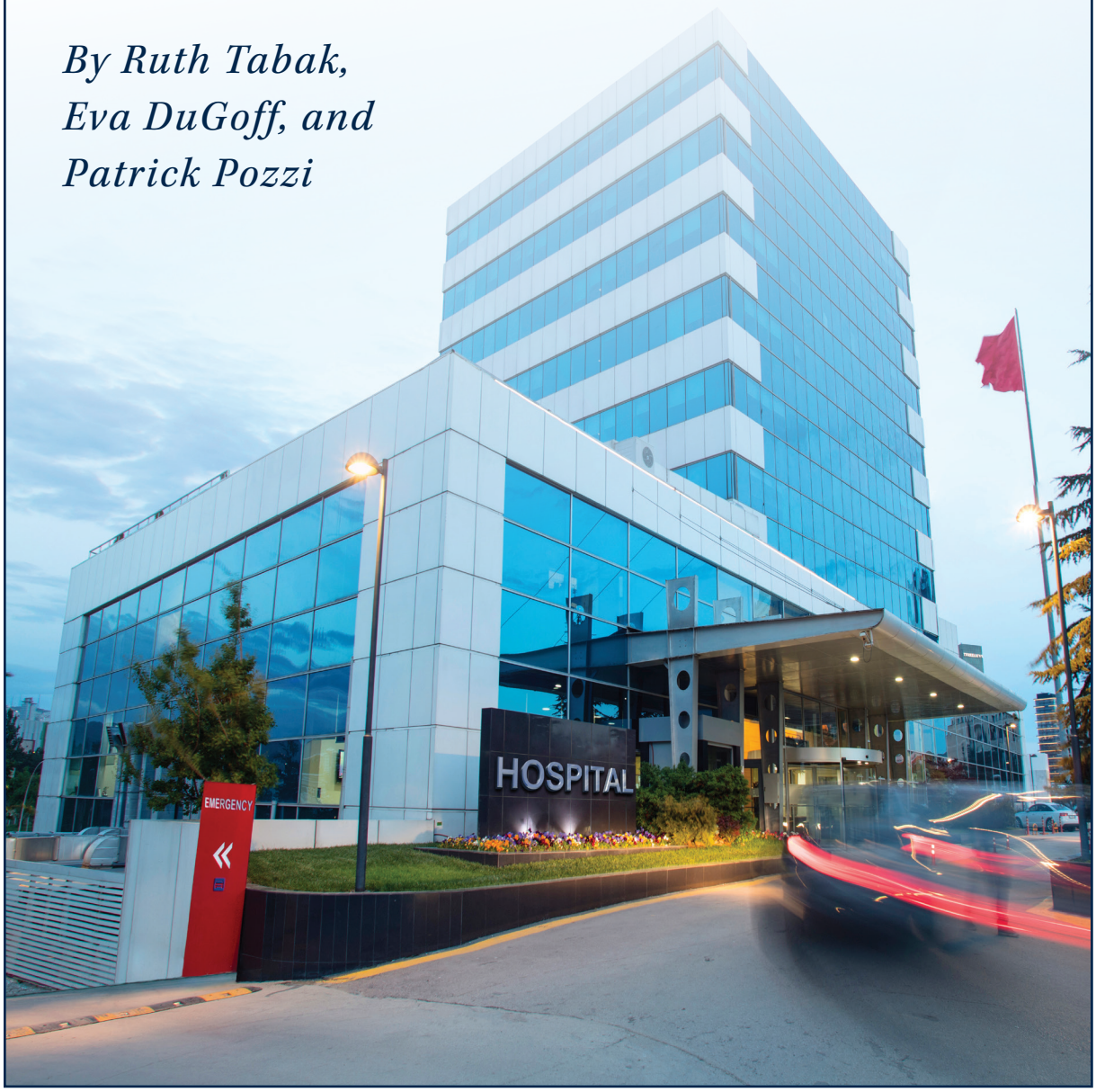
INTELLIGENCE THAT WORKS

BEST PRACTICES IN USING MEDICARE ADVANTAGE ENCOUNTER DATA FOR HEALTHCARE RESEARCH

By Ruth Tabak, Eva DuGoff, and Patrick Pozzi



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HEALTHCARE TRANSACTIONS AND STRATEGY

Introduction

In 2018, the Centers for Medicare and Medicaid Services (CMS) made data on healthcare services used by Medicare Advantage (MA) enrollees, officially named the MA Encounter Data System or "MA encounter data", available to researchers. This marked the first public dissemination of MA encounter data which CMS has collected from plans since 2012. Unlike claims data submitted by providers for reimbursement from fee-for-service (FFS) Medicare, MA encounter data do not solely determine plan payments, though select data from the encounter records is used to adjust the plan's per-member per-month payments for the health of plan enrollees. The data also could be used to assess health plan performance. Due to this difference in purpose and use, as well as the technical structure of the MA data, researchers and experts have raised concerns that MA encounter data may not be appropriate for measuring healthcare utilization or for making comparisons between MA and FFS. This study adds to the existing research by examining the importance of preparing the data for analysis and comparing MA encounter data to external and encounter data-based benchmarks of service utilization at the MA contract level in order to assess completeness of the data. As described below, MA encounter data is not analytic-ready and requires data cleaning and preparation. In addition, data quality and completeness vary by MA contract, provider and file type, and field within the encounter record.

Key findings:

- Between 1% and 16% of service records were identified as duplicates across MA encounter data files organized by provider types, using a de-duplication approach based on CMS recommendations. Depending on the purpose of encounter data analysis, some approach to de-duplicating encounter data is likely appropriate to avoid overestimating utilization.
- MA contracts reported encounter records for their enrollees ranging from 4% of enrollees with records in the Skilled Nursing Facility (SNF) file to 99% in the carrier file, which includes physician and select other outpatient services.
- Encounter records in the outpatient, home health, and durable medical equipment (DME) files were nearly all service records, with more chart reviews found in the carrier, inpatient hospital, and SNF files. Among all encounter records, unlinked chart reviews (i.e., chart reviews not linked to a service record) represented 11% of SNF records and 22% of inpatient hospital records. Small contracts by enrollment that are not part of a larger MA insurer were less likely to report chart review records.
- We calculated HEDIS measures using the MA encounter data and generally found close alignment with MA-reported HEDIS measures, with some outliers.
- Two-thirds of MA contracts had over 60% of MA enrollees with a SNF stay in 2015 present in both the encounter data and provider assessment files reported to CMS. Just over half of MA contracts had 60% to 89% of total home health patients in both encounter data and provider assessment data. Few contracts had over 90% of MA enrollees present in both files. Once we added a date to find common MA enrollee stays, the match rate declined for both home health and SNF.
- Encounter data files include several fields for National Provider Identifier (NPI). The only field with consistently complete provider identifying information was the organization NPI.

Background

MA Encounter Data. CMS has been collecting encounter data in its current form from MA plans since 2012. Unlike the abbreviated Risk Adjustment Processing System (RAPS) data files—where MA plans submit only diagnosis information to CMS—MA encounter data were designed to resemble fee-for-service (FFS) claims data; include many of the same data elements as claims data (e.g., dates of service and provider identifiers); and contain all Medicare covered services and some supplemental benefits.[1] These data were initially collected to support: risk adjustment for plan payments; Disproportionate Share Hospital calculations; quality reviews; and Medicare coverage purposes. In 2014, CMS added new uses for the data, including: "(1) To conduct evaluations and other analysis to support the Medicare program (including demonstrations) and to support public health initiatives and other healthcare-related research; (2) for activities to support the administration of the Medicare program; (3) for activities conducted to support program integrity; and (4) for purposes permitted by other laws."[2]

MA plans are paid based on per-member per-month administrative benchmarks established by CMS. Plans estimate the total cost of care for their projected enrollee population and bid against the CMS benchmark rates in their plan area. Monthly payments are the lower of the bid or the benchmark, with other possible adjustments (e.g., rebate, quality bonus payment). These payments are adjusted to account for the risk of the plan's enrollee population using certain demographic characteristics and diagnosed health conditions.

Beginning in 2016 using 2015 encounter data, CMS started shifting the calculation of risk scores away from RAPS data and toward MA encounter data (see Figure 1).[3] Accurate calculation of risk scores is important for risk adjustment payments to plans. Risk adjustment can greatly increase monthly payments to plans for certain enrollees with high predicted cost (e.g., those also eligible for Medicaid or diagnosed with certain high-cost health conditions).

