MEPS HC-220D:
2020 Hospital Inpatient Stays

July 2022

Due to the COVID-19 pandemic, changes were made to the 2020 MEPS data collection that analysts should keep in mind when doing trend analysis and pooling years of data. 1) The MEPS moved primarily to a phone rather than in-person survey. 2) Panels 23 and 24 were extended to nine rounds (four years) of data collection as opposed to the historical five rounds (two years). Because of the unforeseeable nature of the pandemic, data collection for 2020 included Round 5 interviews for Panel 23 that were fielded under the assumption that that interview would be the panel's last interview. Researchers using variables related to the first interview of the calendar year should read the documentation for their specific variables to understand the sources of the values for Panel 23.

Agency for Healthcare Research and Quality
Center for Financing, Access, and Cost Trends
5600 Fishers Lane
Rockville, MD 20857
(301) 427-1406

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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 data set 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 data set with individually identifiable records from any data sets 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 health care. Estimates can be produced for individuals, families, and selected population subgroups. The panel design of the survey, which includes 5 Rounds of interviews covering 2 full calendar years (and two additional rounds in 2020 covering a third year to compensate for the smaller number of completed interviews in Panel 25), provides data for examining person level changes in selected variables such as expenditures, health insurance coverage, and health status. Using computer assisted personal interviewing (CAPI) technology, information about each household member is collected, 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. Each annual MEPS HC sample size is about 15,000 households. Data can be analyzed at either the person or 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 NHIS implemented a new sample design, which included Asian persons in addition to households with Black and Hispanic persons in the oversampling of minority populations. NHIS introduced a new sample design in 2016 that discontinued oversampling of these minority groups.

2.0 Medical Provider Component

Upon completion of the household CAPI interview and obtaining permission from the household survey respondents, a sample of medical providers are 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 information is collected on dates of visits, diagnosis and procedure codes, charges and payments. The Pharmacy Component (PC), a subcomponent of the MPC, does not collect charges or diagnosis and procedure codes but does collect drug detail information, including 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. Data are collected under contract with Westat, Inc. (MEPS HC) and Research Triangle Institute (MEPS MPC). Data sets and summary statistics are edited and published in accordance with the confidentiality provisions of the Public Health Service Act and the Privacy Act. The National Center for Health Statistics (NCHS) provides consultation and technical assistance.

As soon as data collection and editing are completed, the MEPS survey data are released to the public in staged releases of micro data files and tables via the MEPS website.

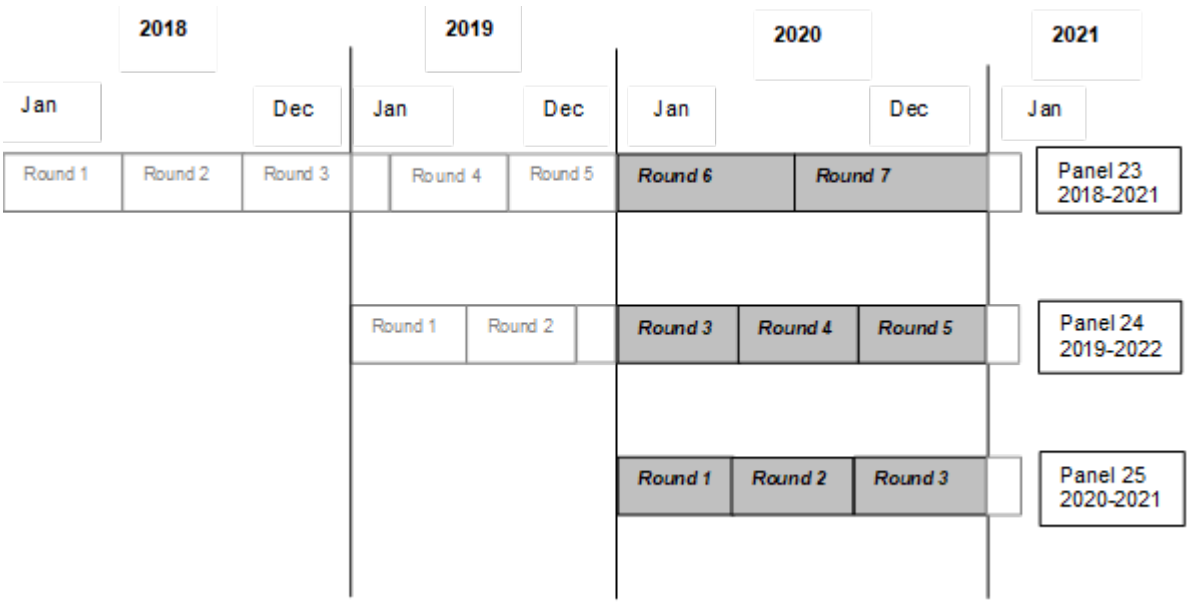
Additional information on MEPS is available from the MEPS project manager or the MEPS public use data manager at the Center for Financing, Access, and Cost Trends, Agency for Healthcare Research and Quality, 5600 Fishers Lane, Rockville, MD 20857 (301-427-1406).

C. Technical and Programming Information

1.0 General Information

This documentation describes one in a series of public use event files from the 2020 Medical Expenditure Panel Survey (MEPS) Household Component (HC) and Medical Provider Component (MPC). Released as an ASCII data file (with related SAS, Stata, SPSS, and R programming statements and data user information), SAS data set, SAS transport file, Stata data set, and Excel file the 2020 Hospital Inpatient Stays (STAZ) public use file provides detailed information on hospital inpatient stays for a nationally representative sample of the civilian noninstitutionalized population of the United States. Data from the STAZ event file can be used to make estimates of hospital inpatient stay utilization and expenditures for calendar year 2020. The file contains 50 variables and has a logical record length of 321 with an additional 2-byte carriage return/line feed at the end of each record. As illustrated below, this file consists of MEPS survey data in Round 6 and the 2020 portion of Round 7 for Panel 23; the 2020 portions of Rounds 3 and 5, and all of Round 4 for Panel 24; and Rounds 1, 2 and the 2020 portion of Round 3 of Panel 25 (i.e., the rounds for the MEPS panels covering calendar year 2020).

Full year (FY) 2020 is the first data year to include three panels of data; Panel 23 was extended to include Rounds 6 and 7.



Hospital stay events reported in Panel 23 Round 7, Panel 24 Round 5, and Panel 25 Round 3 and known to have begun after December 31, 2020 are not included on this file.

