MERATIVE™ MARKETSCAN® RESEARCH DATABASES

Commercial Database & Medicare Database User Guide

Data Year 2023

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Contents

Introduction 1

Commercial Database 1

Medicare Database 2

Health and Productivity Management Database 2

Benefit Plan Design Database 2

Multi-State Medicaid Database 3

MarketScan Lab Database 3

Overview of tables 7

Medical/Surgical tables 7

Inpatient Admissions table (I) 7

Facility Header table (F) 8

Inpatient Services table (S) 8

Outpatient Services table (O) 8

Outpatient Pharmaceutical Claims table (D) 8

Enrollment tables (A, T) 9

Records where ENROLID Is missing 9

Member Days (MEMDAYS) 10

Overview of encounter records 12

Financial variables 13

Medical/Surgical financial variables 20

Encounter record financial variables 22

Medicare financial variables 22

Adjustment records 23

Unresolved adjustments 24

Person-level identifiers 26
Enrollee identifiers 26
Enrollee identifiers prior to 2001 26
Clinical variables 29
MarketScan database construction 33
Data quality 33
Plan type definitions 36
Plan type 37
Key table and field relationships 39
1. ENROLID 39
2. CASEID 39
3. FACHDID 40
4. NDCNUM 40
Glossary of acronyms, abbreviations, and terms 41
Frequently asked questions 56
Appendix A: New in 2023 65
Appendix B: Historical data releases 69
Variable renames 97
Deletion of variables 99
Tables removed 100
Bibliography 101

Introduction

The Merative™ MarketScan® Research Databases capture person-specific clinical utilization, expenditures, and enrollment across inpatient, outpatient, prescription drug, and carve-out services. The data come from a selection of large employers, health plans, and government and public organizations. The MarketScan Research Databases link paid claims and encounter data to detailed patient information across sites and types of providers and over time. The annual medical databases include private-sector health data from approximately 350 payers. Historically, more than 20 billion service records are available in the MarketScan databases. These data represent the medical experience of insured employees and their dependents for active employees, early retirees, Consolidated Omnibus Budget Reconciliation Act (COBRA) continuees, and Medicare-eligible retirees with employer-provided Medicare Supplemental and Medicare Advantage plans.

The Merative MarketScan Research Databases are composed of six individual databases, which are described below and summarized in Exhibit 1.

Commercial Database

The Merative MarketScan Commercial Database (CCAE) contains data from active employees, early retirees, COBRA continuees, and dependents insured by employer-sponsored plans (that is, individuals not eligible for Medicare).

The database has the following table structure:

- Inpatient Admissions Table (I)
- Facility Header Table (F)
- Inpatient Services Table (S)
- Outpatient Services Table (O)
- Outpatient Pharmaceutical Claims Table (D)
- Annual Enrollment Summary Table (A)
- Enrollment Detail Table (T)

Medicare Database

The Merative MarketScan Medicare Database (MDCR) is created for Medicare-eligible retirees with employer-sponsored Medicare Supplemental and Medicare Advantage plans. This database contains predominantly fee-for-service plan data.

The Medicare Database table structure is identical to the Commercial Database table structure.

Both the Medicare-paid amounts and the employer-paid supplemental insurance amounts are included in this database. Only plans in which both the Medicare-paid amounts and the employer-paid amounts were available and evident on the claims were selected for this database.

In the 2020 data year, Medicare Advantage members were added to the dataset to help provide MarketScan users with a more representative, complete, and longitudinal view of the commercially insured US population aged 65 and older. The resulting database includes data from both Medicare Supplemental and Medicare Advantage plans, and a series of monthly flags to distinguish between plan types.

Health and Productivity Management Database

The Merative MarketScan Health and Productivity Management (HPM) Database is an integrated database that contains absence, short-term disability, long-term disability, and worker's compensation experiences. This information is linkable to the medical, pharmacy, and enrollment data in the MarketScan Commercial Database for these employees, making the resulting database a unique and valuable resource for examining health and productivity issues for an employed, privately insured population.

A separate User Guide is provided to customers licensing the HPM Database.

Benefit Plan Design Database

The Merative MarketScan Benefit Plan Design (BPD) Database consists of data for selected benefit plans represented in the MarketScan Research Databases from 1995 forward. A separate User Guide is provided to customers licensing the BPD Database. Benefit plan design information is available for the Commercial and Medicare Databases.

Multi-State Medicaid Database

The Merative MarketScan Multi-Medicaid Database contains the pooled healthcare experience of approximately seven million Medicaid enrollees from multiple states. It includes inpatient services and prescription drug claims, as well as information on enrollment, long-term care, and other medical care. In addition to standard demographic variables such as age and sex, the database includes variables of particular value to researchers investigating Medicaid populations (for example, race/ethnicity, maintenance assistance status, Medicare eligibility).

MarketScan Lab Database

The Merative MarketScan Lab Database contains the pooled healthcare experience of over one million covered lives, gleaned from sources that include both Commercial and Medicare coverage. It captures laboratory tests for a subset of the covered lives and mainly represents lab tests ordered in office-based practice. Linkage of lab results to claims supports analyses that are not feasible with claims alone, such as determining effectiveness of treatment, measuring severity of illness, identifying patients for whom treatment may be indicated, and verifying diagnoses recorded on claims.

Note: This User Guide is intended to cover the Commercial Database and the Medicare Database. The data you receive may contain some or all of the MarketScan data described herein.

Exhibit 1. Overview of the Merative MarketScan Research Databases

Database	Content	Covered Lives	Tables
Commercial (CCAE)	Healthcare coverage eligibility and service use of individuals in plans or product lines with fee-for-service plans and fully capitated or partially capitated plans	Active employees and dependents, early (non-Medicare) retirees and dependents, COBRA continuees	Medical/Surgical: Inpatient Admissions (I) Facility Header (F) Inpatient Services (S) Outpatient Services (O) Prescription Drug (D) Enrollment (A,T)
Medicare (MDCR)	Healthcare coverage eligibility and service use of individuals in plans or product lines with fee-for-service plans and fully capitated or partially capitated plans	Medicare-eligible active and retired employees and their Medicare-eligible dependents from employer-sponsored supplemental plans	Medical/Surgical: Inpatient Admissions (I) Facility Header (F) Inpatient Services (S) Outpatient Services (O) Prescription Drug (D) Enrollment (A,T)

Database	Content	Covered Lives	Tables
Benefit Plan Design (BPD)	Plan characteristics derived from the medical claims submitted by each plan. Additional information specific to each plan is available in the BPD User Guide.	Not applicable	Links to CCAE and MDCR Databases for a subset of plans included in those databases
Health and Productivity Management (HPM)	Absence, short-term disability, long-term disability, and worker's compensation experience for a subset of the covered lives represented in the CCAE Database	Active employees	Absenteeism (ABS) Short-Term Disability (STD) Long-Term Disability (LTD) Worker's Compensation (WC) Eligibility (Elig) Linkable to the medical and prescription drug claims information appearing in the CCAE Database

Database	Content	Covered Lives	Tables
Medicaid	Healthcare coverage eligibility and service use of individuals enrolled in state Medicaid programs for several states and/or Medicaid Managed Care programs	Medicaid recipients for several states	Medical/Surgical: Inpatient Admissions (I) Facility Header (F) Inpatient Services (S) Outpatient Services (O) Long-Term Care (L) Prescription Drug (D) Enrollment (A,T)
Lab	Healthcare service use and eligibility for individuals enrolled in Commercial and Medicare programs, along with laboratory test records and results	Individuals enrolled in Commercial and Medicare programs	Medical/Surgical: Inpatient Admissions (I) Facility Header (F) Inpatient Services (S) Outpatient Services (O) Prescription Drug (D) Enrollment (A,T) Lab Test Results (R)

Abbreviation: COBRA, Consolidated Omnibus Budget Reconciliation Act.

Overview of tables

Note: All of the tables and databases described below are available in both the Commercial Database and the Medicare Database. Exhibit 2 contains the data flow diagram.

Medical/Surgical tables

The MarketScan databases contain inpatient and outpatient medical/surgical data stored in four tables: Inpatient Admissions, Inpatient Services, Facility Header, and Outpatient Services.

Inpatient Admissions table (I)

The Inpatient Admissions Table contains records that summarize information about a hospital admission. Merative constructs this table after identifying all encounters or claims (service records) associated with an admission (for example, hospital claims, physician claims, surgeon claims, and claims from independent laboratories). Facility and professional payment information then is summarized for all services. The summarized information is stored in an admission record in the Inpatient Admissions Table. For definitions of key financial variables, see Financial Variables.

The admission record also includes data that can be identified only after all claims for an admission have been identified. These additional data include the principal procedure, principal diagnosis, major diagnostic category (MDC), and diagnosis-related group (DRG). Merative uses the Centers for Medicare & Medicaid Services (CMS) DRG Grouper to assign an MDC and DRG to the admission record.

In addition to the principal procedure and diagnosis codes, the admission record includes all diagnoses and procedures (up to 14 each) found on the service records that make up the admission. These additional codes (Diagnosis 2 through Diagnosis 15 and Procedure 2 through Procedure 15) are assigned chronologically on the basis of service dates and do not duplicate the principal code.

To be considered an admission, the grouping of these service records must meet certain criteria (for example, a room and board claim must be present). If these criteria are not met, the records are stored in the Outpatient Services Table (O) and no admission record is created.

Facility Header table (F)

The Facility Header Table contains complete header information from facility claims. A Facility Header Record identifier (FACHDID) exists on both the Facility Header Table and the Inpatient Services and Outpatient Claims Tables to identify the individual service records that each header record comprises.

Facility inpatient service records are derived from the Uniform Billing (UB04) form. This form does not link financial information to specific procedures or diagnoses.

Inpatient Services table (S)

The Inpatient Services Table contains the individual facility and professional encounters and services that the inpatient admission record comprises. A Cases and Services Link identifier (CASEID) exists on both the Inpatient Admissions and the Inpatient Services Tables to identify the individual service records that each admission record comprises.

Facility inpatient service records are derived from the UB04 form. This form does not link financial information to specific procedures or diagnoses. Physician services are derived from the CMS 1500 form.

Note: The Inpatient Services Table contains both facility and physician services associated with an inpatient admission. The Inpatient Admissions Table differs from UB04 discharge data in that Merative combines the facility charges with the physician services associated with an inpatient admission. UB04 revenue codes are retained in the MarketScan data when available; however, not all data contributors provide the codes on adjudicated claims.

Outpatient Services table (O)

The Outpatient Services Table contains encounters and claims for services that were rendered in a doctor's office, hospital outpatient facility, emergency department, or other outpatient facility. A small percentage of claims in this table may represent inpatient services, because the claim was not incorporated into an inpatient admission (for example, no room and board charge was found). These claims generally have an "inpatient" Place of Service (STDPLAC) code.

Outpatient Pharmaceutical Claims table (D)

Outpatient pharmaceutical claims data are available for a large portion of the individuals represented in the medical/surgical and populations tables. The outpatient pharmaceutical data are linked by ENROLID to the medical/surgical data. Each record represents either a mail-order or retail program prescription drug claim.

Note: Before you begin your analysis, carefully determine which data sources (for example, medical/surgical, outpatient pharmaceutical, enrollment) will be necessary to support your analytic plan. If you require more than one of these data sources, it first may be necessary to use the various cohort flags to determine which data contributors or plans have the required data. These are found through the Cohort Drug (RX) indicator, Mental Health and Substance Abuse Coverage (MHSACOVG), and/or Enrollee ID Derivation Flag (EIDFLAG) and Enrollment Flag (ENRFLAG) variables.

Enrollment tables (A, T)

The Enrollment tables contain person-level enrollment records with demographic and plan information on users and nonusers of services contained in the MarketScan CCAE and Medicare Supplemental Databases.

The Annual Enrollment Summary Table contains a single record per person per year. The annual summary contains monthly arrays of certain variables such as indicators of enrollment (yes/no), days enrolled, data type, and plan type in each month during the year. There also are variables indicating the number of months during the year with enrollment and the total annual enrollment days.

The Enrollment Detail Table contains one record per person per month of enrollment for an individual enrollee regardless of whether any demographic values have changed from the previous month.

If you need to track changes in variables such as the RX indicator or Geographic Location of Employee (EGEOLOC), use the Enrollment Detail Table.

Beginning with the 2001 data, all data contributors submit person-level enrollment information. When using MarketScan Database releases prior to 2001, the ENRFLAG variable allows the user to select only claims supported by person-level enrollment. When ENRFLAG=1, it indicates that person-level enrollment information is available for that data contributor.

Records where ENROLID Is missing

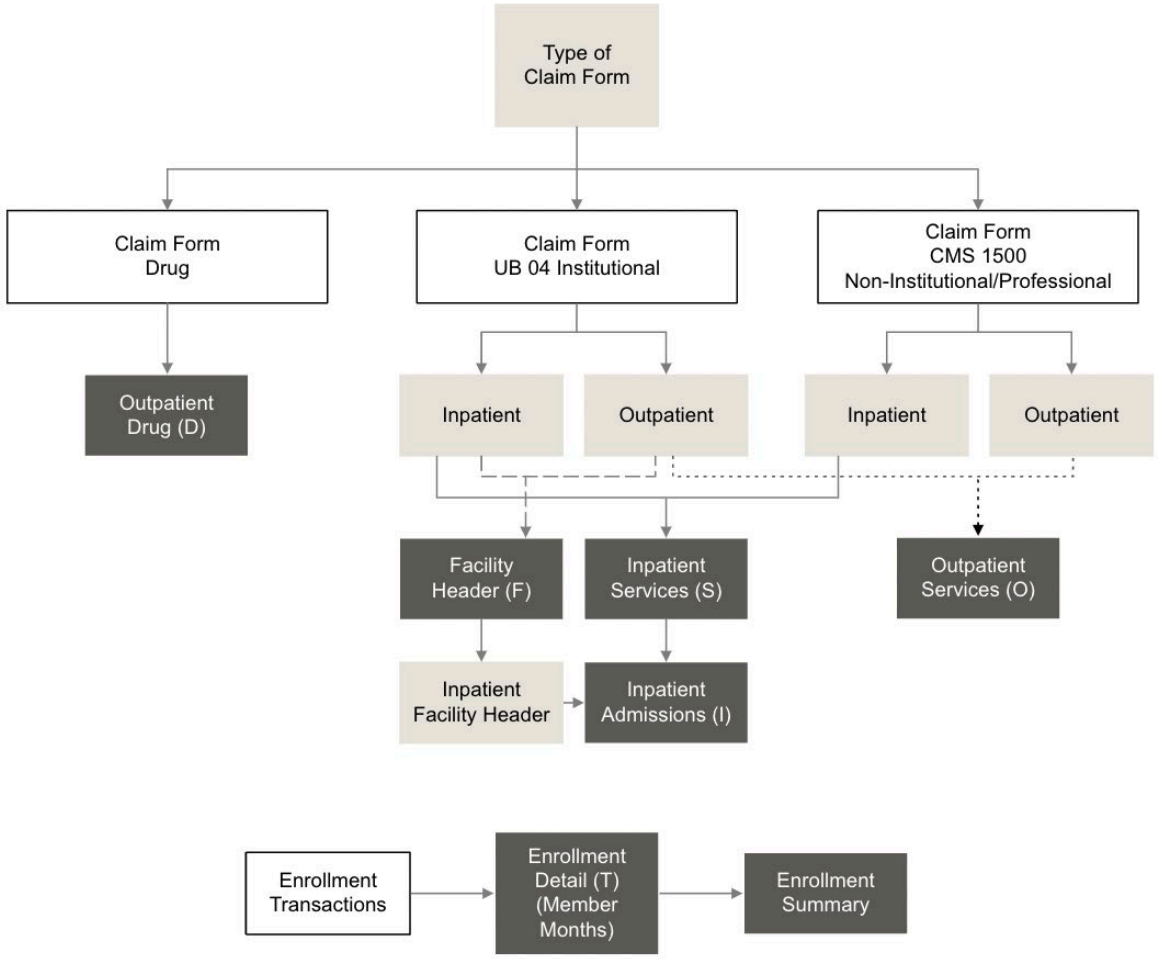
There may be records in which ENRFLAG=1 but the Enrollee ID (ENROLID) is missing. This occurs in less than 1 percent of records. Individual claim records from a data contributor may not have these identifiers assigned if certain key variables are missing (see Person-Level Identifiers). These records may be excluded from analysis, depending on the needs of your study.

Member Days (MEMDAYS)

When obtaining an underlying population or covered life count, evaluate the Date Enrollment Start (DTSTART) and Date Enrollment End (DTEND) data before summing Member Days (MEMDAYS). If a time-based subset or study period is required, the DTSTART and DTEND may be outside the beginning and ending dates of the subset criteria. If so, adjust the DTSTART and DTEND to match the study period and recalculate the member days before calculating an enrollee count.

For example, a record may have DTSTART and DTEND of 1/1/2023 and 1/31/2023, respectively. The MEMDAYS variable on this record is 31 days. If the study period of data begins on 1/15/2023, the DTSTART should be reset to reflect the 1/15/2023 beginning date and MEMDAYS should be recalculated to 16 days (MEMDAYS=DTEND–DTSTART+1).

Exhibit 2. Data flow diagram



Abbreviations: CMS, Centers for Medicare & Medicaid Services; UB, Uniform Billing.

Overview of encounter records

Encounter records represent the service use and cost of individuals in partially and fully capitated plans and allow for the empirical investigation of healthcare under a variety of managed care arrangements.

Historically, not all fully or partially capitated health plans have maintained rigorous cost and utilization data collection systems. Many managed care services are prepaid in fixed sums for each member, which minimizes the need for administrative systems to collect financial encounter information at the time of service delivery. Therefore, unlike indemnity plans (which adjudicate claims for reimbursement), certain types of managed care plans do not process claims for the purpose of financial reporting. For these plans, service delivery information is disconnected from charge and payment information. Instead of generating a claim for reimbursement of prepaid capitated services, a managed care plan generates an encounter record.

