MCBS
Medicare Current Beneficiary Survey

2016 | DATA USER'S GUIDE: GENERAL INFORMATION

Centers for Medicare & Medicaid Services (CMS)

Office of Enterprise Data and Analytics (OEDA)

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August 20, 2018	1.0	Initial version published.
November 5, 2018	1.1	Updated Exhibit 4.2.1.

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LIST OF EXHIBITS

ACRONYM LIST

ACCESSCR	Access to Care segment
ACO	Accountable Care Organization
ACQ	Access to Care Questionnaire
ACS	American Community Survey
ADLs	Activities of Daily Living
ADMNUTLS	Administrative Utilization Summary
AGREESCL	Agreement Scale
ASSIST	Assistance segment
ATC	Access to Care
AVQ	Address Verification Questionnaire
BQ	Background Questionnaire
BRR	Balanced repeated replication (or Fay's method)
CAPI	Computer-Assisted Personal Interviewing
CATI	Computer-Assisted Telephone Interviewing
CAU	Cost and Use
CENWGTS	Continuously enrolled weights
CHRNCOND	Chronic Conditions segment
CMS	Centers for Medicare & Medicaid Services
CSEVRWGT	Cost Supplement File Ever Enrolled weights
CSL2WGTS	Cost Supplement File Longitudinal weights (2-year)
CPS	Charge Payment Summary
DEMO	Demographics segment
DIQ	Demographics and Income Questionnaire
DME	Durable Medical Equipment segment
DUA	Data Use Agreement
DUQ	Dental Utilization Questionnaire
ENS	Enumeration Summary Questionnaire
EOBs	Explanation of Benefit Statements
ERQ	Emergency Room Utilization Questionnaire
ERS	Economic Research Service
ESRD	End-stage renal disease
EVRWGTS	Ever enrolled population weights
EX	Expenditures Questionnaire
FACASMNT	Facility Assessments segment
FACCHAR	Facility Characteristics segment
FAE	Facility Events segment
FALLS	Falls
FFS	Fee-for-Service
FOODINS	Food Insecurity segment
FQ	Facility Questionnaire
GAD	Generalized Anxiety Disorder screening tool (GAD-2)
GENHLTH	General Health segment
HAQ	Housing Characteristics Questionnaire
HFQ	Health Status and Functioning Questionnaire
HHC	Health and Health Care of the Medicare Population
HHCHAR	Household Characteristics segment
HHQ	Home Health Utilization Questionnaire
HHS	Home Health Summary Questionnaire

HIPAA	Health Insurance Portability and Accountability Act
HIQ	Health Insurance Questionnaire
HIS	Health Insurance Summary Questionnaire
HISUMRY	Health Insurance Summary
HITLINE	Health Insurance Timeline segment
HMO	Health Maintenance Organization
HS	Health Status
IADLs	Instrumental Activities of Daily Living
IAQ	Income and Assets Questionnaire
ID	Identification
IN	Introduction Questionnaire
INCASSET	Income and Assets segment
INQ	Introduction Questionnaire
INTERV	Interview Characteristics segment
IPE	Inpatient Hospital Events segment
IPQ	Inpatient Hospital Utilization Questionnaire
IRB	Institutional Review Board
IRQ	Interviewer Remarks Questionnaire
IUE	Institutional Events segment
IUQ	Institutional Utilization Questionnaire
KNQ	Beneficiary Knowledge and Information Needs Questionnaire
LDS	Limited Data Set(s)
LEP	Limited English Proficiency
LNG2WGTS	Survey File longitudinal weights (2-year)
LNG3WGTS	Survey File longitudinal weights (3-year)
LNG4WGTS	Survey File longitudinal weights (4-year)
MA	Medicare Advantage
MAPLANQX	Medicare Advantage Plan Questions segment
MB	Medicare Beneficiary
MBQ	Mobility of Beneficiaries Questionnaire
MBSF	Master Beneficiary Summary File
MCBS	Medicare Current Beneficiary Survey
MCREPLNQ	Medicare Plan Beneficiary Knowledge segment
MDS	Minimum Data Set
MPE	Medical Provider Events segment
MPQ	Medical Provider Utilization Questionnaire
NAGIDIS	NAGI Disability segment
NHATS	National Health and Aging Trends Study
NICOALCO	Nicotine and Alcohol segment
NORC	NORC at the University of Chicago
NSQ	No-Statement Section Questionnaire
OASIS	Outcome and Assessment Information segment
OEDA	Office of Enterprise Data and Analytics
OM	Other Medical Expenses
OMB	Office of Management and Budget
OMQ	Other Medical Expenses Utilization Questionnaire
OPE	Outpatient Hospital Events segment
OPQ	Outpatient Utilization Questionnaire
PAQ	Patient Activation Questionnaire
PHQ	Patient Health Questionnaire depression screening tool (PHQ-9)
PII	Personally Identifiable Information

PM	Prescription Medicine
PME	Prescribed Medicine Events segment
PMQ	Prescribed Medicine Questionnaire
PMS	Prescribed Medicine Summary
PMUSE	Prescription Medicine Usage segment
PPIC	Patient Perceptions of Integrated Care Questionnaire
PPO	Preferred Provider Organization
PREVCARE	Preventive Care segment
PS	Person Summary segment
PSQ	Post-Statement Charge Questionnaire
PSU	Primary Sampling Units
PNTACT	Patient Activation segment
PUF	Public Use File
PVQ	Preventive Care Questionnaire
RESTMLN	Residence Timeline segment
RH	Residence History
RIC	Record Identification Code
RXPARTD	Part D Drug Plan Experience segment
RXQ	Drug Coverage Questionnaire
SAS	Statistical Analysis System
SATWCARE	Satisfaction with Care segment
SCF	Sample Control File
SCQ	Satisfaction with Care Questionnaire
SNF	Skilled Nursing Facility
SS	Service Summary segment
SSN	Social Security Number
SSU	Secondary Sampling Units
STQ	Statement Section Questionnaire
US	Use of Health Services Questionnaire
USCARE	Usual Source of Care segment
USDA	U.S. Department of Agriculture
USQ	Usual Source of Care Questionnaire
USU	Ultimate Sampling Unit
VISHEAR	Vision and Hearing segment
VRDC	Virtual Research Data Center

1. INTRODUCTION

Medicare is the nation's health insurance program for persons 65 years and older and for persons younger than 65 years who have a qualifying disability. The Medicare Current Beneficiary Survey (MCBS) is a representative national sample of the Medicare population sponsored by the Centers for Medicare & Medicaid Services (CMS). The MCBS is designed to aid CMS in administering, monitoring, and evaluating Medicare programs. A leading source of information on Medicare and its impact on beneficiaries, the MCBS provides important information on beneficiaries that is not available in CMS administrative data and plays an essential role in monitoring and evaluating beneficiary health status and health care policy.

The Medicare Current Beneficiary Survey (MCBS) is a continuous, in-person, multi-purpose longitudinal survey covering a representative national sample of the Medicare population, including the population of beneficiaries aged 65 and over and beneficiaries aged 64 and below with disabilities, residing in the United States and Puerto Rico. Fieldwork for the first round of data collection began in September 1991; since then, it has continued to collect and provide essential data on the costs, use, and health care status of Medicare beneficiaries. Recently celebrating its 25th anniversary of continuous data collection, the MCBS has completed 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, including the creation of new benefits such as Medicare's Part D prescription drug benefit.

The MCBS Data User's Guide offers a publicly available, easily searchable resource for data users. Beginning with 2015 MCBS data, it will be updated for each new data year to ensure that users have current documentation on the survey design, methods, and estimation as well as MCBS data products. For questions or suggestions on this document or other MCBS data-related questions, please email MCBS@cms.hhs.gov.

2. GENERAL GUIDELINES FOR DATA USE

Each year, the MCBS data are made available to users as two Limited Data Sets (LDS) – the Survey File and the Cost Supplement File[1] – and a Public Use File (PUF). This Data Users' Guide focuses on the LDS releases, however information on contents and access to the PUF including a codebook and additional documentation can be found at https://www.cms.gov/Research-Statistics-Data-and-Systems/Downloadable-Public-Use-Files/MCBS-Public-Use-File/index.html.

The LDS files contain beneficiary level health information, but exclude specific direct identifiers as outlined in the Health Insurance Portability and Accountability Act of 1996 (HIPAA). LDS files are considered identifiable, even without the inclusion of specific direct identifiers, due to the potential capability to link other sources of data creating an increased risk of re-identification of individuals. Since the information provided on an LDS is considered identifiable, it also remains subject to the provisions of the Privacy Act of 1974.

All requested LDS files require a signed LDS Data Use Agreement (DUA) between CMS and the data requestor to ensure that the data remain protected against unauthorized disclosure. LDS requestors must show that their proposed use of the data meets the disclosure provisions for research. The research purpose must relate to projects that could ultimately improve the care provided to Medicare patients and policies that govern the care. This type of research includes projects related to improving the quality of life for Medicare beneficiaries, improving the administration of the Medicare program, cost and payment related projects, and the creation of analytical reports.

The Survey File contains information on beneficiaries' demographic information, health insurance coverage, self-reported health status and conditions, and responses regarding access to care and satisfaction with care. The Cost Supplement File contains a comprehensive accounting of beneficiaries' health care use, expenditures, and sources of payment. Detailed descriptions of each file, including the contents of the files, file structure, information on new variables, key recodes, and administrative sources for select variables can be found in the complementary data file-specific documents (see MCBS Data User's Guide: Survey File and MCBS Data User's Guide: Cost Supplement File).

2.1 Data Access

In order to gain access to the LDS, data users must complete several steps. First, data users must sign and submit CMS' DUA and complete an LDS Worksheet. The DUA acknowledges the user's agreement to CMS' terms around data exchange, privacy, use, and storage. The LDS worksheet provides CMS with information about the research project, the specific files needed, and payment information for administrative fees associated with the data request. Note that new and repeat data users have distinct requirements and forms depending on the data request.

Administrative processing fees for obtaining the LDS files are $300 for the 2016 Survey File alone, and $600 for the 2016 Survey File with the 2016 Cost Supplement (the Cost Supplement File cannot be acquired separately). The processing of the DUA takes approximately six to eight weeks. Upon approval and payment, CMS releases the data within one week, depending on the size of the data request. Data users will receive the data on DVD or via the CMS Virtual Research Data Center (VRDC) for use with SAS® or other statistical software packages; each data release contains multiple files that are linkable through a key identification variable (BASEID).

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[1] The LDS releases starting with data year 2015 are referred to as the Survey File (formerly Access to Care (ATC)) and the Cost Supplement File (formerly Cost and Use (CAU)).

For additional information on data access, data users can visit the CMS' LDS website at https://www.cms.gov/Research-Statistics-Data-and-Systems/Files-for-Order/Data-Disclosures-Data-Agreements/DUA_-_NewLDS.html.

Questionnaires, codebooks, and bibliographies for each survey year are available for download on the CMS' MCBS website at https://www.cms.gov/Research-Statistics-Data-and-Systems/Research/MCBS/index.html. A link to this documentation is also visible when approved data users log in to the VRDC.

2.2 Guidelines for Citation of Data Source

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Accordingly, CMS requests that data users cite CMS and the Medicare Current Beneficiary Survey as the data source in any publications or research based upon these data. Suggested citation formats are below.

Tables and Graphs: The suggested citation to appear at the bottom of all tables and graphs should read:

> SOURCE: Centers for Medicare & Medicaid Services, Medicare Current Beneficiary Survey, [Data Product], [Year].

Bibliography: The suggested citation for the 2016 MCBS Data User's Guide should read:

> SOURCE: Centers for Medicare & Medicaid Services. 2016 Medicare Current Beneficiary Survey Data User's Guide: General Information. Retrieved from [ADD URL], 2018.

Survey Data: The suggested citation for the MCBS survey data files and other documentation should read:

> SOURCE: Centers for Medicare & Medicaid Services. Medicare Current Beneficiary Survey, Survey File data. Baltimore, MD: U.S. Department of Health and Human Services, 2016.

> SOURCE: Centers for Medicare & Medicaid Services. Medicare Current Beneficiary Survey, Cost Supplement File data. Baltimore, MD: U.S. Department of Health and Human Services, 2016.

3. WHAT'S NEW FOR DATA YEAR 2016?

The MCBS files include two LDS releases and the PUF. The Survey File may serve as a stand-alone research file, however users of the Cost Supplement File will require the Survey File for information on beneficiaries' demographic characteristics and health insurance information.[2]

Below data users will note highlights and updates for the 2016 data year.

3.1 Sampling

Sample eligibility: 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 MCBS panel. Prior to 2015, only beneficiaries who became eligible on or before January 1 of the sampling year were eligible to be sampled. Including the current-year eligible beneficiaries allows for delivery of data products up to one year earlier.

Census tracts replaced ZIP Code areas for Secondary Sampling Units (SSUs): Beginning in the Fall 2014 and continuing into 2015 and 2016, census tracts or groups of tracts, replaced ZIP Code areas as SSUs for the new panel selected and fielded each fall. See Section 4: Survey Overview for more information. This innovation will be completed after the 2017 sample is selected and will then become a permanent feature of the full sample.

Hispanic oversample: Hispanic beneficiaries living outside of Puerto Rico were oversampled for the MCBS. The main goals of the oversampling were to increase the number of Hispanic beneficiaries to allow for more precise estimates of health disparities experienced by these populations and to increase the proportion of MCBS Hispanic beneficiaries from outside Puerto Rico. The full target sample of 1,500 U.S. Hispanic beneficiaries is expected to be reached by 2020.

3.2 Questionnaires

Questionnaire content changes: There were a number of questionnaire sections that were revised in 2016. Data users can view the Questionnaire for each data year along with the questionnaire variable names and question text on the MCBS website at https://www.cms.gov/Research-Statistics-Data-and-Systems/Research/MCBS/Questionnaires.html.

3.2.1 General

- In a number of sections, question wording was revised; references to "doctor," "medical person," or "medical professional" were changed to "doctor or other health professional" for questions that ask about a specific visit, diagnosis, prescription, or other medical encounters.

3.2.2 Section-Specific Changes

Several item and section level changes were made to the Community questionnaire in 2016.

Demographics and Income (DIQ)

In Fall 2016, a Limited English Proficiency (LEP) measure about reading was added to the questionnaire.

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[2] As of the 2015 data year, LDS data were reorganized into newly named segments (formerly RICs).

Dental Utilization (DUQ)

New questions were asked of beneficiaries to determine why they may not have access to dental health services. These questions are asked during each round of data collection and summarized in the DENTAL segment.

Health Status and Functioning (HFQ)

In Fall 2016, questions were revised to align the MCBS Community questionnaire specifications with the Department of Health and Human Services (DHHS) Data Council Recommended Guidance for Survey Questions and Preferred Practices in HHS Surveys for Selected Estimates. This effort resulted in the replacement of existing mental health questions with standardized scales in the Health Status and Functioning (HFQ) questionnaire section. Questions about preventive care were moved from the HFQ section to a new Preventive Care section (PVQ) to enhance the flow of the questionnaire. The HFQ also contains a number of questions on diabetes that are released in the Diabetes segment of the 2016 Survey File LDS.

Income and Assets (IAQ)

In Summer 2016, a five question set was added to the Income and Assets (IAQ) questionnaire. These items were adapted from the Health and Retirement Survey (HRS) to collect information about inheritances and other lump sum assets. Please note that this data was released with the 2015 Survey File LDS since the reference period is 2015.

In Summer 2017, (Round 78) income response categories for two questionnaire items on the IAQ (TOTAL_COMBINED2, TOTAL_SP1) were modified in an effort to standardize income response options across the MCBS Community questionnaires. The data from these items are released with the 2016 Survey File LDS since the reference period is 2016.

Beneficiary Knowledge and Information Needs (KNQ)

In Winter 2016, three items were added to the Beneficiary Knowledge and Information Needs (KNQ) section to identify some of the reasons beneficiaries find it difficult to compare plans and make plan choices. While asked in 2016, the KNQ has a 2015 reference period; these KNQ data are included in the 2015 Survey File in the Medicare Plan Beneficiary Knowledge segment (MCREPLNQ).

Mobility (MBQ)

The MBQ items are released in the Mobility segment of the 2016 Survey File LDS. **These items ask about the beneficiary's travel activities, including driving and transportation availability.**

Nicotine and Alcohol Use (NAQ)

In Fall 2016, existing items about tobacco and alcohol use were replaced with items based on DHHS recommendations. Previously, tobacco and alcohol use questions had been asked as part of the Health Status and Functioning (HFQ) section. The new nicotine and alcohol use items were placed in a new section, Nicotine and Alcohol Use (NAQ), to enhance the flow of the questionnaire.

Preventive Care (PVQ)

Existing items about the seasonal flu vaccine were moved from the Health Status and Functioning (HFQ) section and added to a new section – Preventive Care (PVQ)—beginning in Winter 2016. In Summer 2016, two items were added to the PVQ. One item, regarding the shingles vaccine, is a new item for MCBS, while the other item, about pneumonia vaccine, has previously been part of the HFQ section. In Fall 2016, screening

questions about blood pressure, cholesterol, mammogram, Pap smear, digital rectum exam, prostate cancer that were previously asked in the HFQ section migrated to the PVQ to enhance the flow of the questionnaire.

Usual Source of Care (USQ)

Changes were made in Fall 2016 to the Usual Source of Care (USQ) questionnaire section to remove the Patient Perceptions of Integrated Care (PPIC) items that were added in 2015. This change essentially reverted the USQ back to the version fielded in Fall 2014. The decision to remove the PPIC items in Fall 2016 was informed by feedback from interviewers about the challenges associated with administering these items to beneficiaries. The motivation for removing PPIC items in Fall 2016 was to allow NORC and CMS researchers time to reevaluate the wording, placement, and relevance of PPIC items before refielding a subset of the items in Winter 2018.