Each record on the inpatient hospital event file 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 file can be merged with other 2020 MEPS HC data files for purposes of appending person-level data such as demographic characteristics or health insurance coverage to each hospital inpatient stay record.

This file 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 on the MEPS 2020 Full Year Consolidated Data File, 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 files and the codebook. It contains the following sections:

- Data File Information
- Survey Sample Information
- Strategies for Estimation
- Merging/Linking MEPS Data Files
- References
- Variable - Source Crosswalk

Any variables not found on this file but released on previous years' files 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 on the STAZ file are available in the *Survey Questionnaires* section on the MEPS website.

2.0 Data File Information

The 2020 Hospital Inpatient Stays public use data set consists of one event-level data file. The file contains characteristics associated with the STAZ event and imputed expenditure data.

The 2020 STAZ public use data set contains variable and frequency distributions for a total of 2,255 hospital inpatient stay records reported during Round 6 and the 2020 portion of Round 7 for Panel 23; the 2020 portions of Rounds 3 and 5, and all of Round 4 for Panel 24; as well as Rounds 1, 2, and the 2020 portion of Round 3 for Panel 25 of the MEPS Household Component. This file 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, 2020 or after December 31, 2020 are not included on this file. Some household members may have had multiple hospital inpatient stays reported and, thus, will be represented in multiple records on this file. Other household members may have had reported no hospital inpatient stays and, thus, will have no records on this file. Of the 2,255 hospital inpatient stay records, 2,210 are associated with persons having a positive person-level weight (PERWT20F). The persons represented on this file 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). Thus, the file contains some hospitalizations that were reported as not including an overnight stay.

2. The hospital stay had to have ended during 2020. Stays that began prior to 2020 but ended during 2020 are included on this data file. Stays that began in 2020 but ended during 2021 are excluded from this data file and will be included in a subsequent 2021 IP data file. Persons with no hospital inpatient stay events for 2020 are not included on this event-level IP file but are represented on the person-level 2020 Full Year Population Characteristics file.

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

    a) Be classified as a key in-scope person who responded for his or her entire period of 2020 eligibility (i.e., persons with a positive 2020 full-year person-level sampling weight (PERWT20F > 0)), or

    b) Be an eligible member of a family all of whose key in-scope members have a positive person-level weight (PERWT20F > 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 (FAMWT20F > 0). Note that FAMIDYR and FAMWT20F are variables on the 2020 Full Year Consolidated Data File.

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 on the file only if the newborn was discharged after the mother. Thus, hospital stays associated with a normal birth are generally represented on the file 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 file can be merged with 2020 MEPS HC person-level data (e.g. Full

Year Consolidated or Full Year Population Characteristics file) using the person identifier, DUPERSID. Hospital inpatient stay events can also be linked to the MEPS 2020 Medical Conditions File and the MEPS 2020 Prescribed Medicines File. Please see Section 5.0 or the MEPS 2020 Appendix File, HC-220I, for details on how to merge MEPS data files.

2.1 Codebook Structure

For most variables on the Inpatient Events file, 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 sequence 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 is unique within this data year.

2.2 Reserved Codes

The following reserved code values are used:

Value	Definition
-1 INAPPLICABLE	Question was not asked due to skip pattern
-7 REFUSED	Question was asked and respondent refused to answer question
-8 DK	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 -15 (CANNOT BE COMPUTED) is assigned to MEPS constructed variables in cases where there is not enough information from the MEPS instrument to calculate the constructed variables. “Not enough information” is often the result of skip patterns in the data or from missing information resulting from MEPS responses of -7 (REFUSED) or -8 (DK). Note that reserved code -8 includes cases where the information from the question was “not ascertained” or where the respondent chose “don’t know”.

Generally, the values of -1, -7, -8, and -15 for non-expenditure variables have not been edited on this file. The values of -1 and -15 can be edited by data users/analysts by following the skip patterns in the HC survey questionnaire, located on the MEPS website.

2.3 Codebook Format

The STAZ codebook describes an ASCII data set (although the data are also being provided in an Excel file, a Stata data set, a SAS data set, and a SAS transport file). The following codebook items are provided for each variable:

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 content of the variable. All imputed/edited variables end with an "X".

As variable collection, universe, or categories are altered, the variable name will be appended with "_Myy" to indicate in which year the alterations took place. Details about these alterations can be found throughout this document.

2.4.1 General

Variables on this file were derived from the HC questionnaire itself, derived from the MPC data collection instrument, derived from 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," respectively;

2. Variables which come 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 using complex algorithms are labeled "Constructed" in the "Source" column; and
4. Variables which 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 edited/imputed. Please note that imputed means that a series of logical edits, as well as an imputation process to account for missing data, have been performed on the variable.

The total sum of payments and 10 sources of payment variables are named in the following way:

The first two characters indicate the type of event:

IP - inpatient stay

ER - emergency room visit

HH - home health visit

OM - other medical equipment

OB - office-based visit

OP - outpatient visit

DV - dental visit

RX - prescribed medicine

For expenditure variables on the IP file, 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 (20). The eighth character, being "X", indicates the variable is edited/imputed.

For example, IPFSF20X is the edited/imputed amount paid by self or family for the facility portion of the hospital inpatient stay expenditure incurred in 2020.

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 National Health Interview Survey (NHIS). The dwelling unit ID (DUID) is a seven-digit ID number consisting of a 2-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 ten-character variable DUPERSID uniquely identifies each person represented on the file and is the combination of the variables 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 2020 Full Year Population Characteristics file.

Record Identifiers (EVNTIDX, ERHEVIDX, FFEEIDX)

EVNTIDX uniquely identifies each hospital inpatient stay/event (i.e., each record on the STAZ file) and is the variable required to link hospital inpatient stay events to data files containing details on conditions and/or prescribed medicines (MEPS 2020 Medical Conditions File and MEPS 2020 Prescribed Medicines File, respectively). 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 or the MEPS 2020 Appendix File, HC-220I.

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 "Emergency Room/Hospital Inpatient Stay 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 2020 STAZ file, there are 927 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 file.

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 6 and 7 (partial) are associated with MEPS survey data collected from Panel 23. Likewise, Rounds 3 (partial), 4, and 5 (partial) are associated with data collected from Panel 24 and Rounds 1, 2, and 3 (partial) are associated with data collected from Panel 25.

