

2016 NATIONAL HEALTHCARE QUALITY AND DISPARITIES REPORT

Detailed Methods for the Medical Expenditure Panel Survey

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Background

The Medical Expenditure Panel Survey (MEPS) is designed to provide nationally representative estimates of health care use, expenditures, sources of payment, and insurance coverage for the U.S. civilian noninstitutionalized population. MEPS is cosponsored by the Agency for Healthcare Research and Quality (AHRQ) and the National Center for Health Statistics (NCHS). MEPS comprises three component surveys: the Household Component (HC), the Medical Provider Component (MPC), and the Insurance Component (IC). The HC is the core survey of MEPS.

The MEPS HC collects medical expenditure data at both the person and household levels. The HC collects detailed data on:

- Demographic characteristics,
- Health conditions,
- Health status, including adult disability status as measured by activity limitations,
- 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. Computer-assisted personal interviewing (CAPI) technology is used to collect data from each household on medical expenditures and use for 2 calendar years. This series of data collection rounds is launched each 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 sample of households selected for the MEPS HC is drawn from respondents to the National Health Interview Survey (NHIS), conducted by NCHS. The NHIS provides a nationally representative sample of the U.S. civilian noninstitutionalized population, with oversampling of Hispanics and Blacks. In addition, MEPS oversamples Asians, Blacks, and poor people (those with family income below 200% of the Federal poverty level).

For more detailed information about MEPS and the information discussion here, refer to the documentation for the MEPS 2002-2014 Full Year Consolidated Data Files available at the MEPS website (www.meps.ahrq.gov).

Timeframe

National health care estimates from MEPS for the 2016 *National Healthcare Quality and Disparities Report* (QDR) were derived from the 2002-2014 MEPS HC survey, including the Self-Administered Questionnaire (SAQ), the Child Health and Preventive Care section, and the Diabetes Care Survey (DCS).

The SAQ is a supplement to the MEPS HC. It includes:

- Health care quality measures taken from the health plan version of CAHPS[®],ⁱ an AHRQ-sponsored family of survey instruments designed to measure quality of care from the consumer's perspective;
- General health questions;
- Questions related to attitudes about health; and
- Health status questions as measured by the SF-12 and the EuroQol 5D.

The Child Health and Preventive Care section is part of the regular MEPS HC interview. It includes:

- Health care quality measures taken from the health plan version of CAHPS;
- Children with Special Health Care Needs (CSHCN) Screener questions;
- Children's general health status as measured by several questions from the General Health Subscale of the Child Health Questionnaire;
- Columbia Impairment Scale questions about possible child behavioral problems; and
- Child preventive care questions.

Researchers should note that the CAHPS and CSHCN questions changed from a self-administered parent questionnaire in 2000 to an interviewer-administered questionnaire starting in 2001.

A third supplement to the MEPS HC, the Diabetes Care Survey (DCS), was a self-administered questionnaire given to people identified with diabetes. It asked about the care they received in the treatment of their diabetes.

Population Characteristics

Estimates derived from MEPS are presented at both an aggregate level and for select subpopulations. Characteristics used to define subpopulations include:

- Demographics (age, gender, race, ethnicity, poverty status, education),
- Insurance coverage, including Medicaid/Children's Health Insurance Program (CHIP) for people under age 65,
- Residence location,
- Employment status,
- Perceived health status,
- Special health care needs (children),
- Adult disability status as measured by activity limitations,
- Number of chronic conditions,
- Language spoken at home/language spoken most often at home,
- Usual primary care provider,
- CAHPS composite measure (adults and children),

ⁱ CAHPS is the Consumer Assessment of Healthcare Providers and Systems.

- Receipt of potentially inappropriate prescription medications in the calendar year (adults age 65 and over),
- Birthplace (whether United States or other), and
- Financial burden of health care costs and underinsurance.

A brief description of how each of these population characteristics was defined is provided below.

Age. With the exception of analytic variables associated with round-specific questions noted below, age was defined as a person’s age on December 31 of the data year.

For measures using analytic variables associated with round-specific questions (e.g., questions from the SAQ, the Child Health and Preventive Care supplement, and access to care measures), corresponding round-specific age variables were used to determine age.

Gender. Male and female.