For more information on the sections of the MCBS questionnaires, please see Section 5: Questionnaires. For additional details on segments and variables released for each LDS, please consult the Data User's Guide: Survey File or the Data User's Guide: Cost Supplement File.

3.3 Documentation

MCBS Historical Data Documentation: MCBS data documentation for the Access to Care 1991-2013 and Cost and Use 1992-2013 is available on the CMS MCBS website at https://www.cms.gov/Research-Statistics-Data-and-Systems/Research/MCBS/codebooks.html. Zip files for each Release/Year contain the segment codebooks plus technical documentation.

MCBS Methodology Report: The 2016 MCBS Methodology Report provides an operational perspective on the collection of survey data for the 2016 MCBS data year. It complements the Data User's Guides with an overview of all activities carried out in support of the 2016 data files, including sampling, instrument design, interviewer training, data collection, data processing, and weighting.

MCBS Chartbook: Beginning with 2015 MCBS data and continuing in 2016, CMS issues an MCBS Chartbook with each annual LDS release. It provides the public with a collection of charts and tables presenting estimates from both the Survey File and Cost Supplement File.

CMS historically released two comprehensive data tables of estimates associated with each of the LDS release files. The Chartbook and previous data tables are available on the CMS MCBS website at https://www.cms.gov/research-statistics-data-and-systems/research/mcbs/data-tables.html

3.4 Data Processing

New content: In 2016, the Dental Care Access, Diabetes, Mental Health, and Mobility segments were added to the Survey File LDS.

The 2016 questionnaire changes also resulted in the following variables added to the annual releases:

Exhibit 3.4.1: 2016 MCBS Community Content Additions

Location	Questionnaire Section	Variable	Description
CHRNCOND	HFQ	D_OCDTYP	Type of Diabetes diagnosed
CHRNCOND	HFQ	EMARTHOT	MCARE ELIG CAUSE – ARTHRITS, OTHER
CHRNCOND	HFQ	EMARTOST	MCARE ELIG CAUSE – OSTEOARTHRITIS

Location	Questionnaire Section	Variable	Description
CHRNCOND	HFQ	EMHRTCND	MCARE ELIG CAUSE – VALVE/RHYTHM/OTHER HRT
CHRNCOND	HFQ	OCARTHOT	ARTHRITIS, OTHER (EVER)
CHRNCOND	HFQ	OCCBLOOD	BODY PART CANCER - BLOOD
CHRNCOND	HFQ	OCCBONE	BODY PART CANCER - BONE
CHRNCOND	HFQ	OCCESOPH	BODY PART CANCER - ESOPHAGUS
CHRNCOND	HFQ	OCCGALLB	BODY PART CANCER - GALL BLADDER
CHRNCOND	HFQ	OCCLARNX	BODY PART CANCER - LARYNX
CHRNCOND	HFQ	OCCLEUK	BODY PART CANCER - LEUKOCYTES
CHRNCOND	HFQ	OCCLIVER	BODY PART CANCER - LIVER
CHRNCOND	HFQ	OCCLYMPH	BODY PART CANCER - LYMPH NODES (LYMPHOMA)
CHRNCOND	HFQ	OCCMOUTH	BODY PART CANCER - MOUTH
CHRNCOND	HFQ	OCCPANCR	BODY PART CANCER - PANCREAS
CHRNCOND	HFQ	OCCRECT	BODY PART CANCER - RECTUM
CHRNCOND	HFQ	OCCTESTS	BODY PART CANCER - TESTIS
CHRNCOND	HFQ	OCCTHYR	BODY PART CANCER - THYROID
CHRNCOND	HFQ	OCCTISS	BODY PART CANCER - SOFT TISSUE/FAT
CHRNCOND	HFQ	OCHRTCND	OTHER HEART COND, EG VALVE/RHYTHM (EVER)
CHRNCOND	HFQ	OCOSARTH	OSTEOARTHRITIS (EVER)
CHRNCOND	HFQ	PROSSURG	PROSTATE SURGERY (EVER)
DEMO	None	CENSADI	AREA DEPRIVATION INDEX (ADI) BASED ON CENSUS BLOCK GROUP
DENTAL	DUQ	DDVDADVI	CDN'T GET DENTAL – OTHER DENT REC AGNST
DENTAL	DUQ	DDVDAFRD	CDN'T GET DENTAL - AFRAID
DENTAL	DUQ	DDVDBUSY	CDN'T GET DENTAL – TOO BUSY
DENTAL	DUQ	DDVDCOST	CDN'T GET DENTAL - COST
DENTAL	DUQ	DDVDDIST	CDN'T GET DENTAL – OFFICE TOO FAR
DENTAL	DUQ	DDVDFINE	CDN'T GET DENTAL – NOTHING WRONG
DENTAL	DUQ	DDVDHOUR	CDN'T GET DENTAL – NOT OPEN GOOD TIMES
DENTAL	DUQ	DDVDINS	CDN'T GET DENTAL – INS DID NOT COVER
DENTAL	DUQ	DDVDMONY	CDN'T GET DENTAL – DIDN'T WNT TO SPND $
DENTAL	DUQ	DDVDOTHR	CDN'T GET DENTAL - OTHER
DENTAL	DUQ	DDVDWORK	CDN'T GET DENTAL – CLDN'T TAKE OFF WORK
DENTAL	DUQ	DDVNEED	SP NEEDED DENTAL CARE BUT COULD NOT GET
DIABETES	HFQ	D_INSFRQ	HOW OFTEN TAKE INSULIN (FREQ)
DIABETES	HFQ	D_INSPMP	USE INSULIN PUMP

Location	Questionnaire Section	Variable	Description
DIABETES	HFQ	D_MEDFRQ	HOW OFTEN RX/ORAL DIABETES MED (FREQ)
DIABETES	HFQ	D_SORFRQ	HOW OFTEN CHECK FOOT SORES (FREQ)
DIABETES	HFQ	D_TSTFRQ	HOW OFTEN TEST BLOOD GLUCOSE (FREQ)
DIABETES	HFQ	DIAAGE	SP'S AGE WHEN TOLD HAD DIABETES
DIABETES	HFQ	DIAASPRN	SP TAKES ASPIRIN REGULARLY FOR DIABETES
DIABETES	HFQ	DIACIRCF	DIABETES DIAG POOR CIRCULATION
DIABETES	HFQ	DIACTRLD	BLOOD SUGAR WELL CONTROLLED
DIABETES	HFQ	DIADRSAW	NUMBER OF TIMES SAW DR. LAST YR. FOR DIABETES
DIABETES	HFQ	DIAEYPRB	ANY PROBS W/ EYES DUE TO DIABETES?
DIABETES	HFQ	DIAFEET	ANY PROBS W/ FEET DUE TO DIABETES?
DIABETES	HFQ	DIAFTEVR	EVER PROBS W/ FEET DUE TO DIABETES
DIABETES	HFQ	DIAHEMOC	NUMBER TIMES CHECKED HEMOGLOBIN LAST YR
DIABETES	HFQ	DIAHYPO	EVER EXPERIENCE HYPOGLYCEMIA
DIABETES	HFQ	DIAHYPTR	HOW TREAT SERIOUS HYPOGLYCEMIA
DIABETES	HFQ	DIAINSUL	TAKES INSULIN
DIABETES	HFQ	DIAKDPEV	EVER ANY PROBLEMS WITH KIDNEYS
DIABETES	HFQ	DIAKDPRB	ANY PROBS W/ KIDNEYS DUE TO DIABETES
DIABETES	HFQ	DIAKIDNY	DIABETES DIAG KIDNEY DISEASE
DIABETES	HFQ	DIAKNOW	HOW MUCH KNOWS ABOUT MANAGING DIABETES
DIABETES	HFQ	DIAMEDS	SP TAKES PRESCRIBED DIABETES PILL/MEDICINE
DIABETES	HFQ	DIAMNGE	HAD DIABETES SELF MANAGEMENT COURSE
DIABETES	HFQ	DIANEURO	DIABETES DIAG WITH NEUROPATHY
DIABETES	HFQ	DIAPRESS	MEASURES BLOOD PRESSURE AT HOME
DIABETES	HFQ	DIAPRGNT	DID SP HAVE DIABETES DURING PREGNANCY
DIABETES	HFQ	DIASKINC	DIABETES DIAG WITH CALLUSES
DIABETES	HFQ	DIASORES	CHECKS FOR SORES ON FEET
DIABETES	HFQ	DIASUPPS	KNOW MEDICARE HELPS PAY FOR SUPPLIES
DIABETES	HFQ	DIATENYR	FOOT EXAM IN LAST YEAR
DIABETES	HFQ	DIATEST	TESTS OWN BLOOD FOR SUGAR/GLUCOSE
DIABETES	HFQ	DIATRAIN	LAST TIME SP HAD DIABETES MGMNT TRAINING
DIABETES	HFQ	DIAULCER	DIABETES DIAG WITH FOOT ULCER
DIABETES	HFQ	INSUUNIT	HOW OFTEN TAKE INSULIN (UNIT)
DIABETES	HFQ	MEDSUNIT	HOW OFTEN RX/ORAL DIABETES MED (UNIT)
DIABETES	HFQ	SOREUNIT	HOW OFTEN CHECK FOOT SORES (UNIT)

Location	Questionnaire Section	Variable	Description
DIABETES	HFQ	TESTUNIT	HOW OFTEN TEST BLOOD GLUCOSE (UNIT)
MAPLANQX	HIQ	YDISNROL	WHY STOPPED/CHANGED MCARE ADV PLAN
MENTHLTH	HFQ	GADANXTY	GAD - NERVOUS, ANXIOUS, ON EDGE
MENTHLTH	HFQ	GADWORRY	GAD - UNABLE TO CONTROL WORRY
MENTHLTH	HFQ	PHQDEPRS	PHQ - DOWN, DEPRESSED, HOPELESS
MENTHLTH	HFQ	PHQEATNG	PHQ - PROBLEMS WITH EATING
MENTHLTH	HFQ	PHQFAILR	PHQ - FEEL BAD ABOUT SELF
MENTHLTH	HFQ	PHQMOVE	PHQ - PROBLEMS MOVING OR SPEAKING
MENTHLTH	HFQ	PHQNOINT	PHQ - NO INTEREST DOING THINGS
MENTHLTH	HFQ	PHQNOSLP	PHQ - PROBLEMS WITH SLEEP
MENTHLTH	HFQ	PHQPRDIF	DEPRESSION MAKES LIFE DIFFICULT
MENTHLTH	HFQ	PHQTIRED	PHQ - TIRED OR LITTLE ENERGY
MENTHLTH	HFQ	PHQTRCON	PHQ - TROUBLE CONCENTRATING
MOBILITY	MBQ	DASKRIDE	SP ASKS OTHERS FOR RIDES
MOBILITY	MBQ	DGIVUPDR	SP GIVEN UP DRIVING ALTOGETHER
MOBILITY	MBQ	DLIMDRIV	SP LIMITS DRIVING TO DAYTIME
MOBILITY	MBQ	DREDTRAV	SP HAS REDUCED DAILY TRAVEL
MOBILITY	MBQ	DTBLGTPL	SP HAS TROUBLE GETTING PLACES
MOBILITY	MBQ	DUSETRNS	SP USES TAXI/SPECL TRANSPORT SRVCES
NAGIDIS	HFQ	DISBATH	DOES SP HAVE DIFFICULTY BATHING
NAGIDIS	HFQ	DISDECISION	DOES SP HAVE DIFFICULTY CONCENTRATING
NAGIDIS	HFQ	DISERRANDS	DOES SP HAVE DIFFICULTY DOING ERRANDS
NAGIDIS	HFQ	DISHEAR	DOES SP HAVE DIFFICULTY HEARING
NAGIDIS	HFQ	DISSEE	DOES SP HAVE DIFFICULTY SEEING
NAGIDIS	HFQ	DISWALK	DOES SP HAVE DIFFICULTY WALKING
NICOALCO	NAQ	ALC12MN	ALCOHOL – PAST YEAR FREQUENCY
NICOALCO	NAQ	ALC12MNU	HOW OFTEN SP DRANK ALCOHOL PAST YEAR
NICOALCO	NAQ	ALC2HRS	ALCOHOL - PAST 30 DAYS 5/4 DRINKS OR MORE
NICOALCO	NAQ	ALCDAY	ALCOHOL - PAST YEAR DRINKS PER DAY
NICOALCO	NAQ	ALCLIFE	HAS HAD AT LEAST 12 DRINKS IN LIFE
NICOALCO	NAQ	ALCNDAY	ALCOHOL - PAST YEAR 5/4 DRINKS OR MORE
NICOALCO	NAQ	ALCYEAR	HAS HAD AT LEAST 12 DRINKS IN 1 YEAR
NICOALCO	NAQ	ALPERDAY	EVER 5/4 DRINKS OR MORE ALMOST EVERY
NICOALCO	NAQ	CIG100	HAS SMOKED AT LEAST 100 CIGARETTES
NICOALCO	NAQ	CIGAR50	HAS SMOKED AT LEAST 50 CIGARS
NICOALCO	NAQ	CIGARNOW	DOES SP USE CIGARS NOW

Location	Questionnaire Section	Variable	Description
NICOALCO	NAQ	CIGARONE	HAS EVER SMOKE CIGAR
NICOALCO	NAQ	CIGNOW	DOES SP SMOKE CIGARETTES NOW
NICOALCO	NAQ	ECIGNOW	DOES SP USE E-CIGARETTE NOW
NICOALCO	NAQ	ECIGONE	HAS EVER USED E-CIGARETTE
NICOALCO	NAQ	PIPENOW	DOES SP USE PIPE TOBACOO NOW
NICOALCO	NAQ	PIPEONE	HAS EVER USED PIPE TOBACCO
NICOALCO	NAQ	SMKLSNOW	DOES SP USE SMOKELESS TOBACCO NOW
NICOALCO	NAQ	SMKLSONE	HAS EVER USED SMOKELESS TOBACCO
PREVCARE	HFQ	DIAAWARE	SP AWARE OF DIABETES TEST BEFORE TODAY
PREVCARE	HFQ	DIAEVERT	EVER HAD BLOOD TEST FOR DIABETES
PREVCARE	HFQ	DIARECNT	MOST RECENT TIME TESTED FOR DIABETES
PREVCARE	HFQ	DIARISK	EVER TOLD AT HIGH RISK FOR DIABETES
PREVCARE	HFQ	DIASIGNS	RECEIVED INFO ABOUT SIGNS OF DIABETES
PREVCARE	PVQ	FLUMAIN	Main reason no flu vaccine
PREVCARE	PVQ	SHINGVAC	SP EVER HAD SHINGLES VACCINE

Data editing and imputation procedures: MCBS data files receive thorough editing and quality control checks prior to release. For more detailed information regarding data editing and imputation procedures conducted for the 2016 LDS releases, please consult the 2016 Data User's Guide: Survey File and the forthcoming 2016 MCBS Methodology Report available on the CMS MCBS website.

Weighting: The 2016 Survey File LDS includes a two-year backward longitudinal weight for analyses with 2015 and 2016 data. Given that 2014 data were not released, the three-year backward longitudinal weight is excluded, however a four-year backward longitudinal weight is provided for analyses with 2013 and 2016 data. For the 2016 Cost Supplement LDS, a two-year longitudinal weight is included.

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, this was later determined to be impractical, and beginning in 1994, participation of beneficiaries in the MCBS was limited to no more than four years.

Although limited to four years, MCBS data collection is continual 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 by round configuration (rather than interviewing on an annual basis) is to have shorter periods of recall during the year in order to capture more complete health care costs and utilization from beneficiaries.

The 2016 MCBS data releases reflect data collected from January 2016 through early January 2017 (see Exhibit 4.1.1).[3]

Exhibit 4.1.1:   Typical MCBS Data Collection Year
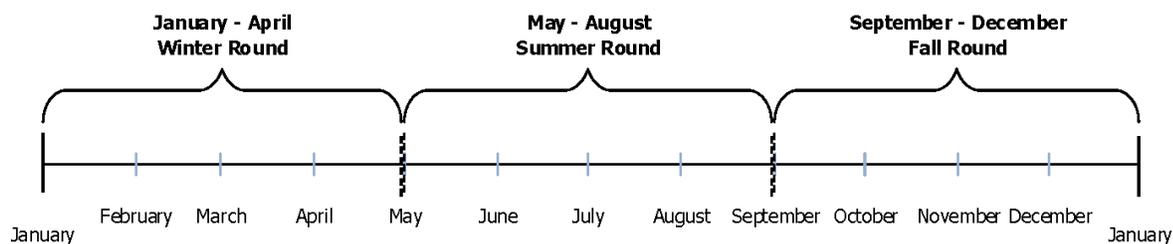
Initial interviews of newly-selected respondents take place in the fall round. Often the fall round begins early (i.e., late July or early August) to allow more time to conduct outreach and collect information from the new survey respondents who are selected to participate in the MCBS. That is, the early start of the fall round overlaps with the final weeks of data collection for the summer round. These small overlap periods as one round ends and another begins are acceptable design features of the survey. For example, the fall round usually extends into early January to allow for the completion of interviews that may have been postponed due to the holiday period.