Panel Indicator (PANEL)

PANEL is a constructed variable used to specify the panel number for the person. PANEL will indicate either Panel 23, Panel 24, or Panel 25 for each person on the file. Panel 23 is the panel that started in 2018, Panel 24 is the panel that started in 2019, and Panel 25 is the panel that started in 2020.

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 Medical Provider Component, 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 file 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 2019 and ending in 2020, 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 (Section 2.5.3). If the dates were unknown, then NUMNIGHX was imputed.

Inpatient hospital stays take into account information from the Medical Provider Component (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 Full Year (FY) 20 data delivery.

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 165 cases where RSNINHOS = 4 (reason entered hospital - to give birth to a baby), this does not mean that there were actually 165 *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 2020 Full Year Population Characteristics File, 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 survey 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 on this file. For information on the ICD-10-CM condition codes and associated CCSR codes, see the MEPS 2020 Medical Conditions File.

2.5.5 Flat Fee Variables (FFEEIDX, FFIPTYPE, FFBEF20, FFTOT21)

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 of time. 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 file include flat fee groups where at least one of the health care events, as reported by the HC respondent, occurred during 2020. 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 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 2020 MEPS event file, 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 on those event files.

Flat Fee Type (FFIPTYPE)

FFIPTYPE indicates whether the 2020 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 -1, "INAPPLICABLE."

Counts of Flat Fee Events that Cross Years (FFBEF20, FFTOT21)

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 2020 as a part of a group of events, and some event occurred before or after 2020, counts of the known events are provided on the STAZ record. Variables that indicate events occurred before or after 2020 are as follows:

> FFBEF20 - total number of pre-2020 events in the same flat fee group as the 2020 hospital inpatient stay(s). This count would not include 2020 hospital inpatient stay(s).
>
> FFTOT21 - the number of 2021 hospital inpatient stays expected to be in the same flat fee group as the hospital inpatient stay that occurred in 2020.

If there are no 2019 events on the file, FFBEF20 will be omitted. Likewise, if there are no 2021 events on the file, FFTOT21 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 2 hospital inpatient stay/event identified as being 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 2020, but the remaining visits that were part of this flat fee group occurred in 2021. In this case, the 2020 flat fee group would consist of one event, the stem. The 2021 events that are part of this flat fee group are not represented on the file. Similarly, the household respondent may have reported a flat fee group where the initial visit began in 2019 but subsequent visits occurred during 2020. In this case, the initial visit would not be represented on the file. This 2020 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

Expenditure variables on this file refer to what is paid 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 slightly from its predecessors: the 1987 NMES and 1977 NMCES surveys where "charges" rather than 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 payments associated with those classifications. While charge data are provided on this file, data users/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 reference the following, "Informing American Health Care Policy" (Monheit, et al., 1999). AHRQ has developed factors to apply to the 1987 NMES expenditure data to facilitate longitudinal analysis. These factors can be accessed via the CFACT data center, and also are available in Zuvekas and Cohen, 2002. For more information, see the Data Center section of the MEPS website.

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 on this file were derived from both the MEPS Household (HC) and Medical Provider Components (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 survey-reported 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 respondents to replace missing data while taking into account the persons' weighted distribution in the imputation process.

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 various 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 Household Component (HC) or Medical Provider Component (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 2020, all of the events that occurred in 2020 will have zero payments. Conversely, if the first event in the flat fee group occurred at the end of 2020, the total expenditure for the entire flat fee group will be on that event, regardless of the number of events it covered after 2020. 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 2020 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 2020 data files include the HC survey data collected using the new 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 of a 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 2020 Emergency Room Visits File 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 file contains two sets of imputed expenditure variables: facility expenditures and physician expenditures.

Hospital Inpatient Facility Expenditures (IPFSF20X-IPFOT20X, IPFXP20X, IPFTC20X)

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.

IPFSF20X - IPFOT20X are the 10 sources of payment. The 10 sources of payment are: self/family (IPFSF20X), Medicare (IPFMR20X), Medicaid (IPFMD20X), private insurance (IPFPV20X), Veterans Administration/CHAMPVA (IPFVA20X), TRICARE (IPFTR20X), other federal sources (IPFOF20X), state and local (non-federal) government sources (IPFSL20X), Workers' Compensation (IPFWC20X), and other insurance (IPFOT20X). IPFXP20X is the sum of the 10 sources of payment for the Hospital Facility expenditures, and IPFTC20X 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 (IPDSF20X - IPDOT20X, IPDXP20X, IPDTC20X)

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 Medical Provider Component 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 on the file. IPDSF20X - IPDOT20X are the 10 sources of payment; IPDXP20X is the sum of the 10 sources of payments; and IPDTC20X is the physician's total charge.

Data users/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 (IPXP20X and IPTC20X)

Data users/analysts interested in total expenditures should use the variable IPXP20X, which includes both facility and physician amounts. Those interested in total charges should use the variable IPTC20X, 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 have been rounded to the nearest penny. Person-level expenditure information released on the MEPS 2020 Person-Level Use and Expenditure File were rounded to the nearest dollar. It should be noted that using the MEPS 2020 event files to create person-level totals will yield slightly different totals than those found on the full year consolidated file. These differences are due to rounding only. Moreover, in some instances, the number of persons having expenditures on the MEPS 2020 event files for a particular source of payment may differ from the number of persons with expenditures on the person-level expenditure file 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 2020 MEPS Data

3.1.1 Summary

Data collection for in-person sample surveys in 2020 presented real challenges after the onset of the COVID-19 pandemic at a national level in mid-March of that year. After major modifications to the standard MEPS study design, it was possible to collect data safely, but there were naturally concerns about the quality of the data after such modifications. Some issues related to data quality were identified and are discussed below. As with most in-person surveys conducted in 2020, researchers are counseled to take care in the interpretation of 2020 estimates including the comparison of such estimates with those of other years.

3.1.2 Overview

The onset of the COVID-19 pandemic in 2020 had a major impact on the MEPS Household Component (MEPS-HC) as it did for most major federal surveys and, of course, American life generally. The following discussion describes 1) the general impact of the pandemic on three major federal surveys (the effects on two of which also affect MEPS); 2) modifications to the MEPS sample design and field operations in 2020 due to the pandemic; and 3) potential data quality issues in the FY 2020 MEPS data related to the COVID-19 pandemic.

