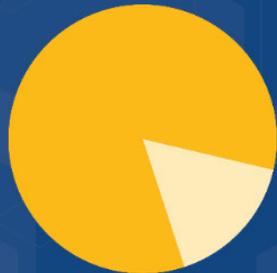


2018 | DATA USER'S GUIDE: PUBLIC USE FILE



Centers for Medicare & Medicaid Services (CMS)
Office of Enterprise Data and Analytics (OEDA)

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ACRONYM LIST

AAPOR	American Association for Public Opinion Research
ACCESSCR	LDS Survey File Access to Care segment
ACCSSMED	LDS Survey File Access to Care, Medical Appointment segment
ADMNUTLS	LDS Survey File Administrative Utilization Summary segment
ASSIST	LDS Survey File Assistance segment
CAPI	Computer-Assisted Personal Interviewing
CHRNCOND	LDS Survey File Chronic Conditions segment
CMS	Centers for Medicare & Medicaid Services
CSV	Comma-separated values file
DEMO	LDS Survey File Demographics segment
DUA	Data Use Agreement
EVRWGTS	LDS Survey File Ever Enrolled Population Weight segment
FALLS	LDS Survey File Falls segment
FOODINS	LDS Survey File Food Insecurity segment
GENHLTH	LDS Survey File General Health segment
HHCHAR	LDS Survey File Household Characteristics segment
HHS	U.S. Department of Health and Human Services
HIC	Health Insurance Claim
HISUMRY	LDS Survey File Health Insurance Summary segment
HITLINE	LDS Survey File Health Insurance Timeline segment
INTERV	LDS Survey File Interview Characteristics segment
IRB	Institutional Review Board
LDS	Limited Data Set(s)
MA	Medicare Advantage
MAPLANQX	LDS Survey File Medicare Advantage Plan Questions segment
MCREPLNQ	LDS Survey File Medicare Plan Beneficiary Knowledge segment
MCBS	Medicare Current Beneficiary Survey
NAGIDIS	LDS Survey File NAGI Disability segment
NICOALCO	LDS Survey File Nicotine and Alcohol segment
NORC	NORC at the University of Chicago
OMB	Office of Management and Budget
PHI	Protected Health Information
PII	Personally Identifiable Information
PREVCARE	LDS Survey File Preventive Care segment
PSU	Primary Sampling Units
PUF	Public Use File
RXMED	LDS Survey File RX Medications segment
SAS	Statistical Analysis System
SATWCARE	LDS Survey File Satisfaction with Care segment
SSU	Secondary Sampling Units
USCARE	LDS Survey File Usual Source of Care segment
USU	Ultimate Sampling Unit
VISHEAR	LDS Survey File Vision and Hearing segment

1. INTRODUCTION

Over the past several years, the Centers for Medicare and Medicaid Services (CMS) has made it a priority to make more data available, including releasing to the public an unprecedented amount of information on services and procedures provided to Medicare beneficiaries. CMS provides users with multiple ways to access Medicare Current Beneficiary Survey (MCBS) data, and a wide array of documentation is publically available on the CMS MCBS website. MCBS data are made available via two annual Limited Data Set (LDS) releases and a MCBS Public Use File (MCBS PUF) based on the Survey File LDS.

The content of the MCBS PUF is governed by its central focus of serving as a unique source of information on beneficiaries' health and well-being that cannot be obtained through CMS administrative sources alone. The file includes data related to Medicare beneficiaries' access to care, health status, other information regarding beneficiaries' knowledge of, attitudes toward, and satisfaction with their health care, as well as demographic data and information on all types of health insurance coverage. Disclosure protections have been applied to the file, including de-identification and other methods; as a result, the MCBS PUF does not require a Data Use Agreement (DUA). In contrast, the MCBS LDS releases contain beneficiary-level protected health information (PHI) and therefore require a DUA. The MCBS PUF is not intended to replace the more detailed LDS files; rather, it makes available a general-use publically-available alternative that provides the highest degree of protection to the Medicare beneficiaries' PHI.

The main benefits of the MCBS PUF are:

1. Increased data access for researchers of the MCBS through a free file download that is consistent with other U.S. Department of Health and Human Services (HHS) public-use survey files;
2. Increased policy-relevant analyses, by attracting new researchers and policy-makers, for whom the cost and time associated with accessing the MCBS LDS can pose significant deterrents to use.

This user guide contains information about the 2018 MCBS PUF. It contains detailed information about the MCBS and specific background information to help data users understand and analyze the PUF. This guide is updated each time a new set of PUF data are released.

Readers interested in understanding or analyzing the 2018 MCBS data should also familiarize themselves with the content of the *2018 Data User's Guide: Survey File* and the *2018 MCBS Methodology Report* documents in order to obtain an overview of the survey, questionnaires, sample design, and other topics relevant to the MCBS. Data users can access these documents along with other data documentation at:

<https://www.cms.gov/Research-Statistics-Data-and-Systems/Research/MCBS/Codebooks>. Data users interested in a collection of charts and tables presenting estimates from the LDS releases can access the *MCBS Chartbook* at: <https://www.cms.gov/Research-Statistics-Data-and-Systems/Research/MCBS/Data-Tables>.

What's New in 2018?

Below, data users will note highlights and updates to the MCBS PUF for the 2018 data year. Detailed information about changes to the 2018 MCBS, sampling, questionnaires, documentation, and data processing is available in the *2018 MCBS Data User's Guide: Survey File*.

1.1 What's New in the 2018 MCBS PUF?

The 2018 MCBS PUF features one important update.

Four variables about the drug coverage gap, or “donut hole,” were removed from the 2018 MCBS PUF Summer segment because they applied to fewer beneficiaries and had mostly missing data.

Exhibit 1.1.1 presents a comparison between the number of variables in the MCBS PUF for data years 2013, 2015, 2016, 2017, and 2018, including weights for the seasonal segments.

Exhibit 1.1.1: Number of Variables in the 2013, 2015, 2016, 2017, and 2018 MCBS PUF

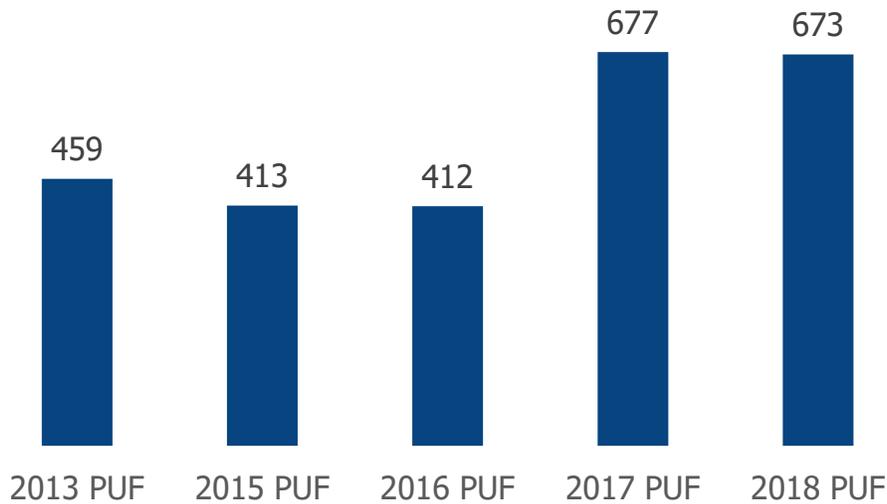


Exhibit 1.1.2 presents a summary of the content updates in the 2018 MCBS PUF.

Exhibit 1.1.2: 2018 MCBS PUF Content Updates

Segment	Variable	Variable Label	Description
PUF_SUMMER	RXS_DHEVHEAR	Ever hear about cvg gap before	Removed
PUF_SUMMER	RXS_DHSTART	How found out cvg gap	Removed
PUF_SUMMER	RXS_DHEND	Ever reached end of cvg gap	Removed
PUF_SUMMER	RXS_DHWORRY	Worry paying Rx during cvg gap	Removed

2. OVERVIEW OF THE MCBS

Medicare is the nation's health insurance program for persons 65 years and over and for persons younger than 65 years who have a qualifying disability. The MCBS is sponsored by CMS and contains data provided by a representative national sample of the Medicare population. The MCBS is designed to aid CMS in administering, monitoring, and evaluating the Medicare program. A leading source of information on Medicare and its impact on beneficiaries, the MCBS provides important information on beneficiaries that is not otherwise collected through operational or administrative data on the Medicare program and plays an essential role in the monitoring and evaluation of beneficiary health status and health care policy.

