Validity of Household Reports of Medicare-covered Home Health Agency Use

Samuel Zuvekas

Agency for Healthcare Research and Quality Working Paper No. 09003

August 2009

Validity of Household Reports of Medicare-covered Home Health Agency Use

ABSTRACT

We examine the validity of reported Medicare-covered home health agency use and spending in the Medical Expenditure Panel Survey (MEPS). We build on several previous studies (Zuvekas and Olin, 2009; Zuvekas and Olin forthcoming, Olin et al. 2008) of a sample of Medicare beneficiaries in the 2001-2003 MEPS who were matched to their Medicare claims and enrollment files. In aggregate, we find no statistically significant differences in mean reported utilization of and spending on Medicare-covered home health agency services between MEPS and Medicare claims for this matched sample of Medicare beneficiaries. At the individual level, we found moderate concordance in reporting between the MEPS and Medicare claims. We discuss possible explanations and implications for analyses of MEPS data on home health agency use and spending.

Samuel H. Zuvekas, Ph.D.
Senior Economist
Center for Financing, Access and Cost Trends
Agency for Healthcare Research and Quality
540 Gaither Road
Rockville, MD 20850
Phone: (301) 427-1673
Fax: (301) 427-1276
Email: samuel.zuvekas@ahrq.hhs.gov

Introduction

The Medical Expenditure Panel Survey (MEPS) is a widely used national resource for conducting descriptive and behavioral analyses that inform health care policy. Conducted annually since 1996, the MEPS is the only source of health care data that combines detailed information about health care use spending with individual and family characteristics for the U.S. community population as a whole. Home health care is an important component of this health care spending, totaling over $34 billion dollars in 2006 (AHRQ, 2008). Numerous studies have used data from the MEPS to analyze home health care use and spending (see for example, Moon and Shin 2006; Carroll, Slattum, and Cox 2005; McAuley et al 2004; Spector, Cohen, and Pesis-Katz 2004; Zhu 2004; Newacheck, Inkelas and Kim, 2004). However, little is known about the validity of reporting of home health agency use and expenditures in the MEPS.

We build on previous analyses (Zuvekas and Olin, 2009; Zuvekas and Olin, forthcoming; Olin et al. 2008) of a sample of Medicare beneficiaries in the MEPS for the period 2001-2003 who were matched to their Medicare claims and enrollment records provided by the Centers for Medicare and Medicaid Services (CMS). In these previous analyses, we found that households accurately reported inpatient hospital stays but systematically underreported emergency department and office-based visits. We use this same matched sample of Medicare beneficiaries to assess the validity of reporting of home health agency use and expenditures. We assess how well MEPS represents Medicare-covered home health service use and Medicare spending in aggregate, as well as concordance between the MEPS and the benchmark Medicare claims at the individual level.

Methods

MEPS

The MEPS is a nationally representative survey of health care utilization and expenditures for the U.S. non-institutionalized civilian population, sponsored by the Agency for Healthcare Research and Quality (SB Cohen 1997; JW Cohen et al. 1997; JW Cohen 1997; Ezzati-Rice, Rhode and Greenblatt 2008).   It has a rotating panel design with two overlapping cohorts. A new cohort is initiated each year and interviewed 5 times to collect 2 calendar years of data. We pooled data for calendar years 2001 through 2003, and subset the sample to persons covered by Medicare at any point during a year. The full sample of Medicare beneficiaries in MEPS for 2001-2003 included 9,015 persons, or 13,680 person-year observations since some of the beneficiaries were in the survey for two years.

Matching MEPS Beneficiaries to Medicare Administrative Records

Under a Data Use Agreement with the CMS, beneficiaries in our full sample were matched to their Medicare enrollment and claims data using survey-reported Medicare health insurance claim numbers (HICNs) or social security numbers (SSNs). Complete HICNs or SSNs were reported for 3,788 sample persons in the 2001-2003 surveys, and 3,463 of these persons (or 91 percent) matched exactly to Medicare administrative records (38 percent of the 9,015 people with Medicare coverage in the full sample). A logistic regression found that the exact matches were more likely to be the household informant (self-respondent), live in the Midwest or South compared to the West and East regions, reside in a non-MSA, report their race as white compared to non-white, and be at least 65 years old compared to the Medicare beneficiaries who did not match exactly or provide their HICN or SSN for the matching (Zuvekas and Olin,

4

forthcoming). We use propensity-score adjusted weights derived from this logistic regression to account for differential matching to Medicare administrative records. As in our previous studies of hospital and office-based visit reporting (Zuvekas and Olin, 2009; Zuvekas and Olin, forthcoming), we use Medicare claims for the exact matches to validate survey-reported Medicare covered home health care services in MEPS.

