MEPS HC 239D:
2022 Hospital Inpatient Stays

May 2024

Agency for Healthcare Research and Quality
Center for Financing, Access, and Cost Trends
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A. Data Use Agreement

Individual identifiers have been removed from the micro-data 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. 299 a-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 for 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 above 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; and

2. If the identity of any person or establishment should be discovered inadvertently, then (a) no use will be made of this knowledge, (b) the Director Office of Management 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; and

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 above 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.

The Agency for Healthcare Research and Quality requests that users cite AHRQ and the Medical Expenditure Panel Survey as the data source in any publications or research based upon these data.

B. Background

1.0 Household Component

The Medical Expenditure Panel Survey (MEPS) provides nationally representative estimates of health care use, expenditures, sources of payment, 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 panel design of the survey includes five rounds of interviews covering 2 full calendar years. Additional rounds were added to Panel 24 in 2021 and 2022, covering the third and fourth years, respectively, to compensate for the smaller number of completed interviews in later panels. These extra rounds provide data for examining person-level changes in selected variables such as expenditures, health insurance coverage, and health status. Information about each household member is collected through computer-assisted personal interviewing (CAPI) technology, and the survey builds on this information from interview to interview. All data for a sampled household are reported by a single household respondent.

The MEPS HC was initiated in 1996. Each year a new panel of sample 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 approximately up to 15,000 households. Data can be analyzed at the person, the family, or the event level. Data must be weighted to produce national estimates.

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

2.0 Medical Provider Component

When the household CAPI interview is completed and permission is obtained from the household survey respondents 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 the 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 amounts of payment. The MPC is not

designed to yield national estimates. It is primarily used as an imputation source to supplement/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, Inc., and the MEPS MPC data are collected under contract with Research Triangle Institute. Datasets and summary statistics are edited and published in accordance with the confidentiality provisions of the Public Health Service Act and the Privacy Act. The 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 datatools.ahrq.gov.

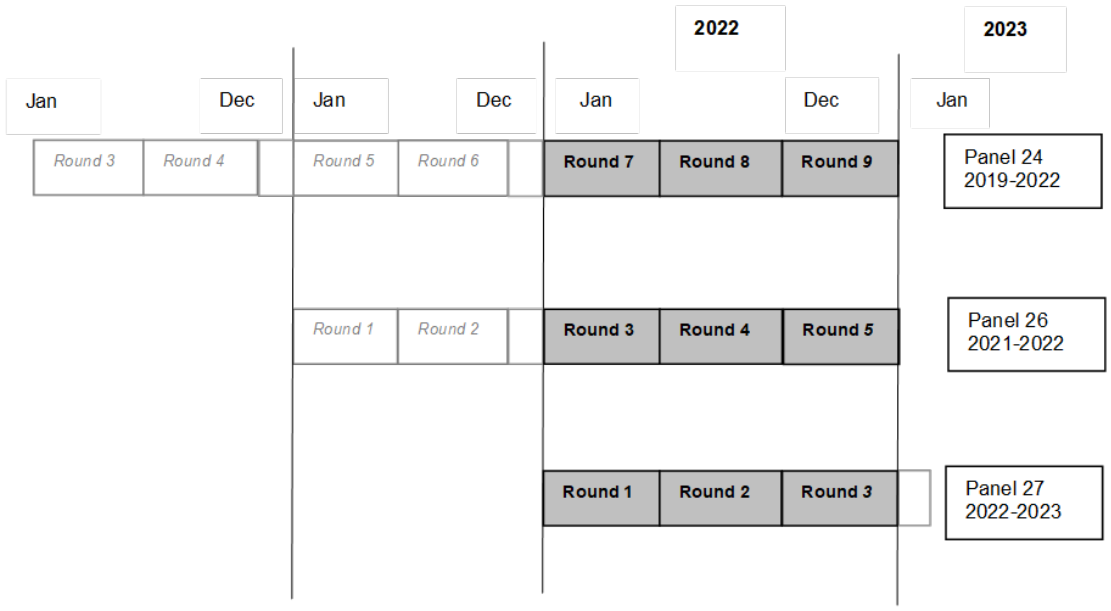
Additional information on MEPS is available from the MEPS project manager or the MEPS public use data manager at the Center for Financing, Access, and Cost Trends, Agency for Healthcare Research and Quality, 5600 Fishers Lane, Rockville, MD 20857 (301-427-1406).

C. Technical and Programming Information

1.0 General Information

This documentation describes one in a series of public use event files from the 2022 MEPS HC and MPC. It was released as an ASCII data file (with related SAS, Stata, SPSS, and R programming statements and data user information) and as a SAS dataset, a SAS transport file, a Stata dataset, and an Excel file. The 2022 Hospital Inpatient Stays (STAZ) Public Use File (hereafter referred to as the STAZ PUF), provides detailed information on hospital inpatient stays from a nationally representative sample of the U.S. civilian noninstitutionalized population. Data from the STAZ PUF can be used to make estimates of hospital inpatient stay utilization and expenditures for calendar year 2022. The file contains 50 variables and has a logical record length of 320 with an additional 2-byte carriage return/line feed at the end of each record. As illustrated below, this PUF consists of MEPS survey data obtained in the 2022 portion of Round 7, and all of Rounds 8 and 9 for Panel 24; the 2022 portion of Round 3, and all of Rounds 4 and 5 for Panel 26; and Rounds 1, 2, and the 2022 portion of Round 3 for Panel 27 (i.e., the rounds for MEPS panels covering calendar year 2022).

Full year (FY) 2022 includes three panels of data; Panel 24 was extended to include Rounds 7, 8, and 9.



Hospital stay events reported in Panel 24 Round 9, Panel 26 Round 5, and Panel 27 Round 3 and known to have begun after December 31, 2022 are not included in this PUF.

Each record in the STAZ PUF represents a unique hospital inpatient stay reported by the household respondent. In addition to expenditures related to the stay, each record contains the length of stay.

Annual counts of hospital inpatient stay utilization are based entirely on household reports. Information from the MEPS MPC is used to supplement expenditure and payment data reported by the household and does not affect use estimates.

Data from this event PUF can be merged with other 2022 MEPS HC PUFs for purposes of appending person-level data such as demographic characteristics or health insurance coverage to each hospital inpatient stay record.

This PUF can also be used to construct summary variables of expenditures, sources of payment, and related aspects of hospital inpatient care. Aggregate annual person-level information on the use of hospital inpatient stays and other health services is provided in the MEPS 2022 Full Year Consolidated PUF (hereafter referred to as the Consolidated PUF) where each record represents a MEPS sampled person.

This documentation offers an overview of the types and levels of data provided, and the content and structure of the PUF and the codebook. It contains the following sections:

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

Any variables not found in this PUF but released on previous years' PUFs may have been excluded because they contained only missing data.

For more information on the MEPS HC sample design, see Chowdhury et al. (2019). For information on the MEPS MPC design, see RTI (2019). Copies of the HC and the MPC survey instruments used to collect the information in this STAZ PUF are available in the *Survey Questionnaires* section on the MEPS website.

2.0 Data File Information

The 2022 STAZ PUF consists of one event-level file. The PUF contains characteristics associated with the STAZ event and imputed expenditure data.