The MCBS is a continuous, in-person, multi-purpose longitudinal survey representing the population of beneficiaries aged 65 and over and beneficiaries aged 64 and below with certain disabling conditions, residing in the United States. Fieldwork for the first round of data collection began in September 1991; since then, the MCBS has continued to collect and provide essential data on the costs, use, and health care status of Medicare beneficiaries. The MCBS has conducted continuous data collection for over 25 years, completing more than one million interviews provided by thousands of respondents.

The MCBS primarily focuses on economic and beneficiary topics including health care use and health care access barriers, health care expenditures, and factors that affect health care utilization. As a part of this focus, the MCBS collects a variety of information about the beneficiary, including demographic characteristics, health status and functioning, access to care, insurance coverage and out of pocket expenses, financial resources, and potential family support. The MCBS collects this information in three data collection periods, or rounds, per year. Over the years, data from the MCBS have been used to inform many advancements to the Medicare program, including the creation of new benefits such as Medicare's Part D prescription drug benefit.

For questions or suggestions on this document or other MCBS data-related questions, please email MCBS@cms.hhs.gov.

3. TECHNICAL AND PROGRAMMING INFORMATION

3.1 General Information

The 2018 MCBS PUF is divided into three segments (Fall, Winter, and Summer), which allows for the release of data collected in all rounds. The Fall segment includes data for 13,441 sampled beneficiaries. The samples for the Winter and Summer segments are subsets of the Fall segment sample. The Winter segment includes data for 10,875 sampled beneficiaries, and the Summer segment includes data for 8,642 sampled beneficiaries. All three segments include survey weights that allow for analysis that is nationally representative of the population of beneficiaries ever enrolled in Medicare at any point in 2018.

All records begin with a PUF_ID, a unique number for each beneficiary in the public use file. This PUF_ID serves to identify records in the three 2018 MCBS PUF segments only and cannot be used for linking to MCBS data files other than the PUF. The PUF_ID does link a beneficiary between the three 2018 MCBS PUF segments. Each beneficiary's PUF_ID is randomly generated each year, so it is not possible to link a beneficiary's data between years, and the value of the PUF_ID does not provide any information about the beneficiary.

All variables in the MCBS PUF are in numeric or integer formats. Formats and values for each variable are available in the MCBS PUF codebook.

Variable groups contain prefixes to help users identify these groups by topic area. Exhibits 3.1.1 – 3.1.3 include information about these variable prefixes and the locations of the corresponding variables in the Survey File LDS data segments (i.e., the 2018 LDS Survey File individual files).

Exhibit 3.1.1: 2018 MCBS PUF Fall Segment Variable Prefixes, Number of Variables, Descriptions, and Related LDS Survey File Segments

MCBS PUF Variable Prefix	Description	Number of PUF Variables in Grouping	LDS Survey File Data Segments
ADM_	Administrative data	22	ADMNUTLS, HISUMRY, HITLINE
INS_	Insurance status, coverage, and type	12	HISUMRY, HITLINE
INT_	Interview characteristics	2	INTERV
DEM_	Age, sex, and race groups	11	DEMO
ACC_	Access to, use, and satisfaction with health care	23	ACCESSCR, SATWCARE, ASSIST
HLT_	Health conditions and limitations in activities of daily living	88	GENHLTH, VISHEAR, NAGIDIS, CHRNCND
PRV_	Preventive care and physical activity	24	PREVCARE, NAGIDIS
RSK_	Health behavior risk factors	5	NICOALCO
FAL_	Falls	12	FALLS
HOU_	Housing characteristics	30	HHCHAR
MA_	Medicare Advantage supplement	6	MAPLANQX
PUFF	PUF ever enrolled weights (fall)	101	EVRWGTS

Exhibit 3.1.2: 2018 MCBS PUF Winter Segment Variable Prefixes, Number of Variables, Descriptions, and Related LDS Survey File Segments

MCBS PUF Variable Prefix	Description	Number of PUF Variables in Grouping	LDS Survey File Data Segments
ACW__	Access to care (winter round)	87	ACCSSMED, USCARE
KNW_	Medicare knowledge	8	MCREPLNQ
PUFW	PUF ever enrolled weights (winter)	101	N/A

Exhibit 3.1.3: 2018 MCBS PUF Summer Segment Variable Prefixes, Number of Variables, Descriptions, and Related LDS Survey File Segments

MCBS PUF Variable Prefix	Description	Number of PUF Variables in Grouping	LDS Survey File Data Segments
FIS_	Food insecurity	4	FOODINS
RXS_	Prescription medication use and access	29	RXMED
PUFS	PUF ever enrolled weights (summer)	101	N/A

3.2 Data File Information

Detailed information about variables in the MCBS PUF can be found in the PUF codebooks. The codebook includes SAS variable names, labels, a note to indicate which beneficiaries were eligible for the question, the question number for the question that was asked in the survey, and a label which summarizes the question text. Certain variables in the PUF were recoded due to disclosure concerns so the categories in the PUF codebook may differ from the categories in the questionnaire specifications (e.g., "no usable vision" for variable HLT_ECTROUB and "deaf" for HLT_HCTROUB both reflect such recoding). Other variables were created by combining two variables, and their variable label indicates a recoded variable (e.g., HLT_ALZDEM).

For each variable, the formats and format values are included in the codebook:

- Values of .R indicate "refused" and .D indicate "don't know."
- All values of "inapplicable" have been combined with missing values.
- Unweighted frequencies of most variables included in the MCBS PUF are provided in the accompanying codebook file.

The MCBS PUF datasets are saved as SAS export files. Directions and sample SAS code are given below and also in Appendix B to help users read the datasets into SAS.

Assume the MCBS 2018 PUF export files (e.g., PUF2018_1_FALL.xpt) are downloaded into the folder "C:\MCBS\DOWNLOAD". The following SAS code can then be used to import the PUF Fall segment into SAS:

```
LIBNAME PUFLIB 'C:\MCBS\SASDATA';
FILENAME F "C:\MCBS\DOWNLOAD\PUF2018_1_FALL.XPT";
PROC CIMPORT LIBRARY=PUFLIB INFIL= F;
```

RUN;

Likewise, the SAS code above could be altered to import the PUF Winter segment (SAS export file PUF2018_2_WINTER.xpt) or PUF Summer segment (SAS export file PUF2018_3_SUMMER.xpt) into SAS. Additionally, a comma-separated values (CSV) file is available for use with other statistical software packages such as R® and STATA®.

A text file with SAS programming code to import the .xpt files, create formats, and apply SAS labels is provided for users.

3.3 Comparison to the LDS

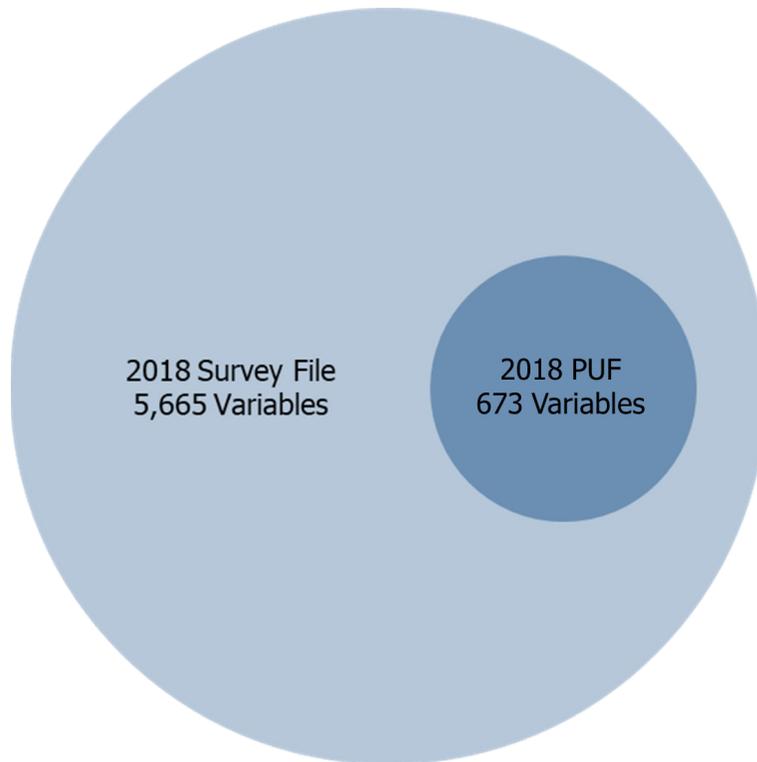
The MCBS PUF differs from the MCBS Survey File LDS, because it has been evaluated for disclosure risk and additional steps were taken to protect beneficiary confidentiality. The 2018 MCBS PUF contains data for 13,441 sampled beneficiaries and 673 variables, which is similar to the number of beneficiaries contained in the community-only 2018 MCBS Survey File LDS segments, but with fewer variables. Many Survey File LDS variables that posed a disclosure risk were dropped or recoded to create the variable set for the MCBS PUF.

