (%)	SE	Estimate (%)	SE	Estimate (%)	SE
Reported health status						
1 Excellent	35.7	0.33	35.9	0.56	36.6	0.63
2 Very good	30.5	0.28	30.5	0.47	30.1	0.56
3 Good	23.8	0.26	23.7	0.46	23.5	0.48
4 Fair	7.5	0.14	7.2	0.23	7.1	0.25
5 Poor	2.5	0.08	2.5	0.13	2.5	0.16
Activity limited in any way	13.5	0.21	13.5	0.34	13.4	0.37
Medical care delayed for cost	9.9	0.18	10.3	0.31	10.5	0.33
In a hospital overnight, 12 months	8.1	0.13	8.3	0.21	8.3	0.24
Received care 10+ times, 12 months	9.8	0.15	9.8	0.23	9.9	0.27
No health insurance past 12 months	4.0	0.14	4.0	0.24	4.2	0.29
No health insurance coverage	14.8	0.25	14.6	0.43	14.4	0.46
Amount family spent for medical care						
0 Zero	9.7	0.25	9.1	0.40	9.1	0.43
1 Less than \$500	33.9	0.42	34.5	0.70	34.3	0.79
2 \$500 - \$1,999	31.4	0.38	31.6	0.68	32.1	0.78
3 \$2,000 - \$2,999	9.5	0.25	9.5	0.41	9.4	0.47
4 \$3,000 - \$4,999	6.6	0.23	6.6	0.39	6.5	0.46
5 \$5,000 or more	5.6	0.18	5.4	0.31	5.3	0.37
Total earnings last year						
0	49.3	0.28	48.7	0.49	49.0	0.55
1 \$1-\$24,999	14.9	0.20	15.3	0.32	15.3	0.36
2 \$25,000-\$44,999	10.6	0.18	10.8	0.32	10.9	0.35
3 \$45,000-\$74,999	8.2	0.15	8.2	0.26	8.2	0.29
4 \$75,000 and over	5.2	0.13	4.9	0.21	5.1	0.24

\*Significant at  $p < 0.05$

**Table 4. Comparison of estimates of selected NHIS variables produced from the 2009 MEPS FY1 responding sample with the 2008 NHIS estimates**

Variable Level	2008 NHIS		2009 MEPS FY1 Respondents	
	Estimate	SE	Estimate	SE
Sample size	N=73,973		N=15,913	
Number of times in hospital overnight, 12 months	0.12	0.00	0.12	0.01
Number of nights in hospital, 12 months	0.50	0.02	0.47	0.03
Number of times visited health professional, 2 wks	0.23	0.00	0.25	0.01
Health insurance - no coverage of any type (%)	14.6	0.25	13.4*	0.55
No health coverage during past 12 months (%)	4.0	0.13	3.9	0.25
Private health insurance (%)	63.7	0.42	66.2*	0.96
Activity limited in any way (%)	12.9	0.21	12.8	0.42
Medical care delayed for cost, 12 months (%)	9.2	0.18	9.3	0.41
Needed but did not get medical care for cost (%)	6.5	0.15	6.7	0.34
In a hospital overnight last 12 months (%)	8.0	0.13	8.5	0.30
Received care 10+ times last 12 months (%)	9.8	0.15	10.3	0.34
Medicare coverage (%)	13.7	0.23	13.4	0.52
Medicaid coverage (%)	10.9	0.25	10.0	0.53
Not born in the United States (%)	13.5	0.26	13.2	0.63
Not US citizen (%)	6.8	0.19	6.9	0.45
Education level (%)				
0-12; Up to 12th grade, no diploma	28.6	0.28	28.4	0.52
13, 14: GED or HS grad	21.4	0.25	20.0*	0.46
15-17: Some college no college degree	21.4	0.24	21.8	0.49
18: 4-yr college degree	13.0	0.23	14.1*	0.43
19-21: MS/PhD/PD	6.3	0.16	7.1*	0.33
<5 yr age	7.0	0.12	7.0	0.23
Reported health status (%)				
1 Excellent	35.5	0.35	34.8	0.72
2 Very good	30.4	0.31	32.6*	0.65
3 Good	24.0	0.29	23.0*	0.58
4 Fair	7.4	0.15	7.2	0.32
5 Poor	2.4	0.08	2.3	0.16
Amount family spent for medical care (%)				
0 Zero	9.0	0.25	7.7*	0.43
1 Less than \$500	34.5	0.39	34.4	0.85
2 \$500 - \$1,999	30.9	0.38	32.6*	0.84
3 \$2,000 - \$2,999	9.2	0.24	10.3*	0.56
4 \$3,000 - \$4,999	6.2	0.19	5.8	0.41
5 \$5,000 or more	5.6	0.18	5.1	0.47