An encounter record provides demographic information about the patient, provider characteristics, and diagnosis and procedure codes; however, in many instances it provides only limited financial information. This presents a certain challenge when using encounter records to analyze healthcare costs.

The challenge involves the correct measurement of reimbursement for capitated managed care plans. Many encounter records contain a Payment (PAY) amount of $1 or $0 for capitated services. The prepaid capitation amounts, whether in the form of per member per month fees or bulk capitation payments, were not contributed by the managed care plans represented in this database. However, managed care plans are beginning to enhance encounter records with fee-for-service-equivalent financial amounts. These amounts are intended to be approximate values for reasonable and customary charges or payments for medical services or procedures. For more information, see Financial Variables.

The implementation of fee-for-service-equivalent financial amounts is in its early stages; as a result, financial variables are potentially understated. Financial measures derived from encounter records should be interpreted with caution, with the exception of Copayment (COPAY), Deductible (DEDUCT), and Coordination of Benefits and Other Savings (COB) amounts—all of which are recorded with reasonable accuracy.

In constructing the MarketScan Research Databases, encounter records are rigorously tested by overall plan-by-plan utilization rates to ensure that plans appearing to submit incomplete data are excluded.

Financial variables

Merative receives paid claims from approximately 350 data sources. Financial variables are defined consistently across all data contributors. Exhibit 3 contains an example of a financial variable calculation.

Exhibit 3. Example of a Merative financial variable calculation

Charge Types[1]	Amount, $
Submitted charges	1,200.00
Charges not covered	–100.00
Eligible charges	1,100.00
Price reductions	–100.00

Description	Data Element	Amount, $
Gross covered payments	Gross Covered Payments (PAY)	1,000.00
Remaining deductible	Deductible (DEDUCT)	–100.00
Coinsurance at 20 percent	Coinsurance (COINS)	–180.00
Penalty for no precertification	Coordination of Benefits and Other Savings (COB)	–270.00
Net payments	Net Payments (NETPAY)	450.00

[1] Charge types are not standard MarketScan variables.

The definitions in Exhibit 4 apply to all MarketScan Research Databases. The definitions apply to the capitated encounter data, even though some of the financial variables are set to zero (0) or one (1), because encounter records may not contain fee-for-service charge and payment equivalents.

Exhibit 4. Definitions of medical/surgical financial variables

Term	Definition[2]	MarketScan Variable	Table
Total Payment	Total gross payment to all providers associated with the admission	Payments, Total Case (TOTPAY)	I
Payment	Total gross payment to a provider for a specific service; that is, the amount eligible for payment after applying pricing guidelines such as fee schedules and discounts and before applying deductibles, copayments, and coordination of benefits	Payment (PAY)	S,O,D

[2] These variables are formatted in dollars and cents.

Term	Definition[2]	MarketScan Variable	Table
Deductible	Amount of gross covered payments applied toward the deductible	Deductible, Total Case (TOTDED)	I
		Deductible (DEDUCT)	F,S,O,D
Coinsurance/ Copayment	Amount of coinsurance applied toward the stop loss and/or amount of copayment	Copayment, Total Case (TOTCOPAY)	I
		Coinsurance, Total Case (TOTCOINS)	I
		Copayment (COPAY)	F,S,O,D
		Coinsurance (COINS)	F,S,O,D
Net Payment	Payment received by the provider excluding patient out-of-pocket and coordination of benefits (that is, employer or plan liability)	Payments, Net (NETPAY)	F,S,O,D

Term	Definition[2]	MarketScan Variable	Table
Total Net Payment	Total net payment to all providers associated with the admission (that is, sum of service-level net) payments	Payments, Net Case (TOTNET)	I
Hospital Payments	Total gross payments to the hospital for an admission	Payments, Hospital (HOSPPAY)	I
Physician Payment	Total gross payments to the principal physician (that is, the professional who charges the most during the admission)[3]	Payments, Physician (PHYSPAY)	I
Hospital Net Payment	Payment received by the hospital for an admission excluding patient out-of-pocket and coordination of benefits (that is, employer or plan liability)	Net Payment, Hospital (HOSPNET)	I

[3] Payments to physicians other than the principal physician are included in Payments Total Case (TOTPAY).

Term	Definition[2]	MarketScan Variable	Table
Physician Net Payment	Payment received by the principal physician (that is, the professional who charges the most during the admission), excluding patient out-of-pocket and coordination of benefits (that is, employer or plan liability)	Net Payment Physician, (PHYSNET)	I
Third-Party Payment	Payment received by the provider from a source other than the patient or the submitting plan	Coordination of Benefits and Other Savings, Total Case (TOTCOB)	I
		COB and Other Savings (COB)	F,S,O,D

To protect business-confidential discount arrangements between our data contributors and their providers, information on submitted charges and allowed amounts are never licensed simultaneously on the same MarketScan dataset.

Starting in data year 2019, actual cost data became unavailable for a small subset (approximately 15 percent) of the population in the databases. For this part of the population, Merative offers imputed cost data for the annual releases. While use of imputed data is a common industry practice, we understand that, depending on a client's intended use for the data, including their objectives and specific study concepts and researcher preferences, the addition of some imputed data may not be a preferred solution. Hence, Merative offers clients for 2019 datasets and beyond a choice between one of the two datasets:

- → Set A (Exhibit 5)
  100 percent of the population, NETPAY only, and/or Imputed. This dataset does not contain an imputation flag to protect the privacy of patients as well as the privacy of our data contributors and suppliers. The methodology used for the imputed cost data is a combination of hotdecking and stochastic regression.
- → Set B (Exhibit 6)
  Approximately 85 percent of the population, actual cost data only

Exhibit 5. Set A: 100 percent of the population

Schedule	Data	
Annual releases	Actual cost data	Actual cost data where available, imputed remainder [a4]
Quarterly updates	Actual cost data	Actual cost data for net payments, Null for other financial variables[5]
Early View updates	Actual cost data	Actual cost data for net payments, Null for other financial variables

Exhibit 6. Set B: Approx. 85 percent of the population

Schedule	Data	
Annual releases	Actual cost data	Actual cost data
Quarterly updates	Actual cost data	Actual cost data
Early View updates	Actual cost data	Actual cost data

[4] Actual cost data for financial variables of approximately 85 percent of the covered population, imputed cost data for the remainder. To protect the privacy of patients as well as the privacy of our data contributors and suppliers, this dataset does not contain any indication to distinguish claims with actual cost data from claims with imputed cost data.

[5] Starting with the 2023 Quarterly Updates, Quarterly Updates may contain actual cost data where available, with imputed data for the remainder

Medical/Surgical financial variables

The following abbreviations indicate the tables on which the variable resides:

- → I – Inpatient Admissions
- → F – Facility Header
- → S – Inpatient Services
- → O – Outpatient Services
- → D – Outpatient Pharmaceutical Claims

Prescription Drug Financial Variables

The Outpatient Pharmaceutical Claims Table contains the Payment (PAY), Copayment (COPAY), Coinsurance (COINS), Deductible (DEDUCT), and Coordination of Benefits and Other Savings (COB) variables, as previously described.

Financial variables specific to prescription drug claims are provided in Exhibit 7.

Exhibit 7. Definitions of outpatient pharmaceutical financial variables in Table D

Term	Definition[6]	MarketScan Variable
Average Wholesale Price[7]	The average wholesale price charged by wholesalers for the specific drug	Average Wholesale Price (AWP)
Administrative Dispensing Fee	Administrative fee charged by the pharmacy for dispensing the prescription	Dispensing Fee (DISPFEE)
Ingredient Cost	The cost or charge associated with the pharmaceutical product[8]	Ingredient Cost (INGCOST)
Sales Tax	The amount of sales tax applied to the cost of the prescription[9]	Sales Tax (SALETAX)

[6] These variables are formatted in dollars and cents.

[7] The Merative™ Micromedex® RED BOOK® Systems Licensed Content may be used only as a referential look-up tool and not for an automated claims processing system; use is for RED BOOK System Licensed Content only. The prices contained in the RED BOOK are based on data reported by manufacturers. Merative Micromedex® has not performed an independent analysis of the actual prices paid by wholesalers and providers in the marketplace. Thus, actual prices may vary from the prices contained in this database, and all prices are subject to change without notice. Further, Merative Micromedex does not warrant the accuracy of the database contents or the pricing information. Please refer to the Average Wholesale Price Policy in the RED BOOK product for more information.

[8] The Ingredient Cost plus the Dispensing Fee and Sales Tax, if applicable, usually represents the entire cost of a prescription.

[9] Calculation of the sales tax, if applicable, usually is based on the Ingredient Cost plus the Dispensing Fee.

Encounter record financial variables

Financial information is captured in a variety of ways for encounter claims. There may be times when a capitated claim has financial variables with amounts of zero because there is no associated paid claim. At other times, the copayment amount may be the only financial information on the claim. If a capitated claim does not include financial information, the financial variables are set to "0" or "1."

Medicare financial variables

Medicare supplemental claim records include paid claims for fee-for-service plans and contain all of the Payment (PAY), Deductible (DEDUCT), Copayment (COPAY), Coinsurance (COINS), Coordination of Benefits and Other Savings (COB), and NETPAY (Payments Net) variables, as previously described. In 1998, Medicare Supplemental encounter records were added to the Medicare Database (please refer to the Encounter Record Financial Variables paragraph above). The Medicare paid amount is reflected in the COB variable, so the majority of the breakdown of PAY will be captured in COB for the medical claims. The Medicare supplemental payments made by the employer will be captured in the NETPAY variable.

Because outpatient prescription drugs generally are covered by the employer rather than by Medicare, the majority of PAY will be captured in the NETPAY variable for outpatient pharmaceutical claims in the Medicare Database.

Within the MarketScan Medicare Database, the Advantage enrollees and the Supplemental enrollees have the same information describing patient demographics and medical/pharmacy claims-level detail. They also have the same variables describing the financial fields. There is also a series of monthly flags to distinguish between plan types corresponding to monthly enrollment indicators. From both the Medicare Supplemental and Advantage insurance standpoint, the Coordination of Benefits (COB) variable represents Medicare paid amounts for fully adjudicated claims and the Net Payment variable represents payment rendered by the primary payer. The COB value for Advantage enrollees will typically be near or at $0 while corresponding net payment amounts will be relatively higher for Medicare Advantage versus Supplemental claims.

Note: Advantage insurers receive a monthly payment from Medicare for each patient covered. This capitated payment is not reflected in MarketScan, since the database is from the employer perspective and payments reflect amounts paid for medical and pharmacy claims.

Adjustment records

Some claims have negative amounts in payment or other financial variables. These are adjustment records that claims processors entered to correct a payment error or any type of coding error.

Resolution of adjustments combines the financial variables on the original record with the financial variables on the adjustment. No information is lost when one is resolving adjustment records. The sum total of the financial variables remains the same. However, instead of reading across multiple records to understand the services rendered, resolution of adjustments creates a single service-level record. Adjustment records are resolved on both the Outpatient Services Table and the Outpatient Pharmaceutical Claims Table. Adjustment records are not resolved on the Inpatient Services Table.

There are two methods claims processors typically use for entering adjustment records: the adjustment method and the void and replace method.

The Adjustment Method allows the entry of a new claim that exactly duplicates all correct variables on the erroneous claim, including the date of service. If the financial information is incorrect, an adjusted dollar amount is entered in the appropriate financial variable(s) (for example, PAY), and all other financial variables are $0. If a nonfinancial variable is incorrect, the data in the appropriate variable (for example, DX1) are corrected and all financial variables are $0 on the adjustment record. This way, the sum of the financial variables of the erroneous claim and the adjustment claim equals the correct financial amounts. Under this method, therefore, two records represent a single transaction. An example is provided in Exhibit 8.

To resolve the adjustment, the MarketScan Database build process matches the adjustment with the original record, with the requirement that certain nonfinancial variables are exactly the same on both records. The financial information on the two records is summed, creating one resulting record.

Exhibit 8. Example of the Adjustment Method

Record Type	ENROLID	SVCDATE	DX1	PAY	NETPAY
Original	9876501	20230630	12345	100	70
Adjustment	9876501	20230630	12345	–20	0
Resulting	9876501	20230630	12345	80	70

The Void and Replace Method allows entry of a new claim that exactly duplicates all variables from the erroneous claim, except that the financial variables are entered as negative numbers. In this way, the original erroneous claim is fully voided, and the claim is re-entered with complete correct data in each variable. Under this method, three records are present to represent a single transaction. An example is provided in Exhibit 9.

To resolve the adjustment, the MarketScan Database build process matches the void record with the original record, provided certain nonfinancial information is exactly the same on both records and the financial information on the void record is the exact negative of the original record. The void and original records are dropped from the database, because all financial information on the combined record is zero. Only the replacement record remains.

Unresolved adjustments

Because strict matching criteria are required to resolve adjustments, some adjustment records remain unresolved; these account for less than 1 percent of the records in the MarketScan Outpatient Services Table. These records generally contain changes to a variable that normally would be used to match the original and adjustment records. For example, if the original Provider ID (PROVID) was incorrect and the adjustment record adjusted for that ID, the two records would not match because PROVID is a key variable. Both records would remain. When performing person-level analysis or broader levels of analysis, for example, geographic region, all claims should be included.

Exhibit 9. Example of the Void and Replace Method

Record Type	ENROLID	SVCDATE	DX1	PAY	NETPAYY
Original	9876501	20230630	12345	100	70
Void	9876501	20230630	12345	–100	–70
Replacement	9876501	20230630	12345	80	70
Resulting	9876501	20230630	12345	80	70

Person-level identifiers

Enrollee identifiers

One of the major strengths of the MarketScan Databases is the ability to track patients and families longitudinally. The unique person-level identifier is consistent across an individual's enrollment, medical, and drug records, even as the individual moves from the Commercial Database to the Medicare Database.

The enrollee identifier (ENROLID) is assigned using the data contributor, an encrypted employee identifier (usually an encrypted contract identifier), the relationship of the enrollee to the contract holder, the sex of the enrollee, and the enrollee's date of birth or birth year and month.

Enrollee identifiers prior to 2001

Beginning in 2001, all MarketScan contributors submitted person-level enrollment information. For data prior to 2001, enrollee identifiers were derived from all data contributors and are not limited to those submitting person-level enrollment data. The methodology used to assign ENROLID differs, depending on the level of information available from a particular data contributor.

MarketScan data contributors fall into three categories with respect to the level of information available on claims data for assigning ENROLID:

- → Contributors submitting person-level enrollment data and also reporting patient date of birth
- → Contributors not submitting person-level enrollment data but reporting patient date of birth
- → Contributors not submitting person-level enrollment data or patient date of birth but reporting patient age

Type 1 data contributors submit sufficient information on enrollment records to differentiate individuals and accurately assign enrollee identifiers. For Type 2 and Type 3 data contributors, enrollee identifiers cannot be assigned using enrollment data; therefore, elements found in the claims data become the basis for assigning enrollee identifiers.

For Type 2 data contributors, ENROLID assignment is derived from claims data using the same set of variables as Type 1 data contributors, but the data source is the claim rather than a person-level eligibility record.

For Type 3 data contributors, ENROLID is assigned by using the patient age provided on the claim to derive the year of birth. Because the date of birth is an approximation for Type 3 contributors, it is impossible to distinguish between same-sex siblings born within a year of each other.

The Enrollee ID Derivation Flag (EIDFLAG) describes which of these three methodologies was used to assign the enrollee identifier. See Exhibits 10a and 10b for a summary of the flag contributors.

- → EIDFLAG=1 indicates that the data contributor supplied person-level enrollment data (ENRFLAG=1) and that an individual's enrollment record was used to assign ENROLID.
- → EIDFLAG=2 indicates that the data contributor supplied enrollment data (ENRFLAG=1) but the variables used to assign ENROLID on a claim did not link to a single person record in the Enrollment data. Claim information was used to assign ENROLID.
- → EIDFLAG=3 indicates that the data contributor supplied enrollment data (ENRFLAG=1) but one or more of the variables needed to identify an individual was missing from the claims record (that is, the claim was missing enrollee relationship to contract holder, sex, or patient date of birth). ENROLID is set to missing.
- → EIDFLAG=4 indicates that the data contributor did not supply person-level enrollment data (ENRFLAG=0) and enrollee identifiers were assigned using claim information.
- → EIDFLAG=5 indicates that data contributor did not supply person-level enrollment data (ENRFLAG=0) and one or more of the variables needed to identify an individual was missing (that is, the claim was missing enrollee relationship to contract holder, sex, or patient date of birth). ENROLID is set to missing.
- → EIDFLAG=6 indicates that the data contributor did not supply person-level enrollment data (ENRFLAG=0) and did not supply patient date of birth on the claim. A "pseudo" ENROLID was assigned on the basis of information derived from the medical claim.

Enrollee ID derivation flag (EIDFLAG)

Exhibit 10a. Enrollment Data Contributors (ENRFLAG=1)

EIDFLAG=1	EIDFLAG=2	EIDFLAG=3
Enrollment	Claim	Claim
ENROLID Present	ENROLID Present	ENROLID Missing

Exhibit 10b. Nonenrollment Data Contributors (ENRFLAG=0)

EIDFLAG=4	EIDFLAG=5	EIDFLAG=6*
Claim	Claim	Claim
ENROLID Present	ENROLID Missing	ENROLID

* A "pseudo" ENROLID is assigned and may be indistinct.

Clinical variables

Diagnosis codes in MarketScan data use the International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) classification system for service dates on or before September 30, 2015. For service dates starting October 1, 2015, the International Classification of Diseases, Tenth Revision, Clinical Modification (ICD-10-CM) classification system is used. A Diagnosis Version field (DXVER) is included in the data to indicate which coding system is in use. Note that it is possible for one string to be valid in both systems.

ICD-9-CM diagnosis codes are three to five digits in length. The first character can be alphanumeric (0–9, E or V); characters two through five are numeric or blank. There are approximately 15,800 valid ICD-9-CM codes. In MarketScan data, the decimal point is implied between the third and fourth digit of the code. The data are left justified. Examples are provided in Exhibit 11a.