The 2022 STAZ PUF contains variable and frequency distributions for a total of 1,933 hospital inpatient stay records reported during the 2022 portion of Round 7, and all of Rounds 8 and 9 for Panel 24; the 2022 portion of Round 3, and all of Rounds 4 and 5 for Panel 26; as well as Rounds 1, 2, and the 2022 portion of Round 3 for Panel 27 of the MEPS HC. This PUF includes hospital inpatient stay records for all household survey members who resided in eligible responding households and for whom at least one hospital inpatient stay was reported. Hospital inpatient stay records known to have ended before January 1, 2022 or after December 31, 2022 are not

included in this PUF. Some household members may have had multiple hospital inpatient stays reported and, thus, will be represented in multiple records in this PUF. Other household members may have no hospital inpatient stays reported and, thus, will have no records in this PUF. Of the 1,933 hospital inpatient stay records, 1,906 are associated with persons having a positive person-level weight (PERWT22F). The persons represented in this PUF had to meet the following three criteria:

1. The hospital stay had to have been reported by a household survey respondent as an inpatient hospital stay (regardless of a stay's length).

2. The hospital stay had to have ended during 2022. Stays that began prior to 2022 but ended during 2022 are included in this PUF. Stays that began in 2022 but ended during 2023 are excluded from this PUF and will be included in a subsequent 2023 STAZ PUF. Persons with no hospital inpatient stay events for 2022 are not included in this event-level PUF but are represented on the person-level 2022 Full Year Population Characteristics PUF (here after referred to as the Population Characteristics PUF).

3. The persons represented in this PUF also had to meet either 3a) or 3b):

    a) Be classified as a Key in-scope person who responded for their entire period of 2022 eligibility (i.e., persons with a positive 2022 full-year person-level weight, PERWT22F > 0), or

    b) Be an eligible member of a family whose Key in-scope members have a positive person-level weight (PERWT22F > 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 (FAMWT22F > 0). Note that FAMIDYR and FAMWT22F are variables on the 2022 Consolidated PUF.

One caveat that should be noted is that in the case of a newborn and the hospital inpatient stay associated with the newborn's birth, a separate hospital inpatient stay record exists in the PUF only if the newborn was discharged after the mother. Thus, hospital stays associated with a normal birth are generally represented in the PUF as a single record (i.e., the mother's hospital inpatient stay record, covering expenditure data for both the mother and baby). In situations where the newborn was discharged after the mother, the birth event will be represented as two records: one record for the mother and one record for the baby. For newborns re-admitted to the hospital during the reference year, each subsequent re-admission will have a separate record.

Each inpatient record includes the following: start and end dates of the hospital inpatient stay; number of nights in the hospital; reason entered the hospital; medicines prescribed at discharge; flat fee information; imputed sources of payment; total payment and total charge for both the facility and physician portions of the hospital inpatient stay expenditure; a full-year person-level weight; variance strata; and variance PSU.

To append person-level information such as demographic or health insurance coverage to each event record, data from this PUF can be merged with 2022 MEPS HC person-level data (e.g. Consolidated or Population Characteristics PUFs) using the person identifier, DUPERSID.

Hospital inpatient stay events can also be linked to the MEPS 2022 Medical Conditions File. Please see Section 5.0 or the MEPS 2022 Appendix PUF, HC 239I, for details on how to merge MEPS data files.

2.1 Codebook Structure

For most variables in the STAZ PUF, both weighted and unweighted frequencies are provided in the accompanying codebook file. 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 Section D, "Variable-Source Crosswalk". The codebook and data file list variables in the following order:

- Unique person identifiers
- Unique hospital inpatient stay identifiers
- Hospital inpatient stay characteristics variables
- Imputed expenditure variables
- Weight and variance estimation variables

Note that the person identifier corresponds to a unique person and the hospital stays event identifier corresponds to a unique event.

2.2 Reserved Codes

This STAZ PUF contains several reserved code values.

Table 1

Reserved Code Values and Definitions

Value		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 having 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 STAZ codebook describes an ASCII dataset (although the data are also being provided in an Excel file, a Stata dataset, a SAS dataset, and a SAS transport file) and provides the programming identifiers for each variable.

Table 2

Programming Identifiers for Each Variable in the STAZ 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, the variable names reflect the content of the variable. All imputed/edited 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 in this STAZ PUF were derived from the MPC data collection instrument, CAPI, or assigned in sampling. The source of each variable is identified in Section D "Variable - Source Crosswalk" 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 those questionnaire sections and question numbers indicated in the "Source" column; questionnaire sections are identified as:

    - HS - Hospital Stays section
    - FF - Flat Fee section
    - CP - Charge Payment section

3. Variables constructed from multiple questions by using complex algorithms are labeled "Constructed" in the "Source" column; and

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, 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 10 source of payment variables are named in the following way:

The first two characters indicate the type of event:

IP - inpatient stay	OB - office-based visit
ER - emergency room visit	OP - outpatient visit
HH - home health visit	DV - dental visit
OM - other medical equipment	RX - prescribed medicine

For expenditure variables on the STAZ PUF, the third character indicates whether the expenditure is associated with the facility (F) or the physician (D).

In the case of the source of payment variables, the fourth and fifth characters indicate:

SF - self or family

MR - Medicare

MD - Medicaid

PV - private insurance

VA - Veterans Administration/CHAMPVA

TR - TRICARE

OF - other federal government

SL - state/local government

WC - Workers' Compensation

OT - other insurance

XP - sum of payments

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

The sixth and seventh characters indicate the year (22). The eighth character, being "X", indicates the variable is edited/imputed.

For example, IPFSF22X is the edited/imputed amount paid by self or family for the facility portion of the hospital inpatient stay expenditure incurred in 2022.

2.5 File Contents

2.5.1 Survey Administration Variables

Person Identifiers (DUID, PID, DUPERSID)

The definitions of Dwelling Units (DUs) in the MEPS Household Survey are generally consistent with the definitions employed for the NHIS. The dwelling unit ID (DUID) is a 7-digit ID number consisting of a 2-digit panel number followed by a 5-digit random number assigned after the case was sampled for MEPS. A 3-digit person number (PID) uniquely identifies each person within the DU. The variable DUPERSID is the combination of DUID and PID. IDs begin with the 2-digit panel number.

For detailed information on dwelling units and families, please refer to the documentation for the 2022 Population Characteristics PUF.

Record Identifiers (EVNTIDX, ERHEVIDX, FFEEIDX)

EVNTIDX uniquely identifies each hospital inpatient stay/event (i.e., each record on the STAZ PUF) and is the variable required to link hospital inpatient stay events to the data file containing details on conditions (2022 Medical Conditions PUF). EVNTIDX begins with the 2-digit panel number and ends with the 2-digit event type number. For details on linking, see Section 5.0:Merging/Linking MEPS Data Files, or the MEPS 2022 Appendix PUF, HC 239I.

ERHEVIDX is a constructed variable identifying a STAZ record that includes the facility expenditures for the preceding emergency room visit. For events where the provider-reported data are not available, this variable is derived from the final link between a hospital inpatient stay and an emergency room visit reported by the household (see "Hospital Inpatient Stay/Emergency Room Expenditures" in Section 2.5.6). For events where the provider-reported data are available, this variable is derived from provider-reported information on linked emergency room and inpatient stay events that matched to corresponding events reported by the household. The variable ERHEVIDX contains the EVNTIDX of the linked event. On the 2022 STAZ PUF, there are 819 hospital stays linked to a preceding emergency room visit, that is, there are records with a valid ERHEVIDX value. Please note that the physician expenditures associated with the emergency room visit remain on the emergency room PUF.

