

COMPARISON OF THE SURVEY ESTIMATES FROM THE MEDICAL EXPENDITURE PANEL SURVEY AND THE MEDICARE CURRENT BENEFICIARY SURVEY

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INTRODUCTION

A large part of the U.S. Department of Health and Human Services (HHS) responsibilities involve the production, collection, aggregation, analysis, and dissemination of health data and information. In this regard the Department conducts numerous surveys of the U.S. population (HHS Directory of Health and Human Services Data Resources, 1999). Some of these are ongoing and have been in existence for many years. For example, the National Health Interview Survey (NHIS) has been conducted for more than 40 years (NCHS, 1999). Others are a one time or periodic surveys of special topics or populations such as the Hispanic Health and Nutrition Examination Survey. Two of the Department's many surveys were specifically designed to produce annual estimates for a variety of measures related to health care use, expenses, sources of payment, health status and insurance coverage. These are the Medical Expenditure Panel Survey (MEPS) and the Medicare Current Beneficiary Survey (MCBS). Both are national representative population based samples; longitudinal, with overlapping panels; and require multiple rounds of in-person data collection to produce an annual estimate of health care use and expenditures. The main difference between the MEPS and the MCBS is with respect to their target populations. The universe for the MEPS household survey is the entire U.S. civilian noninstitutionalized population. The universe for the MCBS is the current U.S. Medicare Beneficiary population -- including the institutionalized, non-institutionalized, as well as those disabled under 65 years of age.

As part of the efforts to "reinvent government", DHHS has undertaken an initiative to restructure its health surveys with the intent of filling major data gaps, and improving the analytic utility and operational efficiencies of the Department's surveys. Known as the HHS Survey Integration Plan, current efforts include: the integration of survey samples; coordination of questionnaires to reduce overlap and increase analytic

capability; and consolidation of field operations (HHS Plan for Integration of Surveys, 1999).

The research reported here was undertaken to further the goals of the Survey Integration Plan, which called for "the analytic linkage of the MCBS and the MEPS samples" (HHS Plan for Integration of Surveys, 1999). As part of the effort to assess the feasibility of an estimation strategy that combines the survey samples, we compare and contrast the design of each survey, explore issues for combining data, and compare and contrast estimates from the surveys. The paper also includes a discussion of key analytic measures considered incompatible for pooling, given survey differences, and provide some recommendations for future efforts.

SURVEY DESIGN

The MEPS

The Medical Expenditure Panel Survey is the third in a series of similar national health care surveys for the U.S. civilian noninstitutionalized population (J. Cohen, 1997; SB. Cohen, 1997). It is co-sponsored by the Agency for Health Care Policy and Research (AHCPR) and the National Center for Health Statistics (NCHS).

Beginning in 1996, the MEPS household survey was re-designed as part of DHHS Survey Integration efforts (Cohen, S, 1997). The MEPS household sample is now selected from households that responded to the most recently completed National Health Interview Survey (e.g., the '96 MEPS was selected from the '95 NHIS). It is a longitudinal two year overlapping panel survey that includes an over-sample of households containing racial and ethnic minorities (Blacks and Hispanics). It is dispersed over 195 primary sampling units (PSU's).

MEPS data are collected for all household members with computer-assisted personal interviewing (CAPI) methods. Three rounds of data collection are required for a calendar's year worth of data. Typically, one household member reports for the household. Westat, Inc., is the prime data collection contractor. The overall MEPS person-level response rate for deriving annual estimates (for 1996) is 70.2 percent, after factoring in the impact of survey attrition (Cohen, et al., 1999).

The MCBS

The Medicare Current Beneficiary Survey is also a continuous multipurpose nationally representative survey. The sample includes the aged, disabled, and institutionalized current Medicare Beneficiaries and includes an over-sample of the oldest old (85 and older) and the disabled populations (Adler, 1991; MCBS: Survey Overview, 1999). Sponsored by the Health Care Financing Administration (HCFA), it is a comprehensive source of information on the entire spectrum of Medicare Beneficiaries -- those residing in the community and in long-term care (LTC) health institutions.