3.1.3 The Impact of the Pandemic on some Major Federal Surveys

Many important federal surveys were collecting data when much of the nation shut down in the face of the pandemic in March 2020. Among them were the Current Population Survey (CPS), the American Community Survey (ACS), and the National Health Interview Survey (NHIS). The ACS and the NHIS field new samples each year. The CPS includes rotating panels, meaning some of the sampled households fielded had participated in prior years while others were fresh. Two of these surveys have important roles in MEPS. Estimates of CPS subgroups serve as benchmarks for the MEPS weighting process (referred to below as “raking control totals”) while

households fielded for Round 1 of MEPS in each year are selected as a subsample of the NHIS responding households from the prior year.

Because data collection in 2020 occurred under such unusual circumstances, all three of these surveys have reported bias concerns. (In fact, the ACS decided not to release a standard database for 2020 due to the uncertain quality of the data, while the CPS and the NHIS released data but included reports discussing concerns about bias.) All three surveys have reported evidence of nonresponse bias, specifically, that households in higher socio-economic levels were relatively more likely to respond and the sample weighting was unable to fully compensate for this. As a result, analysts have been cautioned about the accuracy of survey estimates and the ability to compare resulting estimates with estimates obtained in the years prior to the pandemic.

The quality of CPS data is of particular importance to Full Year 2020 MEPS PUFs as CPS estimates serve as the control totals for the raking component of the MEPS weighting process. These control totals are based on the following demographic variables: age, sex, race/ethnicity, region, MSA status, educational attainment, and poverty status. The CPS estimates used in the development of the FY 2020 MEPS PUF weights that were based on the variables age, sex, race/ethnicity, region, and MSA status were evaluated by the Census Bureau and determined to be of high quality. However, similar evaluations of the corresponding CPS estimates associated with educational attainment and poverty status found that these estimates suffered from bias.

A set of references discussing the fielding of these three surveys during the pandemic and resulting bias concerns can be found in the References section of this document.

3.1.4 Modifications to the MEPS-HC 2020 Sample Design and Implementation Effort in Response to the Pandemic

For the MEPS-HC, face-to-face interviewing ceased due to the COVID-19 pandemic on March 17, 2020. At that time, there were two MEPS panels in the field for which 2020 data were being collected: Round 1 of Panel 25 and Round 3 of Panel 24. The sampled households for Panel 25 were being contacted and asked to participate in MEPS for the first time while those from Panel 24 had already participated in MEPS for two rounds. A third MEPS panel was also in the field in early 2020, Round 5 of Panel 23, collecting data for the last portion of 2019.

In developing a plan for how best to resume MEPS data collection, the primary issues were how to do so safely for both sampled household members and interviewers and the potential impact on data quality. Telephone data collection, although not the preferred method of data collection in general for MEPS-HC, was the natural option because it did not require in-person contact with respondents and could be implemented relatively quickly. The impact of changing to telephone on both response rates and data quality was expected to be larger for Panel 25 Round 1 (e.g., no experience with reporting health care events in the recent past). At the time in-person interviewing stopped in mid-March 2020 completion rates for Panels 23 and 24 were substantially higher than those for Panel 25.

AHRQ decided to field Panel 23 for at least one more year, asking Panel 23 respondents if they would be open to further participation in MEPS in newly added Rounds 6 and 7. Extending Panel 23 was meant to both offset the decrease in the number of cases in the FY 2020 data

related to lower expected sample yields for Panel 25 and to improve data quality by retaining a set of participants who were familiar with MEPS. These decisions required major changes in survey operations, including adding a fall Panel 23 Round 6 interview covering all 2020 events from January 1, 2020 to the date of the interview.

3.1.5 Data Quality Issues for MEPS for FY 2020

Numerous analyses were conducted to examine potential impacts on data quality and to gain a more complete understanding of these issues. Zuvekas and Kashihara (2021) discuss some of these analyses and provide additional background information on how the MEPS study design was modified in 2020 in response to the pandemic. Three sources of potential bias that were identified are noted here: the long recall period for Round 6 of Panel 23; switching from in-person to telephone interviewing which likely had a larger impact on Panel 25; and the impact of CPS bias on the MEPS weights. Each is considered in turn.

Comparisons of health care utilization data for Panel 24 and Panel 23 indicated that the extended reference period for Panel 23 Round 6 may have resulted in recall issues for respondents. Round 6 was initially fielded in the late summer and early fall of 2020, and because the Round 5 reference period ended on December 31, 2019, the recall period for health care events and related information extended back to January 1, 2020, much longer than for typical MEPS rounds. For Panel 23 Round 6 respondents, events of a less salient nature, such as dental visits and office-based physician visits, occurring in early 2020 were under-reported. Underreporting was confirmed through both an examination of differential utilization across 2020 for Panel 23 respondents as well as statistical comparisons of Panel 23 and Panel 24 event estimates. Adjustments were made to the sample weights for Panel 23 to help address this concern. Details on these adjustments can be found in Section 3.3.1.

Comparisons of Panel 25 with Panel 24 health care utilization data found that the difference in estimates reached statistical significance for several event types with those from Panel 25 generally being the higher. The same comparisons between first and second year panels in MEPS in recent years showed relatively few such differences with no differences at all in 2019.

Finally, AHRQ decided to calibrate, via raking, the FY 2020 Consolidated PUF weights to control totals reflecting CPS 2021 poverty status data. As discussed earlier, bias was identified by the Census Bureau in the 2020 and 2021 CPS income data and correlates. Nevertheless, the Census Bureau decided to use its standard sample weighting approach for both the 2020 and 2021 CPS ASEC data sets while recognizing some deficiencies in the nonresponse adjustment approach for the two years as a result of data collection during the pandemic. Similarly, MEPS has used poverty status based on the CPS estimates for calibration for many years and continued to do so for the 2020 Full Year Consolidated PUF as it was decided that the advantages of doing so outweighed the disadvantages.

3.1.6 Discussion and Guidance

The additional procedures for developing person-level and family-level final weights for the 2020 Consolidated MEPS data were designed to correct for potential biases in the data due to

changes in data collection and response bias. However, evaluations of MEPS data quality in 2020 - corroborated in analyses of other Federal surveys fielded in 2020 - suggest that users of the MEPS FY 2020 Consolidated PUF should exercise caution when interpreting estimates and assessing analyses based on these data as well as in comparing 2020 estimates to those of prior years.

3.2 Sample Weight (PERWT20F)

There is a single full-year person-level weight (PERWT20F) assigned to each record for each key, in-scope person who responded to MEPS for the full period of time that he or she was in-scope during 2020. A key person was either a member of a responding NHIS household at the time of 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 he or she is a member of the civilian noninstitutionalized portion of the U.S. population.