FFEEIDX is a constructed variable that uniquely identifies a flat fee group, that is, all events that were a part of a flat fee payment. For example, dialysis treatments are 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.

Round Indicator (EVENTRN)

EVENTRN indicates the round in which the hospital inpatient stay was first reported. Please note: Rounds 7 (partial), 8, and 9 are associated with MEPS data collected from Panel 24. Likewise, Rounds 3 (partial), 4, and 5 are associated with data collected from Panel 26; and Rounds 1, 2, and 3 (partial) are associated with data collected from Panel 27.

Panel Indicator (PANEL)

PANEL is a constructed variable used to specify the panel number for the person. PANEL will indicate either Panel 24, Panel 26, or Panel 27 for each person in the PUF. Panel 24 is the panel that started in 2019, Panel 26 is the panel that started in 2021, and Panel 27 is the panel that started in 2022.

2.5.2 MPC Data Indicator (MPCDATA)

MPCDATA is a constructed variable which indicates whether or not MPC data were collected for the hospital inpatient stay. While all hospital inpatient events are sampled into the MPC, not all hospital inpatient stay records have MPC data associated with them. This is dependent upon the cooperation of the household respondent to provide permission forms to contact the hospital as well as the cooperation of the hospital to participate in the survey.

2.5.3 Hospital Inpatient Stay Event Variables

This PUF contains variables describing hospital inpatient stays/events reported by household respondents in the Hospital Stays section of the MEPS HC questionnaire. The questionnaire contains specific probes for determining details about the hospital inpatient stay.

Start and End Dates of Event (IPBEGMM-IPENDYR)

There are two variables which indicate the month and year a hospital stay began (IPBEGMM and IPBEGYR, respectively). Similarly, there are two variables which indicate the month and year a hospital stay ended (IPENDMM and IPENDYR, respectively). These variables have not been edited.

Length of Stay (NUMNIGHX)

NUMNIGHX denotes the length of a hospital inpatient stay. For stays beginning in 2021 and ending in 2022, this variable would include the nights associated with the entire visit. It was edited using the above mentioned begin and end dates of the hospital inpatient stay. If the dates were unknown, then NUMNIGHX was imputed.

Inpatient hospital stays take into account information from the MPC, the variable NUMNIGHX may not be adjusted to reflect the entire length of stay based on the MPC.

Preceding ER Visits (EMERROOM)

The variable EMERROOM (Did stay begin with emergency room visit) is no longer collected, but it is constructed using the LinkedER_ID for FY 22 data delivery. This variable reflects the emergency room visit that preceded a hospital stay reported by the household.

Other Visit Detail (SPECCOND-ANYOPER)

Also provided are the following unedited variables: hospital inpatient stays related to a medical condition (SPECCOND); the reason the person entered the hospital (RSNINHOS); and any operation or surgery performed while the person was in the hospital (ANYOPER).

With respect to RSNINHOS, please note that while there were 143 cases where RSNINHOS = 4 (reason entered hospital - to give birth to a baby), this does not mean that there were actually 143 *new births*. In fact, it may have been reported that the mother went to the hospital for delivery (hence, the interviewer would have assigned the event RSNINHOS = 4), but the mother could have had, for example, false labor pains or a stillbirth. Thus, this unedited household-reported variable may be inconsistent with reported number of births (see the 2022 Population Characteristics PUF, Section 2.5.2 “Navigating the MEPS Data with Information on Person Disposition Status”).

Discharge Detail (DSCHPMED)

DSCHPMED is derived directly from the Hospital Stays Section of the HC instrument. DSCHPMED indicates whether or not any medicines were prescribed at discharge.

2.5.4 Clinical Classification Software Refined

Information on household-reported medical conditions (ICD-10-CM condition codes) and aggregated clinically meaningful categories generated using Clinical Classification Software Refined (CCSR) for each hospital inpatient stay are not provided in this PUF. For information on the ICD-10-CM condition codes and associated CCSR codes, see the MEPS 2022 Medical Conditions PUF.

2.5.5 Flat Fee Variables (FFEEIDX, FFIPTYPE, FFBEF22, FFTOT23)

Definition of Flat Fee Payments

A flat fee is the fixed dollar amount a person is charged for a package of health care services provided during a defined period. Examples would be: obstetrician's fee covering a normal delivery, as well as pre- and post-natal care; or a surgeon's fee covering surgical procedure and post-surgical care. A flat fee group is the set of medical services (i.e., events) that are covered under the same flat fee payment. The flat fee groups represented on the STAZ PUF include flat fee groups where at least one of the health care events, as reported by the HC respondent, occurred during 2022. By definition, a flat fee group can span multiple years. Furthermore, a single person can have multiple flat fee groups.

It is important to note that certain flat fee bundle types reported by household respondents were identified as having a high likelihood of being simple events misidentified as bundle events. To address this, starting in 2021, HC-reported flat fee bundles were considered as flat fees if the bundle consisted only of dental events, or the bundle started in the previous year and also had events in 2022.

Other HC-reported bundles were not allowed as flat fee bundles, and events in these bundles were treated as simple events. HC-reported bundles that included a mix of emergency room and hospitalization events were treated as linked events. All emergency room expenditures were combined with hospital inpatient expenditures. However, provider-reported flat fees were processed in a similar way to prior years.

Flat Fee Variable Descriptions

Flat Fee ID (FFEEIDX)

As noted in "Record Identifiers," the variable FFEEIDX uniquely identifies all events that are part of the same flat fee group for a person. On any 2022 event PUF, every event that was a part of a specific flat fee group will have the same value for FFEEIDX. Note that prescribed medicine and home health events are never included in a flat fee group and FFEEIDX is not a variable in those event PUFs.

Flat Fee Type (FFIPTYPE)

FFIPTYPE indicates whether the 2022 hospital stay is the "stem" or "leaf" of a flat fee group. A stem (records with FFIPTYPE = 1) is the initial medical service (event) which is followed by

other medical events that are covered under the same flat fee payment. The leaves of the flat fee group (records with FFIPTYPE = 2) are those medical events that are tied back to the initial medical event (the stem) in the flat fee group. These “leaf” records have their expenditure variables set to zero. For the hospital inpatient stays that are not part of a flat fee payment, the FFIPTYPE is set to Inapplicable (-1).

Counts of Flat Fee Events that Cross Years (FFBEF22, FFTOT23)

As described in "Definition of Flat Fee Payments," a flat fee payment covers multiple events and the multiple events could span multiple years. For situations where the hospital inpatient stay/event occurred in 2022 as part of a group of events, and some events occurred before or after 2022, counts of the known events are provided on the STAZ record. Variables that indicate events occurred before or after 2022 are as follows:

> FFBEF22 - total number of pre-2022 events in the same flat fee group as the 2022 hospital inpatient stay(s). This count would not include 2022 hospital inpatient stay(s).
>
> FFTOT23 - the number of 2023 hospital inpatient stays expected to be in the same flat fee group as the hospital inpatient stay that occurred in 2022.

If there are no 2021 events on the file, FFBEF22 will be omitted. Likewise, if there are no 2023 events on the file, FFTOT23 will be omitted. If there are no flat fee data related to the records in this file, FFEEIDX and FFIPTYPE will be omitted as well. Please note that the crosswalk in this document lists all possible flat fee variables.