The survey is a person based rotating panel design. Each fall about one-third of the sample is retired and new sample persons added. Beginning with the 1994 sample, each year's supplementary sample is selected to represent the national population of beneficiaries. MCBS data are collected via CAPI over a four year period in order to produce use and expenditure data for each year, of a three year period. One person is sampled per household and is typically the survey respondent (proxies are utilized 15 percent of the time). Data are collected by Westat, Inc. in 107 PSU's. Response rates, for the community data collection efforts are comparable to those in the MEPS household survey.

The MCBS survey data are supplemented with information from the sampled person's Medicare claims data; currently it is not possible to supplement data for MEPS sample persons with claims information.

STUDY POPULATION

The MEPS and MCBS populations used for this analysis are the community dwelling 1996 Medicare Beneficiaries (Table 1). When weighted with the appropriate calendar year (use and expenditure) sampling

Table 1. Survey sample sizes, by age, 1996

Age	MEPS	MCBS
< 65 years	343	1,786
65 and older	2,515	8,851
Total	2,858	10,637

Source: AHCPR, 1999.

weight, each sample represents approximately 37 million persons. Specifically excluded from analysis are all persons sampled in the MEPS nursing home component (Potter, 1998) and persons from the MCBS sample who were resident in LTC institutions for all of 1996. MEPS and MCBS persons dwelling in both the community and an institution, during 1996, are included in the analysis only for their periods of community dwelling.

Basic demographic characteristics were compared for the two study populations. No important differences were seen on the dimensions of age, gender and race/ethnicity for the MEPS household sample of beneficiaries in comparison to the MCBS population (data not shown).

USE AND EXPENDITURE ESTIMATES

As noted, the MEPS and MCBS were designed to measure health care utilization and expenditures for their respective target populations. Many of the data collection methods employed on these surveys are comparable, especially when considering that the same data collection contractor is used. However, there are notable differences in their CAPI questionnaire design and in the estimation methods.

Questionnaire Design

The MCBS questionnaire was designed to collect data on a single person, while the MEPS questionnaire was designed to collect data on all household members (MCBS: Questionnaires, 1999; MEPS: Survey Instruments and Associated Documentation, 1999). Thus, there is considerably more looping in the MEPS instrument as the questionnaire's focus can move from: family-level to a person, from person to person; and from a person to multiple events (the level at which utilization and expenditure data are collected, e.g., physician visit). But there are other dissimilarities.

Some of these difference can be attributed to when the surveys were initially designed and programmed. Between 1990 (MCBS) and 1995 (MEPS) numerous changes occurred in the health care industry, and the Westat CHESHIRE software (used to program the two CAPI applications) continued to advance to a more sophisticated architecture, which MEPS could take advantage of more easily.

Other differences are the result of the reimbursement mechanisms used for health care services. For example, to facilitate the linkage of the MCBS survey data to the HCFA billing data, the MCBS was designed to collect some survey data at the claims level (when the respondent had a copy of the Medicare Statement), in contrast to the MEPS, where expenditures are typically collected from respondents at an event level.

Each survey has questions that are used to illicit all personal health care use, regardless of the sources of payment. Some examples of the types of service use that are enumerated are:

- Medical provider use (physicians, other

providers who work under the direct supervision of a physician)

- Hospital inpatient stays
- Hospital outpatient visits
- Emergency room visits
- Use of home health services
- Dental service use
- Prescribed medicine use
- Other medical expenses.

However, there are differences across the surveys in: question wording, the order of the questions and question modules, the amount of detail required about an event, what probes and show cards are used to prompt respondent recall of an event, and the definition of a service type. For example, the MCBS asks:

Since (DATE), did (SP) see any medical doctors? [INCLUDE ANY VISITS FOR TESTS / X-RAYS.]

In contrast, the MEPS asks:

Since (DATE), did (PERSON) see or talk to any medical doctor or nurse, such as those types listed on this card? [Please include telephone calls or visits where (PERSON) received advice, prescriptions or test results.]