Exhibit 11a. Examples of ICD-9-CM diagnosis codes

ICD-9-CM	MarketScan Data Value
390	390 (followed by 2 spaces)
012.1	0121 (followed by 1 space)
223.89	22389

ICD-10-CM diagnosis codes are three to seven digits in length. The first character can be alphanumeric, the second character is numeric, the third character is alphanumeric, and the fourth through seventh characters are alphanumeric or blank. There are approximately 70,000 valid ICD-10-CM codes. In MarketScan data, the decimal point is implied between the third and fourth digit of the code. The data are left justified. Examples are provided in Exhibit 11b.

Exhibit 11b. Examples of ICD-10-CM diagnosis codes

ICD-10-CM	MarketScan Data Value
E02	E02 (followed by 4 spaces)
M86.9	M869 (followed by 3 spaces)
C72.20	C7220 (followed by 2 spaces)
B08.010	B08010 (followed by 1 space)
W00.9XXA	W009XXA

Up to four diagnosis codes (DX1, DX2, DX3, DX4) are recorded on every Inpatient Service record. The principal diagnosis on the Inpatient Admissions Table generally is identified as the discharge diagnosis on a hospital claim. Up to 14 secondary diagnosis codes (DX2 through DX15) from individual Inpatient Service records are included on the corresponding Inpatient Admission record. Up to four diagnosis codes (DX1, DX2, DX3, DX4) are recorded on each Outpatient Service record. Up to nine diagnosis codes (DX1 through DX9) are recorded on each Facility Header record.

Procedure codes in MarketScan data are three to seven positions in length, depending on the classification system used. The Current Procedural Terminology, 4th Edition[10] [11], (CPT®-4) coding system is most prevalent. CPT-4 procedure codes appear on physician claims and many outpatient facility claims. CPT-4 codes are five-digit numeric codes.

[10] CPT copyright 2023 American Medical Association (AMA). All rights reserved. Applicable Federal Acquisition Regulation (FAR) and Defense Federal Acquisition Regulation Supplement (DFARS) restrictions apply to government use.

[11] Fee schedules, relative value units, conversion factors, and related components are not assigned by the AMA and are not part of CPT; the AMA is not recommending their use. The AMA does not directly or indirectly practice medicine or dispense medical services. The AMA assumes no liability for data contained or not contained herein.

ICD-9-CM procedure codes or International Classification of Diseases, Tenth Revision, Procedure Coding System (ICD-10-PCS) procedure codes are found on facility claims. These codes are three to four digits in length and are all numeric. There is an implied decimal point between the second and third digits for ICD-9-CM procedure codes; there is no decimal point in ICD-10-PCS procedure codes. Examples are provided in Exhibit 12.

Exhibit 12. Examples of ICD-9-CM and ICD-10-PCS procedure codes

ICD-9-CM, ICD-10-PCS	MarketScan Data Value
13.9	139 (followed by 4 spaces)
13.19	1319 (followed by 3 spaces)
001U3J7	001U3J7

Effective with the 2000 data year, the MarketScan Databases contain CPT-4 procedure code modifiers for some data contributors (see related references in footnotes on previous page).

The CMS Healthcare Common Procedural Coding System (HCPCS) procedure codes are found in MarketScan data less often than CPT and ICD procedure codes. These codes are five digits in length. The first character is alpha; all other characters are numeric. HCPCS codes beginning with "J" are included in the MarketScan Databases and represent injectable drugs.

One procedure code (PROC1) is stored on each Inpatient Service record. From the individual Inpatient Services constituting one Inpatient Admission record, one procedure code is identified and assigned as the principal procedure (PPROC). Up to 14 secondary procedure codes (PROC2 through PROC15) from individual Inpatient Service records are included on the corresponding Inpatient Admission record. One procedure code (PROC1) is included on each Outpatient Service record. Up to six procedure codes (PROC1 through PROC6) are included on each Facility Header record. Most procedure codes on the Facility Header Table use the ICD-9-CM or ICD-10-PCS procedure coding systems.

The variable Procedure Code Type (PROCTYP) identifies the type of procedure code (for example, HCPCS, CPT-4). Use this variable in conjunction with the Procedure Code 1 (PROC1) variables on the Inpatient Service and Outpatient Service records to designate the coding system of interest.

The quality of diagnosis and procedure coding varies among the approximately 350 payers or administrators represented in the MarketScan Databases. Every effort is made to select the data contributors with the best coding. The diagnosis and procedure codes are validated and edited, if necessary. (See Frequently Asked Questions, Q12 for a detailed description of validation and editing.)

Any old codes submitted by data contributors are retained in the MarketScan data and reflect their original definition.

Note: When defining a diagnosis or procedure of interest, first run a frequency distribution in the range of interest. For example, analyze the frequency of 53x.xx (ICD-9-CM), K25.xxxx (ICD-10-CM) diagnosis codes for patients with stomach ulcers. Analyze the coding practices, and then create the criteria for diagnosis and procedure selection.

MarketScan database construction

The Merative MarketScan Research Databases are constructed from privately insured, paid medical and prescription drug claims. The data contributors generally are self-insured. Collectively, the databases incorporate data from almost 350 payers, including commercial insurance companies, Blue Cross® Blue Shield® plans, and third-party administrators.

Each contributor database is constructed by collecting raw data from the appropriate payer(s). These raw data are service-level adjudicated paid claims and capitated encounters containing both inpatient and outpatient services. Financial, clinical, and demographic variables are standardized to common definitions, and variables specific to employers also are added. Clinical detail is added to the Outpatient Pharmaceutical Claims Table. Examples of such detail include therapeutic class, therapeutic group, manufacturer's average wholesale price, and a generic product identifier.

Merative then applies an admission construction methodology to assemble the inpatient paid services into one record per inpatient admission. During the admission creation process, variables such as Primary Diagnosis (PDX) are created and included on both the inpatient admission record and the inpatient service record.

Data quality

Edits on the reasonableness of data check the distribution of categorical fields to ensure that they are reasonable against norms. Validity checks are conducted for selected fields, including diagnosis codes, procedure codes, date(s) of service, sex, and age, to compare recorded values with lists of possible valid values for those fields. Improper coding is flagged to recommend data quality improvement actions to the carrier or data processor.

The MarketScan Databases are created by combining the standard variables of the individual databases (data contributors) and by creating links between years of data and across all data types. The MarketScan Databases are created as a snapshot in time and are based on a calendar-year incurred period. The MarketScan data flow is depicted in Exhibit 13.

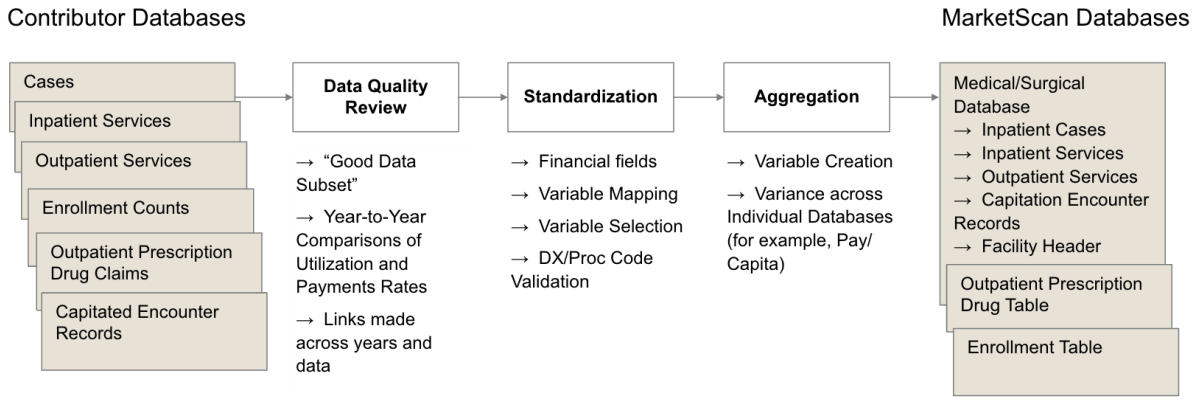
Claims lag periods (the amount of time between the date of service on the claim and the date payment is made) vary considerably across the insurance carriers in the MarketScan Databases. Because of this, the data are collected when close to 100 percent of claims have been paid, which takes about 6 months after year end.

Additional enhancements to the data during the MarketScan Database creation process include the following:

- → Comparing and validating diagnosis and procedure codes to codes that were in effect at that time
- → Adding the Metropolitan Statistical Area (MSA) of the primary beneficiary to claims
- → Integrating benefit plan characteristics, enrollment, outpatient pharmaceutical claims, and medical/surgical data
- → Adding MDCs and DRGs to claims
- → Creating a common synthetic patient identifier, which enables a patient to be tracked over years across medical/surgical, outpatient, pharmaceutical, enrollment, and benefit plan files and across databases (for example, Commercial Database and Medicare Database) while ensuring patient confidentiality
- → Identifying the type of plan for the patient, such as preferred provider organization (PPO), point-of-service (POS) plan, or comprehensive plan
- → Verifying that both the experience and the denominator populations exist for all subsets of the data
- → Standardizing place, service type, and provider type values and industry classifications

Note: Data are not edited for concordance between diagnosis and procedure codes or demographic variables such as sex.

Exhibit 13. MarketScan data flow chart



Abbreviation: DX/Proc, diagnosis/procedure.

Plan type definitions

The plan types in the MarketScan Databases are based on the definitions provided in Exhibit 14. The summary grid identifies the basic differences between plan types.

Exhibit 14. Type of Plan (PLANTYP)

Definition Number and Plan Type	Patient Incentive to Use Certain Providers?	PCP Assigned?	Referrals From PCP to Specialists Required?	Out-of-Network Services Covered?	Partially or Fully Capitated?
1. B/MM	No	No	n/a	n/a	No
2. COMP	No	No	n/a	n/a	No
3. EPO	Yes	Yes	Yes	No	No
4. HMO	Yes	Yes	Yes	No	Yes
5. Non-Cap POS	Yes	Yes	Yes	Yes	No
6. PPO	Yes	No	n/a	Yes	No
7. Cap or Part Cap POS	Yes	Yes	Yes	Yes	Yes

Definition Number and Plan Type	Patient Incentive to Use Certain Providers?	PCP Assigned?	Referrals From PCP to Specialists Required?	Out-of-Network Services Covered?	Partially or Fully Capitated?
8. CDHP	Varies	No	n/a	Varies	No
9. HDHP	Varies	No	n/a	Varies	No

Abbreviations: n/a, not applicable; PCP, primary care physician. Plan type abbreviations are defined below.

Plan type

This section describes the plan types in the MarketScan Databases.

1. Basic/ Major Medical Plan

There is no incentive for the patient to use a specific list of providers. Coverage is handled in two phases: a basic policy covers the first set of charges—usually a hospital admission—with no out-of-pocket charge. After the basic policy will no longer pay, a major medical policy assumes coverage, usually with a deductible and coinsurance.

2. Comprehensive Plan

There is no incentive for the patient to use a specific list of providers. Coverage is handled by only one policy with a deductible and coinsurance.

3. Exclusive Provider Organization Plan

Patients must choose from an approved list of providers for all nonemergency care. Each patient chooses a primary care physician (PCP) to manage all care. Referral from the PCP is required for treatment by specialists. The plan does not pay for services on a capitated basis.

4. Health Maintenance Organization Plan

Patients must choose from an approved list of providers for all nonemergency care. Each patient chooses a PCP to manage all care. Referral from the PCP is required for treatment by specialists. All or some services are paid by the plan on a capitated basis.

5. Non-Capitated (Non-Cap) Point-of-Service Plan

Patients are offered financial incentives through a lower copay or deductible to use an approved list of providers. Each patient chooses a PCP to manage all care. Referral from the PCP is required for treatment by specialists. No services are capitated, and patients may seek treatment outside the network, usually with a financial penalty.

6. Preferred Provider Organization Plan

Patients have financial incentives, such as a lower copay or deductible, to use an approved list of providers. A PCP is not required, and specialist referrals are not necessary. No services are capitated. Patients may seek treatment outside the network, usually with a financial penalty. The financial incentives may be offered only through discounted rates within the network.

7. Capitated (Cap) or Partially Capitated (Part Cap) Point-of-Service Plan

Patients are offered financial incentives to use an approved list of providers through a lower copay or deductible. Each patient chooses a PCP to manage all care. Referral from the PCP is required for treatment by specialists. All or some services are paid on a capitated basis. Patients may seek treatment outside the network, usually with a financial penalty.

8. Consumer-Driven Health Plan

A consumer-driven health plan (CDHP) is a PPO plan coupled with a Health Reimbursement Arrangement (HRA). The PPO plan typically has a relatively high deductible but may carve drugs in or out of the HRA and plan deductible. The HRA is a notional account that is paid 100 percent from employer funds; an HRA is not prefunded with employer monies.

9. High-Deductible Health Plan

A high-deductible health plan (HDHP) is a statutory HDHP (as defined in the Medicare Modernization Act of 2003) that is coupled with a health savings account (HSA). An employee is vesting 100 percent in HSA funds, and either the employer or employee can contribute to the HSA. The HSA is a tax-advantaged, portable savings account owned by the employee. HDHP plan design features such as deductibles and contribution limits are indexed each year by the Treasury Department. An HDHP must conform to the statutory plan design requirements in order to use an HSA to defray HDHP costs.

Key table and field relationships

Although the databases in their native format are not truly normalized, several key fields are used to relate tables to each other. These relationships are described below.

1. ENROLID

Related tables: Inpatient Admissions (I), Inpatient Services (S), Outpatient Services (O), Prescription Drugs (D), Facility Header (F), Annual Enrollment Summary (A), Enrollment Detail (T)

Relationship: Unique on A; not unique on I, S, O, D, F, or T.

Function: This is the unique enrollee identifier across all MarketScan data products. The Annual Enrollment Summary (A) Table provides one record per enrollee for the entire year, so ENROLID will be unique on this table. The Enrollment Detail Table (T) provides one record per enrollee per enrolled month, so one ENROLID can appear on as many records in the T table as the number of months an individual was enrolled. ENROLID can appear multiple times (or not at all, if a person did not receive any services) in the medical and pharmacy claims files.

2. CASEID

Related tables: Inpatient Admissions (I), Inpatient Services (S), Facility Header (F)

Relationship: Unique on I; not unique on S or F.

Function: This field is a unique identifier for each inpatient admission in the data. The Inpatient Admissions (I) Table is structured as one record per inpatient admission, so CASEID values will be unique on the I Table. The individual detail service records that comprise all services that make up an admission are stored in the Inpatient Services (S) Table, and all of these individual services will have the corresponding CASEID value.

CASEID also appears on the Facility Header (F) Table, where applicable.

The CASEID value for a specific admission will not necessarily remain the same between different versions of the same database. Blending database versions is not recommended.

3. FACHDID

Related tables: Facility Header (F), Inpatient Services (S), Outpatient Claims (O)

Relationship: Unique on F; not unique on S or O.

Function: This field is a unique identifier for a Facility Header claim. It is the header information from one UB04 Facility claim form. The related detail information from each facility claim form is found in either the Inpatient Services (S) or Outpatient Claims (O) Table, depending on the site of service (inpatient or outpatient). FACHDID is unique on the F Table. It links to the many detail line services found in either the S or the O Table.

Note: Some of our data suppliers create an artificial, universal one-to-one relationship between header and detail (that is, every facility header record from those data suppliers has exactly one associated detail row).

The FACHDID value for a given claim header will not necessarily remain the same between different versions of the same database. Blending database versions is not recommended.

4. NDCNUM

Related tables: Prescription Drug (D), RED BOOK (R)

Relationship: Unique on R; not unique on D.

Function: The RED BOOK Table is a supplemental table that provides additional information about prescription drugs (for example, generic name, manufacturer, therapeutic class). Drugs are listed in this file by National Drug Code. The code is linkable to the Prescription Drug Claims (D) Table, so that selection of drug claims may be made by the categorical fields included in the RED BOOK.

Glossary of acronyms, abbreviations, and terms

Acute care

(1) Services within a hospital setting intended to provide patients with medical and surgical care over a relatively short period of time.
(2) A hospital that provides short-term medical and surgical care.

Adjudication

The process of claims review by the carrier to determine whether the claims should be paid and, if so, how much money should be paid for each claim.

Adjustment records

Claims in some databases that represent financial adjustments to original claims. The dollar amounts of these adjustments may be negative, or the record may include an adjustment indicator that shows whether the adjustment is positive or negative. There also are specific terms that refer to adjustments as we receive them from carriers. A bulk adjustment is a single quarterly or annual adjustment for a hospital discount (not typically loaded on the database). A void adjustment is a record that simply cancels an earlier claim record. A replacement claim record usually follows it. A void and replace adjustment is a single record that stores both the cancellations of the earlier claim and the new claim. An adjustment to net pay just shows the difference between the original net pay amount and what the carrier actually paid.

Administrator

Person or firm that pays claims under an Administrative Services Only (ASO) contract—also known as a third-party administrator.

Admission

An acute inpatient hospital stay covered by the patient's benefit plan. To the extent that such care is covered, admissions may include hospital stays, psychiatric stays, psychiatric night care, and stays for alcoholism, substance abuse, and rehabilitative care. An admission also may be called a case or a stay.

Admission date

The date a patient begins a stay in a hospital or other overnight healthcare facility.

Ambulatory care

Medical services provided on an outpatient (nonhospitalized) basis. Services may include diagnosis, treatment, surgery, and rehabilitation.

Ambulatory surgery

Surgery for which there is no overnight stay in a hospital. The patient comes into and out of the hospital on the same day.

Annualization

A statistical technique for estimating a yearly rate using data collected over a shorter time period (for example, a quarter or month) or over a longer time period (for example, 30 months).

Average length of stay (ALOS)

The average number of days per hospital admission for a group of admissions. Analysts typically examine the ALOS for a single MDC or DRG at a given employee location or other variable and compare it with a norm, another location, or other measure. See **length of stay**.

Benefit

Conventionally defined as the amount payable for a loss under a specific insurance coverage (indemnity benefits) or as the guarantee that certain services will be paid.