Caveats of Flat Fee Groups

There are 10 hospital inpatient stays/events 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). There are some situations where this is not true. For some of these flat fee groups, the initial visit reported occurred in 2022, but the remaining visits that were part of this flat fee group occurred in 2023. In this case, the 2022 flat fee group would consist of one event, the stem. The 2023 events that are part of this flat fee group are not represented in this PUF. Similarly, the household respondent may have reported a flat fee group where the initial visit began in 2021 but subsequent visits occurred during 2022. In this case, the initial visit would not be represented in this PUF. This 2022 flat fee group would then only consist of one or more leaf records and no stem. Please note that the crosswalk in this document lists all possible flat fee variables.

2.5.6 Expenditure Data

Definition of Expenditures

Expenditures in this PUF refer to payments for health care services. More specifically, expenditures in MEPS are defined as the sum of payments for care received for each hospital stay, 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 NMES and 1977 NMCES surveys 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 due to the increasingly common practice of discounting. Although measuring expenditures as the sum of payments incorporates discounts in the MEPS expenditure estimates, these 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. While charge data are provided in 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 they 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 also can be accessed via the CFACT data center. For more information, see the Data Center section of the MEPS website. If examining trends in MEPS expenditures, please refer to Section 3.5 for more information.

Expenditure data related to hospital inpatient events are broken out by facility and separately billing doctor expenditures. When a hospital bills directly for the services provided by physicians and other providers, in MEPS, the hospital facility charge and payments in such cases include the physician and other providers' charge and payments. This file contains six categories of expenditure variables per stay: basic hospital facility expenses; expenses for doctors who billed separately from the hospital for any inpatient services provided during hospital stay; total expenses, which is the sum of the facility and physician expenses; facility charge; physician charge; and total charges, which is the sum of the facility and physician charges. If examining trends in MEPS expenditures, please refer to Section 3.5 for more information.

Data Editing and Imputation Methodologies of Expenditure Variables

The expenditure data included in this PUF were derived from both the MEPS HC and MPC. The MPC contacted medical providers identified by household respondents. The charge and payment data from medical providers were used in the expenditure imputation process to supplement missing household data. For all hospital inpatient stays, MPC data were used if available; otherwise, HC data were used. Missing data for hospital inpatient stays where HC data were not complete and MPC data were not collected, or MPC data were not complete, were imputed during the imputation process.

General Data Editing Methodology

Logical edits were used to resolve internal inconsistencies and other problems in the HC and MPC data. The edits were designed to preserve partial payment data from households and providers, and to 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 misclassifications between Medicare and Medicaid and between Medicare HMOs and private HMOs as payment sources. These edits produced a

complete vector of expenditures for some events and provided the starting point for imputing missing expenditures in 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 as the event with missing payment was used to impute the missing payment value. The imputations for the flat fee events were carried out separately from the simple events.

The 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 taking into account the donors' weighted distribution in the imputation process to ensure that the weighted distribution of recipients' expenditures reflects the weights distribution of the donors' expenditures.

Hospital Inpatient Stay Data Editing and Imputation

Facility expenditures for hospital inpatient stays were developed in a sequence of logical edits and imputations. "Household" edits were applied to sources and amounts of payment for all events reported by HC respondents. "MPC" edits were applied to provider-reported sources and amounts of payment for records matched to household-reported events. Both sets of edits were used to correct obvious errors (as described above) in the reporting of expenditures. After the data from each source were edited, a decision was made as to whether household- or MPC-reported information would be used in the final editing and imputations for missing expenditures. The general rule was that MPC data would be used for events where a household-reported event corresponded to an MPC-reported event (i.e., a matched event), since providers usually have more complete and accurate data on sources and amounts of payment than households.

Separate imputations were performed for flat fee and simple events. Most hospital inpatient stays were imputed as simple events because facility charges for an inpatient hospital stay are rarely grouped with other events. (See Section 2.5.5 for more details on flat fee groups.)

Logical edits also were 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, while events with missing expenditure data were assigned to various recipient categories. Each event with missing expenditure data was assigned to a recipient category based on the extent of its missing charge and expenditure data. For example, an event with a known total charge but no expenditure information was assigned to one category, while 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 eight recipient categories in which all events had a common extent of missing data. However, for predictive mean matching imputations, the recipients were grouped into four categories based on the known status of total charge and the sources of payment: (1) known charge but unknown payment status of at least one potential paying source, (2) unknown charge and unknown payment status of at least one potential paying source, (3) known charge

and known status of all payment sources, and (4) unknown charge and known status of all payment sources. Separate predictive mean matching imputations were performed on events in each recipient group. For hospital inpatient events, the donor pool was restricted to events with complete expenditures from the MPC. To improve the reliability of imputation, current year donors and inflation-adjusted prior year donors are used for the predictive mean matching imputations.

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).

Expenditures for services provided by separately billing doctors in hospital settings were also edited and imputed. These expenditures are shown separately from hospital facility charges for hospital inpatient, outpatient, and emergency room care.

Imputation Flag (IMPFLAG)

IMPFLAG is a six-category variable that indicates if 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

IMPFLAG = 3 fully imputed

IMPFLAG = 4 partially imputed

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

Flat Fee Expenditures

The approach used to count expenditures for flat fees was to place the expenditure on the first visit of the flat fee group. The remaining visits have zero facility payments, while physician's expenditures may still be present. Thus, if the first visit in the flat fee group occurred prior to 2022, all the events that occurred in 2022 will have zero payments. Conversely, if the first event in the flat fee group occurred at the end of 2022, the total expenditure for the entire flat fee group

will be on that event, regardless of the number of events it covered after 2022. See Section 2.5.5 for details on the flat fee variables.

Zero Expenditures

There are some medical events reported by respondents where the payments were zero. Zero payment events can occur in MEPS for the following reasons: (1) the stay 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 stay, (3) the provider was never paid by an individual, insurance plan, or other source for services provided, (4) the charges were included in another bill, or (5) the event was paid for through government or privately-funded research or clinical trials.

Discount Adjustment Factor

An adjustment was also applied to some HC-reported expenditure data because an evaluation of matched HC/MPC data showed that respondents who reported that charges and payments were equal were often unaware that insurance payments for the care had been based on a discounted charge. To compensate for this systematic reporting error, a weighted sequential hot-deck imputation procedure was implemented to determine an adjustment factor for HC-reported insurance payments when charges and payments were reported to be equal. As for the other imputations, selected predictor variables were used to form groups of donor and recipient events for the imputation process.

Mother/Newborn Expenditures

Expenditure data for newborns were edited to exclude discharges after birth when the newborn left the hospital before or on the same day as the mother. As a result, inpatient expenditures reported for 2022 births were usually applied to the mother and not treated as separate expenditures for the infant. However, if a newborn was discharged at a later date than the mother's discharge date, then the hospitalization was treated as a separate hospital stay for the newborn.

This means that, in most cases, expenditure data for the newborn is included on the mother's record. A separate record for the newborn only exists if the newborn was discharged after the mother. In this case, the expenditure for the newborn is on the newborn's record.

Hospital Inpatient Stay/Emergency Room Expenditures

Records in the MEPS 2022 data files include the HC survey data collected using the CAPI instrument. For persons reporting an emergency room visit that preceded a hospital stay, the instrument creates links between the two events.

For events where provider-reported data are not available, a final link between a hospital inpatient stay and an emergency room visit person is created using the household-reported information in addition to the CAPI generated links. For a given person and facility provider pair, if the emergency room visit occurred anytime within two days before and one day after the hospital inpatient event, then the two events are linked. The facility expenditures, if any, reported for the emergency room visit are rolled onto the facility expenditures of the inpatient event linked to the emergency room visit.