MCBS enumerates conditions during the collection of utilization data. MEPS enumerates conditions prior to (as well as during), use data collection. (Condition enumeration can prompt the recall of event utilization; Bradburn, Rips and Shevell, 1987). MCBS collects expenditure information separate from the collection of the use information. For each use of service, MEPS collects use and expenditures together.

Estimation Methods

Both the MEPS and the MCBS estimate use and expenditures for a calendar year, but utilize a slightly different estimation methodology.

The MCBS was designed to utilize information reported in the Medicare administrative data, most notably, the Medicare fee-for service billing information (MCBS; Survey Overview, 1999). There are two primary reasons for this:

- Correct for under-reporting of events in the survey reported data
- Correct errors in the payment information collected during the survey.

This requires the matching of Medicare claims information with individual events reported in the survey (Eppig and Edwards, 1996). Neither source (MCBS survey data or Medicare claims data) is considered a “gold standard” (Eppig and Chulis, 1997; Linking Survey Data and Medicare Claims, 1999). Rather, the objective is to “create a combined record that embodies the best features of each data source.” The matching process is complicated, requires “extensive” efforts to complete, and is subject to error. A single survey reported event can link to multiple Medicare claims, and a single Medicare claim can link to multiple survey events.

Once the MCBS survey data is linked to the claims data, the survey reported use data is edited to include service use reported in the claims data, but not reported in the survey data (Eppig and Chulis, 1997).

In contrast, the MEPS does not (currently) have access to claims data; however, MEPS does conduct a survey of medical providers that is linked to persons in the MEPS household survey (Cohen, 1998). Known as the Medical Provider Component (MPC), the MEPS MPC was designed to:

- Serve as a data replacement source for household reported events with missing expenditure information
- Serve as an imputation source to reduce the level of bias due to item non-response
- Serve as the primary data source for expenditures for hospital based events
- Permit evaluation of the level of agreement between household and provider reported utilization.

Thus, in order to make estimates of expenditures, the MEPS, like the MCBS, requires the linking of survey reported events to provider reported data. But, unlike the MCBS -- where all sampled persons with Medicare reimbursable service use should be included in the provider claims -- the MEPS MPC data are for a subset of household survey persons. This is the result of MEPS MPC sub-sampling and non-response. To control for this potential effect, the MEPS data (used here) does not incorporate an adjustment for use reported solely by a MEPS MPC medical provider.

Utilization Comparisons

Given all of the similarities, and differences, between the MEPS household survey and the MCBS community survey, we investigated the comparability of estimates for health care use (expenditure data were not available). Of particular interest was what effect would the inclusion

of MCBS Medicare claims only events have on the use estimates, when compared to MEPS, which had (at the time) no similar utilization adjustment. To do this, it was necessary to subset the MCBS (Cost and Use File) and the MEPS data, to a common set of health care events. Thus, events for dental service use were excluded, since they rarely appear in Medicare claims. Also excluded was prescribed medicine utilization -- the MEPS design was judged as too different from MCBS's to permit a comparisons for this report. Home health service use and other medical expenditures use were excluded because these services had no common event-level definition across surveys. For example, MEPS home health use is measured monthly for a person, but is only reported as a yearly aggregate for MCBS sampled persons.

When the analyses were limited to utilization data reported only by survey respondents (and weighted with the appropriate weight), there were no significant differences between the MEPS and MCBS on the estimate of the number of health care utilization events, for three types of hospital-based service use (Table 2).

Table 2. Preliminary comparison of health care utilization estimates for the community dwelling Medicare beneficiary population, by data source, 1996

Events (in millions)	HS Rpt - No Claims		MCBS w/ claims
	MEPS	MCBS	
Inpatient stays	8.9	10.3	11.9*
Hospital ambulatory visits	45.7	50.0	78.5*
Outpat. visits	39.3	43.3	--
ER visits	6.4	6.7	--

* Significantly different from MEPS, $p < .05$. Standard errors, although not shown, were calculated using software that adjusts for the complex survey design of the MEPS and MCBS.

Source: AHCPR, 1999; G. Olin, Westat, 1999.