Business coalitions

Groups of employers, which may or may not include health plans, that seek to control healthcare costs and ensure quality by aggressively regulating prices, assuming administrative tasks related to healthcare, and/or asking health plans to develop and provide data on measures of quality and outcomes.

Capitation

(1) A predetermined amount prepaid to a provider for a specific group of services that are defined in the contract, usually in a health maintenance organization (HMO) arrangement. The provider is paid on the basis of the number of members who have selected him or her as their primary care physician (PCP).
(2) A fixed, predetermined amount paid to a provider for each member who has elected to seek care from that provider. Total payment to the provider (sum of per

person enrolled payment amount) is based on the number of people who enroll without regard to the actual number or nature of services provided to members. This is the characteristic payment method for primary care in HMOs.

Carrier

The party to the group contract that agrees to underwrite and provide certain types of coverage and service. Examples are commercial insurers (for example, Aetna®, Metropolitan Insurance Services, Prudential) and Blue Cross Blue Shield.

Carve-out

A program that is separate from the primary group health plan and designed to provide a specialized type of care, such as mental health services. Carve-out also may describe a method of integrating Medicare with an employer's retiree health plan (making the employer plan excess or secondary), which tends to produce the lowest employer cost.

Case level

A variable that is found in the Inpatient Admissions Table. Case-level variables may be demographic variables that are the same for the entire case (for example, patient age and sex, employee ID number), clinical variables that refer to the case as a whole (for example, MDC, DRG), or financial variables that summarize all services for a case (for example, total payments). See service level for comparison.

Centers for Medicare & Medicaid Services (CMS)

(1) A division within the U.S. Department of Health and Human Services (HHS). This division oversees all regulatory and financing activities for Medicare and Medicaid. (2) The portion of the federal government responsible for payment of Medicare. Prior to June 2001, CMS was named the Health Care Financing Administration (HCFA).

Charges

The amount patients or third-party payers are billed for care.

Claims data

Information that comes from provider claims to third-party payers. Claims data usually include personal patient-identification information, the services performed, and the amount paid by the patient. Claim forms generally are used by enrollees of standard indemnity plans (that is, fee-for-service plans).

Claims lag

(1) This lag generally refers to the period between the date a healthcare service is incurred and the date the claim for that service is submitted to the administrator for payment.
(2) The Merative definition is the period between the service date and the paid date on a claim. See runoff.

Coding

The handling process for the carrier's claims data. A coding problem indicates that the carrier has entered inaccurate or imprecise data into the claims record, has failed to fill in one or more data variables, or has failed to include one or more variables in the record extract.

Coinsurance

(1) The percentage of a covered medical expense that a health plan or beneficiary must pay after a deductible is met.
(2) A policy provision by which both the insured and the insurer share hospital and medical expenses in a specified ratio (commonly 20 percent to 80 percent), after the deductible is met. Coinsurance amounts are stored in the Merative variable COINS.

Completion factors

(1) Factors that allow a quantitative measure of data completeness. These factors range in value between 0 (no data) and 100 (a full month of data) for services in any month. Completion factors are used to derive the number of months of data and an annualization factor for rate calculations. They also are used to derive weighted population averages.
(2) A percentage that estimates how many of the cases that occurred in a given month are online in a client database. Completion factors of less than 100 percent are due to runoff or runup. The percentage of data missing for each month is used to annualize the cost and use rates for that month on clinical reports.

Comprehensive Omnibus Budget Reconciliation Act (COBRA)

(1) A congressional act passed in 1985 that requires continuation of benefits to plan participants who previously would have been ineligible because of a qualifying event.
(2) A program that gives employees who leave a firm the option of continuing their health coverage with that firm for a period of time. The employee pays the premium.

Coordination of benefits (COB)

(1) After one insurance carrier has paid a claim, the second carrier pays an amount that covers the patient up to the benefit level of the second policy only.
(2) COB coverage between carriers so that the insured does not receive double payment for services when a subscriber has coverage from two or more sources. An example is a husband and wife who work at different companies and choose to be covered by both employers' insurance. COB policies also establish primary and secondary payment responsibilities. (In the Merative system for older databases, the COB variable may represent dollars saved for reasons other than COB, such as penalties for noncompliance.)

Copay or copayments

(1) Copayments are generally a preset amount per covered visit or service (for example, $10) paid by the patient.
(2) A fixed payment, paid by the patient, for a given service or procedure. This payment customarily is made at the time of service. Copayment amounts are stored in the Merative variable COPAY.

Cost sharing

Arrangements whereby consumers pay a portion of the cost of the health services, sharing costs with employers. Deductibles, copayments, coinsurance, and payroll deductions (premium contributions) are forms of cost sharing.

Cost shifting

Occurs when a provider inflates charges for a given procedure or patient in order to cover losses associated with charges (payments received) for other patients or procedures.

CPT or CPT-4 codes

Physicians' Current Procedural Terminology codes.
(1) Physicians' most commonly used coding scheme (five-digit codes) used to identify the medical or surgical procedure that occurred for a patient; most frequently used for billing by professionals. (It is often referred to as CPT-4, with 4 representing the fourth edition).
(2) A system developed by the American Medical Association used to classify procedures and services rendered by physicians. Physicians use the CMS 1500 form to describe services rendered to a patient and to request payment for those services. See ICD-9-CM, ICD-10-CM/PCS, HCPCS.

Deductible

The portion of a subscriber's healthcare expenses that must be paid out of pocket before any insurance coverage applies. Commonly $100 to $300. It is not allowed in federally qualified HMOs. The deductible usually must be met again each benefit year before the insurer will begin paying for benefits. The deductible amount is stored in the Merative variable DEDUCT.

Dependent

An insured individual's spouse or (in many policies) domestic partner and unmarried children who meet certain eligibility requirements and who are not otherwise insured under the same group policy. The precise definition of a dependent varies by insurer or employer.

Diagnosis (Dx)

The determination of the nature of a disease based on the medical symptoms of a patient; a concise technical classification of a health situation. The diagnosis helps determine necessary procedures.

Discount

Arrangement whereby a payer has negotiated a reduced payment with a provider in return for a patient incentive.

Eligible

A contract holder and his or her spouse and dependents who are enrolled in a benefit plan.

Encounter

(1) A unit of measure denoting one patient-provider contact or appointment. Multiple services may be delivered during one encounter. Encounters can take place on an inpatient or outpatient basis.
(2) A patient visit to a capitated provider; no fee-for-service payment.

Encounter record

A record of a patient encounter reflecting who visited a given provider and which services were provided. The form used to capture encounter data applies to non-fee-for-service arrangements (capitated).

Enrollees

Employees, contract holders, spouses, and dependents who are enrolled in a benefit plan (also known as **covered lives**).

Exclusions

Services or procedures that are not covered according to the plan provisions.

Exclusive provider organization (EPO)

A preferred provider organization (PPO) in which patients are required to use the PPO network providers.

Fee-for-service (FFS)

A method of payment based on reimbursing providers for each unit of service or treatment provided.

Fee-for-service equivalent (FFSE)

An amount specified on claims records representing what would have been charged for a service if the service had not been covered by a capitation arrangement.

Gatekeeper

(1) The PCP responsible for managing medical treatment rendered to an enrollee of a health plan.
(2) A designated healthcare practitioner who provides primary care services and coordinates specialist and other care for health plan members. Members typically are charged extra costs for care that is not provided or coordinated by the gatekeeper.

Grouper

Software that assigns claims to a common clinical grouping. In the MarketScan Databases, groupers are used to assign a DRG and MDC to each inpatient admission. The assignment is based on diagnosis and procedure coding received from the carrier (provided the diagnosis and procedure coding from the carrier is adequate).

Healthcare Common Procedure Coding System (HCPCS)

(1) A procedure coding system that includes all CPT-4 codes plus supplemental codes not included in CPT-4 (for example, ambulance, chiropractic services).
(2) One of several schemes used to classify healthcare activity. HCPCS was based on CPT-4 coding and expanded to include nonphysician provider procedures. The acronym is pronounced "hick-picks." See **CPT-4**, **ICD-9-CM**, **ICD-10-CM/PCS**.

Health maintenance organization (HMO)

(1) An entity that accepts responsibility and financial risk for providing specified healthcare services to a defined population during a defined period of time at a fixed price. There generally is no coverage for non-emergency-department care panels of practitioners and providers.
(2) The Health Maintenance Act of 1973 (PL93-222) defines an HMO as a legal entity or organized system of healthcare that provides an agreed-upon set of comprehensive health services to a voluntarily enrolled population in exchange for a predetermined, fixed, and periodic payment. See open-ended HMO.

Hospital payments

Facility payments only.

Incurred but not reported (IBNR)

Claims for services that have been incurred but not yet paid by the carrier. See claims lag.

International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM)

A nationally uniform system for coding clinical conditions (diagnoses) that was used prior to October 1, 2015, by nearly all providers and claims payers. It also includes procedure coding used by hospitals. ICD-9-CM includes both diagnostic and procedure coding required by the Grouper to assign DRGs and MDCs. It is also known as I9. See CPT-4, HCPCS, ICD-10-CM/PCS.

International Classification of Diseases, Tenth Revision, Clinical Modification/Procedure Coding System (ICD-10-CM/PCS)

A nationally uniform system for coding clinical conditions (diagnoses), used effective October 1, 2015, by nearly all providers and claims payers. It also includes procedure coding used by hospitals. ICD-10-CM/PCS includes both diagnostic and procedure coding required by the Grouper to assign DRGs and MDCs. It is also known as I10. See CPT-4, HCPCS, ICD-9-CM.

Incurred date

The date on which the activity or service took place. See paid date, claims lag, IBNR.

Indemnity (traditional) insurance

(1) A healthcare insurance plan designed to reimburse patients for losses due to healthcare costs; typically used to characterize fee-for-service payment plans.
(2) The most common form of health insurance coverage in recent decades. The indemnity insurer usually administers claims and does not provide healthcare services. A typical coverage arrangement is 80 percent of a claim covered by the insurer and 20 percent covered by the patient or enrollee (also referred to as coinsurance). Indemnity plans typically also require that the covered person meet an annual deductible (for example, $200) before the insurer will begin to pay a percentage of claims incurred.

Individual practice association (IPA)

A type of HMO. A group of physicians who practice independently but also provide services for an HMO under a contract agreement. An IPA physician also can and does provide "traditional" fee-for-service healthcare to patients not covered by an HMO.

Inpatient

(1) Pertaining to the medical care of an individual admitted to the hospital for at least 1 night.
(2) That portion of the base relating to hospital admissions. Length of stay (DAYS) will be at least one day.

Inpatient payments

All facility, professional and other payments related to a hospital admission.

Length of stay (LOS)

The number of days (DAYS) the patient was confined (spent in the hospital) during the inpatient admission. Also see **average length of stay**.

Long-term disability (LTD)

(1) A significant period of disability generally ranging from 6 months to life.
(2) Wage replacement insurance for individuals who are (partially or totally) permanently disabled.

Mail-order pharmacy

A company that receives prescriptions from physicians or patients via fax or mail and then mails the medication to patients. Meanwhile, the physician provides the patient with enough of the medication to last until the prescription arrives. Generally, the cost

per prescription from mail-order pharmacies is lower than the cost at other pharmacies because of higher volume and lower overhead.

Major diagnostic category (MDC)

(1) A classification system for grouping medical conditions into one of 25 categories. The first 16 categories refer to major body systems; the remaining categories encompass more than one body system.
(2) A widely recognized classification system that groups medical conditions into broad classifications, mostly by body system. Each DRG is assigned to one MDC.

Managed care

(1) Employing incentives at both the provider and patient level that encourage the efficient provision of healthcare services. Common elements of managed care include capitation, a primary physician acting as a gatekeeper, and patient copayments.
(2) An organized system of healthcare services in contrast to the fee-for-service system.

Medical

Clinical in nature, as opposed to surgical.

Medicare

(1) A system of medical insurance provided by the federal government for all Americans aged 65 years and older and for Americans who are permanently disabled or have renal failure.
(2) A federal program under Title XIX of the Social Security Act that provides health insurance for individuals aged 65 years and older and for other specified groups. Part A of Medicare covers hospitalization and is compulsory (that is, automatically provided to any beneficiary who has qualified for participation in Social Security). Part B of the program covers outpatient services and is voluntary.

National Drug Code (NDC)

A standard 12-digit coding system used to identify drugs on drug claims.

Not elsewhere classified (NEC)

An abbreviation used to indicate the most generic category. There may be insufficient information to assign a more specific code.

Net pay

The portion of the charge for a healthcare service that the carrier paid to the employee or assigned provider. NETPAY is calculated as PAY minus DEDUCT minus COPAY minus COINS minus COB.

Network providers

Providers who have contracted to be part of a plan's network; they may be capitated or on a discounted fee-for-service arrangement. Patients who visit out-of-network providers generally pay greater out-of-pocket amounts.

Open-ended HMO

An HMO that allows the patient to receive services from a nonnetwork provider. Although such services will be covered, the patient must pay higher-than-normal copayments and deductibles.

Out-of-pocket (OOP) costs

The portion of the claim that the patient or enrollee is obligated to pay (for example, copayments, coinsurance, deductible). There typically is an annual OOP maximum. If the maximum is met, the insurer pays 100 percent of the costs incurred by the enrollee for the remainder of the plan year.

Paid date

The date on which a claim is paid (PDDATE). Claims data usually are received from carriers on the basis of paid date. For example, a submitted data file may contain all claims that were paid during the fourth quarter of 2013, regardless of when the claims were incurred. See incurred date, claims lag.

Point-of-service (POS) plan

Replacement of an indemnity plan.
(1) A managed care plan that pays (reduced) benefits when patients receive healthcare services either from non-managed-care network providers or without proper referral by their primary care physician.
(2) A benefit plan design in which enrollees must access the healthcare system through a gatekeeper. In addition to differential coinsurance and copayment levels described under PPO, POS plans may include a differential deductible for in- and out-of-network services used (for example, in-network deductible may be $250 and out-of-network deductible may be $500).

Precertification or preauthorization

Permission from the administrator for the hospital admission to occur or the services to be performed. This is a form of utilization review based on the patient's health status and treatment needs.

Preferred provider arrangement or prudent purchaser arrangement (PPA)

Same as a preferred provider organization.

Preferred provider organization (PPO)

(1) A health plan that gives patients lower rates if they use the physicians in the preferred group of providers. Patients may use doctors outside that list, but they usually pay more to do so. Participating physicians normally are under a contract and keep an independent practice in the community. They also typically enroll in other preferred provider programs. Physicians receive reduced rates in return for a larger patient flow—lower price for the promise of higher volume.
(2) Providers (for example, hospitals, physicians) offering discounts or other reduced rates to a healthcare purchaser. Patients usually are "channeled" by receiving improved benefits (for example, lower/no deductibles or copayments). See EPO, point-of-service PPO.

Premium

An amount paid periodically to purchase health benefits; for self-insured groups that do not purchase insurance, the term may refer to the per employee or per family cost of health benefits and may be used for planning and analysis purposes, even when no contribution to coverage is collected from the employee.

Primary care physician (PCP)

The physician that a patient in a managed care plan must see first for any health problem; the PCP acts as a gatekeeper and determines whether and when the patient needs to see a specialist. PCPs generally are internists, pediatricians, family physicians, general practitioners, and occasionally obstetricians/gynecologists.

Procedure group

Outpatient procedure groupings based on CPT-4 and HCPCS procedure code values.

Provider

A person or organization that provides healthcare services, such as a physician or hospital.

Referral

(1) Written authorization from a patient's PCP for the patient to see a specialist.
(2) An arrangement for a patient to be evaluated or treated by another provider.

Reimbursement

The dollar cost of covered products and services for which insurers pay.

Risk sharing

An agreement whereby the risks of providing care under a capitated arrangement are shared by multiple parties. For example, a pharmaceutical manufacturer assumes a portion of the financial risk for the use of a product with the provider. A risk-sharing arrangement may include a capitated payment for the unlimited use of a product, promotion of appropriate usage by the manufacturer, or performance guarantees based on predetermined outcomes.

Runoff period

The period of time representing the number of months between a claim's service date and paid date. For example, if the runoff month's variable is equal to 6, it indicates that most claims are paid within 6 months of their service date.

Self-insurance

Funding of medical care expenses in whole or part through internal resources rather than through transfer of risk to an insurer.

Service date

The date that a medical care service is provided (SVCDATE).

Service level

A variable that is found in the Inpatient Services Table. These variables can be different for each service within an admission. Examples are service date, provider ID, diagnosis and procedure codes, and financial variables that contain only the amount for that service (for example, charge, payment). See case level for comparison.

Short-term disability (STD)

(1) Wage replacement insurance for individuals temporarily disabled because of nonoccupational injury or illness.
(2) Often considered to be a disability lasting not longer than 6 months.

Stop-loss (out-of-pocket max)

(1) Usually, this refers to the maximum out-of-pocket amount that an individual or family could pay in a single plan year, including deductibles and copayment amounts. Alternatively, it may refer to the total dollar value of covered services after which the plan pays 100 percent.
(2) The maximum out-of-pocket liability for a patient each year for deductibles, copayment, and coinsurance.

Subrogation

The assumption by a third party (such as an insurance company) of another's legal right to collect a debt or damages. It is related to COB (for example, recoveries from auto insurance may reduce an insurer's health benefit liability).

Summary Plan Description (SPD)

A legally required document that summarizes a company's healthcare benefit plan.

Surgical

Pertaining to a service performed by a surgeon or involving surgery.

Third-party administration or administrator (TPA)

(1) Administration of a group insurance plan by some person or firm other than the insurer or the policyholder. TPAs also may pay claims.
(2) The administrator or claims administrator.

Total charges

Total eligible charges, prior to reductions for reasonable and customary limits and PPO discounts.

Total payments

Total eligible charges less any reasonable and customary amounts and discounts for PPO services, but prior to reductions for deductibles, copayments, and other savings.

Uniform Billing (UB)

A standardized billing format for hospitals to use when submitting data to third-party payers. The term usually is followed by a year that indicates when the format was last revised (for example, UB04).