Due to disclosure concerns, the MCBS PUF includes only beneficiaries living in the community for at least one interview during the data collection year, and thus excludes all beneficiaries who were in a health care facility during all interviews that year (n=1,796). Variables that were only created for facility residents are excluded.¹ Additionally, the MCBS PUF contains no health care utilization, cost, or payment data (including Medicare claims data) for individual beneficiaries.

The MCBS PUF is free and available for download on the CMS website. For users interested in the MCBS Survey File and Cost Supplement File LDS, more information on the LDS process can be found at: <https://www.cms.gov/Research-Statistics-Data-and-Systems/Research/MCBS>.

A summary of the differences between the two data products is presented in Exhibits 3.3.1.a and 3.3.1.b.

¹ Facilities are defined as nursing homes, retirement homes, domiciliary or personal care facility, distinct long term units in a hospital complex, mental health facility and centers.

Exhibit 3.3.1.a: Comparison between the 2018 MCBS PUF and 2018 MCBS Survey File LDS**Exhibit 3.3.1.b:** Comparison between the 2018 MCBS PUF and 2018 MCBS Survey File LDS

Domain	MCBS PUF	MCBS Survey File LDS
Population	Community	Community and facility
Number of variables	673 variables across three data segments	Over 5,000 variables across 39 data segments
ID	PUF_ID; Randomly generated, can't be linked back to BASEID, changes each year	BASEID; Randomly generated, can't be linked back to health insurance claim (HIC) number, consistent between years
Date fields	NO	YES
Geographic identifiers	NO	YES
Cost/payment data	NO	YES
Demographic data	YES; All variables are categorical, limited age categories	YES; Continuous, all age variables available
Insurance coverage	YES; Summarized to annual level	YES; Monthly level
Identifiable plan-related information for MA or Part D	NO	YES
Population weights	Ever enrolled weights only	Both ever enrolled and continuously enrolled weights

Exhibit 3.3.2 details the socio-demographic variables and values available in the MCBS PUF and the MCBS Survey File LDS, for comparison purposes. Variables in the MCBS Survey File LDS, which do not have an equivalent in the MCBS PUF, are noted below the exhibit.²

Exhibit 3.3.2: Comparison of Socio-demographic Variables and Values in the MCBS PUF and MCBS Survey File LDS

Socio-demographic Characteristic	MCBS PUF Variables and Values	MCBS Survey File LDS Variables and Values
Gender	DEM_SEX (Gender): Male; Female	ROSTSEX (Gender): Male; Female
Age	DEM_AGE (Age group): <65 years; 65-74 years; ≥75 years	D_STRAT (MCBS Sample age stratum): 0-44 years; 45-64 years; 65-69 years; 70-74 years; 75-79 years; 80-84 years; ≥ 85 years H_AGE (Age of beneficiary): Age of beneficiary in years
Armed Services	DEM_ARMED (Ever served in armed forces (AF)): Yes; No	SPAFEVER (Ever served in AF): Yes; No SPAFVIET: Served in AF during Vietnam era; SPAFKORE: Served in AF during Korean conflict; SPAFWWII: Served in AF during WWII; SPAFGULF: Served in AF during the Gulf War; SPAFIRAF: Served in AF during Iraq/Afghanistan conflict; SPAFPEAC: Served in AF during peace time; SPNGEVER: Ever active in National Guard/Reserve; SPNGALL: All active duty spent in National Guard SPNGDSBL: Disability from service SPAVARATE: Current VA disability rating
Education	DEM_EDU (Highest grade completed): Less than high school; High school or vocational, technical, business, etc.; More than high school	SPDEGRCV (Highest grade sampled person (SP) completed): No schooling; Nursery to 8 th grade; 9 th to 12 th grade, but no diploma; High school graduate; Vocational, technical, business, etc.; Some college, but no degree; Associate's degree; Bachelor's degree; Graduate or professional degree
Income	DEM_INCOME (Income group of SP and Spouse): <\$25,000; ≥\$25,000	INCOME (Income range of SP and spouse): <\$5,000; \$5,000 - <\$10,000; \$10,000 - <\$15,000; \$15,000 - <\$20,000; \$20,000 - <\$25,000; \$25,000 - <\$30,000; \$30,000 - <\$40,000; \$40,000 - <\$50,000; ≥\$50,000 INCOME_H (SP and spouse total income last year): Range of values

² The MCBS Survey File LDS contains additional socio-demographic information, including location of residence, rural-urban commuting area details, the number of living children the beneficiary has, employment status, status of SSA check, and English proficiency, which do not have corresponding variables available in the MCBS PUF. Please note that additional race/ethnicity variables from administrative sources are included in the MCBS Survey File LDS.

Socio-demographic Characteristic	MCBS PUF Variables and Values	MCBS Survey File LDS Variables and Values
Interview Language or Language Spoken at Home	INT_LANG (Language of interview): English; Spanish	INTLANG (Language of interview): English; Spanish WHATLANG (Language spoken at home): Spanish; French; German; Italian; Tagalog; Chinese; Polish; Korean; Greek; Filipino; Arabic; Portuguese; Other OTHLRANG (Language other than English spoken at home): Yes; No
Marital Status	DEM_MARSTA (Marital status): Married; Widowed; Divorced/separated; Never married	SPMARSTA (Marital status of SP): Married; Widowed; Divorced; Separated; Never married
Metro Status	DEM_CBSA (Metro status): Metro area; Non-metro area	H_CBSA (Type of CBSA as designated by CBSA): Metropolitan area-population of $\geq 50,000$; Micropolitan area-population between 10,000 to 50,000; Non-CBSA
Race/Ethnicity	DEM_RACE (Race/ethnicity group): Non-Hispanic White; Non-Hispanic Black; Hispanic; Other	D_RACE2 (Race of SP): Asian; African American; Native Hawaiian or Pacific Islander; White; American Indian or Alaska Native; More than one RACEAS: Asian; RACEASAI: Asian Indian; RACEASCH: Chinese; RACEASFI: Filipino; RACEASJA: Japanese; RACEASKO: Korean; RACEASVI: Vietnamese; RACEASOT: Other Asian; RACEAA: Black or African-American; RACENH: Native Hawaiian or Pacific Islander; RACEPIHA: Native Hawaiian; RACEPIGU: Guamanian Chamorro; RACEPISA: Samoan; RACEPIOT: Other Pacific Islander; RACEWH: Caucasian; RACEAI: American Indian or Alaskan Native HISPORIG (Is SP of Hispanic or Latino origin?): Yes; No HISPORMA: Mexican/Mex American/Chicano; HISPORPR: Puerto Rican; HISPORCU: Cuban; HISPOROT: Other Hispanic/Latino/Spanish origin

Socio-demographic Characteristic	MCBS PUF Variables and Values	MCBS Survey File LDS Variables and Values
Race/Ethnicity by Age Group	DEM_RE_AGE (Race/ethnicity age group): Non-Hispanic White, <65 years; Non-Hispanic White, 65-74 years; Non-Hispanic White, 75-84 years; Non-Hispanic White, 85+ years; Non-Hispanic Black, <65 years; Non-Hispanic Black, 65-74 years; Non-Hispanic Black, 75-84 years; Non-Hispanic Black, 85+ years; Hispanic, <65 years; Hispanic 65-74 years; Hispanic 75+ years; Other, <65 years; Other 65-74 years; Other 75+ years	Note: An MCBS Survey File LDS user could construct a similar race/ethnicity by age variable using D_RACE2, HISPORIG, and D_STRAT.
Income Poverty Ratio Medicare Threshold	DEM_IPR_IND (Income Poverty Ratio Medicare Threshold): <=100% of the Federal Poverty Level; >100% and <=120% of the Federal Poverty Level; >120% and <=135% of the Federal Poverty Level; >135% and <=200% of the Federal Poverty Level; >200% of the Federal Poverty Level	IPR_IND (Income Poverty Ratio Medicare Threshold): <=100% of the Federal Poverty Level; >100% and <=120% of the Federal Poverty Level; >120% and <=135% of the Federal Poverty Level; >135% and <=200% of the Federal Poverty Level; >200% of the Federal Poverty Level

