



WHITE PAPER

Harvard-Inovalon Medicare Study:

Quality Outcomes Under Medicare
Advantage vs. Medicare Fee-for-Service

Summary

- While Medicare Advantage (MA) now covers over half of Medicare beneficiaries, including a disproportionate share of those facing socioeconomic disadvantage and complex care needs, there is limited understanding of how quality of care under MA compares to Medicare Fee-for-Service (FFS). There is particularly limited understanding on how quality of care differs under MA and FFS for the most disadvantaged or complex populations.
- Harvard and Inovalon have partnered to shed light on this critical question, using Inovalon's unique data assets and quality measurement analytics. Inovalon's combined data track individuals' pre-65 quality of care outcomes under commercial insurance coverage, as well as post-65 utilization under MA or FFS coverage. Looking at a recent five-year time period, 2015 through 2019, Inovalon's data allowed us to quantify the incremental impact of MA vs. FFS on key quality outcomes, while accounting for any differences that were already pre-existing prior to Medicare enrollment.
- We find that MA delivers superior quality and health outcomes relative to FFS, especially after rigorously adjusting for enrollment differences across the two programs and for the pre-existing disadvantages faced by MA members in terms of baseline demographic, clinical, and social risk factors. These differences were outlined in detail in the first white paper in this series "Who Enrolls in Medicare Advantage vs. Traditional Medicare Fee-for-Service."
- Specifically, MA enrollees have over 70% fewer hospital readmissions and 25% fewer preventable inpatient admissions. At the same time, we find that MA exhibits lower rates of inappropriate medication use, and comparable rates of medication adherence.
- This work is intended to support health plans and policymakers through valuable analytics and new insights. This research and development work gives Inovalon the foundational capabilities to benchmark a specific MA plan's quality of care against its peers, and also evaluate quality of care among specific subpopulations such as the socioeconomically disadvantaged.
- Harvard and Inovalon's analytic insights can pinpoint opportunities for quality improvement, especially among socioeconomically disadvantaged populations, and help health plans promote health equity. This work is timely given the newly announced Centers for Medicare & Medicaid Services (CMS) Health Equity Index framework, which will impact MA plan Five Star Ratings and bonus payments through the reward factor.

70%

**fewer hospital
readmissions**

25%

**fewer preventable
patient admissions**

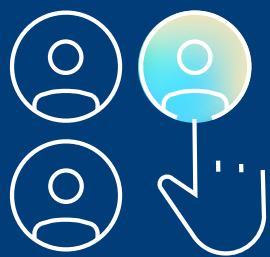
Introduction

For over 40 years, beneficiaries in Medicare have been able to freely choose between two different types of insurance coverage: publicly-administered coverage through traditional Medicare Fee-for-Service (FFS), and privately-administered coverage through a managed Medicare Advantage (MA) plan. In recent years, enrollment in MA has grown dramatically, from 17% of Medicare beneficiaries in 2000 to over 50% in 2023.² As documented in our inaugural white paper, MA has also enrolled a disproportionate share of Medicare beneficiaries with complex care needs, including those that are relatively more socioeconomically disadvantaged in terms of lower household income, education level, and English language proficiency.

Even though MA has become increasingly consequential in terms of the share of Medicare lives it covers, especially those with the most complex care needs, limited information exists on how quality of care received differs under MA vs. FFS coverage. This information is critical for key stakeholders in the MA program, including Medicare beneficiaries, health plans, and policymakers. Inovalon and Harvard researchers have partnered to fill in this research gap.

The cornerstone of this joint effort is Inovalon's set of unique and highly comprehensive data assets. Inovalon's claims data cover 30% of all privately insured lives and 100% of public Medicare lives at any given point in time, linked longitudinally across payers. This data provided the Harvard and Inovalon research team with unprecedented visibility into healthcare quality within Medicare and the U.S. healthcare system more broadly. One feature of the data that is particularly valuable for this research effort is the ability to follow individuals and their associated health outcomes – including quality of care – as they transition across different types of insurance coverage, including the transition from commercial to Medicare coverage at age 65.

This white paper is the third in a series authored by Harvard and Inovalon researchers. The previously released white papers compared characteristics of beneficiaries at the time of enrollment, as well as health resource utilization during the two years prior to enrolling in Medicare while covered by commercial insurance and after enrolling in MA or FFS at age 65. While the previous studies found lower levels of utilization such as hospital stays and emergency room visits under MA compared to those covered by traditional FFS, the studies did not examine quality of care in detail.