For events where the provider-reported data are available, the provider-reported information is used. That is, such a relationship could be identified (using the MPC start and end dates of the events as well as other information from the provider) where the facility expenditures associated with the preceding emergency room visit were included in the hospital facility expenditures.

The record of a linked preceding emergency visit on the MEPS 2022 Emergency Room Visits PUF will have its facility expenditure information zeroed out to avoid double-counting. The variable ERHEVIDX identifies these hospital stays whose expenditures include the facility expenditures for the preceding emergency room visit (see ERHEVIDX in "Record Identifiers"). It should also be noted that for these cases, there is only one hospital stay associated with the emergency room stay.

Sources of Payment

In addition to total expenditures, variables are provided which itemize expenditures according to major source of payment categories. These categories are:

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 Source - includes community and neighborhood clinics, state and local health departments, and state programs other than Medicaid,
9. Workers' Compensation, and

10. Other Unclassified Sources - includes sources such as automobile, homeowner's, and liability insurance, and other miscellaneous or unknown sources.

Prior to 2019, for cases where reported insurance coverage and sources of payment are inconsistent, the positive amount from a source inconsistent with reported insurance coverage was moved to one or both of the source categories Other Private and Other Public. Beginning in 2019, this step is removed and the inconsistency between the payment sources and insurance coverage is allowed to remain - the amounts are not moved to Other Private and Other Public categories any more. The two source of payment categories, Other Private and Other Public, are no longer available.

Imputed Hospital Inpatient Stay Expenditure Variables

This PUF contains two sets of imputed expenditure variables: facility expenditures and physician expenditures.

Hospital Inpatient Facility Expenditures (IPFSF22X-IPFOT22X, IPFXP22X, IPFTC22X)

Hospital facility expenses include all expenses for direct hospital care, including room and board, diagnostic and laboratory work, x-rays, and similar charges, as well as any physician services included in the hospital charge.

IPFSF22X - IPFOT22X are the 10 sources of payment. The 10 sources of payment are: self/family (IPFSF22X), Medicare (IPFMR22X), Medicaid (IPFMD22X), private insurance (IPFPV22X), Veterans Administration/CHAMPVA (IPFVA22X), TRICARE (IPFTR22X), other federal sources (IPFOF22X), state and local (non-federal) government sources (IPFSL22X), Workers' Compensation (IPFWC22X), and other insurance (IPFOT22X). IPFXP22X is the sum of the 10 sources of payment for the Hospital Facility expenditures, and IPFTC22X is the total charge.

Wherever an emergency room visit record is linked to a hospital inpatient stay record (identified by the variable ERHEVIDX, see Section "Record Identifiers"), the facility source of payment variables on the emergency room visit record were zeroed out because the emergency room expenditures were already included in the hospital facility source of payment variables.

Hospital Inpatient Physician Expenditures (IPDSF22X - IPDOT22X, IPDXP22X, IPDTC22X)

Charges for services provided in a hospital setting by physicians and other providers are sometimes billed directly by the hospital. In such cases, these charges are included in the hospital-facility charge and payments. When the charges are not billed directly by the hospital, physicians and other providers bill charges for the provided services directly to the third-party and the patient. In such cases, these providers are called separately billing doctors (SBD). SBD expenses typically cover services provided to patients in hospital settings by providers like anesthesiologists, radiologists, and pathologists, whose charges are often not included in hospital bills.

For medical doctors who bill separately (i.e., outside the hospital bill), a separate data collection effort within the MPC was performed to obtain this same set of expenditure information from each separately billing doctor. It should be noted that there could be several separately billing

doctors associated with a medical event. For example, a hospital inpatient stay could have a radiologist, anesthesiologist, pathologist and a surgeon associated with it. If their services are not included in the hospital bill then this is one medical event with four separately billing doctors. The imputed expenditure information associated with the separately billing doctors for a hospital inpatient stay is combined (i.e., the expenditures incurred by the radiologist + anesthesiologist + pathologist + surgeon) and is provided in the PUF. IPDSF22X - IPDOT22X are the 10 sources of payment; IPDXP22X is the sum of the 10 sources of payments; and IPDTC22X is the physician's total charge.

Analysts need to take into consideration whether to analyze facility and SBD expenditures separately, combine them within service categories, or collapse them across service categories (e.g., combine SBD expenditures with expenditures for physician visits to offices and/or outpatient departments).

Total Expenditures and Charges for Hospital Inpatient Stays (IPXP22X and IPTC22X)

Analysts interested in total expenditures should use the variable IPXP22X, which includes both facility and physician amounts. Those interested in total charges should use the variable IPTC22X, which includes both facility and physician charges (see Section 2.5.6 for an explanation of the "charge" concept).

2.5.7 Rounding

Expenditure variables in the STAZ PUF have been rounded to the nearest penny. Person-level expenditure information released on the Consolidated PUF will be rounded to the nearest dollar. It should be noted that using the MEPS event PUFs to create person-level totals will yield slightly different totals than 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 Consolidated 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

The challenges associated with MEPS data collection in 2020 after the onset of the COVID-19 pandemic continued through 2021 and possibly into 2022. The major modifications to the standard MEPS study design remained in effect, permitting data to be collected safely but with accompanying concerns related to the quality of the data obtained. The suggestion made in the documentation for the FY 2020 and FY2021 MEPS Consolidated PUF data still holds. Researchers are counseled to take care in the interpretation of estimates based on data collected from these three calendar years. This includes the comparison of such estimates to those of other years and corresponding trend analyses.

Section 3.1 of the documentation for the 2020 Consolidated PUF provides a general discussion of the impact of the COVID-19 pandemic on several other major in-person federal surveys as well as on MEPS. In addition, it offers a detailed look at how MEPS was modified to permit safe data collection and the development of useful estimates at a time when the way the U.S. health care system functioned underwent many transformations to meet population needs. Three sources of potential bias were identified for MEPS for FY 2020: (1) long recall period for Round 6 of Panel 23, (2) switching from in-person to telephone interviewing which likely had a larger impact on Panel 25, and (3) the impact of CPS bias on the MEPS weights. A number of statistically significant differences were found between panels for FY 2020. Those findings are discussed in MEPS HC 224.

Concerns of potential bias for FY 2021 and between panel differences are discussed in Section 3.1 of the documentation for the 2021 Consolidated PUF. Additional analysis has also uncovered a concerning trend on event reporting in MEPS following the COVID-19 pandemic. While reporting of other event types has rebounded from the dip experienced in 2020, inpatient (IP) and emergency room (ER) utilization reports collected in FY 2021 did not rebound as much as key benchmarks, even though these are the most salient event types. Modifications made to the MEPS sample design discussed in the 2022 Population Characteristics PUF may have partially contributed to the concerning trend.

Concerns for potential bias for FY 2022 include:

- The impact of the pandemic on NHIS data collection and the resulting Panel 26 MEPS sample (Section 3.1.1 of the 2022 Population Characteristics PUF). NHIS response rates in the pandemic and shifts in the resulting MEPS sample may have increased the likelihood that the MEPS Panel 26 respondents differed in composition compared to previous years.

- The extension of panels (beginning of Section 3.1 of the 2022 Population Characteristics PUF). While there is a benefit in boosting the MEPS sample size by keeping pre-pandemic panels active for an additional two years to counter reduced response rates, there are two risks with this approach: attrition in these panels beyond what is experienced in two years, which may lead households with more serious health issues to leave MEPS, and a conditioning effect whereby respondents learn over time that reporting events results in a longer interview.

