
MCBS Advanced Tutorial on Weighting and Variance Estimation

Version Control Log

Date	Version	Revisions
3/25/20	1.0	Initial version released.
12/21/21	2.0	Content updated with information for data year 2019 and other updates through calendar year 2021.

Section 1: Introduction





Learning Objectives

- After completing this Medicare Current Beneficiary Survey (MCBS) advanced tutorial, you will be able to answer the following questions:
 - What types of weights are provided in the MCBS Limited Data Set (LDS) files?
 - What types of weights should be used for cross-sectional and longitudinal analysis using MCBS data?
 - What methods are appropriate for conducting variance estimation using MCBS data?
- This advanced tutorial was developed using 2019 MCBS data, but this guidance is applicable for all MCBS data years since 2015.



Advanced Tutorial Outline

- Section 1: Introduction
- Section 2: Weighting
- Section 3: Variance Estimation
- Section 4: Analytic Examples

Introduction to the MCBS

- The Medicare Current Beneficiary Survey (MCBS) is a continuous, multi-purpose longitudinal survey of a nationally representative sample of the Medicare population.
- The MCBS consists of a sample of beneficiaries aged 65 and over and beneficiaries aged 64 and below with certain disabling conditions, residing in the United States.
- The MCBS is sponsored by the Office of Enterprise Data and Analytics (OEDA) of the Centers for Medicare & Medicaid Services (CMS) and is conducted through a contract with NORC at the University of Chicago (NORC).
- 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 from the Medicare program and plays an essential role in monitoring and evaluating beneficiary health status and health care policy.

MCBS Documentation and Resources

- CMS provides a wide array of MCBS documentation that is publically available on the CMS MCBS website. This documentation contains more in-depth descriptions of the topics covered in this tutorial.
 - [Tutorials, including the *New User Tutorial* and topical Advanced Tutorials](#)
 - It is recommended that new MCBS data users refer to the *New User Tutorial* before consulting this or other Advanced Tutorials.
 - Annual [Questionnaires and Questionnaire User Documentation](#)
 - Data documentation including [Data User's Guides, Methodology Reports and codebooks](#) for the Limited Data Set (LDS) files
 - Annual [Chartbooks and data tables](#)
 - Annual [Bibliographies](#), which include annotations starting in 2020
 - Annual [Early Looks and topical infographics](#)

CMS Website:

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

Medicare Current Beneficiary Survey (MCBS)

[Questionnaires](#)

[Data Documentation and Codebooks](#)

[Data Tables](#)

[Bibliography](#)

[Data Briefs and Tutorials](#)

The MCBS Survey File Public Use File

- The MCBS Survey File Public Use File (PUF) is available free for download on the CMS website.¹
- The Survey File PUF is available for the 2013, 2015, 2016, 2017, 2018, and 2019 data years.
- The full package available for download includes the data file, codebook, documentation, and SAS code.
- The MCBS Survey File PUF does not contain any health care utilization, cost or payment data for individual beneficiaries.
- The MCBS Survey File PUF differs from the LDS because it has been evaluated for disclosure risk and additional steps were taken to protect respondent confidentiality.
 - LDS variables that posed a disclosure risk were dropped or recoded to create the variable set for the MCBS Survey File PUF.
 - Due to disclosure concerns, the MCBS Survey File PUF includes only those beneficiaries interviewed in the community, and thus excludes all beneficiaries who were in a health care facility during all interviews for the data year.
- This tutorial focuses on weighting and variance estimation using the MCBS LDS files.
 - For more information on weighting and variance estimation for the PUF data, please refer to the *MCBS PUF Data User's Guide*.



Overview of the MCBS COVID-19 Supplement Data

- With the emergence of COVID-19 in the U.S., CMS was uniquely positioned to quickly collect vital information on how the pandemic was impacting the Medicare population by using the MCBS as a vehicle to collect data.
- The MCBS COVID-19 Rapid Response Supplements collected data on topics such as the availability of telemedicine visits, deferred medical care, social distancing and other preventive health behaviors, COVID-19 testing and vaccination, and the consequences for social, emotional, and financial well-being.

Overview of the MCBS COVID-19 Supplement Data (continued)

- Two COVID-19 Community Supplements were fielded in 2020. An additional COVID-19 Community Supplement was fielded in Winter 2021. In Summer 2021, the COVID-19 Supplement content was incorporated into the main MCBS for subsequent interviews as appropriate. The data from the Community supplements are available as PUFs and as part of the LDS.
- A COVID-19 Facility Supplement was also administered to facility staff on behalf of beneficiaries living in a facility in Fall 2020 and Winter 2021. Due to disclosure concerns, those data will not be released as PUFs but will be available in the 2020 and 2021 LDS files, respectively.
- This tutorial focuses on the main MCBS; for more information on the COVID-19 Supplements, please see the corresponding *Data User's Guides* and the *Advanced Tutorial on the COVID-19 Supplement Data*.

COVID-19 Supplements	Date of Survey Administration	Planned LDS File Release	Release Date of LDS File	Planned Public Use File Release	Release Date of Public Use File
COVID-19 Summer 2020 Community Supplement	June- July 2020	2019 Survey File COVIDSUM Segment	Summer 2021	COVID-19 Summer 2020 PUF	Released 10/16/20
COVID-19 Fall 2020 Community Supplement	October- November 2020	2019 Survey File COVIDFAL Segment	Summer 2021	COVID-19 Fall 2020 PUF	Released 1/15/21
COVID-19 Winter 2021 Community Supplement	March- April 2021	2020 Survey File COVIDWIN Segment	Summer 2022	COVID-19 Winter 2021 PUF	Released 7/27/21

Overview of the LDS Files

- Each year, the MCBS data are made available to users via two annual LDS files.
 1. **Survey File** – demographic information, health insurance coverage, self-reported health status and conditions, and responses regarding access to care and satisfaction with care.
 2. **Cost Supplement File** – comprehensive accounting of health care use, expenditures, and sources of payment.
- The Survey File and the Cost Supplement File contain multiple core and topic-related segments that can be merged using a unique beneficiary key ID (the BASEID variable).
- For each LDS file, CMS provides technical documentation with the following resources for data users: codebooks, questionnaires, data files (SAS[®], CSV), research claims (SAS, CSV), format control files, and sample SAS code to apply the formats and labels for those using SAS.
- Researchers must have a Data Use Agreement (DUA) in place with CMS to obtain LDS files.

Survey File LDS

- The Survey File contains beneficiaries' demographic information, health insurance coverage, self-reported health status and conditions, and responses regarding access to care and satisfaction with care.
- The Survey File contains survey data collected directly from beneficiaries themselves or from staff in long-term care facilities, depending on where the beneficiary lives. Survey data are supplemented by facility (non-cost) information, Medicare administrative data, and Medicare Fee-for-Service (FFS) claims to facilitate analysis.
- The Survey File LDS contains over 6,000 variables across 41 segments.¹
- Includes beneficiaries enrolled for at least one day in 2019 who completed an interview in 2019 or Winter 2020, or who died during 2019. Beneficiaries who refused to complete a later interview or became nonrespondents during 2019 are excluded.

¹ Note that the 2018 Survey File LDS included over 4,000 variables. The large increase from 2018 to 2019 is due to the addition of two topic-specific LDS segments on data collected from the MCBS COVID-19 Summer 2020 and Fall 2020 Community Supplements. These segments were released with the 2019 Survey File LDS because the population that was administered those COVID-19 Community Supplements aligns with the 2019 Survey File population.

Survey File Data Files

Data Segments

- Topic-related data including health status and limitations, access to care, and health insurance coverage.
- Facility-related data including a residence timeline, facility characteristics, and assessment [Minimum Data Set] measures.
- Topical questionnaire section data including beneficiary knowledge and drug coverage.

Medicare FFS Claims

- FFS claims data that provide CMS administrative information on medical services and payments paid by Medicare claims for beneficiaries enrolled in original Fee-for-Service Medicare.