Like Medicare FFS claims data, MA encounter data are organized by provider type files. Data files include inpatient, outpatient, carrier, SNF, home health, and DME (Table 1).

FIGURE 1: Data Sources for MA Risk Adjustment, 2016-2021

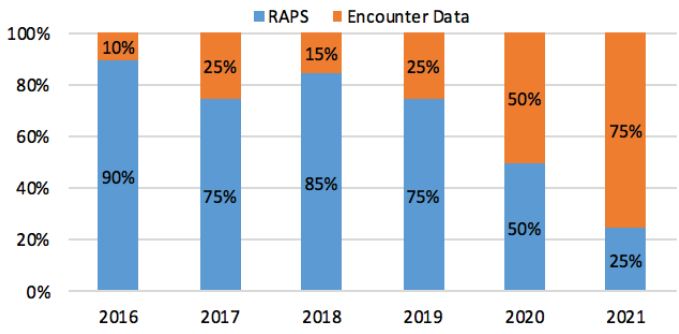


TABLE 1: MA Encounter Data Files by Providers, Services

FILE TYPE	PROVIDERS, SERVICES INCLUDED
Inpatient	Inpatient hospital stays
Outpatient	Hospital outpatient departments, rural health clinics, renal dialysis facilities, outpatient rehabilitation facilities, comprehensive outpatient rehabilitation facilities, Federally Qualified Health Centers and community mental health centers
Carrier	Professional providers, including physicians, physician assistants, clinical social workers, nurse practitioners Some organizational providers including independent clinical laboratories, ambulance providers, freestanding ambulatory surgical centers and freestanding radiology centers
Skilled Nursing Facility	Skilled nursing facility stays
Home Health	Home health agency stays
Durable Medical Equipment	Suppliers of durable medical equipment

1 42 CFR 422.310(c) (2018).
2 79 Fed. Reg. 49,854, 50,325 (August 22, 2014)
3 For the encounter data portion of the risk score, CMS uses diagnoses from both encounter data and RAPS for inpatient hospital services.

In addition to submitting data for specific services delivered, MA plans can also include chart review records. Chart review records are submitted in the same format as service-level encounters but are used specifically to add or delete diagnosis codes from an MA enrollee's medical history. Chart review records do not indicate on their own that a healthcare service was provided to enrollees, but rather can be "linked" to service records to add or delete diagnoses on a service record or "unlinked" to simply add diagnoses to an enrollee's medical record.

Despite the growing importance of MA encounter data for plan payments, there are concerns that these data are incomplete for risk-adjustment purposes[4] and are sufficiently different from Medicare FFS data to make analyses of healthcare service use and comparisons between Medicare FFS and MA difficult. Specifically, analyses indicate that data on both service encounters and diagnoses are incomplete particularly for those encounters for which diagnoses are not used in the CMS risk adjustment calculations, including home health, SNF, and durable medical equipment encounters.[5] Encounter data in inpatient and physician files may also be incomplete because encounters with the same diagnosis as previous encounters in the year do not affect risk-adjustment calculations and plans therefore have less incentive to submit those records to CMS. In addition, there is concern that because the MA encounter data from 2015 was early in the process of being used for risk adjustment, these data may be of lower quality and completeness than subsequent years when plans had more experience with encounter data submissions. Encounter data may also include additional services that are not covered by FFS Medicare but are covered by the plan through supplemental benefits, such as SNF stays without a three-day hospital stay. Finally, questions have been raised about the completeness of encounter records from providers with capitated or value-based contracts that may not submit full encounter data to the plans, particularly in the early years of encounter data collection by CMS, or may not submit complete data.

TABLE 2: Comparison of Medicare Fee-for-Service and Encounter Data

	FFS MEDICARE CLAIMS DATA	MA ENCOUNTER DATA
Who submits data type	Providers	Plans, based on data submitted to them by providers
Use of data	Payment for services; diagnoses used to calibrate risk adjustment model; shared savings/losses for Accountable Care Organizations	Diagnoses used to make risk adjustment payments; data does not reflect provider payments
Type of records included in data set	Service-level claims	Encounter records and chart review records
Services included in data set	All covered services	Not all included (e.g., supplemental benefits like preventive dental)
Provider identification	NPI, CMS certification number	NPI only

4 Pearson, Caroline, Elizabeth Carpenter, and Sean Creighton, *FINAL REPORT: The Impact of Medicare Advantage Data Submission System on Risk Scores*, Avalere Health (February 24, 2017), accessed at: https://avalere.com/insights/final-report-the-impact-of-medicare-advantage-data-submission-system-on-risk-scores; Milliman, "Medicare Advantage and the Encounter Data Processing System: Be Prepared" (September 2016), accessed at: https://www.milliman.com/en/insight/medicare-advantage-and-the-encounter-data-processing-system-be-prepared

5 Johnson, Andy, and Jennifer Podulka, "Medicare Advantage (MA) encounter data validation and potential uses," MedPAC, PDF presentation (April 5, 2018), accessed at: http://medpac.gov/docs/default-source/default-document-library/ma-encounter-data-april18-updatec40112adfa9c665e80adff00009edf9c.pdf?sfvrsn=0.

Previous Evaluations of MA Encounter Data. CMS, the Medicare Payment Advisory Commission (MedPAC), Government Accountability Office (GAO), Office of the Inspector General in the Department of Health and Human Services (HHS OIG), and the RAND Corporation have published evaluations of the MA encounter data. These studies have assessed the completeness of data submissions, variation in data quality by provider type and MA contract, and service utilization. The findings are summarized in Table 3.

TABLE 3: Summary of Previous Reviews of MA Encounter Data Quality

ORGANIZATION (YEAR PUBLISHED)	YEAR(S) OF DATA ANALYZED	FINDINGS
MedPAC (2020)[6]	2014-2017	**MedPAC compared utilization in the MA encounter data to other data sources of MA utilization for select services and found moderate to high agreement between the two data sources.** - MedPAC noted concerns with completeness of the benchmark data. - The share of unique inpatient hospital stays reported through a benchmark dataset (MedPAR) with a matching encounter record increased from 73% in 2014 to 82% in 2015, and essentially did not change through 2017. A greater number of inpatient stays were found in the MA encounter data only than were found in the MedPAR data only. - Beneficiaries with an Outcome and Assessment Information Set (OASIS) home health assessment who also had a home health encounter record in the MA data increased from 45% in 2014 to 82% in 2017, but both data sets had beneficiaries who weren't present in the other data set. - Beneficiaries with a Minimum Data Set (MDS) SNF assessment who were also found in the encounter data increased from 52% to 76%. - MA encounter data identified 94% of patients reported by dialysis facilities in 2017.
HHS OIG (2019)[7]	2016	**OIG used MA encounter data to review chart review records and found that most MA plans submit chart review records to report diagnosis codes.** - 80% of MA contracts submitted any type of chart review records, and 3/4 of those contracts reported risk-adjustment-eligible diagnoses on the chart reviews. - 1.7 million enrollees had chart review records submitted but no service records for medical care related to the diagnosis in the encounter data – potentially indicating missing service records.
CMS/RAND (2019)[8]	2014-2016	**RAND compared utilization over time using the 2015 and 2016 MA encounter data finding similar rates of utilization between the two years.** - In 2015 and 2016, 95% of unique MA beneficiaries had encounter records for professional services, with an average of twenty-one professional visits per beneficiary. - 99.97% of MA contract IDs on the encounter data records matched CMS' enrollment files (2014 data). - Less than 1% of MA enrollees switched to a different MA plan within the year (2014 data). - Outpatient and carrier line level claims sometimes have service date ranges that span multiple days.

6 MedPAC, "The Medicare Advantage program: status report," chapter 13 in *Report to the Congress: Medicare Payment Policy* (March 13, 2020), accessed at http://medpac.gov/docs/default-source/reports/mar20_medpac_ch13_sec.pdf?sfvrsn=0. Johnson and Podulka (2018).