- Significantly lower response rates (Section 3.2 of the 2022 Population Characteristics PUF) that could differentially exclude households more likely to experience IP stays. The demographic shifts on MEPS between 2019 and 2021 suggest a more educated, higher-income, older MEPS.

Preliminary analyses undertaken to examine the quality of the MEPS FY 2022 data compared health care utilization for the MEPS target population between the panels fielded. These comparisons were undertaken for the full sample and the three age groups of 0-17, 18-64, and 65+.

These comparisons found no major differences in IP or ER visits between the three panels. Slight differences were observed in dental visits and outpatient visits. For dental visits, Panel 26 reported at a higher rate than Panel 24 or Panel 27 in the age range 18-64. For outpatient visits, Panel 24 reported at a lower rate than Panel 26 and Panel 27 in the age range 18-64.

In summary, the weights developed for the MEPS FY 2022 data can be expected to produce useful estimates for initial analyses. Further analyses of MEPS estimates will be conducted as part of the production of the FY 2022 Consolidated PUF to be released later in 2024. This will help identify any additional data quality issues as well as possible improvements that could be implemented.

The various actions taken in the development of the person-level weights for the MEPS FY 2022 data were designed to limit the potential for bias in the data due to changes in data collection and response bias. However, evaluations of MEPS data quality in 2021 and 2022 suggest that users of the MEPS FY 2022 PUFs should continue to exercise caution when interpreting estimates and assessing analyses based on these data, as well as in comparing 2022 estimates to those of prior years.

3.2 Sample Weight (PERWT22F)

There is a single full-year person-level weight (PERWT22F) assigned to each record for each Key, in-scope person who responded to MEPS for the full period of time that they were in scope during 2022. 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 the NHIS (the latter circumstance includes newborns as well as 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 civilian noninstitutionalized portion of the U.S. population.

3.3 Details on Person Weight Construction

The person-level weight PERWT22F was developed in several stages. First, a person-level weight for Panel 24 was created, including an adjustment for nonresponse over time and raking. The 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 in the establishment of the initial person-level control figures were: educational attainment of the reference person (three categories: no degree; high school/GED only or some college; bachelor's or a higher degree); Census region (Northeast, Midwest, South, West); MSA status (MSA, non-MSA); race/ethnicity (Hispanic; Black, non-Hispanic; Asian, non-Hispanic; and other); sex; and age (0-18, 19-25, 26-34, 35-44, 45-64, and 65 or older). (Note, however, that for confidentiality reasons, the MSA status variables are no longer released for public use.) The person-level weights for Panel 26 and Panel 27 were created similarly. Secondly, a composite weight was formed by multiplying each weight from Panel 24 by the factor .22, each weight from Panel 26 by the factor .29, and each weight from Panel 27 by the factor .49. The choice of factors reflected the relative effective sample sizes of the three panels, helping to limit the variance of estimates

obtained from pooling the three samples. Weights for the 2022 Population Characteristics PUF were then developed by raking the composite weight to the same set of CPS-based control totals.

The approach for establishing the 2022 Consolidated PUF weight is as follows. When poverty status information derived from MEPS income variables becomes available, a final raking is undertaken. The full sample weight appearing on the Population Characteristics PUF for a given year is re-raked, 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 to 125 percent of poverty, from 125 to 200 percent of poverty, from 200 to 400 percent of poverty, at least 400 percent of poverty) as well as age, race/ethnicity, sex, region, and MSA status are used to calibrate weights.

3.3.1 MEPS Panel 24 Weight Development Process

The person-level weight for MEPS Panel 24 was developed using the 2021 full-year weight for an individual as a "base" weight for 2021 survey participants present in 2022. For Key, in-scope members who joined an RU some time in 2022 after being out of scope in 2021, the initially assigned person-level weight was the corresponding 2021 family weight. The weighting process included an adjustment for person-level nonresponse over Rounds 8 and 9 as well as raking to population control figures for December 2022 for Key, responding persons in scope on December 31, 2022. These control totals were derived by scaling back the population distribution obtained from the March 2023 CPS to reflect the December 31, 2022 estimated population total (estimated based on Census projections for January 1, 2023). Variables used for person-level raking included: education of the reference person (three categories: no degree; high school/GED only or some college; bachelor's or a higher degree); Census region (Northeast, Midwest, South, West); MSA status (MSA, non-MSA); race/ethnicity (Hispanic; Black, non-Hispanic; Asian, non-Hispanic; and other); sex; and age (0-18, 19-25, 26-34, 35-44, 45-64, and 65 or older). (Note, however, that for confidentiality reasons, the MSA status variables are no longer released for public use.) The final weight for Key, responding persons who were not in scope on December 31, 2022 but were in scope earlier in the year was the nonresponse-adjusted person weight without raking.

The 2021 full-year weight used as the base weight for Panel 24 was derived from the 2019 MEPS Round 1 weight and reflected adjustment for nonresponse over the remaining data collection rounds in 2019, 2020, and 2021 as well as raking to the December 2019, December 2020, and December 2021 population control figures.

3.3.2 MEPS Panel 26 Weight Development Process

The person-level weight for MEPS Panel 26 was developed by using the 2021 full-year weight as a "base" weight for survey participants present in 2022.

For Key, in-scope members who joined an RU at some time in 2022 after being out of scope in 2021, the initially assigned person-level weight was the corresponding 2021 family weight. The weighting process also included an adjustment for person-level nonresponse over Rounds 4 and 5 as well as raking to the same population control figures for December 2022 used for the Panel

24 weight for Key, responding persons in scope on December 31, 2022. The same six variables used for Panel 24 raking (education level, Census region, MSA status, race/ethnicity, sex, and age) were also used for Panel 26 raking. Similar to Panel 24, the Panel 26 final weight for Key, responding persons not in scope on December 31, 2022 but in scope earlier in the year was the nonresponse-adjusted person weight without raking.

Note that the 2021 full-year weight that was used as the base weight for Panel 26 was derived using the 2021 MEPS Round 1 weight and reflected adjustment for nonresponse over the remaining data collection rounds in 2021 as well as raking to the December 2021 population control figures.

3.3.3 MEPS Panel 27 Weight Development Process

The person-level weight for Panel 27 was developed using the 2022 Round 1 person-level weight as a "base" weight. The Round 1 weights incorporated the following components: the original household probability of selection for the NHIS and for the NHIS subsample reserved for the MEPS, an adjustment for NHIS nonresponse, the probability of selection for MEPS from the NHIS, an adjustment for nonresponse at the dwelling unit level for Round 1, and raking to control figures at the person level obtained 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 2022 as well as raking to the same population control figures for December 2022 that were used for the Panel 24 and Panel 26 weights for Key, responding persons in scope on December 31, 2022. The same six variables used for Panel 24 and Panel 26 raking (education level of the reference person, Census region, MSA status, race/ethnicity, sex, and age) were also used for Panel 27 raking. Similar to Panel 24 and Panel 26, the Panel 27 final weight for Key, responding persons who were not in scope on December 31, 2022 but were in scope earlier in the year was the nonresponse-adjusted person weight without raking.