NOTE: Approximately 1/3 of Medicare beneficiaries are enrolled in Medicare Advantage (MA) and are therefore not represented by these claims.

Survey File Weights

- General-purpose cross-sectional weights
- A series of replicate weights
- Longitudinal weights

Cost Supplement File LDS

- The Cost Supplement File contains survey-reported data linked with administrative data, on beneficiaries' health care utilization, expenditures, and sources of payment, including out-of-pocket costs and payments.
- The Cost Supplement File can be linked to the Survey File to conduct analyses on health care cost and utilization. By linking survey-reported data in the Survey File to Medicare FFS claims data in the Cost Supplement File, data users can obtain a comprehensive picture of health services received, amounts paid, and sources of payment, including those not covered by Medicare.
- The Cost Supplement LDS contains over 600 variables across 14 segments.
- The Cost Supplement File contains a subset of the beneficiaries included in the Survey File who have complete cost and utilization data for the year. For the 2019 MCBS data year, the Cost Supplement File includes beneficiaries sampled in the 2016 through 2018 Panels, plus members of the 2019 Panel who were enrolled in Medicare during 2019 for at least one day.
- Starting with the 2019 Cost Supplement File, MA encounter data (claims-based information for MA beneficiaries) were used during imputation to improve estimation of medical events and costs for beneficiaries enrolled in MA.

Cost Supplement File Structure

- The Cost Supplement File data are provided at three different levels of summarization. The tri-level structure allows researchers to fit the research problem they are addressing to the available file summary levels, and potentially avoid having to process all the detailed event records in the file when summaries may suffice.
- The Cost Supplement segments are assembled at three levels:
 1. The **Event level** reports all payers, costs and utilization at the most detailed level available (one observation per event per person).
 2. The **Service Summary (SS) level** summarizes all payers, costs, and utilization for a person at the service level (one observation per service type per person).
 3. The **Person Summary (PS) level** summarizes all payers and costs across service categories and summarizes type of service amounts (one observation per person).

Cost Supplement Data Files

Data Segments

- Survey-reported data on the use and cost of medical services, including all sources of payment and out-of-pocket costs.
- Encompass Medicare FFS and prescription drug claims data including administrative and billing information on the cost and utilization of medical services, compiled by type of event and cost.
- MA cost and utilization information.

Cost Supplement File Weights

- General-purpose cross-sectional weights
- A series of replicate weights
- Longitudinal weights



Using MCBS Data for Analysis

In order to analyze MCBS data, a researcher must first define the:

- Research question
- Population of interest
- Desired analysis
- LDS file(s) needed

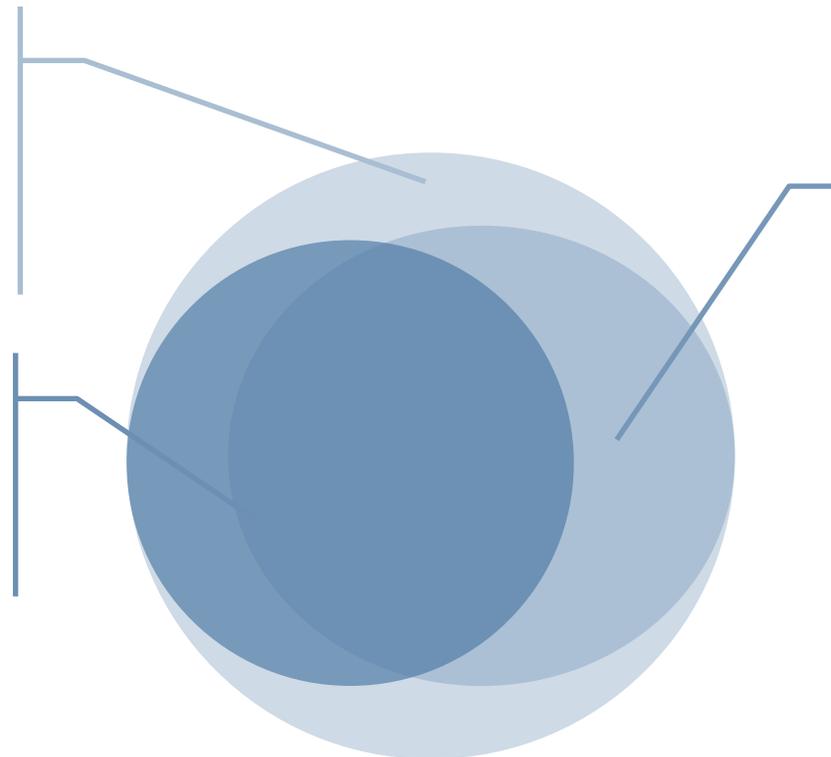
Medicare Population Represented by the MCBS Data

Survey File

The Survey File is representative of the **ever enrolled** population, which is the largest population represented across the MCBS data files and includes anyone enrolled at any time during the calendar year.

The Survey File is also representative of the **continuously enrolled** population, which includes beneficiaries enrolled in Medicare from January 1 up to and including their fall interview.

Note that this graphic is not drawn to scale.



Cost Supplement File

The Cost Supplement File is representative of the **ever enrolled** population. Although this population is identical to the **ever enrolled** population represented by the Survey File, it is derived from a smaller subset of sampled beneficiaries with complete cost and utilization data for the year.

Which File Do I Need?

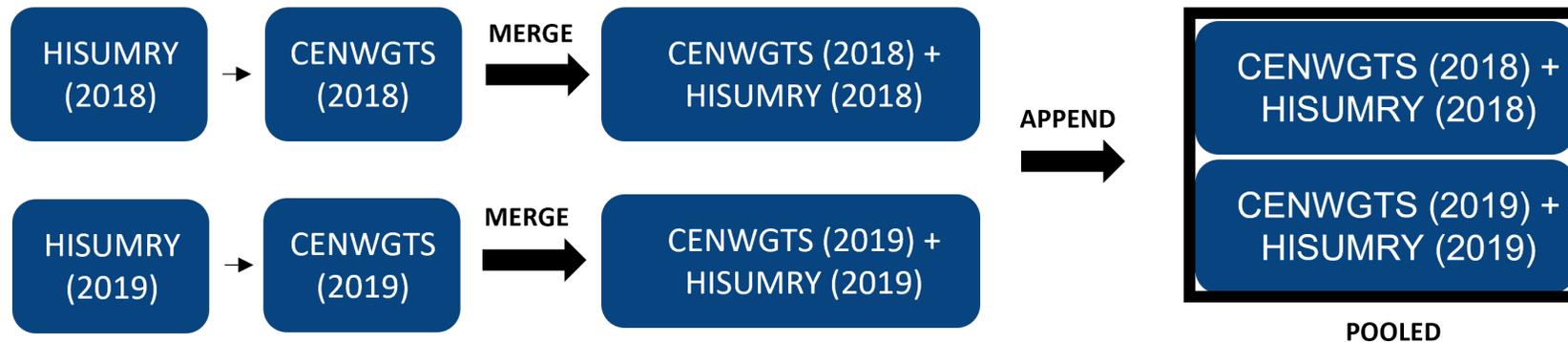
	Survey File Only	Survey File + Cost Supplement File
<i>Types of Research Questions</i>	<ul style="list-style-type: none"> • Demographic characteristics • Health status • Cognitive and functional status • Access to care • Satisfaction with care • Care experience • Cost and utilization for services covered by traditional FFS Medicare 	<ul style="list-style-type: none"> • Total health care spending and utilization, including tracking trends over time • Estimating health care spending by source of payment, including assessing out-of-pocket payment burden
<i>Study Population</i>	<ul style="list-style-type: none"> • “Continuously enrolled” • “Ever enrolled” 	<ul style="list-style-type: none"> • “Ever enrolled”
<i>Types of Analysis</i>	<ul style="list-style-type: none"> • Cross-sectional analysis • Pooled cross-sectional analysis • Longitudinal analysis 	<ul style="list-style-type: none"> • Cross-sectional analysis • Pooled cross-sectional analysis • Longitudinal analysis

Which File Do I Need? (continued)

