CHAPTER 3

Assessing data sources for measuring health care utilization by Medicare Advantage enrollees: Encounter data and other sources

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Chapter summary

Since 2012, Medicare Advantage (MA) plans have been required to submit to Medicare a record of each encounter that MA enrollees have with a health care provider. The Commission has long been interested in using MA encounter data to better understand plan practices and the services used by MA enrollees. Complete and accurate encounter data could also be used to provide more rigorous oversight of Medicare's payments to MA plans—which reached $455 billion in 2023—and to ensure that the Medicare beneficiaries enrolled in an MA plan (now more than half of eligible beneficiaries) receive the full Medicare benefit. Lessons learned from MA encounter data could inform improvements to MA payment policy, facilitate comparison with traditional (fee-for-service) Medicare, and generate new policy ideas that could be applied across the entire Medicare program. If validated for such purposes, encounter data could replace several of the data summarization and submission tasks that are currently conducted by MA plans, improving the consistency of the data used to administer the MA program.

However, in previous assessments, the Commission has found that MA encounter data do not include records of all items or services provided to MA enrollees. In 2019, the Commission recommended that the Congress direct the Secretary to (1) establish thresholds for the completeness and

In this chapter

accuracy of MA encounter data; (2) evaluate MA plans' submitted data and provide feedback to organizations, including comparisons to external data sources; and (3) apply a withhold to plan payments that would be refunded to MA organizations that meet the established thresholds. The Commission also recommended instituting a mechanism for direct submission of provider claims to Medicare administrative contractors as a voluntary option for MA organizations that prefer this method, for MA organizations that fail to meet completeness thresholds, and for all MA organizations if program-wide thresholds are not achieved.

In this chapter, we update our assessment of the relative completeness of MA encounter data and other data sources that contain information about MA enrollees' use of services. Our findings continue to demonstrate the need for policy action to improve the encounter data. We find that the data's completeness in 2020 and 2021 incrementally improved since 2017 for some services but that the data generally remain incomplete. In addition, other data sources that contain information about MA enrollees' use of services also appear to be incomplete: In each of the data comparisons we conducted, we found records of services provided to MA enrollees that were missing from the comparator source.

We also assessed variation in the completeness of data across and within MA contracts. We found that the share of contracts reporting at least one encounter in all six service categories has improved since the early years of encounter data collection, rising from 80 percent of contracts in 2015 to 96 percent of contracts in 2020. Within MA contracts, we found wide ranges of completeness across service sectors, even among contracts with relatively greater completeness for any one sector. In other words, a contract's relatively high completeness with respect to one service category is not a marker of consistently complete data across all service categories. Given these findings, we urge policymakers and researchers to carefully consider the potential impact of missing data when using encounter data to examine MA utilization, particularly when comparing changes in utilization over time or variation in utilization across plans or differences in utilization between MA and FFS Medicare. Using a combination of MA encounter data and other independent sources is one way to reduce the impact of missing data on findings, but it may not fully resolve the problems that can stem from incomplete data.

Because nationally representative independent data sources with which to compare the encounter data are limited, we are not able to assess the accuracy

and completeness of encounter data for important service categories such as physician or outpatient services. In the absence of an independent data source with which to compare the data, the next best available alternative is to compare encounter data with other plan-reported sources, such as plan quality and bid data. Comparing MA encounter data with other plan-generated data sources does not provide an independent validation of data completeness and accuracy, but the comparison can be used to assess the consistency of the information that plans submit to CMS. In this chapter, we also explore whether such comparisons can provide insights regarding the relative completeness of encounter data.

Our findings suggest that the information plans submit to CMS through separate reporting processes is not internally consistent and that there are technical factors that limit our ability to use the data to identify underreporting of encounter data. In our comparison of encounter and Healthcare Effectiveness Data and Information Set® (HEDIS®) data, we found that HEDIS hospitalization data differed substantially from encounter data and that HEDIS was the main cause of this inconsistency. Often, hospital stays that should have been excluded under the instructions for processing HEDIS data were nonetheless reported in HEDIS, but the data were missing a considerable number of hospital stays and hospital users identified through the encounter data. When we limited our analysis to beneficiaries found in both data sources, we found that encounter data included 11 percent more hospitalizations and 19 percent more readmissions than HEDIS data did. This finding suggests that the encounter data are a more complete source for hospital utilization measures than HEDIS data.

Our analysis of bid data and encounter data also showed discrepancies between the two sources. The bid data that MA organizations submit annually to CMS include plan-calculated utilization rates that can be compared with rates calculated from encounter data. We found that, among bids that could be compared with encounter data, utilization rates based on encounter data were within 5 percent of the rates reported in plan bids for less than 40 percent of bids, comprising less than half of enrollees in the analysis. Encounter-based rates for inpatient and skilled nursing facility services were more than 5 percent below the bid-based rate for roughly one-third of bids analyzed (about 20 percent to 30 percent of enrollees in our analysis), suggesting that encounter data remain incomplete, particularly for some organizations.

In conducting the comparisons, we identified a series of factors that would limit the usefulness of bid data and HEDIS data for identifying underreporting of encounter data. For example, because HEDIS specifications (instructions for processing the data) exclude a significant fraction of hospitalizations, HEDIS person-level data cannot be used to assess the completeness of MA encounter data. In comparing bid data and encounter data, we found that less than half of bids (encompassing less than half of enrollees in the analysis) met the criteria needed to conduct the comparison, demonstrating that bid data can, at best, be used to assess only a fraction of plan-reported data. Further analysis is needed to more fully consider the utility of comparing encounter data with bid data.

The encounter data have the potential to be a valuable tool for policymakers seeking to monitor, learn from, and improve the MA program. However, incomplete reporting of the data continues to limit their utility. The Commission will continue to consider approaches for working with the data in their current state, additional methods for validating the data, and policy options for improving the accuracy and completeness of the data. ■

Background

Since 2012, Medicare Advantage (MA) plans have been required to submit to Medicare a record of each encounter that MA enrollees have with a health care provider.[1] The Commission has long been interested in using MA encounter data to better understand plan practices and the services used by MA enrollees. Complete and accurate encounter data would be the best vehicle for learning about the care provided to MA enrollees.[2] The information could also be used to provide more rigorous oversight of Medicare's payments to MA plans—which reached $455 billion in 2023—and to ensure that the Medicare beneficiaries enrolled in MA plans (now more than half of eligible beneficiaries) receive the full Medicare benefit. Lessons learned from MA encounter data could inform improvements of MA payment policy, facilitate comparison with traditional Medicare, and generate new policy ideas that could be applied across the entire Medicare program. If validated for such purposes, encounter data could replace several of the data summarization and submission tasks that are currently conducted by MA plans, increasing consistency in the preparation of the data used to administer the MA program.

However, in reports and presentations since 2019, the Commission has assessed the accuracy and completeness of MA encounter data and found that the data do not include records of all items or services provided to MA enrollees. (The text box on comparing MA encounter data with other data sources gives an overview of the information Medicare collects about MA enrollees' use of services and describes our methods for assessing the relative completeness of the data sources (pp. 98–102)). In our previously published analysis of encounter records for 2014 through 2019, we assessed data for inpatient hospital, home health, skilled nursing facility, and dialysis services and found evidence of missing encounter records for each type of service; we also found evidence of missing data in the non–encounter data sources we used in the comparisons (i.e., records were present in the encounter data but not in the comparator data) (Medicare Payment Advisory Commission 2022, Medicare Payment Advisory Commission 2020, Medicare Payment Advisory Commission 2019).

To improve the completeness and accuracy of MA encounter data, the Commission recommended in 2019 that the Congress direct the Secretary to (1) establish thresholds for the completeness and accuracy of MA encounter data; (2) evaluate MA plans' submitted data and provide feedback to organizations, including comparisons to external data sources; and (3) apply a withhold to plan payments, which would be refunded to MA organizations that meet those thresholds. The Commission also recommended instituting a mechanism for direct submission of provider claims to Medicare administrative contractors as a voluntary option for all MA organizations that prefer this method, for MA organizations that fail to meet completeness thresholds, or for all MA organizations if program-wide thresholds are not achieved. These recommendations have not been adopted.

In this chapter, we first use 2020 and 2021 data to update our assessment of the relative completeness of MA encounter data and other data sources that contain information about MA enrollees' use of services. Because nationally representative independent data sources with which to compare the encounter data are limited, we are not able to assess the completeness of encounter data for important service categories such as physician or outpatient services. In the absence of an independent data source with which to compare the data, the next best available approach is to compare encounter data with other plan-reported sources. In the second half of the chapter, we examine two such sources: HEDIS quality data and plan bid data. Specifically, we assess whether the information that plans submit to CMS in these data sources is consistent with the information in the encounter data. We also evaluate whether such comparisons can provide insights regarding the relative completeness of either data source.

Comparisons of MA encounter data and independent sources show the data to be incomplete

We assessed the relative completeness of MA encounter data and several independent (i.e., not plan-generated) sources and found that the data were generally incomplete. For the four service categories

Comparing Medicare Advantage encounter data with other data sources

One way to assess the accuracy and completeness of Medicare Advantage (MA) encounter data is to compare the data with other sources of information that Medicare collects regarding MA enrollees' use of services. CMS collects and processes a large amount of information from MA plans and health care providers that can be used for such comparisons. Figure 3-1 illustrates the general flow of information from providers and plans to CMS.[3]

There are limited independent sources with which to validate the completeness and accuracy of Medicare Advantage encounter data

When serving Medicare beneficiaries who are enrolled in Medicare Advantage (MA), providers submit claims to the enrollee's MA plan, and the plan adjudicates payment. CMS, and therefore researchers, do not typically have access to MA claims data as they do for fee-for-service (FFS) claims.[4] In lieu of collecting MA claims data, CMS requires MA organizations to submit encounter records for the health care items and services provided to their enrollees. For a few service categories, however, CMS collects information about MA enrollees directly from health care providers (with no involvement of the MA plan) and formats the information as data files available to researchers. Like the encounter data, each of these data sources contains records of services that were provided to MA enrollees. Given CMS's data submission requirements for MA plans and providers, we expect to find records of these services in both data sources (encounter data and others) if data are complete.[5] Records that exist in one source but not the other are evidence that the data source missing the record is incomplete. If encounters are not present in the data files, we are unable to tell whether the absence results from the plan not submitting or the system not accepting the record.[6] We assess the relative completeness of MA encounter data and these independent data sources of information about MA enrollees' use of services:

- **Medicare Provider Analysis and Review (MedPAR) file (for inpatient stays):** For inpatient claims, CMS collects an "information-only" facsimile of the claim the provider submitted to the MA plan. MA and FFS hospitalization data are combined in the MedPAR file, which is used to calculate DSH and graduate medical education payments for certain hospitals.

- **Dialysis risk-adjustment indicator (for dialysis services):** Nephrologists and dialysis facilities submit a medical evidence form to CMS when a patient with end-stage renal disease begins dialysis. Submission of the form triggers an indicator in the risk-adjustment system signaling that the beneficiary has begun dialysis and therefore should have the risk-adjustment model for beneficiaries with ESRD applied (which is a separate risk-adjustment model from the one applied to beneficiaries without ESRD). As a result of this process, CMS risk-adjustment files include an indicator to identify beneficiaries receiving dialysis.

- **Minimum Data Set (MDS) (for skilled nursing stays):** SNFs are required to collect patient assessment data using the MDS for all residents of Medicare- or Medicaid-certified facilities. CMS uses the data to determine FFS payments to facilities under the SNF prospective payment system.

- **Outcome and Assessment Information Set (OASIS) (for home health services):** OASIS assessment data are collected for all Medicare beneficiaries receiving home health services and submitted to CMS by home health agencies at the start of a home health episode and at several points afterward. CMS uses the data to determine FFS payments to home health agencies under the home health care services prospective payment system.

We have previously found that each of these data sources are themselves missing records for MA

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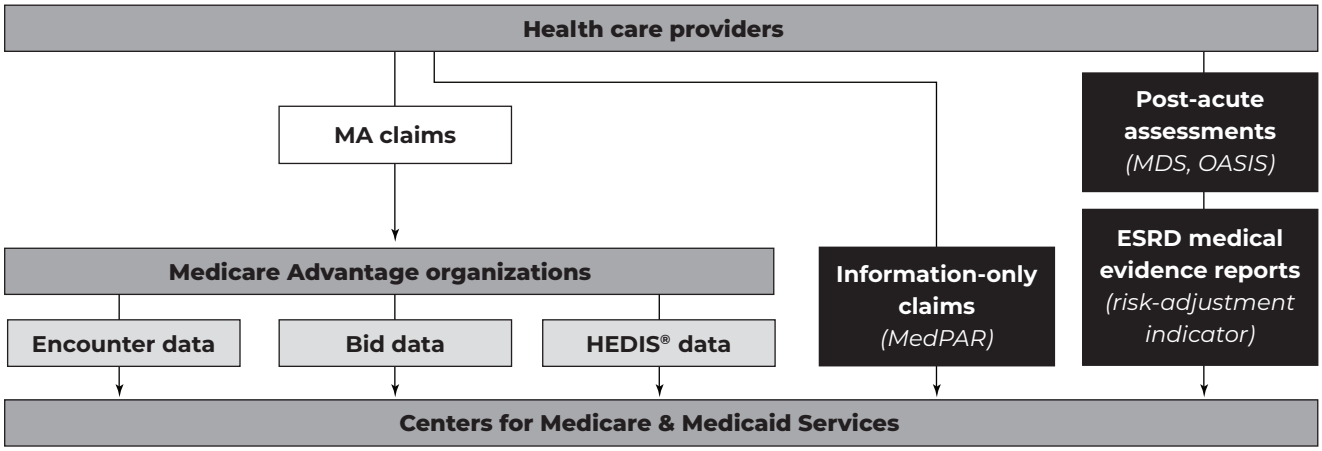
Comparing Medicare Advantage encounter data with other data sources (cont.)

FIGURE 3–1

Medicare collects a large amount of information from plans and providers about MA enrollees' use of services



	Information	Data file or field	Description
Provider submitted	Information-only claims	MedPAR	Providers submit hospital and SNF claims for MA enrollees to the enrollee's MA plan. An "information-only" copy of the claim is generated and submitted directly to CMS. CMS combines the information-only claims with FFS data to create the MedPAR file.
	Post-acute assessments	MDS, OASIS	Providers submit assessments of post-acute care patients to CMS.
	ESRD medical evidence reports	Risk-adjustment indicator	Nephrologists and dialysis facilities submit medical evidence reports to CMS. The information is stored as an indicator variable in the risk-adjustment data.
Plan submitted	Items and services provided to MA enrollees	Encounter data	MA organizations submit encounter records and chart-review records to CMS via the Encounter Data Processing System.
	MA plan quality measures	HEDIS	NCQA collects HEDIS summary-level data on behalf of CMS, and MA plans report HEDIS person-level data to CMS.
	MA plan bids	MA bid pricing data	MA plans submit bids to CMS. Utilization and pricing information is submitted via the Bid Pricing Tool.