4. SURVEY OVERVIEW

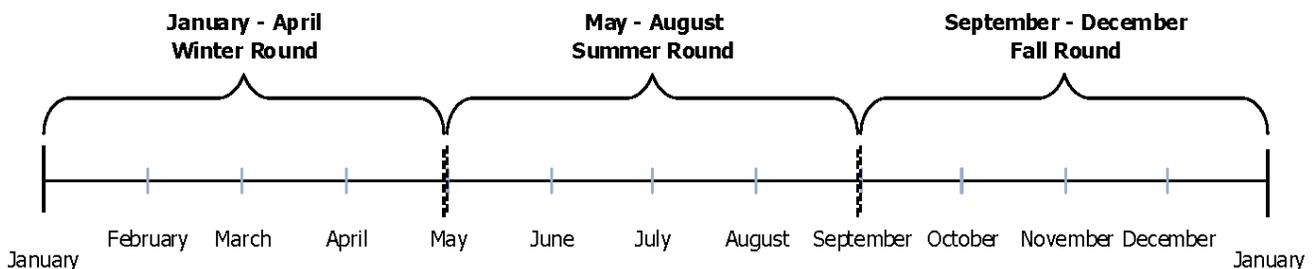
4.1 Design of MCBS

In its initial design, the MCBS was to serve as a traditional longitudinal survey of the Medicare population. There was no predetermined limit to the duration of time a beneficiary, once selected to participate, was to remain in the sample. However, beginning in 1994, participation of beneficiaries in the MCBS was limited to no more than four years.

Although participation in the survey is limited to four years, MCBS data collection is continuous throughout the year with three distinct seasons (i.e., rounds) of data collection per year. In general, the three rounds are: winter (January through April); summer (May through August); and fall (September through December). The primary reason for the round to round design is to create shorter recall periods during the year to capture more complete and accurate health care costs and utilization for beneficiaries.

The 2018 MCBS data releases reflect data collected from January 2018 through early January 2019 (see Exhibit 4.1.1), as well as Topical sections, income and assets data, and chronic pain information collected through the Summer 2019.³ Exhibit 4.1.1 depicts an MCBS data collection year and the typical span of the rounds.

Exhibit 4.1.1: Typical MCBS Data Collection Year

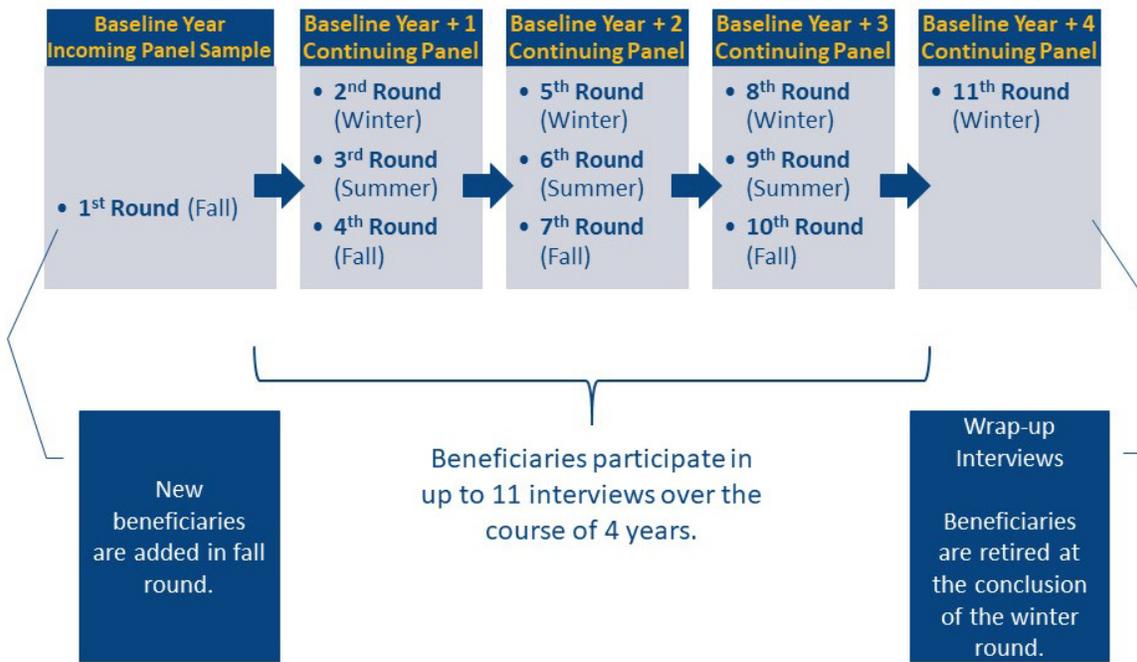


The initial interview of newly-selected beneficiaries takes place in the fall round. Often the fall round begins early (i.e., late July or early August) to allow more time to locate and conduct outreach to the new survey respondents.

Subsequent rounds, which occur every four months, involve the re-interviewing of the same beneficiary (or appropriate proxy respondents or facility staff) over a four year period (up to 11 interviews in total). Exhibit 4.1.2 depicts the timeline of participation for beneficiaries selected to be in the MCBS sample.

³ Due to the nature of some survey items, LDS data for each data year may include data pulled forward from a prior data collection year and/or data added from a future data collection year due to the specific reference period.

Exhibit 4.1.2: MCBS Beneficiary Participation Timeline



4.2 Sample Design

The MCBS uses a rotating panel sample design, covering the population of Medicare beneficiaries residing in the continental U.S. (48 states and the District of Columbia) for the survey year.⁴ Each MCBS panel, an annual statistical sample of all Medicare enrollees, is interviewed up to three times per year over four consecutive years creating a continuous profile of selected beneficiaries' health care experiences.⁵ One panel is retired at the conclusion of each winter round, and a new panel is selected to replace it each fall round (see Exhibit 4.2.1). The size of the new panel is designed to provide a stable number of beneficiaries across all panels participating in the survey annually.

⁴ Alaska and Hawaii are not included among the states from which the sample is selected due to the high cost of data collection in those areas; however, they are included in control totals for weighting purposes. Beginning in 2017, sampling from Puerto Rico was discontinued. Beginning in 2018, all data collection in Puerto Rico was discontinued.

⁵ The three rounds per year are referred to seasonally. Respondents are interviewed in the winter round, the summer round, and the fall round each year.

Exhibit 4.2.1: 2014-2018 MCBS Rotating Panel Design

Data Collection Schedule			Panel				
Data Year	Season	Round#	2014	2015	2016	2017	2018
2014	Winter	68					
	Summer	69					
	Fall	70					
2015	Winter/Summer*	71/72					
	Fall	73					
2016	Winter	74					
	Summer	75					
	Fall	76					
2017	Winter	77					
	Summer	78					
	Fall	79					
2018	Winter	80					
	Summer	81					
	Fall	82					

*The Summer and Winter Rounds in 2015 were combined due to a contract transition.

The MCBS employs a three-stage cluster sample design. Primary sampling units (PSUs) are made up of major geographic areas consisting of metropolitan areas or groups of rural counties. Secondary sampling units (SSUs) are made up of census tracts or groups of tracts within the selected PSUs. Medicare beneficiaries, the ultimate sampling units (USUs), are then selected from within the selected SSUs. The final 2018 MCBS Panel was drawn from 104 PSUs, which contained 685 SSUs. The MCBS sample is annually “supplemented” during the fall round to account for attrition (deaths, dis-enrollments, refusals) and current-year enrollees. Each annual supplement is referred to as the Incoming Panel sample.

Beneficiaries for the MCBS are sampled from the Medicare Administrative enrollment data. The beneficiaries included in the MCBS PUF represent a randomly selected cross-section of all beneficiaries who were ever enrolled in either Part A or Part B of the Medicare program for any portion of 2018.⁶ The MCBS PUF represents four separate MCBS panels identified by the year in which the panel was selected and first interviewed (i.e., for the 2018 MCBS PUF, the 2015, 2016, 2017, and 2018 Panels). Exhibit 4.2.2 shows the distribution of each of the four panels included in the 2018 MCBS PUF.

