# The Medical Expenditure Panel Survey

## *A National Information Resource to Support Healthcare Cost Research and Inform Policy and Practice*

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**Background:** The Medical Expenditure Panel Survey (MEPS) collects detailed information regarding the use and payment for health care services from a nationally representative sample of Americans. The survey is designed to provide analysts with the data they need to support policy-relevant research on health care expenses, utilization, insurance coverage, and access in the United States and to provide policymakers with the results and data they need to make informed decisions.

**Objectives:** This article summarizes the capacity of this broad-based and publicly available information resource to support research efforts directed towards achieving a better understanding of the dynamics of American healthcare and to better characterize its current state.

**Methods:** The MEPS comprises a nationally representative sample of the civilian noninstitutionalized population in the United States, and collects comprehensive data on individuals and their health care experiences over a span of 2 years. Household survey data are collected by means of computer-assisted personal interviews, and those data are supplemented by information collected directly from the medical providers used by survey participants. Insurance data are collected both from households and through a separate state and nationally representative survey of business establishments, which collects information on health insurance provided by United States employers.

**Results:** The MEPS has been used extensively in scientific publications and published reports, as well as by the Federal and state governments to examine the delivery and financing of healthcare in the United States.

**Conclusions:** The analytical findings generated by the MEPS are key inputs to facilitate the development, implementation, and evaluation of policies and practices addressing health care in the United States and its related costs. Recent efforts to reconcile MEPS and the National Health Expenditure Accounts have the potential to provide an even more accurate and powerful data tool for research and policy analysis.

**Key Words:** healthcare costs, national surveys, economic analysis

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Perhaps the most pressing problem with current US healthcare delivery is its high cost. Health care expenditures now represent nearly one-sixth of the United States Gross Domestic Product, exhibit a rate of growth that exceeds other sectors of the economy, and constitute one of the largest components of the Federal and states' budgets.[1] Projections indicate that at current rates of growth health care spending will reach $4.1 trillion by 2016, about double the current level, and constitute 20% of the nation's productive output.[2]

Despite the amount of resources devoted to healthcare in the United States, the existing structure has some troubling shortfalls with respect to access and quality. For example, almost 8% of the US population under the age of 65 was uninsured for a full 4-year period between 2002 and 2005, and over that same period more than one-quarter of the population was uninsured at some point during a year.[3,4] Research has shown that lack of insurance leads to difficulties in accessing care, which in turn leads to poor health outcomes.[5]

Quality problems have also been well documented. A widely publicized Institute of Medicine report on medical errors noted that preventable errors in hospitals may be responsible for as many as 99,000 deaths per year, making them one of the leading causes of mortality in the United States.[6] A follow-up report that examined the overall state of health care quality concluded, after a comprehensive review of the literature, that "Quality problems are everywhere, affecting many patients. Between the health care we have and the care we could have lies not just a gap, but a chasm."[7] Given the high costs, uneven access, and quality problems in US medical care delivery, the question of how to design a system that encourages efficient provision of quality care

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remains an issue of continuing concern to consumers, providers, payers, and policymakers.

To understand how health care is currently delivered and to move toward a system that efficiently provides quality care, researchers and policymakers need accurate, representative data. The growing demand for accurate and reliable information on the population's health care utilization, expenditures, insurance coverage, sources of payment, and access to care, served as the catalyst to initiate the family of national medical expenditure surveys sponsored by the Agency for Healthcare Research and Quality (AHRQ) and its predecessor agencies. AHRQ's Medical Expenditure Panel Survey (MEPS), cosponsored by the Centers for Disease Control's National Center for Health Statistics, collects detailed information regarding the use and payment for health care services from a nationally representative sample of Americans. This article summarizes the capacity of this broad-based and publicly available information resource to support research efforts directed toward achieving a better understanding of the dynamics of American healthcare and to better characterize the current situation, for example, through the development of disease specific health accounts as discussed later in this issue, as well as to inform proposals designed to improve the efficiency and effectiveness of healthcare policy and practice in the United States.