Example research question	Survey File Only	Survey File + Cost Supplement File
Among Medicare beneficiaries, are there differences in the quality of patient experience by <i>income-to-poverty ratio</i> ?	X	
Are there changes in Medicare beneficiaries' <i>out-of-pocket costs over the last 10 years</i> ?		X
What is the difference in <i>skilled nursing facility utilization</i> between beneficiaries with traditional Fee-for-Service (FFS) Medicare and those with Medicare Advantage?		X
Are there differences in <i>food insecurity</i> , that is, a beneficiary's ability to obtain sufficient food, by socio-demographics?	X	

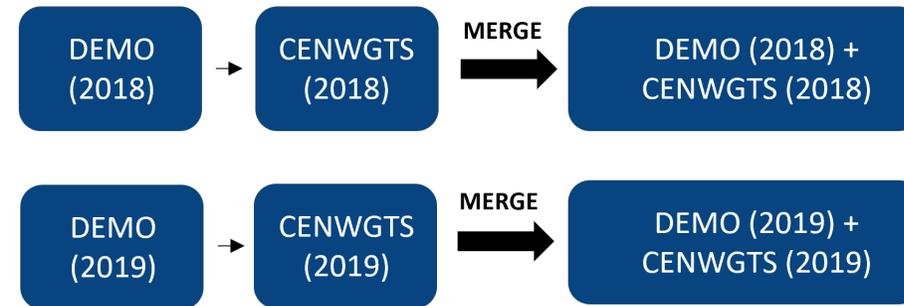
Types of Analyses

- **Cross-sectional analysis:** Cross-sectional analysis is used to obtain nationally representative year-specific estimates for the Medicare population.
- **Pooled analysis:** Pooled data analysis yields estimates that are in effect a moving average of nationally representative year-specific estimates and can be interpreted as being representative of the midpoint of the pooled period.

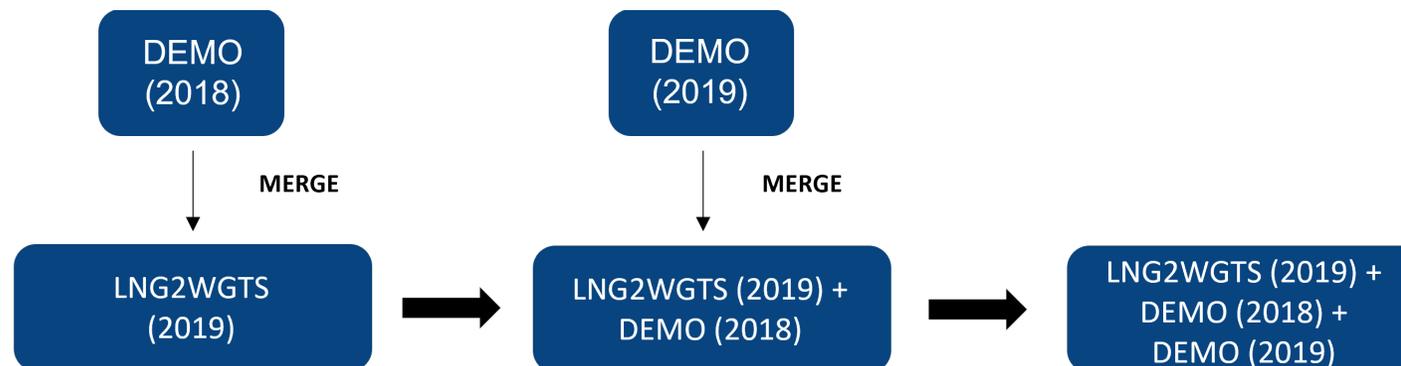


Types of Analyses (continued)

- **Repeated cross-sectional analysis:** Repeated cross-sectional analysis is used for analyzing changes in the Medicare population over multiple years.



- **Longitudinal analysis:** Multiple years of MCBS data can be analyzed to assess changes over time for each sample person, e.g. beneficiary-level changes over time.



Section 2: Weighting



Introduction to Weighting with MCBS Data

- The MCBS sample is designed to produce national estimates of the Medicare population, not regional or state-level estimates.
- The use of **analytic weights** ensures that each population in the Survey File and Cost Supplement File is appropriately represented in any analysis.
- To analyze the data, researchers must use the weights provided in the LDS files. Each set of weights includes a full-sample weight and a set of 100 replicate weights.
 - Full-sample weights are the primary weights used to ensure that the population of inference is appropriately represented when producing point estimates.
 - Replicate weights are used for variance estimation under the Balanced Repeated Replication (BRR) method.

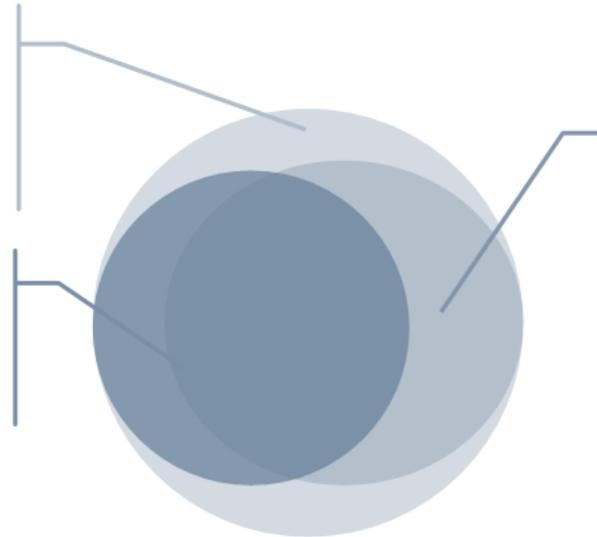
Medicare Population Represented by the MCBS Data

Survey File

The Survey File is representative of the **ever enrolled** population, which is the largest population represented across the MCBS data files and includes anyone enrolled at any time during the calendar year.

The Survey File is also representative of the **continuously enrolled** population, which includes beneficiaries enrolled in Medicare from January 1 up to and including their fall interview.

Note that this graphic is not drawn to scale.



Cost Supplement File

The Cost Supplement File is representative of the **ever enrolled** population. Although this population is identical to the **ever enrolled** population represented by the Survey File, it is derived from a smaller subset of sampled beneficiaries with complete cost and utilization data for the year.

The use of **analytic weights** ensures that each population is appropriately represented.



Weights for Cross-Sectional Analysis; Survey File

- For analysis of Survey File data, there are two populations of inference (ever enrolled and continuously enrolled) that can be studied through the use of two distinct weights.
- The **ever enrolled Survey File weight** is greater than zero for all beneficiaries in the Survey File.
 - This weight segment is EVRWGTS, and the name of the weight is EEYRSWGT.
 - The sum of this weight represents the population of beneficiaries who were entitled and enrolled in Medicare for at least one day at any time during the calendar year.

Weights for Cross-Sectional Analysis; Survey File (continued)

- For the 2019 MCBS data year, the **continuously enrolled Survey File weight** is greater than zero for the subset of beneficiaries in the Survey File who were continuously enrolled in Medicare from January 1, 2019, through completion of their fall interview.
 - This weight segment is CENWGTS, and the weight is named CEYRSWGT.
 - The population represented by the sum of this weight is the continuously enrolled population of Medicare beneficiaries who were enrolled from the first of the year through the Fall 2019 interview.
 - Users should use the continuously enrolled Survey File weight (CEYRSWGT) for time series analysis of survey data across years.
- For specific data segments in the Survey File, specific **Topical Weights** are also available

Weights for Cross-Sectional Analysis; Cost Supplement File

- Analyses of the Cost Supplement File data should be conducted with the **Cost Supplement ever enrolled weight**, which, for the 2019 MCBS data year, represents the ever enrolled population of Medicare beneficiaries enrolled in Medicare on at least one day at any time in 2019.
 - The Cost Supplement weights segment is named CSEVRWGT.
 - The population represented by the sum of this weight is identical to the population represented by the sum of the ever enrolled Survey File weight, but it is populated for a smaller subset of respondents with complete cost and utilization data.