For more information on the sample design, please see the *Survey File Data User’s Guide* at: <https://www.cms.gov/Research-Statistics-Data-and-Systems/Research/MCBS/Codebooks>.

⁶ While beneficiaries included in the LDS releases represent both the ever enrolled and continuously enrolled Medicare population, the MCBS PUF solely represents the ever enrolled population.

Exhibit 4.2.2: 2018 MCBS Composition of Panels in the MCBS PUF

Data Year (Fall)	Number of Beneficiaries Selected
2015	1,576
2016	2,644
2017	3,418
2018	5,803

4.3 Eligibility

4.3.1 Medicare Population Covered by the 2018 LDS and MCBS PUF

Beginning in 2015, beneficiaries who became eligible for Medicare Part A or B and enrolled anytime during the sampling year were eligible to be sampled as part of the annual panel. This is a substantial change in practice; prior to 2015, only beneficiaries enrolled in Medicare by January 1 of the sampling year were eligible to be sampled in an annual panel.

4.4 Case Types

MCBS beneficiaries are classified by their phase of survey participation (i.e., Incoming or Continuing) and interview participation (i.e., Community or Facility), which is determined by residence status. Although they appear in the MCBS LDS releases, beneficiaries for whom only Facility interviews were conducted during the data collection period are not included in the MCBS PUF. Researchers interested in the population of beneficiaries living in facilities will need to use the MCBS LDS, as discussed in Section 3.3.

4.4.1 Incoming and Continuing Cases

Every fall round of data collection, a new panel of sampled beneficiaries is added to the total sample to replace the panel of sampled beneficiaries exiting the MCBS in the prior winter round. Beneficiaries new to the MCBS and introduced in the fall round are referred to as Incoming Panel cases. After the initial interview, they are referred to as Continuing cases.

4.4.2 Community Interviews

Approximately 90 percent of the interviews take place in the beneficiary or proxy's own residence or in a neutral interview location, such as a library or public venue. These interviews are called Community interviews; the remaining 10 percent of the interviews are administered for beneficiaries living in a facility, and these beneficiaries are not included in the MCBS PUF.

Over the course of a four-year period, however, it is not uncommon for beneficiaries to enter long-term care facilities (e.g., nursing homes) or to go back and forth between community and facility settings. To obtain an accurate representation of the experiences of all Medicare beneficiaries, the MCBS includes beneficiaries wherever they reside, even if they enter or reside in a facility for the duration of their four years with the study. The MCBS PUF excludes those beneficiaries who were in a facility for each interview, due to disclosure concerns.

4.5 Interviewing and Training Procedures

4.5.1 Overview of Data Collection

CMS contracts with NORC at the University of Chicago (NORC) to administer the MCBS. A national team of specially trained and certified NORC field interviewers conduct either face-to-face interviews with MCBS beneficiaries or their designated proxies or they conduct face-to-face interviews with Facility administrators on behalf of beneficiaries. The first interview conducted for an Incoming Panel beneficiary is relatively short, as it does not collect health care utilization or cost data. Continuing interviews are longer, as field interviewers collect information about the beneficiary's health care utilization and associated costs.

4.5.1.1 Overview of Recruitment of Beneficiaries and Scheduling Procedures

Medicare beneficiaries selected to participate in the MCBS receive a letter and a brochure in the mail, introducing the study and explaining that an interviewer from NORC will contact them to schedule an appointment. For Incoming Panel interviews, initial contact is typically made in person; for Continuing interviews, outreach to set an appointment is most often made by phone. If beneficiaries are unable to answer questions or require language assistance, beneficiaries can enlist the help of an assistant, such as a family member, to help complete the interview; a proxy can also respond on behalf of the beneficiary if the beneficiary is incapacitated or unable to complete the interview. For Spanish speaking respondents, a Spanish version of the Community Questionnaire is available, and bilingual interviewers conduct the interview.

4.5.1.2 Computer-Assisted Personal Interviewing (CAPI)

Field interviewers complete MCBS interviews using a Computer-Assisted Personal Interviewing (CAPI) instrument loaded on a laptop. The CAPI program automatically guides the field interviewer through the questions, records the answers, and contains logic and skip flows that increase the output of timely and high quality data. The CAPI also contains follow-up questions where data were missing from the previous interview. When the interview is completed, the CAPI system allows the field interviewer to transmit the data electronically to the NORC central office in a secure manner.

4.5.2 Interviewer Training

Nationally, the MCBS employs an average of approximately 200 field interviewers,⁷ who participate in a combination of several targeted training initiatives and careful coaching and monitoring activities throughout data collection. Each training is customized to the level of experience of the interviewer (new to MCBS or MCBS-experienced), the type of interview (Community or Facility), the type of sample (Incoming Panel or Continuing), and the unique requirements of each round (changing questionnaire sections or data collection protocols). Field interviewers who are new to MCBS are always trained in-person; experienced field interviewers participate in a periodic in-person training program and receive continuous online refresher training. Weekly field memos issued to all field managers and field interviewers cover important data collection tips, provide answers to interviewer questions, and offer reminders about how to handle complicated scenarios.

⁷ The fall round starts with a higher number of field interviewers which, over the course of the year, is reduced due to staff turnover. Each summer, a small cohort of new interviewers is hired for the MCBS.

4.5.3 Privacy and Data Security

Field interviewer training stresses the importance of maintaining respondent privacy, and project protocols are documented within the field interviewer manual. Field outreach and contacting procedures also maintain and ensure confidentiality. These procedures include the utilization of standard computer security protocol (dual authentication password protection for each interviewer laptop) and restrictions on submitting personally identifiable information (PII) through electronic mail. All MCBS survey staff directly involved in data collection and/or analysis activities are required to sign a Non-Disclosure Agreement and a confidentiality agreement.

NORC and CMS are committed to protecting respondent confidentiality and privacy, and both organizations diligently uphold provisions established under the Privacy Act of 1974, the NORC Institutional Review Board (IRB), the Office of Management and Budget (OMB), and the Federal Information Security Management Act of 2002. As stated in the MCBS OMB documentation, the information collected for MCBS is protected by NORC and by CMS. Respondent data are used only for research and statistical purposes. As required under the Privacy Act of 1974, identifiable information is not disclosed or released without the consent of the individual or the establishment, except to those involved in research (Public Law 93-579).

5. QUESTIONNAIRES

5.1 Overview

The MCBS Questionnaire structure features two components (Community and Facility), administered based on the beneficiary's residence status. Within each component, the flow and content of the questionnaire varies by interview type and data collection season (fall, winter, or summer). There are two types of interviews (Baseline, Continuing) containing two types of questionnaire sections (Core and Topical). See Exhibit 5.1 within the *Survey File Data User's Guide* for a depiction of the MCBS Questionnaire structure:

<https://www.cms.gov/Research-Statistics-Data-and-Systems/Research/MCBS/Codebooks>.

- Community Component: Survey administered for beneficiaries living in the community (i.e., not in a long-term care facility such as a nursing home) during the reference period covered by the MCBS interview.
- Facility Component: Survey administered for beneficiaries living in facilities, such as long-term care nursing homes or other institutions, during the reference period covered by the MCBS interview. Interviewers conduct the Facility component with staff members located at the facility (i.e., facility respondents); beneficiaries are not interviewed if they reside at a facility.

Within each component, there are two types of interviews – a Baseline interview and a Continuing interview.

- Baseline: The initial questionnaire administered in the fall round of the year the beneficiary is selected into the sample (interview #1).
- Continuing: The questionnaire administered as beneficiaries progress through the study (interviews #2-11).

Depending on the interview type and data collection season (fall, winter, or summer), the MCBS Questionnaire includes Core and Topical sections:

- Core: These sections are of critical purpose and policy relevance to the MCBS, regardless of season of administration. Core sections collect information on beneficiaries' health insurance coverage, health care utilization and costs, and operational management data such as locating information.
- Topical: These sections collect information on special interest topics. They may be fielded every round or on a seasonal basis. Specific topics may include housing characteristics, drug coverage, and knowledge about Medicare.

See Sections 5.2 and 5.3 within the *Survey File Data User's Guide* for additional detail on the 2018 Core and Topical sections: <https://www.cms.gov/Research-Statistics-Data-and-Systems/Research/MCBS/Codebooks>.