Unbundling

Creative or fraudulent billing practices used by providers to increase payment by charging item-by-item for components of a medical procedure.

Usual, customary, and reasonable (UCR)

A method of payment to physicians based on the usual (U) charge of a particular physician for the procedure, the customary (C) charge for the procedure among physicians in the community, and a determination of what a payer's reasonable (R) payment should be. This system is highly inflationary, because physicians typically increase their charges substantially to ensure that they attain a certain income. Plans often pay a percentage of UCR or a percentage of R and C. The patient is liable for the remainder, unless the physician is contractually obligated to accept the adjusted payment in full. (Balance billing is the practice of billing the patient for the remainder.)

Utilization review (UR)

(1) A generic term referring to any program to control hospital runoff and runup admissions, lengths of stay, or both. Examples are second surgical opinion programs, length-of-stay certification, concurrent review, and preadmission certification.
(2) A managed care process focused on the point at which care is (or is to be) provided, typically for expensive events; for example, in the case of hospital admission or outpatient surgery, the necessity and appropriateness of the procedure are reviewed against medical criteria by a third party.

Wellness benefits

A broad range of employer or union-sponsored facilities and activities designed to promote safety and good health among employees. The purpose is to increase worker morale and reduce the costs of accidents and ill health such as absenteeism, lower productivity, and healthcare costs. It may include physical fitness programs, smoking cessation, health risk appraisals, diet information and weight loss, stress management, and blood pressure screening.

Withhold amount/pool process

The dollar amount retained or withheld from the servicing provider and placed in a risk-sharing pool for future distribution.

Frequently asked questions

Q1. How do individuals track data longitudinally across years, plans, and employers?

Merative maintains a unique person-level identifier consisting of a family and member identifier. The person-level identifier is consistent across all tables, plans, databases, and years. However, if an employee changes employer and both the previous and new employers are contained in the MarketScan Databases, the family- and person-level identifiers will change. The family-level identifiers we receive are encrypted in a different manner for each employer.

For more information, see Person-Level Identifiers.

Q2. Why do I have a claim where the enrollment flag (ENRFLAG) is set to 1, but the claim does not have an ENROLID?

This typically happens when a piece of information on the claim such as sex, relationship to employee, or date of birth is missing. This usually occurs for less than 1 percent of claims (EIDFLAG=3).

Q3. How do I identify continuously-enrolled covered lives?

To determine whether an individual was enrolled for an entire calendar year, MEMDAYS should equal 365. To identify the period of continuous enrollment, use the ENRIND1 to ENRIND12 flags. Each flag corresponds to 1 month (for example, ENRIND1=January enrollment, ENRIND2=February enrollment). The start of continuous enrollment is the first ENRINDx flag that is equal to 1. The end of continuous enrollment is the last ENRINDx flag that is equal to 1.

Q4. How do I select the subset of individuals with outpatient pharmaceutical data?

Analysts may wish to construct a subset of individuals in plans with drug information in each year. These individuals can be identified by the RX flag in the medical/surgical claims, enrollment, and populations tables. The RX flag variable (“1” or “0”) that indicates drug data are available (for the data contributor) in the Outpatient Pharmaceutical Claims Table during

that month/year. To select the medical plans with accompanying drug information during a specific month/year, subset to claims where RX="1." This flag does not identify individual patients who submitted a drug claim; it is intended to identify records that came from contributing plans that also contribute a drug feed to the MarketScan Databases.

Employer contributors (HLTHPLAN=0) will have the same value of RX for each patient for the entire year; Health Plan contributors (HLTHPLAN=1) may have their enrollees' RX values change from month to month.

Q5. How do I select patients that had both medical and prescription drug claims in the most current year or in the most current 2 years?

Drug data are available for a significant portion of the total medical-eligible population and for a portion of the medical-eligible population with enrollment data. Therefore, you will need to construct a subset of individuals with drug information in each month/year.

The Cohort Drug Indicator (RX) variable indicates whether an individual is covered by a drug plan in the Outpatient Pharmaceutical Claims Table during that month/year. Use this flag (RX=1) to select the medical plans with accompanying drug information. Employer contributors (HLTHPLAN=0) will have the same value of RX for each patient for the entire year; Health Plan contributors (HLTHPLAN=1) may have their enrollees' RX values change from month to month.

Q6. How do I know whether a patient's lack of utilization data represents a lack of healthcare use or disenrollment from a plan?

You can match the patient's utilization to enrollment information by creating a subset of Medical and/or outpatient pharmaceutical claims where EIDFLAG=1. Use ENROLID from the claims utilization as the subset of criteria for the enrollment data. The resulting subset contains the enrollment records for the patients in the corresponding claims.

Q7. How do I establish a fixed window of continuous enrollment?

Use the Annual Enrollment tables and subset to records with enrolled months that are within the time window of interest (for example, all ENRINDx=1).

Subset the utilization information (for example, claims) to SVCDATE within the time window of interest. Sort the utilization information (for example, claims) by ENROLID. Merge restricted

and sorted Enrollment data with sorted utilization information by ENROLID where records appear in both sets.

Q8. How do I establish a sliding window of continuous enrollment?

For the sliding window continuous enrollment method, only those individuals who actually used healthcare can be considered. Therefore, determination of sliding window enrollment status begins with the claims information (medical/surgical or pharmaceutical claims) for identification of the event of interest, and then the enrollment information is considered.

Next, determine the month and year of the utilization claim of interest. Utilization dates may be a Date Service Incurred (SVCDATE), Date of Admission (ADMDATE), Date Service Ending (TSVCDATE), the beginning of an episode of care, or the end of an episode of care.

Using the enrollment flags (ENRIND1 through ENRIND12) in the Annual Enrollment Table, determine the earliest and latest dates of continuous enrollment. Create variables to identify these dates. It may be necessary to concatenate multiple years of Annual Enrollment tables. An individual may have multiple continuous enrollment periods.

Merge the utilization data with the enrollment data. Select the time period that includes the utilization date of interest.

If the user is interested in enrollment prior to the utilization date of interest or an ending utilization, then define those dates and determine whether the continuous enrollment period selected includes them.

Q9. What is the source of the data?

The MarketScan Databases are constructed from privately insured paid medical and prescription drug claims contributed by employers and health plans that have business relationships with Merative. The employers generally are self-insured. Collectively, the databases incorporate data from approximately 350 payers, including commercial insurance companies, Blue Cross Blue Shield plans, and third-party administrators.

Each contributor's database is constructed by collecting raw data from the appropriate payer(s). These raw data are service-level adjudicated paid claims and capitated encounters containing both inpatient and outpatient services. Financial, clinical, and demographic variables standardized to common definitions and variables that are specific to employers also are added. Clinical detail is added to the Outpatient Pharmaceutical Claims Table (for

example, therapeutic class, therapeutic group, manufacturer's average wholesale price, and generic product identifier). For more information, see MarketScan Database Construction.

Q10. How are the geographic location of the employee (EGEOLOC) and Metropolitan Statistical Area (MSA) determined?

Geographic Location of the Employee (EGEOLOC) is mapped from the postal ZIP Code of the primary beneficiary's residence. Because EGEOLOC is often used for rate-based analysis, EGEOLOC must reside on both the claims and the enrollment files. If there is some uncertainty in the coding of either source, the EGEOLOC values are made more generic than the state level and are set to categories such as Division, Region, or Total United States.

Metropolitan Statistical Area (MSA) is mapped to Enrollment Detail and Summary, Inpatient Admissions, Inpatient Services, Outpatient Services, and Outpatient Pharmaceutical Claims tables.

Q11. Do you ensure that diagnoses, procedures, and demographic information are in concordance with each other?

Diagnosis and procedure codes are edited for validity. If they are invalid, they are set to missing.

Q12. What variables can I use to calculate a rate (for example, per capita, per employee)?

Metrics that require a population-based denominator (such as procedures per 1,000 covered lives) can be calculated only by selecting demographic variables that are contained in the Enrollment Table. Typical subsets for such counts include the geographic location of the employee (EGEOLOC), the type of plan (PLANTYP) or the sex of the patient (SEX).

Please refer to the MarketScan Database Enrollment Summary and Detail tables in the Database Dictionary for a full list of population-supported variables.

Q13. How do I calculate utilization rates and payments by procedure?

When calculating a utilization rate by procedure, using the count of claims as the number of procedures overstates the number of procedures. This is because a specific procedure on a given service date can generate more than one claim (for example, a surgeon's claim, an anesthesiologist's claim, and a facility claim). A day episode for the procedure must be constructed to collapse the related services for each of the procedures of interest.

Using the variable PROC1, subset the Inpatient Services Table and/or the Outpatient Services Tables for the procedures of interest.

To eliminate multiple claims, aggregate the data on ENROLID, PROC1, and SVCDATE to create one record per patient per procedure for a single service date. Sum any other variables of interest (for example, PAY, NETPAY). The number of procedures performed equals the record count in the resulting subset.

Divide the procedure count by the number of covered lives to calculate a utilization rate.

To calculate the covered life counts, count enrollment records in the Enrollment Detail Table and divide by the number of months in the time period.

To calculate payments per procedure, sum PAY and divide by the number of procedures.

Q14. Can a diagnosis be linked to drug claims (and vice versa)?

The Outpatient Pharmaceutical Claims Table does not contain diagnosis variables, because this information is not provided regularly by the physician on a prescription form. Therapeutic Class (for example, corticosteroids) is provided on the pharmaceutical claims representing the broad classification of the drug. However, to impute the diagnosis, the user must access the related medical claims for the individual—usually the claims filed within a specific time window around the prescription:

- → Subset to the National Drug Code (NDC) of interest on the Outpatient Pharmaceutical Claims Table.
- → Use ENROLID and SVCDATE as the selection criteria to subset all services from the medical tables (I, S, O) that fall within a predefined time window around the SVCDATE. The resulting diagnoses on the medical claims may be associated with the pharmaceutical claim.

These steps may be modified to identify the prescriptions associated with a specific diagnosis. First, subset on a diagnosis in the medical claims. Then, select all pharmaceutical claims for

each person with the diagnosis (using ENROLID as the Linkage variable) within a predefined time window around the date of the prescription.

Q15. How do I count emergency department (ED) visits, which can occur in the inpatient or the outpatient table?

The SVCSCAT field can be used to identify most types of service. The field is structured so that the first three digits describe the facility type and the last two digits identify service type. To select emergency department visits, select from the S or O Table any records with a SVCSCAT value that ends in "20".

Because multiple claim records can be generated for a single ED visit, count the number of ED visits by creating day-episode records from the data table produced by aggregating on ENROLID/SVCDATE combinations. Accumulate all analytic variables of interest.

Q16. The National Drug Code in the MarketScan Database is 11 digits long, but the codes from my Food and Drug Administration (FDA) search are only 10 digits long. How can I convert?

The 10-digit codes should be padded with zeros (0) in the appropriate places until the 11-digit, 5-4-2 format is established.

Format	Change this…	To this…
4-4-2	XXXX-XXXX-XX	0XXXX-XXXX-XX
5-3-2	XXXXX-XXX-XX	XXXXX-0XXX-XX
5-4-1	XXXXX-XXXX-X	XXXXX-XXXX-0X

Q17. How are individuals eligible for Medicare determined in the Medicare database?

Primary contract holders are sorted into the MarketScan Medicare Database on the basis of employment status and age. The primary contract holder becomes part of the Medicare Database if a record for a primary contract holder indicates either: (1) age 65 years or older or (2) age 18 years or older and employment status of Medicare-eligible retiree.

Dependents are sorted into the MarketScan Medicare Database on the basis of age. Dependents aged 65 years or older become part of the Medicare Database regardless of the contract holder's status.

Members of an individual family may be split between the Commercial Database and the Medicare Database. Users conducting family-based analysis or per employee rates will need to take this into account.

It also is possible for a single individual to appear in both the Commercial Database and the Medicare Database if (1) the individual is a primary contract holder experiencing a change in Medicare-eligible retiree status during the year or (2) any member, regardless of contract holder status, reaches age 65 years during the year.

Q18. What is the relationship between procedures on the Facility Header (F) table and procedures on the corresponding Inpatient Services (S) or Outpatient Services (O) claim lines?

The MarketScan facility-claims data structure is designed to be similar to the UB04 facility-claim data model. The UB04 claim has a header portion (containing fields reported once per claim) and a revenue center or line-item portion (one or more lines per claim). Multiple ICD-9 or ICD-10 procedures are reported at the header level (once per claim). These correspond to PROC1–PROC6 in the Facility Header table. A CPT-4 or Healthcare Common Procedural Coding System (HCPCS) procedure is reported at the line-item level (one per line item). This procedure corresponds to PROC1 in the facility records of the O and S tables.

The rules for which procedures must be reported on a facility claim and where they should be reported (ICD-9 or ICD-10 header or CPT/HCPCS line item) vary, depending on the type of service, geographic area, and who is paying for the claim. You may see claims in which all procedures are reported only at the header level, others in which they are reported only at the line-item level, and still others in which they are reported in both places.

Generally, PROC1–PROC6 on the Facility record should be different from PROC1 on any of the corresponding Outpatient or Inpatient records, because the procedures on the Facility record should be ICD-9 or ICD-10 codes, and the procedures on the O/S records should be CPT/HCPCS codes. This will not always be true in the MarketScan Databases, because not all data come from actual UB04-type claims. Some data contributors or suppliers may have CPT/HCPCS procedure codes on their Facility records.

Q19. Why do some payments show more than two decimal places (for example, 256.9999999877)?

SAS® stores numeric variables in floating point format. Not all values can be represented exactly in floating point format; rather, they can only be approximated. The values of the financial variables in the MarketScan SAS datasets are not formatted (that is, they do not have a permanent SAS format associated with them). When nonformatted values are printed or displayed by SAS, it is SAS that determines how many decimal places will be shown. If a value can only be approximated, SAS may display many decimal places.

This issue can be overcome by applying either temporary or permanent formats to the financial variables. For example, format 12.2 will display the value with 2 digits to the right of the decimal point and up to 9 digits to the left of the decimal point for a total width of 12 characters (including the decimal point). The value is rounded by the format so that a value that may display unformatted as 123456.499999 will display as 123456.50 when formatted. Formatting affects only how the variable is displayed by SAS procedures or viewers; it does not change the stored value.

Q20. How does Merative determine which claims get sorted into which data year? Why do I see service dates outside of the calendar year of my data?

Data are included in the database for a given year using Enrollment: date of enrollment (DTSTART):

- → Inpatient Admissions and Inpatient Services: admission date (ADMDATE)
- → Outpatient and Drug Claims: service date (SVCDATE)

Inpatient admissions may include inpatient service claims from the day before the admission date. These claims may be for emergency department or preadmission testing services. The earliest service date for inpatient services claims in a database for a given year is 12/31 of the prior year. Admissions that start late in the year or admissions with very long lengths of stay may have discharge dates that are in the next year. The inpatient services claims that correspond to these admissions will have some service dates that occur in the next year. The facility header claims that correspond to the inpatient services facility claims also will have service dates from 12/31 of the prior year through the next year.

Q21. Do studies using MarketScan Databases require Institutional Review Board (IRB) Review?

The data were previously collected and statistically de-identified and are compliant with the conditions set forth in Sections 164.514(a)-(b)(1)ii of the Health Insurance Portability and Accountability Act of 1996 Privacy Rule; therefore, approval from an institutional review board was not sought.

Q22. Why are some values of the MSA field not actually MSAs? Why are some census MSAs not reported in the MSA field?

The MarketScan "MSA" field, while labeled MSA, is actually a mix of Metropolitan Statistical Areas (MSAs) and Core Based Statistical Areas (CBSAs). Values ending in "0" are MSAs, values ending in "4" are CBSAs. CBSAs are smaller geographic areas than MSAs, and have been included to provide more granularity. For example, MSA=14460 (Boston-Cambridge-Newton, MA-NH) isn't actually included in our data or our data dictionary -- instead, we include three distinct CBSAs: 14454 (Boston, MA), 15764 (Cambridge-Newton-Framingham, MA), and 40484 (Rockingham County-Strafford County, NH). For further information about how these codes break out into these different subgroupings, the 2013 Census delineation file (https://www.census.gov/geographies/reference-files/time-series/demo/metro-micro/delineation-files.html ↗) can be referenced.

Appendix A: New in 2023

In our efforts to continuously improve the analytic value and ease of use of the MarketScan Databases, we announce the following changes effective with the 2023 v1.0 update.

Age (AGE)

Based on HIPAA deidentification requirements, values "100" and higher will now be recoded as "100".

Patient Birth Year (DOBYR)

Based on HIPAA deidentification requirements, DOBYR for patients aged 100 and higher will now be recoded to reflect an age of 100.

Diagnosis-Related Group (DRG)

The Diagnosis-Related Group (DRG) variable is assigned using grouper version 41.0. This variable appears on the I and S tables.

Diagnosis Codes (PDX, DX1 .. DX15)

ICD9 codes are no longer included in the data.

Based on HIPAA deidentification requirements, the following ICD-10 codes are now masked:

- X92*-Y09* Assault/Homicide
- P* Certain conditions originating in the perinatal period
- W65*-W74 Drowning
- T750* Effects of lightning
- T745* Forced sexual exploitation, confirmed
- T765* Forced sexual exploitation, suspected
- X71*-X83* Intentional self-harm
- Y35* Legal intervention
- Y37* Military operations
- Y36* Operations of war
- X52* Prolonged stay in weightlessness
- T742* Sexual abuse, confirmed
- T762* Sexual abuse, suspected
- Y38* Terrorism
- R99 Unknown cause of death
- T751* Unspecified effects of drowning

Based on HIPAA deidentification requirements, the following ICD-10 codes are now recoded as indicated:

- Z68.42-Z68.45 (Body Mass Index 49.9 and over) are now reported as "Z68.42"
- E66.01 (Severe Obesity due to excessive calories) is now reported as "E66.0"
- V00-V09 (Pedestrian injured in transport accident) are now reported as "V00-V09"
- V10-V19 (Pedal cycle rider injured in transport accident) are now reported as "V10-V19"
- V20-V29 (Motorcycle rider injured in transport accident) are now reported as "V20-V29"
- V30-V69 (Occupant of three-wheeled motor vehicle injured in transport accident; Car occupant injured in transport accident; Occupant of pick-up truck or van injured in transport accident; Occupant of heavy transport vehicle injured in transport accident) are now reported as "V30-V69"
- V70-V89 (Bus occupant injured in transport accident; Other land transport accidents) are now reported as "V70-V89"
- V90-V99 (Water transport accidents; Air and space transport accidents; Other and unspecified transport accidents) are now reported as "V90-V99"

Facility Bill Type Code (BILLTYP)

Reportable codes subject to masking based on HIPAA deidentification requirements. Values with a second digit of "4" (Religious Nonmedical Hospital) are recoded with a second digit of "1" (Hospital).