3.3 Details on Person Weight Construction

The person-level weight PERWT20F was developed in several stages. Person-level weights for Panel 23, Panel 24, and Panel 25 were created separately. The weighting process for each panel included an adjustment for nonresponse over time and calibration to independent population figures. The calibration was initially accomplished separately for each panel by raking the corresponding sample weights for those in-scope at the end of the calendar year to 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 (no degree, high school/GED no college, some college, bachelor's degree or higher); 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. A 2020 composite weight was then formed by multiplying each weight from Panel 23 by the factor .29, each weight from Panel 24 by the factor .36, and each weight from Panel 25 by the factor .35. The choice of factors reflected the relative sample sizes of the three panels, helping to limit the variance of estimates obtained from pooling the three samples. The composite weight was raked to the same set of CPS-based control totals.

The standard approach for MEPS weighting is as follows. When the poverty status information derived from 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, establishing control figures reflecting poverty status rather than educational attainment. Thus, control totals are established using 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 the other five variables previously used in the weight calibration.

This approach was modified for the full sample weights appearing on the FY 2020 Consolidated PUF. The raking of the Panel 23 weights was re-done as described in Section 3.3.1 below, and then the resulting Panel 23 weights were composited with those previously established for Panels

24 and 25 with the same factors as described previously, producing a new full sample weight. This new weight was then raked to control figures reflecting the standard five variables plus poverty status.

3.3.1 MEPS Panel 23 Weight Development Process

The person-level weight for MEPS Panel 23 was developed using the 2019 full-year weight for an individual as the initially assigned weight for 2019 survey participants present in 2020. For key, in-scope members who joined an RU some time in 2020 after being out-of-scope in 2019, the initially assigned person-level weight was the corresponding 2019 family weight. The weighting process included an adjustment for person-level nonresponse over Rounds 6 and 7 as well as raking to population control figures for December 2020 for key, responding persons in-scope on December 31, 2020. These control totals were derived by scaling back the population distribution obtained from the March 2021 CPS to reflect the December 31, 2020 estimated population total (estimated based on Census projections for January 1, 2021). 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 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. (It may be noted that for confidentiality reasons, the MSA status variables are no longer released for public use. This started with the Full-Year 2013 Person-Level Use PUF.) The final weight for key, responding persons who were not in-scope on December 31, 2020 but were in-scope earlier in the year was the nonresponse-adjusted person weight without raking.

In developing the person-level weight for Panel 23, an additional raking dimension was included beyond those based on the usual six variables. This dimension was added to adjust the distribution of event-based (i.e., office-based [MV] and/or outpatient [OP]) estimates to align with corresponding Panel 24 weighted estimates. The table below shows ratios of weighted totals (population estimates) associated with this additional raking dimension, reflecting the extent to which the Panel 23 estimates were modified in order to correspond to Panel 24 estimates. Generally, the weights of the records with any event in Q1 are inflated to account for the under reporting of events in Q1.

Ratio of Adjusted to Unadjusted Weights

# of Events	Ratio
1: No MV/OP Events	0.8375
2: At least 1 event in Q1 and no events in other quarters	2.7509
3: At least 1 event in Q2 and no events in other quarters	0.9456
4: At least 1 event in Q3 and no events in other quarters	0.7811
5: At least 1 event in Q4 and no events in other quarters	0.7149
6: At least 1 event in Q1 and at least 1 event in at least 1 other quarter	1.3188

# of Events	Ratio
7: At least 1 event in Q2 and at least 1 event in at least 1 Q3 or Q4	0.7199
8: Other	0.6908

The Panel 23 2019 full-year weight used as the base weight for Panel 23 was derived from the 2018 MEPS Round 1 weight and reflected adjustment for nonresponse over the remaining data collection rounds in 2018 and 2019 as well as raking to the December 2018 and December 2019 population control figures.

For the raking variable "education of the reference person" there were four raking categories in prior years: no degree; high school/GED no college; some college; and Bachelor's or a higher degree. However, as mentioned in the discussion of data quality issues in 2020 in Section 3.1, there was evidence that the onset of the COVID-19 pandemic in the years of 2020 and 2021 affected estimates associated with income and education (further details can be found in the references associated with the CPS data quality issues in 2020 and 2021 in the References section). For the full-year 2019 weights, March 2019 CPS was utilized instead of March 2020 CPS in the construction of control totals to avoid data quality issues connected to the COVID-19 pandemic. For the full-year 2020 weights, since there are no reliable education estimates from 2020 or 2021 CPS, a regression approach was implemented to derive education control figures. The regression approach involved two steps. The first step fit a linear regression model for each of the four education categories using the 2013-2018 CPS education of reference person distributions as the predictors in order to estimate the distribution for 2020, and the second step derived the education of reference person control figures by applying the estimated 2020 education distribution to the December 31, 2020 population total. The models for "no degree" and "Bachelor's or a higher degree" performed extremely well with R^2 values of 0.97 and 0.98, respectively. The models for "high school/GED no college" and "some college" showed a lower goodness of fit, especially for some college, with a R^2 value of 0.74. A linear regression for the two categories combined improved the R^2 value to 0.89, so the two levels were combined for the 2020 weight development.

3.3.2 MEPS Panel 24 Weight Development Process

The person-level weight for MEPS Panel 24 was developed using the 2019 full-year weight for an individual as a "base" weight for survey participants present in 2019. For key, in-scope members who joined an RU some time in 2020 after being out-of-scope in 2019, the initially assigned person-level weight was the corresponding 2019 family weight. The weighting process included an adjustment for person-level nonresponse over Rounds 4 and 5 as well as raking to population control totals for December 2020 used for the MEPS Panel 23 weights for key, responding persons in-scope on December 31, 2020. The six standard variables employed for Panel 23 raking (education level, census region, MSA status, race/ethnicity, sex, and age) were also used for Panel 24 raking. Similar to Panel 23, the Panel 24 final weight for key, responding persons not in-scope on December 31, 2020 but in-scope earlier in the year was the nonresponse-adjusted person weight without raking.

Note that the 2019 full-year weight that was used as the base weight for Panel 24 was derived as follows; adjustment of the 2019 MEPS Round 1 weight for nonresponse over the remaining data collection rounds in 2019; and raking the resulting nonresponse adjusted weight to December 2019 population control figures.