7 HHS OIG, *Billions in Estimated Medicare Advantage Payments from Chart Reviews Raise Concerns*, OEI-03-17-00470 (December 2019), accessed at: https://oig.hhs.gov/oei/reports/oei-03-17-00470.pdf

8 Mulcahy, Andrew W., Melony E. Sorbero, Ammarah Mahmud, Asa Wilks, and Jennifer Gildner, *Measuring Health Care Utilization in Medicare Advantage Encounter Data: Methods, Estimates, and Considerations for Research*, RAND Corporation research paper prepared for CMS (March 2019), accessed at: https://www.cms.gov/Medicare/Medicare-Advantage/Plan-Payment/Downloads/Measuring_Health_Care_Utilization_in_MA_ED.pdf

ORGANIZATION (YEAR PUBLISHED)	YEAR(S) OF DATA ANALYZED	FINDINGS
MedPAC (2018)[9]	2014-2015 (prelim.)	**MedPAC updated its previous analysis of MA encounter data completeness using 2014 and non-finalized 2015 encounter data finding data quality and completeness improved over time.** - In 2015, 78% of unique inpatient hospital stays in the MA encounter data were also found in MedPAR, while 90% of unique beneficiaries with any inpatient stay were found. - Unique beneficiaries with home health or SNF stays in the encounter data represented fewer than half of those reported on facility assessment files. - Comparing counts of physician office visits with beneficiary-level HEDIS data, less than half of contracts matched within +/-10%, with the remaining contracts spread equally between reporting fewer or more office visits relative to HEDIS.
HHS OIG (2018)[10]	Q1 2014	**OIG reviewed CMS's process for validating the MA encounter data finding 28% of MA records had at least one potential error, and recommending CMS address its process.** - Inactive or invalid NPI for billing provider for <1% of encounter records with NPI field populated. - 4% of records appeared to have service line duplicates, some of which would be caught by an edit CMS subsequently introduced. - Nine MA organizations submitted over half of the encounter records that had at least one potential error. - Potential errors in MA encounter records included errors such as missing beneficiary last name and inactive/invalid provider NPIs

These evaluations cover a range of issues and identify initial shortcomings of these data, but do not all provide guidance on data preparation for research or analysis of data quality and external benchmarking at the contract level. Understanding contract-level data quality is important because this is the level at which star ratings and bonus payments are determined. To address this gap, this paper provides an approach to using the data for analytics and reports data quality and completeness of 2015 MA encounter data by contract. These results will be useful for researchers interested in studying healthcare utilization within the MA population and in comparison to other claims data sources.

9 MedPAC (2020); Johnson and Podulka (2018).
10 OIG, *Medicare Advantage Encounter Data Shows Promise for Program Oversight, But Improvements Are Needed,* OEI-03-15-00060 (January 2018), accessed at: https://oig.hhs.gov/oei/reports/oei-03-15-00060.pdf.

Methods in Brief. Consistent with CMS recommendations and prior to analysis, we employed a five-key edit or modified four-key edit in each file to remove duplicate submissions for a single healthcare service encounter. For the purpose of measuring utilization, we retain the newest encounter record submitted that is not a chart review to define service use. The analysis is conducted at the MA contract level to examine variation in data completeness and quality. We largely review measures at the encounter data record level, rather than measures of specific variables.

To examine data quality and completeness, we report:

- Proportion of encounter records excluded after data cleaning;
- Share of enrollees with records in each file type, out of total enrollees in encounter data;
- Volume of chart reviews—both linked to a service record and unlinked—submitted by MA plans;
- Benchmarked MA encounter data to publicly reported HEDIS®[11] utilization data, employing the HEDIS specifications for inpatient hospitalizations, ambulatory care visits, emergency department visits, and lumpectomies using 2016 HEDIS data which are based on the 2015 measurement year;
- Benchmarked MA encounter data to post-acute assessment data using the Medicare home health (OASIS) and SNF (MDS) provider data to assess contract-level reported home health and SNF utilization; and,
- Rate that the NPI fields are populated with a default, or dummy, value that does not identify an actual provider.

We compare MA encounter data to publicly-available HEDIS metrics and provider assessment data – each of which present some limitations. HEDIS measures are calculated by MA contracts based on internal encounter data and submitted to the National Committee for Quality Assurance (NCQA) within about six months after the year ends, while MA encounter data can be submitted to CMS for up to thirteen months after the plan year ends. For 2015 encounter data, CMS extended the submission window an additional twenty months, through September 2018. Using HEDIS measures as a comparison reflects an internal benchmarking approach, where both measures are based on plan-reported data, either to CMS as encounter records or to NCQA as quality or utilization measures. Any difference in a measure likely reflects the aforementioned timing difference or issues with MA reporting encounter data to CMS or HEDIS measures to NCQA. Additionally, certain MA contracts do not have HEDIS data publicly reported, including Special Needs Plans (SNPs) and Medicare-Medicaid Plans (MMPs). Provider assessment data for post-acute care services is an external benchmark (i.e., a different data source (from providers) to measure the same beneficiary's utilization). However, these data also may be incomplete and may result in mismatches between the provider assessments and MA encounter data.

11 The Healthcare Effectiveness Data and Information Set (HEDIS®) is a registered trademark of NCQA.

TABLE 4:
Benchmark Utilization Measures

MEASURE	DESCRIPTION	CONSIDERATIONS	FILE SOURCE
Ambulatory Care/ Preventive Care Visit	Proportion of members who had an ambulatory or preventive care visit (HEDIS AOC201-0095)	- MA plans are incentivized to submit complete outpatient data because diagnoses from these claims are used for risk adjustment calculation. - Incentive declines for subsequent encounters after a diagnosis has already been captured. - Physician visits are a commonly used measure of healthcare utilization.	MA Encounter Outpatient, Carrier Files, 2015 MA HEDIS Public Use File, 2016
Inpatient Visit	Total inpatient discharges per 1,000 member years (HEDIS UOS506-0280)	- MA plans are incentivized to submit complete inpatient data because unique diagnoses from these claims are used for risk adjustment calculation. - Incentive declines for subsequent encounters after the diagnosis has already been captured. - Inpatient discharges are a commonly used measure of healthcare utilization.	MA Encounter Inpatient File, 2015 MA HEDIS Public Use File, 2016
Emergency Room Visit	Emergency department visits per 1,000 members (HEDIS UOS507-0380)	- MA plans are incentivized to submit complete inpatient and outpatient data because diagnoses from these claims are used for risk adjustment calculation. - Incentive declines for subsequent encounters after the diagnosis has already been captured. - ED visits are a commonly used measure of inappropriate care.	MA Encounter Outpatient File, 2015 MA HEDIS Public Use File, 2016
Lumpectomy	Lumpectomies per 1,000 member years (HEDIS UOS505-0940, 0950)	- MA plans are incentivized to submit complete inpatient and outpatient data because diagnoses from these claims are used for risk adjustment calculation. - Lumpectomies can also be performed in ASCs where diagnoses are not used for risk adjustment so plans may not be incentivized to report full claims.	MA Encounter Inpatient, Outpatient, Carrier Files, 2015 MA HEDIS Public Use File, 2016
Home Health Admission	Proportion of members with reported home health utilization	- MA plans are not incentivized to submit home health encounter records data to CMS because these claims are not used for risk adjustment. - MA plans may have a wide range of payment arrangements with home health agencies from per capita to FFS leading to inconsistent encounter records.	MA Encounter Home health File, 2015 Home health OASIS
SNF Admission	Proportion of members with reported SNF utilization	- MA plans are not incentivized to submit SNF encounter records to CMS, because these claims are not used for risk adjustment. - MA plans may have a wide range of payment arrangements with SNF providers from per capita to FFS, leading to inconsistent encounter records	MA Encounter SNF File, 2015 Long Term Care MDS

Understanding completeness of MA encounter data and methodologies for achieving valid measures of utilization are crucial prerequisites to analyzing utilization of services by MA enrollees. In addition, these results provide insight into whether the MA encounter data fully captures healthcare encounters used for plan risk-score calculations.

Results

Overview of 2015 MA Encounter Data. The MA population was 16,923,646 as of July 1, 2015, according to the Medicare Beneficiary Summary File. We found 17,360,910 unique beneficiaries with any type of encounter record, which represents ever-enrolled beneficiaries over the course of 2015. Virtually all beneficiaries in the encounter data had at least one service record, and 58% had a chart review record. These beneficiaries were in 784 MA contract IDs, nearly half of which were HMO contracts.

Following the procedures in the Chronic Condition Data Warehouse User Guide for encounter data, we employed a five-key edit for the inpatient file (beneficiary ID, provider NPI, start and end date of the service, and composite type of claim indicator) and a modified four-key edit (without composite type of claim indicator variable) for all other files to remove duplicate records.

