MEPS

Design, Methods, and Field Results of the 1996 Medical Expenditure Panel Survey Medical Provider Component

# Methodology

## Report 9

U.S. Department of Health and Human Services
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## Abstract

The Medical Expenditure Panel Survey (MEPS) is the third in a series of nationally representative surveys of medical care use and expenditures sponsored by the Agency for Healthcare Research and Quality (AHRQ). MEPS comprises four component surveys. The Medical Provider Component (MPC) is a survey of medical professionals and institutions that provided care to sample persons in the MEPS Household Component. The MPC's primary focus is to collect data on expenditures for medical services provided to MEPS respondents. MPC data are critical in the development of MEPS national medical expenditure estimates because household respondents are not always a reliable source of information on medical expenditures. This report describes the design of and methods used in the 1996 MEPS MPC. In addition, information is included on the MPC objectives, instruments and procedures for data collection, sample sizes, and response rates.



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# The Medical Expenditure Panel Survey (MEPS)

## Background

The Medical Expenditure Panel Survey (MEPS) is conducted to provide nationally representative estimates of health care use, expenditures, sources of payment, and insurance coverage for the U.S. civilian noninstitutionalized population. MEPS also includes a nationally representative survey of nursing homes and their residents. MEPS is cosponsored by the Agency for Healthcare Research and Quality (AHRQ), formerly the Agency for Health Care Policy and Research, and the National Center for Health Statistics (NCHS).

MEPS comprises four component surveys: the Household Component (HC), the Medical Provider Component (MPC), the Insurance Component (IC), and the Nursing Home Component (NHC). The HC is the core survey, and it forms the basis for the MPC sample and part of the IC sample. The separate NHC sample supplements the other MEPS components. Together these surveys yield comprehensive data that provide national estimates of the level and distribution of health care use and expenditures, support health services research, and can be used to assess health care policy implications.

MEPS is the third in a series of national probability surveys conducted by AHRQ on the financing and use of medical care in the United States. The National Medical Care Expenditure Survey (NMCES) was conducted in 1977, the National Medical Expenditure Survey (NMES) in 1987. Beginning in 1996, MEPS continues this series with design enhancements and efficiencies that provide a more current data resource to capture the changing dynamics of the health care delivery and insurance system.

The design efficiencies incorporated into MEPS are in accordance with the Department of Health and Human Services (DHHS) Survey Integration Plan of June 1995, which focused on consolidating DHHS surveys, achieving cost efficiencies, reducing respondent burden, and enhancing analytical capacities. To accommodate these goals, new MEPS design features include linkage with the National Health Interview Survey (NHIS), from which the sample for the MEPS HC is drawn, and enhanced longitudinal data collection for core survey components. The MEPS HC augments NHIS by selecting a sample of NHIS respondents, collecting additional data on their health care expenditures, and linking these data with additional information collected from the respondents' medical providers, employers, and insurance providers.

## Household Component

The MEPS HC, a nationally representative survey of the U.S. civilian noninstitutionalized population, collects medical expenditure data at both the person and household levels. The HC collects detailed data on demographic characteristics, health conditions, health status, use of medical care services, charges and payments, access to care, satisfaction with care, health insurance coverage, income, and employment.

The HC uses an overlapping panel design in which data are collected through a preliminary contact followed by a series of five rounds of interviews over a 2½-year period. Using computer-assisted personal interviewing (CAPI) technology, data on medical expenditures and use for 2 calendar years are collected from each household. This series of data collection rounds is launched each subsequent year on a new sample of households to provide overlapping panels of survey data and, when combined with other ongoing panels, will provide continuous and current estimates of health care expenditures.

The sampling frame for the MEPS HC is drawn from respondents to NHIS, conducted by NCHS. NHIS provides a nationally representative sample of the U.S. civilian noninstitutionalized population, with oversampling of Hispanics and blacks.

## Medical Provider Component

The MEPS MPC supplements and validates information on medical care events reported in the MEPS HC by contacting medical providers and pharmacies identified by household respondents. The MPC sample includes all hospitals, hospital physicians, home health agencies, and pharmacies reported in the

HC. Also included in the MPC are all office-based physicians:

- Providing care for HC respondents receiving Medicaid.
- Associated with a 75-percent sample of households receiving care through an HMO (health maintenance organization) or managed care plan.
- Associated with a 25-percent sample of the remaining households.