Race. Variable RACEX classifies people into five single-race categories (1-5) and one for multiple races. For all tables, RACEX was used and/or reordered as: (1) White, (2) Black, (3) Asian, (4) Native Hawaiian or Other Pacific Islander, (5) American Indian or Alaska Native, and (6) multiple races. The race groups include people of Hispanic and non-Hispanic origin in all years.

Since 2002, MEPS has transitioned to the most recent Office of Management and Budget standards issued in 1997 for collecting racial and ethnicity data, which allow respondents to identify more than one racial group (<https://www.gpo.gov/fdsys/pkg/FR-1997-10-30/html/97-28653.htm>). Therefore, estimates for racial categories using 2002 and later years’ data are not directly comparable with estimates from previous years’ data.

Ethnicity. Ethnicity was determined to be either Hispanic or non-Hispanic. People of Hispanic origin may be of any race. Estimates were derived for both Hispanic and non-Hispanic subpopulations. In addition, race was crossed with ethnicity and estimates were reported for people classified as “non-Hispanic, White,” “non-Hispanic, Black,” and “non-Hispanic, other.” For 2002 and later years, “non-Hispanic, White” and “non-Hispanic, Black” categories excluded multiple-race individuals and estimates are not directly comparable with data from previous years.

Poverty status. MEPS includes a five-level categorical variable for family income as a percentage of the Federal poverty level (FPL). For construction of this variable, definitions of income, family, and poverty are taken from the poverty statistics developed by the Current Population Survey (CPS). For the purposes of analysis and reporting in the QDR, the near-poor and low-income categories were combined, which resulted in a four-level categorical variable of poverty status:

1. Negative or poor refers to household incomes below the FPL;
2. Near poor/low income, from the FPL to just below 200% of the FPL;
3. Middle income, 200% to just below 400% of the FPL; and
4. High income, 400% or more of the FPL.

Beginning with the 2002 file, substantial revisions were made to the skip patterns in the Income section. These changes have increased response rates, resulting in a small impact on income estimates for people under age 65, with a somewhat larger impact on people 65 and over.

Education. In MEPS, a person's educational attainment is indicated as the number of completed years of education and is grouped into three categories:

1. Less than high school refers to people with less than 12 completed years of education;
2. High school graduate, people with 12 completed years of education; and
3. At least some college, people with greater than 12 completed years of education.

A different education question was asked in 2013-2014 and was used to produce estimates for the same three categories. The education variable was constructed only for people age 18 years and over and any measure presented for the education subpopulations includes only people in this age group.

Insurance coverage. The insurance coverage variable was constructed in a hierarchical manner and in relation to a person's age. For people under 65 years, those who were uninsured for the entire year were classified as Uninsured; those who had private coverage at any time during the year (including CHAMPUS/VA) were classified as having Any private; and those who had only public coverage (i.e., no private) at any time during the year were classified as Public only.

People age 65 years and over were categorized as having Medicare only, Medicare and private, or Medicare and other public. A small number of people age 65 and over were identified as having private only or being uninsured. These people were not included in insurance-related analyses.

Medicaid/CHIP for people under age 65. The Medicaid coverage variable was constructed in a hierarchical manner based on yearly and monthly insurance variables for people under age 65. First, if a person had any Medicaid or CHIP coverage for at least one month, the person was classified as "Any Medicaid/CHIP." If a person did not have any coverage in any month, the person was classified as "Uninsured all year." If a person did not have Medicaid in any month but had other insurance in at least one month, the person was classified as "Other non-Medicaid/CHIP."

Two additional subcategories were defined for people with Medicaid/CHIP coverage. "Only Medicaid/CHIP" included people with Medicaid/CHIP only and no evidence of other types of insurance. "Medicaid/CHIP with other" included people who also had other types of insurance.

Residence location. For the 2016 QDR, the 2006 NCHS Urban-Rural Classification Scheme for Counties was used. NCHS based this classification scheme for counties on the Office of Management and Budget (OMB) definitions of metropolitan and nonmetropolitan counties; the Rural-Urban Continuum Codes and the Urban Influence Codes developed by the Economic Research Service of the U.S. Department of Agriculture; and county-level data from the Census 2000 and 2004 postcensus population estimates.