TABLE 5: Variables Used to De-Duplicate Service Records in MA Encounter Data

Beneficiary ID	Provider NPI	Service Start Date	Service End Date	Composite Type of Claim Indicator (Inpatient Hospital only)

After data cleaning, we removed 16% of service records in the carrier file, 1% in the inpatient file, 6% in the outpatient file, 2% in the SNF file, 6% in the home health file, and 12% in the DME file. While this approach may have removed some service records capturing instances of more than one service delivered to a beneficiary by the same provider on the same day, we took a conservative approach to estimating utilization and considered these as duplicates.

Results of Data Submission Quality. We expect that data quality might not be uniform for all enrollees in an MA contract. For example, enrollees seen by a capitated provider with less complete data submission might result in under-counted service use in the encounter data. To understand characteristics of MA encounter data submissions at a high level, we evaluated the presence of MA enrollees in any encounter data record, as well as by service type, and the variation across contracts. We evaluated data quality at the contract level and excluded from our analysis any contract that was not present in the CMS Landscape Files or enrollment data files for 2015. This resulted in sixty-four contract exclusions.

The presence of enrollees in MA encounter data for any data file type varied substantially. Nearly half of MA contracts reported 100% of beneficiaries with carrier service records. For share of beneficiaries with an inpatient hospitalization record, three-quarters of the contracts above the median (15%) were either SNPs, MMPs, or Programs of All-Inclusive Care for the Elderly (PACE) contracts—those that typically serve high-need enrollees. For contracts with a share of beneficiaries with SNF service records above the contract median (4%), nearly 80% of contracts were SNPs, MMPs, or PACE plans, including SNPs that serve institutionalized enrollees specifically. High utilization was observed in the outpatient file for PACE plans as well, perhaps reflecting provider visits in Federally Qualified Health Centers (FQHCs) or community mental health centers which are included as encounters in the outpatient file. Some contracts reported no service records or fewer than eleven enrollees with any service records (ranging from 2 contracts in the carrier file to 161 in the home health file). While variation

TABLE 6: 2015 Medicare Advantage Encounter Data Characteristics

UNIQUE BENEFICIARIES WITH A RECORD	17,360,910
Inpatient File	
% Duplicated Service Records	1%
% Beneficiaries with Service Record	14%
Carrier File	
% Duplicated Service Records	16%
% Beneficiaries with Service Record	99%
Outpatient File	
% Duplicated Service Records	6%
% Beneficiaries with Service Record	64%
SNF File	
% Duplicated Service Records	2%
% Beneficiaries with Service Record	4%
Home Health File	
% Duplicated Service Records	6%
% Beneficiaries with Service Record	6%
DME File	
% Duplicated Service Records	12%
% Beneficiaries with Service Record	21%

in the number of enrollees using certain provider types is expected (e.g., more enrollees see a physician annually than use the home health benefit) some of the observed variation may be due to data quality issues or specific MA plan type (e.g., MMPs or PACE). To better understand whether the observed variation is a data quality issue, we compared MA encounter data to internal and external benchmarks in the next section of this paper.

TABLE 7: Distribution of MA Encounter Records by Service and Chart Review by File Type, 2015

	CARRIER	INPATIENT	OUTPATIENT	SNF	HOME HEALTH	DME
Minimum	32%	2%	6%	0.04%	0.1%	0.1%
Maximum	100%	43%	100%	49%	92%	89%
Median	99%	15%	70%	4%	6%	20%
No. of Contracts Reporting No Beneficiaries*	2	45	20	98	161	44

*Data with fewer than eleven enrollees are suppressed so zero utilization may also represent fewer than 11 beneficiaries.

Chart review records can be submitted as linked to service records, linked to other chart reviews, or unlinked to either service records or other chart reviews. Submission of chart review records is at the MA plan's discretion and varies by provider type. CMS has noted that the share of records that are chart reviews ranges from 31% for inpatient hospital to only 0.85% for home health. This variation reflects that CMS only counts diagnoses from certain types of services, for example inpatient hospitalization, toward an enrollee's risk score, while diagnoses from other services, like from home health, are not used for risk score calculations.[12] We found similar results analyzing the volume of records by type in the 2015 encounter data, but also distinguish between linked and unlinked chart reviews.

TABLE 8: Distribution of MA Encounter Records by Service and Chart Review by File Type, 2015

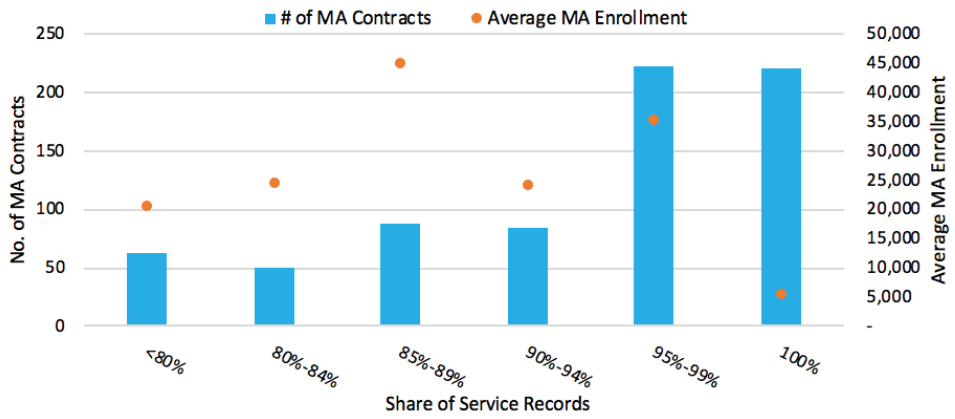
	SERVICE RECORD	CHART REVIEW LINKED TO SERVICE RECORD	CHART REVIEW LINKED TO OTHER CHART REVIEW	CHART REVIEW - UNLINKED
Carrier	90%	4%	0.04%	5%
Inpatient	69%	9%	0.05%	22%
Outpatient	98%	1%	0.08%	1%
SNF	88%	1%	0.01%	11%
Home health	99%	1%	0.00%	0.1%
DME	98%	1%	0.00%	1%

12 CMS, Chronic Condition Data Warehouse, "CCW User Guide: Medicare Encounter Data Files."

The volume of chart review records submitted to CMS, both linked and unlinked, also varied by MA contract. Analyzing the share of total records represented by chart reviews can be an indication of the MA contract's coding efforts. If a researcher is analyzing sub-populations or other metrics based on diagnosis codes, understanding how diligently a plan submits chart reviews may be useful for understanding potential bias introduced in sample definitions. Contracts with few to no chart review records may be missing diagnosis codes; contracts with a high share might have intensive coding review processes to fully capture diagnoses, or are missing service records in the encounter data submission.

The share of total encounter records represented by service records, rather than chart review records, varied across MA contracts too. More than half (61%) of MA contracts submitted 95% or more of their encounter records as service records, rather than as chart reviews. The largest contracts by enrollment submitted 85% to 89% of encounter records as service records, while most smaller contracts reported a higher volume of service records, indicating fewer chart review records. Contracts submitting 100% service records are among the smallest by number of enrollees. Nearly half of these MA contracts are PACE plans, which have payments adjusted for the risk of enrollees, but CMS has continued to include diagnoses from RAPS data with equal weight, giving PACE plans less of an incentive to submit chart reviews if diagnoses are included in RAPS data. Among large national MA carriers, most contracts had similar rates of chart review record submission, regardless of whether the individual contract had low or high enrollment.

FIGURE 2: Most MA Conracts Submit >95% Service Records, But Largest Contracts by Enrollment Submit 85% to 89% Service Records, More Chart Review Records



Measures of Utilization

We compared contract-level performance using the MA encounter data and publicly reported HEDIS scores across outpatient and inpatient utilization measures. Contract-level utilization was generally higher when calculated using encounter data compared to HEDIS benchmarks (Table 9, last column). Ambulatory care was the exception: We found ambulatory care calculated using MA encounter data was greater than HEDIS in only 1% of contracts.