3.3.3 MEPS Panel 25 Weight Development Process

The person-level weight for MEPS Panel 25 was developed using the 2020 MEPS Round 1 person-level weight as a "base" weight. The MEPS Round 1 weights incorporated the following components: the original household probability of selection for the NHIS, use of a subsample of the NHIS panels and quarters reserved for MEPS, an adjustment for NHIS nonresponse, the probability of selection for MEPS from NHIS responding households, adjustment for nonresponse at the dwelling unit level for Round 1, and poststratification 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 family weight served as a "base" weight.

The weighting process also included an adjustment for nonresponse over the remaining data collection rounds in 2020 as well as raking to the same population control figures for December 2020 used for the MEPS Panel 23 and Panel 24 weights for key, responding persons in-scope on December 31, 2020. The six standard variables employed for Panel 23 and Panel 24 raking (educational attainment of the reference person, census region, MSA status, race/ethnicity, sex, and age) were also used for Panel 25. The event-based raking dimension used for Panel 23 was not employed for Panel 25. Similar to Panel 23 and Panel 24, the Panel 25 final weight for key, responding persons who were not in-scope on December 31, 2020 but were in-scope earlier in the year was the person weight after the nonresponse adjustment.

3.3.4 The Final Weight for 2020

The final raking of those in-scope at the end of the year has been described above. In addition, the composite weights of three groups of persons who were out-of-scope on December 31, 2020 were adjusted for expected undercoverage. Specifically, the weights of those who were in-scope some time during the year, out-of-scope on December 31, and entered a nursing home during the year and still 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), Underlying Cause of Death, 1999-2020 on CDC WONDER Online Database, released in 2022, 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, 2020 is 324,539,180 (PERWT20F >0 and INSC1231=1). The sum of person-level weights across all persons assigned a positive person-level weight is 328,545,297.

3.4 Coverage

The target population for MEPS in this file is the 2020 U.S. civilian noninstitutionalized population. However, the MEPS sampled households are a subsample of the NHIS households interviewed in 2017 (Panel 23), 2018 (Panel 24), and 2019 (Panel 25). New households created after the NHIS interviews for the respective panels and consisting exclusively of persons who entered the target population after 2017 (Panel 23), after 2018 (Panel 24), or after 2019 (Panel 25) are not covered by MEPS. Neither are previously out-of-scope persons who join an existing household but are unrelated 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. The set of uncovered persons constitutes a relatively small segment of the MEPS target population.

3.5 Using MEPS Data for Trend Analysis

First, of course, we note that there are uncertainties associated with 2020 data quality as discussed in Section 3.1. Evaluations described in that section suggest that care should be taken in the interpretation of estimates based on data collected in 2020 as well as in comparisons over time. Trend analyses are challenging since the advent of the COVID-19 pandemic resulted in uncertain data quality for MEPS as well as standard benchmark sources such as the CPS, ACS, and NHIS while the pandemic also had an impact on the health and access to health care of the U.S. population. For such reasons, the extent to which 2020 health care parameters may differ from those of prior years is difficult to assess.

In terms of other factors to be aware of, MEPS began in 1996, and the utility of the survey for analyzing health care trends expands with each additional year of data; however, it is important to consider a variety of factors when examining trends over time using MEPS. Tests of statistical significance should be conducted to assess the likelihood that observed trends are not attributable to sampling variation. The length of time being analyzed should also 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 MEPS survey methodology.

With respect to methodological considerations, in 2013 MEPS introduced an effort focused on field procedure changes such as interviewer training to obtain more complete information about health care utilization from MEPS respondents with full implementation in 2014. This effort likely resulted in improved data quality and a reduction in underreporting starting in the second half of 2013 and throughout 2014 full year files and have had some impact on analyses involving trends in utilization across years. The aforementioned changes in the NHIS sample design in 2016 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 U.S. As a result, it can be expected to better cover the full U.S. 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 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 PUFs were established from data collected in Rounds 1-3 of Panel 22 and Rounds 3-5 of Panel 21, they reflected two different instrument designs. In order 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 easy 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. **Data users should be aware of possible impacts on the data and especially trend analyses for these data years due to the design transition.**

Process changes, such as data editing and imputation, may also affect trend analyses. For example, users should refer to the 2020 Consolidated file (HC-224) and, for more detail, the documentation for the prescription drug file (HC-220A) when analyzing prescription drug spending over time.

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

Analysts may wish to consider using techniques to smooth or stabilize analyses of trends using MEPS data 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 MEPS data to test the fit of specified patterns over time.

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, undertaking numerous statistical significance tests of trends increases 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 file can be used to develop national 2020 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 (PERWT20F) across relevant event records while estimates of other variables must be weighted

by PERWT20F to be nationally representative. The tables below contain event-level estimates for selected variables.

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)	PERWT20F	25.2 (1.17)	25.1 (1.16)
Total number of nights in hospital across all stays (in millions)	NUMNIGHX	131.5 (8.70)	130.5 (8.60)
Average number of nights per stay	NUMNIGHX	5.2 (0.25)	5.2 (0.25)
Average number of nights per stay (NUMNIGHX > 0)	NUMNIGHX	5.2 (0.25)	5.2 (0.25)

Hospital Expenditures

Estimate of Interest	Variable Name	Estimate (SE)	Estimate Excluding Zero Payment Events (SE)*
Mean total payments per stay	IPXP20X	$17,706 ($897.84)	$17,802 ($901.3)
Mean out-of-pocket payment per stay	IPDSF20X +IPFSF20X	$365 ($39.0)	$367 ($39.2)
Mean proportion of total expenditures per stay paid by private insurance	(IPDPV20X+ IPFPV20X) /IPXP20X	----------	0.337 (0.0169)
Mean total payments per night (NUMNIGHX > 0)	IPXP20X/ NUMNIGHX	$6,205 ($252.5)	$6,238 ($252.5)

* 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 file to the annual full year consolidated file (which has data for

all MEPS sample persons), or conversely, link person-level information from the full year consolidated file to this event-level file (see Section 5 below for more details). Both this file and the full year consolidated file 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 file cannot be used. Only those persons with at least one inpatient event are represented on this data file. The full year consolidated file 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 data user/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 minus values to values appropriate to the analytic needs. That is, the data user/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 data user/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)

The MEPS has a complex sample design. To obtain estimates of variability (such as the standard error of sample estimates or corresponding confidence intervals) for MEPS estimates, analysts need to take into account the complex sample design of 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, 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 data file does not contain replicate weights, the capability of employing replicate weights constructed using the Balanced Repeated Replication (BRR) methodology is also provided if needed to develop variances for more complex estimators (see Section 5.4.2).