Note: MA (Medicare Advantage), MDS (Minimum Data Set), OASIS (Outcome and Assessment Information Set), ESRD (end-stage renal disease), MedPAR (Medicare Provider Analysis and Review), HEDIS® (Healthcare Effectiveness Data and Information Set®), SNF (skilled nursing facility), FFS (fee-for-service), NCQA (National Committee for Quality Assurance). The figure shows only those provider-submitted data sources analyzed in this chapter. HEDIS is a registered trademark of the NCQA.

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Comparing Medicare Advantage encounter data with other data sources (cont.)

enrollees for whom an encounter record was submitted, suggesting that these data sources may be incomplete and limited in the extent to which they can be used to comprehensively assess the completeness of MA encounter data. Where possible, in reporting our results in this chapter we present the share of records that appear in both the encounter data and the independent data source, as well as the share appearing in one source but not the other. For example, we can identify inpatient hospital records that appear in the MedPAR data and should be included in the inpatient encounter data but are not, and we can find inpatient records that are included in the encounter data but not in the MedPAR data, suggesting that both the MedPAR and encounter data are missing records for some inpatient hospital stays. It is possible that some MA enrollee utilization may be missing from both the encounter and comparison data. As a result, we are unable to determine whether encounter data or comparison data are 100 percent complete.

For each of the service categories for which an independent data source is available, we assessed (1) the number of MA enrollees who had a record in both the encounter data and the corresponding comparison data during the calendar year and (2) the number who appeared in only one of the two sources. For inpatient services, we also evaluated the extent to which specific hospital stays—identified by dates of service—were reported in both the MedPAR and encounter data. For all data sources, we used monthly Medicare enrollment data to restrict our analyses to services rendered to MA plan enrollees in health maintenance organization (HMO) or preferred provider organization (PPO) plans. We excluded chart reviews from our analysis of encounter data because those records might not contain complete information about a health care encounter or might not be linked to any specific health care encounter. We also processed "void" or "replacement" records to avoid counting records for the same service more than once.[7] We then removed any remaining duplicate records.[8]

In the absence of an independent data source, encounter data can be compared with other information that plans submit to Medicare

One challenge with assessing the completeness of encounter data is the paucity of nationally representative independent (i.e., not plan-generated) sources with which to compare the data. Provider-submitted data containing records for MA enrollees are available for inpatient and post-acute care services but are less readily available for other service categories such as physician and outpatient services.

In the absence of an independent data source, encounter data can be compared with other information that plans submit to CMS, such as quality data and data submitted for plan bids. Comparing MA encounter data with other plan-generated data sources does not provide an independent assessment of data completeness and accuracy, but these comparisons may be useful for identifying potential underreporting and assessing whether a plan's data processing is internally consistent.

Medicare Advantage HEDIS data

The Healthcare Effectiveness Data and Information Set® (HEDIS®) is a set of quality measures that has been developed by the National Committee for Quality Assurance (NCQA) to evaluate health plans.[9] CMS requires MA plans to collect and report data annually for a subset of HEDIS measures. Plans are required to report HEDIS summary-level data to NCQA, and those results are used to calculate the MA star ratings, which contribute to an MA contract's quality bonus rating and the level of rebate dollars received by a plan when it bids below its payment benchmark.

CMS requires MA plans to report the person-level data that are used for the HEDIS summary-level data.[10] Thus, CMS considers the person-level HEDIS data equivalent to the data that contribute to

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Comparing Medicare Advantage encounter data with other data sources (cont.)

quality bonus payments and the level of plan rebates (Centers for Medicare & Medicaid Services 2022b, Centers for Medicare & Medicaid Services 2022c). (We found the person-level and summary-level HEDIS data to be largely identical in the number of hospitalizations reported.[11]) The person-level HEDIS data have both beneficiary and plan identifiers, which we can use to match with encounter data. The person-level data includes results for the HEDIS plan all-cause readmissions (PCR) measure, which identifies each beneficiary's unique qualifying hospital discharge, making the measure suitable for comparison with MA encounter data records that also contain discharge-level data for MA enrollees.[12] For the HEDIS PCR measure, CMS requires plans to submit beneficiary and plan identifiers, admission and discharge dates, and a 30-day readmissions indicator for all qualifying index hospitalizations and observation stays.

In this chapter, we examine a subset of quality measurement data that MA plans report in HEDIS, assessing the consistency of person-level HEDIS hospital stay data that are used to calculate the PCR measure with encounter hospital stay data for dates of service in 2021 (the most recent available) among HMOs and PPOs that were in both data sources.[13] This comparison builds on the Commission's prior work. We previously assessed the extent to which beneficiaries with a record in person-level HEDIS data also had a record in the encounter data, and we found large differences in the utilization counts reported through HEDIS and encounter data for inpatient, emergency department, and physician visits (Medicare Payment Advisory Commission 2019). Other researchers have also found discrepancies between the encounter data and publicly available contract-level summary HEDIS data for these services (Jung et al. 2022b, Research Data Assistance Center 2022, Tabak et al. 2020).

For the HEDIS comparison in this chapter, we applied 2021 HEDIS PCR specifications to the inpatient and outpatient encounter data. We verified that the PCR specification changes between 2021 and 2022 were both minimal and negligible for our comparisons (National Committee for Quality Assurance 2022). HEDIS PCR specifications identify index hospitalizations (including observation stays reported in outpatient data) through measurement year 2021 "value sets" that contain procedure, revenue center, principal diagnosis, and bill type codes. We excluded discharges that occurred after December 1, and we used value set codes to identify other stay-level exclusions (nonacute inpatient, pregnancy, and perinatal stays). While HEDIS allows plans to identify PCR index hospitalizations through electronic medical records, we would expect plans to identify all hospitalizations through administrative claims data or through encounter data submissions. To ensure the robustness of HEDIS exclusions of nonacute hospitalizations, we also excluded long-term care hospitalizations (which we identified through provider taxonomy codes and claim value codes applicable to a long-term care stay), which were identified only in the HEDIS electronic medical record codes. Moreover, both HEDIS and encounter data allow denied claims to be submitted for inclusion. We would expect MA plans to apply the same criteria for denied claims when submitting records for both data sources. Further, we used HEDIS specifications to identify beneficiary-level exclusions. We excluded beneficiaries who were not "continually enrolled" in the same parent organization (i.e., 365 days prior to the discharge date and 30 days after the discharge date), died during the hospitalization, were discharged on the same day they were admitted, met the HEDIS definition of excluded "outliers" (i.e., four or more index hospitalizations from the same parent organization during the year), or used hospice at any point in the year (identified through Medicare FFS claims data).[14] When identifying a hospitalization as a readmission, we applied additional exclusions (e.g., value set codes for potentially planned stays) that HEDIS specifies.

When counting unique hospitalizations in the encounter data, we applied HEDIS specifications (including counting encounters separated by one

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Comparing Medicare Advantage encounter data with other data sources (cont.)

or fewer days as the same stay), identified hospital transfers through the encounter data patient discharge status code, excluded long-term care, removed encounters with duplicate claim-from or claim-through dates, and removed encounters that occurred during longer encounter stays.[15] After these adjustments, we counted the number of days between hospitalizations and included the stay as a 30-day readmission if it did not meet the HEDIS definition as a potentially planned stay.

Medicare Advantage bid data

MA plans submit a bid that is an estimate of how much the plan will spend to provide Medicare services to their enrollees in the next calendar year. This spending projection relies on the plan's spending data from the prior year and a projection factor. Aggregated utilization data for the prior year are also included in plans' bids. Because the bid data are required to be actuarially certified and are subject to review and audit by CMS, they may be a reliable source of information about the aggregate level of service use by MA enrollees. The relationship between utilization rates calculated from encounter data and utilization rates reported in plan bids could be a useful way to identify possible underreporting of utilization data. This approach to assessing data completeness has not been widely explored. As a first step in considering the feasibility of this approach, we compare utilization rates for inpatient, SNF, and home health care reported in MA bid data with utilization rates calculated from the encounter data. For our initial comparison of encounter and bid data, we limited our analysis to these services because they are the ones for which we have an independent, provider-submitted data source so that we could assess whether the comparison provides meaningful information about the completeness of each data source. If the comparison produces meaningful information, we plan to compare bid and encounter data for other services, such as physician and outpatient services. ■

we assessed (inpatient hospital use, dialysis, skilled nursing care for non-dual-eligible enrollees, and home health services), we found records for MA enrollees in each data source (the encounter data and the comparison data source) that were not present in the other source. For each service category, most beneficiaries with a record in the independent data source also had an encounter record submitted for that service category during the year. However, in all four service categories, we continued to find that some beneficiaries have records reported in the independent sources that are not reflected in the encounter data and vice versa, suggesting that both sources remain incomplete. These findings are consistent with the trends we have previously observed in our assessments of the MA encounter data (Medicare Payment Advisory Commission 2022, Medicare Payment Advisory Commission 2020).[16] The share of MA enrollees with an inpatient hospital record in both data sources and the share with both a dialysis encounter record and the dialysis indicator in risk-adjustment data has been relatively constant since 2017. In the skilled nursing and home health data, the share of MA enrollees appearing in both the encounter data and the comparator data has improved since 2017.

Our findings have implications for researchers studying MA enrollees' use of services: Studies that rely exclusively on either the MA encounter data or one of the other data sources we assessed will likely be affected by missing data. Some researchers have used encounter data to measure MA utilization rates (Mulcahy et al. 2019), and some have compared utilization rates between MA and fee-for-service (FFS) Medicare (Anderson et al. 2021, Beckman et al. 2023, Jung et al. 2023, Jung et al. 2022a, Jung et al. 2022b, Kozlowski et al. 2023, Xu et al. 2023). For many years, researchers have also used the other sources we

assessed to measure utilization in MA and compare the use of services in MA with that in FFS (see Table 3A-1, pp. 124–125, in the appendix to this chapter, for a list of such studies).[17] Our results show that several of the provider-submitted data sources are missing records for MA enrollees. We encourage researchers to consider the possible effects of missing data when assessing MA utilization using the encounter data or the other sources we examine below. For studying these service categories, using both the encounter data and the provider-submitted data is one way to reduce missing data's impact on the findings, although even this approach might not capture all service use.

Inpatient hospital users: Comparison with MedPAR data

Hospitals that are paid under the inpatient prospective payment systems and treat a disproportionate share of certain low-income patients receive additional payments from Medicare. Disproportionate share hospital (DSH) payments provide a percentage increase in FFS Medicare payment for hospitals that qualify under formulas designed to identify hospitals that serve a disproportionate share of low-income patients. One criterion used to determine eligibility for DSH payments is based on counts of the total number of inpatient days of care provided to Medicare patients entitled to Supplemental Security Income benefits. CMS incorporates the number of hospital days for both MA enrollees and FFS beneficiaries in its calculation. The number of hospital days for MA enrollees is based on information-only claims that hospitals submit to CMS for each MA-enrolled inpatient.[18]

CMS also uses information-only claims to make indirect medical education (IME) payments to teaching hospitals paid under the inpatient prospective payment systems. IME payments to hospitals are made on a per stay basis with an amount added to Medicare's payment for every FFS discharge. To make IME payments for MA hospital patients, in most cases CMS calculates the aggregate IME amount for MA discharges (using the information-only claims) and then makes a lump sum payment directly to the hospital based on the number of MA patients treated. Medicare also makes a payment to teaching hospitals for their direct costs of graduate medical education that is affected by MA patient stay data. The information-only inpatient claims are included in the Medicare Provider Analysis and Review (MedPAR) file, which consolidates inpatient hospital and SNF claims data into stay-level records.

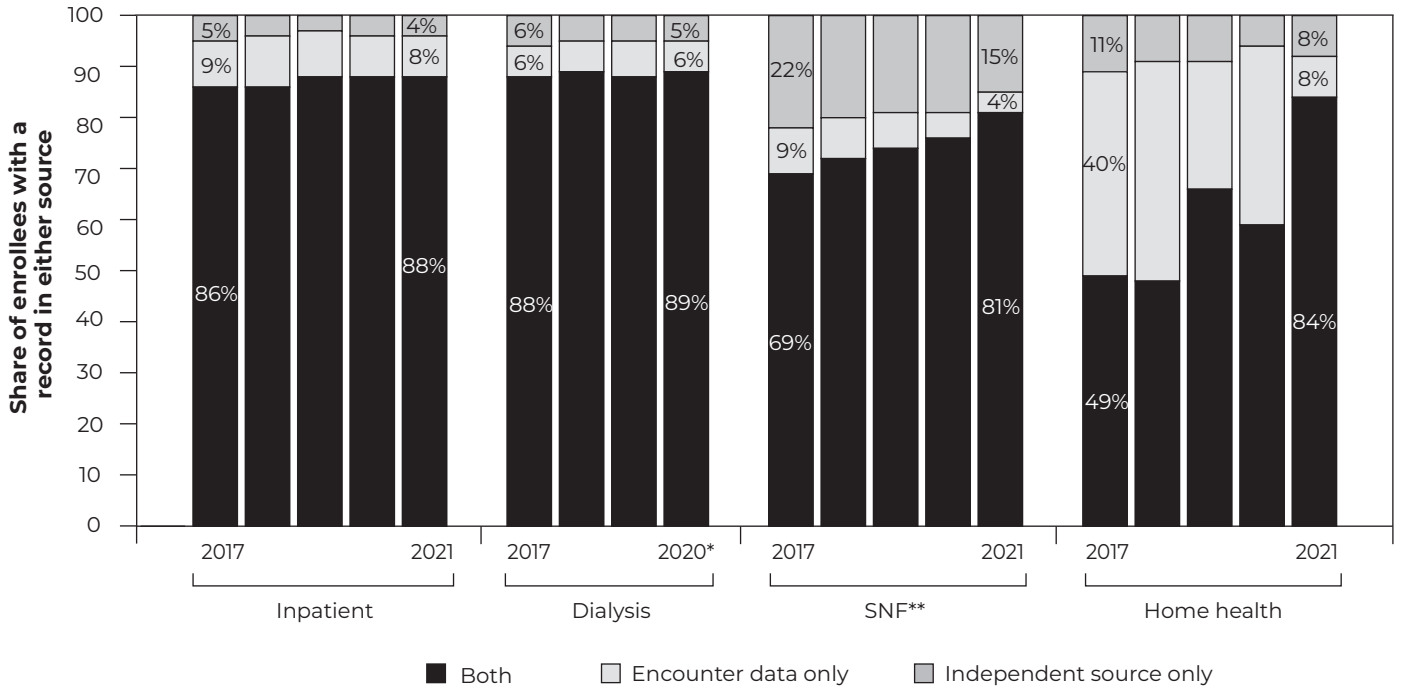
We compared data for MA enrollees who had a record in the MedPAR file with data for MA enrollees with an inpatient encounter record during the calendar year (Figure 3-2, p. 104; MedPAR is the "independent source" for inpatient data). We first assessed only whether a beneficiary's identification number was found in both data sources for the year. In 2021, most MA beneficiaries with at least one inpatient stay that was reported in the MedPAR data also had an inpatient encounter claim during the year. Of all beneficiaries with an inpatient stay reported in either the MedPAR data or the encounter data, 88 percent appeared in both sources. This share was slightly higher than the share in 2017 (86 percent). Some beneficiaries appeared in only the encounter data or the MedPAR data, with a larger share appearing only in the encounter data. These findings suggest that both sources are missing data for some MA enrollees. The presence of records in the encounter data for beneficiaries who had no corresponding record in the MedPAR data is unsurprising given that nonteaching hospitals and hospitals that do not receive DSH payments have little incentive to submit information-only claims to CMS for any MA enrollees they treat.[19]