Subsequent rounds, which occur every four months, involve the re-interviewing of the same respondent (or appropriate proxy respondents) until they have completed four years of participation (up to 12 interviews in total). Interviews are conducted regardless of whether the respondent resides at home or in a long-term care facility, using a questionnaire version appropriate to the setting. Exhibit 4.1.2 depicts the timeline of participation for respondents selected to be in the MCBS sample and Appendix B provides a list of all rounds by data collection year.

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[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
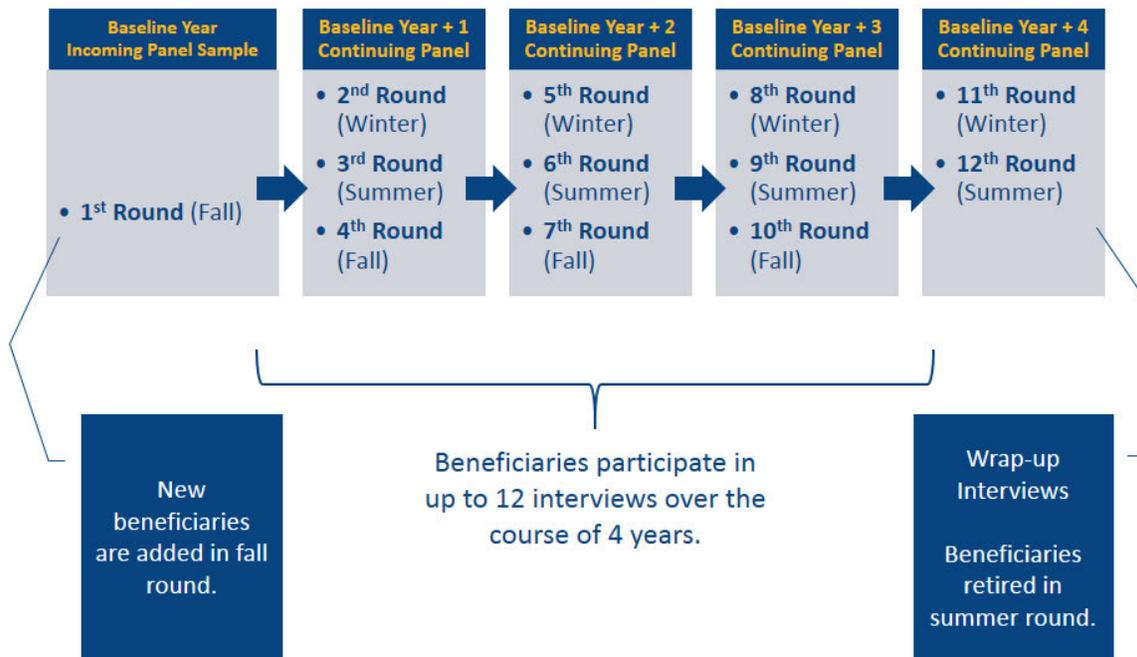
4.2 Sample Design

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) and Puerto Rico.[4] Each sampled beneficiary is scientifically selected as part of a panel and is interviewed up to three times per year.[5] One panel is retired during each summer 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 respondents across all panels participating in the survey annually.

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[4] Alaska and Hawaii are not included among the states from which the sample was selected due to the high cost of data collection in those areas; however, they are included in control totals for weighting purposes.

[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: 2011-2016 MCBS Rotating Panel Design

Data Collection Schedule			Panel					
Data Year	Season	Round#	2011	2012	2013	2014	2015	2016
2012	Winter	62						
	Summer	63						
	Fall	64						
2013	Winter	65						
	Summer	66						
	Fall	67						
2014	Winter	68						
	Summer	69						
	Fall	70						
2015	Winter/Summer	71/72						
	Fall	73						
2016	Winter	74						
	Summer	75						
	Fall	76						

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 MCBS sample is annually "supplemented" during the fall round to account for attrition (deaths, dis-enrollments, refusals) and newly enrolled persons. Each annual supplement is referred to as the Incoming Panel Sample.

Prior to Fall 2001, respondents for the MCBS were drawn from a sample of 107 PSUs that had been selected in 1991 from the 48 continental U.S., the District of Columbia, and Puerto Rico. A second-stage sample of 1,163 SSUs defined by ZIP Code was initially drawn within those PSUs. The second-stage sample was expanded each subsequent year to represent newly created ZIP Code areas, ultimately increasing to 1,523 SSUs in Fall 2000. For Fall 2001, the PSU sample was updated and reselected in a manner that maximized overlap with the original PSU sample. Within the new sample of 107 PSUs, 1,209 SSUs were initially selected in Fall 2001. With the addition of new ZIP Code clusters in subsequent years, the number of SSUs increased to 1,250 by Fall 2013.

Beginning in Fall 2014, census tracts or groups of tracts replaced ZIP Code areas as SSUs for the Incoming Panel selected each fall. A sample of 703 tract-based SSUs was selected within the existing 107 PSUs in 2014; the SSUs were sized to support beneficiary sampling for approximately 20 years. The new tract-based SSU design was chosen because census tracts are more stable and change less often than ZIP Code areas, resulting in less required maintenance. An additional benefit is that tract-based units are more easily merged to federal survey data such as those published by the Census (e.g., decennial census data and the American Community Survey (ACS)).

Respondents for the MCBS are sampled from the Medicare Administrative enrollment data. The sample is designed to be representative of the Medicare population as a whole and by the following age groups: under 45[6], 45 to 64, 65 to 69, 70 to 74, 75 to 79, 80 to 84, and 85 and over. Because of interest in their special

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[6] The MCBS sample frame includes all aged individuals, but only individuals 18 and over are interviewed and included in the LDS files.

health care needs, elderly beneficiaries (age 85 and over) and beneficiaries with disabilities (age 64 and under) are oversampled to permit more detailed analysis of these subpopulations. In 2013 and 2014, an additional oversample of beneficiaries in Accountable Care Organizations (ACOs) was conducted, and beginning in 2015, an oversample of Hispanic beneficiaries was implemented.[7] The MCBS sample is designed to yield about 14,500 completed cases annually in the MCBS Survey File and about 11,500 completed cases annually in the MCBS Cost Supplement File.

The beneficiaries included in the 2016 MCBS LDS releases represent a random cross-section of all beneficiaries who were ever enrolled in either Part A or Part B of the Medicare program for any portion of 2016. A subset of these beneficiaries represent a random cross-section of all beneficiaries who were continuously enrolled from January 1, 2016 up to and including interviews conducted during Fall 2016. The Survey File and Cost Supplement File represent four separate MCBS panels identified by the year in which the panel was selected and first interviewed (i.e., for 2016 LDS files, the 2013, 2014, 2015 and 2016 panels). Exhibit 4.2.2 shows the composition of each of the four panels included in the 2016 data files.

Exhibit 4.2.2: 2016 MCBS Composition of Panels in LDS Data Files

Data Year (Fall)	Number of Beneficiaries Selected
2013	7,400
2014[8]	11,398
2015	8,621
2016	12,145

4.3 Eligibility

4.3.1 Medicare Population Covered by the 2016 LDS

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. More specifically, previously the MCBS would have waited until the 2016 panel to select beneficiaries who became eligible and enrolled during 2015 (e.g., those 'new' to Medicare). Thus, to estimate 2015 events, cost, and utilization would require the 2015 panel and all prior panels plus the new 2015 enrollees who were not sampled until the 2016 panel. Beginning in 2015, these beneficiaries were selected as part of the 2015 panel; thus, the Cost Supplement includes data using the 2015 panel as well as the 2012, 2013 and 2014 previous panels, without the need to use data from the 2016 panel. Likewise, the 2016 Cost Supplement includes data using the 2016 panel as well as the 2013, 2014, and 2015 previous panels, without the need to use data from the 2017 panel.

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[7] Note that once an oversample is implemented for a given fall round, those beneficiaries remain in the survey for four years.

[8] Fall 2014 was the first round collected by NORC after the contract transitioned from the prior incumbent of data collection following a transition between contractors. In September 2014, the final number of Summer 2014 completed interviews from the Continuing sample was provided to NORC. Because the completion rates for the Summer 2014 round were lower than anticipated, CMS and NORC agreed that the Incoming Panel Sample size should be increased to 8,880 cases. Then in December 2014, CMS and NORC agreed to extend the Fall 2014 round to March 2015 so that final re-programming of all questionnaire sections could be completed for fielding of the next round. This decision resulted in an additional buffer of Incoming Panel Sample released in January 2015 with a data collection period of about eight weeks.

4.4 Case Types

MCBS respondents are classified by their phase of participation (i.e., Incoming or Continuing) and interview participation (i.e., Community or Facility), which is determined by residence status. A description of these case types are discussed below.

4.4.1 Incoming and Continuing Cases

Every fall, a new panel of sampled beneficiaries is added to the total sample to replace the panel of respondents completing a final interview and exiting the MCBS in the prior summer round. Respondents 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 and Facility Interviews

Approximately 95 percent of the sample are interviewed in person in the respondent or proxy's own residence or in a neutral interview location, such as a library or public venue. These interviews are called Community interviews. However, over the course of a four year period, it is not uncommon for respondents to enter long-term care facilities (e.g., nursing homes) or to go back and forth between the community and a facility setting (these cases are called Crossovers). In order to obtain an accurate representation of the experiences of all Medicare beneficiaries, the MCBS includes beneficiaries wherever they reside, even if they reside in and/or enter a facility for the duration of their four years with the study. For these Facility interviews, the respondent does not complete an interview; instead, a specially trained interviewer conducts the Facility interview with appropriate Facility staff personnel. That is, the MCBS does not conduct Facility interviews with the respondent directly; Facility interviews are only conducted with Facility administrative staff.

4.5 Interviewing and Training Procedures

4.5.1 Overview of Data Collection

CMS contracts with NORC at the University of Chicago (NORC) to conduct the MCBS. A national team of specially trained and certified NORC field interviewers conduct either face-to-face interviews with MCBS respondents or their designated proxies or they conduct face-to-face interviews with Facility administrators on behalf of respondents. The first interview conducted for an Incoming Panel respondent is relatively short as it does not collect health care utilization or cost data. Continuing respondent interviews are longer as field interviewers collect information about the respondent's health care utilization and associated costs. Telephone interviews are usually conducted for respondents who are in the 12th and final round of the MCBS as this interview is short and does not include questions on cost and utilization.

Overview of recruitment of beneficiaries and scheduling procedures

Medicare beneficiaries selected to participate in the MCBS receive a letter and brochure in the mail, introducing the study and explaining that an interviewer from NORC will contact them to schedule an appointment. For Incoming Panel respondents, initial contact is typically made in person; for Continuing respondents, outreach to set an appointment for the next interview is most often made by phone. If respondents are unable to answer questions or require language assistance, respondents 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 respondent if the respondent is incapacitated or unable to complete the interview. For Spanish speaking respondents, a Spanish version of the Community instrument is available and bilingual interviewers conduct the interview.

Computer-Assisted Personal Interviewing (CAPI)

Field interviewers complete MCBS interviews using a Computer-Assisted Personal Interviewing (CAPI) instrument loaded on a laptop computer. 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, clear, 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.

4.5.2: Interviewer Training

Nationally, the MCBS employs an average of approximately 200[9] field interviewers, 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 reminders about how to handle complicated scenarios.

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 is used only for research and statistical purposes. Identifiable information is not disclosed or released except those involved in research without the consent of the individual or the establishment except as required under the Privacy Act of 1974 (Public Law 93-579).

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[9] The fall round starts with a target of 230 field interviewers which, over the course of the year, is reduced due to staff turnover. Each summer, a cohort of new interviewers is hired for the MCBS.

4.6 Completed Interviews

Exhibit 4.6.1 provides the count of completed interviews by component for 2016.

Exhibit 4.6.1: 2016 Completed Interviews by Component

Round	Component	Completed Interviews
Winter 2016	Community	10,984
	Facility	937
Summer 2016	Community	7,524
	Facility	726
Fall 2016	Community	12,952
	Facility	1,099

SOURCE: 2016 MCBS Internal Sample Control File

Exhibit 4.6.2 lists the number of completed interviews for the Fall 2016 Continuing (2013, 2014, and 2015) and Incoming (2016) Panels by age strata. Under the rotating panel design, the beneficiaries selected in Fall 2012 exited the study prior to Fall 2016.

Exhibit 4.6.2: 2016 MCBS Fall Round Completed Interviews: Continuing and Incoming Panels

Age Category as of 12/31/2016	2013 Panel	2014 Panel	2015 Panel	2016 Panel	Total
Under 45 years	150	179	221	688	1,238
45-64 years	179	246	203	500	1,128
65-69 years	176	380	312	1,140	2,008
70-74 years	449	589	413	739	2,190
75-79 years	318	460	483	958	2,219
80-84 years	333	495	472	1,019	2,319
85+ years	393	711	571	1,285	2,960
Total	1,998	3,060	2,675	6,329	14,062

SOURCE: 2016 MCBS Internal Sample Control File

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). The beneficiary's residence status determines which questionnaire component is used and how it is administered. See Exhibit 5.1 for a depiction of the MCBS Questionnaire structure.

- Community Component: Survey of beneficiaries residing in the community at the time of the interview (i.e., their residence or a household). Interview may be conducted with the beneficiary or a proxy.

- Facility Component: Survey of beneficiaries residing in facilities such as long-term care nursing homes or other institutions at the time of the interview. Interviewers do not conduct the Facility component with the beneficiary, but with staff members located at the facility (i.e., facility respondents). This is a key difference between the Community and Facility components.

Within each component, there are two types of interviews – an initial (Baseline) interview administered to new beneficiaries, and an interview administered to repeat (Continuing) beneficiaries as they progress through the study.

- Baseline: The initial questionnaire administered to beneficiaries new to the study; administered in the fall of the year they are selected into the sample (interview #1).

- Continuing: The questionnaire administered to beneficiaries as they progress through the study (interviews #2-12).

Depending on the interview type and data collection season (fall, winter, or summer), the MCBS Questionnaire includes Core and Topical sections. See Sections 5.2 and 5.3 for tables of the 2016 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.

Exhibit 5.1:   MCBS Questionnaire Overview
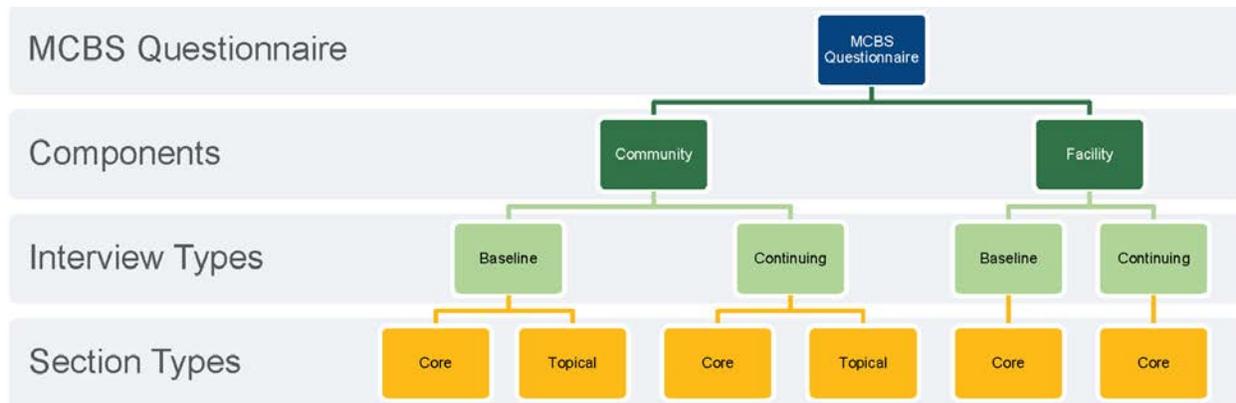
5.2 Community Questionnaire

The content of the MCBS Community questionnaire consists of Core and Topical sections. Core sections include the standard opening and closing sections covering interview characteristics and socio-demographics, health insurance, utilization, cost, experiences with care, and health status sections. The questionnaire sections in each of these categories may be asked each round or seasonally (Fall, Winter, Summer). Topical sections in the Community questionnaire include information about housing characteristics, health behaviors, and knowledge and decision-making.

Different combinations of Core and Topical sections are used depending on a number of criteria, including interview type (Baseline vs. Continuing); the season of the round of data collection (fall, winter, summer); whether the respondent is alive, deceased, or in a facility; and whether the interview is being completed with the beneficiary or a proxy.

The first Community interview conducted with Incoming Panel respondents is referred to as the Baseline interview. This interview is always conducted in the fall round and consists of a combination of Core and Topical sections. However, this first interview does <u>not</u> include Core sections that collect health care utilization and cost data. The respondent's 2nd through 11th interviews, also known as the Continuing interviews, consist of Core and Topical sections including those that collect health care utilization and cost data; these interviews essentially provide three calendar years of reported health care utilization and cost data for each beneficiary. Finally, there is a short 'exit' interview that is conducted in the final summer round; this 12th interview completes the beneficiary's participation in the MCBS; it generally consists of mobility of beneficiaries, preventative care, income and assets, and patient activation sections (and for those who did not have an 11th interview, it completes any utilization data that was still open as of the previous calendar year).

In summary, the Community questionnaire consists of the following components (see Exhibit 5.2):

- Community Baseline questionnaire
- Community Continuing questionnaire (exit interview conducted in final round)

Exhibit 5.2: Overview of the MCBS Community Questionnaire Components

Community Baseline

Conducted:

Always conducted in fall round and only with new respondents for first ever interview

Sections:

Core (excluding health care utilization and cost sections) and Topical

Community Continuing

Conducted:

3 calendar years post Baseline

Sections:

Core & Topical

Community Exit

Conducted:

Final round

Sections:

Mobility, preventative care, income and assets, patient activation, health care utilization and cost (if not already complete)

5.2.1 Baseline Interview

As the first interview conducted, the Baseline interview provides an opportunity for the field interviewer to develop a strong rapport and connection with the respondent, acquaint the respondent with the intent of the survey, and emphasize the importance of keeping accurate records of medical care and expenses. Whenever possible, field interviewers are assigned the same beneficiary over the course of their participation in the survey so establishing a positive relationship is critical during this first interview. Exhibit 5.2.1 depicts the sections and flow of the Community Baseline interview.