Metropolitan Statistical Area (MSA) / Geographic Location Employee (EGEOLOC)

Due to HIPAA deidentification requirements, families of size 8 and greater (based on EFAMID) will not have MSA reported.

Some MSAs are not reportable in the data in order to protect the privacy of MarketScan patients, data contributors and suppliers. Key changes for the 2023 data year are outlined below.

MSAs reportable in 2023 (previously not reportable in 2022)

- 10420 - Akron, OH
- 11020 - Altoona, PA
- 15380 - Buffalo-Cheektowaga-Niagara Falls, NY
- 15940 - Canton-Massillon, OH
- 16820 - Charlottesville, VA
- 19180 - Danville, IL
- 19780 - Des Moines-West Des Moines, IA

- 21780 - Evansville, IN-KY
- 31900 - Mansfield, OH
- 33220 - Midland, MI
- 40060 - Richmond, VA
- 40340 - Rochester, MN
- 42100 - Santa Cruz-Watsonville, CA
- 42200 - Santa Maria-Santa Barbara, CA
- 49660 - Youngstown-Warren-Boardman, OH-PA
- 49700 - Yuba City, CA

MSAs not reportable in 2023 (reportable in 2022)

- 10540 - Albany, OR
- 11700 - Asheville, NC
- 17860 - Columbia, MO
- 18700 - Corvallis, OR
- 21340 - El Paso, TX
- 21660 - Eugene, OR
- 22180 - Fayetteville, NC
- 32780 - Medford, OR
- 33124 - Miami-Miami Beach-Kendall, FL
- 40900 - Sacramento--Roseville--Arden-Arcade, CA

EGEOLOC not reportable in 2023 (reportable in 2022)

- 64 – Oregon

Place of Service (STDPLAC)

Based on HIPAA deidentification requirements, Code "26" (Military Treatment Facility) will now be recoded as "99" (Other/Unknown).

There are three new values for Place of Service (STDPLAC):

- 10: Telehealth Provided in Pat Hm
- 27: Outreach Site/Street
- 66: Programs of All-Inclusive Care

Procedure Code Modifier (PROCMOD)

There are two new values for Procedure Code Modifier (PROCMOD):

- "JK": 1 mo/< suppl drug/bio

- "JL": 3 mo suppl drug/biologic

Provider Type (STDPROV)

There are four new values of Provider Type (STDPROV). These values denote Nurse Practitioners and Physician Assistants who have privileges to be recognized as Primary Care Providers (PCPs) by the plan and/or have the authorization to write prescriptions:

- 828: Nurse Practitioner w PCP Priv
- 829: Nurse Practitioner w PCP Rx
- 847: Physician Assistant w PCP Priv
- 848: Physician Assistant w PCP Rx

Appendix B: Historical data releases

Merative strives to deliver consistent data variables from year to year. However, periodic revisions are made to the MarketScan Databases to improve and enhance the data. The revisions can include renaming variables or aliases, revising variable definitions, creating new variables, and deleting variables.

The following is a list of data changes that could produce anomalies when one is using several years of data.

Changes in 2022

The Diagnosis-Related Group (DRG) variable is assigned using grouper version 40. This variable appears on the I and S tables. Lookups are included in the metadata delivered with the databases.

There is one new value, and one changed label, affecting the Place of Service (STDPLAC) field. The new value is "10-Telehealth Provided in Pat Hm". The changed label is "27 - Outreach Site/Street (Effective October 1, 2023); Inpatient Long-Term Care (NEC) (Claims incurred 2008 and prior only)".

There are seven new codes for Metropolitan Statistical Area (MSA):

- 16984 Chicago-Naperville-Evanston, IL
- 19430 Dayton-Kettering, OH
- 23224 Frederick-Gaithersburg-Rockville, MD
- 35154 New Brunswick-Lakewood, NJ
- 39100 Poughkeepsie-Newburgh-Middletown, NY
- 39150 Prescott Valley-Prescott, AZ
- 49500 Yauco, PR

Five previously valid codes for MSA are no longer valid, to reflect the seven new codes listed above:

- 16974 Chicago-Naperville-Arlington Heights, IL

- 19380 Dayton, OH
- 20524 Dutchess County-Putnam County, NY
- 39140 Prescott, AZ
- 43524 Silver Spring-Frederick-Rockville, MD

Changes in 2021

The database delivery option known as "Set A" (see Financial variables) has now been enhanced to include imputed financial variables in those instances where Merative does not have the ability to report actual financial information (approximately 15 percent of the overall database population). For instances where Merative has the ability to report actual financial information (approximately 85 percent of the overall database population), actual financial information is reported. The methodology used for the imputed cost data is a combination of hotdecking and stochastic regression. To protect the privacy of patients as well as the privacy of our data contributors and suppliers, users will not have the ability to distinguish between actual and imputed financial information.

Moving forward, imputed cost information will be reported for Annual database releases only (i.e., Version 1.0 and higher). "Set A" options for Standard Quarterly Updates and Early View will continue to have all financial information except Net Payments set to Null.

The Diagnosis-Related Group (DRG) variable is assigned using grouper version 39. This variable appears on the I and S tables. Lookups are included in the SAS format file delivered with the databases.

Changes in 2020

To help provide MarketScan users with a more representative, complete, and longitudinal view of the commercially insured 65+ US population, we have enhanced our existing Merative MarketScan® Medicare Database with Medicare Advantage data. The resulting database includes data from both Medicare Supplemental and Medicare Advantage plans, and a series of monthly flags to distinguish between plan types.

Within the MarketScan Medicare Database, the Advantage enrollees and the Supplemental enrollees have the same information describing patient demographics and medial/pharmacy claims-level detail. They also have the same variables describing the financial fields. There is also a series of monthly flags to distinguish between plan types corresponding to monthly enrollment indicators. From both the Medicare Supplemental and Advantage insurance

standpoint, the Coordination of Benefits (COB) variable represents Medicare paid amounts for fully adjudicated claims and the Net Payment variable represents payment rendered by the primary payer. The COB value for Advantage enrollees will typically be near or at $0 while corresponding net payment amounts will be relatively higher for Medicare Advantage versus Supplemental claims.

Note: Advantage insurers receive a monthly payment from Medicare for each patient covered. This capitated payment is not reflected in MarketScan, since the database is from the employer perspective and payments reflect amounts paid for medical and pharmacy claims.

The Diagnosis-Related Group (DRG) variable is assigned using grouper version 38. This variable appears on the I and S tables. Lookups are included in the SAS format file delivered with the databases.

Three subgroups have been added to the SVCSCAT field to accommodate telemedicine services. There are 23 new codes within the following three subcategories (using the last two digits of the code):

- → 16 OP Telemed Behavioral Health
- → 22 OP Telemed Preventive Visits
- → 45 OP Telemed

Two new values have been added to PROCMOD:

- → J5 Dmepos compet bid PT/OT
- → V4 Demonstration modifier 4

Also, the label of one value of PROCMOD has been changed: 'CS' changed from "CS-Item/svc rel-oil spill" to "CS-Covid-19 testing rel svc".

Changes in 2019

The Diagnosis-Related Group (DRG) variable is assigned using grouper version 37. This variable appears on the I and S tables. Lookups are included in the SAS format file delivered with the databases.

For a small subset of the population (approximately 15 percent), actual cost data is not available starting with the 2019 v1.0 data releases. Hence, for data years 2019 and later, Merative offers clients a choice between two datasets:

Set A: A dataset with 100 percent of the population and actual cost data for Net Payment fields only.

Set B: A dataset with approximately 85 percent of the population and actual cost data for all Payment fields.

Due to copyright concerns, we are no longer distributing a complete lookup of Bill Type Code and Revenue Code. These codes will continue to appear unencrypted and unredacted in the data itself.

A new value of Procedure Group Code (PROCGRP) has been added: 123-Telemedicine Inter-Professional consult. Three values (113, 114, 128) underwent changes in label.

Changes in 2018

The Diagnosis-Related Group (DRG) variable is assigned using grouper version 36. This variable appears on the I and S tables. Lookups are included in the SAS format file delivered with the databases.

Two new values of Revenue Code (REVCODE) have been added:

- → 0826=Hemodialysis-Shorter Duration
- → 1006=BH R&B Outdoor/Wilderness

One new value of Metropolitan Statistical Area (MSA) has been added:

- → 46300=Twin Falls, ID

Changes in 2017

As a result of ongoing discussions with our data contributor pool, we have agreed to implement with this release additional steps to protect their anonymity and their business-confidential information such as pricing and discounts. This involves masking geography in areas in certain circumstances where any one data source dominates the data pool. The fields affected are MSA (urban area of subscriber) and EGEOLOC (state of subscriber). The impact is that the percent missing of EGEOLOC and MSA in CCAE has risen in this release to about 12 percent to 19 percent, and in MDCR it has risen to about 24 percent-40 percent. The impact disproportionately affects smaller geographic areas; the larger the area, the less likely it is affected.

The Diagnosis-Related Group (DRG) variable is assigned using grouper version 35. This variable appears on the I and S tables. Lookups are included in the SAS format file delivered with the databases.

Three new fields are being added to the Redbook drug reference table:

- → NDC Active Indicator (ACTIND): an indication of whether the NDC code is still active.
- → Date Deactivated (DEACTDT): the date on which the NDC code was deactivated.
- → Date Reactivated (REACTDT): the date on which the NDC code was reactivated.

The label of Place of Service (STDPLAC) value 54 has been changed to "Intermed Care/Intellect Disab".

The labels of two values of Metropolitan Statistical Area (MSA) have been changed. MSA=25980 has been changed to "Hinesville, GA"; and MSA=31420 has been changed to "Macon-Bibb County, GA".

The labels of two values of Procedure Code Modifier (PROCMOD) have been changed. PROCMOD=JG has been changed to "Drug/bio 340b dis/AMB-FS->ESRD"; and PROCMOD=Q6 has been changed to "Subst MD fee-for-service".

Several new values of PROCMOD have also been added:

96 Habilitative Services

97 Rehabilitative Services

FY X-ray computed/cassette

TB Drug acq 340b disct-info

X1 Continuous/broad svc

X2 Continuous/focused svc

X3 Episodic/broad services

X4 Episodic/focused svc

X5 Dx svc req by anoth clin

ZC Merck/Samsung Bioepis

Two new values of Therapeutic Class (THERCLS) has been added: THERCLS=270, "Genitourinary Agent," and THERCLS=292, "Phosphorus Regulating Agents".

The label of Therapeutic Group (THERGRP) 29 has been changed to "Unclassified Agents (Classes 234-236, 251, 254, 257-258, 270)", and the label of THERGRP 13 has been changed to "Electrolytic, Caloric, Water (Classes 100-126, 241, 292)".

Changes in 2016

The Diagnosis-Related Group (DRG) variable is assigned using grouper version 34. This variable appears on the I and S tables. Lookups are included in the SAS format file delivered with the databases.

New fields POAPDX and POADX1–POADX15 have been added to the I tables, and POADX1–POADX9 to the F tables, to indicate whether the diagnosis codes appearing in the PDX and DX1–DX15 fields were present on admission. These are character fields of length 1. Valid values are as follows:

- → Blank: Missing/Unknown
- → 1: Unreported/Not Used
- → N: No, not present at admission
- → U: Unknown
- → W: Clinically Undetermined
- → Y: Yes, present at admission

The AGE field is being modified to accommodate increased privacy concerns. Beginning in 2016, AGE will be reported as follows:

- → Age 0–6: actual age as of the Date of Service/Enrollment Start Date/Admission Date. This is unchanged from the current MarketScan format.
- → Age 7–16: age as of the 15th of the month of the Date of Service/Enrollment Start Date/Admission Date.
- → Age 17+: age as of the July 1 of the year of the Date of Service/Enrollment Start Date/Admission Date.

The DSTATUS field also is being modified to accommodate increased privacy concerns. DSTATUS values indicating death or transfer to court/law enforcement (DSTATUS=20, 21, 40, 41, 42, 87) now will be coded as Missing.

The following new Therapeutic Class (THERCLS) values have been added:

- → 266: Antidiabetic Ag, Meglitinides
- → 267: Antidiabetic Ag, SGLT Inhibitr
- → 268: Antidiabetic Ag, TZD
- → 271: Kallikrein Inhibitor
- → 272: COMT Inhibitors
- → 273: Per-Act Mu Op Rcp Ant (PAMORA)
- → 290: Antifungal, EENT

The following Lookup values for Therapeutic Group have been edited to include the new THERCLS values cited above:

- → 07: Cardiovascular Agents (Classes 46–56, 245, 250, 271)
- → 08: Central Nervous System (Classes 57–77, 272)
- → 16: Eye, Ear, Nose Throat (Classes 132–146, 240, 290)
- → 17: Gastrointestinal Drugs (Classes 147–162, 273)
- → 20: Hormones & Synthetic Substitutes (Classes 165–180, 246, 252–253, 256, 266-268)

A new value, 02-Telehealth, has been added to Place of Service (STDPLAC).

A new value, 21420 Enid, OK, has been added to Metropolitan Statistical Area (MSA).

Changes in 2015

The Diagnosis-Related Group (DRG) variable was assigned using grouper version 33. This variable appears on the Inpatient Admissions (I) and Inpatient Services (S) tables. Lookups are included in the SAS format file delivered with the databases.

The Populations (P) Table was discontinued. This table no longer provides value in favor of the Annual Enrollment Summary and Enrollment Detail tables.

The length of all diagnosis code variables (PDX, DX1–DX15) was increased from five to seven characters to accommodate the implementation of ICD-10-CM.

The length of all procedure code variables (PPROC, PROC1–PROC15) was increased from five to seven characters.

A diagnosis code version indicator variable (DXVER) was added to the Facility Header (F), Inpatient Admissions (I), Outpatient (O), and Inpatient Services (S) tables. DXVER is one character in length and has values "9"=ICD-9-CM and "0"=ICD-10-CM. In the Admissions Table, DXVER indicates the ICD version of PDX and DX1. In the other tables, DXVER indicates the ICD version of all diagnosis code variables in the record.

A new value was added for the procedure code type variable (PROCTYP) in the O and S tables to identify ICD-10-PCS procedure codes. This new value is "0"=ICD-10-PCS.

The fields PLANKEY and PLNKEY1–12 no longer are being included. These fields linked to the MarketScan Benefit Plan Design Database, which has been restructured to link on ENROLID effective with the 2015 data year.

The field WGTKEY no longer is being included. This field was linked to the MarketScan National Weights, which were based on the Medical Expenditure Panel Survey (MEPS).

Effective with the 2015 data year, the source for the National Weights has been changed to the American Community Survey (ACS), and a new field MSWGTKEY has been added to contain the key to link to the new ACS-based MarketScan National Weights.

A new field, UNITS, was added to the S and O tables. This field is intended to capture units of service (as opposed to the quantity of services captured in the QTY field). For example, for an injectable drug, QTY would contain the number of injections, whereas UNITS would contain the amount of substance injected. It is valued only for some data contributors.

Two new fields, MSCLMID and NPI, were added to the S, F, and O tables. MSCLMID, when used in conjunction with ENROLID and Facility-Professional Claim Indicator (FACPROF; O and S tables), can enable the user to reconstruct which services were submitted as part of the same claim from a claims administration standpoint. NPI is an encrypted version of the National Provider Identifier. It is valued only for some data contributors.

Two fields were added to the RED BOOK file to denote the route of administration of a drug: Route of Administration Code (ROACD; 2 characters) and Route of Administration Description (ROADS; 30 characters). The variable ROADS is the text description for the value appearing in ROACD.

In keeping with changes in CMS coding, the Outpatient Hospital place of service was split into two parts.

Other changes included the following:

- → STDPLAC value 19 was added as Outpatient Hospital-Off Campus.
- → The lookup for STDPLAC value 22 was changed to Outpatient Hospital-On Campus.
- → A new value for Therapeutic Class (THERCLS) was added. The new value is 259 Blood Form/Coagul Agents, Misc.
- → The lookup for THERGRP value 06 was changed to Blood Form/Coagul Agents (Classes 35–45, 259).

Changes in 2014

The DRG variable was assigned using grouper version 32. This variable appears on the I and S tables. Lookups are included in the SAS format file delivered with the databases.

Six new values for THERCLS were added:

- → 260: Interferons, Antineoplastic
- → 261: Chemotherapy
- → 262: Hormone-Modifying Therapy

- → 263: Molecular Targeted Therapy
- → 264: Radiopharmaceu/Antineoplastic
- → 265: Antineoplastic Agent, Misc.

The mapping of the Metropolitan Statistical Area (MSA) field was updated to conform with the U.S. Census Bureau's 2013 mapping. Some slight changes have occurred to the boundaries of individual MSAs as well as to the labels applied to them. For a complete listing of updated MSAs effective with the 2014 data year, see the Data Dictionary.

Changes in 2013

The DRG variable was assigned using grouper version 31. This variable appears on the I and S tables. Lookups are included in the SAS format file delivered with the databases.

A new value for Place of Service (STDPLAC) was added—18: Place of Employment-Worksite.