In this study we ask: Does MA deliver better quality of care and more equitable health outcomes for Medicare beneficiaries in comparison to FFS? We evaluate this by comparing quality of care for MA enrollees to FFS enrollees using the same set of validated quality measures relevant to health outcomes in the Medicare population. We separate the impact of MA from any accompanying differences in program enrollment by using detailed patient matching and other statistical techniques.

While there have been previous studies on this topic, they have often been restricted to narrow sets of quality measures and limited sample populations. In our study, we evaluate a broad spectrum of quality measures for a large and nationally representative population, over a two-year time span, as beneficiaries transition from commercial insurance coverage to either MA or FFS coverage. Additionally, our use of Inovalon's unique longitudinal data allows us to adjust for underlying differences in enrollee composition in ways that past studies have been unable to do. This adjustment is particularly important when studying quality and health outcomes, given that these outcomes are especially sensitive to any underlying differences in enrollment across programs. For example, previous comparisons of quality under MA vs. FFS may have underestimated outcomes in MA by not fully accounting for the greater socioeconomic disadvantages faced by MA members.

We overcome this perennial challenge by leveraging the availability of pre-65 commercial data on beneficiaries prior to their enrollment in MA or FFS. We use this data to match the MA and FFS cohorts based on their pre-65 health diagnoses and their demographic and socioeconomic characteristics to make the two groups as comparable as possible. Past studies have matched cohorts based on post-65 health characteristics, which is potentially problematic as these measures could be influenced by whether a beneficiary is in MA vs. FFS and differences in coding or in care received. We also leverage the pre-65 data to implement a difference-in-differences design, which allows us to make additional adjustments for enrollment differences, effectively based on each individual's pre-65 quality and health outcomes. In other words, we are not only comparing the difference in quality outcomes in MA vs. FFS after they enroll but removing any differences that already existed before the beneficiaries enrolled in Medicare and while they were insured by a private commercial insurance plan.

The final white paper in this series will compare different types of plans within MA to one another, such as comparing health maintenance organizations (HMOs) to preferred provider organizations (PPOs) and zero to non-zero premium plans, to help stakeholders understand the implications of different MA plan design features on healthcare utilization, quality, and other key outcomes.

Objective

In this white paper, we document how health and quality of care outcomes differ under MA vs. FFS coverage among comparable populations during the year following Medicare enrollment at age 65. We do so to address the broader question of whether the greater use of care management under MA leads to improved beneficiary outcomes.



Data, Sample, and Methods

For this research, we leverage Inovalon's Medical Outcomes Research for Effectiveness and Economics (MORE²) Registry[®] dataset, which covers about 30% of the U.S. privately-insured population in a given year. These nationally representative data assets include medical and pharmacy claims and member enrollment files covering a variety of different market segments, including employer-sponsored commercial health insurance, individually-purchased Accountable Care Act (ACA) plans, Medicaid Managed Care, and MA plans. These data are combined, harmonized, de-duplicated, and linked together at the patient level to track healthcare resource utilization and outcomes fully and accurately.

This consolidated dataset enables us to capture individuals' health and quality of care outcomes over time, as individuals transition from commercial to either MA or FFS coverage at age 65. Inovalon's CMS data are approved for research use through a research data use agreement (DUA) with CMS. These data include 100% of the medical and pharmacy insurance claims for all Medicare beneficiaries enrolled in FFS, as well as enrollment data covering all Medicare beneficiaries enrolled in MA and FFS.

Using these datasets, we construct a sample of beneficiaries who turned age 65 between 2015 and 2019. We limited the sample to those who fully enrolled in the Medicare program (i.e., for FFS in Parts A, B, and D and for MA in a Part C plan with Part D coverage) within three months of turning 65. We defined whether a beneficiary "counted" as an MA or FFS enrollee based on their initial enrollment status and restricted the study population to those who remained enrolled in their initially chosen coverage type – either MA or FFS – for all 24 months following initial Medicare enrollment.

We excluded those simultaneously enrolled in a Medicaid (i.e., "dual eligible") or a commercial plan during the 24 months after enrolling in Medicare. We further limited to those enrolled in an employer-sponsored health insurance plan tracked in MORE² for all 24 months before turning 65. This guaranteed that we had enough time to establish a baseline level of utilization for sample beneficiaries. With these restrictions in place, our final analytic sample includes 50,512 individuals who enrolled in FFS and 10,158 individuals who enrolled in MA at age 65. We can track both cohorts' quality of care outcomes throughout all 24 months preceding and 24 months following Medicare enrollment.