Exhibit 5.2.1: 2016 MCBS Community Questionnaire Flow for Baseline Interview
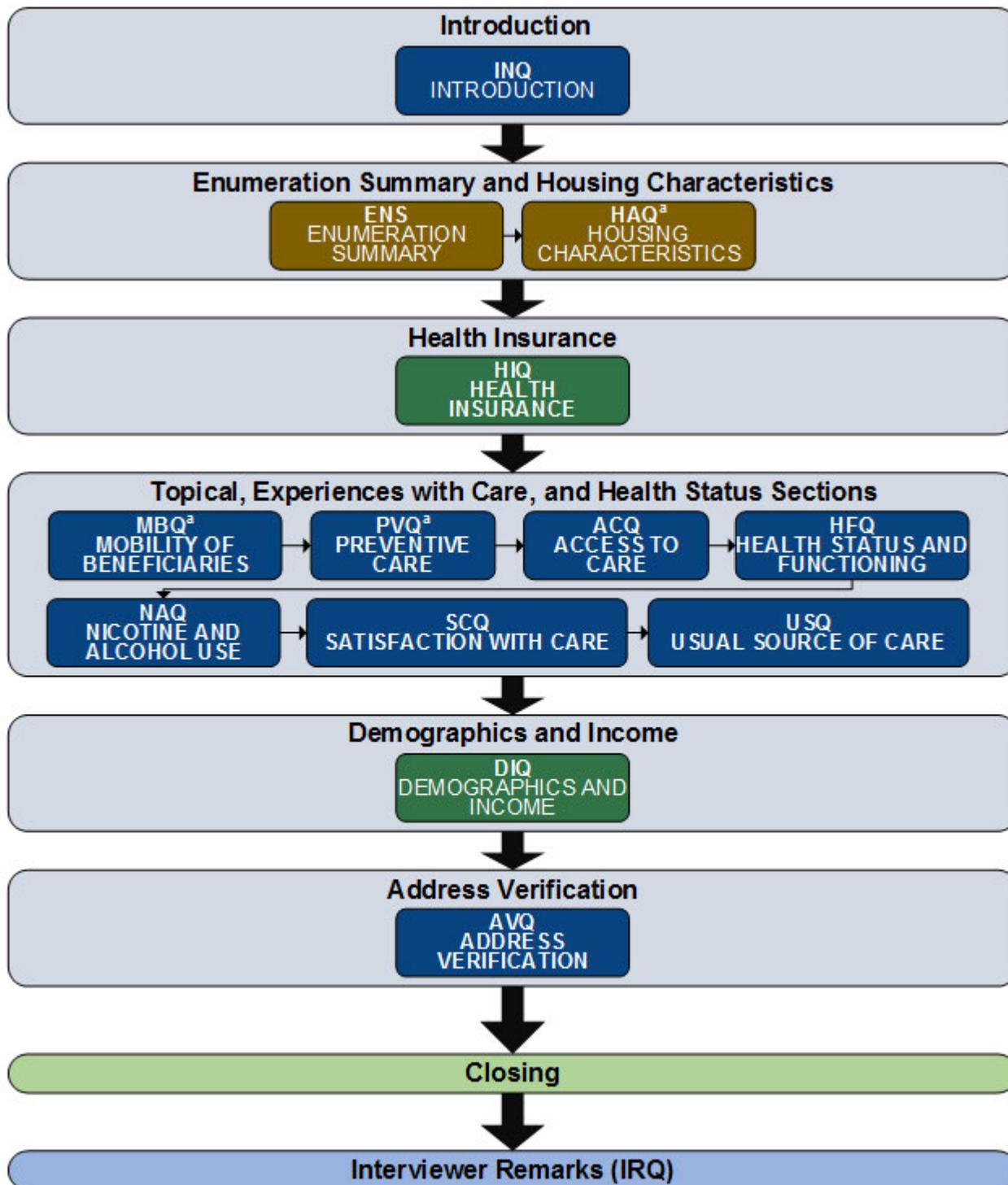
a = Topical Section

5.2.2 Continuing Interview

The Continuing interview consists of Core sections that focus on use of medical services and the resulting costs, and are asked in essentially the same way each and every time a section is administered. The

respondent is asked about new health events, and to complete any partial information that was collected in the last interview. For example, the respondent may mention a doctor visit during the health care "utilization" part of the interview. In the "cost" section, the field interviewer will ask if there are any receipts or statements from the visit. If the answer is "yes", the field interviewer will record information about costs from the statements, but if the answer is "no," the question will be stored until the next interview. The Continuing interview also includes sections about health insurance. During each interview, the respondent is asked to verify ongoing health insurance coverage and to report any new health insurance plans.

Continuing interviews also include Topical sections that cover subjects such as mobility or drug coverage. Exhibit 5.2.2 depicts the sections and flow of the Continuing Community interview. All sections are considered "Core" sections unless otherwise noted.

Exhibit 5.2.2: 2016 MCBS Community Questionnaire Flow for Continuing Interview
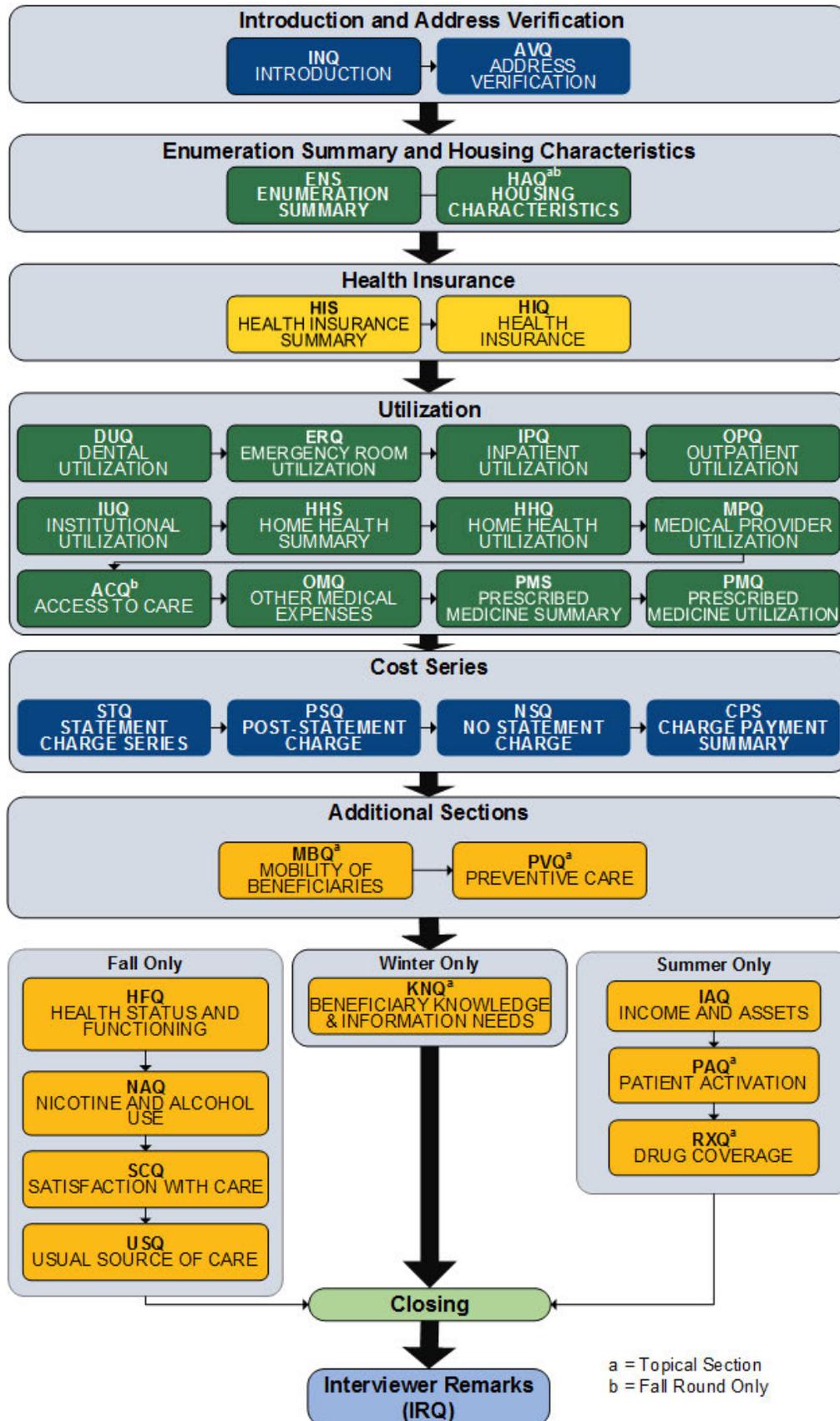
5.2.3 Core Questionnaire Sections

New respondents receiving the Baseline interview do not receive Core sections about health care utilization and costs; these sections are reserved for Continuing respondents. As such, in Fall 2016, only persons in the 2013, 2014, and 2015 panels received the Core sections about health care utilization and health care costs. All panels received the health insurance section. Exhibit 5.2.3 displays the Core Community questionnaire sections that are included in the Survey File and the Cost Supplement File.

Exhibit 5.2.3: 2016 MCBS Community Core Sections by Data File and Administration Schedule*

Section Group	Abbr.	Section Name	Survey File	Cost Supplement File	Administrative Season
Socio-Demographics	IAQ	Income and Assets	X		Summer**
	DIQ	Demographics/Income	X		Fall, Baseline Interview
Health Insurance	HIS	Health Insurance Summary***	X		All Seasons
	HIQ	Health Insurance	X		All Seasons
Utilization	DUQ	Dental Utilization		X	All Seasons
	ERQ	Emergency Room Utilization		X	All Seasons
	IPQ	Inpatient Hospital Utilization		X	All Seasons
	OPQ	Outpatient Hospital Utilization		X	All Seasons
	IUQ	Institutional Utilization		X	All Seasons
	HHS	Home Health Summary**		X	All Seasons
	HHQ	Home Health Utilization		X	All Seasons
	MPQ	Medical Provider Utilization		X	All Seasons
	OMQ	Other Medical Expenses Utilization		X	All Seasons
	PMS	Prescribed Medicine Summary***		X	All Seasons
	PMQ	Prescribed Medicine Utilization		X	All Seasons
Cost	STQ	Statement Cost Series		X	All Seasons
	PSQ	Post-Statement Charge		X	All Seasons
	NSQ	No Statement Charge		X	All Seasons
	CPS	Charge Payment Summary***		X	All Seasons
Experiences with Care	ACQ	Access to Care	X		Fall
	SCQ	Satisfaction with Care	X		Fall
	USQ	Usual Source of Care	X		Fall
Health Status	HFQ	Health Status and Functioning	X		Fall

SOURCE: 2016 MCBS Community Questionnaire

*Certain procedural or operational management sections are collected specifically to manage the data collection process. These sections are not directly included in the LDS files (e.g., Introduction (INQ), Address Verification (AVQ), Enumeration (ENS), Closing (CLQ), and Interview Remarks (IRQ)).

**The IAQ is administered in the Summer round following the current data year.

***Summary sections: Updates and corrections are collected through the summary sections. The respondent is asked to verify summary information gathered in previous interviews. Changes are recorded if the respondent reports information that differs from what was previously recorded.

5.2.4 Topical Questionnaire Sections

Exhibit 5.2.4 lists the topical sections and administration season. Note that information collected via topical questionnaire sections are included in the Survey File only and are not included in the Cost Supplement File. In addition, some topical questionnaire data are collected through the summer following the current data year (i.e., IAQ, KNQ, PVQ, PAQ, and RXQ). Annually, special non-response adjustment weights are included within the segments for use in analysis when data are not collected within the same calendar year (see Exhibit 8.1.1).

Exhibit 5.2.4: 2016 MCBS Community Topical Sections by Administration Schedule

Section Group	Abbr.	Section Name	Traditional Season	Administrative Season
Housing Characteristics	HAQ	Housing Characteristics	Fall only	Fall 2016
Health Behaviors	MBQ	Mobility of Beneficiaries	All seasons	Winter 2016, Summer 2016, Fall 2016
	NAQ	Nicotine and Alcohol Use	Fall only	Fall 2016
	PVQ	Preventive Care	All seasons	Fall 2016, Winter 2017, Summer 2017
	IAQ	Food Insecurity	Summer only	Summer 2017
Knowledge and Decision Making	KNQ	Beneficiary Knowledge and Information Needs	Winter only	Winter 2017
	PAQ	Patient Activation	Summer only	Summer 2017
	RXQ	Drug Coverage	Summer only	Summer 2017

5.2.5 Community Questionnaire Section Rotation within a Data Year

Exhibit 5.2.5 presents the MCBS Questionnaire section rotation schedule for 2016. Thus, the 2016 MCBS data releases reflect data collected from January 2016 through the first week in January 2017, as well as topical modules collected through Summer 2017.

Exhibit 5.2.5: 2016 MCBS Community Questionnaire Section Rotation
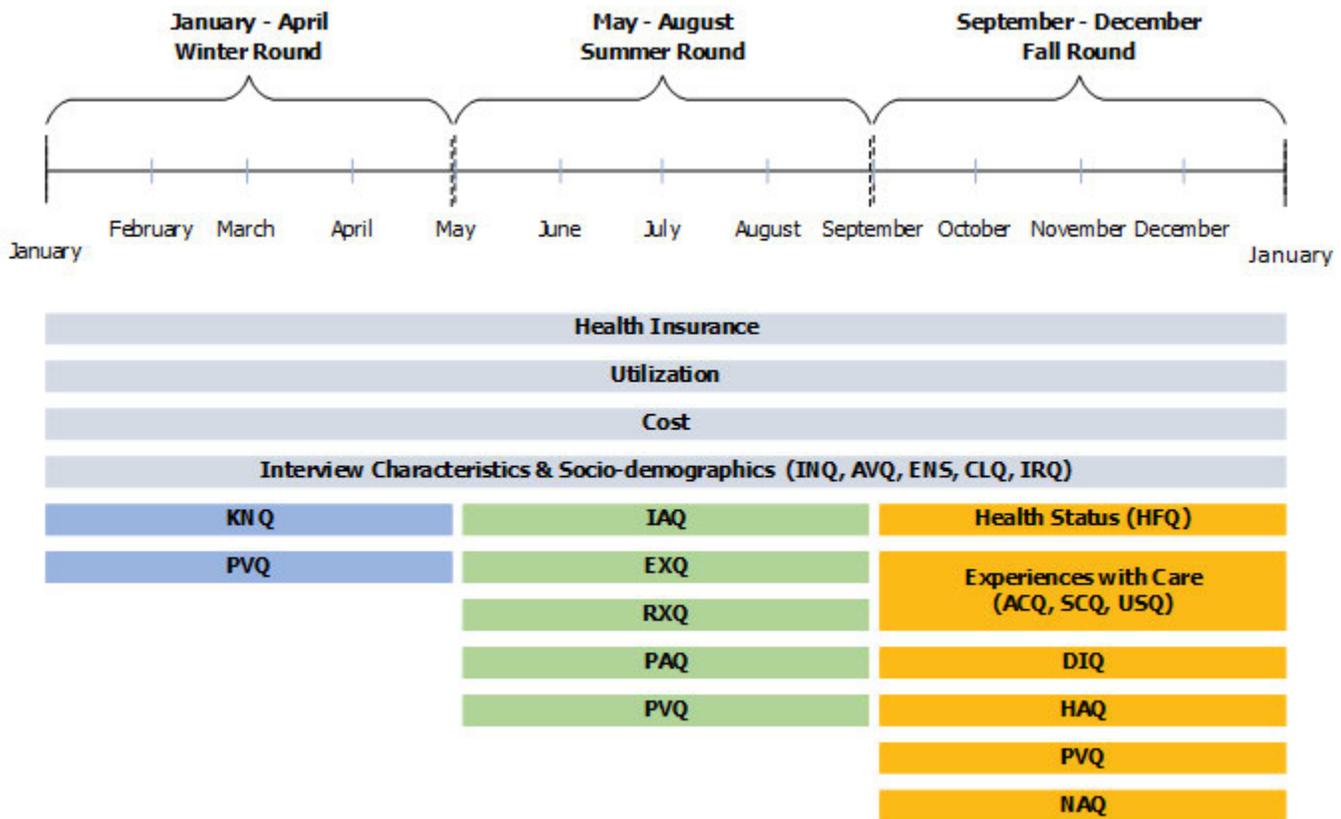
5.3 Facility Instrument

In addition to collecting information from respondents living in the community, the MCBS collects information at the institutional level if the beneficiary is residing in a facility at the time of the interview. Information is obtained only by interviewing facility staff; the beneficiary is never interviewed directly.

Similar to the Community questionnaire, if a beneficiary is living in a facility when first selected to participate in the MCBS, a Facility Baseline interview is conducted. For cases in the 2nd through 11th round, a Facility Continuing interview is conducted. While administration of the Facility instrument sections varies by season and interview type, the Facility instrument is comprised exclusively of Core sections; each section collects information that is considered of critical importance to the MCBS.