Using Weights for Cross-Sectional Analyses of Core Content

- As described, the Survey File and Cost Supplement file both contain weight segments.
- Users analyzing Survey File or Cost Supplement data separately should use the weights included with each respective file.
- However, users wishing to conduct joint analysis of both Survey File and Cost Supplement data must use the Cost Supplement weights.

Rule of thumb: When conducting joint analysis of survey data, always use the weights that correspond to the segment that is the smaller subset of the other.

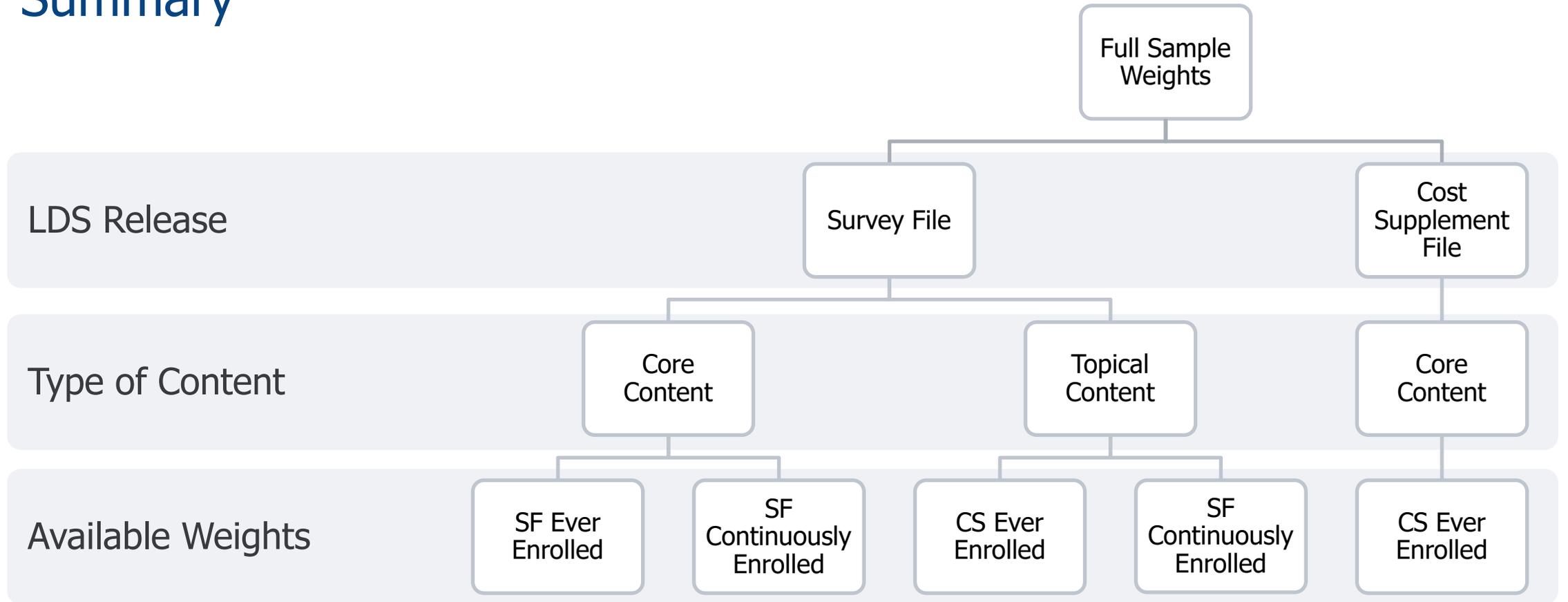
Using Weights for Cross-Sectional Analyses of Topical Content

- As shown in the Data User's Guide, Topical content includes the following Survey File segments:
 - ACCSSMED, CHRNPAIN, COVIDSUM, COVIDFAL, FOODINS, INCASSET, MCREPLNQ, PNTACT, RXMED, US CARE
- To generate estimates using the data from one of the ten Topical Questionnaire sections on their own or merged with another segment, researchers must **always** use the special non-response adjustment weights included in the Topical segment **INSTEAD** of using the weights that appear in the separate weight segments (CENWGTS, EVRWGTS).

Using Weights for Cross-Sectional Analyses of Topical Content (continued)

- Topical module data from questionnaire sections collected in the same round include the same set of beneficiaries and the same weights, so joint analysis of multiple topical section data is possible in this case. There are no topical module weights that allow joint analysis of questionnaire section data collected in different rounds.
 - Please refer to the *Data User's Guide* for information on the timing of data collection for each section.
- The “continuously enrolled” Topical weights represent the Survey File continuously enrolled population. The “ever enrolled” Topical weights represent the Cost Supplement ever enrolled population.
 - Weights corresponding to the Survey File ever enrolled population are available starting with the 2018 MCBS data year.

Summary



Weights for Longitudinal Analysis

- Longitudinal weights allow for the study of respondents across data years.
- Weights that are part of the most recent annual release among the years of interest should be used.
- The following longitudinal weights are provided with the 2019 Survey File LDS's:
 - **Survey File Two-Year Longitudinal Weights (LNG2WGTS):** Two-year longitudinal weights apply to members of the 2016, 2017, and 2018 panels who were alive and entitled as of the Fall 2019 interview, had 2018 and 2019 Survey File data, enrolled on or before 1/1/2018, and were continuously enrolled for **two years**.
 - **Survey File Three-Year longitudinal weights (LNG3WGTS):** Three-year longitudinal weights are populated for members of the 2016 and 2017 panels who were alive and entitled as of the Fall 2019 interview, had Survey File data in 2017 and 2019, enrolled on or before 1/1/2017, and were continuously enrolled through the fall of 2019 (**three years**).
 - **Survey File Four-Year Longitudinal Weights (LNG4WGTS):** Four-year longitudinal weights are populated only for members of the 2016 panel who were alive and entitled as of the Fall 2019 interview, enrolled on or before 1/1/2016, and were continuously enrolled during all of the years 2016-2019 (**four years**).

Weights for Longitudinal Analysis (continued)

- The following longitudinal weights are provided with the 2019 Cost Supplement LDS's:
 - **Cost Supplement Two-Year Longitudinal Weights (CSL2WGTS):** The two-year longitudinal weights are populated for members of the 2016, 2017, and 2018 panels who were ever enrolled in Medicare at any time during both 2018 and 2019 and provided utilization and cost data for **both years**.
 - **Cost Supplement Three-Year Longitudinal Weights (CSL3WGTS):** The three-year longitudinal weights are populated for members of the 2016 and 2017 panels who were ever enrolled in Medicare at any time during 2017, 2018, and 2019, and provided utilization and cost data for all **three years**.
- **Note:** The three-year longitudinal Survey File weights only require that 2017 and 2019 be complete, while 2018 can be incomplete. That is in contrast with the Cost Supplement three-year weights, which do require complete data in all three years. The reason for this difference is that the Survey File longitudinal weights are meant to compare two snapshots at two points in time, but the Cost Supplement longitudinal weights are meant for analysis of data spanning over the entire time period.

Weights for Longitudinal Analysis (continued)

- Note that to accommodate changes in sampling and data collection methodologies, the 2014 MCBS data were not released.
- In order to perform a longitudinal analysis spanning 2014 of continuously enrolled beneficiaries in the Survey File, utilize 2013 and 2015 MCBS data.
- A true longitudinal analysis spanning 2014 of ever enrolled beneficiaries is not possible.
 - Instead, perform a repeated cross-sectional analysis using the cross-sectional weights in the Survey File or Cost Supplement File for the years of interest.
 - For example, an analysis of utilization and cost data for the combined calendar years 2013-2015 is not possible. The user would need to analyze 2013 and 2015 separately, using cross-sectional weights, and compare.