We employ a number of statistical approaches to ensure that our MA vs. FFS comparison only captures the impact of the programs themselves. As shown in our first white paper 'Who Enrolls in Medicare Advantage vs. FFS,' the populations who enroll in MA vs. FFS are very different from one another, especially in terms of social determinants of health (SDOH). Therefore, any difference in raw outcomes across the two programs is reflective not only of the impact of MA vs. FFS, but also underlying differences in who enrolls in MA vs. FFS and possible pre-existing outcome differences across these populations. This issue is particularly problematic when it comes to quality-of-care outcomes, given the particular sensitivity of these outcomes to underlying socioeconomic and clinical characteristics. Numerous studies have shown the association of SDOH with poor health outcomes.³

We use a combination of our unique dataset and statistical techniques to control for these underlying enrollment differences, which past studies have largely been unable to do. As a first step, we used matching to ensure that the FFS control group was similar to the group of MA enrollees. We grouped together each MA enrollee with five comparable FFS enrollees. We strictly matched beneficiaries with identical characteristics as determined at the age of 64 including commercial plan type before Medicare enrollment (HMO vs. PPO), state of residence, and calendar year of initial Medicare enrollment. We then performed a second round of propensity-score based matching using additional age-64 characteristics, including socioeconomic status (income and net worth), gender, race, CMS's composite risk-adjustment factor (RAF) score, and disease indicators based on high-level Hierarchical Chronic Condition (HCC) groupings.

Following the matching exercise, we employed a difference-in-differences research design. This technique compares outcomes for two groups who received different treatments (in this case, MA vs. FFS), both in the years after the treatment is applied (i.e., after Medicare enrollment at age 65) and before, when the treatment had not yet been applied (i.e., before the age of 65), then take the difference between these two comparisons. Essentially, the extent to which differences change before and after treatment reveals the true effect of MA enrollment relative to FFS. At age 64, before they enroll in the Medicare program, differences in health and quality of care outcomes between eventual MA vs. FFS enrollees reflect only underlying differences in member characteristics. Controlling for these pre-Medicare enrollment differences means that any remaining gap between MA and FFS outcomes reflects the actual impact of MA relative to FFS. We specifically include person-level fixed effects (which account for pre-existing differences between MA and FFS in outcomes) as well as matched group identifiers interacted with pre/post quarter-level indicators (which account for pre-existing differences in trends).

We constructed a number of quality-of-care outcomes, tracking a broad range of clinical management, clinical effectiveness, clinical appropriateness, and general health outcome measures. First, we construct outcomes related to acute and chronic disease management, measuring quality in terms of preventable hospitalizations. Specifically, we look at inpatient admissions arising from preventable acute or chronic disease complications, using AHRQ's widely employed PQI (Prevention Quality Indicator)⁴ algorithm to identify them.

As an additional gauge of clinical management, we also construct a 30-day inpatient all-cause readmissions measure based on the standard HEDIS[®] definition. This particular measure is indicative of the quality of outpatient care management, given that effective care management following an inpatient visit has been shown to keep individuals from getting readmitted to the hospital. In addition, we gauge clinical management in terms of medication adherence, employing standard HEDIS adherence measures covering three chronic conditions that are highly prevalent in the Medicare population: diabetes, high cholesterol, and hypertension. As a gauge of clinical appropriateness, we measured the inappropriate use of high risk medications in the elderly using the standard HEDIS definition.

We aggregate all HEDIS measures at the MA vs. FFS member population level rather than the plan level to enable a cross-cohort comparison.

Results

The results compare quality outcomes under MA vs. FFS during the year following Medicare enrollment after netting out pre-existing differences between the cohorts from the year preceding Medicare enrollment.

In Table 1, we present average quality outcomes from the year following Medicare enrollment (age 65) for the MA and FFS groups. Table 1 reflects both the effects of MA as well as underlying differences between the two populations. The unmatched samples columns present outcomes for the original, unmatched cohorts, and show particularly striking differences in terms of inpatient related quality outcomes such as readmissions, consistent with higher quality under MA. FFS has 3.6 times higher rates of 30-day readmissions compared to MA. FFS also has 1.6 times higher rates of potentially avoidable hospitalizations overall, with 2.5 times higher rates for acute conditions and 1.3 times higher rates for chronic conditions.

The matched samples columns show outcomes among the MA and FFS cohorts that are matched to be comparable along socioeconomic and other key patient characteristics. We continue to find indications of better quality outcomes under MA than FFS after matching. For some measures such as readmissions, the quality advantage of MA over FFS widens even further upon matching with 3.8 times higher rates in FFS compared to MA. After matching, FFS still shows 1.7 times higher rates of avoidable hospitalizations overall.