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 public use files. 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 corresponding software user documentation.

Using 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 MEPS data file serve to 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 computer software packages will provide estimated standard errors appropriate for assessing the variability of MEPS survey 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 have at least 100 degrees of freedom associated with the estimated standard errors for national estimates based on this MEPS database.

Prior to 2002, 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. However, beginning with the 2002 Point-in-Time PUF, the variance strata and PSUs were developed to be compatible with all future PUFs until the NHIS design changed. Thus, when pooling data across years 2002 through the Panel 11 component of the 2007 files, the variance strata and PSU variables provided can be used without modification for variance estimation purposes for estimates covering multiple years of data. There were 203 variance estimation strata, each stratum with either two or three variance estimation PSUs.

From Panel 12 of the 2007 files, a new set of variance strata and PSUs were 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, starting from Panel 12. Therefore, there are a total of 368 (203+165) variance strata in the 2007 Full Year file as it consists 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 next NHIS design, there are only 165 variance strata. These variance 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 in the event that data are pooled for several years.

As discussed, a complete change was made to the NHIS sample design in 2016, effectively changing the MEPS design beginning with calendar year 2017. There were 117 variance strata originally formed under this new design intended for use until the next fully new NHIS design was implemented. In order to make the pooling of data across multiple years of MEPS more straightforward, the numbering system for the variance strata has changed. Those strata associated with the new design (implemented in 2016) were numbered from 2001 to 2117.

However, the new NHIS sample design implemented in 2016, was further modified in 2018. With the modification in the 2018 NHIS sample design, the MEPS variance structure for the 2019 Full Year file has also had to be modified, reducing the number of variance strata to 105. Consistency was maintained with the prior structure in that the 2019 Full Year file 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.

Some analysts may be interested in pooling data across multiple years of MEPS data. As noted on the cover page of this document, due to data quality issues arising from collecting data during the COVID-19 pandemic in 2020, caution should be taken when interpreting the results of such pooling.

If pooling is to be undertaken, it should be noted that, to obtain appropriate standard errors when doing so, it is necessary to specify a common variance structure. Prior to 2002, each annual MEPS public use file was released with a variance structure unique to the particular MEPS sample in that year. Starting in 2002, the annual MEPS public use files were released with a common variance structure that allowed users to pool data from 2002 through 2018. However, with the need to modify the variance structure beginning with 2019, this can no longer be routinely done.

To ensure that variance strata are identified appropriately for variance estimation purposes when pooling MEPS data across several years, one 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) 2019 and beyond with any earlier year, use the pooled linkage public use file HC-036 that 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 can be found in the public use documentation of the HC-036 file.

4.4.2 Balanced Repeated Replication (BRR) 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 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 to compute variances of complex non-linear estimators for which a Taylor linear form is not easy to derive and not available in commonly used software. For instance, it is not possible to calculate the variances of a median or the ratio of two medians using the Taylor linearization method. For these types of estimators, users may 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 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 1996-2018 Replicates for Variance Estimation File, contains the information necessary to construct the BRR replicates. It contains 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 analysis of

MEPS data pooled across years, the BRR replicates can be formed in the same way using the HC-036, MEPS 1996-2018 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 file can be used alone or in conjunction with other files for different analytic purposes. This section summarizes various scenarios for merging/linking MEPS event files. The set of households selected for MEPS is a subsample of those participating in the National Health Interview Survey (NHIS), thus, each MEPS panel can also be linked back to the previous year's NHIS public use data files. For information on obtaining MEPS/NHIS link files please see the MEPS website.

5.1 Linking to the Person-Level File

Merging characteristics of interest from other MEPS files (e.g., MEPS 2020 Full-Year Consolidated File) expands the scope of potential estimates. For example, to estimate the total number of hospital inpatient stays for persons with specific demographic characteristics (such as, age, race, sex, and education), population characteristics from a person-level file need to be merged onto the hospital inpatient stays file. This procedure is illustrated below.

1. Create data set PERSX by sorting the MEPS 2020 Full Year Consolidated File by the person identifier, DUPERSID. Keep only variables to be merged onto the hospital inpatient stays file and DUPERSID.

2. Create data set STAZ by sorting the hospital inpatient stays file by person identifier, DUPERSID.

3. Create final data set NEWSTAZ by merging these two files by DUPERSID, keeping only records on the hospital inpatient stays file.

The following is an example of SAS code that completes these steps:

```
PROC SORT DATA=HCXXX(KEEP=DUPERSID AGE31X AGE42X AGE53X SEX
RACEV1X EDUCYR HIDEG) OUT=PERSX;
    BY DUPERSID;
RUN;

PROC SORT DATA=STAZ;
    BY DUPERSID;
RUN;

    DATA NEWSTAZ;
    MERGE STAZ (IN=A) PERSX(IN=B);
    BY DUPERSID;
```

```
    IF A;
RUN;
```

5.2 Linking to the Prescribed Medicines File

The prescribed medicines-event link (RXLK) file provides a link from the MEPS event files to the Prescribed Medicine Event File. When using RXLK, data users/analysts should keep in mind that one inpatient stay can link to more than one prescribed medicine record. Conversely, a prescribed medicine event may link to more than one inpatient stay visit or different types of events. When this occurs, it is up to the data user/analyst to determine how the prescribed medicine expenditures should be allocated among those medical events.

5.3 Linking to the Medical Conditions File

The conditions-event link file (CLNK) provides a link from MEPS event files to the 2020 Medical Conditions File. When using the CLNK, data users/analysts should keep in mind that (1) conditions are household-reported, (2) there may be multiple conditions associated with a hospital inpatient stay, and (3) a condition may link to more than one hospital inpatient stay or any other type of visit. Data users/analysts should also note that not all hospital inpatient stays link to the medical conditions file.

References

Bramlett, M.D., Dahlhamer, J.M., & Bose, J. (2021, September). *Weighting Procedures and Bias Assessment for the 2020 National Health Interview Survey.* Centers for Disease Control and Prevention.

Chowdhury, S.R., Machlin, S.R., Gwet, K.L. *Sample Designs of the Medical Expenditure Panel Survey Household Component, 1996-2006 and 2007-2016. Methodology Report #33*. January 2019. Agency for Healthcare Research and Quality, Rockville, MD.