Dialysis service users: Comparison with the dialysis risk-adjustment indicator

Nephrologists and dialysis facilities submit a medical evidence form to CMS when a patient with ESRD begins dialysis. Submission of the form for an MA enrollee changes how CMS calculates the amount paid to the MA plan for that enrollee (payments for MA enrollees receiving dialysis are based on a separate risk-adjustment model from the one used for other enrollees). As a result of this process, CMS risk-adjustment files include an indicator to identify beneficiaries receiving dialysis. We compared the data for MA enrollees who had the dialysis indicator during the year with data for MA enrollees with an outpatient dialysis encounter record during the calendar year.[20] This analysis assesses only whether a beneficiary's identification number was found in both data sources for the year. Figure 3-2 (p. 104; the dialysis risk-adjustment indicator is the "independent source" for outpatient dialysis data) shows that 89 percent of MA enrollees receiving dialysis (i.e., enrollees with either a

FIGURE 3–2

Encounter data and independent sources are missing information for some MA enrollees, 2017–2021



Service category	Independent source
Inpatient	MedPAR
Dialysis	Dialysis risk-adjustment indicator
Skilled nursing facility	MDS
Home health	OASIS

Note: MA (Medicare Advantage), SNF (skilled nursing facility), MedPAR (Medicare Provider Analysis and Review), MDS (Minimum Data Set), OASIS (Outcome and Assessment Information Set). Includes only data for health maintenance organization (HMO)/HMO point of service, local preferred provider organization (PPO), and regional PPO contracts.
*Outpatient encounter data for 2021 were not available at the time of analysis.
**Excludes MA enrollees who were also eligible for full Medicaid benefits during the calendar year.

Source: MedPAC analysis of MA encounter data and MedPAR, risk-adjustment, MDS, and OASIS data.

dialysis medical evidence form submitted to CMS (i.e., a dialysis indicator) or a dialysis encounter record) were present in both files in 2020 (the most recent year of data available). The share was relatively consistent from 2017 to 2020.

Skilled nursing service users: Comparison with MDS

An MDS assessment is required for all residents in Medicare- or Medicaid-certified nursing facilities.[21] We compared data for MA enrollees who had any MDS assessment during the calendar year with data for

enrollees who had a SNF encounter record during the year to determine whether a beneficiary's identification number was found in both data sources. We excluded MA enrollees who were eligible for full Medicaid benefits to avoid including MDS assessments for non-Medicare-covered long-term stays.[22]

Given the MDS requirement for all residents, we would expect MA enrollees to have both a SNF encounter record and an MDS assessment. However, we found that the MDS contains records for more MA enrollees than do the encounter data (Figure 3-3, p. 106; the MDS is the "independent source" for SNF stays). We also found that the encounter data include records for MA enrollees who did not have MDS records, although there were fewer of these cases than cases in which the beneficiary appeared only in the MDS.[23] The share of MA enrollees appearing in both files appears to be improving over time: In 2021, 81 percent of beneficiaries with records in either source had records in both files, compared with 69 percent in 2017 (Figure 3-2, p. 104).

Fifteen percent of MA enrollees with a record in either source were identifiable only in the MDS assessment data in 2021. While this finding may indicate missing encounter data records, it is also possible that our method failed to remove some assessments of MA enrollees who were receiving services not covered under Medicare, for which an encounter record would not be submitted. If such records were included, then our assessment of agreement between the two sources would be too low. We are continuing to refine our methods to compare SNF assessments with encounter records of SNF services.

A similar study—using 2015 encounter data—assessed the extent to which MA enrollees had a record in both the MDS and MA encounter data, but the research did not restrict the analysis to non-dual-eligible enrollees (Tabak et al. 2020). That study also found incomplete overlap between the MDS data and MA encounter data: Roughly half of MA contracts had match rates between 60 percent and 80 percent, and less than a quarter of contracts had match rates above 80 percent.

Home health service users: Comparison with OASIS

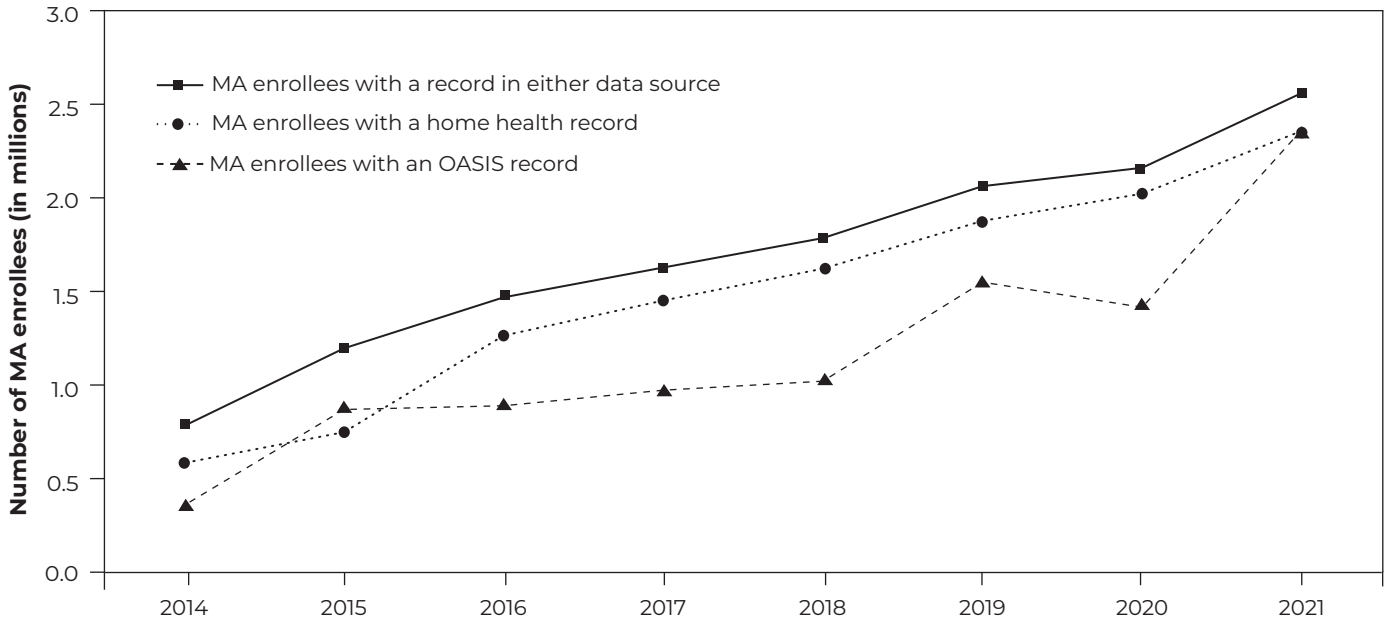
Home health agencies are required to submit an OASIS assessment for all Medicare beneficiaries at the start of a home health episode and at several points thereafter. Providers must submit an OASIS assessment to CMS for FFS payment, but submission for MA enrollees generally does not affect the provider's payment from the MA plan or the payment rate that Medicare pays the provider for services under FFS Medicare (in contrast to inpatient hospitals, where Medicare makes payments on behalf of MA enrollees). We compared data for MA enrollees who had OASIS assessments with data for MA enrollees who had home health encounter records during the calendar year. This analysis assesses only whether a beneficiary's identification number was found in both data sources for the year. Figure 3-2 (the OASIS is the "independent source" for home health services) shows that most MA beneficiaries with an OASIS assessment in 2021 were also identified in home health encounter data for the year. From 2017 to 2020, many beneficiaries appeared in the home health encounter records but were missing from the OASIS data. However, the share of MA enrollees appearing in both sources improved significantly in 2021, increasing from 49 percent to 84 percent of all beneficiaries appearing in either source.[24] Figure 3-3 (p. 106) shows that this change appears to have been driven by an increase in the number of beneficiaries with an OASIS assessment record. The number of MA enrollees with an OASIS assessment record fluctuated between 2018 and 2021, while the number of MA enrollees with a home health encounter record increased more steadily.

We assessed only whether MA enrollees had at least one record in each data source, not whether all home health visits were reported in each source. Nevertheless, because records for some beneficiaries can be found in the OASIS data but not in the encounter data and vice versa, we can conclude that both sources are incomplete. As a result, studies of home health service use in MA that rely exclusively on OASIS data or encounter data may be affected by missing data.

A similar study of 2015 encounter data also assessed the extent to which MA enrollees had a record in both the OASIS and MA encounter data (Tabak et al. 2020). That study found that a plurality of MA contracts had match rates between 70 percent and 80 percent.

FIGURE 3–3

The number of MA enrollees with an OASIS record was generally lower and more variable than the number with a home health encounter record, 2014–2021



Note: MA (Medicare Advantage), OASIS (Outcome and Assessment Information Set). Includes data only for health maintenance organization (HMO)/HMO point of service, local preferred provider organization (PPO), and regional PPO contracts.

Source: MedPAC analysis of MA encounter and OASIS data.

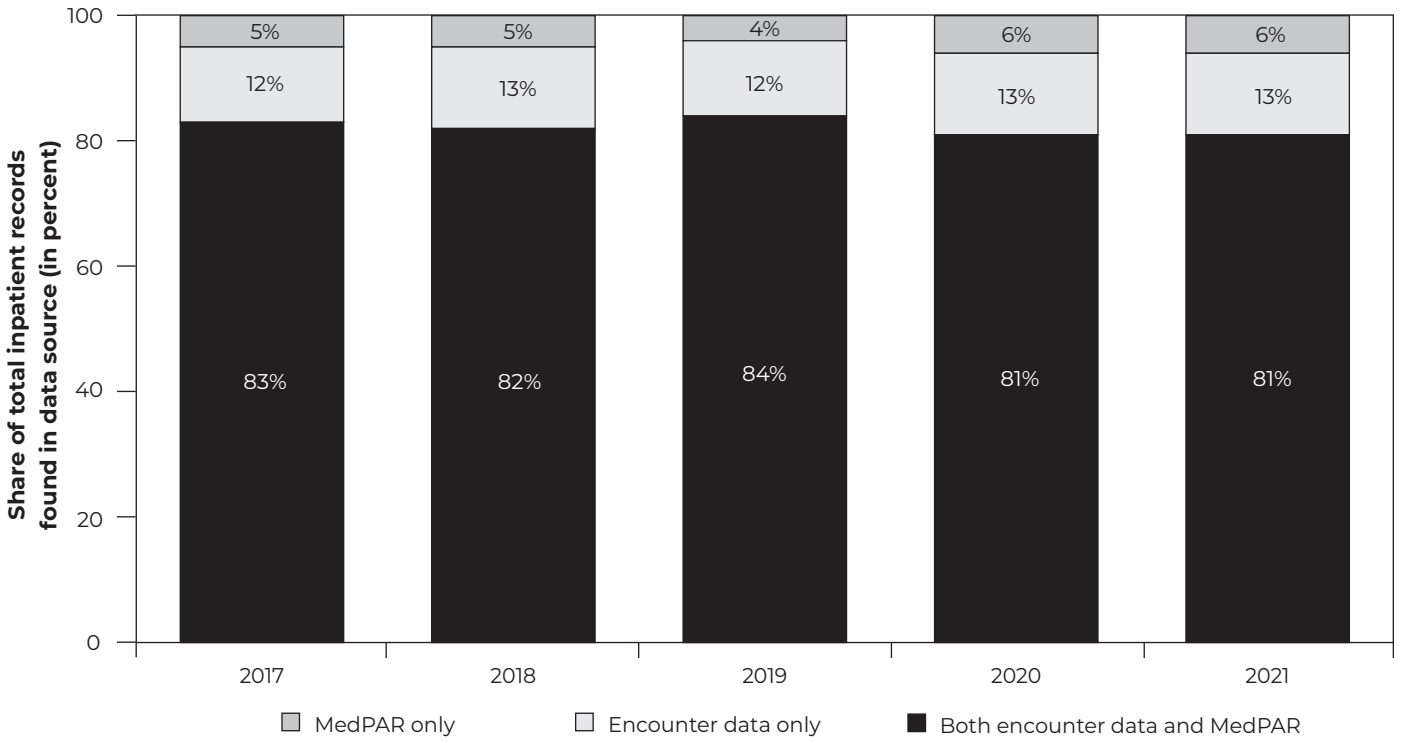
Data sources are missing information about MA enrollees' use of inpatient hospital services

In addition to assessing whether records for MA enrollees were present in both data sources, we also assessed the extent to which the MedPAR and inpatient encounter data contain records for the same hospital stay by matching records based on the beneficiary identifier and discharge date listed on the record. To complete the comparison, we began by identifying unique hospitalizations in the encounter data.[25] We also removed chart reviews so as not to double-count the same hospital stay found in both encounter records and chart reviews. In that match, we found that 81 percent of 2021 hospital stays recorded in either MedPAR or the encounter data had a record in both files (Figure 3-4). In 2021, 13 percent of hospitalizations appeared only in the encounter data—suggesting that some records are missing from MedPAR—and 6 percent of hospitalizations appeared only in MedPAR—suggesting some records are missing from encounter data.