Analytic Sample

To ensure that our analytic sample had complete utilization data for a comparable period from both sources, we restricted the matched sample to survey respondents who were in MEPS for the entire calendar year, leaving 5,169 person-year observations. We further restricted this group to beneficiaries with Part A and Part B Medicare fee-for-service coverage for the entire calendar year based on their monthly Medicare enrollment data. These restrictions allowed us to compare utilization for survey respondents who were asked about their health care for the entire year and also had Medicare claims for covered services regardless of what was reported in MEPS. The final analytic sample contained 2,649 persons and 4,045 person-year observations.

Comparing Medicare-covered Home Health Care Use and Spending

We limit our analyses to home health care services for which Medicare was identified as a payer in the MEPS and in the Medicare claims. Home health care use is potentially right censored in the Medicare claims data because Medicare reimburses home health agencies on a prospective basis based on 60-day episodes of care.   That is, an episode that begins in November or December will appear in the Medicare final action claims dated the following January or February. Because of this right censoring for the 2003 year records (because we do not have

5

2004 claims) , we examined home health care use and spending for the first 10 months only of each year.

We constructed two parallel sets of measures of utilization from the MEPS and Medicare home health claims data: 1) any use of Medicare-covered home health services and 2) number of months of Medicare-covered home health services during the first 10 months of each calendar year. Medicare-covered services were identified from home health care records in both the MEPS (Home Health Care event files HC-059H, HC-067H, and HC-077H) and Medicare claims (Home Health Care Agency Standard Analytic Files for 2001-2003) for which Medicare paid at least a portion of the home health services. We also constructed measures of total Medicare spending on home health services in the first 10 months of each year for both the MEPS and Medicare claims. For home health care episodes that began in the previous year and ended in January or February, we allocated Medicare spending based on the proportion of the episode that occurred in the current year. The results were not sensitive to alternative assumptions about timing.

We pool all three calendar years (2001, 2002, and 2003) for our matched sample to increase power. All Medicare spending amounts were placed in 2003 dollars using the home health care component of the CMS Office of the Actuary's Personal Health Care Expenditure Price Index (CMS, 2009).

Analytical Approach

We compared reporting of Medicare-covered home health care use and Medicare claims both in aggregate for the matched sample and concordance at the individual level. For the aggregate comparisons, we report sample means and test for differences in means using a standard z-score test. We determined the agreement between the MEPS reported Medicare-

covered home health care use and Medicare claims at the individual level using a standard two-by-two contingency table and Kappa statistics for the binary indicator of any Medicare-covered home health care use. For the continuous measures of number of months of Medicare-covered home health care use and total Medicare spending, we used Lin's concordance correlation coefficient (Lin 1989, 2000) to estimate concordance at the individual level.

All standard errors and confidences intervals were constructed, and statistical tests performed, using the propensity-score adjusted MEPS survey weights and the method of balanced repeated replication (BRR) to adjust for the complex and stratified sampling design of the MEPS. The BRR method also corrects for repeated observations of individuals (Williams 2000). All analyses were conducted with Stata MP 10.1.

RESULTS

Table 1 describes the agreement in the reporting of any Medicare-covered home health care use between the MEPS-HC and the Medicare claims data in the form of a standard 2X2 contingency table (n=4,045 person-year observations). The high overall agreement rate (that is, the percentage of the sample for which both sources reported 'yes' or both sources reported 'no') of 96.0 percent (95.2-96.8 95% C.I.) was driven primarily by the large numbers reported to be both 'no' in the MEPS-HC and Medicare claims (93.2 percent of the matched sample). The Kappa statistic of 0.56 (0.48-0.65 95% C.I.), however, suggests moderate agreement (Landis and Koch 1977) between the MEPS-HC reports of Medicare-covered home health care use and Medicare claims. This lower Kappa value results from the significant number of false positives (1.8% of the full matched sample, false positive rate=1.9%) and false negatives (2.2% of the full matched sample, false negative rate=44%) relative to the true positives (5.0%). Specificity was high (98%) but sensitivity was low (56%). The false positives and false negatives largely

7

balanced each other out, with the net result that 4.6% of the matched sample were reported to have Medicare-covered home health care services in the MEPS-HC compared to 5.0% in the Medicare claims. This difference in reports of any home health care use between the MEPS-HC and Medicare claims was not statistically significant (p=0.275).