\*Significant at p<0.05



**Table 5. Comparison of estimates of selected NHIS variables produced from the 2010 MEPS FY1 responding sample with the 2009 NHIS estimates**

Variable Level	2009 NHIS		2010 MEPS FY1 Respondents	
	Estimate	SE	Estimate	SE
Sample size	N=88,129		N=14,348	
Number of times in hospital overnight, 12 months	0.120	0.003	0.120	0.007
Number of nights in hospital, 12 months	0.534	0.032	0.503	0.037
Number of times visited health professional, 2 wks	0.246	0.004	0.249	0.008
Health insurance - no coverage of any type (%)	15.3	0.25	14.2*	0.55
No health coverage during past 12 months (%)	4.0	0.14	4.0	0.28
Private health insurance (%)	61.6	0.47	64.4*	1.02
Activity limited in any way (%)	13.3	0.20	13.2	0.39
Medical care delayed for cost, 12 months (%)	10.1	0.18	10.7*	0.39
Needed but did not get medical care for cost (%)	6.9	0.14	7.4*	0.33
In a hospital overnight last 12 months (%)	8.2	0.13	8.4	0.33
Received care 10+ times last 12 months (%)	9.7	0.15	10.0	0.36
Medicare coverage (%)	13.8	0.25	13.4	0.46
Medicaid coverage (%)	11.8	0.27	10.8*	0.57
Not born in the United States (%)	13.6	0.27	13.7	0.57
Not US citizen (%)	6.8	0.20	6.8	0.38
Education level (%)				
0-12; Up to 12th grade, no diploma	28.1	0.27	27.1	0.60
13, 14: GED or HS grad	21.2	0.26	19.6*	0.51
15-17: Some college no college degree	22.2	0.22	23.3*	0.45
18: 4-yr college degree	13.1	0.21	14.2*	0.46
19-21: MS/PhD/PD	6.7	0.16	7.8*	0.42
<5 yr age	7.0	0.13	7.0	0.25
Reported health status (%)				
1 Excellent	35.8	0.32	36.5*	0.71
2 Very good	30.4	0.28	31.1	0.65
3 Good	23.8	0.26	23.2	0.58
4 Fair	7.4	0.14	7.0	0.29
5 Poor	2.4	0.07	2.1	0.15
Amount family spent for medical care (%)				
0 Zero	9.9	0.26	8.4*	0.49
1 Less than \$500	34.1	0.42	34.3	0.91
2 \$500 - \$1,999	31.2	0.38	32.9*	0.91
3 \$2,000 - \$2,999	9.4	0.24	9.9	0.62
4 \$3,000 - \$4,999	6.5	0.23	6.3	0.43
5 \$5,000 or more	5.5	0.18	5.4	0.48

\*Significant at p<0.05

## 5. Conclusion

To evaluate the effectiveness of the MEPS sample design, the variables collected in the NHIS are attached to the MEPS frame and MEPS sample, and selected estimates of these variables based on the MEPS frame and MEPS sample are compared with the estimates obtained from the NHIS sample. The comparisons show that the estimates produced from the MEPS sample or from the MEPS frame are highly consistent with the estimates produced from the NHIS full sample. None of the estimates between these three sets of estimates is significantly different. The comparisons are repeated for both 2009 and 2010 MEPS and the overall result is the same.