Based on this scheme, the urban-rural categories used are:

1. Large central metro (“central” counties of metropolitan areas of 1 million or more population).
2. Large fringe metro (“fringe” counties of metropolitan areas of 1 million or more population).
3. Medium metro (counties in metropolitan areas of 250,000 to 999,999 population).
4. Small metro (counties in metropolitan areas of 50,000 to 249,999 population).
5. Micropolitan (counties with at least one urban cluster of at least 10,000 residents).
6. Noncore (counties without an urban cluster of at least 10,000 residents).

The two nonmetropolitan levels of the NCHS classification, micropolitan and noncore, are derived directly from the differentiation of nonmetropolitan territory specified in the 2003 OMB standards for defining metropolitan and micropolitan counties.

For more information, visit https://www.cdc.gov/nchs/data_access/urban_rural.htm and <https://www.ers.usda.gov/topics/rural-economy-population/rural-classifications/what-is-rural.aspx>.

Employment status. MEPS includes four-level round-specific categorical variables for employment status for people age 16 and over. For the MEPS measures, employment status variables were set for adults ages 18-64 and grouped into two categories: Employed, which refers to adults who were (1) currently employed, (2) had a job to return to, or (3) had a job but did not work during the reference period; and Not employed.

Perceived health status. MEPS includes five-level round-specific categorical variables for perceived health status: Excellent; Very good; Good; Fair; and Poor. The five levels were collapsed into two levels: Excellent/Very good/Good; and Fair/Poor.

Children with special health care needs. The Child Health and Preventive Care section identifies children with special health care needs (CSHCN) based on the CSHCN Screener instrument. This instrument was developed through a national collaborative process as part of the Child and Adolescent Health Measurement Initiative under the coordination of the Foundation for Accountability. Children whose “special health care needs” status could not be determined were coded as “unknown.” Data for individuals classified as “unknown” are not shown in the QDR.

Adult disability status as measured by activity limitations. The measure used in the QDR for MEPS is based on the work of an interagency work group that was instituted to provide a measure of disability as consistent and compatible as possible across all the datasets used for the QDR. For the purpose of the QDR, adults with disability are defined as those with a physical, sensory, and/or mental health condition that can be associated with a decrease in functioning in such day-to-day activities as bathing, walking, doing everyday chores, and/or engaging in work or social activities.

The committee recommended using paired measures in displaying disability data for adults to preserve the qualitative aspects of the data. The first measure, Limitations in *basic activities*, represents problems with mobility and other basic functioning at the person level. The second measure, Limitations in *complex activities*, represents limitations encountered when the person, in interaction with his or her environment, attempts to participate in community life.

Basic activities includes problems with: Mobility; self-care (activities of daily living, or ADLs); domestic life (instrumental ADLs); and activities that depend on sensory functioning (limited to people who are blind or deaf). *Complex activities* includes limitations experienced in work; and in community, social, and civic life. These two categories are not mutually exclusive since people may have limitations both in *basic activities* and in *complex activities*. The residual category *Neither* includes adults with neither basic nor complex activity limitations.

Number of chronic conditions. The variable (MCC) was constructed and stored in an internal use file, MEPS Multiple Chronic Condition (MEPSyMCC). This file first constructed 20 individual chronic condition variables based on the medical conditions a person had and Clinical Classification System (CCS) codes. MCC is the summary variable of total number of chronic conditions treated each year for each person.

The 20 chronic conditions and CCS codes include:

- Hypertension (CCS=98, 99),
- Hyperlipidemia (CCS=53),
- Congestive Heart Failure (CCS=108),
- Coronary Artery Disease (CCS=100, 101),
- Diabetes (CCS=49,50),
- Stroke (CCS=109-112),
- Cardiac Arrhythmias (CCS=105, 106),
- Arthritis (CCS=202,203),
- Cancer (CCS=11-43),
- Depression (CCS=657),
- Dementia (CCS=653),
- Substance Abuse Disorders (CCS=660, 661),
- COPD (CCS=127),
- Asthma (CCS=128),
- Chronic Kidney Disease (CCS=156, 158),
- HIV (CCS=5),
- Hepatitis (CCS=6),
- Autism Spectrum Disorder (International Classification of Diseases, 9th Revision=299.00, 299.01),
- Schizophrenia (CCS=659), and
- Osteoporosis (CCS=206).

For the QDR tables, the variable is stratified to five age categories: 18 and over, 18-44, 45-64, 18-64, and 65 and over.