If an institutionalized person returns to the community, a Community questionnaire is conducted. If the beneficiary spent part of the reference period in the community and part in a facility, then a separate interview is conducted to collect information pertaining to the beneficiary's experiences covering each distinct period of time. In this way, a beneficiary is followed in and out of facilities and a continuous record is maintained regardless of the location of the beneficiary.

In summary, the Facility instrument consists of the following components (see Exhibit 5.3):

- Facility Questionnaire (establishes that the facility meets the MCBS Facility interview requirements)
- Facility Baseline interview
- Facility Continuing interview

Exhibit 5.3: Overview of the MCBS Facility Instrument

Facility Questionnaire

Conducted:

This is the first section within the Facility Instrument and is used to confirm that a facility meets the MCBS definition

Sections:

Core

Facility Baseline Interview

Conducted:

Only if respondent lives in Facility for first ever MCBS interview

Sections:

Core

Facility Continuing Interview

Conducted:

Three years post Baseline

Sections:

Core

5.3.1 Facility Baseline Interview

The Facility Baseline interview (see Exhibit 5.3.1) serves as a reference interview and gathers information on the facility itself as well as the health status, insurance coverage, residence history and demographic information for the beneficiary.

Exhibit 5.3.1: 2016 MCBS Facility Instrument Flow for Baseline Interview
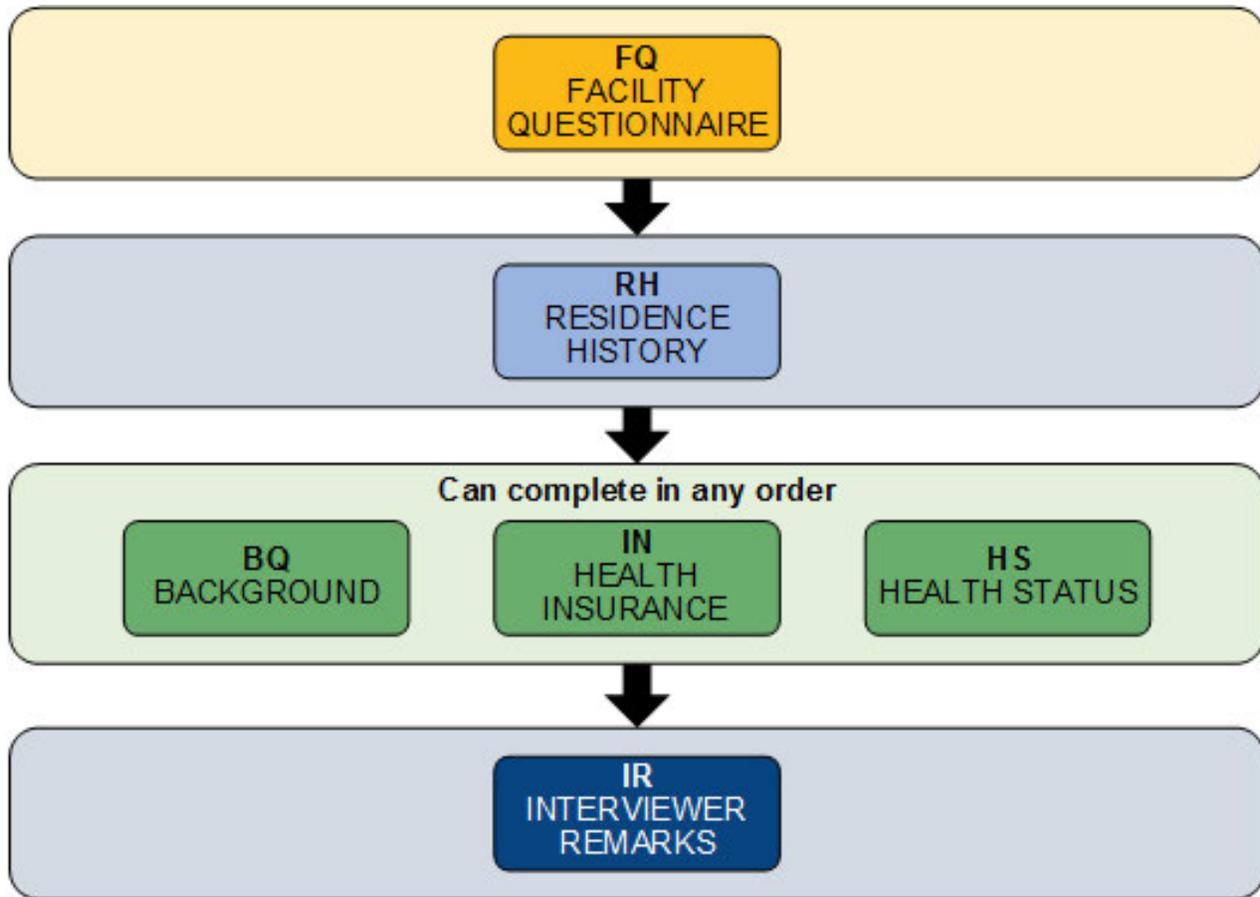
5.3.2 Facility Continuing Interview

Exhibit 5.3.2 illustrates the flow of the Facility Continuing interview sections. Note that beneficiaries who move to a facility from the community (Community to Facility cases), move to a new facility (Facility to Facility cases), or move to the community from the facility (Facility to Community cases) receive a different combination of Facility Continuing sections than beneficiaries who have lived continuously in the same facility.

Exhibit 5.3.2: 2016 MCBS Facility Instrument Flow for Continuing Interviews

FQ
FACILITY
QUESTIONNAIRE

RH
RESIDENCE
HISTORY

Can complete in any order

BQ
BACKGROUND

IN
HEALTH
INSURANCE

HS
HEALTH STATUS

US
USE OF HEALTH
SERVICES

PM
PRESCRIBED
MEDICINES

EX
EXPENDITURES

IR
INTERVIEWER
REMARKS
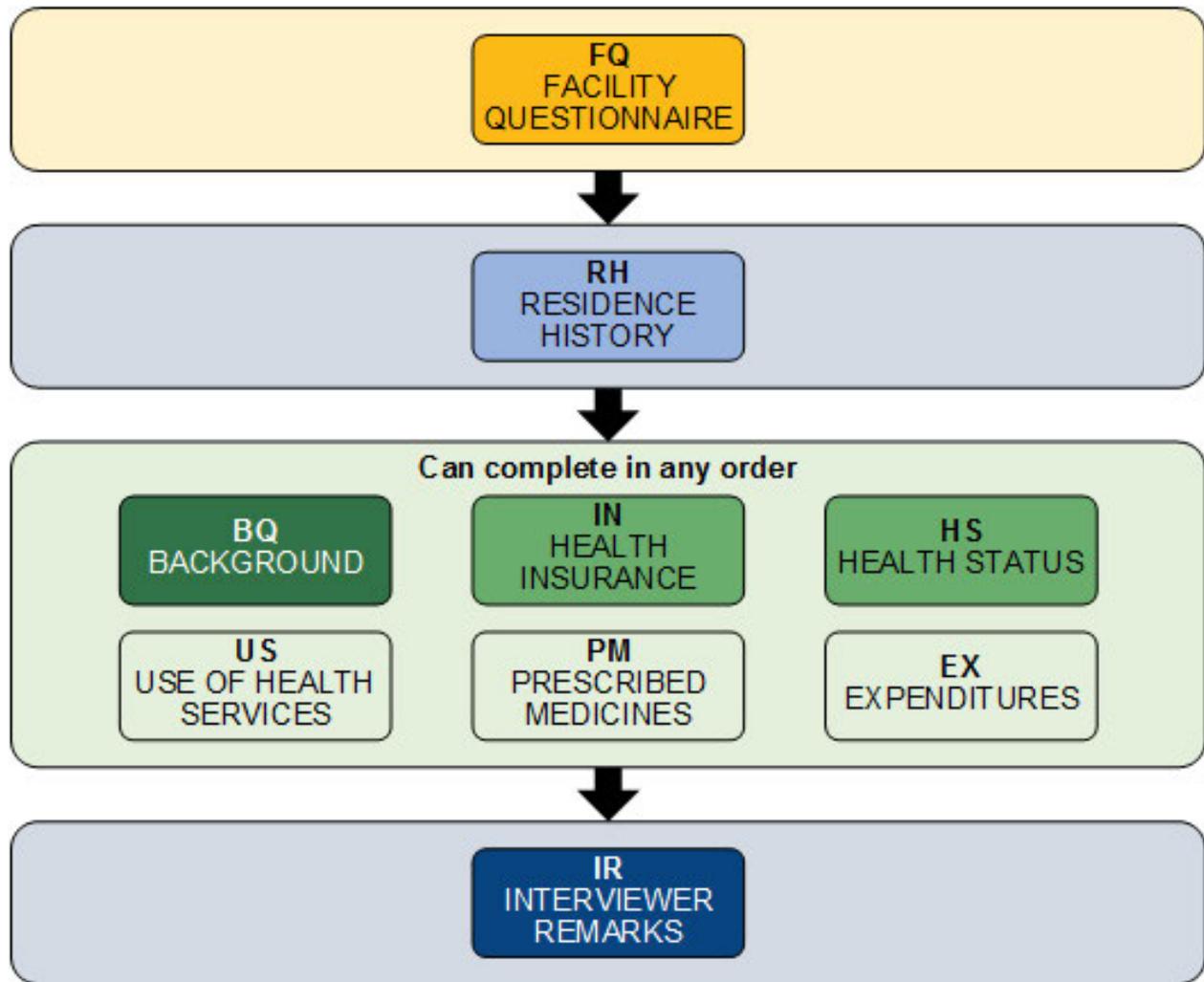
Administered only for Community to Facility interviews

Administered to all sample types in Fall round. Otherwise, administered only for Community to Facility, Facility to Facility, and for beneficiaries residing in a Facility whose last interview was a Community interview and who completed a Facility interview in a prior round.

Administered for all Facility interviews

5.3.3 Facility Continuing Core Sections

The sections depicted in Exhibit 5.3.3 parallel the Core sections for the Community component. These sections of the Facility Continuing interview are administered in the same rotation as the Community Continuing interview (the 2nd through the 11th rounds), however beneficiaries new to a facility receive additional Core sections.

Similarly to the Community questionnaire, operational management/procedural data is collected through the Interviewer Remarks (IR) section, which is completed by the interviewer and primarily used for case finalization. Exhibit 5.3.3 summarizes each component of the Facility questionnaire by data release.

Exhibit 5.3.3: 2016 MCBS Facility Core Sections by Data File and Administration Schedule*

Section Group	Abbrev	Section Name	Survey File	Cost Supplement File	Administrative Season
Facility Characteristics	FQ	Facility Questionnaire	X		All seasons
Socio-Demographics	RH	Residence History	X		All seasons
	BQ	Background	X		Fall**
Health Insurance	IN	Health Insurance	X		Fall***
Utilization	US	Use of Health Services		X	All seasons
	PM	Prescribed Medicines		X	All seasons
Cost	EX	Expenditures		X	All seasons
Health Status	HS	Health Status	X		Fall***

SOURCE: 2016 MCBS Facility Instrument

*Certain procedural or operational management sections are collected specifically to manage the data collection process. These sections are not directly included in the LDS files (e.g., Interview Remarks (IR)).

**The BQ section is also administered to Community to Facility cases each season.

***The IN and HS sections are also administered to Community to Facility and Facility to Facility cases each season.

6. SAMPLING

6.1 Medicare Population Covered by the 2016 MCBS Data

The MCBS data releases are a reflection of enrolled Medicare beneficiaries residing in the continental U.S. and Puerto Rico. Excluded from both populations are residents of foreign countries and U.S. possessions and territories other than Puerto Rico. 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 2016 as well as those who dis-enrolled or died prior to their fall interview.[10] The ever enrolled population includes beneficiaries who were enrolled in Medicare for at least one day at any point during 2016.

- The continuously enrolled population represents only those individuals continuously enrolled in Medicare from January 1, 2016 up to and including their fall interview; this specifically, excludes beneficiaries who enrolled during the calendar year 2016 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.

Exhibits 6.1.1 and 6.1.2 present estimates of the size of the continuously enrolled and ever enrolled Medicare populations by race, and age (as of December 31, 2016) for male and female beneficiaries. Exhibit 6.1.3 presents the aggregated estimates of the size of the two Medicare populations overall and by sex and race.

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[10] Note that data collection for beneficiaries who enrolled during 2016 and died in 2016 after enrollment but before their fall interview was still pursued through attempts at conducting proxy interviews.

Exhibit 6.1.1: 2016 Estimated Male Medicare Beneficiaries by Race and Age

Race	Age as of 12/31/2016	Continuously Enrolled	Ever Enrolled
White non-Hispanic	0-44	550,991	587,676
	45-64	2,268,922	2,231,865
	65-69	4,074,509	4,574,823
	70-74	4,273,751	4,364,755
	75-79	2,925,189	3,069,766
	80-84	2,030,708	2,184,499
	85+	1,862,107	2,115,839
Black non-Hispanic	0-44	170,652	184,226
	45-64	530,133	512,861
	65-69	585,473	649,776
	70-74	410,155	418,070
	75-79	355,025	346,021
	80-84	171,409	193,198
	85+	125,701	134,460
Hispanic	0-44	87,744	92,890
	45-64	349,131	327,412
	65-69	381,247	412,692
	70-74	413,358	428,256
	75-79	308,337	326,704
	80-84	149,440	165,024
	85+	141,416	185,275
Other*	0-44	98,707	153,143
	45-64	252,946	419,147
	65-69	1,224,660	2,007,850
	70-74	231,622	229,406
	75-79	105,488	111,051
	80-84	74,270	79,348
	85+	77,226	81,643

SOURCE: 2016 Survey File and Sample Control File, weighted counts.

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

Exhibit 6.1.2: 2016 Estimated Female Medicare Beneficiaries by Race and Age

Race	Age as of 12/31/2016	Continuously Enrolled	Ever Enrolled
White non-Hispanic	0-44	447,607	481,400
	45-64	2,308,872	2,305,659
	65-69	4,707,025	5,075,570
	70-74	5,229,495	5,340,843
	75-79	3,699,268	3,754,010
	80-84	2,535,153	2,691,465
	85+	3,172,845	3,591,905
Black non-Hispanic	0-44	163,029	172,452
	45-64	660,983	636,806
	65-69	662,716	676,979
	70-74	573,565	598,733
	75-79	415,839	442,100
	80-84	299,779	311,470
	85+	315,209	356,083
Hispanic	0-44	107,308	109,926
	45-64	340,184	347,169
	65-69	491,585	544,055
	70-74	598,740	631,424
	75-79	349,362	352,008
	80-84	214,579	233,124
	85+	266,687	291,505
Other*	0-44	66,112	98,648
	45-64	210,921	357,140
	65-69	1,016,236	2,009,176
	70-74	244,206	270,212
	75-79	107,437	109,680
	80-84	141,283	139,133
	85+	120,762	125,090

SOURCE: 2016 Survey File and Sample Control File, weighted counts.

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

Exhibit 6.1.3: 2016 Total Estimated Medicare Beneficiaries by Sex and Race

Group	Subgroup	Continuously Enrolled	Ever Enrolled
Overall Total		53,697,103	58,641,440
Sex	Male Total	24,230,315	26,587,675
	Female Total	29,466,788	32,053,765
Race	White non-Hispanic Total	40,086,442	42,370,075
	Black non-Hispanic Total	5,439,669	5,633,233
	Hispanic Total	4,199,117	4,447,464
	Other Total*	3,971,875	6,190,667

SOURCE: 2016 Survey File and Sample Control File, weighted counts.
*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 2013 and 2014 (the two rounds in which the 2013 and 2014 Panels included in the 2016 MCBS data were first selected), the targeted populations for the new panels included those individuals enrolled as of January 1 of 2013 and 2014 respectively. For Fall Rounds 2015 and 2016 (the two rounds in which the 2015 and 2016 Panels included in the 2016 MCBS data were selected), the targeted population for the new panels included those individuals enrolled as of December 31 of 2015 and 2016, respectively.

The universe of beneficiaries for the MCBS is divided into seven sampling strata based on age as of a specified date during the calendar year of the data release. Beginning in 2015, this date was moved from July 1 to December 31 of the sampling year in order to include all beneficiaries enrolling during the sampling year. The age categories are: under 45, 45 to 64, 65 to 69, 70 to 74, 75 to 79, 80 to 84, and 85 or older. Beginning in 2015, the strata were expanded to separate U.S. Hispanic, U.S. non-Hispanic, and Puerto Rican beneficiaries by age group. The 21 strata in 2016 include those depicted in Exhibit 6.2.1.

Exhibit 6.2.1: 2016 MCBS Sampling Strata

U.S. Hispanic	U.S. Non-Hispanic	Puerto Rican Resident
Under 45 years U.S. Hispanic	Under 45 years U.S. non-Hispanic	Under 45 years Puerto Rican resident
45 - 64 U.S. Hispanic	45 - 64 U.S. non-Hispanic	45 - 64 Puerto Rican resident
65 - 69 U.S. Hispanic	65 - 69 U.S. non-Hispanic	65 - 69 Puerto Rican resident
70 - 74 U.S. Hispanic	70 - 74 U.S. non-Hispanic	70 - 74 Puerto Rican resident
75 - 79 U.S. Hispanic	75 - 79 U.S. non-Hispanic	75 - 79 Puerto Rican resident
80 - 84 U.S. Hispanic	80 - 84 U.S. non-Hispanic	80 - 84 Puerto Rican resident
85 and over U.S. Hispanic	85 and over U.S. non-Hispanic	85 and over Puerto Rican resident

Additionally, in the 2013 and 2014 Panels, beneficiaries in an ACO were oversampled, and in the 2015 and 2016 Panels, beneficiaries residing within the U.S. who were Hispanic (based on a Hispanic ethnicity

classification code in the Medicare enrollment data; see Eicheldinger[11] for more details) were oversampled. Exhibit 6.2.2 displays the beneficiaries selected as part of the 2016 Panel, by age and ethnicity.