2019 MCBS Data Files Summary of Weights

Limited Data Set	Description	Segment	Full-Sample Weight	Replicate Weights	Population
Survey File	Continuously Enrolled Cross-Sectional Weights	CENWGTS	CEYRSWGT	CEYRS001-CEYRS100	Continuously enrolled from 1/1/2019 through the fall of 2019
Survey File	Ever Enrolled Cross-Sectional Weights	EVRWGTS	EEYRSWGT	EEYRS001-EEYRS100	Ever enrolled for at least one day at any time during 2019
Survey File	Continuously Enrolled Two-Year Longitudinal Weights	LNG2WGTS	L2YRSWGT	L2YRS001-L2YRS100	Continuously enrolled from 1/1/2018 through the fall of 2019
Survey File	Continuously Enrolled Three-Year Longitudinal Weights	LNG3WGTS	L3YRSWGT	L3YRS001-L3YRS100	Continuously enrolled from 1/1/2017 through the fall of 2019
Survey File	Continuously Enrolled Four-Year Longitudinal Weights	LNG4WGTS	L4YRSWGT	L4YRS001-L4YRS100	Continuously enrolled from 1/1/2016 through the fall of 2019
Cost Supplement File	Ever Enrolled Cross-Sectional Weights	CSEVRWGT	CSEVRWGT	CSEVR001-CSEVR100	Ever enrolled for at least one day at any time during 2019
Cost Supplement File	Two-Year Longitudinal Weights	CSL2WGTS	CSL2YWGT	CSL2Y001- CSL2Y100	Enrolled at any time during both 2018 and 2019
Cost Supplement File	Three-Year Longitudinal Weights	CSL3WGTS	CSL3YWGT	CSL3Y001- CSL3Y100	Enrolled at any time during each of 2017, 2018, and 2019

2019 MCBS Data Files Summary of Weights (continued)

Limited Data Set	Description	Segment	Full-Sample Weight	Replicate Weights	Population
Survey File Topical Section	KNQ Survey File Continuously Enrolled	MCREPLNQ	KNSCWT	KNSC1-KNSC100	Continuously enrolled in 2019 and still alive, entitled, and not living in a facility in Winter 2020
Survey File Topical Section	KNQ Survey File Ever Enrolled	MCREPLNQ	KNSEWT	KNSE1-KNSE100	Ever enrolled in 2019 and still alive, entitled, and not living in a facility in Winter 2020
Survey File Topical Section	KNQ Cost Supplement Ever Enrolled	MCREPLNQ	KNCEWT	KNCE1-KNCE100	Ever enrolled in 2019 and still alive, entitled, and not residing in a facility in Winter 2020
Survey File Topical Section	ACQ Survey File Continuously Enrolled	ACCSSMED	ACSCWT	ACSC1- ACSC100	Continuously enrolled in 2019 and still alive, entitled, and not living in a facility in Winter 2020
Survey File Topical Section	ACQ Survey File Ever Enrolled	ACCSSMED	ACSEWT	ACSE1-ACSE100	Ever enrolled in 2019 and still alive, entitled, and not living in a facility in Winter 2020
Survey File Topical Section	ACQ Cost Supplement Ever Enrolled	ACCSSMED	ACCEWT	ACSFCE1-ACSFCE100	Ever enrolled in 2019 and still alive, entitled, and not living in a facility in Winter 2020
Survey File Topical Section	USQ Survey File Continuously Enrolled	USCARE	USSCWT	USSC1- USSC100	Continuously enrolled in 2019 and still alive, entitled, and not living in a facility in Winter 2020
Survey File Topical Section	USQ Survey File Ever Enrolled	USCARE	USSEWT	USSE1- USSE100	Ever enrolled in 2019 and still alive, entitled, and not living in a facility in Winter 2020
Survey File Topical Section	USQ Cost Supplement Ever Enrolled	USCARE	USCEWT	USCE1- USCE100	Ever enrolled in 2019 and still alive, entitled, and not residing in a facility in Winter 2020

2019 MCBS Data Files Summary of Weights (continued)

Limited Data Set	Description	Segment	Full-Sample Weight	Replicate Weights	Population
Survey File Topical Section	IAQ Survey File Continuously Enrolled	INCASSET	INSCWT	INSC1-INSC100	Continuously enrolled in 2019 and still alive, entitled, and not living in a facility in Summer 2020
Survey File Topical Section	IAQ Survey File Ever Enrolled	INCASSET	INSEWT	INSE1-INSE100	Ever enrolled in 2019 and still alive, entitled, and not living in a facility in Summer 2020
Survey File Topical Section	IAQ Cost Supplement Ever Enrolled	INCASSET	INCEWT	INCE1-INCE100	Ever enrolled in 2019 and still alive, entitled, and not residing in a facility in Summer 2020
Survey File Topical Section	IAQ Survey File Continuously Enrolled	FOODINS	FDSCWT	FDSC1-FDSC100	Continuously enrolled in 2019 and still alive, entitled, and not living in a facility in Summer 2020
Survey File Topical Section	IAQ Survey File Ever Enrolled	FOODINS	FDSEWT	FDSE1-FDSE100	Ever enrolled in 2019 and still alive, entitled, and not living in a facility in Summer 2020
Survey File Topical Section	IAQ Cost Supplement Ever Enrolled	FOODINS	FDCEWT	FDCE1-FDCE100	Ever enrolled in 2019 and still alive, entitled, and not residing in a facility in Summer 2020
Survey File Topical Section	PAQ Survey File Continuously Enrolled	PNTACT	PASCWT	PASC1-PASC100	Continuously enrolled from 1/1/2019 through the fall of 2020
Survey File Topical Section	PAQ Survey File Ever Enrolled	PNTACT	PASEWT	PASE1-PASE100	Ever enrolled for at least one day at any time during 2019
Survey File Topical Section	PAQ Cost Supplement Ever Enrolled	PNTACT	PACEWT	PACE1-PACE100	Ever enrolled for at least one day at any time during 2019

2019 MCBS Data Files Summary of Weights (continued)

Limited Data Set	Description	Segment	Full-Sample Weight	Replicate Weights	Population
Survey File Topical Section	RXQ Survey File Continuously Enrolled	RXMED	RXSCWT	RXSC1-RXSC100	Continuously enrolled in 2019 and still alive, entitled, and not living in a facility in Summer 2020
Survey File Topical Section	RXQ Survey File Ever Enrolled	RXMED	RXSEWT	RXSE1-RXSE100	Ever enrolled in 2019 and still alive, entitled, and not living in a facility in Summer 2020
Survey File Topical Section	RXQ Cost Supplement Ever Enrolled	RXMED	RXCEWT	RXCE1-RXCE100	Ever enrolled in 2019 and still alive, entitled, and not residing in a facility in Summer 2020
Survey File Topical Section	CPQ Survey File Continuously Enrolled	CHRNPAIN	CPSCWT	CPSC1-CPSC100	Continuously enrolled in 2019 and still alive, entitled, and not residing in a facility in Summer 2020
Survey File Topical Section	CPQ Survey File Ever Enrolled	CHRNPAIN	CPSEWT	CPSE1-CPSE100	Ever enrolled in 2019 and still alive, entitled, and not residing in a facility in Summer 2020
Survey File Topical Section	CPQ Cost Supplement Ever Enrolled	CHRNPAIN	CPCEWT	CPCE1-CPCE100	Ever enrolled in 2019 and still alive, entitled, and not residing in a facility in Summer 2020
Survey File Topical Section	Summer 2020 COVID Survey File Continuously Enrolled	COVIDSUM	VSSCWT	VSSC1-VSSC100	Continuously enrolled in 2019 and still alive, entitled, and not residing in a facility in Summer 2020
Survey File Topical Section	Summer 2020 COVID Survey File Ever Enrolled	COVIDSUM	VSSEWT	VSSE1-VSSE100	Ever enrolled in 2019 and still alive, entitled, and not residing in a facility in Summer 2020
Survey File Topical Section	Summer 2020 COVID Cost Supplement Ever Enrolled	COVIDSUM	VSCEWT	VSCE1-VSCE100	Ever enrolled in 2019 and still alive, entitled, and not residing in a facility in Summer 2020

2019 MCBS Data Files Summary of Weights (continued)

Limited Data Set	Description	Segment	Full-Sample Weight	Replicate Weights	Population
Survey File Topical Section	Fall 2020 COVID Survey File Continuously Enrolled	COVIDFAL	VFSCWT	VFSC1-VFSC100	Continuously enrolled in 2019 and still alive, entitled, and not residing in a facility in Fall 2020
Survey File Topical Section	Fall 2020 COVID Survey File Ever Enrolled	COVIDFAL	VFSEWT	VFSE1-VFSE100	Ever enrolled in 2019 and still alive, entitled, and not residing in a facility in Fall 2020
Survey File Topical Section	Fall 2020 COVID Cost Supplement Ever Enrolled	COVIDFAL	VFCEWT	VFCE1-VFCE100	Ever enrolled in 2019 and still alive, entitled, and not residing in a facility in Fall 2020



For more information on weighting, see the *MCBS Data User's Guide* or the *MCBS Methodology Report*.