Language spoken at home/Language spoken most often at home. From 2002 to 2013, families were asked what language is spoken in your home most of the time, with categories of English, Spanish, Other. The categories were collapsed into two levels: English; and Other (includes Spanish and Other).

In 2014, the questionnaire changed. Families were asked whether anyone age 5 and above in their family spoke a language other than English at home. The two categories with this question are: Speak only English; and Speak language other than English. The estimates are not comparable with previous data.

Whether or not U.S. born. The Access to Care section ascertains whether a person was born in the United States. This question was previously asked only if a language other than English was spoken in the home and only of people uncomfortable speaking English. Beginning in 2007, the question was asked of all residential unit members regardless of the language most often spoken in the home and regardless of whether all household members were comfortable speaking English. Therefore, only data beginning in 2007 are shown in the QDR tables.

Usual primary care provider. People are considered to have a usual primary care provider if they have a usual source of care not located in a hospital emergency room, to which they go for new health problems; preventive health care such as general checkups, examinations, and immunizations; and referrals to other professionals when needed.

CAHPS composite measure (adults and children). This measure identified people who had a doctor's office or clinic visit in the last 12 months whose health providers listened carefully, explained things clearly, showed respect for what they had to say, and spent enough time with them. For adults (children) who had a doctor's office or clinic visit in the last 12 months, percent distribution of how often the response categories of Always, Usually, and Sometimes or Never were selected for the four CAHPS questions asking about health providers: (1) listening carefully; (2) explaining things clearly; (3) showing respect for what they had to say; and (4) spending enough time with them.

For example, if a person responded "Always" for each of the four questions, the composite measure would be 100% for Always, 0% for Usually, and 0% for Sometimes or Never. If people did not complete all four questions, the percentage estimates were weighted by the percentage of the four questions that they completed.

Adults age 65 and over who received potentially inappropriate prescription medications in the calendar year. Prescription medications received includes all prescribed medications initially purchased or otherwise obtained during the calendar year, as well as any refills. Inappropriate medications are defined by the implementation of the Beers criteria in MEPS.

According to this definition, the 11 drugs that should always be avoided for older patients include barbiturates, flurazepam, meprobamate, chlorpropamide, meperidine, pentazocine, trimethobenzamide, belladonna alkaloids, dicyclomine, hyoscyamine, and propantheline.

The 22 drugs that should often be avoided for older patients include carisoprodol, chlorzoxazone, cyclobenzaprine, metaxalone, methocarbamol, amitriptyline, chlorthalidone, diazepam, doxepin, indomethacin, dipyridamole, ticlopidine, methyldopa, reserpine, disopyramide, oxybutynin, chlorpheniramine, cyproheptadine, diphenhydramine, hydroxyzine, promethazine, and propoxyphene.

Financial burden of health care costs and underinsurance. Financial burden of health care costs and underinsurance are defined for people under age 65. Financial burden of health care costs is defined when a person's family-level out-of-pocket health insurance premiums and medical expenditures are greater than 10% of total family income. Underinsurance is defined for people with private insurance when a person's family-level out-of-pocket medical expenditures (excluding premiums) are greater than 10% of total family income.

The following family-level variables are defined for these measures:

- *Family.* The definition of family is based on the MEPS health insurance eligibility unit (HIEU), which includes all members of the family who would typically be covered under a private insurance family plan. HIEUs include adults, their spouses, and their unmarried natural/adoptive children under age 18 and children under age 24 who are full-time students.

Nonelderly families include families in which at least one person is under age 65. In these cases, family-level expenditures include the expenditures for the older person as well. Families in which all persons are age 65 years or over are not included in this analysis.

- *Out-of-pocket expenditures on health care services.* Out-of-pocket expenses include all out-of-pocket payments for deductibles, coinsurance, copayments, and payments for any noncovered services and supplies. Using the HIEU definition of family unit, we add out-of-pocket expenditures on health care services across all members of the family to calculate family-level out-of-pocket expenditures on health care services.
- *Out-of-pocket expenditures on health insurance premiums.* MEPS collects out-of-pocket expenditures on premiums for private health insurance from household respondents. We add private out-of-pocket premium costs and (imputed) Medicare Part B premiums across all health insurance policies covering family members. For example, if there are two single policies covering the two adults of a childless couple unit, we add these together. Premiums are prorated to account for the number of months of coverage during the year. For employer-sponsored group coverage, employer contributions toward premiums are not included in this analysis.
- *Person-level insurance status.* Results are reported by individual health insurance status, which is defined hierarchically for the categories below:
 - Private, employer sponsored: people who had at least 1 month of employer-sponsored insurance and no uninsured months in the year.
 - Private, nongroup: people who had least 1 month of nongroup private insurance and no uninsured months in the year.
 - Public only: people who had public insurance only for all available months in MEPS during the year.