6. SAMPLING

6.1 Medicare Population Covered by the 2018 MCBS PUF

The MCBS data releases are a reflection of enrolled Medicare beneficiaries residing in the continental United States.⁸ The sample for the MCBS is drawn from a subset of the Medicare enrollment data, which is a list of all Medicare beneficiaries. Excluded are residents of foreign countries and U.S. possessions and territories. The MCBS PUF further excludes Medicare beneficiaries who only provided facility-based interviews during the data year. The MCBS data releases include two overlapping but differing populations:

- The ever enrolled population represents individuals who were enrolled in Medicare at any time during the calendar year. This population includes beneficiaries who enrolled during the calendar year 2018 as well as those who dis-enrolled or died prior to their fall interview.⁹ The ever enrolled population includes beneficiaries who were enrolled in Medicare for at least one day at any point during 2018.
- The continuously enrolled population represents only those individuals continuously enrolled in Medicare from January 1, 2018 up to and including their fall interview; this specifically excludes beneficiaries who enrolled during the calendar year 2018 and those who dis-enrolled or died prior to their fall interview. The concept of continuously enrolled is consistent with the concept of being exposed or “at risk” for using services up to and including their fall interview.

The MCBS PUF includes weights that represent the ever enrolled population, whereas the MCBS LDS releases include separate sets of weights that represent both the ever enrolled and continuously enrolled Medicare population.

Exhibits 6.1.1 and 6.1.2 present estimates of the size of the ever enrolled Medicare population living in the community by race and age (as of December 31, 2018), by sex in the 2018 MCBS PUF. Exhibit 6.1.3 presents the aggregated estimates of the size of the ever enrolled Medicare population living in the community overall and by sex and race.

Exhibit 6.1.1: Estimated Number of Male Community Medicare Beneficiaries by Race and Age, in the 2018 MCBS PUF*

Race	Age as of 12/31/2018	Weighted Count
White non-Hispanic	Under 65 years	2,735,108
	65-74 years	9,942,465
	75+ years	6,723,798
Black non-Hispanic	Under 65 years	641,349
	65-74 years	1,126,030
	75+ years	571,004

⁸ Prior to 2017, Puerto Rico was also included as part of the MCBS sampling geography. Beginning in 2017, Puerto Rico was removed, and only beneficiaries residing in the continental U.S. were eligible to be sampled for the MCBS. The decision to remove Puerto Rico from the sample was based largely on the fact that Medicare in Puerto Rico is very different and difficult to compare to (or combine analytically with) Medicare in the U.S.

⁹ Note that data collection for beneficiaries who enrolled during 2018 and died in 2018 after enrollment but before their fall interview was still pursued through attempts at conducting proxy interviews.

Race	Age as of 12/31/2018	Weighted Count
Hispanic	Under 65 years	493,492
	65-74 years	1,098,004
	75+ years	525,458
Other†	Under 65 years	393,908
	65-74 years	1,112,139
	75+ years	481,386

SOURCE: 2018 MCBS PUF, weighted counts.

*Weighted counts may not sum to the total of beneficiaries living in the community in the U.S. due to missingness.

†The 'Other' race category includes other races, more than one race, and unknown race.

Exhibit 6.1.2: Estimated Number of Female Community Medicare Beneficiaries by Race and Age, in the 2018 MCBS PUF*

Race	Age as of 12/31/2018	Weighted Count
White non-Hispanic	Under 65 years	2,484,546
	65-74 years	11,553,364
	75+ years	8,572,254
Black non-Hispanic	Under 65 years	758,063
	65-74 years	1,397,106
	75+ years	1,013,677
Hispanic	Under 65 years	436,683
	65-74 years	1,329,929
	75+ years	873,981
Other†	Under 65 years	225,606
	65-74 years	1,150,652
	75+ years	680,368

SOURCE: 2018 MCBS PUF, weighted counts.

*Weighted counts may not sum to the total of beneficiaries living in the community in the U.S. due to missingness.

†The 'Other' race category includes other races, more than one race, and unknown race.

Exhibit 6.1.3: Estimated Number of Community Medicare Beneficiaries by Race and Age, in the 2018 MCBS PUF*

Group	Subgroup	Weighted Count
Overall Total		56,320,370
Sex	Male Total	25,844,141
	Female Total	30,476,229
Race	White non-Hispanic Total	42,011,534
	Black non-Hispanic Total	5,507,229
	Hispanic Total	4,757,547
	Other Total†	4,044,059

SOURCE: 2018 MCBS PUF, weighted counts.

*Weighted counts may not sum to the total of beneficiaries living in the community in the U.S. due to missingness.

†The 'Other' race category includes other races, more than one race, and unknown race.

6.2 Targeted Population and Sampling Strata

Historically, the targeted population for the MCBS consisted of persons enrolled in one or both parts of the Medicare program, that is, Part A or Part B, as of January 1 of the applicable sample-selection year, and whose address on the Medicare files is in one of the 48 contiguous states (excludes Alaska and Hawaii), the District of Columbia, or Puerto Rico. Beginning in 2015, the targeted population for the MCBS consisted of Part A and/or Part B enrollees as of December 31 of the sample-selection year. For example, for Fall Rounds 2015, 2016, 2017, and 2018 (the four rounds in which the 2015, 2016, 2017, and 2018 Panels, included in the 2018 MCBS data, were selected), the targeted population included those individuals enrolled as of December 31 of 2015, 2016, 2017, and 2018 respectively. Beginning in 2017, Puerto Rico was removed from the MCBS sample; thus, the MCBS sample was selected entirely from the continental U.S. and the District of Columbia beginning with the 2017 Panel.

For more information on the sampling strata, please see Section 6 of the *Survey File Data User's Guide*: <https://www.cms.gov/Research-Statistics-Data-and-Systems/Research/MCBS/Codebooks>.

Exhibit 6.2.1 displays the number of beneficiaries included in the 2018 MCBS PUF, by age and ethnicity.

Exhibit 6.2.1: 2018 Panel of Selected Beneficiaries by U.S. Hispanic and U.S. Non-Hispanic Ethnicity Classification and Age Category*

Age Category as of 12/31/2018	TOTAL Sample Size	TOTAL Weighted	Hispanic Sample Size	Hispanic Weighted	Non-Hispanic Sample Size	Non-Hispanic Weighted
Under 65 years	2,333	8,168,754	272	930,175	2,061	7,238,579
65-74 years	4,383	28,709,690	473	2,427,933	3,910	26,281,757
75+ years	6,725	19,441,926	670	1,399,439	6,055	18,042,487
Total	13,441	56,320,370	1,415	4,757,547	12,026	51,562,823

SOURCE: 2018 MCBS PUF.

*Weighted counts may not sum to the total of beneficiaries living in the community in the U.S. due to missingness.

6.3 Primary and Secondary Sampling Units

All of the panels in the 2018 data releases are distributed across the subset of 104 non-Puerto Rican PSUs from the redesigned sample of 107 PSUs selected in 2001.¹⁰ These PSUs are a representative, national sample of beneficiaries who are geographically dispersed throughout metropolitan areas and groups of non-metropolitan counties. Recall that SSUs are census tracts or groups of contiguous tracts within the selected PSUs.

6.4 Sample Selection

The MCBS sampling design provides nearly self-weighting (i.e., equal probabilities of selection) samples of beneficiaries within each of the 14 sampling strata. Within the selected PSUs and SSUs, a systematic sampling

¹⁰ An original set of 107 PSUs was selected at the start of the MCBS in 1991; the current PSUs were selected in 2001 with a focus on maximizing overlap with the original set of PSUs. With the rotating panel design, the PSU redesign is transparent to data users and no special processing is required. For more details on the PSU redesign, see Lo, A, A Chu, and R Apodaca. "Redesign of the Medicare Current Beneficiary Survey Sample," Proceedings of the Survey Research Section of the American Statistical Association 2002.

scheme with random starts is employed for selecting beneficiaries.¹¹ For each Continuing beneficiary, the survey questions corresponding to the Survey File data release are administered in the fall of the data collection year. Similarly, for beneficiaries new to the MCBS, the survey questions are administered as part of the initial fall Baseline interview.

¹¹ The MCBS 2018 Panel was drawn by systematic random sampling with probability proportional to probabilities of selection with an independently selected random start within each PSU. For more information on this sampling method, please see the *MCBS Methodology Report*, available at: <https://www.cms.gov/Research-Statistics-Data-and-Systems/Research/MCBS/Codebooks>.