TABLE 9: Variation Between Encounter Data and HEDIS Scores, by Measure

MEASURE	MA EDS PERCENT DIFFERENCE FROM BENCHMARK AVERAGE (MIN, MAX)	SHARE OF CONTRACTS WITH LARGE DIFFERENCES*	SHARE OF CONTRACTS REPORTING GREATER UTILIZATION IN ENCOUNTER DATA THAN HEDIS
Ambulatory Care, Percentage of Members with Ambulatory or Preventative Care Visit	4% (0%, 67%)	5%	1%
Inpatient Discharges per 1,000 Member Years	23% (0%, 859%)	10%	51%
ED Visits per 1,000 Member Months	27% (0%, 90%)	18%	93%
Lumpectomy			
65-74	8% (0%, 169%)	10%	78%
75-84	10% (0%, 48%)	10%	75%

** We define a "large difference" between the MA EDS and HEDIS benchmarks as differences greater than one standard deviation above the mean difference*

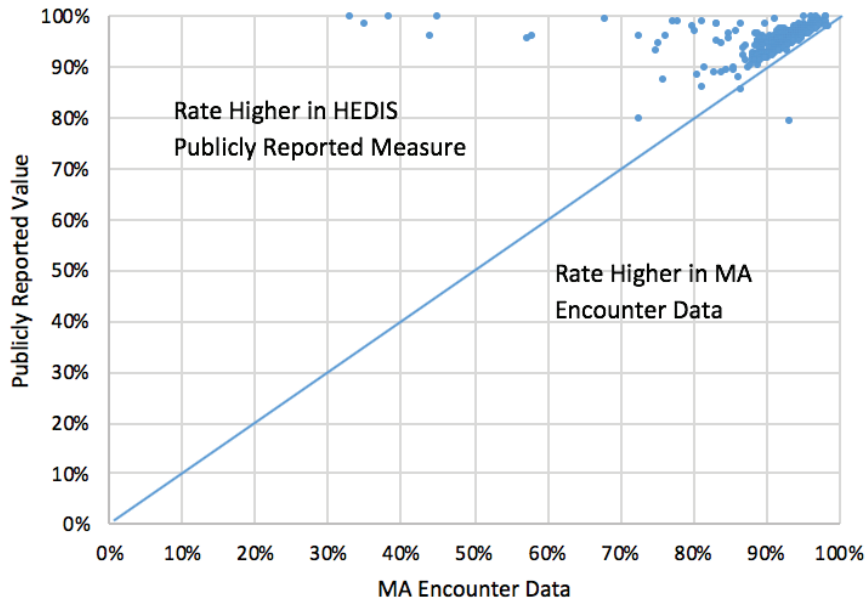
Among ambulatory care visits, ED visits, and Inpatient discharges, average differences between encounter data and HEDIS data varied from 4% to 27%. In these measures, we also found some contracts with perfect concordance, or agreement, between the two data sets as well as contracts with substantial differences despite removing contracts with nonsensical HEDIS data submissions. To assess whether the average difference was substantial, we also report the share of contracts with large differences between MA encounter data and HEDIS: The calculated difference between MA encounter data and HEDIS scores was large (defined as greater than one standard deviation above the mean difference) for 5% to 18% of contracts, depending on measure.

Ambulatory Care

We also evaluated data completeness for professional services in the MA encounter carrier file and in the outpatient file. Diagnoses from these provider types are used by CMS to calculate risk scores, giving MA plans an incentive to thoroughly report services and associated diagnosis codes—at least for the first encounter that captures the diagnosis.

Based on HEDIS specifications, we calculated utilization rates as the percentage of members with any ambulatory and preventive care visits using both the carrier and outpatient files. The measure is the share of members with any visits, without regard to the frequency of visits. These visits could be at an office-based clinic or a hospital outpatient clinic and are identified by a set of evaluation and management and preventive care visit codes.

FIGURE 3: Percentage of Members with Ambulatory or Preventive Care Visit



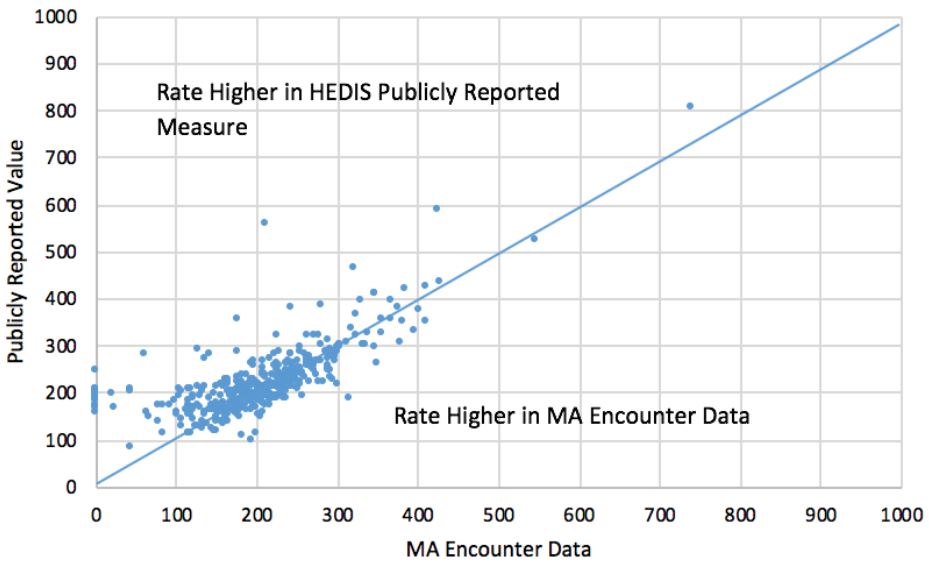
Overall, the reported share of members with an ambulatory care visit was highly concordant; most MA contracts had slightly higher rates of members with an ambulatory or preventive care visit in the HEDIS publicly-reported data than as calculated from the MA encounter data. On average, encounter data reflected a 4% difference from the HEDIS measure, and 5% of contracts were greater than one standard deviation from the mean difference between the encounter data rate and the HEDIS rate. Most outliers had low ambulatory care visits calculated in the MA encounter data relative to the HEDIS measure. The MA encounter utilization for outlier contracts range from 20% to 60% below HEDIS. A single large MA parent organization represented nearly half of the outlier contracts within this range of variation. Contracts with enrollment in New York accounted for about 40% of the outliers. Outliers included both low and high enrollment contracts.

Contract-level reporting of ambulatory care utilization in 2015 is largely consistent with other internal benchmarks suggesting it is complete, except for certain outlier contracts. However, this measure does not account for the number, date, or specific type of ambulatory care visits. This analysis suggests that the encounter data for most MA contracts may be used to assess use of any ambulatory care services but does not indicate whether the intensity or specificity of that utilization can be determined.

Inpatient Discharges

Diagnoses from MA encounter data reflecting inpatient hospital use are included in the risk-adjustment scores for MA payments. Because MA plans have an incentive to submit more complete records of inpatient hospital use, we would expect robust utilization metrics as compared with an external benchmark. To measure completeness of inpatient hospital data, we compared utilization in MA encounter data to publicly reported HEDIS measures of inpatient discharges. This is a more granular measure than ambulatory care, as it includes measurement of all visits, not just any visit. We report the match rate at the contract level.

FIGURE 4: Inpatient Discharges per 1,000 Member Years



The share of MA contracts with higher utilization reported in the public HEDIS measures is about equal to the share with higher utilization based on MA encounter data—that is, contracts are fairly evenly distributed above and below the line. Among MA contracts to the right of the chart line—representing those with higher utilization represented in encounter data—inpatient discharges per 1,000 member years were approximately 11% higher based on encounter data calculations, than as reported in the public HEDIS measures. Among contracts to the left of the line—where the HEDIS public measure is higher—inpatient discharges per 1,000 member years were approximately 19% higher than as calculated with encounter data. On average, encounter data reflected a 23% difference from the HEDIS measure, and 10% of contracts were greater than one standard deviation from the mean difference between the encounter data rate and the HEDIS rate (Table 9).

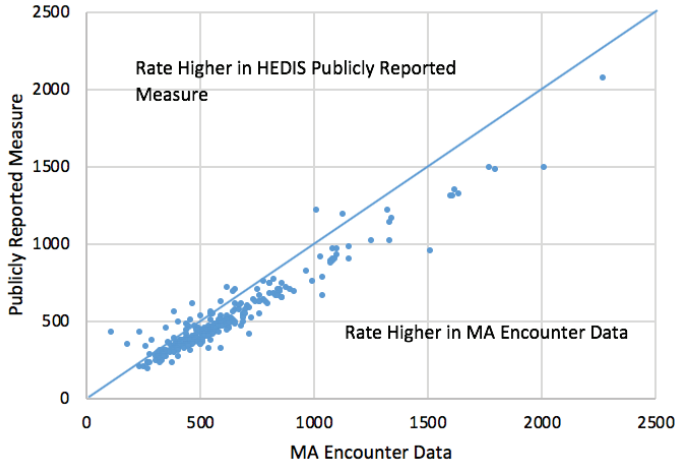
Outlier contracts with the greatest variation between data sources were analyzed to identify potential trends in geography, parent organization, or enrollment. The percentage point difference in discharge rates for these outlier contracts range from 60% to 100%, and nearly 70% of these outliers have MA encounter rates below HEDIS, potentially indicating missing service records in the encounter data. These contracts represent a variety of state markets and parent organizations. Additionally, most of these contracts are large, with enrollment greater than the national median.