- Part-year uninsured: people whose number of uninsured months is less than the number of available months in MEPS during the year.
- Full-year uninsured: people whose number of uninsured months is equal to the number of available months in MEPS during the year.
- *Total family income.* Total family income is the sum of person-level pretax total income, refund income, and sales income.

Round-specific variables. For analytical variables asked at specific rounds, age and other population characteristics variables were also defined using the round-specific variables. In some cases, missing values were replaced with the value from the closest prior round.

MEPS Estimates

MEPS estimates were generated for each year from 2002 to 2014. Standard errors of the estimates were provided to permit an assessment of the sampling variability. All estimates and standard errors were derived using SUDAAN statistical software, which accounts for the complex survey design of MEPS.

All estimates are weighted to reflect the experiences of the U.S. civilian noninstitutionalized population at the aggregate and subpopulation levels. Person-level weights, specific to the SAQ and DCS, were used for measures derived with data from these supplements. For other person-level measures, including those from the Child Health and Preventive Care section, the overall person-level weight was used. In analyzing data from the Child Health and Preventive Care section, the full file should be used subset to those cases eligible for this section. More information about these weights is available from the MEPS website: <http://www.meps.ahrq.gov>.

In analyzing data from the DCS, a “diabetes pseudo-weight” was used with the file subset to cases where the original DCS weight was positive in order to produce the same variance estimates using different statistical software. The “diabetes pseudo-weight” was defined to equal the diabetes weight when the diabetes weight was positive; was defined to equal 1 when the diabetes weight was zero and the SAQ weight was positive; and was set as undefined when the SAQ weight was zero.

Some MEPS measures were age adjusted to the 2000 U.S. standard population. Among the age-adjusted measures are the following pertaining to:

- Diabetes.
- Asthma.
- Adult current smokers.
- Adults with obesity. People who received prescription medications.
- People with hospital emergency department visits.
- People who had hospital inpatient discharges.

Measures pertaining to children were not age adjusted. Table 1 lists measures that are age adjusted and provides information about the age groups used for adjustment.

Table 1. Age-adjusted measures in the National Healthcare Quality and Disparities Report

Measure Title	Age Groups Used in Adjustment (Years)
Composite measure: Adults age 40 and over with diagnosed diabetes who received all four recommended services for diabetes in the calendar year (two or more hemoglobin A1c measurements, dilated eye examination, foot examination, and flu vaccination)	40-59, 60+
Adults age 40 and over with diagnosed diabetes who received at least two hemoglobin A1c measurements in the calendar year	40-59, 60+
Adults age 40 and over with diagnosed diabetes who received a dilated eye examination in the calendar year	40-59, 60+
Adults age 40 and over with diagnosed diabetes who had their feet checked for sores or irritation in the calendar year	40-59, 60+
Adults age 40 and over with diagnosed diabetes who received a flu vaccination in the calendar year	40-59, 60+
People with current asthma who are now taking preventive medicine daily or almost daily (either oral or inhaler)	0-17, 18-44, 45-64, 65+
Adult current smokers with a checkup in the last 12 months who received advice to quit smoking	18-44, 45-64, 65+
Adults with obesity who ever received advice from a health professional to exercise more	18-44, 45-64, 65+
Adults with obesity who ever received advice from a health professional about eating fewer high-fat or high-cholesterol foods	18-44, 45-64, 65+
Adults with obesity who do not now spend half an hour or more in moderate or vigorous physical activity at least five times a week	18-44, 45-64, 65+

Consistent with the established criteria for data reporting in the QDR, MEPS estimates are suppressed when they are based on sample sizes of less than 100, or when their relative standard errors are 30% or more. In the tables, these data are replaced with a notation (DSU) to indicate that data are statistically unreliable. Records in which analytic variables have missing values were excluded for analysis.