

# **MEPS HC 254B: 2024 Dental Visits**

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## A. Data Use Agreement

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Individual identifiers have been removed from the microdata contained in these files. Nevertheless, under Sections 308 (d) and 903 (c) of the Public Health Service Act (42 U.S.C. 242m and 42 U.S.C. 299a-1), data collected by the Agency for Healthcare Research and Quality (AHRQ) and/or the National Center for Health Statistics (NCHS) may not be used for any purpose other than the purpose for which they were supplied; any effort to determine the identity of any reported cases is prohibited by law.

Therefore, in accordance with the previously referenced federal statute, it is understood that

1. No one is to use the data in this dataset in any way except for statistical reporting and analysis.
2. If the identity of any person or establishment should be discovered inadvertently, then (a) no use will be made of this knowledge, (b) Director - Office of Management Services AHRQ will be advised of this incident, (c) the information that would identify any individual or establishment will be safeguarded or destroyed, as requested by AHRQ, and (d) no one else will be informed of the discovered identity.
3. No one will attempt to link this dataset with individually identifiable records from any datasets other than the Medical Expenditure Panel Survey or the National Health Interview Survey. Furthermore, linkage of the Medical Expenditure Panel Survey and the National Health Interview Survey may not occur outside the AHRQ Data Center, NCHS Research Data Center (RDC), or the U.S. Census RDC network.

By using these data, you signify your agreement to comply with the previously stated statutorily based requirements with the knowledge that deliberately making a false statement in any matter within the jurisdiction of any department or agency of the federal government violates Title 18, part 1, Chapter 47, Section 1001, and is punishable by a fine of up to \$10,000 or up to 5 years in prison.

AHRQ requests that users cite AHRQ and the Medical Expenditure Panel Survey as the data source in any publications or research based on these data.

## **B. Background**

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### **1.0 Household Component**

The Medical Expenditure Panel Survey (MEPS) provides nationally representative estimates of healthcare use, expenditures, payment sources, and health insurance coverage for the U.S. civilian noninstitutionalized population. The MEPS Household Component (HC) also provides estimates of respondents' health status, demographic and socio-economic characteristics, employment, access to care, and satisfaction with care. Estimates can be produced for individuals, families, and selected population subgroups. The survey's panel design includes five rounds of interviews spanning 2 full calendar years. The interviews use computer-assisted personal interviewing (CAPI) technology or computer-assisted video interviewing (CAVI) technology to collect information about each household member, which the survey builds on from interview to interview. A single household respondent reports all data for a sampled household.

The MEPS HC was initiated in 1996. Each year, a new panel of sampled households is selected. Because the data collected are comparable to those from earlier medical expenditure surveys conducted in 1977 and 1987, it is possible to analyze long-term trends. Historically, each annual MEPS HC sample consists of up to 15,000 households. Data can be analyzed at the person, family, or event level. Data must be weighted to produce national estimates.

The set of households selected for each MEPS HC panel is a subsample of households participating in the previous year's National Health Interview Survey (NHIS) conducted by NCHS. The NHIS sampling frame provides a nationally representative sample of the U.S. civilian noninstitutionalized population. In 2006, NCHS implemented a new NHIS sample design that included households with Asian persons in addition to households with Black and Hispanic persons in minority group oversampling. In 2016, NCHS introduced another sample design that discontinued the oversampling of these minority groups.

### **2.0 Medical Provider Component**

When the household CAPI instrument is completed and permission is obtained from the sampled members to contact their medical provider(s), a sample of these providers is contacted by telephone to obtain information that household respondents cannot accurately provide. This part of MEPS is called the Medical Provider Component (MPC), and it collects information on dates of visits, diagnosis and procedure codes, and charges and payments. The Pharmacy Component (PC), a subcomponent of the MPC, does not collect data on charges or on diagnosis and procedure codes, but it does collect detailed information on drugs, including the National Drug Code (NDC) and medicine name, as well as payment amounts. The MPC is not designed to yield national estimates; it is primarily used as an imputation source to supplement or replace household-reported expenditure information.

### **3.0 Survey Management and Data Collection**

MEPS HC and MPC data are collected under the authority of the Public Health Service Act. The MEPS HC data are collected under contract with Westat, and the MEPS MPC data are collected under contract with RTI International. Datasets and summary statistics are edited and published in accordance with the confidentiality provisions of the Public Health Service Act and the Privacy Act. NCHS provides consultation and technical assistance.

As soon as the MEPS data are collected and edited, they are released to the public in stages of microdata files and tables via the [MEPS website](#) and [AHRQ Data Tools site](#).

Additional information on MEPS is available from the MEPS project manager or the MEPS public use data manager at the Center for Financing, Access and Cost Trends, AHRQ, 5600 Fishers Lane, Rockville, MD 20857 (301-427-1406).

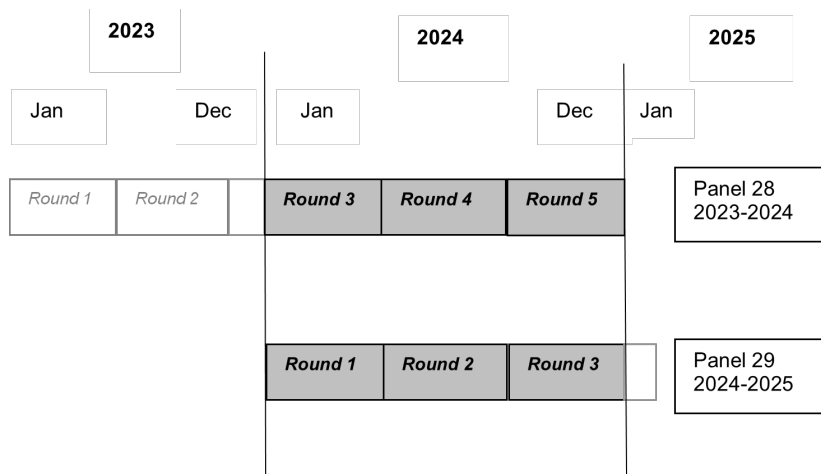
## C. Technical and Programming Information

### 1.0 General Information

This documentation describes one in a series of public use files (PUFs) from the 2024 MEPS HC. It was released as an ASCII data file (with related SAS, SPSS, R, and Stata programming statements and data user information) and as a SAS dataset, SAS transport file, Stata dataset, and Excel file. The 2024 Dental Visits PUF (hereafter referred to as the Dental PUF) provides detailed information on dental events from a nationally representative sample of the U.S. civilian noninstitutionalized population. Data from the Dental PUF can be used to estimate dental event utilization and expenditures for calendar year 2024. This file contains 47 variables and has a logical record length of 227 with an additional 2-byte carriage return/line feed at the end of each record. This PUF consists of MEPS survey data obtained in (1) the 2024 portion of Round 3 and all of Rounds 4 and 5 for Panel 28, and (2) Rounds 1 and 2 and the 2024 portion of Round 3 for Panel 29 (i.e., the rounds for MEPS panels covering calendar year 2024), as illustrated in the following figure.

**Figure 1**

**Portions of MEPS Panel 28 and Panel 29 Survey Data Included in the 2024 Dental PUF**



Each record on this PUF represents a unique dental event; that is, a dental event reported by the household respondent. Counts of dental event utilization are based entirely on household reports. Dental events were not included in the MPC; therefore, all expenditure and payment data on this Dental PUF are reported by the household.

Data from this event PUF can be merged with other 2024 MEPS HC PUFs to append person-level data, such as demographic characteristics or health insurance coverage, to each dental record.