7. TECHNICAL NOTES ON USING THE DATA

7.1 Weights and Variance Estimation

The sample design of MCBS includes stratification, clustering, multiple stages of selection, and disproportionate sampling. Furthermore, the MCBS sampling weights reflect adjustments for survey nonresponse. These survey design and estimation complexities require special consideration when analyzing MCBS data (i.e., it is not appropriate to assume simple random sampling).

To obtain accurate estimates from MCBS data, for either descriptive statistics or more sophisticated analyses based on multivariate models, the survey design complexities need to be taken into account by applying MCBS weights to produce estimates and using an appropriate technique to derive standard errors associated with the weighted estimates.

Each segment of the MCBS PUF includes ever enrolled, full sample cross-sectional weights (Fall: PUFFWGT; Winter: PUFWWGT; Summer: PUFSWGWT). The MCBS PUF segments do not include the continuously enrolled cross-sectional weights in order to protect the confidentiality of the beneficiaries. The continuously enrolled cross-sectional weights are available, however, in the LDS.

The ever enrolled cross-sectional weights apply to both the Continuing sample (beneficiaries sampled between 2015-2017) and to the Incoming Panel sample (beneficiaries sampled in 2018). These weights are intended for use in cross-sectional statistics involving the total (combined) Fall 2018 sample. Each weight is greater than zero for all beneficiaries on the file. The ever enrolled cross-sectional weights should be used to make estimates of parameters for the Medicare population who were enrolled at any point in 2018 (i.e., the ever enrolled population).

To generate estimates using the data from merged seasonal segments, the data user must always use the weights that correspond to the segment that is the smaller subset of the other. The samples for the Winter and Summer segments are subsets of the Fall segment sample. Thus, when generating estimates from a merged Summer segment and Fall segment analytic file, the data user must use the Summer segment weights. There are no weights that support joint analysis between the Summer segment and Winter segment, as each segment has a different set of beneficiaries included. To permit the calculation of random errors due to sampling, a series of replicate weights were computed. Unless the complex nature of the MCBS is taken into account, estimates of the variance of a survey statistic may be biased downward. The replicate weights included in the MCBS PUF can be used to calculate standard errors of the sample-based estimates. The replicate cross-sectional weights in the Fall segment are labeled PUFF001 through PUFF100 corresponding to the ever enrolled weight PUFFWGT. The replicate cross-sectional weights in the Winter segment are labeled PUFW001 through PUFW100 corresponding to the ever enrolled weight PUFWWGT. The replicate cross-sectional weights in the Summer segment are labeled PUF001 through PUF100 corresponding to the ever enrolled weight PUFSWGWT.

Most commercial software packages today include techniques to accommodate the complex design, through replicate weight approaches. Among these are STATA®, SUDAAN®, R®, and the complex survey procedures in SAS®. When using the replicate weight approach to variance estimation, the variance estimation method of balanced repeated replication (BRR) using Fay's adjustment of 0.3 is recommended. Sample code in SAS, STATA, and R for estimating statistics can be found in Appendix B. Analysis of subgroups should utilize the domain functions within the statistical package of your choice (e.g., the DOMAIN statement in SAS, or the OVER function in STATA); restricting the sample to the subgroup and then performing an analysis would lead to slightly biased point estimates and estimates of variance.

7.2 Item Non-Response

As in any other survey, some respondents could not, or would not, supply answers to some questions.¹² Item non-response rates are generally low in the MCBS data, but the analyst still needs to be aware of the missing data and be cautious about patterns of non-response.¹³ The calculation of the study-wide response rates generally follows the guidelines specified in the American Association for Public Opinion Research (AAPOR) and OMB. For the ever enrolled cross-sectional sample represented by the MCBS 2018 Survey File, the calculated overall response rate was 65.4%. This rate includes non-response for persons in facilities, as the response rates are not calculated separated by questionnaire component. Therefore, this may not reflect exactly the response rate for the sample represented in the 2018 MCBS PUF, which excludes beneficiaries for whom only Facility interviews were conducted during the data collection year.

7.3 Subgroup Analysis

When analyzing survey data, researchers are often interested in focusing their analyses on specific subgroups of the full population sample (e.g., Medicare beneficiaries age 65 and over, Hispanics, or females). A common pitfall when performing sub-group analysis of survey data when variance estimation methods such as Taylor-series are used is to delete or exclude observations not relevant to the subgroup of interest. Standard errors for MCBS estimates are most accurate when the analytic file includes all beneficiaries. However, when replicate weights are used for variance estimation, deleting observations not relevant to the subgroup of interest prior to analyzing the subgroup will still produce unbiased standard errors. Almost all statistical packages provide the capability to limit the analysis to a subgroup of the population.

The Taylor Series linearization method of variance estimation is not recommended for subgroup analysis with MCBS data because accidentally excluding any observation in the sample while conducting the subgroup analysis using this variance estimation method will result in biased standard error estimates. Variance estimation using the Taylor Series linearization method for subgroup analyses requires a “domain” or “subgroup” statement (available in most statistical packages) to account for estimated domain sizes (i.e., uncertainty in the denominator). The recommended method of variance estimation for subgroup analysis is the BRR method; which does not require any special subgroup considerations. The BRR method allows the analyst to subset data to a subgroup of interest and still produce unbiased standard error estimates.

7.4 Example Research Questions

Exhibit 7.4.1 presents example research questions by topic, differentiating between those that can be addressed by the MCBS PUF or MCBS Survey File LDS, and those that can only be addressed by the MCBS Survey File LDS. These research questions are intended to illustrate the types of analyses researchers can perform using either the MCBS PUF or MCBS Survey File LDS, and are not meant to be a comprehensive list of possible research questions that can be answered with these data. The variables that are unique to the MCBS Survey File LDS and not contained in the MCBS PUF are italicized below.

¹² This is different from when an individual refuses to participate in the survey altogether, which is called unit non-response. Unit non-response is discussed in detail in the *MCBS Methodology Report*, Section 9.

¹³ In the LDS files, item non-response types are indicated by missing type codes in SAS, including refusal to answer, don't know the answer, and invalid skip. The code .D represents a “don't know” response, the code .R represents a “refused” response, and .N represents an “invalid skip” response.

Exhibit 7.4.1: Example Research Questions That Can be Answered Using the MCBS PUF or MCBS Survey File LDS

Topic	Example Research Questions Addressed Using the MCBS PUF or MCBS Survey File LDS	Example Research Questions Addressed Using the MCBS Survey File LDS
Quality of Patient Experience	Are there differences in Medicare beneficiaries' quality of patient experience across socio-demographic characteristics?	Are there differences in Medicare beneficiaries' quality of patient experience between those with <i>limited English proficiency</i> and those who are proficient in English?
Access to Care	Among Medicare beneficiaries, are there differences in access to care by income (below or above \$25,000) and level of education?	Among Medicare beneficiaries, are there differences in access to care by <i>employment status</i> ?
Preventive Care	Are there differences in receipt of preventive care (e.g., pneumococcal vaccination) by age?	Are there differences in receipt of preventive care (e.g., pneumococcal vaccination) by <i>patient activation</i> ; that is, the degree to which beneficiaries actively participate in their own health care and decisions concerning that health care?
Cost and Utilization	Among Medicare beneficiaries, are there differences in the average number of inpatient hospital stays between 2013 and 2018 (PUF data were first available in 2013)?	Are there changes in Medicare beneficiaries' <i>out-of-pocket costs over the last 10 years</i> (between 2008 and 2018)?
Health Behaviors or Social Determinants of Health	Are there differences in the percentage of Medicare beneficiaries who smoke cigarettes or consume excessive amounts of alcohol by socio-demographics?	Are there differences in the percentage of Medicare beneficiaries who have <i>used e-cigarettes</i> by socio-demographics?
Health Status and Functioning	Which disease conditions are more common among Medicare beneficiaries who had falls requiring medical help?	Are there differences in the disease conditions associated with falls <i>between 2008 and 2018</i> ?
Housing Characteristics	What is the profile (e.g., socio-demographic characteristics and disease conditions) of Medicare beneficiaries with accessibility modifications (e.g., a ramp, bathroom modification and/or railing) in the house?	Are <i>specific IADL or ADL limitations</i> associated with accessibility modifications among Medicare beneficiaries?