However, significant differences were found when the MEPS estimates were compared to MCBS data that was adjusted to also include events reported only in the claims. These difference were found for all service use types that could be assessed. Consistently, MCBS (with claims) reported more utilization than what was reported by the MEPS household survey respondents.

DISCUSSION

The Medical Expenditure Panel Survey Household Component and the Medicare Current Beneficiary Survey were specifically designed to produce annual national estimates of health care use, expenses, and sources of payment. They differ with respect to their target populations.

Sub-setting the MEPS and MCBS data to a common population of 1996 community dwelling Medicare

beneficiaries, estimates of health care utilization from the surveys were compared. No significant differences in health care use were seen when the comparisons were limited to data reported only by survey respondents. Difference were seen, between MEPS and MCBS, when the MCBS data also included use reported solely by the medical provider (in the claims data).

It is well known that dissimilar data collection methods can result in disparate survey estimates. Given the similarities in the MEPS and MCBS methods -- a three to four month recall period, use of memory recall aids, similar interviewing staffs and training methods -- and that no significant differences were seen between surveys (when analyses were limited to only survey reported data; Table 2, columns 1 and 2), evidence is provided to support the conclusion that the MEPS /MCBS community data could be pooled -- provided that use was based on survey reported data only.

The findings for hospital-based service use, when comparing MEPS survey only use, to MCBS use including claims (Table 2, columns 1 and 3), is suggestive of the under reporting of health care use in the MEPS and MCBS household surveys. This finding is consistent with previous research conducted on the MCBS (Eppig and Edwards, 1996; Eppig and Chulis, 1997; Linking Survey Data and Medicare Claims, 1999), as well as, numerous other health care use validation studies that controlled for data collection effects, including the effects of proxy reporting (for example: Cartwright, 1963; Cannel, 1977; Harlow and Linet, 1989; Eisenhower and Schmitt, 1994; Roberts, et.al., 1996; Steinwachs, et.al., 1998).

Recommendations for the Future

To implement an estimation strategy that permits the pooling of samples from the MEPS and the MCBS, as suggested by the DHHS Survey Integration Plan, requires careful consideration of the technical issues. These findings suggest that such a strategy may not be a straightforward task, although it would improve the precision of the estimates. Therefore, we recommend the following, prior to implementing a MEPS/MCBS combined sample estimation strategy.

- (1) Across the surveys, develop common definitions for all service use categories.

Should medical provider service use (and/or expenditures) include telephone calls, or exclude them?

Of particularly importance are service categories for events associated with multiple providers when providers bill separately for their services. Using the vocabulary of

Medicare claims data, these providers are known as “separately billing doctors” and “separately billing laboratories”. If during an office based physician encounter, blood was drawn and sent to a laboratory, should this encounter be represented in the pooled database as one medical provider event (one visit) or two medical provider events? If a physician sees a hospitalized person three times during an inpatient stay, is that one hospital utilization event (including all physician expenses) or one hospitalization and three physician visits?

(2) Develop a use and expenditure estimation strategy, that is as consistent as possible (between surveys) in the treatment of use reported solely by the medical provider (claims in MCBS, and the MPC in the MEPS).

Currently, MCBS adjusts the data to include utilization reported in the Medicare claims, but there is no similar adjustment for non-Medicare covered services. Similarly, the MEPS Household Component could be adjusted to include use reported only by the medical provider data (and may be in the future), but this is only possible for the subset of the events in the MEPS sample that were eligible for the MEPS MPC.

(3) Develop a consistent methodology to estimate expenditures for use provided in a HMO setting.

As Medicare beneficiaries move into a managed care environment, consideration needs to be given to insuring that these expenditures are estimated in an accurate manner, across surveys.

(4) Develop a MEPS/MCBS combined survey estimation weight that adjusts for the possible effects of sample design (e.g., sampling strata, post-stratification adjustments) and differential survey non-response.

This is especially important when joint analyses are to be conducted for important sub-populations. The MCBS is subject to “substantial sampling error” for estimates of small sub-groups (MCBS: Survey Overview, 1999).

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