This PUF can also be used to construct summary variables for expenditures, source of payment, and related aspects of the dental event. Aggregate annual person-level information on the use of dental events and other health services is provided on the MEPS 2024 Full Year Consolidated Public Use File (hereafter referred to as the Consolidated PUF) where each record represents a MEPS sampled person.

This document offers a brief overview of the types and levels of data provided, as well as the content and structure of the PUF and codebook. It contains the following sections:

- Data File Information (Section C.2.0)
- Survey Sample Information (Section C.3.0)
- Strategies for Estimation (Section C.4.0)
- Merging/Linking MEPS Data Files (Section C.5.0)
- Variable - Source Crosswalk (Appendix)

For more information on the MEPS HC sample design, see Chowdhury et al. (2019). A copy of the [MEPS HC survey instrument](#) used to collect the information in this Dental PUF is available on the [MEPS website](#).

## 2.0 Data File Information

The 2024 Dental PUF consists of one event-level file, which contains characteristics associated with the dental event and imputed expenditure data.

The 2024 Dental PUF contains 20,929 dental event records; of these, 20,759 are associated with persons who have a positive person-level weight (PERWT24F). This file includes dental visit (DV) event records for all household members residing in eligible responding households who reported at least one dental event. Each record represents one household-reported dental event that occurred during calendar year 2024. Dental visits known to have occurred before January 1, 2024, and after December 31, 2024, are not included on this PUF. Some household members may have multiple dental events and thus will be represented in multiple records on this PUF. Conversely, other household members may have no dental events reported and thus will have no records on this PUF. These data were obtained from the MEPS HC in (1) the 2024 portion of Round 3 and all of Rounds 4 and 5 for Panel 28, and (2) Rounds 1 and 2 and the 2024 portion of Round 3 for Panel 29. The persons represented in this PUF had to meet either of the following criteria:

1. Be classified as a Key in-scope person who responded for their entire period of 2024 eligibility (i.e., persons with a positive 2024 full-year person-level weight,  $PERWT24F > 0$ )
2. Be an eligible member of a family whose Key in-scope members have a positive person-level weight ( $PERWT24F > 0$ ). (Such a family consists of all persons with

the same value for FAMIDYR.) That is, the person must have a positive full-year family-level weight (FAMWT24F > 0). Note that FAMIDYR and FAMWT24F are variables on the Consolidated PUF.

Persons with no dental events for 2024 are not included on this event-level Dental PUF but are represented on the person-level 2024 Consolidated PUF.

Each dental event record includes the following information: date of the dental event, type of provider seen, procedure(s) associated with the dental event, flat fee information, imputed sources of payment, total payment and total charge of the dental event expenditure, and a full year person-level weight.

To append person-level information, such as demographic characteristics or health insurance coverage, to each event record, data from this PUF can be merged with 2024 MEPS HC person-level data (e.g., Consolidated PUF) using the DUPERSID person identifier. Please see Section C.5.0 or HC 254I: Appendix to MEPS 2024 Event Files (hereafter referred to as the Appendix PUF) for details on how to merge MEPS data files.

## **2.1 Codebook Structure**

For most variables on the Dental PUF, both weighted and unweighted frequencies are provided in the accompanying codebook. The exceptions to this are weight variables and variance estimation variables. Only unweighted frequencies of these variables are included in the accompanying codebook file. See the Weights Variables list in the appendix.

The codebook and data file list variables in the following order:

- Unique person identifier
- Unique dental event identifier
- Dental characteristic variables
- Imputed expenditure variables
- Weight and variance estimation variables

The person identifier corresponds to a unique person, and the dental event identifier corresponds to a unique event.

## **2.2 Reserved Codes**

This Dental PUF contains several reserved code values (Table 1).

**Table 1****Reserved Code Values and Definitions**

| Value | Label              | Definition  |
|-------|--------------------|---|
| -1    | Inapplicable       | Question was not asked due to skip pattern  |
| -7    | Refused            | Question was asked and respondent refused to answer question                                      |
| -8    | Don't know         | Question was asked and respondent did not know answer or the information could not be ascertained |
| -15   | Cannot be computed | Value cannot be derived from data   |

The value Cannot be Computed (-15) is assigned to MEPS constructed variables when there was not enough information from the instrument to calculate the constructed variables. Not enough information is often the result of skip patterns in the data or of missing information stemming from the responses Refused (-7) or Don't Know (-8). Note that, in addition to Don't Know, reserved code -8 also includes cases for which the information from the question was not ascertained.

Generally, values of -1, -7, -8, and -15 for non-expenditure variables have not been edited in this PUF. Analysts who would like to recode these values can find skip patterns in the [HC survey questionnaire](#) located on the MEPS website.

## 2.3 Codebook Format

The codebook describes an ASCII dataset and provides the programming identifiers for each variable (see Table 2).

**Table 2****Programming Identifiers for Each Variable in the Dental PUF**

| Identifier  | Description   |
|-------------|---|
| Name        | Variable name   |
| Description | Variable descriptor   |
| Format      | Number of bytes   |
| Type        | Type of data: numeric (indicated by NUM) or character (indicated by CHAR) |
| Start       | Beginning column position of variable in record                           |
| End         | Ending column position of variable in record                              |

## 2.4 Variable Source and Naming Conventions

In general, variable names reflect the variable's content. All edited/imputed variables end with an "X".

As the collection, universe, or categories of variables were altered, some variable names have been appended with "\_Myy", where "yy" indicates the collection year in which the alterations were made. Such alterations are described in detail throughout this document.

### 2.4.1 Variable - Source Crosswalk

Variables on this Dental PUF were derived from the CAPI. The source of each variable is identified in the appendix in one of four ways:

1. Variables derived from CAPI or assigned in sampling are indicated as "CAPI derived" or "Assigned in sampling"
2. Variables from one or more specific questions have questionnaire sections and question numbers indicated in the "Source" column; questionnaire sections are identified as
  - FF - Flat Fee section
  - DN - Dental Event section
  - CP - Charge Payment section
3. Variables constructed from multiple questions by using complex algorithms are labeled "Constructed" in the Source column
4. Variables that have been edited or imputed are so indicated

### 2.4.2 Expenditure and Source of Payment Variables

The names of the expenditure and source of payment variables follow a standard convention, are seven characters in length, and end in an "X", indicating that they were edited/imputed. Please note that imputed means that a series of logical edits, as well as an imputation process to account for missing data, were performed on the variable.

The total sum of payments and the 10 sources of payment variables are named using the following approaches.

The first two characters indicate the type of event:

IP - inpatient stay

HH - home health visit

ER - emergency room visit

OM - other medical equipment

OB - office-based visit

DV - dental visit

OP - outpatient visit

RX - prescribed medicine

The third and fourth characters indicate the source of payment:

SF - self or family

OF - other federal government

MR - Medicare

SL - state/local government

MD - Medicaid

WC - workers' compensation

PV - private insurance

OT - other insurance

VA - Veterans Health  
Administration/CHAMPVA

TR - TRICARE

XP - sum of payments

In addition, the total charge variable is indicated by "TC" in the variable name.

The fifth and sixth characters (24) indicate the year. The seventh character, "X", indicates the variable was edited/imputed.

For example, DVSF24X is the edited/imputed amount paid by self or family for 2024 dental expenditures.