Exhibit 6.2.2: 2016 Panel of Selected Beneficiaries by U.S. Hispanic and U.S. Non-Hispanic Ethnicity Classification and Age Category

Age Category as of 12/31/2016	TOTAL Sample Size	TOTAL Weighted	U.S. Hispanic Sample Size	U.S. Hispanic Weighted	U.S. Non-Hispanic Sample Size	U.S. Non-Hispanic Weighted	Puerto Rican Sample Size	Puerto Rican Weighted
Under 45 years	1,302	1,796,137	116	178,649	1,174	1,609,734	---	7,754
45-64 years	836	7,185,118	67	568,425	759	6,551,768	22*	64,925
65-69 years	2,386	15,948,528	192	1,031,611	2,165	14,838,310	29	78,607
70-74 years	1,425	12,387,493	111	801,401	1,295	11,514,335	19	71,757
75-79 years	1,799	8,343,076	134	588,038	1,640	7,694,757	25	60,281
80-84 years	1,888	5,749,163	159	329,218	1,709	5,385,394	20	34,552
85+ years	2,509	6,522,762	208	335,055	2,275	6,151,237	26	36,469
Total	12,145	57,932,277	987	3,832,398	11,017	53,745,535	141	354,344

SOURCE: 2016 MCBS Internal Sample Control File

*For Puerto Rican counts, beneficiaries in age categories 'Under 45 years' and '45-64 years' are combined such that all cell sizes meet non-disclosure standards.

6.3 Primary and Secondary Sampling Units

All of the panels in the 2016 data releases are distributed across the redesigned sample of 107 PSUs selected in 2001.[12] 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.

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 21 sampling strata. Within the selected PSUs and SSUs, a systematic sampling scheme with random starts is employed for selecting beneficiaries.[13] 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. A brief summary of the number of selected beneficiaries and the inclusion criteria for the 2013 – 2016 Panels is provided in Exhibit 6.4.

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[11] Eicheldinger, C. "More Accurate Racial and Ethnic Codes for Medicare Administrative Data," *Health care financing review* 29, no. 3.

[12] 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.

[13] The MCBS 2016 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.

Exhibit 6.4:   2016 MCBS Sample Selection for the LDS Releases

Panel	# of Selected Beneficiaries	Previously Enrolled Beneficiaries Still Alive as of January 1 of Panel Year	Newly Enrolled Beneficiaries Since Last Panel Selection[*]
2013	7,400	Enrolled on or before 1/1/2012	Enrolled 1/2/2012 – 1/1/2013
2014	11,398	Enrolled on or before 1/1/2013	Enrolled 1/2/2013 – 1/1/2014
2015	8,621	Enrolled on or before 1/1/2014	Enrolled 1/2/2014 – 12/31/2015
2016	12,145	Enrolled on or before 1/1/2015	Enrolled 1/1/2016 – 12/31/2016

SOURCE: 2016 MCBS Internal Sample Control File

*Newly enrolled beneficiaries need not be living as of January 1st of the panel year; because these beneficiaries were not eligible for selection in any previous panels and could have incurred medical costs any time after enrollment, they are eligible for selection into the current panel regardless of vital status.

7. DATA PRODUCTS & DOCUMENTATION

7.1 Contents of Data Release

MCBS data are made available via releases of annual files. For 2016, two annual LDS releases (the Survey File and the Cost Supplement File), and one PUF (based on the Survey File data only) are planned. The LDS releases contain multiple files, called segments, which are easily linkable through a common beneficiary key ID. The Survey File LDS contains 4,043 variables across 37 segments and the Cost Supplement LDS contains 636 variables across 10 segments.

Below we present a general overview of the contents of each data release and the associated documentation. Detailed descriptions of each segment, including the core contents of each segment, key variable definitions, and special notes on new variables, recodes, and administrative sources for select variables can be found in the data release-specific documents (see MCBS Data User's Guide: Survey File and MCBS Data User's Guide: Cost Supplement File).

Exhibit 7.1 displays the components of each LDS release. Both the Survey File and Cost Supplement File contain data segments, codebooks, questionnaires and technical documentation. The Survey File release contains the Fee-for-Service (FFS) claims data, which provide CMS administrative information on medical services and payments paid by Medicare claims; claims data for Medicare Advantage beneficiaries are not available. While users can conduct analyses with the Survey File alone, users interested in the Cost Supplement File data will need both LDS files to link cost and utilization variables with demographic or health insurance coverage variables.

Data users should note that some questionnaire sections are asked in the calendar year following the LDS file data year. The reason for this delay is that the reference period, or the timeframe to which the questionnaire item refers, is the prior year. For example, the Income and Assets Questionnaire (IAQ) asks about 2016 income in the 2017 calendar year in order to capture a beneficiary's complete income record for 2016. For survey questions such as these, the calendar year following the LDS file data year is the most reasonable time period to collect the information. Data are released with this in mind. As such, IAQ data collected in Summer 2017 are released with the 2016 LDS files.

Alternatively, data may be pulled forward from a prior data collection year. For example, a beneficiary in 2013 that answered affirmative to the question, "Have you ever had a hysterectomy?" will have that answer pulled forward to the 2016 data.

Exhibits 7.1.1 and 7.1.2 designate each segment included in the Survey File and Cost Supplement File along with the abbreviation, description, and the equivalent historic segment from the 1991-2013 data release structure.

Exhibit 7.1: 2016 Contents of Data Releases
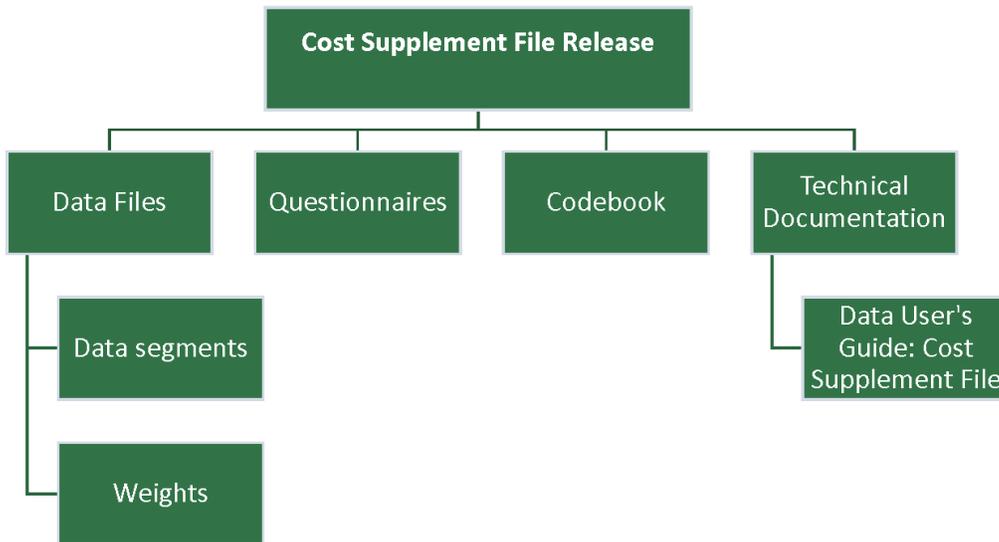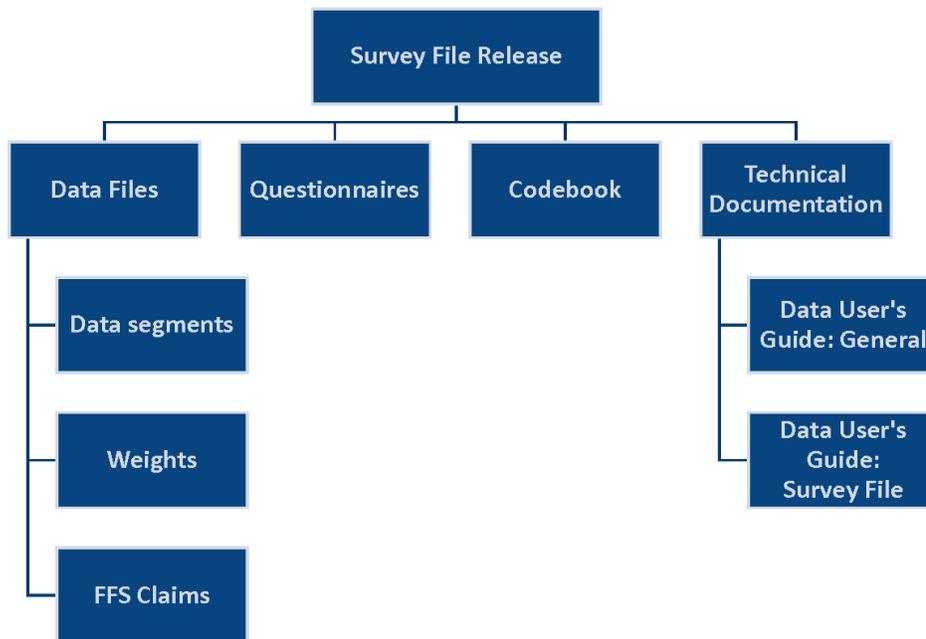
7.1.1 2015 MCBS Survey File

The Survey File contains data collected directly from respondents and supplemented by administrative items plus the facility (non-cost) information and FFS claims. The Survey File includes multiple topic-related segments, including health status and limitations, access to care, health insurance coverage, and household characteristics. The Survey File also includes information on Facility interviews including a residence timeline, facility characteristics, and assessment (Minimum Data Set) measures. Finally, Topical questionnaire sections (e.g., beneficiary knowledge, drug coverage) are included with this release. To facilitate analysis, the information collected in the survey is augmented with data on the use and program cost of Medicare services from Medicare claims data and administrative data.

Exhibit 7.1.1: 2016 MCBS Survey File Segments and Contents

Survey File Segment	Segment Abbrev	Description	Historic RIC Segment	Respondent Type (C, F, B)*
Access to Care	ACCESSCR	Survey responses related to ability to obtain health care, delay of care related to costs, and reasons for not obtaining needed health care	3	C
Administrative Utilization Summary	ADMNUTLS	Summarized administrative information on Medicare, program expenditures, and utilization	A	B
Assistance	ASSIST	Identifies the person helping and type of assistance that the beneficiary may receive performing ADLs and IADLs (e.g., assistance with dressing, shopping, eating).	2H	C
Beneficiary Demographics	DEMO	Demographic information collected in the survey and enhanced by Medicare Administrative data.	1, 9, A, K	B
Chronic Conditions	CHRNCOND	Survey responses related to chronic and other diagnosed medical conditions.	2, 2P	C
Dental Care Access	DENTAL	Asks respondents about their access to dental care, and why they may not have had dental care.	New	C
Diabetes	DIABETES	Survey responses related to diabetes management such as insulin usage.	New	C
Facility Assessments	FACASMNT	Assessment information conducted while the beneficiary was a resident in a Medicare approved or non-Medicare approved facility.	2F	F
Facility Characteristics	FACCHAR	Contains primarily information from the Facility Questionnaire, plus Skilled Nursing Facility (SNF) stay information, which could include Community residents.	7, 7S	B
Falls	FALLS	Survey responses related to injuries and attitudes related to falls.	2, 2P	C
Food Insecurity	FOODINS	Information regarding the beneficiary's availability to obtain sufficient food. The FOODINS data that was collected in Summer 2017 is released with the 2016 Survey File given that the reference period is 2016. Special non-response adjustment weights are included with this file.	New	C

Survey File Segment	Segment Abbrev	Description	Historic RIC Segment	Respondent Type (C, F, B)*
General Health	GENHLTH	Survey responses regarding a beneficiary's general health status and functioning such as height and weight.	2	C
Health Insurance Summary	HISUMRY	Information on the characteristics of insurance coverage as well as information regarding premiums, co-pays, deductibles, what is covered, and capitated payments.	4, A	B
Health Insurance Timeline	HITLINE	Types of insurance plans and the coverage eligibility timeline.	4, A	B
Household (HH) Characteristics	HHCHAR	Information about the beneficiary's household and home.	5	B
Income and Assets	INCASSET	Data on a beneficiary's income and assets. Income and Assets (IAQ) data were collected in Summer 2017 but released with the 2016 Survey File, because the reference period is 2016. Special non-response adjustment weights are included with this file.	1, Income Asset	B
Interview Characteristics	INTERV	Summarizes the characteristics of the interview such as the type of interview conducted and whether or not a proxy was used.	4, 8, 9, K	B
Medicare Advantage (MA) Plan Questions	MAPLANQX	Augments information from the Access to Care and Satisfaction with Care sections of the questionnaire for beneficiaries enrolled in Medicare Part C.	H	C
Medicare Plan Beneficiary Knowledge	MCREPLNQ	Information about the beneficiary's experience with the Medicare open enrollment period and knowledge about Medicare covered expenses. The Knowledge of Beneficiaries (KNQ) data were collected in Winter 2017 but released with the 2016 Survey File, because the reference period is 2016. Special non-response adjustment weights are included with this file.	KN	C
Minimum Data Set	MDS3	Assessment information conducted while the beneficiary was in an approved Medicare Facility.	MDS, 10	B
Mental Health	MENTHLTH	Survey responses regarding the beneficiary's mental health such as feelings of anxiety or depression.	New	C
Mobility	MOBILITY	Information on the beneficiary's use of available transportation options and whether the beneficiary's health affects their daily travel.	New	C
NAGI Disability	NAGIDIS	Information on difficulties with beneficiary's performance of activities of daily living.	2, 2H, 2P	C

Survey File Segment	Segment Abbrev	Description	Historic RIC Segment	Respondent Type (C, F, B)*
Nicotine and Alcohol	NICOALCO	Information on the prevalence and frequency of alcohol and nicotine use.	2, 2P	C
Outcome and Assessment Information	OASIS	Assessment information conducted while the beneficiary was receiving home health services.	OAS, 10	B
Patient Activation	PNTACT	This questionnaire section is designed to assess the degree to which Medicare beneficiaries actively participate in their own health care and decisions concerning that care. PAQ data were collected in Summer 2017, but released with the 2016 Survey File because the reference period is 2016. Special non-response adjustment weights are included with this file.	PA	C
Preventive Care	PREVCARE	Data on preventative services such as vaccinations and routine screening procedures.	2, 2P	C
Part D Drug Plan Experience	RXPARTD	Augments information from the Access to Care and Satisfaction with Care sections of the questionnaire for those enrolled in Medicare Part D. Drug Coverage (RXQ) data were collected in Summer 2017, but released with the 2016 Survey File because the reference period is 2016. Special non-response adjustment weights are included with this file.	RX	C
Prescription Medicine Usage	PMUSE	Information about prescription medication usage including how beneficiaries pay for prescriptions and why they may not obtain a prescription.	3	C
Residence Timeline	RESTMLN	Where the beneficiary resided over the course of the year.	6, 9, A, K	B
Satisfaction with Care	SATWCARE	Data on satisfaction with health care and reasons why beneficiaries do not seek medical care.	3	C
Usual Source of Care	USCARE	Data on where and how the beneficiary typically seeks medical care.	2, 3	C
Vision and Hearing	VISHEAR	Information on the beneficiary's eye health and hearing status.	2	C
Weights	CENWGTS EVRWGTS LNG2WGTS LNG4WGTS	The weights file provides: longitudinal weights for the continuously enrolled population, general-purpose cross-sectional weights, a series of replicate weights, and weights to represent the ever enrolled population.	X, XE, X3, X4	B

Survey File Segment	Segment Abbrev	Description	Historic RIC Segment	Respondent Type (C, F, B)*
Fee-for-Service Claims	FFS	These files include abbreviated FFS claims data. Claims-like data will be included as they become available in subsequent years (e.g., Encounter Data, Medicaid claims data).	Research Claims	B

* = Respondent type describes the expected setting where beneficiaries resided during the course of the calendar year (i.e., C = respondent only resided in the community and only completed Community-administered survey instruments, F = respondent only resided in a facility and only completed Facility-administered survey instruments, or B = respondents completed instruments in both settings). In each data year, some differences by segment will exist (i.e., data may reflect a prior or future calendar year due to the specific questionnaire and reference period used to collect the information).

7.1.2 2016 MCBS Cost Supplement File

The Cost Supplement File contains both individual event and summary files and can be linked to the Survey File to conduct analyses on healthcare cost and utilization. The Cost Supplement File links survey-reported events to Medicare FFS claims and provides a comprehensive picture of health services received, amounts paid, and sources of payment, including those not covered by Medicare. Survey-reported data include information on the use and cost of all types of medical services, as well as information on supplementary health insurance costs. Medicare FFS claims data include administrative and billing information on the use and cost of inpatient hospitalizations, outpatient hospital care, physician services, home health care, durable medical equipment, skilled nursing home services, hospice care, and other medical services.[14] The Cost Supplement File can support a broader range of research and policy analyses on the Medicare population than would be possible using either survey data or administrative claims data alone.

The Cost Supplement File undergoes a careful reconciliation process to separately identify and flag health care services reported: 1) from the survey alone, 2) from the claims data alone, and 3) from both sources. This process results in a file with a much more complete and accurate picture of health services received, amounts paid, and sources of payment. Due to the added processing time required to reconcile survey reported events with the claims data, this file is generally released 18 months after the close of the calendar year for data collection.