## Background

MEPS was initiated in 1996 and designed, in the aftermath of the health care reform effort of the early 1990s, as a continuous ongoing survey to permit annual estimates of health care utilization, expenditures, insurance coverage, and sources of payment for the US civilian noninstitutionalized population. Since 1977, AHRQ's expenditure surveys have been the only nationally representative surveys that combine data on Americans' insurance status, health conditions, and health care expenditures. Before the 1977 National Medical Care Expenditure Survey (NMCES), there was no individual database that provided a single source for nationally representative detailed data on individuals' and families' demographic characteristics, insurance coverage, health status, and medical care use and expenditures, even though an integrated source of such data is invaluable in efforts to model the impacts of changes in healthcare in the United States.[8] The MEPS is the most recent of these expenditure survey efforts.

The MEPS consists of a family of 3 interrelated surveys: the Household Component (HC), the Medical Provider Component (MPC), and the Insurance Component (IC). Insurance data are collected from households in the HC as well as from employers (businesses and state and local governments) in the IC. Table 1 summarizes the content of each of these components. The MEPS household sample, which provides the basis for HC and MPC data collection, is selected

**TABLE 1.** MEPS Questionnaire Content

| Survey Component | Respondent | Summary of Content |
|---|---|---|
| Household | Household member | Demographics (age, sex, race, ethnicity, etc.) |
| | | Health status and health conditions |
| | | Medical events by type: hospital (inpatient, outpatient, emergency room) office-based, dental, home health, prescribed medications, other (glasses, ambulance, equipment, etc.) |
| | | Dates of events, conditions associated with visits, characteristics of providers, services received, types of medicines purchased |
| | | Charges and payments by source for each event |
| | | Employment (including current employment, industry type, hours worked, wages, whether health insurance offered) |
| | | Health insurance (including source of health insurance; type of health insurance; policyholder; who in household is covered) |
| | | Income |
| | | Access to and satisfaction with care |
| | | Opinions and about medical care, health behaviors and preferences |
| Medical provider | Providers of care to household sampled persons | Dates of visits/admissions<br>Diagnoses (ICD-9 codes)<br>Services provided (CPT-4 codes)<br>Full charges (before adjustments and discounts)<br>Amounts of payments by source (patient or patient's family, private insurance, Medicare, Medicaid, VA, CHAMPUS and other)<br>Reasons for any difference between charges and payments. |
| Insurance | Employers (private businesses and state and local governments) | Establishment characteristics (type of business, numbers of employees, number of health insurance plans, whether establishment offers health insurance as an employee benefit)<br>Characteristics of plans offered (type of plan, specific medical services covered, enrollment, whether plan was self insured, stop loss coverage, administrative costs, deductible and coinsurance amounts, maximum coverage amounts, coverage of preexisting conditions)<br>Total premiums (single and family coverage)<br>Employee contributions<br>Total cost to organization |

from participants in the previous year's National Health Interview Survey (NHIS). The HC sample size has ranged from approximately 9,000 families and 22,000 individuals to the current 15,000 families and 35,000 individuals. The most recent MEPS-HC panel contains oversamples of the following policy relevant population subgroups: Hispanics, blacks, Asians, and low-income households. Another subgroup that has been oversampled in the survey consists of those more likely to incur high medical expenditures, based on their characteristics in the previous year as measured in the NHIS.[9–11]

Data from 2 panels are combined to produce estimates for each calendar year, and each panel separately produces longitudinal estimates over 2 years.[12,13] In addition, each MEPS Household Component (MEPS-HC) panel can be linked to the data from the previous year's NHIS to provide health care related information covering as many as 4 consecutive years. Although some data elements are similar in MEPS and NHIS, all MEPS data are collected independently and there is no formal reconciliation between the 2 surveys.

The MEPS-HC is designed to provide annual national estimates of the health care use, medical expenditures, sources of payment, and insurance coverage for the US civilian noninstitutionalized population. In addition to collecting data designed to yield annual estimates for a variety of measures related to and health care coverage, use, and expenditures, the MEPS-HC also provides data on individuals' health status, demographic characteristics, employment, and access to health care, which can be aggregated to provide estimates for families and population subgroups of interest.