## 2.5 File Contents

### 2.5.1 Survey Administration Variables

#### ***Person Identifiers (DUID, PID, DUPERSID)***

The definitions of dwelling units (DUs) in the MEPS HC are generally consistent with those used in NHIS. The dwelling unit identifier (DUID) is a seven-digit number consisting of a two-digit panel number followed by a five-digit random number assigned after the case was sampled for MEPS. A three-digit person number (PID) uniquely identifies each person within the DU. The variable DUPERSID is the combination of the variables DUID and PID. Identifiers begin with the two-digit panel number.

For detailed information on DUs and families, please refer to the documentation for the Consolidated PUF.

### ***Record Identifiers (EVNTIDX, FFEEIDX)***

EVNTIDX uniquely identifies each dental event (i.e., each record on this Dental PUF). EVNTIDX begins with the two-digit panel number and ends with the two-digit event type number. For details on linking see Section C.5.0, or the Appendix PUF.

FFEEIDX is a constructed variable that uniquely identifies a flat fee group, which includes all events that were part of a flat fee payment. For example, a charge for orthodontia is typically covered in a flat fee arrangement where all visits are covered under one flat fee dollar amount. These events would have the same value for FFEEIDX. FFEEIDX identifies a flat fee payment based on information from the HC.

### ***Round Indicator (EVENTRN)***

EVENTRN indicates the round in which the dental event was reported. Please note that Rounds 3 (partial), 4, and 5 are associated with data collected from Panel 28. Rounds 1, 2, and 3 (partial) are associated with data collected from Panel 29.

### ***Panel Indicator (PANEL)***

PANEL is a constructed variable used to specify the panel number for the person. PANEL will indicate either Panel 28 or Panel 29 for each person on the PUF. Panel 28 started in 2023, and Panel 29 started in 2024.

## **2.5.2 Dental Event Variables**

This PUF contains variables describing dental events reported by household respondents in the Dental section of the MEPS HC survey questionnaire.

### ***Date of Visit (DVDATEMM - DVDATEYR)***

Certain variables indicate the month and year a dental event occurred (DVDATEMM and DVDATEYR, respectively). These variables have not been edited or imputed.

### ***Type of Provider Seen (GENDENT\_M18 - DENTYPE\_M18)***

Respondents were asked about the type of provider seen during the dental visit (e.g., general dentist, pediatric dentist, dental hygienist, specialist). More than one type of provider may have been identified on an event record.

## ***Treatment, Procedures, and Services (EXAMINEX - ORTHDONX)***

Respondents reported the types of services or treatments they received during their visit, such as root canals or x-rays. It is possible to record more than one type of service or treatment for a single visit. In some instances, instead of selecting one of the standard services or treatment categories, respondents provided text strings indicating the type of treatment. Where possible, these text strings were reclassified into the appropriate procedure and service categories. The DENTOTHX variable “Other specify dental procedures - edited” provides the residual text strings (i.e., treatments that could not be reclassified into a standard category). The PUF incorporates only the edited procedure and service category variables, which include both the originally reported and reclassified responses.

### **2.5.3 Flat Fee Variables (FFEEIDX, FFDVTYPE, FFBEF24, FFTOT25)**

#### ***Definition of Flat Fee Payments***

A flat fee is the fixed dollar amount a person is charged for a package of services provided during a defined period. Examples are an orthodontist’s fee, which covers multiple visits; or a dental surgeon’s fee, which covers a surgical procedure and post-surgical care. A flat fee group is the set of medical services that are covered under the same flat fee payment. The flat fee groups represented in the Dental PUF include flat fee groups where at least one of the health care events, as reported by the HC respondent, occurred during 2024. By definition, a flat fee group can span multiple years. Furthermore, a single person can have multiple flat fee groups.

#### ***Flat Fee Variable Descriptions***

##### **Flat Fee ID (FFEEIDX)**

As previously noted, the variable FFEEIDX uniquely identifies all events within a person’s flat fee group. On any 2024 event PUF, every event that is part of a specific flat fee group has the same value for FFEEIDX. Note that prescribed medicine and home health events are never included in a flat fee group, and none of the flat fee variables are on those event PUFs.

##### **Flat Fee Type (FFDVTYPE)**

FFDVTYPE indicates whether the 2024 dental event is the “stem” or “leaf” of a flat fee group. A stem (records with FFDVTYPE = 1) is the initial dental service (event), which is followed by other dental events that are covered under the same flat fee payment. The leaves of the flat fee group (records with FFDVTYPE = 2) are dental events that tie back to the initial dental event (the stem) in the flat fee group. These “leaf” records have their expenditure variables set to 0. For dental visits that are not part of a flat fee payment, the FFDVTYPE is set to Inapplicable (-1).

##### **Counts of Flat Fee Events that Cross Years (FFBEF24, FFTOT25)**

As described earlier in this section, a flat fee payment covers multiple events, which could span multiple years. For situations where a 2024 dental visit is part of a group of events, and some of the events occurred before or after 2024, counts of the known events are provided on the dental

record. The variables that indicate whether events occurred before or after 2024 are the following:

FFBEF24 - indicates the total number of pre-2024 events in the same flat fee group as the 2024 dental event (this count would not include 2024 dental events)

FFTOT25 - indicates the number of 2025 medical events expected to be in the same flat fee group as the 2024 dental event record

If there are no 2023 events on this PUF, FFBEF24 will be omitted. Likewise, if there are no 2025 events on this PUF, FFTOT25 will be omitted. If there are no flat fee data related to the records on this PUF, FFEEIDX and FFDVTYPE will be omitted as well. Please note that the appendix lists all possible flat fee variables.

### ***Caveats of Flat Fee Groups***

Analysts should note that flat fee payments are common on the dental PUF. On the 2024 PUF, 3,508 events are identified as part of a flat fee payment group. In general, every flat fee group should have an initial visit (stem) and at least one subsequent visit (leaf). In some situations, however, this is not true. For some of these flat fee groups, the initial visit occurred in 2024, but the remaining visits of the flat fee group occurred in 2025. In this case, the 2024 flat fee group represented on this PUF would consist of one event (the stem). The 2025 “leaf” events that are part of this flat fee group would not be represented on the file. Similarly, the household respondent may have reported a flat fee group with an initial visit occurring in 2023 and subsequent visits occurring in 2024. In this case, the initial visit would not be represented on this PUF. This 2024 flat fee group would consist of one or more leaf records, with no stem. Note that the appendix lists all possible flat fee variables.

#### **2.5.4 Condition Codes**

Conditions data are not collected for dental events; therefore, this PUF cannot be linked to the Conditions PUF.

#### **2.5.5 Expenditure Data**

##### ***Definition of Expenditures***

Expenditures in this PUF refer to payments for dental services. More specifically, expenditures in MEPS are defined as the sum of payments for care received, including out-of-pocket payments and payments made by private insurance, Medicaid, Medicare, and other sources. The definition of expenditures used in MEPS differs from its predecessors, the 1987 National Medical Expenditure Survey (NMES) and 1977 National Medical Care Expenditure Survey (NMCES) where “charges” rather than the sum of payments were used to measure expenditures. This change was adopted because charges became a less appropriate proxy for medical

expenditures during the 1990s as a result of the increasingly common practice of discounting. Although measuring expenditures as the sum of payments incorporates discounts in the MEPS expenditure estimates, the estimates do not incorporate any payment not directly tied to specific medical care visits, such as bonuses or retrospective payment adjustments paid by third party payers. Currently, charges associated with uncollected liability, bad debt, and charitable care (unless provided by a public clinic or hospital) are not counted as expenditures because there are no associated payments. Although charge data are provided on this PUF, analysts should use caution when working with these data because a charge does not typically represent actual dollars exchanged for services or the resource costs of those services, nor are the charge data directly comparable to the expenditures defined in the 1987 NMES.