Section 3: Variance Estimation



Introduction to Variance Estimation with MCBS Data

- **Variance estimation involves measuring the statistical precision of an estimate.**
- In many statistical packages, the procedures for calculating sampling errors (e.g., variances, standard errors) assume that the data were collected in a simple random sample. Procedures of this type are not appropriate for calculating the sampling errors of statistics based upon a stratified, unequal-probability, multi-stage sample such as the MCBS.
- MCBS data users must use statistical packages that can estimate sampling errors for “complex” survey designs. Most commercial software packages today (including R, Stata, SUDAAN, and SAS) include techniques to accommodate the complex design of the MCBS.

Variance Estimation Methods

- Two methods are appropriate for conducting variance estimation under a complex survey design: the **Taylor series linearization method** and the **balanced repeated replication (BRR) method**.
- The MCBS includes variables to obtain weighted estimates and estimated standard errors using these methods:
 1. **Taylor-series linearization method**: the variables SUDSTRAT (sampling strata) and SUDUNIT (primary sampling unit) are included for variance estimation using this method. This does not require replicate weights.
 2. **Balanced repeated replication (BRR) method (Balanced half-sample method; Fay's method)**: a series of 100 replicate weights are included for variance estimation using this method. This is the recommended method.

Variance Estimation Notes for Cross-Sectional Analysis

- **National-level estimates:**

- Either the Taylor Series or BRR methods can be used to obtain estimates and estimated standard errors.

- **Subgroup analysis:**

1. **Taylor-series linearization method:** requires a “domain analysis” or “subgroup” statement in most packages to account for estimated domain sizes (i.e., uncertainty in the denominator).
2. **Balanced repeated replication (BRR) method:** does not require special subgroup considerations. This is the recommended method.

Variance Estimation Notes for Repeated Cross-Sectional Analysis or Pooled Analysis

- There is both serial and intra-cluster correlation in the data:
 - Sampling second-stage units within primary sampling units
 - Sampling beneficiaries with second-stage units
 - Repeated observations of the selected beneficiary across time
- Use the **BRR method** to account for various correlations.
- Replicate cross-sectional weights include:
 - **Survey File**: labeled **CEYRS001 through CEYRS100** and can be found in each year's cross-sectional weights file (**CENWGTS**).
 - **Cost Supplement File**: labeled **CSEVR001 through CSEVR100** and can be found in each year's cross-sectional weights file (**CSEVRWGTS**).

Variance Estimation Notes for Longitudinal Analysis

Just as there are full-sample longitudinal weights, there are corresponding sets of replicate weights used to calculate standard errors of the sample-based estimates. For example:

- **Survey File:** Replicate longitudinal weights labeled **L2YRS001 through L2YRS100** may be found on the two-year longitudinal weights file (**LNG2WGTS**).
- **Survey File:** Replicate longitudinal weights labeled **L3YRS001 through L3YRS100** may be found on the three-year longitudinal weights file (**LNG3WGTS**).
- **Survey File:** Replicate longitudinal weights labeled **L4YRS001 through L4YRS100** may be found on the four-year longitudinal weights file (**LNG4WGTS**).
- **Cost Supplement File:** Replicate longitudinal weights labeled **CSL2Y001 through CSL2Y100** may be found on the two-year longitudinal weights file (**CSL2WGTS**).
- **Cost Supplement File:** Replicate longitudinal weights labeled **CSL3Y001 through CSL3Y100** may be found on the three-year longitudinal weights file (**CSL3WGTS**).

Variance Estimation for a Difference of Estimates

- Repeated cross-sectional estimates can yield estimates of change over time.
- A point estimate of a difference is straightforward to calculate as the difference between the two individual cross-sectional estimates; for each cross-sectional estimate, use the full-sample weight from that year's data release.
- Estimating the standard error of estimates of net change is more complicated, due to correlation:
 - many beneficiaries are retained from one year to the next (serial correlation);
 - the same set of Primary Sampling Units (PSUs) and Secondary Sampling Units (SSUs) are used for each year (intra-cluster correlation)

Variance Estimation for a Difference of Estimates (continued)

- To estimate the variance of net change estimates, the data user may:
 - use statistical software such as SAS; or
 - calculate estimates directly as part of a custom program.
- SAS method example
 - Proc SURVEYREG can produce both point estimates of differences and estimates of standard errors for differences
 - An example of this methodology using SAS can be found in the *MCBS Advanced Tutorial on the COVID-19 Supplement Data*.

Example- Direct Calculation of Variance for a Difference of Estimates

- Let X_0^t be a cross-sectional estimate of a population mean from the year t MCBS Survey File LDS (using the full-sample weights)
- Let $X_1^t, X_2^t, \dots, X_{100}^t$ be estimates of the same population mean from LDS t using each of the 100 corresponding replicate weights.
- Similarly, let $X_0^{t-1}, X_1^{t-1}, X_2^{t-1}, \dots, X_{100}^{t-1}$ be estimates of the same population LDS $t-1$ (using the weights from the LDS $t-1$).
- Then, let $D_1 = X_1^t - X_1^{t-1}, D_0 = X_0^t - X_0^{t-1}$ etc.
- Finally, an estimate of the variance of the estimate of net change from LDS $t-1$ to LDS t is:

$$\text{Var}(D_0) = \frac{2.04}{100} \sum_{i=1}^{100} (D_i - D_0)^2$$

- The square root of this estimate is an estimate of the standard error.



For more information on variance estimation, see the *MCBS Data User's Guide*.

Section 4: Analytic Examples



Analyzing MCBS Data



Analyzing MCBS Data (continued)

- This section will walk through the process of producing basic descriptive statistics using MCBS data.
 - **Step 1: Define your research question.** The MCBS can support a broad range of analyses on the health and health care of the Medicare population. For examples, refer to the annual *MCBS Bibliographies* on the CMS website.
 - **Step 2: Create your analytic file.** Once you have defined your research question, identify the MCBS data file(s), weights files, and data segments and variables that your research question requires. Merge segments within or across files to create your analytic dataset, and recode variables as necessary.
 - **Step 3: Conduct analyses using appropriate variance estimation methods.** The MCBS includes variables to obtain weighted estimates and estimated standard errors using two approaches: 1) the Taylor-series linearization method and 2) the balanced repeated replication (BRR) method (Fay's method).
- For more information regarding any of the topics discussed, see the *MCBS Data User's Guide*.

Example 1 Step 1: Define Your Research Question





Example 1 Step 1: Defining Your Research Question

To what extent does out-of-pocket spending vary by health status for all Medicare beneficiaries aged 65 and over in 2019?

- Objectives of this example:
 - Demonstrate how to link Survey File and Cost Supplement File segments
 - Demonstrate how to merge data from Community and Facility segments
 - Demonstrate how to apply cross-sectional weights to produce nationally representative estimates

Example 1 Step 2: Create Your Analytic File



Example 1 Step 2: Creating Your Analytic File

- After you have defined your research question, you are ready to create your analytic file.
- Creating your analytic file requires five steps:
 1. Identify the MCBS data file(s) that your research question requires.
 2. Identify the data segments and variables that your research question requires.
 3. Identify considerations specific to coding, data collection, and/or processing of variables of interest.
 4. Identify the study population and use the corresponding weights.
 5. Merge segments to create your analytic dataset.