The MEPS-HC consists of an overlapping panel design (Fig. 1) in which any given sample panel is interviewed a total of 5 times in person over a fielding period of about 30 months. This yields annual health insurance coverage, use, and expenditure data for 2 calendar years. The rounds of interviewing for any individual sampled family are spaced about 5 months apart. The interview is administered through a computer-assisted personal interview loaded onto a laptop computer, and takes place with a knowledgeable family respondent who reports for him or herself and for other family members.

The MEPS Medical Provider Component (MEPS-MPC) is a supplement to the household component. It is designed to provide additional information on charges and sources and amounts of payment received by providers for care reported by household respondents. For the MPC, household interviewers obtain a permission form to collect information directly from the providers used by participants in the household survey, and those providers are contacted separately for charge and payment data associated with those events. The MPC focuses on individuals and types of medical events for which household respondents are known to be poor reporters. For example, persons covered by Medicaid typically do not receive a bill for services and consequently can not report how much the Medicaid program paid by for their care. Similarly, household survey respondents are often unaware of physician expenses associated with hospital stays that are paid directly by their insurance plan for services billed separately, for example anesthesia, radiology, or pathology. In such cases, accurate charge and payment infor-

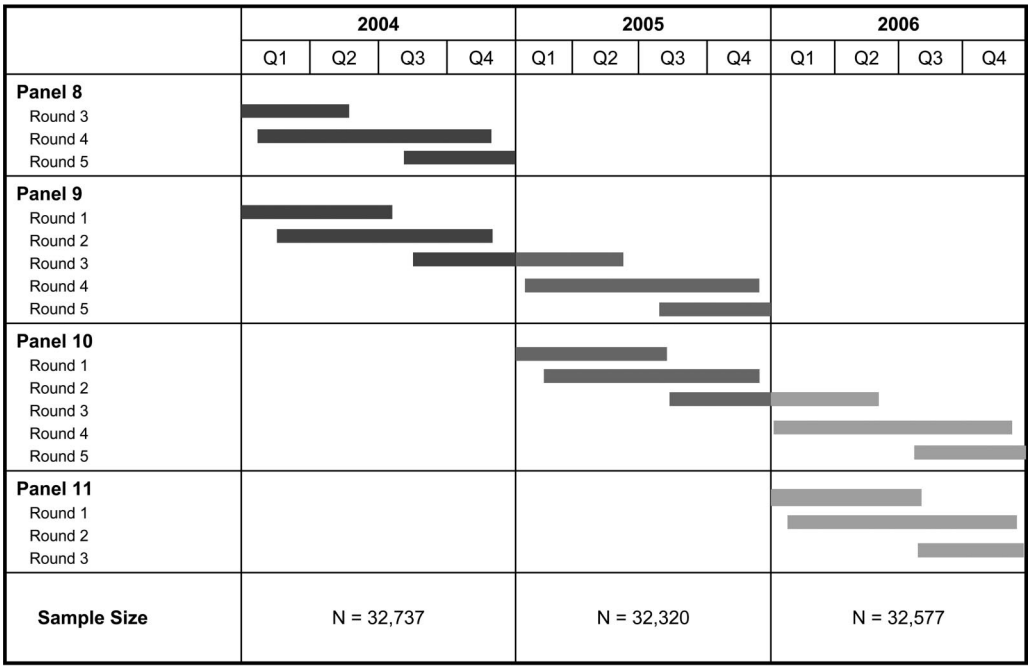


**FIGURE 1.** MEPS panel design: data reference periods.

mation must be obtained directly from providers, which is accomplished through the MPC. The MPC sample for 2006 consisted of approximately 5500 hospitals, emergency rooms, and outpatient departments, 12,000 office-based doctors, 7500 pharmacies, and 600 home care agencies used by MEPS sampled persons. In addition, the sample contained about 13,000 separately billed physicians who provided care associated with reported hospital events.