8. REFERENCES

Eicheldinger, Celia, and Arthur Bonito. "More accurate racial and ethnic codes for Medicare administrative data." *Health care financing review* 29, no. 3 (2008): 27.

Lo, A, A Chu, and R Apodaca. "Redesign of the Medicare Current Beneficiary Survey Sample." *Proceedings of the Survey Research Section of the American Statistical Association* (2002): 2139-44.

APPENDICES

9. APPENDICES

Appendix A: Glossary

Baseline interview: The initial questionnaire administered in the fall round of the year the beneficiary is selected into the sample (interview #1).

Beneficiary: Beneficiary refers to a person receiving Medicare services who may or not be participating in the MCBS. Beneficiary may also refer to an individual selected from the MCBS sample about whom the MCBS collects information. Beneficiaries must meet at least one of three criteria for Medicare eligibility (is aged 65 years or older, is under age 65 with certain disabilities, or is of any age with End-Stage Renal Disease) and is entitled to health insurance benefits. (Source: <https://www.cms.gov/Medicare/Medicare-General-Information/MedicareGenInfo/index.html>).

Community component: Survey administered for beneficiaries living in the community (i.e., not in a long-term care facility such as a nursing home) during the reference period covered by the MCBS interview.

Continuing interview: The questionnaire administered as beneficiaries progress through the study (interviews #2-11).

Continuously enrolled (aka always enrolled): A Medicare beneficiary who was enrolled in Medicare from the first day of the calendar year until the fall interview and did not die prior to the fall round. This population excludes beneficiaries who enrolled during the calendar year 2018, those who dis-enrolled or died prior to their fall interview, residents of foreign countries, and residents of U.S. possessions and territories other than Puerto Rico.

Core sections: These sections of the MCBS Questionnaire are of critical purpose and policy relevancy to the MCBS. They may be fielded every round or on a seasonal basis.

Crossover: A beneficiary who enters a long-term care facility setting (e.g., nursing homes) or who alternates between a community and a facility setting.

Ever enrolled: A Medicare beneficiary who was enrolled at any time during the calendar year including people who dis-enrolled or died prior to their fall interview. Excluded from this population are residents of foreign countries and of U.S. possessions and territories other than Puerto Rico.

Facility component: Survey administered for beneficiaries living in facilities, such as long-term care nursing homes or other institutions, during the reference period covered by the MCBS interview. Interviewers conduct the Facility component with staff members located at the facility (i.e., facility respondents); beneficiaries are not interviewed if they reside at a facility.

Incoming Panel sample (formerly known as Supplemental Panel): A statistically sampled group of beneficiaries that enter the MCBS in the fall round of a data collection year. One panel is retired at the conclusion of each winter round, and a new panel is selected to replace it each fall round. Panels are identified by the data collection year (e.g., 2018 Panel) in which they were selected.

Long-term care facility: A facility that provides rehabilitative, restorative, and/or ongoing skilled nursing care to patients or residents in need of assistance with activities of daily living.

Medicare: Medicare is the federal health insurance program for people who are 65 or over, certain younger people with disabilities, and people with End-Stage Renal Disease (permanent kidney failure requiring dialysis or a transplant, sometimes called ESRD). The different parts of Medicare help cover specific services:

- Hospital Insurance (Part A): covers inpatient hospital stays, care in a skilled nursing facility, hospice care, and some home health care.
- Medical Insurance (Part B): covers certain doctors' services, outpatient care, medical supplies, and preventive services.
- Medicare Advantage (Part C): an alternative to coverage under traditional Medicare (Parts A and B), a health plan option similar to a Health Maintenance Organization (HMO) or Preferred Provider Organization (PPO) administered by private companies.
- Prescription Drug Coverage (Part D): additional, optional coverage for prescription drugs administered by private companies.

For more information, please visit the Medicare.gov website at <https://www.medicare.gov/sign-up-change-plans/decide-how-to-get-medicare/whats-medicare/what-is-medicare.html>.

Medicare Advantage (MA): Medicare Advantage Plans, sometimes called "Part C" or "MA Plans," are offered by private companies approved by Medicare. An MA provides, or arranges for the provision of, a comprehensive package of health care services to enrolled persons for a fixed capitation payment. The term "Medicare Advantage" includes all types of MAs that contract with Medicare, encompassing risk MAs, cost MAs, and health care prepayment plans (HCPPs).

Medicare beneficiary: See beneficiary.

Panel: See Incoming Panel sample.

Primary Sampling Unit (PSU): Primary sampling unit refers to sampling units that are selected in the first (primary) stage of a multi-stage sample ultimately aimed at selecting individual elements (Medicare beneficiaries in the case of MCBS). PSUs are made up of major geographic areas consisting of metropolitan areas or groups of rural counties.

Proxy: Beneficiaries who were too ill, or who could not complete the Community interview for other reasons, were asked to designate a proxy, someone very knowledgeable about the beneficiary's health and living habits. In most cases, the proxy was a close relative such as the spouse, a son or daughter. In a few cases, the proxy was a non-relative like a close friend or caregiver. In addition, a proxy was utilized if a beneficiary had been reported as deceased during the current round's reference period or if a beneficiary who was living in the community in the previous round had since entered into a long-term care facility. Proxy interviews are only used for the Community interview, as the Facility interview is conducted with a staff member located at the facility (see definition of "Facility component").

Race/ethnicity: Responses to race and ethnicity questions are self-reported by the respondent. Respondents who reported they were white and not of Hispanic origin were coded as white non-Hispanic; those who reported they were black/African-American and not of Hispanic origin were coded as black non-Hispanic; persons who reported they were Hispanic, Latino/Latina, or of Spanish origin, regardless of their race, were coded as Hispanic; persons who reported they were American Indian or Alaska Native, Asian, Native Hawaiian or other Pacific Islander, two or more races, or other race and not of Hispanic origin were coded as other race/ethnicity.

Respondent: The person who answers questions for the MCBS; this person can be the beneficiary, a proxy, or a staff member located at a facility where the beneficiary resides.

Round: The MCBS data collection period. There are three distinct rounds each year; winter (January through April); summer (May through August); and fall (September through December).

Secondary Sampling Unit (SSU): SSUs are made up of census tracts or groups of tracts within the selected PSUs.

Topical sections: Sections of the MCBS Questionnaire that collect information on special interest topics. They may be fielded every round or on a seasonal basis. Specific topics may include housing characteristics, drug coverage, and knowledge about Medicare.

Ultimate Sampling Unit (USU): USUs are Medicare beneficiaries selected from within the selected SSUs.

Appendix B: Technical Appendix – Sample Code and Output

Please note that the code examples below use the Fall PUF weights, which begin with the prefix "PUFF." You should use the Fall PUF weights only if you are using data from the PUF Fall segment that have not been merged with data from any other segment. If you are analyzing data from the winter, summer, or a combination of PUF segments, please see the discussion in section 7.1 of this document as to which weights should be used.

SAS Analysis Statements

Cross-tabulations

```
proc surveyfreq data=<Analytic dataset> VARMETHOD = brr (fay=.30);
  table <Var name> / row chisq lrchisq;
  weight PUFFWGT;
  repweight PUFF001 - PUFF100;
run;
```

Subgroup Analysis

```
proc surveyfreq data=<Analytic dataset> VARMETHOD = brr (fay=.30);
  table <Var name> * <Subgroup variable> / row chisq lrchisq;
  weight PUFFWGT;
  repweight PUFF001 - PUFF100;
run;
```

Stata Analysis Statements

Declare dataset as survey sample with replicate weights

```
svyset _n [pweight= PUFFWGT ], brrweight(PUFF001 - PUFF100) fay(.3) vce(brr) singleunit(missing)
```

For categorical variables, use:

```
svy brr, fay(.3) : tabulate <Var name> <Var name>
```

For subgroup analysis use:

```
svy brr, subpop(if <Subgroup>) fay(.3) : tabulate <Var name>, over(<Var name>)
```

R Analysis Statements

Declare MCBS survey design object with replicate weights

```
mcbs <- svrepdesign(
  weights = ~PUFFWGT,
  repweights = "PUFF[001-100]+",
  type = "Fay",
  rho = 0.3,
  data = <Source dataset>,
  combined.weights = TRUE
)
```

For categorical variables, use:

```
svytable(~<Var name>, design=mcbs)
```

For subgroup analysis use:

```
mcbs_subgrp <- subset(mcbs, <Subgroup criteria>)
svytable(~<Var name>, design=mcbs_subgrp)
```