We conducted sensitivity tests to determine the extent to which our findings were affected by our matching criteria and found that roughly one-fifth of hospitalizations that appeared in only the encounter data in our initial match (using beneficiary identifier and discharge date) had overlapping dates of service with a MedPAR record that was initially unmatched (equivalent to approximately 3 percent of total records). Roughly one-quarter of unmatched encounter records (26 percent) were for MA enrollees who had at least one record in MedPAR (regardless of service dates). We plan to continue refining how we link specific services across the two data sources. However, given our finding that not all beneficiaries had records reported in both files, it is unlikely that improving our method

FIGURE 3–4

Roughly 80 percent of MA inpatient hospital stays were reported in both the MedPAR and inpatient encounter data, 2017–2021



Note: MA (Medicare Advantage), MedPAR (Medicare Provider Analysis and Review). Includes only data for health maintenance organization (HMO)/HMO point of service, local preferred provider organization (PPO), and regional PPO contracts.

Source: MedPAC analysis of MA encounter and MedPAR data.

will demonstrate that either file is complete. For now, we can conclude that both the MedPAR and encounter data appear to have missing records for some MA enrollees' hospitalizations and that combining the two sources is likely the most comprehensive approach to identifying MA enrollees' hospital use.

Our findings are comparable with the results of a recent thorough review of the MedPAR and inpatient encounter data (Cotterill 2023). That study was limited to hospitals paid under the inpatient prospective payment systems between 2016 and 2019. The analysis found that 83 percent of hospital stays identified in either data source in 2019 were present in both sources (and that 10 percent were present only in the encounter data and 7 percent were present only in the MedPAR data).

Encounter data completeness varies across and within MA contracts

We also assessed variation in the completeness of data across and within MA contracts. We found that the share of contracts reporting at least one encounter in all six service categories has improved since the early years of encounter data collection, rising from 80 percent of contracts in 2015 to 96 percent of contracts in 2020. Within MA contracts, we found wide ranges of completeness across service sectors, even among contracts with relatively better completeness for any one sector. In other words, relatively high completeness with respect to one service category is not a marker of consistently complete data across all service categories. Given these findings, we urge policymakers and researchers to carefully consider the

TABLE 3–1

The share of contracts submitting at least one record for all service categories increased from 80 percent in 2015 to 96 percent in 2020

	Share of contracts with at least one data record	
Encounter data file	**2015**	**2020**
Physician	99%	100%
Inpatient	98	100
Outpatient	98	100
Skilled nursing facility	95	98
Home health	82	98
Durable medical equipment	96	99
In all six settings	**80**	**96**

Note: Includes only health maintenance organization (HMO)/HMO point of service, local preferred provider organization (PPO), and regional PPO contracts. Contracts with 10 or fewer enrollees are excluded.

Source: MedPAC analysis of MA encounter data and CMS enrollment data..

possible effects of missing data when using encounter data to examine MA utilization; using a combination of MA encounter data and provider-submitted data (such as those examined above) is one way to reduce the impact of missing data on findings, but it may not fully resolve the issue.

The share of contracts successfully submitting encounter data has increased

To assess variation in MA plans' submission of encounter data, we checked whether MA contracts successfully submitted any records for each type of service: inpatient hospital, outpatient hospital, physician/supplier Part B, skilled nursing facility, home health, and durable medical equipment.

When plans submit encounter data, CMS's encounter data system performs automated front-end checks before accepting each record. Errors or problems cause the system to reject the submission, which means no record will appear in the encounter data files unless the plan resubmits corrected data. In other words, if encounter records are not present in the data files, we are unable to tell whether that is a result of the plan not submitting or the system not accepting the record.

The share of contracts reporting at least one encounter record all six service categories has improved since the early years of encounter data collection, rising from 80 percent of contracts in 2015 to 96 percent of contracts in 2020 (Table 3-1).

All contracts submitted at least one record for physician, inpatient, and outpatient services. Diagnoses identified during hospital inpatient, hospital outpatient, and physician services are used to calculate MA risk scores, which determine payments to MA plans. Because encounter data are used as the source of diagnostic information, MA plans have a strong incentive to ensure that they are submitting complete encounter records for those settings, which likely contributes to the higher share of contracts submitting encounter records for those services (Pope et al. 2004). The share of contracts submitting encounter records for the other service categories has improved significantly since 2015: In 2020 only a small share of contracts, representing an extremely small share of enrollment (less than 0.5 percent of enrollees in HMO and PPO contracts), did not submit at least one SNF, home health, or DME encounter record. We are unable to tell whether these contracts did not submit

TABLE 3–2 **Encounter data completeness varied within and across MA contracts, 2020**

Share of MedPAR records with a matching encounter record*	Share of records in comparison data set with a matching encounter record: Inpatient stays (MedPAR)	Home health users (OASIS)**	Skilled nursing users (MDS)	Dialysis users (risk indicator)
	Mean (minumum–maximum)			
Higher than 90 percent *311 contracts*	97% (90%–>99.5%)	88% (1%–99%)	84% (1%–100%)	94% (66%–100%)
80–90 percent *15 contracts*	85% (80%–90%)	85% (64%–98%)	69% (12%–98%)	93% (77%–100%)
Less than 80 percent *28 contracts*	21% (1%–79%)	85% (60%–98%)	75% (15%–100%)	94% (79%–100%)

Note: MA (Medicare Advantage), MedPAR (Medicare Provider Analysis and Review), OASIS (Outcome and Assessment Information Set), MDS (Minimum Data Set). Includes only health maintenance organization (HMO)/HMO point of service, local preferred provider organization (PPO), and regional PPO contracts. Contracts with fewer than 2,500 enrollees and fewer than 10 records in any of the service categories are excluded.
*Matching is based on the number of hospital stays with matching service end dates for the same beneficiary.
**2020 is the most recent year for which data were available across all service categories. Match rates between OASIS and encounter data improved significantly from 2020 to 2021. Match rates between the MDS and encounter data also improved in 2021, but to a lesser degree.

Source: MedPAC analysis of MA encounter data, OASIS, MDS, risk-adjustment, MedPAR, and CMS enrollment data.

encounter records because their enrollees did not use those services or because their reporting does not reflect all services that were provided.

Variation in data completeness across MA contracts

We also assessed whether the completeness of encounter data varied across service categories within each contract. To assess such variation, we summarized how each MA contract performed on the comparisons with independent data sources discussed earlier in this chapter. Table 3-2 shows that data completeness varied across the service categories we measured, even among plans with a high degree of completeness in one category. For example, we found an average encounter-MedPAR match rate of 97 percent among the subset of MA contracts for which at least 90 percent of their MedPAR inpatient stays in 2020 had a corresponding encounter record. However, the average encounter-OASIS match rate for contracts in this group was 88 percent when comparing beneficiaries with an OASIS record and a home health encounter record.

Out of 354 HMO and PPO contracts enrolling at least 2,500 enrollees in July 2020 and having at least 10 records for each service category (a sample that includes over 98 percent of all HMO and PPO enrollees), we found 311 contracts that had inpatient encounter records matching at least 90 percent of MedPAR records for their enrollees.[26] These contracts had an average encounter match rate of 97 percent for inpatient services based on MedPAR records; however, we found that those contracts had lower encounter data completeness for other services, with an average encounter match rate of 88 percent for home health, 84 percent for skilled nursing, and 94 percent for dialysis service users. Also, some of the 311 contracts with relatively high MedPAR match rates reported very low encounter match rates—as low as 1 percent—for home health and skilled nursing service

users. Finally, we found that of the 311 contracts that had encounter records matching at least 90 percent of MedPAR records, only 66 contracts (covering 4.2 million enrollees, or roughly 17 percent of all MA enrollees) had encounter records matching at least 90 percent of beneficiaries with a record in the comparison data set for all three other comparison sources (OASIS, MDS, dialysis risk-adjustment indicator) (data not shown).

This analysis used an approach similar to a method proposed by Jung and colleagues that has been used by researchers to account for missing data when analyzing MA encounter data (Beckman et al. 2023, Jung et al. 2023, Jung et al. 2022a, Jung et al. 2022b, Xu et al. 2023). The method attempts to limit the influence of incomplete encounter data by restricting the analysis to records from MA contracts that achieved a certain level of agreement with other data sets. Among contracts that are required to submit encounter data for all Medicare items and services provided to their enrollees, and contracts with at least 2,500 enrollees, the researchers selected those for which:

- less than 10 percent of inpatient stays were missing from the encounter data (measured as the number of encounter records divided by the total number of inpatient stays reported in either the encounter or the MedPAR data);
- there was a less than 10 percent difference (in either direction) between the number of ambulatory visits reported in the encounter data and Healthcare Effectiveness Data and Information Set® (HEDIS®) data; and
- there was a less than 10 percent difference (in either direction) between the number of emergency department visits reported in the encounter data and HEDIS data (Jung et al. 2022a).

We found wide ranges of encounter data completeness across service sectors when comparing with independent data sources (HEDIS data are generated by MA plans), even among contracts with relatively better completeness relative to MedPAR. It is therefore important to consider the possible influence of incomplete encounter data when interpreting the results of analyses using the encounter data to examine service use in MA, including those using Jung and colleagues' list of "relatively complete submitting contracts." Such studies could be affected by the persistence of incomplete data among contracts meeting the inclusion criteria. In data for 2018, for example, Jung and colleagues found that the contracts they listed as "relatively complete" were missing 3.2 percent of all hospital stays—lower than the 6.7 percent observed across all contracts, but potentially large enough to meaningfully affect the interpretation of the results of some studies. Applying the criteria may reduce the influence of missing data but is not sufficient to resolve the issue entirely. Our results also demonstrate that relatively high completeness in one service category is not a marker of consistently complete data across all service categories. This issue is particularly important for studies using encounter data from multiple service categories, some of which do not have a viable independent data source with which to validate the completeness of the data (Beckman et al. 2023, Jung et al. 2023). In such cases, it is even more difficult to rule out the possibility that missing data are affecting the results.

Finally, we also encourage researchers to consider the possible effects of missing data when examining MA utilization using other sources of data such as the provider-submitted data sources we examined above—particularly when attempting to draw conclusions about small differences in patterns of service use in MA and FFS. Our results show that several of the provider-submitted data sources are missing records for MA enrollees. For studying these service categories, using both the encounter data and the provider-submitted data is one way to reduce the impact of missing data on the findings (although this approach might not fully resolve the issue).

The fact that encounter data and other sources are missing records for some items and services provided to MA enrollees, although concerning, does not entirely preclude the use of the data, but researchers should consider how the missing data, and any patterns in the missing data, would influence the results of a study. For example, if encounter records are systematically missing for certain types of plans, providers, or beneficiaries, careful use of exclusion criteria may reduce the influence of missing data but could also reduce the generalizability of any findings. But if encounter records are missing at random, the data might produce reliable information about the

relative distribution of services but could produce underestimates of utilization rates (though perfect randomness is unlikely). Studies that compare service use of MA and FFS enrollees and rely on data sources that are comparatively less complete for MA enrollees than for FFS beneficiaries will be biased toward finding lower service use among MA enrollees.

Overall, the fact the encounter data continue to be an incomplete source of information about MA enrollees' use of services, despite some incremental progress, is a barrier to monitoring, learning from, and improving the MA program. Policymakers and researchers must keep in mind the implications of incomplete data for assessments of the MA program and MA enrollees' use of services. The Commission is eager for MA encounter data to achieve sufficient completeness to evaluate MA care delivery and service use relative to FFS Medicare, to facilitate quality comparisons between MA plans and across MA and FFS Medicare, and to inform policy options to improve the Medicare program.

MA encounter data are inconsistent with other plan-reported information

Our comparison of MA encounter data with the independent, provider-submitted data sources (described above) was limited to inpatient, post-acute, and dialysis services. However, MA plans also submit encounter data for outpatient hospital services, physician/supplier Part B services, and durable medical equipment. For most of these services, a nationally representative independent data source (i.e., one submitted by an entity other than the MA plan) is not available. In the absence of an independent source, encounter data can be compared with other information that plans submit to CMS. Comparing MA encounter data with other plan-generated data sources does not provide an independent assessment of data completeness and accuracy. However, these comparisons can be used to assess whether the data that plans report to CMS are internally consistent, and the comparisons may be useful for flagging potential underreporting of data (in either the encounter data or comparator source). To assess the consistency of plan-reported data and to explore the use of the data for these other purposes, we compared encounter data with two other plan-reported sources. In the first comparison, we examined a subset of quality measurement data that MA plans report in HEDIS. In the second, we compared utilization rates reported in MA bid data with utilization rates calculated from the encounter data. We limited our analysis to these services because they are the ones for which we have an independent, provider-submitted data source with which to assess and contextualize the completeness of the encounter data.

Our findings suggest that the information that plans submit to CMS through separate reporting processes is not internally consistent and that there are technical factors that would limit our ability to use the data to identify underreporting of data. In our comparison of encounter and HEDIS data, we found that HEDIS hospitalization data differed significantly from encounter hospitalization data and that HEDIS was the main cause of this inconsistency. HEDIS data often included hospital stays that were required to be excluded under the instructions for processing the data; at the same time, HEDIS data were missing a considerable number of hospital stays and hospital users identified through the encounter data that should have been included. When we limited our analysis to beneficiaries found in both data sources, we found that encounter data included 11 percent more hospitalizations and 19 percent more readmissions than HEDIS data. Thus, the encounter data are a more complete source for hospital utilization measures than HEDIS data.

Our analysis of bid data and encounter data also showed discrepancies between the two sources. Utilization rates based on encounter data were within 5 percent of the rates reported in plan bids for less than 40 percent of bids we analyzed, comprising less than half of enrollees in the analysis. Encounter-based rates for inpatient and skilled nursing facility services were more than 5 percent below the bid-based rate for roughly one-third of analyzed bids (roughly 20 percent to 30 percent of enrollees in our analysis), suggesting that encounter data remain incomplete, particularly for some organizations. Variation in how plans report home health data in their bids limited our ability to assess those data's relationship with the encounter data.

In conducting the comparisons, we identified a series of factors that would limit the utility of the data for identifying underreporting of data. For example, we

found that HEDIS specifications (instructions for processing the data) exclude a significant fraction of hospitalizations. These exclusions limit the utility of HEDIS person-level data as a source with which to assess the completeness of MA encounter data. Nevertheless, our findings demonstrate that comparisons of plan-reported sources can reveal useful information about the consistency and completeness of the data that plans submit to CMS. In comparing bid data and encounter data, we found that less than half of bids (encompassing less than half of enrollees in the analysis) met the criteria needed to conduct the comparison. This limitation shows that bid data can, at best, be used to assess only a fraction of plan-reported data. Further analysis is needed to more fully consider the usefulness of comparing encounter data with bid data.