For details on expenditure definitions, please refer to Monheit, et al. (1999). AHRQ has developed factors to apply to the 1987 NMES expenditure data to facilitate longitudinal analysis. These factors are published in Zuvekas and Cohen (2002) and can also be accessed via the Center for Financing, Access and Cost Trends data center. For more information see the [Data Center section](#) of the MEPS website. If examining trends in MEPS expenditures, please refer to Section C.3.5 for more information.

### ***Data Editing and Imputation Methodologies of Expenditure Variables***

The general methodology used for editing and imputing expenditure data is described in this section. The MPC did not include dental events or other medical expenditures (e.g., glasses, contact lenses, hearing devices). Therefore, although the general procedures remain the same for dental and other medical expenditures, editing and imputation methodologies were applied only to household-reported data. Please see the following for the differences between these editing/imputation methodologies. Separate imputations were performed for flat fee and simple (non-flat fee) events.

#### **General Data Editing Methodology**

Logical edits were used to resolve internal inconsistencies and other problems in the HC data. The edits were designed to (1) preserve partial payment data from households and providers and (2) identify actual and potential sources of payment for each household-reported event. In general, these edits accounted for outliers, copayments or charges reported as total payments, and reimbursed amounts that were reported as out-of-pocket payments. In addition, edits were implemented to correct for payment source misclassifications between Medicare and Medicaid, and between Medicare health maintenance organizations (HMOs) and private HMOs. These edits produced a complete vector of expenditures for some events and provided the starting point for imputing missing expenditures for the remaining events.

#### **Imputation Methodologies**

The predictive mean matching imputation method was used to impute missing expenditures. This procedure uses regression models (based on events with completely reported expenditure data) to predict total expenses for each event. Then, for each event with missing payment information, a donor event with the closest predicted payment with the same pattern of expected payment sources was used to impute the missing payment value. The imputations for the flat fee events were performed separately from the simple events.

A weighted sequential hot-deck procedure was used to impute the missing total charges. This procedure uses survey data from donors to replace missing data while considering the donors' weighted distribution in the imputation process, ensuring that the weighted distribution of recipients' expenditures reflects the weighted distribution of the donors' expenditures.

### **Dental Data Editing and Imputation**

Expenditures for dentist visits were developed in a sequence of logical edits and imputations. The household edits were used to correct obvious errors in expenditure reporting and identify actual and potential payments sources. Some of the edits were global (i.e., applied to all events); others were hierarchical and mutually exclusive. One critical edit separated flat fee events from simple events. This edit was necessary because groups of events covered by a flat fee (i.e., a flat fee bundle) were edited and imputed separately from individual events, each covered by a single charge (i.e., simple events). Dental services were imputed as flat fee events if the charges covered a package of health care services (e.g., orthodontia) and all the services were part of the same event type (i.e., a pure bundle). If a bundle contained more than one type of event, the services were treated as simple events in the imputations (See Section C.2.5.3 for more details on the definition and imputation of events in flat fee bundles.)

Logical edits were also used to sort each event into a specific category for the imputations. Events with complete expenditures were flagged as potential donors for the predictive mean matching imputations. Events with missing expenditure data were assigned to various recipient categories based on the extent of missing charge and expenditure data. For example, an event with a known total charge but no expenditure information was assigned to one category, whereas an event with a known total charge and partial expenditure information was assigned to a different category. Similarly, events without a known total charge and no or partial expenditure information were assigned to separate recipient categories.

The logical edits produced nine recipient categories for events with missing data. Eight of the categories were for events with a common pattern of missing data and a primary payer other than Medicaid. Medicaid events were imputed separately because persons on Medicaid rarely know the provider's charge for services or the amount paid by the state Medicaid program. As a result, the total charge for Medicaid-covered services was imputed and discounted to reflect the amount that a state program might pay for the care.

Separate predictive mean matching imputations were used to impute missing data in each of the eight recipient categories. The donor pool included "free events" because, in some instances, providers are not paid for their services. These events represent charity care, bad debt, provider failure to bill, and third-party payer restrictions on reimbursement in certain circumstances. If free events were excluded from the donor pool, total expenditures would be over-counted because the distribution of free events among complete events (donors) would not be represented among incomplete events (recipients).

### ***Imputation Flag Variable (IMPFLAG)***

IMPFLAG is a six-category variable that indicates whether the event contains complete HC or MPC data, was fully or partially imputed, or was imputed in the capitated imputation process

(for OP and OB events only). The following list identifies how the imputation flag is coded; the categories are mutually exclusive.

IMPFLAG = 0; not eligible for imputation (includes zeroed-out and flat fee leaf events)

IMPFLAG = 1; complete HC data

IMPFLAG = 2; complete MPC data (not applicable to DV events)

IMPFLAG = 3; fully imputed

IMPFLAG = 4; partially imputed

IMPFLAG = 5; complete MPC data through capitation imputation (not applicable to DV events)

### ***Flat Fee Expenditures***

To count flat fee expenditures, the expenditure was placed on the first visit of the flat fee group, and the remaining visits had zero payments. Thus, if the first visit in the flat fee group occurred before 2024, all events that occurred in 2024 would have zero payments. Conversely, if the first event in the flat fee group occurred at the end of 2024, the total expenditure for the entire flat fee group would be on that event, regardless of the number of events it covered after 2024. See Section C.2.5.3 for details on the flat fee variables.

### ***Zero Expenditures***

As noted previously, some respondents reported dental events with zero payments. This could occur if (1) the visit was covered under a flat fee arrangement (flat fee payments are included only on the first event covered by the arrangement), (2) there was no charge for a follow-up visit, (3) the provider was never paid directly for services provided by an individual, insurance plan, or other source, (4) the charges were included in another bill, or (5) the event was paid through government or privately funded research or through clinical trials. If all medical events for a person fell into one of these categories, then the total annual expenditures for that person would be zero.

### ***Sources of Payment***

In addition to total expenditures, variables are provided that itemize expenditures by major source of payment category:

1. Out-of-pocket by user (self or family) - includes any deductible, coinsurance, and copayment amounts not covered by other sources, as well as payments for services and providers not covered by the person's insurance or other sources
2. Medicare

3. Medicaid
4. Private insurance
5. Veterans Administration/CHAMPVA, excluding TRICARE
6. TRICARE
7. Other federal sources - includes Indian Health Service, military treatment facilities, and other care by the federal government
8. Other state and local sources - includes community and neighborhood clinics, state and local health departments, and state programs other than Medicaid
9. Workers' compensation
10. Other unclassified sources - includes sources such as automobile, homeowner's, and liability insurance, and other miscellaneous or unknown sources.

***Dental Expenditure Variables (DVSF24X - DVTC24X)***

DVSF24X through DVOT24X are the variables relating to the 10 sources of payment. DVXP24X is the sum of the 10 sources of payment for the dental expenditures, and DVTC24X is the total charge. The 10 sources of payment are: self/family (DVSF24X), Medicare (DVMR24X), Medicaid (DVMD24X), private insurance (DVPV24X), Veterans Administration/CHAMPVA (DVVA24X), TRICARE (DVTR24X), other federal sources (DVOF24X), state and local (non-federal) government sources (DVSL24X), workers' compensation (DVWC24X) and other insurance (DVOT24X).