Table 2 presents additional comparisons between the MEPS-HC and Medicare claims in the intensity of home health care use. In the full matched sample, there were no statistically significant differences between the MEPS-HC and Medicare claims in either the mean number of months of Medicare-covered home health care services (0.13 vs. 0.15, p=.203) or mean Medicare spending (2003 dollars) on home health care services ($142 vs. $159, p=.339). Similarly, there were no statistically significant differences in the average numbers of months of home health care use among users (2.9 vs. 3.0, p=.575) and average Medicare spending per Month ($1077 vs. $1070, p=.939). Lin's concordance correlation coefficients were 0.59 (0.44-0.74 95% C.I.) for number of months per person and 0.49 (0.33-0.65 95% C.I.) for Medicare spending per person.

DISCUSSION

Similar levels of reporting of Medicare covered home health care services and spending were found in the MEPS-HC compared to Medicare claims for the matched sample. This suggests that, in aggregate, the MEPS-HC is a reliable source for data on Medicare-covered home health care services.

At the individual level, we found moderate agreement between the MEPS-HC and Medicare claims. We lack the power to analyze differences in reporting accuracy of home health care services across subgroups of Medicare beneficiaries. However, in previous analyses with this matched sample, we found that the variations in reporting accuracy of inpatient hospital

stays, emergency department visits, and office-based visits across population subgroups were generally small (Zuvekas and Olin, forthcoming).

Some of the differences in reporting accuracy at the individual level in the MEPS-HC may be related to uncertainty over whether or not home health care services reported in the MEPS for Medicare beneficiaries actually were covered by Medicare. That is, false negatives can arise not only in situations where a MEPS respondent reports no use of home health care use, but also when home health care use was reported but Medicare was not identified as paying for those services when Medicare administrative records indicate otherwise. Conversely, Medicare may be identified incorrectly as a payer for home health care services reported in MEPS, leading to false positives. We note that Medicare covers only a minority of home health care use even among Medicare beneficiaries, increasing the likelihood of misidentifying Medicare as a payer compared to other types of health care utilization. For example, Medicare pays some portion of almost all inpatient hospital stays of Medicare beneficiaries (the notable exception being for Veterans Affairs hospitals). Further methodological investigations of the editing and imputation procedures in MEPS may yield better alignment of payment sources for home health care services. In particular, analyses of the types of services provided and types of home health providers utilized might better identify situations where Medicare is likely to be a payment source.

Other caveats apply. First, while we matched a large sample of Medicare beneficiaries in MEPS to claims data, our matched sample itself is not nationally representative of Medicare beneficiaries. Although we used a propensity-score reweighting procedure to adjust for differential matching, this may not account for all differences between our matched sample (38% of all Medicare beneficiaries in MEPS for 2001-2003) and the full Medicare population.

Second, we examine household reporting for Medicare beneficiaries only and our findings may

not generalize to the reporting for other family members of Medicare beneficiaries or to the rest

of the U.S. population residing in households with no Medicare beneficiaries. This is less of a

concern for home health care services compared to other types of health care use because

Medicare beneficiaries account for more than three-quarters of all home health care expenditures

(Author's tabulations from the 2003 MEPS).

REFERENCES

Agency for Healthcare Research and Quality. 2008. *Medical Expenditure Panel Survey Summary Data Tables- Table 9: Home Health Services – Median and Mean Expenses per Person with Expense and Distribution of Expenses by Source of Payment: United States, 2006*. Available online at http://www.meps.ahrq.gov/mepsweb/data_stats/quick_tables.jsp (accessed 16 June 2009).

Carroll NV, Slattum PW, and Cox FM. 2005. "The Costs of Falls Among the Community-Dwelling Elderly." *Journal of Managed Care Pharmacy* 11(4): 307-316.

Centers for Medicare and Medicaid Services. 2009. *National Health Expenditures Accounts: Definitions, Sources, and Methods, 2007*. Available online at http://www.cms.hhs.gov/NationalHealthExpendData/downloads/dsm-07.pdf (Accessed 16 June 2009).

Cohen JW. 1997. *Design and Methods of the Medical Expenditure Panel Survey Household Component*. MEPS Methodology Report no. 1, AHCPR Pub. no. 97-0026. Rockville, Md.: Agency for Health Care Policy and Research (AHCPR).

Cohen JW, Monheit AC, Beauregard KM et al. 1996/1997. The Medical Expenditure Panel Survey: A National Health Information Resource. *Inquiry* 33(4): 373-389.