Misreporting of hospitalizations in MA HEDIS results in inconsistencies with MA encounter data

We examined a subset of quality measurement data that MA plans report in HEDIS. We assessed the consistency of person-level HEDIS hospital stay data that are used for the plan all-cause readmission (PCR) measure with hospital-stay encounter data for dates of service in 2021 (the most recent available) among HMOs and PPOs that were in both data sources. We applied the HEDIS PCR specifications to all hospital inpatient and outpatient records in the encounter data.

HEDIS PCR measure specifications result in the exclusion of a substantial share of hospitalizations from the calculation of the measure. In particular, HEDIS specifies that plans exclude stays for beneficiaries who enrolled in hospice at any point during the year, had four or more index hospitalizations during the year, or were not continually enrolled in the same parent organization (a year before the discharge date through a month after the discharge date) (National Committee for Quality Assurance 2022). When applied to encounter data, the HEDIS specifications excluded 45 percent of index hospitalizations and 71 percent of readmissions. Thus, HEDIS person-level data is limited in its ability to be used as a source to assess the completeness of MA encounter data.[27]

Despite this limitation, we can assess the consistency between HEDIS PCR data and MA encounter data by applying HEDIS specifications to encounter-data hospitalizations. (The text box on comparing MA encounter data with other data sources describes our methods for assessing the consistency between the two data sources (pp. 98–102)). While MA plans have a much longer time frame for submitting encounter data than HEDIS data, we would not expect these time frames to materially impact our comparison.[28] We would expect all HEDIS hospitalizations to be in the encounter data and nearly all encounter hospitalizations to be in the HEDIS data.[29]

We found that, even when the HEDIS PCR specifications were applied to encounter data, HEDIS hospitalization data were inconsistent with encounter hospitalization data. HEDIS PCR data often included hospital stays that, according to HEDIS specifications, should have been excluded (e.g., hospitalizations for beneficiaries that did not meet continuous enrollment criteria). When we relaxed (i.e., did not apply) these exclusions in the encounter data, only 4 percent of HEDIS stays and 1 percent of HEDIS beneficiaries were not found in the encounter data. Perhaps more concerning, we identified a considerable number of qualifying hospital stays and hospital users through the encounter data that were not reported in HEDIS. In addition, when we limited our analysis to beneficiaries found in both data sources, we found that encounter data included 11 percent more hospitalizations and 19 percent more readmissions than HEDIS data did. Thus, HEDIS was the main cause of this inconsistency between the two data sets, such that the encounter data would be a more complete source for hospital utilization measures. Further investigation would be needed to assess the extent to which quality bonus payments and rebates would change if encounter data were used as the source for some measures in MA star ratings.[30]

MA plans inconsistently applied HEDIS exclusions in hospital data

As an initial comparison of consistency between HEDIS and the encounter data, we examined the extent to which the 3.1 million HEDIS hospitalizations (as measured by unique beneficiary, MA contract, and discharge date) were in the encounter data in 2021. We would expect that effectively all HEDIS hospitalizations would be in the encounter data. We applied HEDIS specifications to the encounter data. We found that

TABLE 3–3

Inconsistent treatment of exclusions in 2021 MA HEDIS® data led to inconsistencies with MA encounter data

	HEDIS hospitalizations found in encounter data (in percent)					
		Percentile				
Encounter-data population	**Overall**	**10th**	**25th**	**50th**	**75th**	**90th**
Applying HEDIS exclusions	85%	64%	75%	84%	89%	95%
Relaxing HEDIS exclusions	96	79	94	98	99	100
HEDIS exclusions:						
Hospice	4	1	1	3	5	13
Continuous enrollment	3	1	2	3	7	87
Outlier	4	1	2	4	6	17

Note: MA (Medicare Advantage), HEDIS® (Healthcare Effectiveness Data and Information Set®), PCR (plan all-cause readmissions). Hospitalizations were matched by beneficiary, MA contract, and discharge date. Distribution by percentile is at the MA contract level and excludes private fee-for-service plans and MA contracts with fewer than 30 index hospitalizations. HEDIS hospitalizations come from HEDIS PCR patient-level data, which include observation stays. HEDIS specifications were applied to MA encounter data. "Continuous enrollment" is measured as an enrollee being in the same parent organization for the 365 days prior to the discharge date and 30 days after the discharge date. HEDIS defines outliers as those beneficiaries with four or more index hospitalizations from the same parent organization during the year.

Source: MedPAC analysis of MA encounter data, HEDIS patient-level hospital discharge data, and Medicare enrollment data, 2021.

85 percent of HEDIS hospitalizations were in the encounter data (Table 3-3), which accounted for 90 percent of HEDIS hospital users (data not shown). However, only a small part of this discrepancy was due to encounter data missing HEDIS hospitalizations. Instead, we found that the difference was mainly due to HEDIS hospitalizations that matched HEDIS exclusions for beneficiaries who elected hospice (4 percent of HEDIS hospitalizations), beneficiaries who were not continually enrolled in the plan's parent organization (3 percent of HEDIS hospitalizations), and "outlier" beneficiaries with at least four index hospitalizations within the plan's parent organization during the year (4 percent of HEDIS hospitalizations).[31,32] After relaxing all HEDIS exclusions, we found that 96 percent of HEDIS hospitalizations were in the encounter data, which accounted for 99 percent of HEDIS hospital users. Nearly all 549 MA contracts included 1 or more stays that met the HEDIS exclusion criteria. Some MA contracts may have misreported beneficiaries who did not meet hospice criteria because the MA contract lacked enrollment information about the beneficiary for the entire year. In 2022, NCQA clarified that enrollees who were in hospice at any point in the year should be excluded. In addition, some MA contracts may have misreported beneficiaries who did not meet continuous enrollment criteria because the MA contract lacked complete enrollment data for those beneficiaries. Further, some contracts may have included outlier beneficiaries because the contract did not report all of a beneficiary's index admissions. Even so, our results suggest that HEDIS specifications are not applied consistently across MA plans.

HEDIS omitted a notable share of hospitalizations found in encounter data

After applying the HEDIS specifications to the encounter data, we examined the extent to which 3.6 million encounter-data hospitalizations (as measured by unique beneficiary, MA contract, and discharge

TABLE 3–4

A substantial share of 2021 hospitalizations in encounter data were not found in HEDIS® data

Encounter-data hospitalizations that were also found in HEDIS data (in percent)		
Overall	**Inpatient**	**Observation stays**
73%	86%	40%

Note: HEDIS® (Healthcare Effectiveness Data and Information Set®). Hospitalizations were matched by beneficiary, Medicare Advantage (MA) contract, and discharge date. Excludes private fee-for-service plans. HEDIS hospitalizations come from HEDIS plan all-cause readmissions patient-level data, which include observation stays. HEDIS specifications were applied to MA encounter data.

Source: MedPAC analysis of MA encounter data, HEDIS patient-level hospital discharge data, and Medicare enrollment data, 2021.

date) were included in the HEDIS data. A small share of encounter-data hospitalizations may be unknown to plans when they submit HEDIS data (about 7 months after the data collection period) because the time frame for encounter-data submissions provides much more time (about 13 additional months) for claims maturity. However, because 99 percent of hospital claims are submitted within seven months in FFS Medicare, we would expect that nearly all encounter-data hospitalizations would be in the HEDIS data too (Chronic Condition Warehouse 2017). However, we found that just 73 percent of encounter-data hospitalizations were in the HEDIS data (Table 3-4), which accounted for 78 percent of encounter-data hospital users (data not shown). The hospitalization match rate was 90 percent or better for only 14 percent of MA contracts that submitted HEDIS data in 2021 (data not shown). In addition, a much larger share of inpatient encounters (86 percent) was found in HEDIS data compared with observation stays found in HEDIS data (40 percent). It is unclear why such a substantial share of encounter-data hospitalizations were not reported in HEDIS—in particular for observation stays. While HEDIS data are submitted and audited by entities approved through NCQA, it is not clear whether the data are validated against other sources of discharge-level data for the same MA contract, whether different data systems affect the results produced by software algorithms, whether the specifications are consistently applied between entities, and whether audits conduct parallel coding with an MA contract's source data and compare discharge-level results.

Because some required HEDIS exclusions are applied inconsistently (e.g., continuous enrollment), it is difficult to estimate how many unique hospitalizations and readmissions would have been added to HEDIS if it fully reflected encounter data.[33] As an alternative, we calculated the differences in the total number of index hospitalizations and readmissions among 2.3 million beneficiaries who were in both the encounter data and HEDIS. We found that the number of encounter-data index hospitalizations was 11 percent higher than index hospitalizations in HEDIS, and the number of encounter-data readmissions was 19 percent higher than readmissions in HEDIS (data not shown). This finding is consistent with prior research that also found underreporting in HEDIS of hospitalizations and readmissions (Kim et al. 2020, Panagiotou et al. 2019). This result does not suggest that readmission rates would have been higher if encounter data were the source used for the PCR measure because the number of index hospitalizations can alter whether a beneficiary meets the HEDIS outlier exclusion threshold. However, the larger number of hospitalizations in the encounter data provides further evidence that these data would be a more complete source for the PCR measure than HEDIS. Further investigation would be needed to determine whether the encounter data would be a more complete source of information for other quality measures and the extent to which using encounter data would alter quality bonus payments and plan rebates. In addition, our findings on the inconsistency of HEDIS reporting

for the PCR measure conform with prior research that found large inconsistencies in the reporting of HEDIS measures (Jung et al. 2022b, Kim et al. 2020, Medicare Payment Advisory Commission 2019, Panagiotou et al. 2019, Research Data Assistance Center 2022). These findings raise questions about whether HEDIS data are a reliable tool for identifying contracts with complete encounter data.

MA bid data include utilization rates that can be compared with MA encounter data

In addition to HEDIS data, we also compared MA encounter data with information that MA organizations submit annually in their bids to provide MA plans. The MA bidding cycle unfolds primarily during the year preceding a contract year. Plans submit bids to CMS by the first Monday of June using a form called the Bid Pricing Tool (BPT) (Centers for Medicare & Medicaid Services 2023b).[34] The bids include information about each plan's members' use of services and plan spending for those services during the preceding year (i.e., the year two years prior to the contract year, referred to as the "base period"). Plans also submit projection assumptions that, when applied to the data describing the base period, equal the plan's estimated costs for the upcoming contract year.[35] Those projections, along with a set of other factors, determine the plan's bid for the contract year.[36] As an example, for contract year 2023, plans submitted bids in June of 2022 that included information about their members' service use in 2021.

The base-period data in the bids include utilization rates, along with information about plan and beneficiary spending. MA plans use data from claims submitted to the plan by providers to generate information about the base period. Those claims data are not submitted to CMS as part of the regular bidding process and are not publicly available. Data for bids that were accepted or approved by CMS are generally made publicly available after four years (42 CFR 422.272(b)).

Plans' bid data must be certified by an actuary, are subject to review and audit by CMS, and CMS requires that the base-period data match the MA organization's audited financial statements (Centers for Medicare & Medicaid Services 2023b).[37] Because financial statements generally do not contain information about service use, the utilization rates reported in the data might not receive the same scrutiny and may not be as reliable as the fields describing payments. We interviewed actuaries who prepare MA bids to learn more about the preparation of the data and gather their perspectives about the reliability of the data. They generally supported the view that the utilization rates reported in the bid data are a reasonable source of information about a plan's base-period experience because they are typically derived from the same claims data that are used to populate the payment fields; however, actuaries noted that there is more than one reasonable way to summarize the utilization data for inclusion in plans' bids.

MA bid data: How plans calculate utilization rates

MA plans submit base-period utilization rates (measured as a rate per 1,000 enrollees) for 11 Medicare-covered service categories in their bids. Plans can choose the unit of measure they use to report the data from a list of CMS-provided options. For example, in bids for 2023 (reflecting utilization for 2021), 90 percent of bids reported the number of days of inpatient care for their members, while 10 percent reported the number of inpatient admissions. For SNF care, 98 percent of bids reported the number of days of care; for home health, 99 percent of bids reported the number of visits (Table 3A-2, p. 126, in the appendix to this chapter, presents the units used to report other categories of services). We included bids that used the most common unit for each category: days for inpatient and skilled nursing facility services, visits for home health care.

MA encounter data: Calculating utilization rates

We calculated utilization rates for inpatient, SNF, and home health services using MA encounter data and other administrative data sources. Our method was designed to approximate, as closely as possible, the methods used to prepare MA bids. To inform our approach, we consulted with actuaries who have experience preparing MA bids. We used administrative data to exclude records for enrollees who were in hospice status as of the first of the month and to assign the plan in which the beneficiary was enrolled at the time of the service; we used risk-adjustment data to exclude records for services provided in a month in which a beneficiary was in ESRD status.

Differences between encounter data and bid data will affect the comparison of utilization rates

Both the encounter data and bid data describe services delivered to Medicare Advantage (MA) enrollees in a year. As such, utilization rates calculated from encounter data should generally be consistent with the information submitted in plan bids. However, there are reasons to expect that the former ("encounter-based rates") would be at least slightly different from the latter ("bid-based rates"):

- ***Incomplete encounter data:*** As described earlier in this chapter, the Commission has found that the encounter data are incomplete. Missing encounter data could lead our estimate of utilization to be lower than what plans report in their bids.

- ***Payment denials:*** MA organizations (MAOs) are required to submit encounter data for all items and services provided to their members, including those for which the MA plan denied payment to the provider (e.g., out-of-network care or instances in which the plan acted as a secondary payer) (Centers for Medicare & Medicaid Services 2022a). In contrast, MA bids reflect only the items and services for which the MA plan made payment. The encounter data do not include a reliable way to identify denied claims (Office of Inspector General 2023).[38] As a result, utilization rates calculated from the encounter data may include some services that are excluded from the bid data, which would cause the utilization rates we calculated to be higher than what plans report in their bids.

- ***Variation in encounter submissions and claims processing methods:*** CMS provides limited guidance about how plans should calculate the utilization rates reported in their bids. Without consistent guidelines from CMS, plans do not have a standardized method for calculating utilization rates, and methods vary across plans. Additionally, although MAOs must use standardized claim formats to submit encounter records, MAOs may differ in how they populate the records for certain services (Centers for Medicare & Medicaid Services 2022a). For example, some plans might submit encounters that conform to claims-submission requirements used for fee-for-service claims, while others might use somewhat different standards. These sources of variation could result in differences between encounter-based and bid-based utilization rates.