New and revised values for Discharge Status (DSTATUS) were added: the descriptions for values 50 and 51 were changed, and values 69, 81–95 were added—

- → 50: Discharged/transferred to hospice
- → 51: Discharged/transferred to hospice medical facility
- → 69: Transfer to disaster alternative care site
- → 81: Discharge to home/self-care w plan inpatient (IP) readmit
- → 82: Transfer to short-term general hosp w/plan IP readmit
- → 83: Transfer to skilled nursing facility (SNF) w/plan IP readmit
- → 84: Transfer to custodial/supportive care w/plan IP readmit
- → 85: Transfer to cancer center/child hosp w/plan IP readmit
- → 86: Transfer to home health service w/plan IP readmit
- → 87: Transfer to court/law enforce w/plan IP readmit
- → 88: Transfer to federal HCF w/plan IP readmit
- → 89: Transfer to Medicare swing bed w/plan IP readmit
- → 90: Transfer to inpatient rehabilitation facility (IRF) w/plan IP readmit
- → 91: Transfer to long-term care hospital (LTCH) w/plan IP readmit
- → 92: Transfer to Medicaid nursing facility w/plan IP readmit
- → 93: Transfer to psych unit/hospital w/plan IP readmit
- → 94: Transfer to critical access hospital (CAH) w/plan IP readmit
- → 95: Transfer to other facility NEC w/plan IP readmit

Changes in 2012

The DRG variable was assigned using grouper version 30. This variable appears on the I and S tables. Lookups are included in the SAS format file delivered with the databases.

The YEAR field was added to the Enrollment Detail (T) Table. It previously appeared on all other claims and enrollment tables.

Changes in 2011

The MarketScan Databases periodically undergo review by an external independent consultant to ensure that the databases are indisputably categorized as having deidentified data that comply with Health Insurance Portability and Accountability Act (HIPAA) requirements. Such a review was completed in 2011 and, as a result, the following changes were made to the Commercial and Medicare Supplemental data structure, effective with the 2011 v1.0 database released in December 2012. These changes are reflected in all database releases moving forward.

1. The following geographic variables no longer are included:

- → County Employee (EMPCTY), County Hospital (HOSPCTY), County Pharmacy (PHRMCTY), County Provider (PROVCTY)
- → 3-digit ZIP Code Employee (EMPZIP), 3-digit ZIP Code Hospital (HOSPZIP), 3-digit ZIP Code Pharmacy (PHRMZIP), 3-digit ZIP Code Provider (PROVZIP)

All other geographic variables (MSA, State, and region) remain.

2. The following clinical and provider variables no longer are included:

- → Standard Hospital ID (UNIHOSP)
- → Service Type (STDSVC)

Provider ID (PROVID) remains in the database. Service subcategory code (SVCSCAT), a more current and detailed variable grouping of services, also remains in the database.

1. The Geographic Location Employee (EGEOLOC) field no longer reports values of 98 (Virgin Islands) and 99 (Other International). Records for these values are recoded to Nation Unknown Region (EGEOLOC=1).

2. The Place of Service (STDPLAC) field no longer report values of 5 (Indian Health Services Free Standing Facility), 6 (Indian Health Services Provider-Based Facility), 7 (Tribal 638 Free Standing Facility), 8 (Tribal 638 Provider-Based Facility), or 9 (Prison-Correctional Facility). Records for these values are recoded to Other Unlisted Facility (STDPLAC=99).

3. A Family Identifier field (EFAMID) was added. This enables users to study family members enrolled together under a single subscriber policy.

The DRG was assigned using grouper version 29. This variable appears on the I and S tables. Searches are included in the SAS format file delivered with the databases.

Changes in 2010

The DRG variable was assigned using grouper version 28. This variable appears on the I and S tables. Lookups are included in the SAS format file delivered with the databases.

Changes in 2009

The DRG variable was assigned using grouper version 27. This variable appears on the I and S tables. Lookups are included in the SAS format file delivered with the databases.

Diagnosis Code 3 (DX3) and Diagnosis Code 4 (DX4) were added to the S and O tables.

Industry Code (INDSTRY) has three new values. These values are A: Agriculture, Forestry, Fishing; C: Construction; and W: Wholesale.

Changes in 2008

The DRG variable was assigned using grouper version 26. This variable appears on the I and S tables. Lookups are included in the SAS format file delivered with the databases.

Therapeutic Class (THERCLS) had two new values. These appeared only in RED BOOK and were not yet present in the claims data. The new values were 248: Leukotriene Modifiers and 249: Uricosuric Agents.

Plan Indicator (PLANTYP) had a new value of 9, representing High-Deductible Health Plan (HDHP).

Changes in 2007

The DRG variable was assigned using grouper version 25. This variable appears on the I and S tables. Lookups are included in the SAS format file delivered with the databases.

Three new variables were added. Capitated Service-Claim Indicator (CAP_SVC) is an indication of whether the individual service or claim was paid on a capitated basis. Valid values

are "Y" for Yes if the claim was paid on a capitated basis and "N" for No if the claim was not paid on a capitated basis. This field appears on the D, F, O, and S tables.

Network Provider Indicator (NTWKPROV) is an indication of whether the provider of an individual service was a member of the payer's network. Valid values are "Y" for Yes if the provider was a member of the network and "N" for No if the provider was not a member of the network. This field appears on the Drug Claims (D), F, O, and S tables.

Network Paid Indicator (PAIDNTWK) is an indication of whether an individual claim was paid as in network. Valid values are "Y" for Yes if the claim was paid as in network and "N" for No if the claim was not paid as in network. This field appears on the D, F, O, and S tables.

Changes in 2006

The following changes were effective with the 2006 v1.0 update.

The DRG variable was assigned using grouper version 24. This variable appears on the I and S tables. Lookups are included in the SAS format file delivered with the databases.

Pharmacy Class Code (PHCLASS) was discontinued. It formerly appeared on D Table. This variable had been assigned using a legacy lookup table that has not been updated since 2002. The vendor for the lookup table no longer supplies these fields.

Changes in 2005

We introduced a new Benefit Plan Type (PLANTYP) value 8=Consumer Driven Health Plan (CDHP). This field and new value are available on all database tables.

The MSA variable values were changed from four-digit codes to five-digit codes on all tables. The new values are listed in the Data Dictionary.

The Revenue Code (REVCODE) variable was changed from three-digit codes to four-digit codes. This variable appears on the O and S tables. Both three- and four-digit values are included in the SAS format file delivered with the databases.

The DRG variable was assigned using grouper version 23. This variable appears on the I and S tables. Lookups are included in the SAS format file delivered with the databases.

The RX[*year*] and PHY[*year*] variables were removed from the A and T tables. Instead, the variables RX and Physician flag (PHYFLAG) were added to the A and T tables. The year-specific flags originally were implemented when enrollment information was delivered in a

cumulative, all-time-period table; because the format was changed to one enrollment table per database year, these year-specific variables no longer are necessary.

The Payments Total Case (TOTPAY) variable was dropped from the S Table. It still appears on the I Table and easily is associated with the individual services of an inpatient admission using the CASEID variable.

A new variable, Merative Service Sub-Category Code (SVCSCAT), was added to the O and S tables. The lookup for this new field appears in the Data Dictionary. SVCSCAT is a highly detailed service category code with more than 570 values.

Changes in 2004

Data Expansion: Inclusion of Health Plan Data Contributors

The 2004 MarketScan files include data obtained from our health plan contributors, combined with the data from our employer customers. Two new variables also were added to the data files.

Historically, we have delivered data from contributors capturing full carve-out services. In 2004, contributors with potentially incomplete mental health and substance abuse (MHSA) coverage were included in the data files. To identify enrollees in plans where MHSA coverage may not have been fully captured, we included an MHSA Coverage variable (MHSACOVG). This variable can be used to exclude enrollees from mental health-related analyses or to further investigate the utilization rates of the subpopulation.

To easily identify which enrollees come from our new health plan data contributors, we created a Health Plan Indicator variable (HLTHPLAN). This variable allows the user to distinguish between data source types; it is set to 1 for health plan lives and 0 for employer lives.

Note: Health Plan data contributors also were added retrospectively to the 2002 and 2003 data years. Missing values of MHSACOVG in these years should be interpreted as "1," and missing values of HLTHPLAN in these years should be interpreted as "0."

New Fields

New fields were as follows:

- → Health Plan Indicator (HLTHPLAN): Tables I, S, O, D, P, A, T
- → Coverage Indicator MHSA (MHSACOVG): Tables I, S, O, D, P, A, T
- → New SAS formats

The format listing has been updated, and new formats have been included for the new categorical fields.

New DRG Grouper Version

The 2004 release used DRG Grouper 22.0. The 2003 MarketScan Databases used Grouper 21.0.

Changes in 2003

New Table: Facility Header (F)

The records in the F Table represent facility claim information that occurs at the overall claim level (once per claim). (Facility records in the O and S tables represent facility claim detail lines at the UB04 revenue center or individual service level.) Facility header variables included the following: nine ICD-9-CM diagnosis codes (DX1–DX9), six ICD-9-CM procedure codes (PROC1–PROC6), Net Payment Amount (NETPAY), Copayment Amount (COPAY), Deductible Amount (DEDUCT), COB Amount (COB), Coinsurance Amount (COINS), UB04 Bill Type (BILLTYP), Facility ID (PROVID and UNIHOSP), Place of Service (STDPLAC), and Provider Type (STDPROV). The facility header financial variables repeat the amounts contained in those variables in the facility detail records in the O and S tables.

Facility header records may be linked to their corresponding facility detail records in the O and S tables by the Facility Header Record Identifier (FACHDID) variable that appears in the F, O, and S tables. (FACHDID is missing in the O and S tables for all professional claims.) There may be multiple detail records per facility header record. Facility header records that are part of inpatient admissions may be linked to the Inpatient Admission (I) and the corresponding Inpatient Services (S) records by the CASEID variable that appears in the F, I, and S tables. (CASEID is missing in the F Table for noninpatient claims.)

The inclusion of the F Table allows users to access up to nine diagnosis and six procedure variables on a facility claim (as opposed to the five diagnosis and one procedure variables currently retained in the S and O tables). The inclusion of the F Table provides an easier correspondence of complete diagnoses and procedures associated with facility detail records.

The new F Table renders the DX3–DX5 fields on the S and O tables superfluous, so these have been removed.

See the MarketScan Data Dictionary for a complete listing of fields included on the F Table. In 2003, all but one (BILLTYP) appeared on other tables.

New Table: Annual Enrollment Summary (A)

A new Annual Enrollment Summary (A) Table was included in the CCAE and Medicare Supplemental and COB Databases. This table was structured as one record per person (ENROLID) enrolled during the year. The annual summary contains monthly arrays of certain variables such as indicators of enrollment (yes/no), days enrolled, data type, and plan type in each month during the year. There also are variables indicating the number of months during the year with enrollment and the total annual enrollment days.

Demographics variables in the new A table fell into two categories:

- → Monthly arrays—12 fields give the value of the variable applicable for each month during the calendar year. This treatment is used for the DATATYP, PLANTYP, and PLANKEY fields (DATTYP1–DATTYP12, PLNTYP1–PLNTYP12, PLNKEY1–PLNKEY12).
- → Modal values—the value that appears in the largest number of enrollment months during the year. (This is how the values of these variables are set in the current Enrollment Summary [E] Table.) This treatment is used for fields such as MSA, employment classification (EECLASS), and so forth.

The current monthly Enrollment Detail (T) Table for a year of data continued as currently structured.

The Enrollment Summary (E) Table as it appeared in data releases 2002 and prior no longer were produced.

New Fields

New fields were as follows—

- → Facility Bill Type Code (BILLTYP): Table F
- → Date Service Ending (TSVCDAT): Historically included on the S Table, it now also appears on the O Table.
- → Coinsurance (COINS): Tables S, O, F, D
- → Date of Discharge (DISDATE): Tables I, S
- → Facility Header Record ID (FACHDID): Tables S, O, F
- → Facility-Professional Claim Indicator (FACPROF): Tables S, O
- → Net Payments Hospital (HOSPNET): Table I
- → Net Payments Physician (PHYSNET): Table I
- → COB and Other Savings Total Case (TOTCOB): Table I
- → Coinsurance Total Case (TOTCOINS): Table I
- → Copayment Total Case (TOTCOPAY): Table I
- → Deductible Total Case (TOTDED): Table I

Fields Removed

The following fields were removed:

- → Diagnosis 3 through Diagnosis 5 (DX3–DX5) removed from S and O tables only
- → Days from Prior Discharge (LASTADM)
- → Days to Next Admission (NEXTADM)
- → Payment Indicator (PAYIND)
- → Primary Care Physician ID Number (PCPID)
- → Primary Care Physician Specialty (PCPSPEC)
- → Physician Classification (PHYCLAS)
- → Primary Medical Group ID (PMGID)
- → Record Flag (RECFLAG)
- → Referral Indicator (REFIND)
- → Referral Type (REFTYP)
- → Treatment Group (TG)
- → Trim Flag Length of Stay (TRIMLOS)
- → Trim Flag Per Diem (TRIMPDM)

New SAS Formats

The format listing was updated and new formats were included for the new categorical fields. Formats for fields no longer delivered were removed. There also were some new values for STDPLAC and THERCLS.

Changes in 2002

The 2002 CCAE and Medicare Supplemental and COB Databases were larger in 2002 because several new data contributors were added. The datasets represented 25 percent to 50 percent more covered lives than in 2001.

We implemented an audit of the Length of Stay (DAYS) field on the S Table. Previously, there was a possibility of discrepancy between the sum of service-level DAYS for an inpatient admission and the length of stay listed on the corresponding admission record in the Inpatient Admissions (I) Table. We corrected the discrepancy so that approximately 90 percent of admissions would have no discrepancy between length of stay on the admission- and service-level records and an additional 5 percent would be within 1 or 2 days. The remaining 5 percent were not correctable, and we recommend using the admission-level length of stay in those instances.

Changes in 2001

DRG Grouper Update

The 2001 release used DRG Grouper 19.0. The 2000 MarketScan Databases used Grouper 17.0.

Encryption of Provider Fields

The provider identifying fields in the MarketScan Databases were encrypted to better protect the confidentiality of the data contributors. The fields affected were Provider ID, Pharmacy ID, Uniform Hospital ID, Physician ID, Primary Care Physician ID, Primary Medical Group ID.

RX Mail Order-Retail Indicator Field

A new field was added to the Outpatient Pharmaceutical Claims file RX Mail Order-Retail Indicator (RXMR) to denote whether the prescription was filled by a retail pharmacy or through a mail-order program.

National Weights

MarketScan person-level national weights were constructed using the Household Component of the MEPS. The MEPS provides estimates of the number of people with employer-sponsored private health insurance. The estimates are used to weight individuals in MarketScan to reflect the national employer-sponsored insurance (ESI) distribution, as captured by the most relevant year of MEPS data.

To construct the weights, MEPS respondents were stratified using combinations of demographic variables that account for substantial differences in utilization and expenditures. The variables include the following:

- → Region (Northeast, North Central, South, West)
- → Age (three groups: 0–17, 18–44, 45–64)
- → Sex (male, female)
- → MSA classification (MSA, non-MSA)
- → Insurance policy holder status (policy holder, spouse/dependent).

Not all combinations of these demographic categories were used. We collapsed the policyholder/nonpolicyholder status for non-MSA strata in the Northeast and West regions because of small cell sizes for these areas. We did not distinguish between policyholder and nonpolicyholder for the 0–17 year age group. In all, 72 strata were used to construct the weights.

The person-level weight is the ratio of MEPS-based estimates in the different age, sex, and region categories and the MarketScan number in the same category.

Note: Person-level weights are assigned to the MarketScan data on all tables by means of a numeric key pointer (WGTKEY) to a standalone table of weights values. The weights table itself is not delivered as part of the standard MarketScan Databases. Interested parties should contact Merative regarding purchase of the weights table.

Change in Medicare-Eligible Classification Methodology

Primary contract holders were sorted into the MarketScan Medicare Supplemental and COB Database on the basis of employment status. If a record for a primary contract holder indicated Medicare Eligible Retiree, the primary contract holder became part of the MarketScan Medicare Supplemental and COB Database.

Dependents were sorted into the MarketScan Medicare Supplemental and COB Database on the basis of age. Dependents aged 65 years or older became part of the Medicare Supplemental and COB Database regardless of the contract holder's status.

Members of an individual family, therefore, may have been split between the MarketScan CCAE Database and the Medicare Supplemental and COB Database. Users conducting family-based analysis or per employee rates will need to take this into account.

Previously, the data were divided according to the age and employment status of the primary contract holder; thus, non-Medicare-eligible dependents of Medicare-eligible contract holders formerly appeared in the Medicare Supplemental and COB Database, and Medicare-eligible dependents of non-Medicare-eligible contract holders formerly appeared in the CCAE Database.

Enrollment File Structure Change

Beginning with the 2001 data release, the Enrollment Detail Table changed in structure. A single record represents 1 month of enrollment for an individual. Individuals enrolled continuously for the entire calendar year 2001 will have 12 records in the 2001 Enrollment Detail Table. Databases will be delivered with monthly enrollment records that are applicable to that particular database; periods of enrollment prior to the period of the medical claims data no longer will be included.

The structure of the Enrollment Summary Table has not changed, but the file now contains enrollment records only for calendar year 2001, with one record per period of continuous enrollment per enrollee and the prevailing demographics. Continuously-enrolled individuals will have one record in the Enrollment Summary Table; however, enrollees still may have multiple records per year in the summary file if they have discontinuous enrollment.

Addition of Age and Age Group to Enrollment Tables

In 2001, Age and Age Group of each enrollee appeared on the Enrollment Detail and Summary tables. This represents age as of the start of the enrollment period indicated on the record.

Addition of MSA to the Populations Table

The MSA field was valued wherever possible on the Populations Table.

Deleted Identifier Fields

The family identifiers and member identifiers of both the enrollee and patient identification systems (EFAMID, EMEMID, FAMID, MEMID) were removed. This was to conform with the requirements of HIPAA and to reduce the risk of implicit patient identification through other demographic fields.

Changes in 2000

New Variables

→ The variables Dx3, Dx4, and Dx5 (S, O) were added.