Cohen SB. 1997. *Sample Design of the 1996 Medical Expenditure Panel Survey Household Component*. MEPS Methodology Report no. 2, AHCPR Pub no. 97-0027. Rockville, Md.: AHCPR.

Ezzati-Rice T, Rhode F, and Greenblatt J. *Sample Design of the Medical Expenditure Panel Survey Household Component, 1998-2007*. MEPS Methodology Report no. 22. Rockville, Md.: AHRQ.

Landis JR and Koch GG. 1977. "The measurement of observer agreement for categorical data" *Biometrics* 33: 159–174.

Lin LI. 2000. "A Note on the Concordance Correlation Coefficient". *Biometrics* 56: 324–325.

Lin LI. 1989. "A Concordance Correlation Coefficient to Evaluate Reproducibility". *Biometrics* 45 (1): 255–268.

McAuley WJ, Spector WD, Van Nostrand J, Shaffer T. 2004. "The Influence of Rural Location on Utilization of Formal Home Care: The Role of Medicaid." The Gerontologist 44(5): 655-664.

Moon S and Shin J. 2006. "Health Care Utilization among Medicare-Medicaid Dual Eligibles: A Count Data Analysis. *BMC Public Health* 6:88. Newacheck PW, Inkelas M, and Kim SE.

2004. "Health Services Use and Health Care Expenditures for Children with Disabilities." *Pediatrics* 114: 79-85.

Olin GL, Zuvekas SH, Kumar V, et al. 2008. "Medicare-MEPS Validation Study: A Comparison of Hospital and Physician Expenditures." Agency for Healthcare Research and Quality Working Paper No. 08003, March 2008.

Spector WD, Cohen JW, and Pesis-Katz I. 2004. "Home Care Before and after the Balanced Budget Act of 1997: Shifts in Financing and Services." *The Gerontologist* 44(1): 39-47.

Williams RL. 2000. A Note on Robust Variance Estimation for Cluster-Correlated Data. *Biometrics* 56(2): 645-646.

Zhu CW. 2004. "Effects of the Balanced Budget Act on Medicare Home Health Care Utilization." *Journal of the American Geriatric Society* 52: 989-994.

Zuvekas SH and Olin GL. *In press*. "Validating Household Reports of Health Care Use in the Medical Expenditure Panel Survey," *Health Services Research*.

Zuvekas SH and Olin GL. 2009. "An Examination of the Accuracy of Medicare Expenditures in the Medical Expenditure Panel Survey," *Inquiry* 46(1): 92-108.

Table 1.   Agreement between MEPS-HC and Medicare Claims on Any Use of Medicare-Covered Home Health Care Services, 2001-2003 Matched Sample (n=4,045 person-year observations)

| | | MEDICARE CLAIMS | | |
		NO	YES	TOTAL
MEPS-HC	**NO**	93.2% (0.6)	2.2% (0.3)	95.4% (0.5)
	YES	1.8% (0.3)	2.8% (0.3)	4.6% (0.5)
	TOTAL	95.0% (0.4)	5.0% (0.4)	100.0%
Kappa Statistic		0.56 (0.4)		
Agreement Rate		96.0% (0.4)		

Notes: All estimates were weighted using the propensity-score derived weight for the matched sample. All statistical tests adjusted for the clustered and stratified design of MEPS using the method of Balanced Repeated Replication which also accounts for lower levels of clustering at the household and individual level.

Standard errors in parentheses.

Table 2. Agreement between MEPS-HC and Medicare Claims on Quantity of Medicare-Covered Home Health Care Services, 2001-2003 Matched Sample (n=4,045 person-year observations)

	weighted sample mean		Lin's Concordance Correlation Coefficient
	MEPS-HC	**Medicare Claims**	
Full Sample:			
% With Any Medicare-Covered Home Health Care Use	4.6 (0.5)	5.0 (0.4)	----
Number of Months of Medicare Covered Home Health Services	0.13 (0.02)	0.15 (0.02)	0.59 (0.08)
Total Medicare Spending on Home Health Care Services	$142 (24)	$159 (25)	0.49 (0.08)
Among Users:			
Number of Months of Medicare Covered Home Health Services	2.9	3.0	----
Per Month Spending	$1,077	$1,070	----

Notes: All estimates were weighted using the propensity-score derived weight for the matched sample. All statistical tests adjusted for the clustered and stratified design of MEPS using the method of Balanced Repeated Replication which also accounts for lower levels of clustering at the household and individual level.
Standard errors in parentheses.

ACKNOWLEDGEMENTS