***Rounding***

Expenditure variables on the 2024 Dental PUF have been rounded to the nearest penny. Person-level expenditure information to be released on the Consolidated PUF will be rounded to the nearest dollar. Of note, using the MEPS event PUFs to create person-level totals will yield slightly different totals from those found on the Consolidated PUF. These differences are due to rounding only. Moreover, in some instances, the number of persons with expenditures in the event PUFs for a particular source of payment may differ from the number of persons with expenditures on the person-level expenditure PUF for that source of payment. This difference is also an artifact of rounding only.

## 3.0 Survey Sample Information

### 3.1 Discussion of Pandemic Effects on Quality of MEPS Data

Like most surveys, MEPS has been substantially affected by the COVID-19 pandemic. One effect of the pandemic is significantly lower response rates (see Section C.3.2 in the Consolidated PUF), which might differentially exclude households more likely to experience IP stays. The demographic shifts on MEPS between 2019 and 2022 suggest a more educated, higher-income, older MEPS sample. (For more details, see Section C.3.1 of the [2020 Consolidated PUF](#), Section C.3.1 of the [2021 Consolidated PUF](#), and Section C.3.1.2 of the [2022 Consolidated PUF](#).) MEPS sample design modifications due to the COVID-19 pandemic reverted in 2022. Thus, concerns about potential bias due to these modifications no longer apply to data collected in this PUF.

To examine the quality of the MEPS FY 2024 data, analyses compared healthcare utilization and health insurance coverage for the MEPS target population between the panels fielded. These comparisons were undertaken for the full sample and three age groups: 0-17, 18-64, and 65 or older. Analysts found no abnormal differences between the two panels. Analyses across years also suggest a rebound to pre-pandemic utilization levels for most essential event types.

The development of the person-level weights for the MEPS full-year 2024 data was designed to limit the potential for response bias. However, analysts of the MEPS full-year 2024 data should continue to exercise caution when interpreting estimates and assessing analyses, especially for data collected from 2020 through 2022. This includes comparing estimates with those of other years and conducting corresponding trend analyses.

### 3.2 Sample Weight (PERWT24F)

A single full-year person-level weight (PERWT24F) is assigned to each record for each Key in-scope person who responded to MEPS for the entire duration that they were in scope during 2024. A Key person was either a member of a responding NHIS household at the time of the interview or joined a family associated with such a household after being out of scope at the time of NHIS (the latter circumstance includes newborns and those returning from military service, an institution, or residence in a foreign country). A person is in scope whenever they are a member of the U.S. civilian noninstitutionalized population.

### 3.3 Details on Person Weight Construction

The person-level weight PERWT24F was developed in several stages. First, a person-level weight for Panel 28 was created, including an adjustment for nonresponse over time and raking. Raking involved adjusting to several sets of marginal control totals reflecting Current Population

Survey (CPS) population estimates based on six variables. The six variables used to establish the initial person-level control figures include the following:

- Educational attainment of the reference person (no degree, high school/GED only or some college, bachelor's or a higher degree)
- Census region (Northeast, Midwest, South, West)
- Metropolitan statistical area (MSA) status (MSA, non-MSA) (Note: For confidentiality reasons, the MSA status variables are no longer released for public use)
- Race/ethnicity (Hispanic; Black, non-Hispanic; Asian, non-Hispanic; other)
- Sex (male, female)
- Age (0-18, 19-25, 26-34, 35-44, 45-64, 65 or older)

The person-level weight for Panel 29 was created similarly. A composite weight was formed by multiplying each weight from Panel 28 by the factor 0.44 and each weight from Panel 29 by the factor 0.56. The choice of factors reflects the relative effective sample sizes of the two panels, helping to limit the variance of estimates obtained from pooling both samples.

Weights for the 2024 Consolidated PUF were then developed by raking the composite weight to CPS-based control totals, replacing educational attainment with poverty status while retaining the other five raking variables previously indicated. Specifically, control totals based on CPS estimates of poverty status (five categories: below poverty, from 100% - 125% of poverty, from 125% - 200% of poverty, from 200% - 400% of poverty, at least 400% of poverty) in addition to age, race/ethnicity, sex, region, and MSA status are used to calibrate weights.

### **3.3.1 MEPS Panel 28 Weight Development Process**

The person-level weight for Panel 28 was developed using the 2023 full-year weight as a “base” weight for survey participants present in 2024.

For Key in-scope members who joined a reporting unit (RU) at some time in 2024 after being out of scope in 2023, the initially assigned person-level weight was the corresponding 2023 family weight. The weighting process also included an adjustment for person-level nonresponse over Rounds 4 and 5, as well as raking to the population control figures for December 2024 for Key responding persons in scope on December 31, 2024. These control totals were derived by scaling back the population distribution obtained from the March 2025 CPS to reflect the December 31, 2024, estimated population total (based on census projections for January 1, 2025). The six variables listed in Section C.3.3 were also used for person-level raking: education of the reference person, census region, MSA status, race/ethnicity, sex, and age. The final weight for Key responding persons who were not in scope on December 31, 2024, but were in scope earlier in the year was the nonresponse-adjusted person weight without raking.

Note that the 2023 full-year weight that was used as the base weight for Panel 28 was derived using the 2023 MEPS Round 1 weight and reflected adjustment for nonresponse over the remaining data collection rounds in 2023, as well as raking to the December 2023 population control figures.

### **3.3.2 MEPS Panel 29 Weight Development Process**

The person-level weight for Panel 29 was developed using the 2024 Round 1 person-level weight as a base weight. The Round 1 weights incorporated the following components: the original household probability of selection for NHIS and for the NHIS subsample reserved for MEPS, an adjustment for NHIS nonresponse, the probability of selection for MEPS from NHIS, an adjustment for nonresponse at the DU level for Round 1, and raking to control figures at the person level from the March CPS of the corresponding year. For Key in-scope members who joined an RU after Round 1, the Round 1 DU weight served as a base weight.

The weighting process also included an adjustment for nonresponse over the remaining data collection rounds in 2024, as well as raking to the same population control figures for December 2024 that were used for the Panel 28 weight for Key responding persons in scope on December 31, 2024. The same six variables used for Panel 28 raking (education level of the reference person, census region, MSA status, race/ethnicity, sex, and age) were also used for Panel 29 raking. Similar to Panel 28, the Panel 29 final weight for Key responding persons who were not in scope on December 31, 2024, but were in scope earlier in the year was the nonresponse-adjusted person weight without raking.

### **3.3.3 The Final Weight for 2024**

The final raking of those in scope at the end of the year has been described previously. In addition, the composite weights of two groups of persons who were out of scope on December 31, 2024, were adjusted for expected undercoverage. Specifically, the weights of those who were out of scope on December 31, 2024, but in scope at some time during the year and were residing in a nursing home at the end of the year were poststratified to an estimate of the number of persons who were residents of Medicare- and Medicaid-certified nursing homes for part of the year (approximately 3-9 months) during 2014. This estimate was developed from data on the Minimum Data Set (MDS) of the Centers for Medicare & Medicaid Services (CMS). The weights of persons who died while in scope were poststratified to corresponding estimates derived using data from the Centers for Disease Control and Prevention (CDC), NCHS, and [About Provisional Mortality Statistics, 2018 through Last Week](#) on the CDC WONDER online database (released in 2025, the latest available data at the time). Separate decedent control totals were developed for the “65 or older” and “under 65” civilian noninstitutionalized populations.