Data are collected on medical and financial characteristics of medical and pharmacy events reported by HC respondents, including:

- Diagnoses coded according to ICD-9 (9th Revision, International Classification of Diseases) and DSM-IV (Fourth Edition, *Diagnostic and Statistical Manual of Mental Disorders*).
- Physician procedure codes classified by CPT-4 (Current Procedural Terminology, Version 4).
- Inpatient stay codes classified by DRG (diagnosis-related group).
- Prescriptions coded by national drug code (NDC), medication names, strength, and quantity dispensed.
- Charges, payments, and the reasons for any difference between charges and payments.

The MPC is conducted through telephone interviews and mailed survey materials.

## Insurance Component

The MEPS IC collects data on health insurance plans obtained through employers, unions, and other sources of private health insurance. Data obtained in the IC include the number and types of private insurance plans offered, benefits associated with these plans, premiums, contributions by employers and employees, and employer characteristics.

Establishments participating in the MEPS IC are selected through four sampling frames:

- A list of employers or other insurance providers identified by MEPS HC respondents who report having private health insurance at the Round 1 interview.
- A Bureau of the Census list frame of private-sector business establishments.
- The Census of Governments from the Bureau of the Census.
- An Internal Revenue Service list of the self-employed.

To provide an integrated picture of health insurance, data collected from the first sampling frame (employers and other insurance providers) are linked back to data provided by the MEPS HC respondents. Data from the other three sampling frames are collected to provide annual national and State estimates of the supply of private health insurance available to American workers and to evaluate policy issues pertaining to health insurance.

The MEPS IC is an annual panel survey. Data are collected from the selected organizations through a prescreening telephone interview, a mailed questionnaire, and a telephone followup for nonrespondents.

## Nursing Home Component

The 1996 MEPS NHC was a survey of nursing homes and persons residing in or admitted to nursing homes at any time during calendar year 1996. The NHC gathered information on the demographic characteristics, residence history, health and functional status, use of services, use of prescription medications, and health care expenditures of nursing home residents. Nursing home administrators and designated staff also provided information on facility size, ownership, certification status, services provided, revenues and expenses, and other facility characteristics. Data on the income, assets, family relationships, and caregiving services for sampled nursing home residents were obtained from next-of-kin or other knowledgeable persons in the community.

The 1996 MEPS NHC sample was selected using a two-stage stratified probability design. In the first stage, facilities were selected; in the second stage, facility residents were sampled, selecting both persons in residence on January 1, 1996, and those admitted during the period January 1 through December 31.

The sampling frame for facilities was derived from the National Health Provider Inventory, which is updated periodically by NCHS. The MEPS NHC data were collected in person in three rounds of data collection over a $1\frac{1}{2}$-year period using the CAPI system. Community data were collected by telephone using computer-assisted telephone interviewing (CATI) technology. At the end of three rounds of data collection,

the sample consisted of 815 responding facilities, 3,209 residents in the facility on January 1, and 2,690 eligible residents admitted during 1996.

## Survey Management

MEPS data are collected under the authority of the Public Health Service Act. They are edited and published in accordance with the confidentiality provisions of this act and the Privacy Act. NCHS provides consultation and technical assistance.

As soon as data collection and editing are completed, the MEPS survey data are released to the public in staged releases of summary reports and microdata files. Summary reports are released as printed documents and electronic files. Microdata files are released on CD-ROM and/or as electronic files.

Printed documents and CD-ROMs are available through the AHRQ Publications Clearinghouse. Write or call:

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Additional information on MEPS is available from the MEPS project manager or the MEPS public use data manager at the Center for Cost and Financing Studies, Agency for Healthcare Research and Quality, 2101 East Jefferson Street, Suite 500, Rockville, MD 20852 (301-594-1406).

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# Design, Methods, and Field Results of the 1996 Medical Expenditure Panel Survey Medical Provider Component

by Steven R. Machlin, M.S., and Amy K. Taylor, Ph.D., Agency for Healthcare Research and Quality

## Introduction

The 1996 Medical Provider Component (MPC) of the Medical Expenditure Panel Survey (MEPS) is a survey of medical professionals and institutions that provided care to sample persons in MEPS. The 1996 MEPS is the third in a series of nationally representative surveys sponsored by the Agency for Healthcare Research and Quality (AHRQ) to collect information on the health care utilization and expenditures of the American public. The first of these surveys, the National Medical Care Expenditure Survey (NMCES), was conducted in 1977, and the second, the National Medical Expenditure Survey (NMES), in 1987. The 1996 MEPS is cosponsored by AHRQ and the National Center for Health Statistics, both agencies of the U.S. Public Health Service.