  Additional differences could arise if plans categorized services differently when preparing the two sources. The Bid Pricing Tool (BPT) requires plans to group data for Medicare-covered services into 11 categories (see Table 3A-2, p. 126, in

(continued next page)

We then calculated total days of inpatient and SNF care occurring during the base period for each plan (calculated at the segment level).[39] To calculate the number of home health visits, we counted the number of home health revenue codes listed on the encounter record.[40]

Comparing utilization rates calculated from encounter data with rates reported in bids

We compared utilization rates for plan year 2021 using the 2021 encounter data and the 2023 bid data (for which the base period was 2021) for HMO and PPO plans that reported base-period experience data, covered enrollees with Part A and Part B, and did not participate in the MA value-based insurance design (VBID) model.[41] Just over half of all MA bids and slightly less than half of all enrollment represented in MA bids met these criteria (see Table 3-A3 (p. 127), in the appendix to this chapter, for a summary of our exclusion criteria). We then checked whether the enrollment information submitted in the bids matched the enrollment information in our administrative

Differences between encounter data and bid data will affect the comparison of utilization rates (cont.)

the appendix to this chapter, for the list of service categories). CMS provides minimal guidance as to which types of claims should be included in each category. Plans may apply discretion as to how to categorize certain types of claims. Differences between bid data and encounter data could arise if plans categorize services in their bids differently than we did when calculating utilization rates with the encounter data.

- ***Differences between plans' internal data and CMS enrollment data:*** Utilization rates reported in plan bids are aggregated from the experience of members enrolled in plans that were active in the base period, which can include multiple predecessor plans. MAOs report the identification numbers of the plans that were used to develop the base-period utilization rates for each bid, but only a single, aggregate utilization rate is reported for each service category for each bid.[42,43] Plans must exclude any utilization by enrollees who were in end-stage renal disease or hospice status when reporting utilization rates for Medicare-covered services.[44] Plans use their internal data, along with the enrollment data they submit to CMS, to identify the enrollees and claims to include in their bids. In contrast, we used enrollment data from CMS to identify encounter records for inclusion or exclusion. We found that the enrollment information that plans submitted in their bids was not always consistent with the enrollment data we used. To account for these differences, we omitted any bids for which the difference between the enrollment reported in the bid and in the administrative sources was more than 5 percent. The remaining difference between the enrollment information that plans used to prepare their bids and the data we used to process encounter data could contribute to small differences in rates calculated from the two sources.[45]

Altogether, differences between the encounter data and the claims data underlying plan bids could cause the encounter-based utilization rates we measured to be higher or lower than the rates reported in the bids. The overall direction of the difference depends on which factor is larger for a particular bid, a factor that is likely to vary across service categories and plans. For plans submitting relatively complete encounter data, the utilization rates we calculate are likely to be higher than what the plan reports in its bid due to factors like the inclusion of encounter records for denied claims; for plans submitting incomplete encounter data, the missing data could put downward pressure on the calculated rate, moving it closer to or below the reported rate. ■

data sources. For all comparisons with the bid data, we omitted any bids for which the difference between the enrollment reported in the bid and in the administrative sources differed by more than 5 percent. Roughly one-third of all bids, encompassing approximately half of enrollees, met these criteria. After the exclusion, the average difference in enrollment between the two sources was less than 1.5 percent. We then merged our encounter-based utilization rates with the list of plans that contributed to each bid. We omitted any bids for which we did not find encounters for all of the plans corresponding to the bid. In total, approximately 30 percent of bids (encompassing roughly 40 percent of enrollment) met our inclusion criteria. We then aggregated the utilization rates to the bid level using the enrollment of each contributing plan.

Table 3-5 (p. 118) illustrates the calculation using a hypothetical 2023 bid. This plan's bid was based on the experience of three fictitious plans serving members in 2021; the plan reported an aggregate utilization

TABLE 3–5 **Illustrative example of comparing bid data with encounter-based utilization rates**

	Bid data		Calculated from administrative and MA encounter data	
MA 2023 bid number*	**Member months**	**Utilization rate (per 1,000 enrollees)**	**Member months (administrative data)**	**Encounter-based utilization rate (per 1,000 enrollees)**
H####-###-001	100,000	1,245 inpatient days		1,295 inpatient days
2021 bid numbers for plans used to develop the 2023 bid above	**Plans used by MAO to develop base-period utilization rate**			
H####-###-001	75,000 (75%)		75,500 (76%)	1,180
H####-###-002	15,000 (15%)		14,750 (<15%)	1,580
H####-###-003	10,000 (10%)		9,750 (<10%)	1,750

Note: MA (Medicare Advantage), MAO (Medicare Advantage organization). All data are illustrative.
*Contract-plan segment number.

Source: Illustrative example based on MedPAC analysis of 2023 MA bids, CMS 2021 enrollment data, and 2021 MA encounter data.

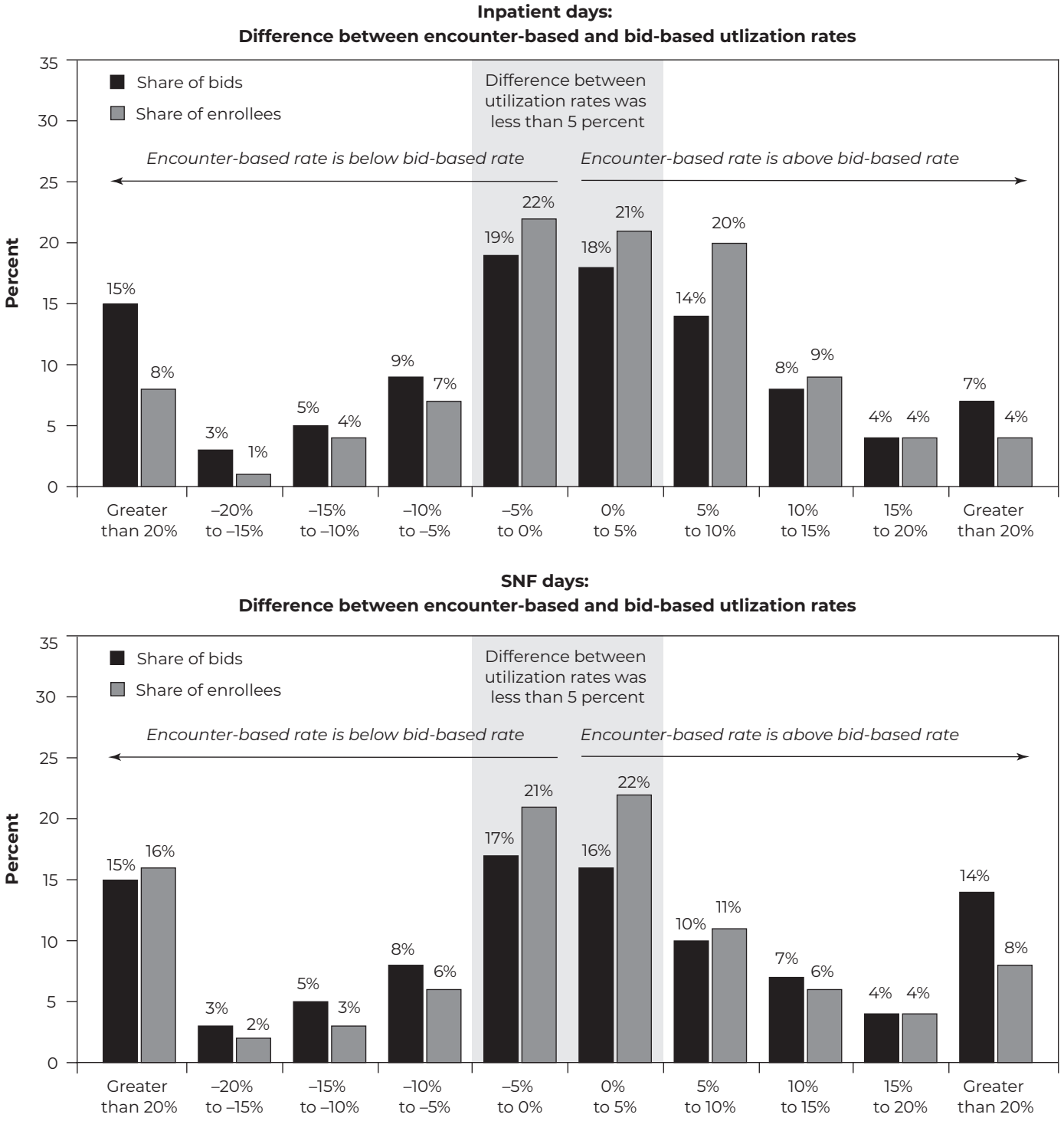
rate of 1,245 days of inpatient care per 1,000 enrollees. That rate was based on the experience of three plan segments operating in 2021: The largest (001) contributed approximately 75,000 member months to the bid (roughly 75 percent); 2 smaller segments (002 and 003) made up the rest. In the example, the enrollment for these three plans was similar in our administrative enrollment data, though segment 001 made up a slightly larger share of the total in the administrative data (76 percent). From the encounter data, we would calculate utilization rates for the three contributing plans; for this example, we show inpatient utilization rates ranging from 1,180 to 1,750 days per 1,000 enrollees. Because bid data do not include utilization rates for each contributing plan, we cannot directly compare the utilization for each contributing segment. Combining the administrative enrollment data with the encounter-based utilization rates, we would calculate an aggregate rate of 1,295 inpatient days per 1,000 enrollees—roughly 4 percent higher than the hypothetical rate for the bid. We conducted a similar comparison for all 2023 bids that met our inclusion criteria; for each bid, we compared inpatient days of care, skilled nursing days of care, and home health visits.

Utilization rates calculated from encounter data are not consistently above or below those reported in plan bids

We found that between 30 percent and 40 percent of bids meeting our inclusion criteria—comprising roughly 43 percent of enrollees in our analysis—reported inpatient and SNF utilization rates in their bids that were within 5 percent (in either direction) of the encounter-based rates we calculated (Figure 3-5). The share of bids reporting rates within 10 percent of the calculated rate was higher—between 50 percent and 60 percent of bids meeting the inclusion criteria, or 60 percent to 70 percent of enrollment. For inpatient days, the encounter-based rates ranged from more than 500 percent above the bid-based rate to 99 percent below the bid-based rate; the enrollment-weighted average rate across all bids was within 1 percent of the bid-based rate, but just over 20 percent of bids that met the inclusion criteria (accounting for 12 percent of enrollees) had rates that differed by more than 20 percent (in either direction). For skilled nursing facility days of care, the range was wider (from 2,700 percent above to more than 99 percent below the bid-based rate), and the rates for nearly 30 percent of bids that met the inclusion criteria (accounting for roughly a

FIGURE 3–5

Inpatient and SNF days: Wide variation in the relationship between encounter-based and bid-based utilization rates, 2021



Note: SNF (skilled nursing facility). Includes bids for health maintenance organizations and preferred provider organizations that reported base-period days of inpatient or SNF care based on experience from no more than eight plans. Plans reporting base-period enrollment that differed from CMS enrollment data by more than 5 percent were excluded.

Source: MedPAC analysis of 2023 MA bids, CMS 2021 enrollment data, and 2021 MA encounter data.

quarter of enrollees) differed by more than 20 percent (in either direction).

Our initial exploration of using bid data to assess encounter data shows the limitations of such an approach. Due to data limitations, we excluded a significant number of bids from the analysis and were able to assess only a fraction of total bids. Additional data limitations such as the inability to exclude encounters for denied claims limit the precision of the comparison. Nevertheless, the finding that encounter-based rates and bid-based rates were well correlated for a large number of bids suggests that comparing MA encounter data with MA plan bid data could be useful for identifying underreporting of encounters for some plans. We found that encounter-based rates were more than 5 percent below the rate reported in the bid data for roughly one-third of bids that met the criteria for inclusion in our analysis (comprising roughly 20 percent to 30 percent of enrollees), a potential indicator of incomplete encounter data for the plans submitting those bids. Further analysis—such as assessing the correlation between the bid data and the match rates we calculated when comparing encounter data with independent data sources—is needed to more fully assess whether the bid data can be used for such purposes.

A similar analysis of bid and encounter data, conducted by researchers at RAND Health Care as part of an evaluation of the MA VBID model, also found that utilization rates calculated from encounter data vary significantly from rates reported in plan bids (Eibner et al. 2023a). That study analyzed data for nonsegmented plans from 2017 through 2020 and found that less than 20 percent of beneficiaries included in the analysis were enrolled in plans for which the encounter-based utilization rate was within 10 percentage points of the rate reported in the bid. In our analysis of 2021 data, which included some segmented plans, we found greater agreement between the encounter-based rates and bid-reported rates: Roughly 70 percent of the enrollees in our analysis were enrolled in plans for which the encounter-based inpatient rate was within 10 percent of the rate reported in the plan's bid.[46] The RAND study found that encounter-based rates of inpatient utilization were, on average, 17 percent higher than bid-based rates (Eibner et al. 2023a).[47] We also observed that encounter-based rates frequently exceeded the rate reported in the bid (roughly half of bids we analyzed reported bid-based rates below the encounter-based rate), but we found that the average difference across all bids was less than 1 percent (i.e., encounter-based rates were approximately evenly distributed above and below the bid-based rates).