To evaluate the effectiveness of the MEPS weighting and nonresponse adjustment procedures, the estimates produced from MEPS final responding sample (excluding a small proportion of cases that joined the sampled households later i.e., the non-linked cases) using the MEPS final weight are compared with the NHIS estimates. Again the comparison is repeated for both the 2009 and 2010 MEPS. The differences between the estimates are still mostly not significant. However, the differences are significant for some estimates. Notable are the difference in insurance coverage rate (about 1 percentage point) and the difference in private insurance coverage (about 3 percentage points) in both 2009 and 2010 MEPS. There also appear to be differences in the distributions in terms of education level, reported health status, and the amount the family spent on medical care. Both in 2009 and 2010, the estimated proportion of persons with less than 12th grade education appears to be lower in the MEPS than in the NHIS. In terms of the distribution of persons by reported health status, the MEPS estimates a higher proportion of persons with 'good' to 'excellent' health status than the NHIS. The estimate of persons in families that spent no money out-of-pocket for medical care is lower in the MEPS than in the NHIS. Most of the differences in estimates that are significant are only marginally significant except for private health insurance and the proportion who spent nothing out-of-pocket for medical care. For some estimates, the difference becomes statistically significant because of the large NHIS sample size and a large covariance due to a complete overlap of the MEPS sample with the NHIS, but from a practical point of view most of the differences are not large.

Overall, the MEPS sample selection and the estimation procedures appear to be effective. The MEPS sample, with a much smaller size, can reproduce estimates very close to those from the NHIS. However, a few estimates from the MEPS responding sample, as mentioned above, appear to be significantly different from the NHIS estimates, particularly the differences in insurance status. The MEPS estimation procedure may benefit by doing an adjustment to the sample weight based on the NHIS in terms of the estimates of insurance status (private, public, no insurance) and by education and reported health status distributions. However, the impact of such adjustments may not be that large given that, although significant, the differences in estimates are not large. However, an adjustment using the relevant variables could provide an additional control for the MEPS estimates.

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## Appendix

**Table A1. Comparison of estimates of selected NHIS variables produced from the 2010 MEPS frame and the sample with the 2009 NHIS estimates for age group 0-17 years**

Variable Level	2008 NHIS		2009 MEPS Frame		2009 MEPS Sample	
	Estimate (%)	SE	Estimate (%)	SE	Estimate (%)	SE
Sample size	N=23,830		N=8,740		N=6,320	
Sex						
1 Male	51.2	0.39	50.9	0.64	50.9	0.76
2 Female	48.8	0.39	49.1	0.64	49.1	0.76
Census region						
1 Northeast	16.9	0.59	16.2	1.38	16.6	1.46
2 Midwest	23.3	0.75	24.2	1.83	24.6	1.99
3 South	35.4	0.80	35.5	1.97	35.5	2.01
4 West	24.4	0.70	24.0	1.64	23.3	1.66
Education level						
0-12: Up to 12th grade, no diploma	72.3	0.43	72.3	0.71	72.7	0.82
13, 14: GED or HS grad	0.4	0.05	0.3	0.06	0.4	0.08
15-17: Some college no degree	0.1	0.02	0.1	0.03	0.1	0.05
<5 yr age	26.2	0.42	26.3	0.70	25.8	0.80
Race/ethnicity						
1 Hispanic	22.7	0.53	22.6	1.02	22.6	1.10
2 Non-Hispanic White	56.8	0.68	56.9	1.30	57.1	1.49
3 Non-Hispanic Black	14.6	0.47	14.9	0.92	14.9	1.00
4 Non-Hispanic Asian	4.7	0.23	4.5	0.36	4.5	0.37
Private health insurance	55.6	0.77	56.4	1.30	56.3	1.42
Not born in the United States	4.4	0.21	4.2	0.32	4.2	0.33
Not US citizen	2.7	0.16	2.7	0.26	2.6	0.25
No insurance coverage of any type	9.3	0.37	8.9	0.60	8.9	0.65
Reported health status						
1 Excellent	56.7	0.61	56.9	1.03	57.8	1.19
2 Very good	26.9	0.51	26.6	0.87	26.3	1.00
3 Good	14.6	0.40	14.6	0.67	14.1	0.74
4 Fair	1.6	0.10	1.6	0.17	1.5	0.19
5 Poor	0.2	0.04	0.3	0.07	0.3	0.09
Activity limited in any way	8.4	0.25	8.6	0.40	8.6	0.45
Medical care delayed for cost	4.7	0.26	5.2	0.46	5.3	0.48
In a hospital overnight, 12 months	5.2	0.18	5.4	0.31	5.3	0.34
Received care 10+ times, 12 months	4.1	0.18	4.2	0.32	4.6	0.41
No health insurance past 12 months	8.5	0.34	8.2	0.59	8.0	0.63
No health insurance coverage	8.3	0.34	7.9	0.58	7.8	0.62