The MPC's primary focus was to collect data on expenditures for medical services provided to MEPS sample persons. Data from the MPC are critical in the development of MEPS national medical expenditure estimates because household respondents are not always a reliable source of information on medical expenditures. In a significant number of instances, they are simply not aware of the total amount billed, services received, or how much the provider is paid for these services. This is especially true of individuals enrolled in the Medicaid program, where financial transactions occur only between the provider and the State Medicaid agency, and enrollees of managed care plans, who may be aware only of paying a predetermined copayment that is not necessarily related to the total amount the provider receives. In addition, inpatient hospital stays often produce bills that survey respondents are likely to overlook in the interview, such as bills from an anesthesiologist or pathologist that are paid separately from the main hospital bill.

This report describes the design of and methods used in the 1996 MEPS MPC. In addition, information is included on the MPC objectives, instruments and procedures for data collection, sample sizes, and response rates. Westat, Inc., the prime contractor for MEPS data collection, was assisted by the National Opinion Research Center in the collection of data for the 1996 MPC.

## Relationship Between Household and Medical Provider Components

The 1996 MEPS Household Component (HC) is a nationally representative survey of the U.S. civilian noninstitutionalized population (J. Cohen, 1997; S. Cohen, 1997). Its purpose is to collect detailed information on the demographic characteristics, health status, health insurance, employment, and medical care use and expenditures of individuals and families in this country. In 1996, the HC collected full-year data from a nationally representative sample of 8,655 families, totaling approximately 23,000 individuals in 195 different communities across the United States. HC information on all medical care events (e.g., doctor visits, hospitalizations) and associated expenditures for sample persons during 1996 was collected using computer-assisted personal interviewing (CAPI) in three interviews that were conducted during 1996-97. The 1996 MPC collected information about these medical events from a subset of the medical care providers of HC sample persons. These interviews were conducted primarily by telephone during 1997.

Data collected in the MPC are used in conjunction with HC data to produce MEPS national medical expenditure estimates. In general, the methodology used to develop these estimates was based on medical events reported in the HC, with expenditure data from the MPC used whenever possible.

## Objectives of the MPC

The primary objective of the MPC is to supplement and validate expenditure data collected in the HC for

selected types of persons and medical events. More specifically, MPC data are used to:

- Replace expenditure information reported in the HC with information reported by providers, which is generally more complete and may be less prone to reporting errors.
- Serve as an imputation source for item nonresponse to reduce the level of bias in survey estimates of medical expenditures.
- Serve as the source of expenditure information on physician charges that are associated with hospital care but not included in the hospital bill.
- Serve as the primary source of expenditure information for Medicaid recipients.

## Sample Selection: Design and Implementation

The sample for the MPC was chosen from medical care providers identified in the HC as having provided care to MEPS sample persons in 1996. The major categories of providers included were:

- Office-based medical doctors (MDs), doctors of osteopathy (DOs), and other medical providers under the supervision of MDs and DOs.
- Hospitals providing inpatient care, outpatient care (including visits to all provider types), or emergency room care.
- Home health agencies.

Dentists, optometrists, psychologists, podiatrists, chiropractors, and others not providing care under the supervision of an MD or DO were considered out of scope for the MPC. A separate pharmacy component in MEPS that collected data from pharmacies on expenditures for prescription medicines is not covered in this report.

A sampling scheme was developed for provider types covered by the MPC. In general, this scheme targeted providers associated with persons whose household-reported data were expected to be least sufficient for making estimates of medical expenses. The sample included all identified hospitals, home health agencies, and physicians providing care to Medicaid recipients. In addition, office-based physicians providing care to privately insured persons in managed care plans were sampled at higher rates than other physicians because households with members in those plans were not expected to report third-party payments accurately. The sampling scheme was implemented by the CAPI. Only providers for whom the respondent completed a signed permission form authorizing contact were candidates for data collection in the MPC. The overall rate at which respondents granted signed permission to contact their providers was about 85 percent.

It is important to note that the MPC was not designed as an independent survey for purposes of producing national estimates of total medical expenditures. In particular, the MPC does not cover all types of health care providers. Also, the MPC sample is generated from responses to the HC and only providers for whom the respondent completed a signed permission form were contacted. In summary, the MPC was designed mainly to collect information to help compensate for important areas of potentially unreliable and missing expenditure data in the HC.

### Office-Based and HMO Physician Samples

The MPC office-based physician sample included MDs and DOs, as well as providers practicing under the direction or supervision of an MD or DO (e.g., physician assistants and nurse practitioners working in clinics). Providers of care in private offices and health maintenance organizations (HMOs) were in scope for the MPC.

This sample was selected from each of the following three different groups of households, as classified from responses to the first household interview:

- *Medicaid:* Households with one or more persons enrolled in the Medicaid program.
- *Managed Care:* Households not classified as Medicaid that had one or more persons reported as covered by a private HMO insurance plan (with hospital and physician benefits) or a private plan that requires a person to sign up with a primary physician.