Example 1: Identifying Data File(s), Data Segments, and Variables

Out-of-pocket spending by health status for beneficiaries aged 65 and over

- This research question requires the following variables:

Measure	File	Segment	Variable
Age	2019 Survey File	Demographics (DEMO)	H_AGE
Self-reported health status, Community	2019 Survey File	General Health (GENHLTH)	GENHELTH
Self-reported health status, Facility	2019 Survey File	Facility Assessments (FACASMNT)	SPHEALTH
Out-of-pocket costs	2019 Cost Supplement File	Person Summary (PS)	PAMTOOP

Example 1: Identifying Population and Weights

- The Survey File and Cost Supplement File are representative of the “ever enrolled” population, which includes anyone enrolled at any time during the calendar year. However, the population represented in the Cost Supplement File includes a smaller subset of beneficiaries with complete cost and utilization data for the year. As such, users conducting joint analysis of both Survey File and Cost Supplement File data must use the ever enrolled weights in the Cost Supplement File.

Example 1: Merge and Append Segments to Create Analytic File

- The below code shows how multiple Survey File segments can be merged with the CSEVRWGT segment in SAS using BASEID as the key variable. When merging segments, all observations in the CSEVRWGT segment should be preserved.

```
data oop_merged;  
  merge cost19.CSEVWGTS (in=a)  
    survey19.DEMO (keep=BASEID H_AGE)  
    survey19.GENHLTH (keep=BASEID GENHEALTH)  
    cost19.PS (keep=BASEID PAMTOOP)  
    survey19.FACASMNT (keep=BASEID SPHEALTH);  
  if a then output;  
  by BASEID;  
  
run;
```

Example 1: Recoding Variables

- There are numerous ways to convert raw variables into analytic variables. This example recodes GENHEALTH from the Community segment and SPHEALTH from the Facility segment as such:

```
data oop_recode;  
  set oop_merged;  
  if SPHEALTH = 0 or GENHEALTH=1 then ALLHEALTH=1; /* Excellent health */  
  else if SPHEALTH = 1 or GENHEALTH=2 then ALLHEALTH=2; /* Very good health */  
  else if SPHEALTH = 2 or GENHEALTH=3 then ALLHEALTH=3; /* Good health */  
  else if SPHEALTH = 3 or GENHEALTH=4 then ALLHEALTH=4; /* Fair health */  
  else if SPHEALTH = 4 or GENHEALTH=5 then ALLHEALTH=5; /* Poor health */  
run;
```

Example 1: Recoded Variables

Measure	Original variables	Recoded variable
Self-Reported Health Status	GENHEALTH	ALLHEALTH
	1 Excellent	1 Excellent
	2 Very good	2 Very good
	3 Good	3 Good
	4 Fair	4 Fair
	5 Poor	5 Poor
	SPHEALTH	
	0 Excellent	
	1 Very good	
	2 Good	
	3 Fair	
	4 Poor	

Example 1: Segmenting the Population

- In order to restrict the file to beneficiaries aged 65 and over, this example segments the file on the variable H_AGE.

```
data oop_final;  
  set oop_recode;  
  where H_AGE GE 65;  
run;
```

Example 1 Step 3: Conduct Analyses Using Appropriate Variance Estimation Methods



Example 1 Step 3: Variance Estimation

- Recall that the MCBS includes variables to obtain weighted estimates and estimated standard errors using two approaches:
 - 1. Taylor-series linearization method:** the variables SUDSTRAT (sampling strata) and SUDUNIT (primary sampling unit) are included for variance estimation using this method.
 - 2. Balanced repeated replication (BRR) method (Fay's method):** a series of replicate weights are included for variance estimation using this method.
- This example uses the BRR method of variance estimation.

Example 1 SAS Code: Out-of-pocket spending, all Medicare beneficiaries aged 65 and over by self-reported health status, 2019

Balanced Repeated Replication (BRR) Method

The following code requests the mean value and standard errors of out-of-pocket spending (PAMTOOP) for all Medicare beneficiaries aged 65 and over by self-reported health status using the BRR method of variance estimation. Code for the counts of beneficiaries is also provided.

```
proc surveymeans data=oop_final varmethod=brr (fay=.30);  
  var PAMTOOP;  
  weight CSEVRWGT;  
  repweights CSEVR001-CSEVR100;  
  domain ALLHELTH;  
run;
```

```
proc surveyfreq data=oop_final varmethod=brr (fay=.30);  
  table ALLHELTH;  
  weight CSEVRWGT;  
  repweights CSEVR001-CSEVR100;  
run;
```

Example 1 Results: Out-of-pocket spending, all Medicare beneficiaries aged 65 and over by self-reported health status, 2019

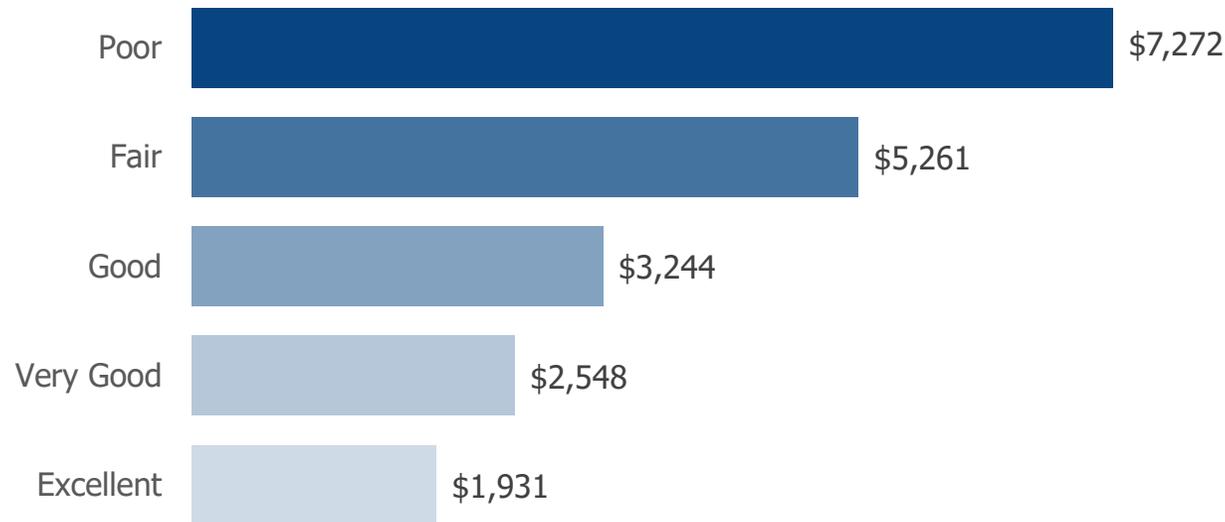
Average out-of-pocket spending, all Medicare beneficiaries aged 65 and over by self-reported health status, 2019

Self-Reported Health Status	Unweighted N	Weighted N	Estimate - \$ (St. Error - \$)
			Out-of-Pocket Spending [Average]
Excellent	1,247	8,999,569	1,931 (107)
Very Good	2,530	17,339,322	2,548 (123)
Good	2,421	16,012,461	3,244 (158)
Fair	1,222	7,050,736	5,261 (387)
Poor	314	1,765,442	7,272 (898)

SOURCE: Centers for Medicare & Medicaid Services, Medicare Current Beneficiary Survey, Survey File and Cost Supplement File, 2019.

Example 1 Results: Out-of-pocket spending among all Medicare beneficiaries aged 65 and over by self-reported health status, 2019

Out-of-pocket spending among all Medicare beneficiaries aged 65 and over by self-reported health status, 2019



SOURCE: Centers for Medicare & Medicaid Services, Medicare Current Beneficiary Survey, Survey File and Cost Supplement File, 2019.