\*Significant at p<0.05

## Appendix

**Table A2. Comparison of estimates of selected NHIS variables produced from the 2010 MEPS frame and the sample with the 2009 NHIS estimates for age group 18-64 years**

Variable Level	2009 NHIS		2010 MEPS Frame		2010 MEPS Sample	
	Estimate (%)	SE	Estimate (%)	SE	Estimate (%)	SE
Sample size	N=54,181		N=19,874		N=14,090	
Sex						
1 Male	48.4	0.18	48.3	0.28	48.3	0.33
2 Female	51.6	0.18	51.7	0.28	51.7	0.33
Census region						
1 Northeast	17.9	0.49	17.5	1.30	17.6	1.33
2 Midwest	22.9	0.57	23.3	1.64	23.4	1.66
3 South	36.0	0.67	36.6	1.83	36.4	1.82
4 West	23.1	0.54	22.7	1.41	22.6	1.41
Education level						
0-12: Up to 12th grade, no diploma	12.6	0.26	12.5	0.45	12.5	0.47
13, 14: GED or HS grad	27.1	0.35	26.8	0.57	26.9	0.65
15-17: Some college no degree	30.9	0.31	30.9	0.52	30.8	0.58
18: 4-Yr college degree	18.5	0.28	19.0	0.49	19.0	0.56
19-21: MS/PhD/PD	9.3	0.24	9.4	0.43	9.4	0.48
Race/ethnicity						
1 Hispanic	14.8	0.33	14.7	0.62	14.9	0.65
2 Non-Hispanic White	67.7	0.48	67.7	0.94	67.3	0.99
3 Non-Hispanic Black	11.2	0.28	11.2	0.56	11.3	0.57
4 Non-Hispanic Asian	5.2	0.20	5.3	0.33	5.4	0.34
Private health insurance	65.3	0.44	66.2	0.77	66.8	0.78
Not born in the United States	17.5	0.36	17.6	0.66	17.6	0.69
Not US citizen	9.2	0.27	9.3	0.47	9.3	0.49
No insurance coverage of any type	19.9	0.32	19.6	0.53	19.5	0.58
Reported health status						
1 Excellent	31.7	0.33	31.9	0.57	32.4	0.65
2 Very good	32.5	0.32	32.6	0.52	32.4	0.62
3 Good	25.3	0.30	25.3	0.54	25.2	0.57
4 Fair	7.8	0.16	7.5	0.26	7.4	0.29
5 Poor	2.5	0.09	2.5	0.16	2.4	0.19
Activity limited in any way	11.3	0.20	11.2	0.35	11.1	0.37
Medical care delayed for cost	13.2	0.22	13.6	0.40	13.9	0.43
In a hospital overnight, 12 months	7.5	0.13	7.5	0.23	7.5	0.26
Received care 10+ times, 12 months	10.0	0.19	9.7	0.29	9.7	0.34
No health insurance past 12 months	4.4	0.15	4.5	0.24	4.6	0.28
No health insurance coverage	20.4	0.31	20.1	0.53	20.0	0.58

\*Significant at  $p < 0.05$

## Appendix

**Table A3. Comparison of estimates of selected NHIS variables produced from the 2010 MEPS frame and the sample with the 2009 NHIS estimates for age group 65+ years**