ED visits

Emergency department visit rates, or visits per 1,000 member months, are also based on carrier and outpatient files, so we expect encounter data measures to be similar to plan-reported HEDIS measures. This is also a more specific measure than ambulatory care, as it includes all visits, not just any visit. We found that the absolute value of the difference between ED utilization calculated from the MA encounter data and HEDIS measures was 27%, with 18% of contracts greater than one standard deviation away from the mean difference. For the 7% of contracts with ED utilization based on MA encounter below HEDIS public measures, variation was slightly less, at 20% below HEDIS on average.

Contracts with the greatest variation between data sources have an MA encounter utilization between 60% and 90% above HEDIS. Two-thirds of outlier contracts operate in Pennsylvania and have enrollment greater than the national median. We did not find a consistent pattern in parent organizations among the outliers.

FIGURE 5: ED Visits per 1,000 Member Months



Lumpectomy

Lumpectomies can be observed in the carrier and outpatient data and, like inpatient visits, are a measure of intensity of use. At a contract level, lumpectomy rates were correlated strongly between the two data sources. For about three-quarters of MA contracts, rates calculated from MA encounter data are higher than the HEDIS measures reported by contract. Among these contracts, lumpectomy rates for members age sixty-five to seventy-four are on average 9% higher in the MA encounter data than the HEDIS measures, and for members age seventy-five to eighty-four on average 13% higher in the MA encounter data. Across all contracts, on average, encounter data reflected an 8% difference from the HEDIS measure for age sixty-five to seventy-four and a 10% difference for age seventy-five to eighty-four, and 10% of contracts were greater than one standard deviation from the mean difference between the encounter data rate and the HEDIS rate.

We found 10% of contracts with significant differences between the two data sources – for example a contract reporting 2.3 procedures per 1,000 members age sixty-five to seventy-four in the MA encounter data, but 6.2 per 1,000 in the HEDIS public measure. Contracts with the greatest variation between data sources have an encounter utilization rate between 52% and 92% greater than HEDIS, compared to an average variation of about 10%. Two large national contracts appear as outliers in both categories of the analysis, age sixty-five to seventy-four and age seventy-five to eighty-four. Outlier contracts included a variety of states and tended to have enrollment higher than the national median.

FIGURE 6: Lumpectomies per 1,000 Member Months, Age 65-74

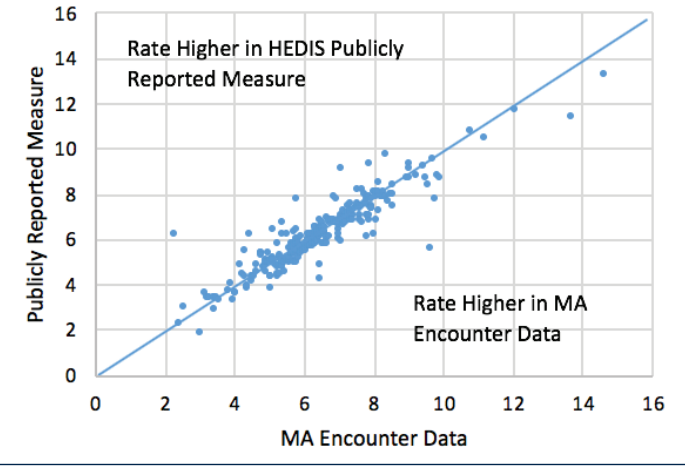
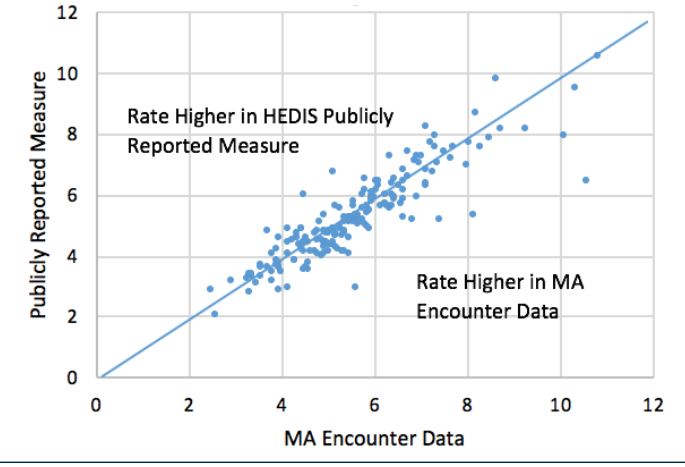


FIGURE 7: Lumpectomies per 1,000 Member Months, Age 75-84

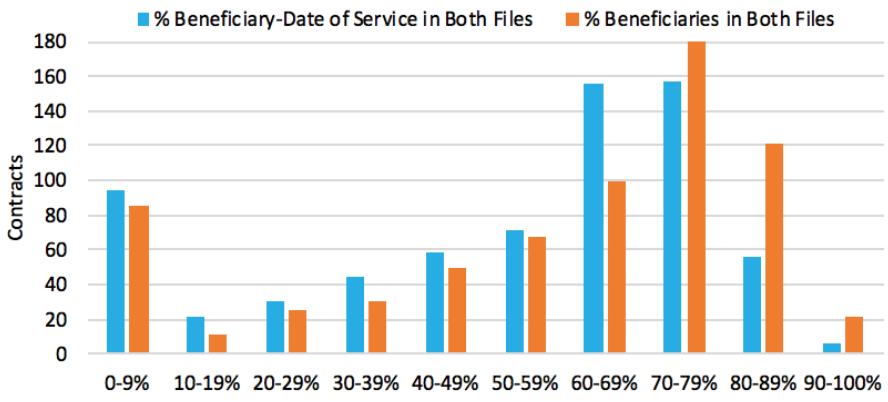


Home Health and SNF

To assess completeness of MA encounter data by contract, we benchmarked home health and SNF utilization as reported in the encounter data to utilization as represented in provider assessment files submitted to CMS.[13] CMS requires home health agencies to submit the Outcome and Assessment Information Set (OASIS) for adult patients whose care is reimbursed by Medicare and Medicaid. For 2015, home health agencies were required to submit assessments for 70% of their patients under a CMS pay-for-reporting program, increasing to 100% in future years. SNFs are required to submit Minimum Data Set (MDS) assessments for all patients by the fourteenth day of the stay. If a SNF stay ended before then, we would expect to see the encounter data record but no corresponding MDS record. Both home health and SNF providers are required to include MA-enrolled patients in their assessment files. We calculated total unique MA enrollees found in either the 2015 MA encounter data or the provider assessment files and the percentage of total MA enrollees with SNF or home health stays who were present in both data sets, by MA contract. Across the analysis, we are restricted from reporting values less than eleven so we may under-report match rates, particularly for smaller MA contracts.

In Figure 8, the orange bars represent the number of MA contracts with rates of matching data between encounter data and MDS or OASIS, regardless of date of service. For example, the plurality of MA contracts has 70% to 79% of SNF MA patients with records in both the encounter data and MDS assessment files. The blue bars represent the number of MA contracts with rates of matching data between encounter data and MDS or OASIS when a date-of-service restriction is included. When we look for matching records by beneficiary and date, the number of MA contracts shifts leftward toward lower matching rates between the data sets.