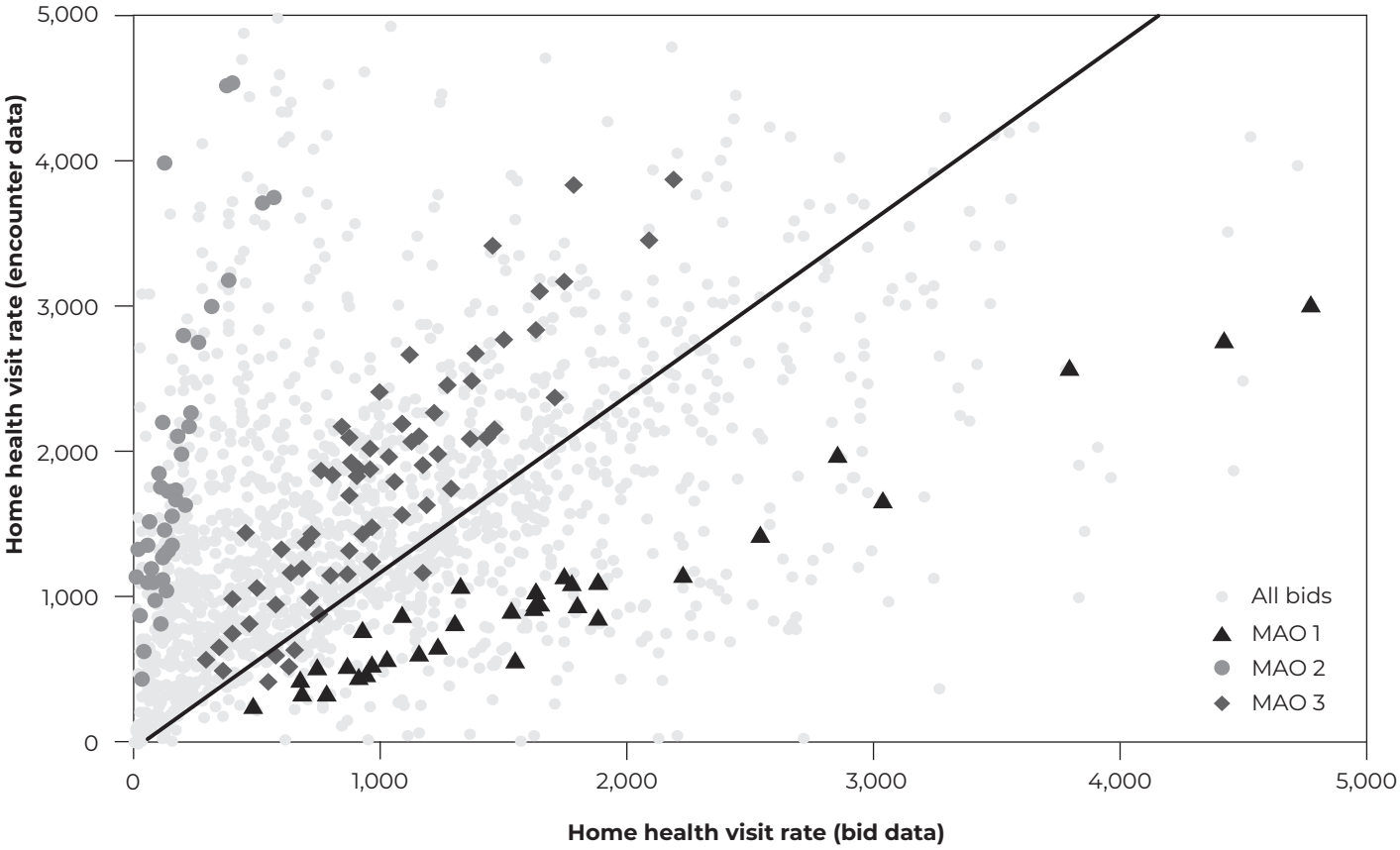
Inconsistencies in how plans report home health visits limits our ability to compare bid data with encounter data

Inconsistencies between encounter-based rates and bid-based rates for home health service use demonstrate that the flexibility allowed under the current system would be a barrier to using the bid data to assess encounter-data completeness. Using the encounter data, we calculated the number of home health visits provided by each plan segment. Figure 3-6 shows the relationship between the encounter-based rates (plotted on the vertical axis) and the bid-based rates (plotted on the horizontal axis). The diagonal line shows the point at which the two rates are equal: Points along this line represent bids for which the encounter-based rate is equal to the bid-based rate. Points below the line represent bids for which the encounter-based rate was less than the bid-based rate, and points above the line represent bids for which the encounter-based rate was greater than the bid-based rate. Each point represents the comparison for one bid. For many bids, the two rates were well correlated. However, we found that the relationship between the two rates varied systematically depending on the MAO or contract associated with the bid. Bids for three example contracts are highlighted in the figure.

All three of the MAOs shown in the figure indicated in the BPT that they report home health utilization using a "visit" as the reporting unit. Example 1 (triangles) shows the bids for an MAO for which the encounter-based rate was significantly lower than the bid-based rate for that MAO. Examples 2 and 3 show the bids of MAOs for which the encounter-based rate was significantly above the bid-based rate. For all three examples (and for many other bids), there is a clear linear relationship between the two rates. This relationship suggests that MAOs are using a consistent method to summarize home health visits for each bid within a contract, but that the method can vary from contract to contract. Due to this variation, we are unable to draw

FIGURE 3–6

Home health visits: Comparison of encounter data and bid data suggests that plans use different definitions when reporting home health visits



Note: MAO (Medicare Advantage organization). "Visit rate" is the number of visits per 1,000 enrollees. Includes bids for health maintenance organizations and preferred provider organizations that reported base-period home health visits based on experience from no more than eight plans. Plans reporting base-period enrollment that differed from CMS enrollment data by more than 5 percent were excluded. Data for outliers (visit rates exceeding 5,000 visits per 1,000 enrollees) are not shown.

Source: MedPAC analysis of 2023 MA bids, CMS 2021 enrollment data, and 2021 MA encounter data.

a representative conclusion about the relationship between encounter-based and bid-based utilization rates.

This variation would be a barrier to using plan bid data to evaluate MA encounter data: CMS would need to develop instructions to standardize how MAOs report base-period utilization in the bids to ensure that methodological and reporting differences are not distorting comparisons with the encounter data.

The Commission's 2019 recommendation would address the shortcomings of MA encounter data

Complete and accurate encounter data are imperative for learning about the care provided to MA enrollees and would be a valuable tool for providing more rigorous oversight of the $455 billion paid to MA plans in 2023. However, our comparisons of MA encounter

data and independent sources of information about MA enrollees continue to show that the data do not include records of all items or services provided to MA enrollees and that validating the data is an ongoing challenge.

The Commission's standing recommendation to improve the completeness and accuracy of the encounter data would address the problem of incomplete records by establishing clear thresholds for measuring data completeness and by providing plans with a financial incentive to report complete data (Medicare Payment Advisory Commission 2019). We found that encounter data for inpatient services tended to be more complete than the data for other service categories, suggesting that MA organizations are capable of achieving higher levels of data completeness, particularly when data submission is linked to payment (e.g., via risk scores, as in the case of inpatient encounter data).

In addition to finding evidence that the data are incomplete, our analysis of encounter data and other plan-reported sources suggests that the information MA plans submit to CMS is not consistent across sources, likely due in part to missing encounter records. Our comparison of HEDIS data found that the encounter data are likely more complete than the plan-reported quality data, meaning that those data are unlikely to be useful for assessing encounter-data completeness. Further investigation is needed to determine whether using the encounter data to calculate certain quality measures would alter MA star ratings, quality bonus payments, and plan rebates. Our assessment of plans' bids shows that while bid data may offer a way to identify underreporting of encounter data for service categories for which no independent source exists, there are limitations that would significantly constrict the value of that potential approach, including inconsistencies in how data are reported (as in the case of home health visits), a lack of standardized claims processing instructions from CMS, the inability to identify encounter records for denied claims, and the complexity of aggregating base-period data to the bid level (the level at which plans are required to report utilization rates). Nevertheless, assessing the distribution of the relationship between encounter-based rates and bid-based rates may still be informative for some service categories. We plan to continue assessing whether the data can be used for such purposes.

The encounter data could be a valuable tool for policymakers seeking to monitor, learn from, and improve the MA program. However, incomplete reporting of the data significantly limits the data's utility. The Commission is eager for MA encounter data to achieve sufficient completeness to evaluate MA care delivery and service use. We will continue to consider approaches for working with the data in their current state, additional methods for validating the data, and policy options for improving the accuracy and completeness of the data. ■

APPENDIX 3–A

Supplemental tables for Chapter 3

TABLE 3A–1

Studies using the independent data sources we used in our assessment of MA encounter data

Reference	Data source(s)
Differences in nursing home quality between Medicare Advantage and traditional Medicare patients (Chang et al. 2016)	MDS
Less intense postacute care, better outcomes for enrollees in Medicare Advantage than those in fee-for-service (Huckfeldt et al. 2017)	MedPAR
Hospital readmission rates in Medicare Advantage and traditional Medicare: A retrospective population-based analysis (Panagiotou et al. 2019)	MedPAR
Racial disparities in avoidable hospitalizations in traditional Medicare and Medicare Advantage (Park et al. 2021)	MedPAR
Racial disparities in readmission rates among patients discharged to skilled nursing facilities (Rivera-Hernandez et al. 2019)	MDS
Site of death, place of care, and health care transitions among U.S. Medicare beneficiaries, 2000–2015 (Teno et al. 2018)	MDS
Comparison of the quality of hospitals that admit Medicare Advantage patients vs. traditional Medicare patients (Meyers et al. 2020)	MedPAR
Analysis of drivers of disenrollment and plan switching among Medicare Advantage beneficiaries (Meyers et al. 2019)	MedPAR, MDS, OASIS
Medicare Advantage enrollees more likely to enter lower-quality nursing homes compared to fee-for-service enrollees (Meyers et al. 2018)	MDS
Comparison of the use of top-ranked cancer hospitals between Medicare Advantage and traditional Medicare (Kim et al. 2021)	MedPAR
Comparing post-acute rehabilitation use, length of stay, and outcomes experienced by Medicare fee-for-service and Medicare Advantage beneficiaries with hip fracture in the United States: A secondary analysis of administrative data (Kumar et al. 2018)	MedPAR
Comparing receipt of prescribed post-acute home health care between Medicare Advantage and traditional Medicare beneficiaries: An observational study (Loomer et al. 2021)	MedPAR, OASIS
Effects of Medicare advantage on patterns of end-of-life care among Medicare decedents (Park et al. 2022)	MedPAR, MDS, OASIS
Quality of home health agencies serving traditional Medicare vs Medicare Advantage beneficiaries (Schwartz et al. 2019)	OASIS
Home health and post-acute care use in Medicare Advantage and traditional Medicare (Skopec et al. 2020a)	MedPAR, MDS, OASIS
Home health use in Medicare Advantage compared to use in traditional Medicare (Skopec et al. 2020b)	OASIS
Dying with dementia in Medicare Advantage, accountable care organizations, or traditional Medicare (Teno et al. 2021)	MDS
Home health use following a cancer diagnosis among patients enrolled in Medicare Advantage and traditional Medicare: Findings from the newly linked SEER-Medicare and home health OASIS data (Thomas et al. 2020)	OASIS
Does Medicare Advantage enrollment affect home healthcare use? (Waxman et al. 2016)	OASIS
Ambulatory care sensitive condition admission rates in younger and older traditional Medicare and Medicare Advantage populations, 2011–2019 (Weeks et al. 2022)	MedPAR

TABLE 3A–1

Studies using the independent data sources we used in our assessment of MA encounter data *(cont.)*

Reference	Data source(s)
Changes in home health care use in Medicare Advantage compared to traditional Medicare, 2011–2016 (Zuckerman et al. 2020)	OASIS
Association of Medicare Advantage vs. traditional Medicare with 30-day mortality among patients with acute myocardial infarction (Landon et al. 2022)	MedPAR
Medicare Advantage enrollment and disenrollment among persons with Alzheimer disease and related dementias (James et al. 2023)	MedPAR, MDS, OASIS
Post-acute care for Medicare Advantage enrollees who switched to traditional Medicare compared with those who remained in Medicare Advantage (Huckfeldt et al. 2024)	MedPAR

Note: MA (Medicare Advantage), MDS (Minimum Data Set), MedPAR (Medicare Provider Analysis and Review), OASIS (Outcome and Assessment Information Set), SNF (skilled nursing facility).

Source: MedPAC review of articles identified in a recent review of the literature (Ochieng and Fuglesten Biniek 2022) and additional articles.

TABLE 3A–2

Units used by MA plans to report base-period utilization in bids

		Bids using unit	
Service category	**Unit**	**Number**	**Percentage**
Inpatient facility	Days	5,071	90%
	Admissions	589	10
Skilled nursing facility	Days	5,567	98
	Admissions	93	2
Home health	Visits	5,607	99
	Procedures	53	1
Ambulance	Trips	5,539	98
	Procedures	121	2
DME/prosthetics/diabetes	Other	4,739	84
	Procedures	921	16
Outpatient facility: Emergency	Visits	5,591	99
	Procedures	69	1
Outpatient facility: Surgery	Visits	5,455	96
	Procedures	205	4
Outpatient facility: Other	Visits	3,059	54
	Other	1,918	34
	Procedures	683	12
Professional	Visits	3,943	70
	Procedures	1,717	30
Part B: Drugs	Scripts	3,882	69
	Other	1,778	31
Part B: Other	Scripts	3,098	55
	Other	1,846	33
	Procedures	716	12

Note: MA (Medicare Advantage), DME (durable medical equipment). Includes only health maintenance organization (HMO)/HMO point of service, local preferred provider organization (PPO), and regional PPO contracts. Contracts with 10 or fewer enrollees are excluded.

Source: MedPAC analysis of MA encounter data and CMS enrollment data.

TABLE 3A–3

Exclusion criteria used for analysis of bid data

Criteria	Number of bids remaining in sample	Share of bids remaining in sample	Share of enrollment remaining in sample
All bids	5,660	100%	100%
Bids for HMO/PPO plans, covering Part A and Part B enrollees,* and not participating in the value-based insurance design model*, **	4,611	81	73
Bids reporting any base-period experience	3,112	55	73
Bids with no more than eight contributing contracts	3,110	55	73
Bids reporting base-period enrollment within 5 percent of administrative sources	1,805	32	50
Bids for which we found encounters for all base-period plans			
Inpatient	1,799	32	44
Skilled nursing facility	1,688	30	42
Home health	1,782	31	44
Bids using most common unit			
Inpatient	1,594	28	39
Skilled nursing facility	1,673	30	42
Home health	1,755	31	44

Note: HMO (health maintenance organization), PPO (preferred provider organization). Includes HMO/HMO point of service, local PPO, regional PPO contracts, and private fee-for-service plans. Employer group plans do not submit bids.
*Medicare beneficiaries are generally required to be covered under Part A and Part B to enroll in a Medicare Advantage (MA) plan. However, some beneficiaries who were enrolled in a Section 1876 cost plan as of December 31, 1998, may enroll. MA organizations providing coverage to such enrollees submit separate bids for that coverage (Centers for Medicare & Medicaid Services 2023b).
**Medicare Advantage organizations were allowed to include the Medicare hospice benefit in their benefit package for plan years 2021 through 2024 under the CMS MA value-based insurance design model (Centers for Medicare & Medicaid Services 2023a). Base-period data for Medicare-covered services excludes experience for enrollees in hospice status, and we excluded encounter records for enrollees in hospice status in our calculation of utilization rates.

Source: MedPAC analysis of 2023 MA bid data.

Endnotes

1 Our June 2019 report to the Congress gives greater detail about the encounter data submission and screening process, feedback provided to plans about submitted data, potential uses of encounter data, and our assessment of encounter data completeness and accuracy (Medicare Payment Advisory Commission 2019).

2 CMS currently uses encounter data as a source of diagnostic information for risk adjustment and calculation of Medicare disproportionate share percentages. CMS has started to use the data to support or evaluate other Medicare program activities and to conduct quality review and improvement activities, though the agency could expand the uses of these data. For example, CMS recently announced that it will use encounter data in addition to fee-for-service claims data to learn how frequently providers perform certain procedures and will make the data available to states to support the administration of Medicaid programs and to improve care coordination for dually eligible individuals (Centers for Medicare & Medicaid Services 2024, Centers for Medicare & Medicaid Services 2023e). CMS has also identified other potential uses for encounter data, such as estimating risk-adjustment models and informing Medicare coverage determinations.