3.3.4 The Final Weight for 2022

The final raking of those in scope at the end of the year has been described above. In addition, the composite weights of two groups of persons who were out of scope on December 31, 2022 were adjusted for expected undercoverage. Specifically, the weights of those who were out of scope on December 31, 2022, 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 Center for Medicare and Medicaid Services (CMS). The weights of persons who died while in scope were poststratified to corresponding estimates derived using data obtained from the Centers for Disease Control and Prevention (CDC), National Center for Health Statistics (NCHS), Provisional Mortality Statistics, 2018 through Last Week on CDC WONDER Online Database, released in 2023, the latest available data at the

time. Separate decedent control totals were developed for the "65 and older" and "under 65" civilian noninstitutionalized populations.

Overall, the weighted population estimate for the civilian noninstitutionalized population for December 31, 2022 is 329,059,733 (PERWT22F >0 and INSC1231=1). The sum of person-level weights across all persons assigned a positive person-level weight is 333,053,243.

3.4 Coverage

The target population associated with MEPS is the 2022 U.S. civilian noninstitutionalized population. However, the MEPS sampled households are a subsample of the NHIS households interviewed in 2018 (Panel 24), 2020 (Panel 26), and 2021 (Panel 27). New households created after the NHIS interviews for the respective panels and consisting exclusively of persons who entered the target population after 2018 (Panel 24), after 2020 (Panel 26), or after 2021 (Panel 27) are not covered by the 2022 MEPS. Nor are previously out of scope persons who joined an existing household but are not related to the current household residents. Persons not covered by a given MEPS panel thus include some members of the following groups: 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, we note that there are uncertainties associated with 2020, 2021, and possibly 2022 data quality for reasons discussed throughout Section 3. Preliminary evaluations of a set of MEPS estimates of particular importance suggest that they are of reasonable quality. Nevertheless, analysts are advised to exercise caution in interpreting these estimates, particularly in terms of trend analyses, since access to health care was substantially affected by the COVID-19 pandemic, as were related factors such as health insurance and employment status for many persons.

The MEPS began in 1996, and the utility of the survey for analyzing health care trends expands with each additional year of data; however, when examining trends over time using the MEPS, the length of time being analyzed should be considered. In particular, large shifts in survey estimates over short periods of time (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 health care utilization from MEPS respondents; the changes were fully implemented in 2014. This effort likely resulted in improved data quality and a reduction in underreporting starting in the second half of 2013 and continuing throughout 2014 full year files; the changes have also had some impact on analyses involving trends in utilization across years. The changes in the NHIS sample design in 2016 and 2018 could also potentially 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, as well as many of its subpopulations. Better 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 involved major modifications to the MEPS instrument design and data collection process, particularly in the events sections of the instrument. These were introduced in the spring of 2018 and thus affected data beginning with Round 1 of Panel 23, Round 3 of Panel 22, and Round 5 of Panel 21. Since 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 reflected 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 make them as consistent as possible with data collected under the previous design. The changes in the instrument were designed to make the data collection effort more efficient and easier to administer. In addition, expectations were that data on some items, such as those related to health care events, would 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. ***Analysts should be aware of the possible impacts of these changes on the data and especially on 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, users should refer to Section 2.5.11:Utilization, Expenditures, and Source of Payment Variables in the Consolidated PUF (HC 243) and, for more detail, to the documentation for the prescription drug file (HC 239A) when analyzing prescription drug spending over time.

As always, it is recommended that, before conducting trend analyses, analysts should review relevant sections of the documentation for descriptions of these types of changes that might affect the interpretation of changes over time.

To smooth or stabilize trend analyses based on the MEPS data, analysts may also wish to consider using statistical techniques such as comparing pooled time periods (e.g. 1996-1997 versus 2011-2012), working with moving averages, or using modeling techniques with several consecutive years of the 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, the use of numerous statistical significance tests of trends will increase the likelihood of concluding that a change has taken place when one has not.

4.0 Strategies for Estimation

4.1 Developing Event-Level Estimates

The data in this PUF can be used to develop national 2022 event-level estimates for the U.S. civilian noninstitutionalized population on inpatient hospital stays as well as expenditures, and sources of payment for these stays. Estimates of total stays are the sum of the weight variable (PERWT22F) across relevant event records while estimates of other variables must be weighted by PERWT22F to be nationally representative. The tables below contain event-level estimates for selected variables.

Table 3

Selected Event-Level Estimates - Hospital Stays

Estimate of Interest	Variable Name	Estimate (SE)	Estimate Excluding Zero Payment Events (SE)*
Total number of inpatient hospital stays (in millions)	PERWT22F	24.6 (1.16)	24.5 (1.16)
Total number of nights in hospital across all stays (in millions)	NUMNIGHX	125.7 (10.30)	125.4 (10.28)
Average number of nights per stay	NUMNIGHX	5.1 (0.32)	5.1 (0.33)
Average number of nights per stay (NUMNIGHX > 0)	NUMNIGHX	5.1 (0.32)	5.1 (0.33)

Table 4

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

Estimate of Interest	Variable Name	Estimate (SE)	Estimate Excluding Zero Payment Events (SE)*
Mean total payments per stay	IPXP22X	$16,609 ($860.2)	$16,658 ($865.9)
Mean out-of-pocket payment per stay	IPDSF22X +IPFSF22X	$496 ($71.5)	$497 ($71.8)
Mean proportion of total expenditures per stay paid by private insurance	(IPDPV22X+ IPFPV22X) /IPXP22X	----------	0.309 (0.0186)
Mean total payments per night (NUMNIGHX > 0)	IPXP22X/ NUMNIGHX	$5,923 ($250.6)	$5,940 ($251.5)

* Zero payment events can occur in MEPS for the following reasons: (1) the stay 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 stay, (3) the provider was never paid by an individual, insurance plan, or other source for services provided, (4) the charges were included in another bill, or (5) the event was paid for through government or privately-funded research or clinical trials.

4.2 Person-Based Estimates for Hospital Inpatient Stays

To enhance analyses of hospital inpatient stays, analysts may link information about inpatient stays by sample persons in this PUF to the annual Consolidated PUF (which has data for all MEPS sample persons), or conversely, link person-level information from the Consolidated PUF to this event-level PUF (see Section 5 for more details). Both this PUF and the Consolidated PUF may be used to derive estimates for persons with hospital inpatient care and annual estimates of total expenditures. However, for estimates that pertain to those who did not have hospital inpatient care as well as those who did (for example, the percentage of adults who had at least one inpatient event during the past year or the mean number of inpatient events in the past year among those 65 or older), this PUF cannot be used. Only those persons with at least one inpatient event are represented in this PUF. The Consolidated PUF must be used for person-level analyses that include both persons with and without inpatient care.

4.3 Variables with Missing Values

It is essential that the analyst 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 taken, it may be necessary to set negative values to values appropriate to the analytic needs. That is, the analyst should either impute a value or set the value to one that will be interpreted as missing by the software package used. For categorical and dichotomous variables, the analyst may want to consider whether to recode or impute a value for cases with negative values or whether to exclude or include such cases in the numerator and/or denominator when calculating proportions.

Methodologies used for the editing/imputation of expenditure variables (e.g., sources of payment, flat fee, and zero expenditure) are described in Section 2.5.6.

4.4 Variance Estimation (VARSTR, VARPSU)

To obtain estimates of variability in the MEPS estimates (such as the standard error of sample estimates or corresponding confidence intervals), analysts should take into account the complex sample design of the MEPS for both person-level and family-level analyses. Several methodologies have been developed for estimating standard errors for surveys with a complex sample design, including the Taylor-series linearization method, balanced repeated replication (BRR), and jackknife replication. Various software packages provide analysts with the capability of implementing these methodologies. MEPS analysts most commonly use the Taylor series approach. Although this PUF does not contain replicate weights, analysts can use the BRR methodology to construct replicate weights to develop variances for more complex estimators (see Section 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 permit the use of the Taylor-series linearization method include SUDAAN, Stata, SAS (version 8.2 and higher), SPSS (version 12.0 and higher), and R. For complete information on the capabilities of a package, analysts should refer to the user documentation for the software.