Variable Level	2009 NHIS		2010 MEPS Frame		2010 MEPS Sample	
	Estimate (%)	SE	Estimate (%)	SE	Estimate (%)	SE
Sample size	N=10,118		N=3,557		N=2,496	
Sex						
1 Male	44.4	0.46	45.1	0.80	45.7	0.82
2 Female	55.6	0.46	54.9	0.80	54.3	0.82
Census region						
1 Northeast	18.4	0.81	17.6	1.64	17.2	1.65
2 Midwest	24.4	0.87	24.6	2.25	23.9	2.26
3 South	36.0	1.09	36.8	2.59	37.3	2.68
4 West	21.2	0.73	21.0	1.79	21.6	1.91
Education level						
0-12: Up to 12th grade, no diploma	21.7	0.63	21.6	1.09	21.9	1.25
13, 14: GED or HS grad	32.6	0.63	31.6	1.03	31.2	1.19
15-17: Some college no degree	21.8	0.54	22.8	0.96	22.4	1.07
18: 4-Yr college degree	12.7	0.52	13.0	0.92	12.9	0.99
19-21: MS/PhD/PD	8.6	0.39	8.5	0.66	9.0	0.79
Race/ethnicity						
1 Hispanic	5.7	0.27	5.3	0.52	5.3	0.53
2 Non-Hispanic White	82.1	0.53	83.3	0.98	83.5	0.99
3 Non-Hispanic Black	8.0	0.35	7.5	0.59	7.4	0.60
4 Non-Hispanic Asian	3.6	0.22	3.4	0.43	3.4	0.43
Private health insurance	54.9	0.80	55.5	1.40	54.5	1.54
Not born in the United States	11.3	0.40	10.9	0.69	11.0	0.80
Not US citizen	2.4	0.17	2.3	0.30	2.3	0.36
No insurance coverage of any type	1.8	0.17	1.8	0.28	1.7	0.31
Reported health status						
1 Excellent	14.1	0.49	14.4	0.81	15.1	1.04
2 Very good	27.6	0.63	27.4	1.07	26.7	1.19
3 Good	34.4	0.64	34.0	1.10	33.8	1.30
4 Fair	17.2	0.46	17.0	0.80	16.8	0.94
5 Poor	6.4	0.31	6.9	0.52	7.3	0.65
Activity limited in any way	34.2	0.68	34.7	1.14	33.8	1.31
Medical care delayed for cost, 12 month	4.4	0.25	4.7	0.43	4.7	0.50
In a hospital overnight, 12 months	17.0	0.49	18.3	0.80	18.0	0.98
Received care 10+ times, 12 months	19.9	0.52	20.8	0.87	20.9	0.97
No health insurance past 12 months	1.2	0.14	1.3	0.26	1.2	0.24
No health insurance coverage	0.9	0.12	1.1	0.22	1.0	0.22

\*Significant at  $p < 0.05$

## Appendix

**Table A4. Comparison of estimates of selected NHIS variables produced from the MEPS 2010 FY1 responding sample with the 2009 NHIS estimates for 18-64 years**