- *Other:* All households not classified as Medicaid or managed care.

Different sampling rates were applied to these groups in order to select higher proportions of persons enrolled in Medicaid and in managed care because those groups were expected to have less information on third-party payments for their medical care. Specifically, 100 percent of households with Medicaid recipients and 75 percent of households with managed care insurance arrangements were sampled, compared with only 25 percent of other households. Once a household was selected for the sample, all office-based physicians and HMOs associated with physician care provided to persons in that household in 1996 became part of the MPC sample. Overall, all physicians providing care for persons from more than half the MEPS sample reporting units with any visits (5,138 out of 8,991) were selected for the office-based physician MPC sample (Table 1).[1]

### Table 1. Medical Provider Component office-based physician sample, 1996

| Household group | Number of reporting units with physician visit(s) |
|---|---|
| Total | 8,991 |
| Not in sample | 3,853 |
| Total in sample | 5,138 |
| Medicaid | 1,745 |
| Managed care | 2,379 |
| Other | 1,014 |

**Source:** Center for Cost and Financing Studies, Agency for Healthcare Research and Quality: Medical Expenditure Panel Survey Medical Provider Component, 1996.

Prior to sample selection, households were sorted by selected geographic and demographic characteristics within each sampling group. This sorting, in conjunction with the systematic procedure used to select each sample, was designed to ensure greater control over the sample allocation.

## Hospital and Separately Billing Doctor Samples

All hospitals that were reported as the site of care for inpatient stays, outpatient department visits, and emergency room encounters for sample persons during 1996 were included in the MPC survey. Hospitals were sampled with certainty because household responses concerning hospital expenditures are often inaccurate or incomplete and a large percentage of national medical expenditures are associated with hospital care.

All physicians identified by sample hospitals as providing care to sample persons during the course of any hospital event in 1996 but whose charges were not contained in the hospital bill (often anesthesiologists, pathologists, and radiologists) were also included in the MPC. Data were collected for these "separately billing doctors" as a separate operation after the hospital data collection process was completed. To avoid duplication, separately billing doctors identified by hospitals were not included in the separately billing doctor sample if they had already been selected for the office-based physician sample, since the required expenditure data were already being collected.

## Home Health Agency Sample

All home health agencies, hospitals, social service agencies, and other places identified as providing paid home health care services to sample persons during 1996 were included in the MPC. However, self-

[1] MEPS reporting units primarily represent distinct families living in the same household (both single and multiple persons), but college students under 24 years of age living away from home are treated as living in separate reporting units.

employed and unpaid persons identified as providing home health care were not considered in scope for the MPC.

## Instruments and Data Collection Procedures

Providers for the MPC sample were identified based on three rounds of HC interviews in which data were collected about all health care received by sample persons in 1996. During these interviews, a provider directory database was used to conduct a computerized search for the sampled providers and to prepare a list for fielding the MPC. As stated previously, only providers for which sample persons had signed permission forms were fielded for the MPC.

The MPC data were collected primarily by telephone during 1997.[2] In these interviews, providers were asked about all the care they provided to the sample persons during 1996. The interview for office-based physicians, home health agencies, clinics, and separately billing doctors was directed to the person who handles the billing for the provider (either someone in the provider's office or an outside billing agency). Hospital interviews were conducted with both the billing department and the medical records department (to determine the names of all the doctors who treated the patient during a stay or visit and who may have billed separately). In some hospitals, it was also necessary to contact the administrative office to determine whether the doctors identified by medical records billed separately from the hospital and, if so, their addresses and phone numbers.

Different versions of the MPC questionnaires were used to collect data from different types of providers and are available on the MEPS Web site at the following addresses:

- Office-based providers (http://www.meps.ahrq.gov/) Medical Event Booklet (MPC) Questionnaire.
- Hospitals (http://www.meps.ahrq.gov/misc/questmpc/m-hosp4.PDF).
- Separately billing doctors (http://www.meps.ahrq.gov/misc/questmpc/sbd4.PDF).
- Home health agencies (http://www.meps.ahrq.gov/misc/questmpc/hh0213.PDF).

These questionnaires were designed to obtain information on both the medical and financial characteristics of care provided to sample persons. The following types of data were collected in the questionnaires:

- Diagnoses.
- Procedure and inpatient stay codes—CPT-4 (Current Procedural Terminology, Version 4) codes and DRGs (diagnosis-related groups).
- Charges or charge equivalents (where available) before any contractual adjustments or discounts.
- Sources and amounts of all payments made.
- The reasons for any difference between charges and payments.