Procedure code modifiers and revenue codes were made available for a subset of MarketScan data contributors:

- → Procedure Code Modifier (S, O). A procedure code lookup file (including CPT and modifier codes) is available upon execution of the American Medical Association CPT license agreement.
- → Revenue Code (S, O). A revenue code lookup file is included on the documentation CD.

Variable Changes

Standard Place of Service (STDPLAC) and Standard Provider Type (STDPROV) were given values that are consistent with new Merative company-wide standards. Place of Service values now correspond to CMS standard values. Provider Type values were expanded to represent the breadth of provider types now covered by medical benefit programs. We have provided a map of old values to new values for your convenience.

Facility, professional, and other providers now are identified according to the following values:

- → 001–099: Facilities
- → 100–799: Physicians
- → 100–199: Nonadmitting Physicians
- → 200–799: Admitting Physicians

- → 500–599: Surgeons
- → 800–899: Professionals (Nonphysician)
- → 900–999: Agencies

Financial variables. Effective with the 2000 data year, Merative has a new standard format for financial data. Inpatient, outpatient, and prescription drug financial variables now are represented in dollars and cents with an explicit decimal point. Some customer databases continue to reflect financial data for inpatient and outpatient claims in whole dollars. The percentage of these claims will diminish over time. Databases delivered in SAS format will contain the explicit decimal point. There will be no change in field format for databases delivered in DataProbe®.

The new standard is to assign the principal procedure (PPROC) only when the procedure is part of the DRG/MDC assignment. PPROC will have missing values when the DRG/MDC is for a nonsurgical admission.

Quarterly Updates Released

In an effort to release to our customers the most current data available while still maintaining the highest level of data quality, MarketScan data releases follow a quarterly schedule. Only data contributors with at least 3 months of paid runoff (the lag time between a service being incurred and a claim being paid) are included with each interim quarterly release. Each December, we will continue to release a complete version of the prior year's data, with at least 6 months of paid runoff (considered to be analytically complete).

Quarterly updates are released in March, June, September, and December. These databases include all tables that normally are found in a yearly database: Inpatient Admissions, Inpatient Services, Outpatient Services, Outpatient Pharmaceutical Claims, and Enrollment. The Benefit Plan Design Database is released annually.

Included with each quarterly update is a Quarterly Comparison Report, which shows changes in overall covered lives, continuous covered lives, claim volume by quarter, and claim payments by quarter. The volume of each quarterly data release depends on the update cycle of the individual data contributors and the level of completeness of the data.

Enrollee Identifier Transition

Historical MarketScan Databases contain two sets of person identifiers. Enrollee identifiers (ENROLID, EMEMID, EFAMID) were derived solely from eligibility data prior to 1999. These identifiers then were assigned to corresponding claims using the eligibility data as the source. Patient identifiers (PATID, MEMID, FAMID), which identify unique claimants, are based on

information available on the claim without reference to an eligibility record. The use of these identifiers has not been straightforward, and we have taken steps to simplify their use.

With the 1999 MarketScan data release, we began a new system of person identification that, over time, will eliminate the need to maintain two types of identifiers. MarketScan data now contain an enrollee identifier that is assigned to all patients regardless of whether enrollment data are present. This "universal" identifier provides continuous person identification for data contributors with prior years of enrollment data in the MarketScan Databases and is more reliable than the historical patient identifier (PATID) assignment method. For data contributors without enrollment data (about 9 percent of covered lives in 2000), an enrollee identifier is derived. A Person Identifier Flag (EIDFLAG) variable describes the source and quality of the enrollee identification derivation and assignment. The method for deriving the enrollee identifier differs depending on whether enrollment or claims data are used and whether the data contributor reports patient date of birth on the claim.

The current patient identifier variables (PATID, MEMID, FAMID) are being maintained for an indefinite period for compatibility with prior year deliverables and analyses. We plan to replace these variables entirely with the universal enrollee identifier variables when practical for our database users.

For more information on the development of the enrollee identifier variables, see Person-Level Identifiers.

Changes in 1999

Adjustment Records

Adjustment records result from corrections made to a paid claim. These records may contain negative amounts in financial or other variables (for example, QTY). Historically, the MarketScan databases have applied an adjustment algorithm to claims on the Outpatient Services Table in an effort to resolve records with negative financial amounts. This algorithm combines financials on the original record with financials on the adjustment record. The financial variables used are PAY, DEDUCT, COPAY, COB, NETPAY.

This year, the adjustment algorithm was reviewed and applied to the Outpatient Pharmaceutical Claims Table. Some negative records remain. These records represent voided claims where the original claim is missing. Users should use discretion in deleting these "orphan" voids, because they were intended to cancel other positive values where we could not link the void and original.

DRG Grouper 17.0

DRG values now are assigned using HCFA Grouper 17.0 values. Sixteen new values have been added.

New Table

An extensive list of RED BOOK variables now is available on the MarketScan Databases. These variables have been included in a separate table (RED BOOK Supplement) to enhance prescription drug analyses. Licensed users of MarketScan Research Databases may use these variables to develop internal reports. The RED BOOK variables are linked to the Outpatient Pharmaceutical Table by the NDC. Many RED BOOK variables have text lookup values in corresponding "description" variables, allowing text searches. We have removed the NDCNUM1 and NDCNUM2 variables from the Outpatient Pharmaceutical Claims Table because manufacturer, product name, and package size information now can be linked from the RED BOOK Table.

Merative licenses the variables from RED BOOK that are listed in the following table.

Variable	Description
DEACLAS	DEA Class Code
DEACLDS	DEA Class Description
DESIDRG	DESI Drug Indicator
EXCDGDS	Exceptional Drug Description
EXCLDRG	Exceptional Drug Indicator
GENERID	Generic Product ID
GENIND	Generic Indicator
GENNME	Generic Drug Name
GNINDDS	Generic Indicator Description

Variable	Description
MAINTDS	Maintenance Indicator Description
MAINTIN	Maintenance Indicator
MANFNME	Manufacturer Name
MASTFRM	Master Form Code
METSIZE	Metric Size
MSTFMDS	Master Form Description
NDCNUM	National Drug Code
ORGBKCD	Orange Book Code
ORGBKDS	Orange Book Code Description
ORGBKFG	Orange Book Standard Flag
PKQTYCD	Package Quantity Code
PKSIZE	Package Size
PRDCTDS	Product Category Description
PRODCAT	Product Category Code
PRODNME	Product Name
SIGLSRC	Single Source Indicator

Variable	Description
STRNGTH	Strength
THERCLS	Therapeutic Class
THERDTL	Therapeutic Detail Code
THERGRP	Therapeutic Group
THRCLDS	Therapeutic Class Description
THRDTDS	Therapeutic Detail Code Description
THRGRDS	Therapeutic Group Description

Database Renaming

1998

The databases formerly known as Private Pay Fee-for-Service and Encounter were combined and renamed to the MarketScan CCAE Database. The Medicare Database was the MarketScan Medicare Supplemental and COB Database.

Introduction of New Variables

1999

Five-digit state-county variables describing the county of the employee, hospital, provider, and pharmacy were made available. These variables are based on Federal Information Processing Standards (FIPS) state code and county name, where the state code is two digits and the FIPS county code is three digits (for example, 06013, where 06=California and 013=Contra Costa county).

Other new variables are as follows:

- → County Employee (EMPCTY)
- → County Hospital (HOSPCTY)
- → County Provider (PROVCTY)

- → County Pharmacy (PHRMCTY)
- → Enrollee ID Derivation Flag (EIDFLAG) describes the source of data used to assign ENROLID, EFAMID, and EMEMID as well as the quality of that assignment.
- → Date Claim Paid (PDDATE) was assigned to the Inpatient Services, Outpatient Services, and Outpatient Pharmaceutical Claims tables.
- → Diagnosis15 (DX15) replaced DX_N. DX_A through DX_N were renamed DX2 through DX15. DX1 is now the PDX.
- → Procedure15 (PROC15) replaced PROC_N. PROC_A through PROC_N were renamed PROC2 through PROC15. PROC1 is now the PPROC.
- → REGION was added to the Enrollment tables.
- → Cohort Drug Indicator (RX) was added to the Populations Table, replacing the three RX(CCYY) variables.

1998

Data Type (DATATYP). Encounter and fee-for-service data now reside in the same database. A data type variable was created to allow users to easily identify and use these data in analyses. DATATYP=1 or 2 identifies fee-for-service and encounter records, respectively, in the CCAE Database. DATATYP=3 and 4 identifies fee-for-service and encounter records, respectively, in the Medicare Supplemental and COB Database.

Payment Indicator (PAYIND). In-network and out-of-network payments for individuals enrolled in managed care plans with network incentives now can be examined. Payment In/Out of Plan values are as follows:

- → 1=Pd in plan; in-plan provider
- → 2=Pd in plan; out of area
- → 3=Pd in plan; referred out
- → 4=Pd in plan; other
- → 5=Pd out-of-plan (opt-out)

1997

Bundled Deliveries Flag (BUNDELV). This flag indicates that some data contributors may bundle infants' claims with their mother's claims for normal deliveries; hence, there may be no separate record for the newborn in the Inpatient Admissions or Services tables (appears only in 1997 data).

Enrollment_Flag (ENRFLAG). This flag may be used to subset data only to those patients and individuals eligible for coverage from data contributors for whom we have enrollment

information. This flag is available on the Inpatient Admissions, Inpatient Services, Outpatient Services, Outpatient Pharmaceutical Claims, and Populations tables.

Physician Specialty Coding Flag (PHYFLAG). This flag may be used to subset to data with highly differentiated physician specialty coding (>70 percent) on claims. This flag is available on the Inpatient Admissions, Inpatient Services, Outpatient Services, Outpatient Pharmaceutical Claims, Populations, and Enrollment tables.

1996

A Sequence Number (SEQNUM) was added to every record in every table. Within each table, this serves as a unique identifier for every record and is useful in file management and file linkage operations.

1995

Coordination of Benefits and Other Savings (COB) replaced the sum of COB Savings (COBSAVE) and Other Savings (OTHSAVE).

- → NDCNUM: The concatenation of NDCNUM1 and NDCNUM2. In prior years of data, often only NDCNUM1 and NDCNUM2 were delivered as standard variables, which the user then concatenated to produce the NDCNUM variable.
- → PATID: The concatenation of FAMID and MEMID. In prior years of data, often only FAMID and MEMID were delivered as standard variables, which the user then concatenated to produce the PATID variable.

Variable Definition Revisions

1999

ZIP Code variables. Historically, the MarketScan Databases have provided ZIP Code information for enrollees and providers of healthcare services (for example, EMPZIP, HOSPZIP, PROVZIP, PHRMZIP). These variables, when examined with other person-level information (for example, age, sex) may reveal more information about individuals on the file than we are comfortable releasing. Our policy is to protect the confidentiality of individual patients and data contributors. For this reason, we now are releasing a three-digit ZIP Code. We also are delivering State-county variables based on FIPS codes (EMPCTY, HOSPCTY, PROVCTY, PHRMCTY).

State Hospital (STATE). This variable now uses the same set of state code values (01–99) as Geographic Location Employee (EGEOLOC).

Additional revised variables included the following:

- → Discharge Status (DSTATUS)

- → Dispense as Written Indicator (DAWIND)
- → Geographic Location Employee (EGEOLOC)
- → Major Diagnostic Category (MDC)
- → Hospital State (STATE)
- → Place of Service (STDPLAC)
- → Treatment Group (TG)
- → Therapeutic Group (THERGRP)

1998

Industry (INDSTRY): See Data Dictionary: CCAE_Medicare Data Dictionary tab for the latest values.

1997

Therapeutic Class (THERCLS): See Data Dictionary, Attachment K.

Therapeutic Group (THERGRP): See Data Dictionary, Attachment L.

Maintenance Indicator (MAINTIN)

- → New Values (1997 forward):

1: Used primarily for long-term treatment of chronic conditions

2: Used for both chronic and acute conditions

3: Used primarily for short-term treatment of acute conditions

4: Other/unavailable

- → Old Values (prior to 1997):

1: Maintenance drug

Pharmacy Class (PHCLASS)

- → New Values (1997 forward):

0: Other

1: Independent

2: Chain

3: Hospital

4: Clinic

5: Franchise

→ Old Values (prior to 1997):

1: Community Pharmacy

2: Chain Pharmacy (4+ stores)

3: Hospital Pharmacy

4: Clinic Pharmacy

5: Nursing home/Ext Care Pharmacy

6: Department Store Pharmacy

7: Grocery Store Pharmacy

8: Other

Generic Indicator (GENIND)

→ New Values (1997 forward):

1: Single source brand

2: Not used

3: Brand name, generic available

4: Multisource generic 5: Single source generic

6: Over the counter

7: Other/unavailable

→ Old Values (prior to 1997):

1: Brand—Single Source

2: Brand—Multi Source

3: Original Product—Generic Available

4: Generic Product

1996 and Subsequent Years

The missing value for ENROLID is actually "missing" for individuals in data contributors and plans without enrollment information. Prior to 1996, all individuals not receiving an enrollee ID were assigned an ENROLID of all zeroes (that is, 00000000000).

1995 and Subsequent Years

Diagnosis_A through Diagnosis_N and Procedure_A through Procedure_N are true secondary codes in the 1995 data and subsequent years. Previously, these variables could contain the primary diagnosis or procedure code as well as secondary codes.

On the Outpatient Pharmaceutical Claims Table, the financial variables contain amounts accurate to the penny. The enhancement was made to achieve greater accuracy when handling small charge or payment amounts. In prior years of data, the financial variables on the Outpatient Pharmaceutical Claims Table could contain whole dollar amounts.

1994 and Subsequent Years

The number of valid definitions for Plan Indicator (PLANTYP) increased from four to seven for 1994 forward. (Refer to the Data Dictionary for the valid values.)

Variable renames

1999

DX_A through DX_N were made DX2 through DX15, where DX1 is the PDX.

PROC_A through PROC_N were made PROC2 through PROC15, where PROC1 is the PPROC.

On prescription drug variables, the P suffix was removed from financial variables to simplify variable naming.

New Variable Name	Old Variable Name
AWP	AWPP
COB	COBP
COPAY	COPAYP
DEDUCT	DEDUCTP
DISPFEE	DISPFEP
INGCOST	INGCSTP

New Variable Name	Old Variable Name
NETPAY	NETPAYP
PAY	PAYP
SALETAX	SALETXP

CASEINP/INP

There is now one variable to identify a hospital admission and its related services:

- → CASEINP was renamed CASEID.
- → INP was renamed CASEID.

1996

New Variable Name	Old Variable Name
MEDCCYY[a]	MEDYY
RXCCYY	RXYY

[a] CCYY represents the century and year (for example, 1997).

Variable Renames in DataProbe. The following variable aliases were renamed in DataProbe for the 1995 database and subsequent years. The variable definitions have not changed.

New Variable Name	Old Variable Name
SEX	SEX

New Variable Name	Old Variable Name
PLANTYP	TYPE
PATID	PATNT
MEDyy[a]	CMEDyy[a]
Rxyy[a]	CDRUGyy[a]

[a] yy represents specific year of data.

Deletion of variables

1999

NDCNUM1 and NDCNUM2 were removed from the Outpatient Pharmaceutical Claims Table and are now available in the RED BOOK Table.

MED(CCYY) variables were eliminated from the database to simplify use. Information on whether the data contributor had medical data in a specific year can be derived from the Enrollment tables.

RX (CCYY) variables were removed from the Populations Table. In their place, the Cohort Drug Indicator (RX) describes plans with available drug data in 1999. RXCCYY variables (RX1993 to RX1999) are present in the Enrollment Tables for CCAE, and RX1998 and RX1999 are present for Medicare Supplemental and COB data. These variables allow users to subset on enrollees with prescription drug claims for those years.

1998

The Bundled Deliveries Flag (BUNDELV) variable was eliminated. This variable was delivered for the first time in the 1997 research databases and was intended to indicate claims with a bundled charge for the baby and mother during normal deliveries. After careful review, we concluded that the data needed to accurately develop this variable were not available for all data contributors.

1996

The State_Employee (EMPSTAT) variable was deleted. Please refer to other employee-specific geographic variables: Employee Geographic Location (EGEOLOC) and Employee ZIP Code (EMPZIP).

The following variables were deleted in the database for 1995 and subsequent years:

- → The Disease Staging variables (EXPMORT, LOSCALE, LOSERR, PDXCAT, STAGE, RDSCALE, RDERR, and TRIMRD) are no longer delivered as standard variables, unless the Disease Staging application has been licensed.
- → AHAID was deleted from the Inpatient Admissions Table and the Inpatient Services Table.
- → QCC, QDEATHS, and QTRACER were deleted from the Inpatient Admissions Table.
- → STDPLAC was deleted from the Outpatient Pharmaceutical Claims Table because the Place was always set to "outpatient."

Tables removed

1999

The COHORT Selection Table is one of three methods for selecting data contributors and plans with prescription drug claims. This file was developed because not all data contributors provide prescription drug information to the MarketScan Databases. The table does not ensure that a family opted for that coverage or had claims in a given year.

To simplify the use of the database and reduce the number of redundant variables, we have eliminated this table. Users may continue to use the Cohort Drug Indicator (RX)—now available on the Claims and Population tables—or the RXCCYY variable on the Enrollment tables to identify enrollees with drug coverage in a given data year.

Bibliography

In preparing an analytic plan, it may be useful to refer to studies that have used the Merative MarketScan Research Databases. It also may be helpful to examine other references regarding analysis of administrative data from these databases. Since 1988, healthcare researchers have used MarketScan data to understand disease progression, treatment patterns, health outcomes, and their associated costs to patients, employers, health plans, and the government. The MarketScan Databases are fully compliant with the Health Insurance Portability and Accountability Act (HIPAA) of 1996. They are considered the gold standard in proprietary databases used for healthcare research in the United States. More than 3,000 publications are available in the literature using MarketScan Data since the first article by J.B. Hillman and colleagues appeared in the New England Journal of Medicine in 1990. Research using MarketScan data has made a substantial contribution to the body of literature used to formulate policy decisions and improve healthcare for Americans.

The following shows a selection of recent published articles. These and prior years can be accessed through PubMed and other sources.

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