Overall, the weighted population estimate for the civilian noninstitutionalized population for December 31, 2024, is 336,022,966 (PERWT24F >0 and INSC1231 = 1). The sum of person-level weights across all persons assigned a positive person-level weight is 339,797,629.

### **3.4 Coverage**

The target population associated with MEPS is the 2024 U.S. civilian noninstitutionalized population. However, the MEPS sampled households are a subsample of the NHIS households interviewed in 2022 (Panel 28) and 2023 (Panel 29). New households created after the NHIS interviews for the respective panels and consisting exclusively of persons who entered the target population after 2022 (Panel 28) or after 2023 (Panel 29) are not covered by the 2024 MEPS. Nor are previously out of scope persons who joined an existing household but are not related to the current household residents. Thus, persons not covered by a given MEPS panel include some members of the following groups: newborns, immigrants, persons leaving the military, U.S. citizens returning from residence in another country, and persons leaving institutions. Those not covered represent a small proportion of the MEPS target population.

### **3.5 Using MEPS Data for Trend Analysis**

For analysts using the MEPS data for trend analysis, there are uncertainties associated with 2020, 2021, and 2022 data quality, as discussed in Section C.3.1. Evaluations of important MEPS estimates suggest that the estimates are of reasonable quality. Nevertheless, analysts are advised to exercise caution when interpreting these estimates, particularly for trend analyses, because the pandemic substantially affected healthcare access and related factors (e.g., health insurance coverage, employment status).

MEPS began in 1996, and the utility of the survey for analyzing healthcare trends expands with each additional year of data; however, when examining trends over time using MEPS, the duration being analyzed should be considered. In particular, large shifts in survey estimates over short periods (e.g., from one year to the next) that are statistically significant should be interpreted with caution, unless they are attributable to known factors such as changes in public policy, economic conditions, or the MEPS methodology.

With respect to methodological considerations, changes in data collection methods, such as interviewer training, were introduced in 2013 to obtain more complete information about healthcare utilization from MEPS respondents; the changes were fully implemented in 2014. This effort likely improved data quality and reduced underreporting starting in the second half of 2013 and continuing throughout the 2014 full-year files. The changes have also affected analyses involving utilization trends across years. Changes in the NHIS sample design in 2016 and 2018 could also affect trend analyses. The new NHIS sample design is based on more up-to-date information related to the distribution of housing units across the United States. As a result, it can be expected to better cover the full civilian noninstitutionalized population, the target population for MEPS, and many of its subpopulations. Improved coverage of the target population helps to reduce the potential for bias in both NHIS and MEPS estimates.

Another change with the potential to affect trend analyses involves major modifications to the MEPS instrument design and data collection process, particularly in the events sections of the instrument. These were introduced in spring 2018 and thus affected data beginning with Round 1 of Panel 23, Round 3 of Panel 22, and Round 5 of Panel 21. Because the full-year 2017 MEPS files were established from data collected in Rounds 1-3 of Panel 22 and Rounds 3-5 of Panel 21,

they reflect two instrument designs. To mitigate the effect of such differences within the same full-year file, the Panel 22 Round 3 data and the Panel 21 Round 5 data were transformed to be as consistent as possible with data collected under the previous design. The changes to the instrument were designed to make data collection more efficient and easier to administer. In addition, data on some items, such as those related to healthcare events, were expected to be more complete, with the potential of identifying more events. Increases in service use reported since the implementation of these changes are consistent with these expectations. Note: Analysts should be aware of the possible impacts of these changes on data, especially trend analyses, that include the year 2018 because of the design transition.

Process changes, such as data editing and imputation, may also affect trend analyses. For example, analysts should refer to Section C.2.5.11: Utilization, Expenditures, and Sources of Payment Variables in the Consolidated PUF (HC 256). For more details, refer to the documentation for the prescription drug file (HC 254A) when analyzing prescription drug spending over time. As always, before conducting trend analyses, analysts should review relevant documentation sections for descriptions of changes that might affect interpretation over time.

To smooth or stabilize trend analyses based on the MEPS data, analysts may also wish to consider statistical approaches such as comparing pooled time periods (e.g., 1996-1997 vs. 2011-2012), working with moving averages, or using modeling techniques with several consecutive years of data.

Finally, statistical significance tests should be conducted to assess the likelihood that observed trends are not attributable to sampling variation. In addition, researchers should be aware of the impact of multiple comparisons on Type I error. Without making appropriate allowance for multiple comparisons, conducting numerous statistical significance tests of trends will increase the likelihood of concluding that a change has occurred when one has not.

## **4.0 Strategies for Estimation**

### **4.1 Developing Event-Level Estimates**

The data on this PUF can be used to develop national 2024 event-level estimates for the U.S. civilian noninstitutionalized population on dental visits and expenditures, as well as sources of payment for these visits. The weight assigned to each dental visit reported is the person-level weight of the person who visited the dentist. If a person reported several visits, each visit is assigned that individual's person-level weight. Estimates of total visits are the sum of the weight variable (PERWT24F) across relevant event records, whereas estimates of other variables must be weighted by PERWT24F to be nationally representative. For example, the appropriate estimate for the mean out-of-pocket payment per dental visit can be represented as follows (the subscript "j" identifies each event and represents a numbering of events from 1 through the total number of events in the PUF):

$$(\sum W_j X_j)/(\sum W_j), \text{ where,}$$

$W_j = \text{PERWT24F}_j$  (full year person weight for the person associated with event j), and

$X_j = \text{DVSF24X}_j$  (amount paid by self/family for event j).

Estimates and corresponding [standard errors \(SEs\)](#) can be derived using an appropriate computer software package for complex survey analysis, such as SAS, Stata, SUDAAN, R, or SPSS. The following tables contain the event-level estimates for several key variables on this file.

**Table 3**

***Selected Event-Level Estimates - Visits***

| Estimate of interest   | Variable name | Estimate (SE)  | Estimate excluding zero payment events (SE) |
|--|---------------|----------------|---|
| Total number of dental visits (in millions)                    | PERWT24F      | 361.3 (11.95)  | 310.7 (9.86)                                |
| Proportion of dental visits with expenditures > 0 <sup>a</sup> | DVXP24X       | 0.860 (0.0059) | -----                                       |

<sup>a</sup>Zero payment events can occur in MEPS for the following reasons: (1) the visit was covered under a flat fee arrangement (flat fee payments are included only on the first event covered by the arrangement), (2) there was no charge for a follow-up visit, (3) the provider was never paid directly for services provided by an individual, insurance plan, or other source, (4) the charges were included in another bill, or (5) the event was paid through government or privately funded research or through clinical trials.