In contrast to the other questionnaires, the home health questionnaire was structured to collect summary data on a monthly basis rather than on an event basis. In addition to the medical and financial items cited above (except procedure codes), this questionnaire asked for the types of practitioners who provided services and the number of hours of service or visits provided during the applicable month.

Interviewers who worked on the MPC data collection were required to have experience conducting interviews for an establishment survey or to have worked in a medical or medical billing setting. All interviewers had general training in basic interviewing techniques and administrative procedures and completed a 4-day training session covering the specifications and procedures for the MPC questionnaire.

## Sample Sizes and Participation Rates

For data collection purposes, a sampled medical provider, along with its associated patients in 1996, was considered an MPC case. A provider was classified as a participant if data were obtained about medical care

[2] About 10 percent of responding physician offices and roughly one-third of responding hospitals chose to provide medical records to the data collection contractors for abstraction rather than respond to a telephone interview.

provided during the year for any sample patients on most key data items. Key data items are:

- Date of visit (month of visit reported).
- Associated diagnosis—ICD-9 (9th Revision, International Classification of Diseases) or DSM-IV (Fourth Edition, Diagnostic and Statistical Manual of Mental Disorders) code.
- Service(s) provided (CPT-4 code or description).
- Reimbursement basis (fee-for-service or capitated).
- Sources of payments (for fee-for-service events only).

Table 2 contains a summary of 1996 sample sizes and participation rates for the various types of medical providers included in the MPC. Responses were obtained from 7,116 office-based physicians and HMOs, 3,067 hospitals, 6,857 separately billing doctors who provided care to sample persons at responding hospitals, and 309 home health agencies. Overall participation rates ranged from 87.5 percent for office-based physicians and home health agencies to 95.1 percent for hospitals. Refusal to participate (including unwillingness to accept signed permission forms) accounted for about 40 percent of the nonresponding hospitals and separately billing doctors, 50 percent of the nonresponding home health agencies, and 56 percent of the nonresponding office-based physicians and HMOs. The primary other reasons for nonparticipation were that the provider could not be located or had no record of the patient.

The number of respondents at the person-provider pair level can be calculated from Table 2 by multiplying the number of respondents by the sample persons per provider average. This average ranged from 1.1 for home health agencies to 2.0 for hospitals. Participation rates at the person-provider pair level were the same or slightly lower than at the provider level—86.0 percent for office-based physicians, 93.2 percent for hospital facilities, 88.6 percent for separately billing doctors, and 87.5 percent for home health agencies.

## Table 2. Sample sizes and participation rates in the Medical Provider Component sample by provider type, 1996

| Provider type | Sample size | Respondents | Participation rate | Sample persons per provider (average) |
|---|---|---|---|---|
| Office-based physician[a] | 8,131 | 7,116 | 87.5 | 1.35 |
| Hospital[b] | 3,224 | 3,067 | 95.1 | 2.00 |
| Separately billing doctor | 7,601 | 6,857 | 90.2 | 1.19 |
| Home health agency | 353 | 309 | 87.5 | 1.09 |

[a]This category includes health maintenance organization (HMO) providers. Based on provider's name, about 7 percent of the cases in this category were identified as HMO and were handled separately for data collection purposes.

[b]The hospital sample size is greater than the number of unique facilities because inpatient departments and other affiliated units, such as outpatient departments and satellite clinics, were treated as separate sample cases for some hospitals.

**Source:** Center for Cost and Financing Studies, Agency for Healthcare Research and Quality: Medical Expenditure Panel Survey Medical Provider Component, 1996.

## Use of Data in Estimation

Data obtained from providers in the MPC were critical in the development of MEPS expenditure estimates because household respondents did not always know the total payments for their medical events. Providers generally had complete information on reimbursement arrangements (capitation vs. fee-for-service) and how much was paid by individuals and other sources for the care delivered to sample persons.

In general, the methodology used to develop MEPS medical expenditure estimates was based on medical events reported in the Household Component, with expenditure data from the MPC used whenever possible. The first stage of the MEPS expenditure estimation methodology required matching the provider-reported expenditure data in the MPC to the household-reported medical events in the Household Component. When a match was found for a particular medical event, expenditure data from the MPC were substituted for household-reported information. Data collected in the MPC were also used to impute expenditures for medical events that were missing both HC and MPC data. This approach is similar to that used for the 1987 National Medical Expenditure Survey (Cohen and Carlson, 1994). In addition, more information on the 1996 estimation strategy is available on the MEPS Web site at <http://www.meps.ahrq.gov/> public use file HC-011.

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