Cohen, S.B. (1996). The Redesign of the Medical Expenditure Panel Survey: A Component of the DHHS Survey Integration Plan. *Proceedings of the COPAFS Seminar on Statistical Methodology in the Public Service.*

Current Population Survey: 2021 Annual Social and Economic (ASEC) Supplement. (2021). U.S. Census Bureau.

Dahlhamer, J.M., Bramlett, M.D., Maitland, A., & Blumberg, S.J. (2021). *Preliminary evaluation of nonresponse bias due to the COVID-19 pandemic on National Health Interview Survey estimates, April-June 2020.* National Center for Health Statistics.

Daily, D., Cantwell, P.J., Battle, K., & Waddington, D.G. (2021, October 27), *An Assessment of the COVID-19 Pandemic's Impact on the 2020 ACS 1-Year Data.* U.S. Census Bureau.

Fay, R.E. (1989). Theory and Application of Replicate Weighting for Variance Calculations. *Proceedings of the Survey Research Methods Sections, ASA*, 212-217.

Lau, D.T., Sosa, P., Dasgupta, N., & He, H. (2021). Impact of the COVID-19 Pandemic on Public Health Surveillance and Survey Data Collections in the United States. *American Journal of Public Health, 111* (12), pp. 2118-2121.

Monheit, A.C., Wilson, R., and Arnett, III, R.H. (Editors). *Informing American Health Care Policy*. (1999). Jossey-Bass Inc., San Francisco.

Rothbaum, J. & Bee, A. (2020). Coronavirus Infects Surveys, Too: Nonresponse Bias During the Pandemic in the CPS ASEC (SEHSD Working Paper Number 2020-10). U.S. Census Bureau.

Rothbaum, J. & Bee, A. (2021, May 3). *Coronavirus Infects Surveys, Too: Survey Nonresponse Bias and the Coronavirus Pandemic*. U.S. Census Bureau.

Rothbaum, J., Eggleston, J., Bee, A., Klee, M., & Mendez-Smith, B. (2021). *Addressing Nonresponse Bias in the American Community Survey During the Pandemic Using Administrative Data.* U.S. Census Bureau.

RTI International (2019). *Medical Provider Component (MEPS-MPC) Methodology Report 2017 Data Collection.* Rockville, MD. Agency for Healthcare Research and Quality.

Shah, B.V., Barnwell, B.G., Bieler, G.S., Boyle, K.E., Folsom, R.E., Lavange, L., Wheeless, S.C., and Williams, R. (1996). *Technical Manual: Statistical Methods and Algorithms Used in SUDAAN Release 7.0,* Research Triangle Park, NC: Research Triangle Institute.

Villa Ross, C.A., Shin, H.B., & Marlay, M.C. (2021, October 27). *Pandemic Impact on 2020 American Community Survey 1-Year Data.* U.S. Census Bureau.

Zuvekas, S.H. and J.W. Cohen. A guide to comparing health care expenditures in the 1996 MEPS to the 1987 NMES. *Inquiry*. 2002 Spring;39(1):76-86. doi: 10.5034/inquiryjrnl_39.1.76. PMID: 12067078.

Zuvekas, S.H. & Kashihara, D. (2021). *The Impacts of the COVID-19 Pandemic on the Medical Expenditure Panel Survey*. *American Journal of Public Health, 111 (12)*, pp. 2157-2166.

D. Variable-Source Crosswalk

FOR MEPS HC-220D 2020 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
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 - ear	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
FFBEF20	Total # of visits in FF before 2020	FF50
FFTOT20	Total # of visits in FF after 2020	FF60

Imputed Total Expenditure Variables

Variable	Description	Source
IPXP20X	Total expenditure for event (IPFXP20X+IPDXP20X)	Constructed
IPTC20X	Total charge for event (IPFTC20X+IPDTC20X)	Constructed

Imputed Facility Expenditure Variables

Variable	Description	Source
IPFSF20X	Facility amount paid, self/family (Imputed)	CP Section (Edited)
IPFMR20X	Facility amount paid, Medicare (Imputed)	CP Section (Edited)
IPFMD20X	Facility amount paid, Medicaid (Imputed)	CP Section (Edited)
IPFPV20X	Facility amount paid, private insurance (Imputed)	CP Section (Edited)
IPFVA20X	Facility amount paid, Veterans/CHAMPVA (Imputed)	CP Section (Edited)
IPFTR20X	Facility amount paid, TRICARE (Imputed)	CP Section (Edited)
IPFOF20X	Facility amount paid, other federal (Imputed)	CP Section (Edited)
IPFSL20X	Facility amount paid state & local government (Imputed)	CP Section (Edited)
IPFWC20X	Facility amount paid, workers' compensation (Imputed)	CP Section (Edited)
IPFOT20X	Facility amount paid, other insurance (Imputed)	CP Section (Edited)

Variable	Description	Source
IPFXP20X	Facility sum payments IPFSF20X - IPFOT20X	Constructed
IPFTC20X	Total facility charge (Imputed)	CP Section (Edited)

Imputed Separately Billing Physician Expenditure Variables

Variable	Description	Source
IPDSF20X	Doctor amount paid, family (Imputed)	Constructed
IPDMR20X	Doctor amount paid, Medicare (Imputed)	Constructed
IPDMD20X	Doctor amount paid, Medicaid (Imputed)	Constructed
IPDPV20X	Doctor amount paid, private insurance (Imputed)	Constructed
IPDVA20X	Doctor amount paid, Veterans/CHAMPVA (Imputed)	Constructed
IPDTR20X	Doctor amount paid, TRICARE (Imputed)	Constructed
IPDOF20X	Doctor amount paid, other federal (Imputed)	Constructed
IPDSL20X	Doctor amount paid, state & local government (Imputed)	Constructed
IPDWC20X	Doctor amount paid, workers' compensation (Imputed)	Constructed
IPDOT20X	Doctor amount paid, other insurance (Imputed)	Constructed
IPDXP20X	Doctor sum payments IPDSF1X-IPDOT20X	Constructed
IPDTC20X	Total doctor charge (Imputed)	Constructed
IMPFLAG	Imputation status	Constructed

Weight Variables

Variable	Description	Source
PERWT20F	Expenditure file person weight, 2020	Constructed
VARSTR	Variance estimation stratum, 2020	Constructed
VARPSU	Variance estimation PSU, 2020	Constructed