Because of inconsistencies in the reporting of the same medical events between the HC and MPC, medical events from the 2 sources must be linked using a statistical probabilistic matching procedure. The linked data set is then used as the primary source of data for expenditure estimation. Because the provider reported data are generally considered to be more accurate than household reported, where MPC data exist they are used to construct the MEPS expenditure variables even where data from both sources are available. Response rates for the MPC are high, ranging from about 80% for pharmacies to more than 90% for hospitals. (For more detail see the MEPS-MPC Methods report.)[14]

The MEPS Insurance Component (IC) is a survey of private business establishments and governments designed to obtain information on health insurance availability, coverage, and cost derived from employers in the United States. The sample for this survey is selected from the Census Bureau's Business Register for private employers and Census of Governments for public employers. The IC is an annual survey designed to provide both nationally and state representative data on the types of health insurance plans offered by employers, enrollment in plans by employees, the amounts paid by both employers and employees for those plans, and the characteristics of the employers.[15] The IC is not directly linked to the household survey. The data are collected by the Census Bureau and are protected under the confidentiality provisions of Title 13 (the Bureau's authorizing legislation).[16] As a result, IC data are disseminated publicly only through summary data tables posted on the AHRQ website.[17]

## Applications

Since its inception, MEPS data have been used in a variety of scientific publications and published reports, as well as by the Federal and state governments to examine healthcare delivery and financing in the United States.[18] Government and nongovernmental entities rely upon these data to evaluate health reform policies, examine the effect of tax code changes on health expenditures and tax revenue, and estimate the impacts of proposed changes in public health programs such as Medicare and Medicaid. Recently, for example, MEPS data were used to inform Congressional deliberations on the reauthorization of the State Children's Health Insurance Program.[19] MEPS data have also been used frequently to examine the scope and extent of private insurance coverage and expenditures, and in studies of expenditures for specific medical conditions, as will be discussed below. MEPS public use files and tabular data are readily available to researchers for download from the web (www.meps.ahrq.gov).

The data are also used to develop economic indicators and projections. For example, since 2000, data on premium costs from the MEPS Insurance Component have been used by the Bureau of Economic Analysis in estimates of the Gross Domestic Product for the nation.[20] The data are also used in calculating national health care cost estimates for the National Health Expenditure Accounts and to assess time trends in the provision of employer health benefits by many states.[21] In the following sections, we discuss the application of MEPS data to 2 issues that generate a high level of policy interest in the United States, enrollment in private and public health insurance, and expenditures for care.

## Health Insurance

Important questions for health care policymakers are the size and composition of the insured and uninsured populations, as well as information on how demographic characteristics, economic factors, and health status are associated with health plan eligibility and decisions to enroll in health insurance. Furthermore, efforts to address inequities in the availability of private health insurance and to control health insurance premiums and medical care costs need information about the employment-related health insurance market. MEPS data have provided information on these issues. For example, recent MEPS-based studies have examined changes in the sources of the health insurance held by individuals within families over time,[22] trends in retiree health coverage,[23] and eligibility and take up rates under the State Children's Health Insurance Program.[24] In addition, MEPS data and analyses were used in a recent Institute of Medicine report on the consequences of being uninsured, to examine the financial impacts of lack of health insurance on American families.[25]

MEPS data on duration of coverage for the US civilian noninstitutionalized population also provide a basis for examining issues related to the uninsured. Health insurance helps people get timely access to medical care and protects them against the risk of expensive and unanticipated medical events. Compared with people with healthcare coverage, uninsured people are less likely to visit a doctor, have a usual source of medical care, receive preventive services, or have a recommended test or prescription filled. Consequently, individuals who experience extended periods of being uninsured are particularly at risk for restrictions in access to care, exposure to untreated illness and financial jeopardy. Because of its flexibility as a source of data on the duration of coverage in the United States, research efforts using MEPS were able to distinguish that individuals who experienced short spells of being uninsured differ significantly from those who have been uninsured for more than a year. The 2 groups differ on several dimensions, including access to employer sponsored coverage, attitudes and preferences regarding the need for coverage, and sensitivity to the cost of acquiring coverage.[26,27]