**Table 4**

***Selected Event-Level Estimates - Expenditures***

| Estimate of interest  | Variable name       | Estimate (SE)   | Estimate excluding zero payment events (SE) |
|---|---------------------|-----------------|---|
| Mean total payments per visit   | DVXP24X             | \$462 (\$12.00) | \$537 (\$14.40)                             |
| Mean out-of-pocket payments per visit                                     | DVSF24X             | \$214 (\$10.60) | \$249 (\$12.60)                             |
| Mean proportion of total expenditures paid by private insurance per visit | DVPV24X/<br>DVXP24X | -----           | 0.497 (0.0083)                              |

**Table 5****Expenditures: Dental Hygienist Visits (DENTHYG = 1)**

| Estimate of interest   | Variable name       | Estimate (SE)  | Estimate excluding zero payment events (SE) |
|--|---------------------|----------------|---|
| Mean total payments per visit where person saw hygienist   | DVXP24X             | \$300 (\$8.90) | \$309 (\$9.20)                              |
| Mean out-of-pocket payment per visit where person saw hygienist                                      | DVSF24X             | \$102 (\$5.60) | \$105 (\$5.90)                              |
| Mean proportion of total expenditures per visit paid by private insurance where person saw hygienist | DVPV24X/<br>DVXP24X | -----          | 0.577 (0.0100)                              |

**4.2 Person-Based Estimates for Dental Care**

To enhance analyses of dental care, analysts may link information about dental visits by sampled persons in this PUF to the annual Consolidated PUF (which has data for all MEPS sampled persons) or conversely, link person-level information from the Consolidated PUF to this event-level PUF (see Section C.5.0 for more details). Both this PUF and the Consolidated PUF may be used to derive estimates relative to persons with dental care and annual estimates of total expenditures. However, for estimates pertaining to those who did not visit the dentist as well as those who did (e.g., the percentage of adults who visited the dentist at least once during the past year or the mean number of visits to the dentist in the past year among those ages 65 or older) this PUF cannot be used. Only those persons with at least one dental visit are represented on this PUF. The Consolidated PUF must be used for person-level analyses that include both persons with and without dental care.

**4.3 Variables With Missing Values**

Analysts must examine all variables for the presence of negative values used to represent missing values. For continuous or discrete variables, where means or totals may be calculated, it may be necessary to set negative values to values appropriate to analytic needs. That is, analysts should either impute a value or set it to a value that the software package will interpret as missing. For categorical and dichotomous variables, analysts can consider whether to recode or impute a value for cases with negative values or whether to include or exclude such cases in the numerator, denominator, or both when calculating proportions.

Section C.2.5.5 describes methodologies used for the editing/imputation of expenditure variables (e.g., sources of payment, flat fee, zero expenditures).

## 4.4 Variance Estimation (VARSTR, VARPSU)

To obtain estimates of variability in MEPS estimates (e.g., the standard error of sample estimates or corresponding confidence intervals), analysts should consider MEPS's complex sample design for both person-level and family-level analyses. Several methods have been developed to estimate standard errors for surveys with complex sample designs, including the Taylor series linearization method, balanced repeated replication (BRR), and jackknife replication; various software packages can implement these methods. MEPS analysts most commonly use the Taylor series approach. Although this PUF does not contain replicate weights, analysts can use the BRR method to construct replicate weights to develop variances for more complex estimators (see Section C.4.4.2).

### 4.4.1 Taylor Series Linearization Method

The variables needed to calculate appropriate standard errors based on the Taylor series linearization method are included on this file, as well as all other MEPS PUFs. Software packages that support the Taylor series linearization method include SUDAAN, R, Stata, SAS (version 8.2 or higher), and SPSS (version 12.0 or higher). For complete information on a package's capabilities, analysts should refer to the software's user documentation.

With the Taylor series linearization method, variance estimation strata and the variance estimation primary sampling units (PSUs) within these strata must be specified. The variables VARSTR and VARPSU on this Dental PUF identify the sampling strata and PSUs required by the variance estimation programs. Specifying a "with replacement" design in one of the previously mentioned software packages will provide estimated standard errors appropriate for assessing the variability of MEPS estimates. Note that the number of degrees of freedom associated with estimates of variability indicated by a package may not appropriately reflect the number available. For variables of interest distributed throughout the country (and thus across the MEPS sample PSUs), one can generally expect to see at least 100 degrees of freedom associated with the estimated standard errors for national estimates based on this MEPS database.

Before 2002, the MEPS variance strata and PSUs were developed independently from year to year, and the last two characters of the strata and PSU variable names denoted the year. Beginning with the 2002 point-in-time PUF, the approach changed with the intention that variance strata and PSUs would be developed to be compatible with all future PUFs until the NHIS design changed. Thus, when pooling data from 2002 through Panel 11 in the 2007 files, analysts can use the variance strata and PSU variables provided without modifying them for variance estimation purposes for estimates covering multiple years of data. There are 203 variance estimation strata; each stratum has either two or three variance estimation PSUs.

Beginning with Panel 12 in the 2007 files, a new set of variance strata and PSUs was developed because of the introduction of a new NHIS design. There are 165 variance strata with either two or three variance estimation PSUs per stratum. Therefore, there are a total of 368 (203 + 165) variance strata in the 2007 Consolidated PUF because it consists of two panels selected under two independent NHIS sample designs. Because both MEPS panels in the full-year files from

2008 to 2016 are based on the same NHIS design, there are only 165 variance strata. These strata (VARSTR values) have been numbered from 1001 to 1165 so they can be readily distinguished from those developed under the former NHIS sample design when pooling data across multiple years.

The NHIS sample design was changed again in 2016, effectively changing the MEPS design beginning with calendar year 2017. Beginning with Panel 22 in the 2017 files, a new set of variance strata and PSUs was developed. There are 117 variance strata with either two or three variance estimation PSUs per stratum. Therefore, there are a total of 282 (165 + 117) variance strata in the 2017 Consolidated PUF because it consists of two panels selected under two independent NHIS sample designs. To simplify data pooling across multiple years of MEPS, the variance strata numbering system was changed. The strata associated with the new design are numbered from 2001 to 2117.

The NHIS sample design was further modified in 2018, so the MEPS variance structure for the 2019 Consolidated PUF was also modified, reducing the number of variance strata to 105. The new variance structure maintained consistency with the prior structure by assigning the 2019 variance strata to values within the same 2001-2117 range, though there are now some gaps in the sequence of assigned values. Because of the modification, each stratum could contain up to five variance estimation PSUs.

For Panel 26 in the 2021 and 2022 Consolidated PUFs, an additional NHIS sample was used for MEPS to account for increasing nonresponse during the pandemic (as discussed in Section C.3.1). The additional sample was assigned to the existing variance strata, so the 2021 and 2022 Consolidated PUFs continued to have 105 variance strata, numbered from 2001-2117, with a few gaps in the values in that range. In many cases, the additional sample was assigned to new variance estimation PSUs. Thus, in the 2021 and 2022 Consolidated PUFs, each stratum contained up to eight variance estimation PSUs.

Additional NHIS samples were no longer needed beginning in 2023, leading to fewer variance estimation PSUs than in the 2021 and 2022 Consolidated PUFs. The Consolidated PUF continues to have 105 variance strata, numbered from 2001-2117, with a few gaps in the values in that range. Each stratum contains up to seven variance estimation PSUs.

When pooling data across multiple years of MEPS data, analysts should note that, to obtain appropriate standard errors, it is necessary to specify a common variance structure. Before 2002, each annual PUF was released with a variance structure unique to the particular MEPS sample in that year. Starting in 2002, the annual PUFs were released with a common variance structure to allow analysts to pool data from 2002 to 2018. However, analysts can no longer do this routinely because the variance structure was modified beginning in 2019.

To ensure that variance strata are identified appropriately for variance estimation purposes when pooling MEPS data across several years, analysts should proceed as follows:

1. When pooling any year from 2002 to 2018, use the variance strata numbering as is.
2. When pooling (a) any year from 1996 to 2001 with any year from 2002 or later, or (b) the year 2019 and beyond with any earlier year, use the pooled linkage PUF HC-

036, which contains the proper variance structure. The HC-036 PUF is updated every year so that appropriate variance structures are available with pooled data. Further details are included in the public use documentation for the HC-036 PUF.