With the Taylor-series linearization method, variance estimation strata and the variance estimation PSUs within these strata must be specified. The variables VARSTR and VARPSU on this STAZ PUF identify the sampling strata and primary sampling units 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 the MEPS estimates. It should be noted that the number of degrees of freedom associated with estimates of variability indicated by such a package may not appropriately reflect the number available. For variables of interest distributed throughout the country (and thus 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 across years 2002 through Panel 11 of 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 with either two or three variance estimation PSUs.

Beginning in Panel 12 of 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 Population Characteristics PUF, as it consisted of two panels that were selected under two independent NHIS sample designs. Since both MEPS panels in the full-year files from 2008 through 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 that they can be readily distinguished from those developed under the former NHIS sample design if data are pooled for several years.

The NHIS sample design was changed again in 2016, effectively changing the MEPS design beginning with calendar year 2017. Beginning in Panel 22 of the 2017 files, a new set of variance strata and PSUs were 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 Population Characteristics PUF, as it consisted of two panels that were selected under two independent NHIS sample designs. To make the pooling of data across multiple years of the MEPS more straightforward, the numbering system for the variance strata 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 Population Characteristics PUF was also modified, reducing the number of variance strata to 105. Consistency was maintained with the prior structure in that the 2019 variance strata were also numbered within the range of values from 2001-2117, although there are now gaps in the values assigned within this range. Because of the modification, each stratum could contain up to 5 variance estimation PSUs.

For Panel 26 in the 2021 and 2022 Population Characteristics PUFs, an additional NHIS sample was used for the MEPS to account for increasing nonresponse during the pandemic (as discussed in Section 3.1). The additional sample was assigned to the existing variance strata, so the Population Characteristics PUF continues to have 105 variance strata, numbered 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 Population Characteristics PUF, each stratum contains up to eight variance estimation PSUs.

Some analysts may be interested in pooling data across multiple years of MEPS data. When doing so, 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 that allowed users to pool data from 2002 through 2018. However, analysts can no longer do this routinely because the variance structure had to be modified beginning with 2019.

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

1. When pooling any year from 2002 through 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 file is updated every year so that appropriate variance structures are available with pooled data. Further details on the HC-036 file are included in the public use documentation of the HC-036 file.

4.4.2 Balanced Repeated Replication Method

BRR replicate weights are not provided on this MEPS PUF for the purposes of variance estimation. However, a file containing a BRR replication structure is made available so that users 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, users can calculate a variance using BRR or Fay's modified BRR methods. However, it should be noted that the replicate weights

have been derived from the final weight through a shortcut approach. Specifically, the replicate weights are not computed starting with the base weight, and all adjustments made in different stages of weighting are not applied independently in each replicate. Thus, the variances computed by 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 1996-2021 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 1996-2021 Pooled Linkage Variance Estimation File. For more information about creating BRR replicates, users 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, and 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) there may be multiple conditions 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 public use files. This is because the set of households selected for MEPS is a subsample of those participating in the NHIS. For information on obtaining MEPS/NHIS link files please see the MEPS website.

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D. Variable-Source Crosswalk

FOR MEPS HC 239D 2022 HOSPITAL INPATIENT STAYS

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
ERHEVIDX	Event ID for corresponding emergency room visit	Constructed
FFEEIDX	Flat fee ID	CAPI derived
PANEL	Panel Number	Constructed
MPCDATA	MPC Data Flag	Constructed

Characteristics of Hospital Inpatient Stays Variables

Variable	Description	Source
IPBEGYR	Event start date - year	CAPI derived
IPBEGMM	Event start date - month	CAPI derived
IPENDYR	Event end date - year	CAPI derived
IPENDMM	Event end date - month	CAPI derived
NUMNIGHX	# of nights in hospital - Edited/Imputed	(Edited/Imputed)
EMERROOM	Did stay begin with emergency room visit	Constructed
SPECCOND	Hospital stay related to condition	HS30
RSNINHOS	Reason entered hospital	HS50
ANYOPER	Any operations or surgeries performed	HS70
DSCHPMED	Medicines prescribed at discharge	HS90

Flat Fee Variables

Variable	Description	Source
FFIPTYPE	Flat Fee Bundle	Constructed
FFBEF22	Total # of visits in FF before 2022	FF50
FFTOT23	Total # of visits in FF after 2022	FF60

Imputed Total Expenditure Variables

Variable	Description	Source
IPXP22X	Total expenditure for event (IPFXP22X+IPDXP22X)	Constructed
IPTC22X	Total charge for event (IPFTC22X+IPDTC22X)	Constructed

Imputed Facility Expenditure Variables

Variable	Description	Source
IPFSF22X	Facility amount paid, self/family (Imputed)	CP Section (Edited)
IPFMR22X	Facility amount paid, Medicare (Imputed)	CP Section (Edited)
IPFMD22X	Facility amount paid, Medicaid (Imputed)	CP Section (Edited)
IPFPV22X	Facility amount paid, private insurance (Imputed)	CP Section (Edited)
IPFVA22X	Facility amount paid, Veterans/CHAMPVA (Imputed)	CP Section (Edited)
IPFTR22X	Facility amount paid, TRICARE (Imputed)	CP Section (Edited)
IPFOF22X	Facility amount paid, other federal (Imputed)	CP Section (Edited)
IPFSL22X	Facility amount paid state & local government (Imputed)	CP Section (Edited)
IPFWC22X	Facility amount paid, workers' compensation (Imputed)	CP Section (Edited)
IPFOT22X	Facility amount paid, other insurance (Imputed)	CP Section (Edited)

Variable	Description	Source
IPFXP22X	Facility sum payments IPFSF22X - IPFOT22X	Constructed
IPFTC22X	Total facility charge (Imputed)	CP Section (Edited)

Imputed Separately Billing Physician Expenditure Variables

Variable	Description	Source
IPDSF22X	Doctor amount paid, family (Imputed)	Constructed
IPDMR22X	Doctor amount paid, Medicare (Imputed)	Constructed
IPDMD22X	Doctor amount paid, Medicaid (Imputed)	Constructed
IPDPV22X	Doctor amount paid, private insurance (Imputed)	Constructed
IPDVA22X	Doctor amount paid, Veterans/CHAMPVA (Imputed)	Constructed
IPDTR22X	Doctor amount paid, TRICARE (Imputed)	Constructed
IPDOF22X	Doctor amount paid, other federal (Imputed)	Constructed
IPDSL22X	Doctor amount paid, state & local government (Imputed)	Constructed
IPDWC22X	Doctor amount paid, workers' compensation (Imputed)	Constructed
IPDOT22X	Doctor amount paid, other insurance (Imputed)	Constructed
IPDXP22X	Doctor sum payments IPDSF22X-IPDOT22X	Constructed
IPDTC22X	Total doctor charge (Imputed)	Constructed
IMPFLAG	Imputation status	Constructed

Weight Variables

Variable	Description	Source
PERWT22F	Expenditure file person weight, 2022	Constructed
VARSTR	Variance estimation stratum, 2022	Constructed
VARPSU	Variance estimation PSU, 2022	Constructed