FIGURE 8: MA Enrollees with SNF Stays Present in Encounter and MDS Data, Out of Total MA SNF Patients



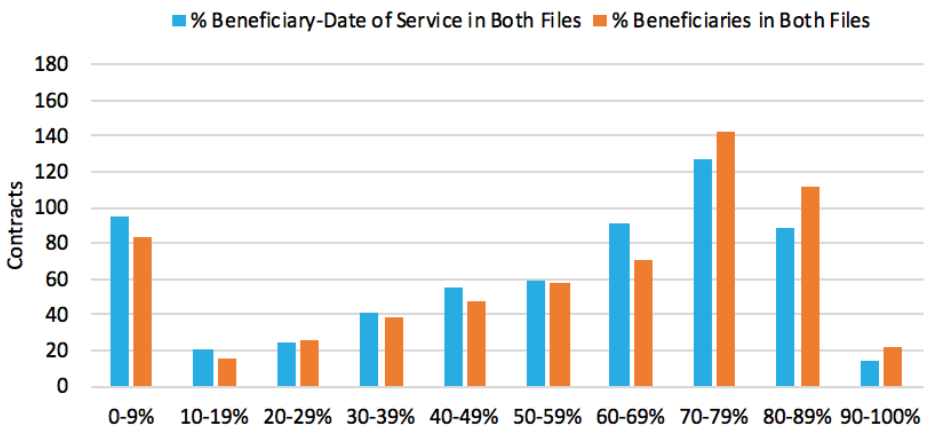
The orange bars do not consider dates of service or other characteristics of the SNF stay(s)—solely the presence of a beneficiary in the records. Adding a date-of-service restriction reduced the match rate (blue bars), despite allowing for matches that had a start date in the encounter data within seven days before or after the start date in the provider assessment file. Just under one-quarter of MA contracts had 70% to 79% of total SNF patients with records in both files; a similar percentage had 60% to 69% of beneficiaries in both files; and fewer contracts had over 80% of beneficiaries matched. For around 10% of MA contracts, no beneficiary matches could be found across the two data sets. These are primarily small MA contracts, with a median enrollment of just over 350 as compared to an overall median enrollment of about 5,200.

Like SNF beneficiaries, few home health contracts have over 90% match between the MA encounter and provider assessment files. The match rate with the most MA contracts is 70-79% of home health patients found in both files. Match rates declined when home health stays were matched by date of service—again allowing for matches that had a start date in the encounter data within 7 days before or after the start date in the provider assessment file. The median enrollment size of MA contracts with no match between data sources is 810, higher than the MA contracts with no SNF matches, but relatively small for MA contracts.

13 We exclude "swing beds," which are hospital beds that can be used to provide either acute or SNF care and are likely reported by hospital providers rather than SNFs.

Incomplete data for home health and SNF is expected and has been previously reported by MedPAC in 2018, 2019, and 2020. As discussed previously, MA encounter data are used to risk adjust MA payments; however, diagnoses found on home health and SNF encounters are not eligible for risk-adjustment purposes. While CMS still requires MA plans to submit encounters for these services, the incentive is far less than for risk-adjustment eligible services. Additionally, in 2015, home health agencies were not required to report assessment data for every patient they saw.

FIGURE 9: MA Enrollees with Home Health Stays Present in Encounter and OASIS Data, Out of Total MA Home Health Patients



NPI

MA encounter data includes variables to identify providers involved in a patient's care. Researchers may be interested in using these NPI variables to look at referral patterns, provider practice patterns, or beneficiary use of services. To review the completeness of these fields, we identify the incidence of a default NPI which is permitted in certain circumstances, but limits researchers' ability to identify the provider involved in treatment. Table 10 shows the percentage of records that are blank or populated with the default NPI, which follows the form 19999999XX. Claims where it is acceptable to report a default NPI include those for members who received medical services outside of the country, and those where the appropriate NPI could not be found by the submitter when searching the National Plan and Provider Enumeration System. We reviewed both base and line or revenue files, where applicable, as file types are used differently to report provider NPIs. Base files contain the header portion of the encounter record, while line and revenue center files contain revenue center and line item charges related to procedures performed or specific services delivered, which correspond to the single base encounter claim.

The only fields well populated consistently across file types are the NPI of the organization and of the claim attending physician who has overall responsibility of the beneficiary's care and treatment. The referring physician field is largely incomplete, likely due to both missing data submissions and lack of referring physician for the service rendered. The physician who rendered services on the revenue center record is well populated in the SNF file, but not in the inpatient or outpatient files where the provider who rendered the service is identified at the claim level in the base table. Based on these observed differences, studies of MA encounter data would need to take into consideration the completeness and reliability of NPI fields across the different file types. This analysis assessed only the reliability of the fields with regard to default NPIs populated but research that relies on NPI fields for analysis could conduct other tests for data reliability.

TABLE 10: Percentage of Fields Blank or Populated with Default NPI, by File Type and NPI Field

NPI FIELD	CARRIER BASE	CARRIER LINE	INPATIENT BASE	INPATIENT REVENUE	UTPATIENT BASE	OUTPATIENT REVENUE	SNF BASE	SNF REVENUE	HHA BASE
Organization	0.8%	--	0.3%	--	0.4%	--	0.3%	--	0.3%
Line Rendering Physician	--	99%	--	--	--	--	--	--	--
Referring Physician	75%	--	--	--	99%	--	--	--	99%
Claim Attending Physician	--	--	33%	--	18%	--	29%	--	24%
Revenue Center Rendering Physician	--	--	--	99.9%	--	99.9%	--	0.2%	--

Discussion

This analysis presents descriptive information about data cleaning and analytic steps that are important prerequisites to thorough analysis of the MA encounter data, as well as a contract-level evaluation of utilization measures benchmarked to other data sources or calculations. The work in this analysis helps to reveal strengths and limitations of the MA encounter data and informs an approach to using data to study healthcare utilization within the MA population.

2015 MA Encounter Data is not an analytic-ready dataset. CMS recommends applying edits to remove duplicate rows in the inpatient file. We applied this edit and a modified version to the other file types and removed between 1% and 16% of records. Other researchers should consider employing this or another approach to reduce duplicate observations. One limitation of this approach is that it may lead to underestimation of some procedures delivered multiple times per day, particularly by the same physician (e.g., procedures done on the both the left and right eyes, or an evaluation and management visit and a procedure performed on the same day). Depending on the specific services analyzed, type of provider delivering the services, and how the services are usually billed, researchers might modify the suggested edit to be more targeted in identifying duplicates. In addition, cross-walking MA plans to the CMS Landscape file or other external source of MA offerings in the contract year is important to eliminate contracts with encounter data that did not actually enroll beneficiaries in that current year (but likely offered MA plans in the prior year).

Another important decision is whether researchers want to include chart reviews in measures of utilization. In this report, we excluded chart reviews to determine utilization. MedPAC in its March 2020 report took a different approach: specifically, using chart reviews to identify home health utilization. Our analysis identified a range of the proportion of chart reviews out of total encounter records, from very few in home health and SNF to a greater proportion in inpatient hospital. Excluding chart reviews from home health would be of lesser impact than for inpatient hospital. Other types of analysis with encounter data, such as looking at diagnoses of MA beneficiaries, may want to include chart reviews, as these records can add or remove diagnosis data that is not present on the service records.

Overall utilization measures were consistent internally but can vary widely by contract. We examined overall utilization using different healthcare services, MA encounter data files, and provider types. For most measures, we did not evaluate the duration or dates of service. For example, we did not examine the validity of the number of preventive care visits during the year, or the length of a home health or SNF stay. However, comparing home health and SNF visits to the assessment data revealed greater discrepancies when date of service was added to the matching criteria, indicating that measuring duration of services might be challenging for some types of care. In addition, the measures of utilization that included intensity of services (including ED, inpatient, and lumpectomy) revealed greater differences between encounter data and HEDIS measures than for ambulatory care, a measure of any use. Finally, our analysis of encounter data NPI fields suggests that assigning care to a specific NPI would be challenging for certain provider types.

Contract-level analysis revealed significant variation by type of service, some of which may be driven by the patient population. For example, MA contracts serving high-need individuals had higher levels of inpatient hospitalizations. However, this was not uniformly true and may raise questions of data quality. Perhaps more problematic are the MA contracts reporting very low rates of service use, raising questions about successful data submission and processing by CMS, given that both encounter data and HEDIS measure reporting are generated by the MA plans themselves. It is possible this discrepancy is driven in part by MA plans that have capitated arrangements with providers and don't receive complete encounter data to submit to CMS, which would limit the value of the encounter data for research. Determining whether an MA contract has capitated provider relationships is not possible solely from the encounter data.

Researchers seeking to use MA encounter data to measure utilization of home health and SNF services should do so very cautiously, limiting analysis to contracts where MA encounter data is complete relative to provider assessment files which is difficult for 2015 given that OASIS data is incomplete. In addition, for the subset of contracts with more complete data, robust analysis may be limited to overall utilization metrics rather than intensity or duration of stays, given the poor match rate between the MA encounter data and the assessment

Comparison of HEDIS, OASIS, and MDS data identifies that MA contracts with lower enrollment are more likely to have data quality issues. Most contracts had high concordance, or agreement, rates with other available data sources, based on our measures of overall utilization. Certain contracts have high variation across more than one measure, but none are outliers across all HEDIS measures. MA contracts with lower concordance were more likely to be smaller contracts as measured by enrollment. This indicates that measures of utilization that look at use of any home health or SNF services based on CMS encounter data, measured nationally or by large geographic areas, would reflect utilization generally as tracked internally by MA contracts. However, more specific contract analysis may require closer review to ensure the encounter data is reliable. When compared to external benchmarks like the home health or SNF assessment data, the encounter data appears less complete. We note that the contracts with lower concordance rates in HEDIS also had lower concordance rates on home health and SNF utilization indicating systematic data quality issues.