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[14] Only Medicare claims for beneficiaries enrolled in Medicare Fee-for-Service (FFS, often called 'traditional' Medicare), are available for linkage; similar claims information for Medicare Advantage (MA) beneficiaries is not available. To the extent that health care use and costs may be underreported in the survey, or reported differentially between FFS and MA beneficiaries, this will be reflected in the data as MA beneficiaries' information will not be supplemented by claims data. In 2016, MA beneficiaries accounted for nearly one in three Medicare beneficiaries (https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/Dashboard/Medicare-Enrollment/Enrollment%20Dashboard.html).

Exhibit 7.1.2: 2016 MCBS Cost Supplement File Segments and Contents

Cost Supplement Segment	Abbrev	Description	Historic RIC Segment
Dental Utilization Events	DUE	This file contains individual dental events for the MCBS population.	DUE
Facility Events	FAE	This file includes individual facility events for the MCBS population. There is one record for each stay that occurred at least partly in the data year.	FAE
Inpatient Hospital Events	IPE	This file contains individual inpatient hospital events for the MCBS population.	IPE
Institutional Events	IUE	This file contains individual short-term facility (usually SNF) stays for the MCBS population that were reported during a community interview or created from Medicare claims data.	IUE
Medical Provider Events	MPE	This file contains individual events for a variety of medical services, equipment, and supplies.	MPE
Outpatient Hospital Events	OPE	This file contains individual outpatient hospital events for the MCBS population.	OPE
Prescribed Medicine Events	PME	This file contains individual outpatient prescribed medicine events for the MCBS population.	PME
Person Summary	PS	Summarization of utilization and expenditures by type of service and summarization of expenditures by payer, yielding one record per person.	PS
Service Summary	SS	Summarization of the seven individual event files along with home health and hospice utilization, yielding a total of nine summary records per person.	SS
Cost Supplement Ever Enrolled Weights	CSEVWGTS CSL2WGTS	The Weights file provides weights for the ever enrolled population who had cost and utilization information, including general-purpose weights and a series of replicate weights. The CSL2WGTS file is the two-year longitudinal weights file for the population ever enrolled on or before 1/1/2015 and still enrolled at any time during 2016.	X

As an aid to users, the Cost Supplement File data are provided at three different levels of summarization: event level, person summary level (PS), and service summary (SS) level. The tri-level structure allows analysts 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. For example, an analysis of differences in total health spending per person between men and women could use the person level summary, and thereby avoid having to process the more numerous event level records. Similarly, an analysis of differences in use of Medicare hospital payments by race could use the type of service summary records. Event level records would be used for more detailed analyses, for example, average length of long-term facility stays or average reimbursements per prescription drug type. For a more complete discussion of the tri-level file structure, see the MCBS Data User's Guide: Cost Supplement File document.

7.1.3 Using the Data

The MCBS data releases are made available in two formats: SAS® formatted files, and comma delimited files for use with Stata® and R®. Directions and sample SAS® code are given below to help users read the dataset into SAS.®

Files with programming code to create formats and labels are provided for both SAS users and for use with comma delimited files.

7.1.4 Research Claims Files

The fixed-length claims (also known as the research claims) are abbreviated versions of the full claim record layout. Each claim type has a subset of variables selected for their relevancy to data analysis of that service. Additionally, institutional claim types have a corresponding revenue center file that links back to the claim-level data file through a unique claim identifier. See the data file-specific Data User's Guide documents for more on the claims file specifications.

There is one observation per data record for all of the MCBS claims files except the Physician/Supplier Claims and DME Claims. Those claim types treat each line item as a separate observation with the claim-level detail repeating for each line item.

7.2 Which File Do I Need?

The identification of the target population for a given research question will influence both the selection of weights and the particular segments that a data user will need to conduct analyses. Exhibit 7.2 depicts the relationship between the beneficiaries included in the annual data releases.[15] The ever enrolled population from the Survey File is the largest, including anyone enrolled at any time during the calendar year. The continuously enrolled population is limited to those beneficiaries who were enrolled from January 1 of the survey year through the fall interview date. The Survey File includes a weights segment that allows for subsetting the data by the ever enrolled and continuously enrolled populations. The Cost Supplement File includes a weights segment that allows for subsetting the data by the ever enrolled population.

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[15] Exhibit 7.2 is not drawn to scale, but provided as a visual reference for the relationship of populations between data files.

Exhibit 7.2:   MCBS Populations in Data Products

Medicare Population Represented by the 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. This population is identical to the ever enrolled population represented in the Survey File, but includes a smaller subset of beneficiaries with complete cost and utilization data for the year.

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

7.2.1 Survey File Only

Users who wish to focus on research questions around health-related topics such as health status and access to care and/or Medicare FFS utilization only need the Survey File. Similarly, data users conducting year-to-year or longitudinal analyses with the 1991 through 2013 Access to Care files only need the Survey File to make comparisons of services.

7.2.2 Using Both Survey File and Cost Supplement File

To the extent that a data user needs demographic and health insurance information to conduct research on the cost and utilization of medical services, both the Survey File and the Cost Supplement File are required. Data users must also use the ever enrolled cost weights when analyzing any cost data from the Cost Supplement File combined with survey-reported information from the Survey File. For more information on using the weights, please see Section 8.2: Weighting.

8. TECHNICAL NOTES ON USING THE DATA

8.1 Merging Segments within 2016

Data users can merge segments within and/or across the Survey File and Cost Supplement File. Appendix C provides a hypothetical research question with sample SAS© code for the construction of an analytic file using the 2016 Survey File LDS.

8.2 Weighting

8.2.1 Preparing Statistics (Using the Full Sample Weights)

The data user may choose to conduct analyses of the Survey File data alone or use the Cost Supplement data to conduct joint analyses of both survey and cost and utilization data. Exhibit 8.2.1 provides an overview of the weights for the 2016 Survey File and Cost Supplement File. For analysis of Survey File data, there are two populations of inference that can be obtained 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.

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, 2016, through completion of their fall interview. This weight segment is CENWGTS and the weight is named CS1YRWGT. 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 of 2016.[16] Users should use the continuously enrolled Survey File weight (CS1YRWGT) for time series analysis of survey data across years.

Analyses of the Cost Supplement File data should be done with the Cost Supplement weight, which represents an ever enrolled population of Medicare beneficiaries enrolled in Medicare on at least one day at any time in 2016. 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. Users wishing to conduct joint analysis of both Survey File and Cost Supplement File data should use the Cost Supplement File weights.

The weights mentioned above for the calendar year 2016 are full-sample weights. The term "full-sample" distinguishes these weights from the replicate weights used for variance estimation, as discussed in the Section 8.3: Variance Estimation. Additional information on using the weights is available in the file-specific MCBS Data User's Guide documents that accompany each data file release.

Longitudinal weights allow for the study of respondents across data years. The following longitudinal weights are provided with the 2016 Survey File and Cost Supplement LDS's.[17]

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[16] This is identical to the historical Access to Care (ATC) cross-sectional weight that was available in previous years.

[17] Beginning with the 2016 LDS, the Survey File longitudinal weight names reflect the number of years the beneficiary was enrolled in Medicare (i.e., LNG2WGTS weights are referred to as 'two-year' rather than 'one-year' as they represent the population continuously enrolled for two years). This change was made to align the names of the longitudinal weights in the Survey File LDS with the naming convention used for the Cost Supplement LDS.

- Survey File Two-Year Longitudinal Weights (LNG2WGTS): Two-year longitudinal weights apply to members of the 2013, 2014, and 2015 panels who were alive and entitled as of the Fall 2016 (Round 76) interview, had 2015 and 2016 Survey File data, enrolled on or before 1/1/2015, and were continuously enrolled for two years.

- Survey File Four-Year longitudinal weights (LNG4WGTS): Four-year longitudinal weights are populated for members of the 2013 panel who were alive and entitled as of the Fall 2016 (Round 76) interview, had Survey File data in 2013 and 2016, enrolled on or before 1/1/2013, and were continuously enrolled through the fall of 2016 (i.e., four years).

- Cost Supplement Two-Year Longitudinal Weights (LNG2WGTS): The two-year longitudinal weights are populated for members of the 2013, 2014, and 2015 panels who were ever enrolled in Medicare at any time during both 2015 and 2016 and provided utilization and cost data for both years.

Topical questionnaire modules related to the Survey File and Cost Supplement File are weighted separately as they are fielded in the winter and summer rounds following the data year. There are two sets of full-sample and replicate weights for each module, one based on the 2016 Survey File continuously-enrolled population, and the other based on the 2016 Cost Supplement ever-enrolled population. These weights may be used to conduct joint analyses of Topical module data, Survey File data, and Cost Supplement data. Note that counts of cases with positive Topical module weights may vary within the data year and may change across years due to response rates, sample sizes, and fielding methods. The Topical weights account for these changes. The Topical module weights, segments, and weight names are listed in Exhibit 8.2.1.

Exhibit 8.2.1: 2016 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	CS1YRWGT	CS1YR001-CS1YR100	Continuously enrolled from 1/1/2016 through the fall of 2016
Survey File	Ever Enrolled Cross-Sectional Weights	EVRWGTS	EEYRSWGT	EEYRS001-EEYRS100	Ever enrolled for at least one day at any time during 2016
Survey File	Continuously Enrolled Two-Year Longitudinal Weights	LNG2WGTS	L2YRSWGT	L2YRS001-L2YRS100	Continuously enrolled from 1/1/2015 through the fall of 2016
Survey File	Continuously Enrolled Three-Year Longitudinal Weights	Will not be released in 2016	-	-	Continuously enrolled from 1/1/2014 through the fall of 2016
Survey File	Continuously Enrolled Four-Year Longitudinal Weights	LNG4WGTS	L4YRSWGT	L4YRS001-L4YRS100	Continuously enrolled from 1/1/2013 through the fall of 2016
Cost Supplement File	Ever Enrolled Cross-Sectional Weights	CSEVRWGT	CSEVRWGT	CSEVR001-CSEVR100	Ever enrolled for at least one day at any time during 2016
Cost Supplement File	Two-Year Longitudinal Weights	CSL2WGTS	CSL2YWGT	CSL2Y001-CSL2Y100	Enrolled on or before 1/1/2015 and still enrolled at any time during 2016
Cost Supplement File	Three-Year Longitudinal Weights	Will not be released in 2016	-	-	Enrolled on or before 1/1/2014 and still enrolled at any time during 2016
Cost Supplement File	Four-Year Longitudinal Weights	Will not be released in 2016	-	-	Enrolled on or before 1/1/2013 and still enrolled at any time during 2016
Survey File Topical Section	KNQ Continuously Enrolled	MCREPLNQ	KNCWT	KNC1-KNC100	Continuously enrolled in 2016 and still alive, entitled, and non-institutionalized in Winter 2017
Survey File Topical Section	KNQ Ever Enrolled	MCREPLNQ	KNEWT	KNE1-KNE100	Ever enrolled in 2016 and still alive, entitled, and non-institutionalized in Winter 2017

Limited Data Set	Description	Segment	Full-Sample Weight	Replicate Weights	Population
Survey File Topical Section	IAQ Continuously Enrolled	INCASSET FOODINS	IACWT	IAC1-IAC100	Continuously enrolled in 2016 and still alive, entitled, and non-institutionalized in Summer 2017
Survey File Topical Section	IAQ Ever Enrolled	INCASSET FOODINS	IAEWT	IAE1-IAE100	Ever enrolled in 2016 and still alive, entitled, and non-institutionalized in Summer 2017
Survey File Topical Section	PAQ Continuously Enrolled	PNTACT	PACWT	PAC1-PAC100	Continuously enrolled in 2016 and still alive, entitled, and non-institutionalized in Summer 2017
Survey File Topical Section	PAQ Ever Enrolled	PNTACT	PAEWT	PAE1-PAE100	Ever enrolled in 2016 and still alive, entitled, and non-institutionalized in Summer 2017
Survey File Topical Section	RXQ Continuously Enrolled	RXPARTD	RXCWT	RXC1-RXC100	Continuously enrolled in 2016 and still alive, entitled, and non-institutionalized in Summer 2017
Survey File Topical Section	RXQ Ever Enrolled	RXPARTD	RXEWT	RXE1-RXE100	Ever enrolled in 2016 and still alive, entitled, and non-institutionalized in Summer 2017

8.2.2 Item Non-Response

As in any other survey, some respondents could not, or would not, supply answers to some questions. Item non-response rates are generally low in the MCBS data release, but the analyst still needs to be aware of the missing data and be cautious about patterns of non-response. 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.

Some of the missing data are attributable to the fact that some of the Community interviews and all of the Facility interviews are conducted through a proxy respondent. In other words, the respondent may not have had knowledge of the information sought on the sample person. In other situations the respondent may have simply refused to answer.

8.2.3 Imputation

There are several techniques for handling cases with missing data. One option is to impute the missing data. This can be done in such a way as to improve univariate tabulations, but techniques that retain correlation structure for multivariate analyses are extremely complex. For more discussion of imputation, see Kalton and Kasprzyk.[18]

The 2016 IA imputation used IAQ data reported in 2017, as the 2017 IAQ asks about total income in the prior year (2016). We imputed different sets of variables for respondents to the 2017 IAQ and for the 2016 ever enrolled respondents that did not complete the 2017 IAQ. For the first group, we imputed a selection of variables from the 2017 IAQ. These include probe variables, which are indicators of whether the beneficiary and/or the spouse have income or asset items, and amount variables, which give the amount of the income or asset items that the beneficiary and/or the spouse have. For the second group, only the amount of total income was imputed.

We created one imputation flag for each imputed variable. For the probes, only the hot deck imputation method was used, so the imputation flags indicate whether the probe was imputed or not. For the amounts, we used a variety of imputation methods. The imputation flags indicate whether the amount was not imputed, imputed by the hot deck method, imputed by the carry forward method, or imputed by data edits. The imputation used information from the Income and Assets and Facility Assessments Survey File segments and demographic information from the Beneficiary Demographics and Household Characteristics segments.

Using information from the Cost Supplement File segments and Medicare claims data, we imputed missing payer and payment information for medical events reported in 2016. We first imputed whether or not a payer, such as an insurance plan, paid for a particular event. If the payer paid, then the amount paid was imputed next. Imputation was performed using the hot deck imputation method, and a flag was created for each imputed variable indicating whether or not the corresponding cost value was imputed.

8.3 Variance Estimation (Using the Replicate Weights)

8.3.1 Variables Available for Variance Estimation

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

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[18] Kalton, Graham, and Daniel Kasprzyk. "The treatment of missing survey data." Survey methodology 12, no. 1 (1986): 1-16.

for calculating the sampling errors of statistics based upon a stratified, unequal-probability, multi-stage sample such as the MCBS. The MCBS includes variables to obtain weighted estimates and estimated standard errors using either the Taylor-series linearization approach or balanced repeated replication (Fay's method). For details on the strengths and weaknesses of the two variance estimation methods, please refer to Wolter.[19]

The variables SUDSTRAT (sampling strata) and SUDUNIT (primary sampling unit) are used for variance estimation using the Taylor-series linearization method. To estimate variance using the balanced repeated replication method, a series of replicate weights are included in the 2016 Survey File release for each of the five types of weights described above. Unless the complex nature of the MCBS is taken into account, estimates of the variance of a survey statistic may be biased downward.

As displayed in Exhibit 8.2.1 above, there are five types of full-sample weights, two for cross-sectional analyses and three for longitudinal analyses, and five corresponding sets of replicate weights. The replicate weights can be used to calculate standard errors of the sample-based estimates as described below. For the Survey File, the replicate cross-sectional weights are labeled CS1YR001 through CS1YR100 corresponding to the continuously enrolled weight CS1YRWGT, and EEYRS001 through EEYRS100 corresponding to the ever enrolled weight EEYRSWGT. These weights may be found on CENWGTS and EVRWGTS respectively. The Survey File replicate longitudinal weights are found on segments LNG2WGTS and LNG4WGTS.

The Survey File's longitudinal weights (LNG2WGTS) are populated only for members of the 2015 and 2016 panels who were continuously enrolled in 2016. The population represented by these weights is the population of beneficiaries enrolled on or before 1/1/2016 and surviving and entitled as of completion of the Fall 2016 interview. Given that 2014 MCBS data was not released, the three-year longitudinal weights are not released. The four-year backward longitudinal weights (LNG4WGTS) are populated only for members of the 2013 panel that were continuously enrolled during all of the years 2013-2016. The resulting weights represent the population of Medicare beneficiaries that enrolled on or before 1/1/2013 and were still alive and entitled as of completion of the Fall 2016 interview.

8.3.2 Variance Estimation for Analyses of Single Year of MCBS

Most commercial software packages today include techniques to accommodate the complex design, either through Taylor-expansion type approaches or replicate weight approaches. Among these are R®, STATA®, SUDAAN®, and the complex survey procedures in SAS®.

8.3.3 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 is 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 accurate standard errors. Almost all statistical packages provide the capability to limit the analysis to a subgroup of the population.

8.4 Combining Multiple Years of Data

The MCBS is based on a rotating panel design, which allows for longitudinal analysis of up to three years when appropriate longitudinal weights are used. Multiple years of MCBS data can also be pooled to perform serial

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[19] Wolter, Kirk. Introduction to variance estimation. Springer Science & Business Media, 2007.

cross-sectional or pooled analysis. The appropriate method to combine data across years will depend on the analytic design of the study. Sample code is presented in Appendix C to demonstrate the steps involved in combining multiple years of data to perform two types of analysis: (1) Longitudinal analysis; (2) Pooled, cross-sectional analysis.