3 Providers and plans also submit other data to CMS, state Medicaid agencies, disease registries, and (in certain cases) to private or state-managed claims databases. Some private claims-processing companies also aggregate claims data for MA enrollees. For our analysis, we selected data sources that are readily available to CMS and researchers and that are likely to have data that are as complete as possible for all MA enrollees. Figure 3-1 (p. 99) shows only the data sources discussed in this chapter.

4 When serving Medicare beneficiaries under the fee-for-service (FFS) program, providers submit claims (i.e., billing information) to Medicare in order to receive payment. These claims provide detailed insight into the services beneficiaries receive and the payments that Medicare makes for the services. Because claim submission is required for payment in FFS Medicare, providers have a strong incentive to submit claims and provide the information necessary for payment. Once FFS claims are adjudicated for payment, they are formatted as data files available to researchers. These FFS claims data are generally considered a complete record of the number of Medicare-covered services provided to beneficiaries covered under FFS (except for services for which the claim was denied) and of the payments that Medicare has made to providers for those services.

5 Encounter data can include records for services for which the claim was denied because plans are required to submit records for all items and services provided to their enrollees. In addition, encounter data might not include services provided out of a plan's network if the plan did not receive a claim, but records of such services might be included in other data sources.

6 When CMS receives encounter data, it performs automated front-end checks to verify data quality (identifying missing elements, incorrect format, and inconsistent values, for instance) and provides plans with feedback about which encounter records were accepted or the reason for rejecting an encounter record. However, there is no formal assessment of whether encounter data include a record for every item and service provided to MA enrollees, or whether rejected encounter records are corrected, resubmitted, and accepted by CMS.

7 MA organizations may void and/or replace previously submitted encounter records by submitting to CMS a new encounter record that includes information identifying the original record and how it is to be processed. Processing these encounter records ensures that services are not counted more than once across the original and subsequent records.

8 We removed duplicate inpatient and skilled nursing facility encounter records using the five-key edit recommended by CMS (Chronic Condition Warehouse 2023).

9 HEDIS is a registered trademark of the National Committee for Quality Assurance.

10 CMS reduces contracts' HEDIS measure ratings to 1 star if the patient-level data files are not successfully submitted and validated by the submission deadline. Also, if the HEDIS summary-level data value varies substantially from the value in the patient-level data, the measure is reduced to a rating of 1 star (Centers for Medicare & Medicaid Services 2023d).

11 For the 529 HMO and PPO contracts in both data sets in 2021, we tested the consistency of the HEDIS patient-level data and the HEDIS summary data for plan all-cause readmissions. We restricted our comparison to contracts with at least 30 index admissions in the HEDIS summary-level data. We found that the patient-level and summary data were largely identical. Total index admissions were nearly the same amount (3.1 million), and the HEDIS summary-level total was 99.9 percent of the HEDIS patient-level total. At the contract level, 515 (97 percent) of 529 contracts had summary-level

total index admissions within 0.5 percentage points of the patient-level total; these contracts represented 99 percent of total index admissions. In addition, 493 (93 percent) of 529 contracts had the same total number of index admissions in both data sets. Further, 522 (99 percent) of 529 contracts had the same total number of readmissions in both data sets.

12 The following describes HEDIS specifications for PCRs: "For members 18 years of age and older, the number of acute inpatient and observation stays during the measurement year that were followed by an unplanned acute readmission for any diagnosis within 30 days and the predicted probability of an acute readmission."

13 The HEDIS plan all-cause readmissions (PCR) measure is an outcome measure used to determine a plan's MA star rating (and quality bonus payment). The PCR measure went through recent technical changes and was temporarily removed from the calculation of the star rating. However, for MA payments in 2025, the PCR measure will be reinstated in the star rating calculations.

14 We applied the most conservative definition of continuous enrollment by calculating it at the parent organization level and accounting for contract consolidations. Applying a more strict definition of continuous enrollment (e.g., contract-level enrollment) would have resulted in a greater number of inconsistencies between the encounter data and HEDIS.

15 We found that the patient discharge status code reliably identified hospital transfers. Transfers identified through the patient discharge status code nearly always contained a subsequent encounter with a claim-from date that matched the discharge date on the hospital transfer encounter. In addition, HEDIS data submissions generally did not conflict with our identification of a hospital transfer. Only 0.2 percent of HEDIS hospitalizations had a discharge date that matched a transfer discharge date in the encounter data.

16 Our analysis of MA encounter data differs from some of our previous assessments by excluding chart review records and using a slightly different method for defining unique inpatient hospital stays. The denominator we use to describe the match rate between data sources also differs: The denominator in this analysis is the total number of MA enrollees with records in either data source.

17 Researchers have also used survey data such as the Medicare Current Beneficiary Survey or Medicare Expenditure Panel Survey to examine differences between MA and FFS. Survey data do not provide the detail available in claims data, and they require researchers to use statistical techniques to estimate utilization, which limits the potential uses of the data. Claims data are available for prescriptions filled by both MA and FFS enrollees under Medicare Part D, but they do not contain information about the use of other health care services. We have considered whether prescription drug event data could be used to assess the completeness of MA encounter data. There are technical limitations to doing so, and it is not clear that the exercise would provide a meaningful measure of data completeness. Insurers and providers have, in certain instances, given researchers access to claims data for MA enrollees. The Commission does not have access to such data. Findings from studies that use specific providers' or insurers' claims data may not be generalizable to other providers, insurers, or the program as a whole.

18 Facilities submit information-only claims to CMS for MA enrollees in order to support the calculation of DSH, indirect medical education, and graduate medical education payments to facilities. Before the collection of encounter data, the agency generally did not receive information on individual services provided to MA enrollees, in contrast to FFS beneficiaries. DSH-related information is one such exception.

19 One study comparing the MedPAR and encounter data found that data completeness varied according to whether the hospital was a teaching hospital and/or received DSH payments (Cotterill 2023).

20 Starting in 2017, Medicare began paying for renal dialysis services provided to Medicare beneficiaries with acute kidney injury (AKI). Because the dialysis risk-adjustment indicator is specifically for dialysis patients with ESRD (and not AKI), we excluded encounter records for AKI dialysis treatments.

21 The MDS is completed for all residents in Medicare- or Medicaid-certified nursing homes and residents receiving SNF care at a non-critical access hospital that has a Medicare swing bed agreement. The schedule for MDS administration depends on the payer, the duration of the stay, and changes in the resident's condition (Centers for Medicare & Medicaid Services 2023c).

22 By excluding MA enrollees who are eligible for full Medicaid benefits from the analysis, we could be reasonably certain that non-Medicaid MA enrollees with an MDS assessment would also have a SNF encounter record. However, MDS assessments of MA enrollees for non-Medicare-covered long-term stays (for which we would not expect there to be an encounter record) may be included in the comparison.

23 Finding an encounter record but no MDS assessment could reflect beneficiaries treated in a critical access hospital (CAH) swing bed, for which an MDS assessment is not required. CAH swing bed use is very low overall but represents a larger share of SNF use in some areas.

24 The decrease in OASIS assessments for MA enrollees in 2020 coincides with a period during which CMS exempted home health agencies from certain reporting requirements (October 2019 through June 2020) due to the COVID-19 public health emergency (Centers for Medicare & Medicaid Services 2020).

25 MedPAR is a stay-level file, meaning that there is generally only one observation per hospitalization; in contrast, MA plans may submit more than one encounter record over the course of a single hospitalization for a beneficiary. We joined multiple encounter records with the same beneficiary and provider and with overlapping dates of services and then selected only one record per discharge date for each beneficiary. This step affected less than 1 percent of records.

26 PACE (the Program of All-Inclusive Care for the Elderly) plans are required to submit encounter data records only for Medicare-covered items and services for which the organization collects claims. Cost plans are required to submit encounter data records for all Medicare-covered items and services included in their CMS cost reports.

27 For effectiveness of care measures, HEDIS specifications give plans the option of excluding beneficiaries who died after discharge and had not elected hospice (National Committee for Quality Assurance 2022).

28 MA plans are typically required to submit encounter data within 13 months of the end of the plan year. The timeline was extended during the COVID-19 public health emergency such that MA plans were allowed to submit 2021 MA encounter data through July 2023. In contrast, MA plans were required to submit patient-level HEDIS data in mid-June 2022.

29 CMS estimates that 98 percent to 99 percent of FFS claims are complete with a three-month runout at the end of a given year (Centers for Medicare & Medicaid Services 2022d). Inpatient and outpatient hospital claims are received more quickly relative to other service types. Thus, we would expect that MA plans would have received nearly all hospital claims by the date they submit patient-level HEDIS data.

30 Further investigation would need to assess the appropriateness of HEDIS specification exclusions and the time frames used for encounter data submission.

31 Less than 0.5 percent of HEDIS stays corresponded to a required HEDIS exclusion related to a hospital transfer date, a hospitalization with the same admission and discharge date, or a nonacute stay.

32 Prior to applying any exclusions, beneficiaries who elected hospice represented 12 percent of encounter-data hospitalizations, beneficiaries who were not continually enrolled in the plan's parent organization represented 27 percent of encounter-data hospitalizations, and "outlier" beneficiaries represented 17 percent of encounter-data hospitalizations.

33 We excluded 3 million hospitalizations because they were part of HEDIS specification exclusions. Among these HEDIS-specified exclusions, we found that 11 percent were in the HEDIS patient-level data.

34 Medicare Advantage organizations (MAOs) must submit bids for MA plans, Medical Savings Account (MSA) plans, and end-stage renal disease–only special needs plans. MAOs do not submit bids for cost plans, Program of All-Inclusive Care for the Elderly plans, Medicare-Medicaid plans, or employer group plans (Centers for Medicare & Medicaid Services 2023b).

35 Projection assumptions may account for projected changes in members' service use (including anticipated effects of changes in the application of utilization management tools), changes in the plan's benefit package, changes in the demographic composition of the covered population, and other factors (Centers for Medicare & Medicaid Services 2023b).

36 Other factors can include sales and marketing expenses, administrative costs, reinsurance costs, and profit margin (Centers for Medicare & Medicaid Services 2023b).

37 In addition to the data collected through the BPT, MAOs are also required to submit documentation justifying how the base-period data were prepared, along with documentation reconciling the base-period data with the MAO's "auditable material such as corporate financials and bid-level operational data" (Centers for Medicare & Medicaid Services 2023b).

38 MA encounter data do not include an indicator for identifying payment denials, and no standardized algorithm exists for identifying such claims (Office of Inspector General 2023). The data also do not include an indication of whether a service was provided outside a plan's network. MA plans might not receive claims for items or services provided to their enrollees outside of the plan's network and thus might not submit encounters for such services. Work is ongoing to identify payment denials and out-of-network care in the encounter data.

39 MAOs bid to provide coverage in service areas that include one or more counties. Plans may subdivide their service area into "segments" consisting of one or more counties. MAOs must submit separate bids for each nonsegmented plan or each segment of a segmented plan (Centers for Medicare & Medicaid Services 2023b).

40 We counted each instance of a revenue code reported on an encounter record to identify the number of home health visits. We included revenue codes 042x, 043x, 044x, 055x, 056x, and 057x, following the revenue codes used in FFS home health claims (Centers for Medicare & Medicaid Services 2023f).

41 Medicare beneficiaries generally must have Part A and Part B to enroll in an MA plan. However, some beneficiaries who were enrolled in a Section 1876 cost plan as of December 31, 1998, may enroll. MAOs providing coverage to such enrollees submit separate bids for that coverage (Centers for Medicare & Medicaid Services 2023b). MAOs were allowed to include the Medicare hospice benefit in their benefit package for plan years 2021 through 2024 under CMS's MA–VBID model (Eibner et al. 2023b). Base-period data for Medicare-covered services exclude services for enrollees in hospice status, and we excluded encounter records for enrollees in hospice status in our calculation of utilization rates.

42 MA organizations can add to, discontinue, or reorganize the plans they offer in a given service area each year. To accommodate these yearly changes, plans may (within statutory guidelines) move enrollees from one plan to another of the same type, a form of passive enrollment known as crosswalking. For example, an MAO combining two or more plans from a previous year into a single plan in the next year would use a crosswalk to move enrollees from the previous plan(s) into the consolidated plan.

43 The Bid Pricing Tool provides space to list up to eight plans. Approximately three-quarters of bids were based on just one contributing plan, and less than 1 percent of bids were based on more than eight plans. We excluded bids based on more than eight plans from our analysis because we cannot determine which plans were used to calculate the utilization rate.

44 Utilization by members in end-stage renal disease or hospice status is excluded from the Medicare-covered services reported in the bid. Plans have the option to include hospice experience when reporting utilization of non-Medicare services because plans are required to continue offering supplemental benefits to enrollees in hospice status (Centers for Medicare & Medicaid Services 2023b). Hospice status is defined as of the first day of a month of service use.

45 Other minor technical differences between the data sources may also exist. For example, MAOs are required to submit encounter data on (at minimum) a weekly, biweekly, or monthly basis but are encouraged to submit data daily. Plans are generally allowed to make adjustments to their submissions for up to 13 months following the end of a plan year (42 CFR 422.310(g)(2)(ii)) (Centers for Medicare & Medicaid Services 2022a). There is comparatively less time between the end of the base period and the submission of bids. CMS instructs plans to report base-period data using claims incurred in the base year and at least 30 days of paid claims run-out (Centers for Medicare & Medicaid Services 2023b). Plans use a multiplicative "completion factor" to account for claims that have been received but not paid as of the time of analysis. Small differences between the encounter data and bid data may arise due to differences in how claims and encounters are ultimately adjudicated. We do not anticipate that such differences have a material impact on our estimates.

46 Our analysis used different inclusion criteria than were used in the RAND study: Our analysis used data for services delivered in 2021, included data for some segmented plans (those for which the enrollment reported in the bid data was within 5 percent of CMS enrollment data), and was limited to bids for HMO/PPO plans covering Part A and Part B enrollees that reported base-period utilization data for no more than eight predecessor plans and did not participate in the CMS value-based insurance design (VBID) model. In contrast, RAND's analysis included VBID plans and plans that would have been eligible to participate in the VBID model (although the hospice component of the VBID model was not active in the years they assessed) (Eibner et al. 2023b). Additionally, RAND did not make exclusions based on discordant enrollment data.

47 The study also assessed the rate of emergency department visits and found that encounter-based rates were, on average, 3 percent lower than the bid-reported rate (Eibner et al. 2023a).

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