MEPS data also support examination of insurance coverage not just annually or at a single point in time, but at all points over a 2-year period, or 4 years when MEPS data are linked to the NHIS, thus allowing analyses of patterns and changes in coverage over time. Allowing alternative definitions of the uninsured provides a basis for evaluating proposals for covering that population, where policymakers may want to make distinctions between those uncovered for short

periods of time versus those uncovered for at least 6 months or a year. Information on the particular characteristics of the long-term uninsured may assist in targeting policy proposals for encouraging greater take up of private insurance among that population. In this area, the MEPS data have been the basis for both published and unpublished studies of what it would cost to provide coverage for those currently uninsured.[28]

The survey's inclusion of data on both insurance coverage and expenditures makes MEPS and its predecessor surveys one of the few sources of nationally representative data for analyses of the adequacy of health insurance in preventing excessive financial burdens, a topic often referred to as under-insurance. Although information on insurance coverage is available from other surveys, it is the combination of information on coverage, family income, and expenditures that makes MEPS unique and allows analyses of this issue. Underinsurance is typically defined as being at risk for spending more than a certain amount of family income on out-of-pocket expenses in the event of a catastrophic medical illness. By combining information on private insurance coverage, family income, and individuals' medical expenditures analysts have been able to estimate the extent to which individuals who are insured nonetheless are confronted with extraordinarily burdensome medical expenditures. A recent MEPS-based study estimated that 17.1 million persons under age 65 were underinsured in 2003, even though many of them had private employment-related or private nongroup insurance.[29]

## Expenditures

With health care absorbing increasing amounts of the nation's resources, the question of how to design a system that encourages the provision of high quality care as efficiently as possible remains an issue of continuing concern to both private and public payers. To address this issue, researchers and policymakers have used MEPS data to better understand how individual characteristics, behavioral factors, financial incentives, and institutional arrangements affect health care expenditures in a rapidly changing health care market. For example, research findings from the MEPS have served to provide health care decision makers with a better understanding of the highly concentrated nature of health care expenditures and the persistence of these high expenditures over time.[30–32] MEPS studies that examine the persistence of high levels of expenditures over time have been used to discern the factors most likely to drive health care spending and the characteristics of the individuals who incur them.

The MEPS has also been used to examine the impact of specific conditions on both levels and rates of growth in medical expenditures. It is the only source of nationally representative data on individuals' use of and expenses for medical services, which are linked to specific conditions. National estimates of the costs of specific illnesses, sources of payment for specific conditions, and the extent to which particular conditions or combinations of conditions contribute to persistently high expenditures all depend on the MEPS. For example, recent MEPS analyses have indicated that persons with chronic conditions account for more than three-quarters of overall medical care expenditures in the United States, that increases in treated disease prevalence are associated with a large proportion of the increase in expenditures under private insurance, and that the growing rate of obesity in the United States is a large contributor to the country's increasing medical expenses.[33–37]

When MEPS data are aligned and reconciled to the National Health Expenditure Accounts (NHEA), it further enhances estimates of the costs of illness. The NHEA and the MEPS provide 2 of the most comprehensive sources of estimates of national expenditures for health care. The NHEA include a broader population and a wider range of health care expenditures than MEPS, while MEPS includes person-level data that can support disease specific costs that are not available from the NHEA. One of the main reasons to reconcile the 2 sources of data is to provide a consistent baseline of health care expenditure data for policy purposes that can also be projected into future years consistent with NHEA expenditure projections. Although alignment and reconciliation are not used to adjust the official estimates from either data source, they do document the differences and provide a basis for calibrating MEPS estimates to the NHEA for analytic studies or policy simulations.

Aligning the databases is the first step in assessing how well the MEPS compares with the NHEA. This process involves making various subtractions to the NHEA so that it includes only the smaller subset of direct personal health care costs and the smaller population measured by the MEPS, and then aligning the various health care services and sources of payment so they are consistent across the 2 datasets.[38] AHRQ and Centers for Medicare and Medicaid Services staff recently completed a project aligning and then reconciling MEPS and NHEA expenditure estimates for 2002.[39] The results indicated that MEPS estimates of national health care spending are about 14% lower than the MEPS-aligned estimates from the NHEA. This is the difference after having removed from the NHEA expenditures for populations and services not covered by the MEPS. To inflate MEPS to the overall NHEA total, estimates of expenditures for those populations and services would have to be added as well.