#### **4.4.2 Balanced Repeated Replication Method**

BRR replicate weights are not provided on this MEPS Dental PUF for the purposes of variance estimation. However, a file containing a BRR structure is available so that analysts can form replicate weights, if desired, from the final MEPS weight to compute variances of MEPS estimates using either BRR or Fay's modified BRR (Fay, 1989) methods. The replicate weights are useful for computing variances of complex nonlinear estimators for which a Taylor linear form is neither easy to derive nor available in commonly used software. For instance, it is not possible to calculate the variances of a median or the ratio of two medians by using the Taylor linearization method. For these types of estimators, analysts can calculate a variance using BRR or Fay's modified BRR methods. However, it should be noted that the replicate weights are derived from the final weight through a shortcut approach. Specifically, the replicate weights are not computed from the base weight, and all adjustments made in different stages of weighting are not applied independently in each replicate. Thus, the variances computed using this one-step BRR do not capture the effects of all weighting adjustments that would be captured in a set of fully developed BRR replicate weights. The Taylor series approach does not fully capture the effects of the different weighting adjustments, either.

The dataset HC-036BRR; MEPS 1996-2024 Replicates for Variance Estimation File contains the information necessary to construct the BRR replicates. It includes a set of 128 flags (BRR1-BRR128) in the form of half sample indicators, each of which is coded 0 or 1 to indicate whether the person should or should not be included in that particular replicate. These flags can be used in conjunction with the full-year weight to construct the BRR replicate weights. For an analysis of MEPS data pooled across years, the BRR replicates can be formed in the same way by using the HC-036, MEPS 1996-2024 Pooled Linkage Variance Estimation File. For more information about creating BRR replicates, analysts can refer to the documentation for the [HC-036BRR pooled linkage file](#) on the AHRQ website.

## **5.0 Merging/Linking MEPS Data Files**

Data from this PUF can be used alone or in conjunction with other PUFs for different analytic purposes. Merging characteristics of interest from other MEPS PUFs expands the scope of potential estimates. For example, the medical event PUFs can be merged with the person-level Consolidated PUF to calculate event-level estimates for persons with specific characteristics (e.g., age, race, sex, education).

Most of the event PUFs can also be linked to the Medical Conditions PUF by using the Condition-event Link (CLNK) PUF. When using the CLNK PUF, analysts should keep in mind that (1) conditions are household reported, (2) multiple conditions may be associated with a medical event, (3) one condition may link to more than one event, and (4) not all medical events link to the Medical Conditions PUF.

In addition to linking to other MEPS PUFs, each MEPS panel can also be linked back to the previous year's NHIS PUFs. This is because the set of households selected for MEPS is a subsample of NHIS participants. For information on obtaining MEPS/NHIS link files please see the [MEPS website](#).

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# Appendix

## Variable-Source Crosswalk

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### FOR MEPS HC 254B: 2024 DENTAL VISITS

See the Household section under Survey Components on the [MEPS home page](#) for information on the [MEPS HC questionnaire sections](#) shown in the Source column (e.g., DN) of the tables in this appendix.

#### Survey Administration Variables

| Variable | Description                       | Source               |
|----------|-----------------------------------|----------------------|
| DUID     | Panel # + encrypted DU identifier | Assigned in sampling |
| PID      | Person number                     | Assigned in sampling |
| DUPERSID | Person ID (DUID + PID)            | Assigned in sampling |
| EVNTIDX  | Event ID                          | Assigned in sampling |
| EVENTRN  | Event round number                | CAPI derived         |
| FFEEIDX  | Flat fee ID                       | CAPI derived         |
| PANEL    | Panel number                      | Constructed          |

#### Dental Events Variables

| Variable     | Description   | Source        |
|--------------|---|---------------|
| DVDATEYR     | Event date - year   | CAPI derived  |
| DVDATEMM     | Event date - month  | CAPI derived  |
| GENDENT_M18  | General dentist seen  | DN10          |
| DENTHYG_M18  | Dental hygienist seen   | DN10          |
| DNSPCLST_M18 | Dental specialist seen  | DN10          |
| PEDDENT_M18  | Pediatric dentist seen  | DN10          |
| DENTYPE_M18  | Other dental specialist seen                                    | DN10          |
| EXAMINEX     | General exam, checkup or consultation - edited                  | DN20 (Edited) |
| CLENTETX     | Cleaning, prophylaxis, polishing or periodontal recall - edited | DN20 (Edited) |
| JUSTXRYX     | X-rays, radiographs or bitewings - edited                       | DN20 (Edited) |

| Variable | Description   | Source          |
|----------|---|-----------------|
| FLUORIDX | Fluoride treatment - edited   | DN20 (Edited)   |
| SEALANTX | Sealant application - edited  | DN20 (Edited)   |
| FILLINGX | Fillings, inlays, crowns or caps - edited                                 | DN20 (Edited)   |
| ROOTCANX | Root canal - edited   | DN20 (Edited)   |
| GUMSURGX | Periodontal scaling, root planing or gum surgery - edited                 | DN20 (Edited)   |
| IMPLANTX | Implants - edited   | DN20 (Edited)   |
| ORALSURX | Extraction, tooth pulled or oth oral surgery - edited                     | DN20 (Edited)   |
| BRIDGESX | Fixed or relining/repair of bridges/dentures, removable dentures - edited | DN20 (Edited)   |
| ORTHDONX | Orthodontia, braces or retainers - edited                                 | DN20 (Edited)   |
| DENTPROX | Other dental procedures - edited  | DN20OS (Edited) |
| DENTOTHX | Other specify dental procedures - edited                                  | DN20OS (Edited) |

### Flat Fee Variables

| Variable | Description                         | Source      |
|----------|-------------------------------------|-------------|
| FFDVTYPE | Flat fee bundle                     | Constructed |
| FFBEF24  | Total # of visits in FF before 2024 | FF50        |
| FFTOT25  | Total # of visits in FF after 2024  | FF60        |

### Imputed Expenditure Variables

| Variable | Description                                     | Source              |
|----------|---|---------------------|
| DVSF24X  | Amount paid, family (Imputed)                   | CP Section (Edited) |
| DVMR24X  | Amount paid, Medicare (Imputed)                 | CP Section (Edited) |
| DVMD24X  | Amount paid, Medicaid (Imputed)                 | CP Section (Edited) |
| DVPV24X  | Amount paid, private insurance (Imputed)        | CP Section (Edited) |
| DVVA24X  | Amount paid, Veterans/CHAMPVA (Imputed)         | CP Section (Edited) |
| DVTR24X  | Amount paid, TRICARE (Imputed)                  | CP Section (Edited) |
| DVOF24X  | Amount paid, other federal (Imputed)            | CP Section (Edited) |
| DVSL24X  | Amount paid, state & local government (Imputed) | CP Section (Edited) |

| Variable | Description                               | Source              |
|----------|---|---------------------|
| DVWC24X  | Amount paid, workers' comp (Imputed)      | CP Section (Edited) |
| DVOT24X  | Amount paid, other insurance (Imputed)    | CP Section (Edited) |
| DVXP24X  | Sum of DVSF24X - DVOT24X (Imputed)        | Constructed         |
| DVTC24X  | Household reported total charge (Imputed) | CP Section (Edited) |
| IMPFLAG  | Imputation status                         | Constructed         |

### **Weights Variables**

| Variable | Description                          | Source      |
|----------|--------------------------------------|-------------|
| PERWT24F | Expenditure File Person Weight, 2024 | Constructed |
| VARSTR   | Variance estimation stratum, 2024    | Constructed |
| VARPSU   | Variance estimation PSU, 2024        | Constructed |