8.4.1 Longitudinal Analysis

The study objective in longitudinal analysis is to assess changes over time for each sample person. Most longitudinal analyses require the data to be in long-format (i.e. repeated observations – each representing a calendar year the sample person was surveyed – are stored in a separate row for each sample person). To construct a longitudinal analytic dataset, the first step is to use the appropriate longitudinal weights file. For example, as shown in Exhibit 8.4.1, to assess changes over time beneficiaries who have been in the sample for at least two years – from CY2015 to CY2016 – the two-year longitudinal weights (i.e., one-year "backward longitudinal weights") (LNG2WGTS) should be used.

> Please note that because 2014 MCBS data was not released, the examples in this section use MCBS data for 2015 and 2016 and, thus, demonstrate how to construct an analytic file with the two-year backward longitudinal weights segment (LNG2WGTS). Beginning with data year 2017, the Survey File LDS will include two-, three-, and four-year backward longitudinal weights that can be used for longitudinal analyses.

Variables from current year files representing the outcome of interest should then be merged with the current year's "backward longitudinal weights" file. While merging, all observations in the weights file should be preserved. Next, the same variables from the prior year's files should be merged with the current year's "backward longitudinal weights" file.

**Exhibit 8.4.1:**   Constructing a Longitudinal Analytic File
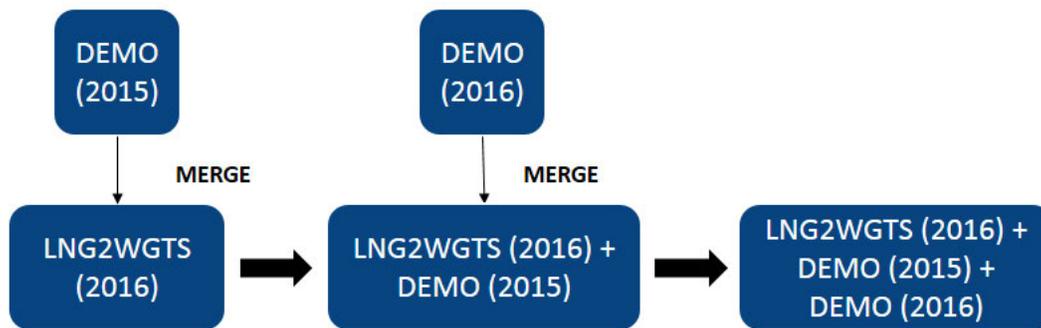
Variance estimation for longitudinal analysis (using replicate weights)

Just as there are full-sample "backward longitudinal weights", there are corresponding sets of replicate weights. The replicate weights included in the "backward longitudinal weights" data files can be used to calculate standard errors of the sample-based estimates. The first set of replicate longitudinal weights is labeled L2YRS001 through L2YRS100 and may be found on the two-year "backward longitudinal weights" file (LNG2WGTS). The second set of replicate longitudinal weights is labeled L4YRS001 through L4YRS100 and may be found on the four-year "backward longitudinal weights" file (LNG4WGTS).

8.4.2 Repeated Cross-Sectional or Pooled Analysis

Multiple years of MCBS data can be pooled to perform serial cross-sectional or pooled analysis. Repeated cross-sectional analysis is used for analyzing changes in the Medicare population as a whole over time. In contrast, the longitudinal analysis described earlier is used to analyze beneficiary level changes over time. Pooled data analysis yield estimates that are in effect a moving average of nationally representative year-specific estimates. The pooled estimates can be interpreted as being representative of the midpoint of the calendar year of the pooled period. Exhibit 8.4.2 demonstrates the steps involved in constructing a repeated cross-sectional or pooled analytic dataset using CY2015 and CY2016 data. For each year in the study, variables representing the outcome of interest should then be merged with the cross-sectional weights file. While merging, all observations in the weights file should be preserved. Next, the year-specific files are appended to produce the analytic dataset.

Exhibit 8.4.2:   Constructing a Repeated Cross-Section or Pooled Analytic File
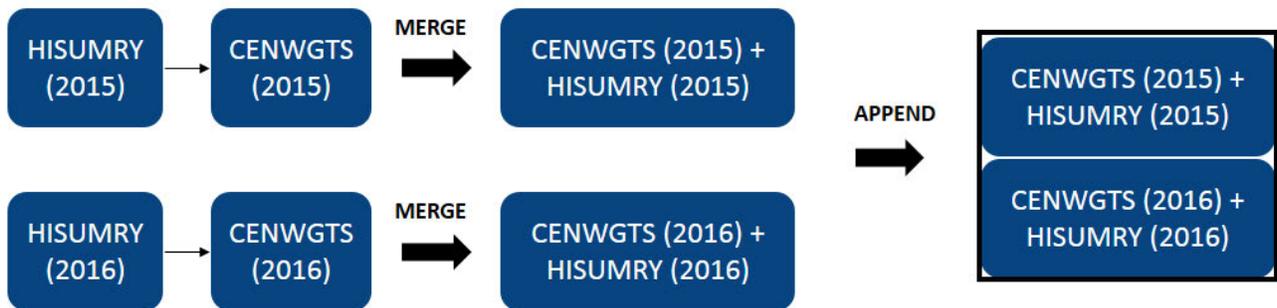
Variance estimation for repeated cross-sectional or pooled analysis (using replicate weights)

Due to the rotating-panel and multistage-sampling design of the MCBS, there is both serial and intra-cluster correlation in the data when pooling multiple years of data. Using the balanced half-sample method (also known as the balanced repeated replication, or BRR, method) of variance estimation throughout appropriately accounts for the various correlations due to sampling second-stage units within primary sampling units, sampling beneficiaries within second-stage units, and repeated observations of the selected beneficiary across time. The replicate cross-sectional weights are labeled CS1YR001 through CS1YR100 and can be found in each year's cross-sectional weights file (CENWGTS).

9. 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.

Kalton, Graham, and Daniel Kasprzyk. "The Treatment of Missing Survey Data." *Survey methodology* 12, no. 1 (1986): 1-16.

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.

Wolter, Kirk. Introduction to variance estimation. Springer Science & Business Media, 2007.

APPENDICES

10. APPENDICES

Appendix A: MCBS Common Definitions

Activities of daily living (ADLs): Activities of daily living are activities related to personal care. They include bathing or showering, dressing, getting in and out of bed or a chair, walking, using the toilet, and eating.

Baseline interview: The initial questionnaire administered to new respondents to the study; administered in the fall of the year they are selected into the sample (interview #1).

Beneficiary: An individual selected from MCBS' sample about whom the MCBS collects information. Beneficiary may also refer to a person receiving Medicare services who may or not be participating in the MCBS.

Claim-only event: A claim-only event is a medical service or event known only through the presence of a Medicare claim. The event did not originate from an event or service reported by a respondent during an interview.

Community component: Survey of beneficiaries residing in the community at the time of the interview (i.e., not in a long-term care facility such as a nursing home). Beneficiaries answered health status and functioning questions themselves, unless they were unable to do so.

Continuing interview: The questionnaire administered to repeat respondents as they progress through the study (interviews #2-12).

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 2015, 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 modules: These sections of the MCBS Questionnaire are of critical purpose and policy relevancy to the MCBS, regardless of season of administration.

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

Current-year Enrollee: Beneficiaries who were eligible and enrolled in Medicare (Parts A or B) anytime from January 1 to December 31 of the year the sample was selected.

Ever enrolled: A Medicare beneficiary who was enrolled at any time during the calendar year including those 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.

Exit interview: Conducted in the summer round, this interview completes the respondent's participation in the MCBS (interview #12). The exit interview is a special case of the Continuing interview.

Facility component: Survey of beneficiaries residing in facilities, such as long-term care nursing homes or other institutions, at the time of the interview. Facility interviewers do not conduct the Facility component with

the respondent, but with a staff member located at the facility. This is a key difference between the Community and Facility components.

Fee-for-Service (FFS) payment: Fee-for-Service is a method of paying for medical services in which each service delivered by a provider bears a charge. This charge is paid by the patient receiving the service or by an insurer on behalf of the patient.

Field interviewer: The principal contact for collecting and securing respondent data.

Field manager: A supervisor who motivates and manages a group of field interviewers to meet the goals of high quality data collection on time and within budget limits.

Incoming Panel Sample (formerly known as Supplemental Panel): A scientifically selected group of sampled beneficiaries that enter the MCBS in the fall of a data collection year. One panel is retired during each summer round, and a new panel is selected to replace it each fall round. Panels are identified by the data collection year (e.g., 2015 panel) in which they were selected.

Instrumental activities of daily living (IADLs): Instrumental activities of daily living are activities related to independent living. They include preparing meals, managing money, shopping for groceries or personal items, performing light or heavy housework, and using a telephone. If a beneficiary had any difficulty performing an activity by himself/herself, or did not perform the activity at all, because of health problems, the person was deemed to have a limitation in that activity. The limitation may have been temporary or chronic at the time of the survey. Facility interviewers did not ask about the beneficiary's ability to prepare meals or perform light or heavy housework, since they are not applicable to the beneficiary's situation; however, interviewers did question proxies about the beneficiary's ability to manage money, shop for groceries or personal items, or use a telephone.

Internal Sample Control File: A data file that contains every beneficiary sampled back through the beginning of MCBS. The file contains sampling information, year of selection, primary sampling unit, secondary sampling unit, contact information, and other sampling demographic information as well as final disposition codes to indicate completion status per round, component fielded per round, dates of death, and lost entitlement information.

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 older, 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 (aka, beneficiary): An individual who meets at least one of three criteria (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).

Minimum Data Set (MDS): The Minimum Data Set (MDS) is part of the federally mandated process for clinical assessment of all residents in Medicare and Medicaid certified nursing homes. For more information, please visit https://www.cms.gov/Research-Statistics-Data-and-Systems/Computer-Data-and-Systems/Minimum-Data-Set-3-0-Public-Reports/index.html.

Panel: see Incoming Panel Sample

Personal health care expenditures: Personal health care expenditures consist of health care goods and services purchased directly by individuals. They exclude public program administration costs, the net cost of private health insurance, research by nonprofit groups and government entities, and the value of new construction put in place for hospitals and nursing homes.

Prescription medicines: The basic unit measuring use of prescription medicines is a single purchase of a single drug in a single container. Prescription drug use is collected only for beneficiaries living in the community or in a facility, and does not include prescription medicines administered during an inpatient hospital stay.

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.

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.

Reference Period: The timeframe to which a questionnaire item refers.

Residence status: Full-year community residents are Medicare beneficiaries who lived solely in household units during the data collection year and who received community interviews only. Full-year facility residents are Medicare beneficiaries who lived solely in a long-term care facility during the data collection year and who received Facility interviews only. Part-year community/part-year facility residents are Medicare beneficiaries who lived part of the year in the community and part of the year in a long-term care facility, and who received

both Community and Facility interviews. Skilled nursing facility users are Medicare beneficiaries who lived in either the community or a facility, and who used skilled nursing facility services during the data collection year.

Respondent: The person who answers questions about the beneficiary for the MCBS; this person can be the beneficiary themselves, 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).

Sample person: An individual beneficiary selected from MCBS' Incoming Panel sample to participate in the MCBS survey.

Survey-reported event: A survey-reported event is a medical service or event reported by a respondent during an interview. The event may have been matched to a Medicare claim, or it may be a survey-only event, in which case it was not matched to a Medicare claim and is only known through the survey.

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: MCBS Rounds by Data Year and Season

Year	Winter	Summer	Fall
1991	n/a	n/a	1
1992	2	3	4
1993	5	6	7
1994	8	9	10
1995	11	12	13
1996	14	15	16
1997	17	18	19
1998	20	21	22
1999	23	24	25
2000	26	27	28
2001	29	30	31
2002	32	33	34
2003	35	36	37
2004	38	39	40
2005	41	42	43
2006	44	45	46
2007	47	48	49
2008	50	51	52
2009	53	54	55
2010	56	57	58
2011	59	60	61
2012	62	63	64
2013	65	66	67
2014	68	69	70
2015	71/72	71/72	73
2016	74	75	76
2017	77	78	79
2018	80	81	82

Appendix C: Technical Appendix

Merging Segments within the 2016 Survey File LDS (Section 8.1)

Data users can merge segments within and/or across the Survey File and Cost Supplement File. What follows below is a hypothetical research question with sample SAS© code for the construction of an analytic file. In this example, we are interested in studying the usual source of care for community-dwelling Medicare beneficiaries with diabetes.

First, there are two measures required to identify our study population: residence status and self-reported diabetes. These variables can be found in the following Survey File segments, respectively: Demographics (DEMO) and Chronic Conditions (CHRNCOND). Usual source of care information is found in the Usual Source of Care (USCAREC). To ensure estimates are representative of the continuously enrolled Medicare population, we will also require the CENWGTS file.

Below, we show how multiple Survey File segments can be merged with the CENWGTS segment in SAS using BASEID as the key variable. When merging segments, all observations in the CENWGTS segment should be preserved.

```
data merged;
      merge  survey16.CENWGTS (in=a)
             survey16.DEMO (keep = BASEID H_AGE INT_TYPE)
             survey16.CHRNCOND (keep = BASEID D_OCDTYP)
             survey16.USCARE (keep = BASEID PLACEPAR PLACEKND);
      by BASEID;
      if a;
run;
```

In order to segment the file to community-dwelling beneficiaries only, we would then segment the file on the variable INT_TYPE.

```
data merged_surveyfile;
      set merged;
      where INT_TYPE = 'C';  /* denotes individuals living only in the community */
run;
```

We now have an analytic file that includes all the Survey File variables and weights required to analyze usual source of care for community-dwelling Medicare beneficiaries with diabetes.

SAS Output:

```
proc print data=merged_surveyfile(obs=10);
      var BASEID H_AGE INT_TYPE D_OCDTYP PLACEPAR PLACEKND;
run;
```

Sample code and output

The sample code below demonstrates the steps involved in constructing a repeated cross-sectional or pooled analytic dataset and performing analysis. The example estimates percent of Medicare beneficiaries that are dual eligibles (i.e. enrolled in both Medicare and Medicaid programs) during CY2015 and CY2016.

Although the MCBS includes variables to obtain weighted estimates and estimated standard errors using Taylor-series linearization approach, the balanced repeated replication (Fay's method) method provides more analytic flexibility when performing analysis using pooled cross-sectional data.[20] Therefore, the examples presented in this section involving multiple years of MCBS data use replicate weights – a form of the BRR technique.

Example

```
/* Create Analytic Dataset for Repeated Cross-Section or Pooled Analysis */
/* Merge 2016 administrative records (HISUMRY) file with 2016 cross-sectional weights (CENWGTS) file */
data mcbs16;
        merge survey16.CENWGTS (in = a drop = VERSION)
                survey16.HISUMRY (keep = BASEID H_OPMDCD);
        by BASEID;
        YEAR = 2016;
        if a;
run;

/* Merge 2015 administrative records (HISUMRY) file with 2015 cross-sectional weights (CENWGTS) file */
data mcbs15;
        merge survey15.CENWGTS (in = a drop = VERSION)
                survey15.HISUMRY (keep = BASEID H_OPMDCD);
        by BASEID;
        YEAR = 2015;
        if a;
run;


/* Append 2015 and 2016 cross-sectional files */
data mcbs_analytic_file;
        set mcbs15 mcbs16;
run;
```

SAS

```
* Estimate Percent of Medicare Beneficiaries that are Dually-Eligible (Pooled estimate representing the moving average of nationally representative year-specific estimates) (using balanced repeated replication (Fay's method));
proc surveyfreq data = mcbs_analytic_file varmethod = brr (fay=.30);
```

---

[20] Given the rotating panel design of the MCBS, performing pooled cross-sectional analysis using Taylor-Series Linearization method of variance estimation will require additional adjustments to account for non-independence of beneficiaries across years in a multi-year dataset.

```
        table H_OPMDCD;
        weight CS1YRWGT;
        repweights CS1YR001 - CS1YR100;
run;
```

```
* Estimate Percent of Medicare Beneficiaries that are Dually-Eligible by Year (nationally representative, year-
specific estimates) (using balanced repeated replication (Fay's method));
proc surveyfreq data = mcbs_analytic_file varmethod = brr (fay=.30);
        table YEAR * H_OPMDCD/ row;
        weight CS1YRWGT;
        repweights CS1YR001 - CS1YR100;
run;
```

Stata

```
* Declare survey dataset
svyset _n [pweight= CS1YRWGT], brrweight(CS1YR001-CS1YR100) fay(.3) vce(brr)
```

```
* Estimate Percent of Medicare Beneficiaries that are Dually-Eligible (Pooled estimate representing the
* moving average of nationally representative year-specific estimates)
svy brr, fay(.3): tab H_OPMDCD
```

```
* Estimate Percent of Medicare Beneficiaries that are Dually-Eligible (nationally representative, year-specific
estimates)
svy brr, fay(.3): tab H_OPMDCD YEAR, column
```

R

Note: Data users will need to install the 'survey' package to use the svrepdesign function below.

```
# Specify survey design object
        mcbs <- svrepdesign(
                        weights = ~CS1YRWGT,
                        repweights = "CS1YR[001-100]+",
                        type = "Fay",
                        rho = 0.3,
                        data = mcbs_analytic_file,
                        combined.weights = TRUE
                )
```

```
# Estimate Percent of Medicare Beneficiaries that are Dually-Eligible by Year (Pooled estimate representing the
moving average of nationally representative year-specific estimates)
prop.table(svytable(~H_OPMDCD,  design=mcbs))
```

```
# Estimate Percent of Medicare Beneficiaries that are Dually-Eligible by Year (nationally representative, year-
specific estimates)
```

```
prop.table(svytable(~H_OPMDCD + YEAR,  design=mcbs), 2)
```