Combining data from MEPS and NHEA has the potential to create an even more powerful methodological tool for studying cost of illness. A nationally representative, person level database such as the MEPS provides the basis for cost of illness studies that can avoid duplication of costs and overcome the problem of comorbidities, as can be seen in the Rosen and Cutler article also in this volume. Furthermore, using a nationally representative database that is reconciled to the National Health Expenditure Accounts permits the generation of cost of illness estimates that are consistent with national health expenditure estimates.

# DISCUSSION

## Limitations

Although the MEPS is unique in its breadth and depth of information on individuals' insurance coverage, medical

care use, and expenditures in the United States, there are some limitations to the data. First, as noted above, the survey is limited to the civilian, noninstitutionalized population and thus excludes individuals in institutions, for example, nursing homes. As a result, the survey excludes some high cost populations and precludes studies of transitions between acute and long-term care.

Second, although the MEPS is comprehensive in terms of including the full array of subgroups in the noninstitutionalized population and all types of formal medical care used by that population, because utilization estimates from the survey are based on household reports there is some underreporting of individual medical events. As noted above, MEPS expenditure estimates are lower than comparable estimates from the National Health Expenditure Accounts, which preliminary research has suggested is a result both of some overall underreporting of events by households and the difficulty of representing the high cost tail of the distribution with a national sample.

Another issue is that household respondents are subject to misreporting because of a lack of specific technical knowledge. For example, condition information in the MEPS is largely based on household respondents' descriptions of conditions that resulted in medical visits or limitations in activities for themselves and their family members. Because of the technical nature of condition identification and coding, this leads to some level of misreporting, particularly at high levels of specificity. Because of this, as well as confidentiality concerns, ICD-9 (International Classification of Diseases—9th revision) conditions reported in the public use files are reported only at a 3-digit level of specificity, rather than the full 5-digit level. In addition, much of the condition related research conducted using the MEPS is based on aggregations of conditions, as developed by AHRQ in the Clinical Classification Software (CCS) system. The CCS is a tool for clustering the approximately 17,000 ICD-9 condition codes into 285 mutually exclusive and homogeneous categories that are more tractable for analytic purposes.[40] Recent research has indicated that household condition reporting in MEPS is most accurate for conditions that are highly salient to individuals because they involve ongoing treatment, prescribed medications, or lifestyle changes. Thus, MEPS can support many, but not all types of condition analyses.[41]

Finally, many of the MEPS databases include considerably more data than can be made available to the general public because of the constraints of confidentiality guidelines. To facilitate the use of such data while maintaining the confidentiality promised to respondents, AHRQ has developed a data center where researchers with approved projects can be allowed access to data files not available for public dissemination. To protect the confidentiality of respondents, the environment in the data center is monitored and researchers are allowed access only to the information required to complete their project. Information on how to access MEPS nonpublic use data can be found on the MEPS website.[42]

## CONCLUSION

MEPS is a publicly available, nationally representative resource to support research and inform policy on issues related to health insurance coverage, the cost and financing of health care, sources of payment and their distribution, access to care, and health care quality. Research on health care costs and financing, broadly defined, using the MEPS data has informed our understanding of the functioning of the employment-related health insurance market, and the cost, availability, and trends in coverage for workers in different economic and employment circumstances, as well as the number and characteristics of the uninsured. Related research efforts have focused on the impact of various payment mechanisms on quality and costs and the impact of specific conditions on overall medical expenditures and burden of illness. By including a wide range of content in the areas of health care costs, coverage, access, utilization, and quality, MEPS data can support analyses of the determinants of health care costs and their impacts on care, long-term trends in payment, coverage and access, and the identification of the dominant factors associated with increases in spending for medical care. These studies necessitate inclusion of controls for the impact of market factors, organizational structures, and processes on resource use and cost. The MEPS, because of its range of data and linkages to other databases, is well suited to support these investigations and other related analyses that are focused on the intersection of health care costs, coverage, access, and quality.

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