Example 2 Walkthrough: Process Overview



Example 2 Step 1: Defining Your Research Question

What is the association between year-to-year obesity (BMI \geq 30) and total health care expenditures among Medicare beneficiaries aged 65 and over living in the community during 2018 and 2019?

- Objectives of this example:
 - Demonstrate how to link Survey File and Cost Supplement File segments
 - Demonstrate how to apply longitudinal weights to produce nationally representative estimates

Example 2 Step 2: Create Your Analytic File



Example 2 Step 2: Creating Your Analytic File

- After you have defined your research question, you are ready to create your analytic file.
- Creating your analytic file requires five steps:
 1. Identify the MCBS data file(s) that your research question requires.
 2. Identify the data segments and variables that your research question requires.
 3. Identify considerations specific to coding, data collection, and/or processing of variables of interest.
 4. Identify the study population and use the corresponding weights.
 5. Merge segments to create your analytic dataset.

Example 2: Identifying Data File(s), Data Segments, and Variables

Obesity and total health expenditures for beneficiaries living in the community aged 65 and over

- This research question requires the following variables:

Measure	File	Segment	Variable
Age	2019 Survey File	Demographics (DEMO)	H_AGE
Residence status	2019 Survey File	Demographics (DEMO)	INT_TYPE
Body mass index	2018 & 2019 Survey File	General Health (GENHLTH)	BMI_CAT
Total expenditures	2018 & 2019 Cost Supplement File	Person Summary (PS)	PAMTTOT



Example 2: Identifying Population and Weights

- The Survey File and Cost Supplement File are representative of the “ever enrolled” population, which includes anyone enrolled at any time during the calendar year. However, the population represented in the Cost Supplement File includes a smaller subset of beneficiaries with complete cost and utilization data for the year. As such, users conducting joint two-year longitudinal analysis of both Survey File and Cost Supplement File data must use the weights in the Cost Supplement File.

Example 2: Merge and Append Segments to Create Analytic File

- The SAS code below shows how multiple Survey File segments can be merged with the CSL2WGTS segment in SAS using BASEID as the key variable. When merging segments from 2018, all observations in the CSL2WGTS segment of the 2019 Cost Supplement File should be preserved.

```
data bmi19_merged;
  merge cost19.CSL2WGTS (in=a)
        survey19.DEMO (keep=BASEID H_AGE INT_TYPE)
        survey19.GENHLTH (keep=BASEID BMI_CAT)
        cost19.PS (keep=BASEID PAMTTOT);
  by BASEID;
  rename BMI_CAT=BMI_CAT19 PAMTTOT=COST19;
  if a then output;
run;
```

```
data bmi18_merged;
  merge      survey18.DEMO (keep=BASEID)
        survey18.GENHLTH (keep=BASEID BMI_CAT)
        cost18.PS (keep=BASEID PAMTTOT);
  by BASEID;
  rename BMI_CAT=BMI_CAT18 PAMTTOT=COST18;
run;
```

```
data bmi_all;
  merge bmi19_merged (in=b)
        bmi18_merged (in=c);
  by BASEID;
  if b and c then output;
run;
```

Example 2: Converting Real Dollars to Inflation-Adjusted Dollars

- Prior to comparing costs between 2018 and 2019, one needs to account for inflation by converting dollars to inflation-adjusted dollars. The Consumer Price Index (CPI)¹ can be used for adjustment when comparing spending between two or more years.

```
data bmi_adj;  
  set bmi_all;  
  COST18_ADJ = COST18* (251.712/247.867);  
run;
```

1. U.S. Bureau of Labor Statistics. <https://data.bls.gov/cgi-bin/surveymost?cu>

Example 2: Recoding Variables

- There are numerous ways to convert raw variables into analytic variables. This example creates COSTDIFF and recodes BMI_CAT from 2018 and 2019 into a two-category variable as such:

```
data bmi_recode;
  set bmi_adj;
  BMI18=.;
  BMI19=.;
  if BMI_CAT18 in (1,2,3) then BMI18=0; else if BMI_CAT18 in (4,5) then BMI18=1;
  if BMI_CAT19 in (1,2,3) then BMI19=0; else if BMI_CAT19 in (4,5) then BMI19=1;
  COSTDIFF=COST19-COST18_ADJ;
run;

data bmi_final;
  set bmi_recode;
  BMI=.;
  if BMI18=0 and BMI19=0 then BMI=1; /* Beneficiary was not obese in 2018 or 2019 */
  if BMI18=1 and BMI19=1 then BMI=2; /* Beneficiary remained obese in 2018 and 2019 */
  if BMI18=1 and BMI19=0 then BMI=3; /* Beneficiary was no longer deemed obese in 2019 */
  if BMI18=0 and BMI19=1 then BMI=4; /* Beneficiary was deemed obese in 2019 */
run;
```

Example 2: Recoded Variables

Measure	Original variable	Recoded variable
Body Mass Index	BMI_CAT18/19 1 Underweight 2 Healthy 3 Overweight 4 Obese 5 Extreme or high risk obesity	BMI18/19 1 Obese 0 Not obese
Change in Body Mass Index	BMI18/19 1 Obese 0 Not obese	BMI 1 Beneficiary was not obese in 2018 or 2019 2 Beneficiary remained obese in 2018 and 2019 3 Beneficiary was no longer deemed obese in 2019 4 Beneficiary was deemed obese in 2019 . Data not available

Example 2: Segmenting the Population

- In order to restrict the file to beneficiaries living in the community, this example will segment the file on the variables INT_TYPE and H_AGE.

```
data bmi_seg;  
  set bmi_final;  
  where INT_TYPE='C' and H_AGE GE 65;  
run;
```

Example 2 Step 3: Conduct Analyses Using Appropriate Variance Estimation Methods



Example 2 Step 3: Variance Estimation

- Recall that the MCBS includes variables to obtain weighted estimates and estimated standard errors using two approaches:
 1. **Taylor-series linearization method:** the variables SUDSTRAT (sampling strata) and SUDUNIT (primary sampling unit) are included for variance estimation using this method.
 2. **Balanced repeated replication (BRR) method (Fay's method):** a series of replicate weights are included for variance estimation using this method.
- This example will use the BRR method of variance estimation.

Example 2 SAS Code: Total health care expenditures, Medicare beneficiaries aged 65 and over living in the community in 2018 and 2019 , by change in BMI

Balanced Repeated Replication (BRR) Method

The following code requests the 2018 and 2019 total health care expenditures among beneficiaries aged 65 and over living in the community by their change in BMI from <30 to >=30 using the BRR method for variance estimation.

```
proc surveymeans data= bmi_seg varmethod=brr (fay=.30) missing;  
  var COSTDIFF COST18_ADJ COST19;  
  weight CSL2YWGT;  
  repweights CSL2Y001-CSL2Y100;  
  domain BMI;  
run;
```

Example 2 Results: Total health care expenditures, Medicare beneficiaries aged 65 and over living in the community in 2018 and 2019, by change in BMI

Total health care expenditures, Medicare beneficiaries aged 65 and over living in the community in 2018 and 2019

Change in BMI	Estimate - \$(St. Error - \$)	
	2018	2019
Beneficiary was not obese in 2018 or 2019	11,075 (484)	13,849 (619)
Beneficiary remained obese in 2018 and 2019	14,037 (913)	16,088 (828)
Beneficiary was no longer deemed obese in 2019	15,787 (3,201)	18,432 (2,232)
Beneficiary was deemed obese in 2019	16,361 (3,368)	18,034 (3,651)

Note: 2018 estimates are shown in 2019 dollars.

SOURCE: Centers for Medicare & Medicaid Services, Medicare Current Beneficiary Survey, Survey File and Cost Supplement File, 2018 & 2019.

Thank you!

If you have any questions, please contact CMS at the following email address: MCBS@cms.hhs.gov.



The MCBS is authorized by section 1875 (42 USC 139511) of the Social Security Act and is conducted by NORC at the University of Chicago for the U.S. Department of Health and Human Services. The OMB Number for this survey is 0938-0568.

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