Variable Level	2009 NHIS		2010 MEPS FY1 Respondents	
	Estimate	SE	Estimate	SE
Sample size	N=54,181		N=8,655	
Number of times in hospital overnight, 12 months	0.11	0.00	0.11	0.01
Number of nights in hospital, 12 months	0.47	0.05	0.42	0.04
Number of times visited health professional, 2 wks	0.24	0.00	0.25	0.01
Health insurance - no coverage of any type (%)	20.5	0.33	18.9*	0.72
No health coverage during past 12 months (%)	4.5	0.15	4.5	0.30
Private health insurance (%)	65.0	0.44	68.4*	0.94
Activity limited in any way (%)	11.1	0.19	10.9	0.46
Medical care delayed for cost, 12 months (%)	13.3	0.23	14.2*	0.52
Needed but did not get medical care for cost (%)	9.5	0.20	10.1	0.44
In a hospital overnight last 12 months (%)	7.4	0.13	7.5	0.37
Received care 10+ times last 12 months (%)	9.8	0.18	10.1	0.46
Medicare coverage (%)	3.1	0.10	2.8	0.21
Medicaid coverage (%)	7.3	0.21	6.4*	0.44
Not born in the United States (%)	17.5	0.36	17.7	0.76
Not US citizen (%)	9.3	0.28	9.3	0.53
Education level (%)				
0-12; Up to 12th grade, no diploma	12.9	0.27	11.6*	0.53
13, 14: GED or HS grad	27.1	0.35	24.8*	0.64
15-17: Some college no college degree	31.0	0.31	32.1	0.64
18: 4-yr college degree	18.4	0.28	20.2*	0.66
19-21: MS/PhD/PD	9.0	0.23	10.3*	0.59
Reported health status (%)				
1 Excellent	32.0	0.33	32.5	0.79
2 Very good	32.4	0.32	33.0	0.71
3 Good	25.3	0.30	25.0	0.69
4 Fair	7.8	0.16	7.4	0.39
5 Poor	2.5	0.09	2.1*	0.19
Amount family spent for medical care (%)				
0 Zero	9.9	0.27	8.7*	0.53
1 Less than \$500	34.3	0.42	34.2	0.91
2 \$500 - \$1,999	31.2	0.39	33.0*	0.93
3 \$2,000 - \$2,999	9.6	0.26	10.0	0.63
4 \$3,000 - \$4,999	6.3	0.21	6.1	0.45
5 \$5,000 or more	5.6	0.18	5.3	0.48

\*Significant at p<0.05



## Appendix

**Table A5. Comparison of estimates of selected NHIS variables produced from the MEPS 2010 FY1 responding sample with the 2009 NHIS estimates for 65+ years**

Variable Level	2009 NHIS		2010 MEPS FY1 Respondents	
	Estimate	SE	Estimate	SE
Sample size	N=10,118		N=1,543	
Number of times in hospital overnight, 12 months	0.26	0.01	0.3	0.03
Number of nights in hospital, 12 months	1.41	0.08	1.4	0.18
Number of times visited health professional, 2 wks	0.44	0.01	0.4	0.03
Health insurance - no coverage of any type (%)	1.9	0.18	1.3*	0.30
No health coverage during past 12 months (%)	0.8	0.09	0.6	0.27
Private health insurance (%)	54.2	0.80	54.5	1.82
Activity limited in any way (%)	34.1	0.67	34.1	1.49
Medical care delayed for cost, 12 months (%)	4.5	0.25	4.5	0.61
Needed but did not get medical care for cost (%)	2.6	0.18	3.1	0.47
In a hospital overnight last 12 months (%)	17.0	0.49	17.7	1.19
Received care 10+ times last 12 months (%)	19.9	0.52	20.6	1.39
Medicare coverage (%)	93.7	0.32	94.8	0.73
Medicaid coverage (%)	6.7	0.31	6.6	0.75
Not born in the United States (%)	12.3	0.42	11.3	1.05
Not US citizen (%)	2.6	0.19	2.6	0.46
Education level (%)				
0-12: Up to 12th grade, no diploma	12.9	0.27	11.6	0.53
13, 14: GED or HS grad	27.1	0.35	24.8	0.64
15-17: Some college no college degree	31.0	0.31	32.1	0.64
18: 4-yr college degree	18.4	0.28	20.2	0.66
19-21: MS/PhD/PD	9.0	0.23	10.3	0.59
Reported health status (%)				
1 Excellent	32.0	0.33	32.5	0.79
2 Very good	32.4	0.32	33.0	0.71
3 Good	25.3	0.30	25.0	0.69
4 Fair	7.8	0.16	7.4	0.39
5 Poor	2.5	0.09	2.1	0.19
Amount family spent for medical care (%)				
0 Zero	7.8	0.39	6.5	0.78
1 Less than \$500	34.2	0.71	35.1	1.88
2 \$500 - \$1,999	31.2	0.72	31.5	1.84
3 \$2,000 - \$2,999	9.2	0.43	8.8	1.14
4 \$3,000 - \$4,999	6.8	0.43	7.3	1.10
5 \$5,000 or more	5.4	0.37	6.3	0.99

\*Significant at p<0.05