The October 2015 transition from ICD-9 to ICD-10 likely created some noise in the diagnosis code reporting. For this reason, we did not assess the quality of the diagnosis data in the 2015 Medicare Advantage encounter data. Other analyses have reported substantial differences in the rate of diseases coded after the use of ICD-10. While this is not an issue we address directly, we urge researchers use caution in measuring disease rates in 2015.

Conclusions

MA encounter data is not an analytic-ready data set for researchers to evaluate MA utilization or quality measures. Analyses presented in this paper highlight the importance of data cleaning steps to ensure the data is de-duplicated, as well as differentiating between service records and chart reviews when constructing utilization measures. In addition, we found that contract-level evaluation against both external benchmarks and internal data quality measures was important to validate data quality prior to analysis and potentially exclude outlier contracts. However, external benchmarks are not available for all types of services or providers. For most MA contracts, we found that measuring whether enrollees used a service—but not the intensity, dates, or specificity of services—was generally aligned between MA encounter data and HEDIS measures in outpatient and carrier files. Measuring rates of utilization revealed larger discrepancies, as these measures required more complete data reporting. However, specific fields on the records (e.g., dates of services and NPI) are less complete and restrict the types of analyses possible with the data. Overall, 2015 MA encounter data would be useful for researchers to potentially answer broad questions about utilization, to the extent that the data is first thoroughly evaluated and prepared for use in the analyses planned.

The authors would like to thank Mindy Cohen at the Centers for Medicare and Medicaid Services and Jennifer Podulka at Health Management Associates for their technical assistance and feedback throughout this analysis.

TECHNICAL APPENDIX

Encounter data are represented by both header and line-level records. Header, or base, records contain identifying information about the beneficiary, provider, dates of service, and diagnoses. Line-level files contain more detailed information about the encounter including the provider's NPI and the HCPCS code. For institutional or non-professional providers, revenue center files include more detail about the type of services provided (e.g., within inpatient hospital, whether the patient had laboratory services, was treated in an operating room, or had an emergency department visit).

For overall measures of utilization, header-level files may be appropriate for most providers that are paid a per diem or bundled rate for all services. Evaluating professional claims may warrant evaluation of the line-level files, since multiple visits within the same provider NPI may occur on the same date. This report used header-level files for analysis of home health and SNF utilization as well as beneficiary presence in encounter data for all provider types; we used both header and line-level files for analysis of professional utilization in the carrier, inpatient, and outpatient files.

To assess the quality of the MA encounter data, we employed data-cleaning strategies recommended by CMS for the inpatient file and similar approaches for all other files. Because CMS allows MA plans to submit multiple encounter records for the same service for the purpose of correcting diagnosis and procedure codes, data cleaning is an important step for any researcher using these data. In the inpatient file we used the procedures described in the Chronic Condition Data Warehouse User Guide: we employed a five-key edit (beneficiary ID, provider NPI, start and end date of the service, composite type of claim indicator (defined as claim frequency code, type of bill, facility type code, and type of service). Without formal recommendations, we used a modified four-key edit (beneficiary ID, provider NPI, start and end date of the service) for all other files to remove duplicate records.

We defined the denominator for each utilization measure consistent with the HEDIS technical specification for 2015. This allowed us to construct annual measures of utilization for ED visits and ambulatory care visits without accounting for enrollees who joined or left MA mid-year. Researchers may also choose to develop per-member per-month metrics to include a more complete enrollee population or to compare full-year enrollees to enrollees who joined or left MA mid-year to.

We note that we benchmark these data to HEDIS because it provided an opportunity to assess data quality across a range of settings of care. HEDIS data are a useful benchmark because the data are analyzed and reported in consistent formats across plans. However, we did not employ the HEDIS measures expecting 100% consistency. The MA encounter data were collected for a longer period of time than the HEDIS data which may create inconsistencies. Specifically, for hemoglobin A1C testing, MA plans can conduct retrospective medical record chart reviews to identify hemoglobin tests – the HEDIS data may not contain this information if the plan calculated the HEDIS measure prior to completion of retrospective chart review.

For the Home Health and SNF data comparisons we did not exclude certain types of enrollees who may have different utilization profiles, primarily because these represent very small shares of the MA population and are unlikely to affect contract-level metrics(e.g., MA enrollees who elect hospice and stay enrolled in the plan but whose services are covered by FFS Medicare). We also did not exclude patients with end-stage renal disease, who are much costlier than typical Medicare beneficiaries. Certain plan types may also have distinct utilization profiles(e.g., PACE programs, MMPs for dual eligibles, SNPs serving high-cost populations, or Medicare Medical Savings Account plans). These plans were included in our analysis, but other analyses may wish to exclude them or note differences in utilization profiles or data-submission trends.

About the Authors

Ruth Tabak

Ruth Tabak has nearly fifteen years of experience in federal health policymaking, data analytics, and program operations, including in the public and private sectors. Ms. Tabak joined BRG from the Centers for Medicare and Medicaid Services (CMS) where she ran a team of over twenty-five staff conducting an enrollment data reconciliation process between nearly three hundred health insurers offering Federally Facilitated Marketplace coverage and the federal enrollment database (healthcare.gov), including analyzing data quality, determining validation rules for database updates, and establishing business requirements and use cases. In this position, Ms. Tabak also developed annual validation processes for federal funds paid to the health insurance plans, directed analytic and operational teams, and served as an expert resource for offices throughout CMS on enrollment and payment analytics.

During the Affordable Care Act legislative process, Ms. Tabak also served on the majority staff of the US House of Representatives, Ways and Means Committee, handling a portfolio focused on Medicare private plans and post-acute care on behalf of the Health Subcommittee. Her work included drafting and enactment of final provisions in the law related to Medicare Advantage reimbursement rates and Part D plans.

Ms. Tabak began her career as a consultant at a leading healthcare consulting firm, advising pharmaceutical and health plan clients on implications of legislation, regulations, and market trends in the Medicare Advantage and Medicare Part D programs. She received an MPP/MPH from the University of Michigan, Ann Arbor.

Dr. Eva DuGoff

Dr. Eva DuGoff is a senior member of BRG's Healthcare Transactions & Strategy team and a visiting assistant professor in the Department of Health Policy and Management at the University of Maryland School of Public Health. For more than a decade, she has conducted research to improve healthcare quality and delivery for older adults using Medicare claims, commercial claims, and patient survey data. Her academic research has examined the influence of Medicare policies on care delivery, quality of care, and developed new measures of care coordination. Her research integrates insights from health services research, social network analysis, biostatistics, demography, and public policy. She has led or coauthored over thirty peer-reviewed papers published in journals such as the *New England Journal of Medicine, Health Affairs, and Medical Care.*

Before starting her PhD, Dr. DuGoff served as a Health Policy advisor to Senator Ron Wyden, now Ranking Member on the Senate Committee on Finance. During her time on the Hill, she covered health and aging issues including Medicare, Medicare Advantage, Medicaid, the Children's Health Insurance Program, and rural health. She began her career in health policy as a fellow at the Medicare Rights Center and later worked for Representative Jan Schakowsky of Illinois.

Dr. DuGoff received a PhD from the Johns Hopkins Bloomberg School of Public Health in health services research and policy and an MPP from George Washington University.

Patrick Pozzi

Patrick Pozzi is an analyst with experience in the organization, technical manipulation, and analysis of large datasets and has performed data analysis for more than forty M&A buy-side engagements with private equity firms. He has expertise in programming, analyzing, and visualizing data to deliver key insights into competitive dynamics, and the pricing of healthcare products and services. Mr. Pozzi has worked extensively with an array of different healthcare datasets, including commercial claims, Medicare fee-for-service (including Innovator data), and Medicare Advantage data. He has led a variety of SQL trainings for the firm.

Mr. Pozzi has a BS in mathematics and an AB in economics from Lafayette College in Easton, Pennsylvania.

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