MA and FFS show similar rates of adherence to medications to treat hypertension, diabetes, and cholesterol as well as initiation and engagement in treatment for alcohol and other drug abuse problems, both before and after matching. However, rates of inappropriate use of high-risk medications are 1.6 times higher in FFS before matching and remain 1.4 times higher after controlling for patient characteristics.

We present the results of regression analyses in Tables 2, 3, and 4, capturing the incremental impact of MA on quality outcomes relative to FFS, after adjusting for pre-existing differences between the cohorts. In Table 2, we look at various quality measures related to inpatient hospitalizations. We find that MA has 24% fewer preventable hospitalizations relative to FFS. The reduction is especially concentrated among preventable acute-related hospitalizations, for which we see a 59% reduction, which is highly statistically significant. Preventable chronic hospitalizations are also 8.6% lower under MA. We additionally find 70% fewer 30-day all-cause readmissions, after adjusting for any differences that existed prior to Medicare enrollment, a result which is also highly statistically significant.

We also examine additional aspects of care quality through measures of medication adherence, care appropriateness, and prevention (Tables 3 and 4). First, we look at medication adherence rates among those with common conditions, including diabetes, hypertension, and high cholesterol. We find neither statistically nor clinically meaningful differences in these measures between MA and FFS (Table 3). Looking next at measures of treatment appropriateness (Table 4), we find 21% lower rates of high-risk medication use under MA, a substantial difference that is also highly statistically significant. As a final measure of treatment quality, we look at management of substance abuse disorders (SAD), finding lower rates between treatment initiation and treatment engagement among SAD patients in MA relative to FFS. However, the effect on SAD treatment engagement is not statistically significant, while the effect on treatment initiation is statistically significant at the 10% but not at the 5% level.

Discussion

This study compares quality of care under MA and FFS, looking at the incremental impact of the programs on quality outcomes after netting out any differences across the cohorts that preceded their enrollment into Medicare and that are not attributable to the programs themselves. The study leverages Inovalon's unique data assets and quality analytics capabilities to look at a broad range of quality measures and across care settings such as inpatient use and prescription drug use. Inovalon's data enables us to conduct this analysis for a nationally representative population, and, unlike past studies, to net out pre-existing differences across the cohorts more effectively than feasible with standard data.

We find suggestive evidence that MA beneficiaries have better quality of care outcomes relative to similar FFS beneficiaries. Specifically, we find that MA substantially reduces acute hospitalizations, and that this is indicative of MA reducing chronic and acute care complications more generally. This result lines up with expectations, given that acute-related improvements are relatively more feasible than chronic-related improvements over a shorter time period, such as the two-year time frame that we look at. We additionally find that MA substantially reduces rates of inpatient readmissions by 70% after adjusting for differences that existed before enrolling in Medicare. These results build on findings from our previous white paper, which indicated that MA had lower overall utilization than FFS, and that this lower utilization was driven by fewer inpatient visits. We show here that some of this reduction in inpatient visits, and utilization overall, comes from reduced preventable and readmission visits. This provides further evidence that utilization reductions under MA relative to FFS may be a direct result of improved quality of care rather than care rationing or reduced access.

We also find that MA reduces inappropriate medication use by over 20% while keeping overall medication use unchanged. This suggests that MA is able to target inappropriate care while retaining high value care, particularly since we previously found that rates of overall medication use under MA and FFS were comparable. Avoiding the use of high-risk drugs is an important and effective strategy for reducing medication-related problems and adverse drug events in older adults.⁵ Many older adults also access care across multiple healthcare providers, so there is an increased risk of harmful drug interactions due to lack of communication and coordination between providers.⁶ The greater use of care coordination in MA is reflected in the significantly lower use of high-risk medications that present serious danger to older adults.

These results build on [findings from our previous studies](#), and specifically our previous finding of substantial inpatient utilization reductions under MA. Furthermore, given that we can only capture MA's short-term impact on quality, over the course of a year, we may be missing additional quality improvements that MA delivers but which take longer to materialize. Our most recent results suggest that overall utilization reductions under MA come through improved care quality rather than impaired access to care. The results also point to the potential benefits of care management, which is much more prevalent under MA than FFS, and how this feature can deliver better outcomes for patients as well as reduce cost of care. In addition to demonstrating the benefits of MA's care model, these results also point to potential shortcomings in the FFS model, and the detrimental effect that FFS's lack of care management may have on FFS beneficiaries.



How Can This Research Help Health Plans?

This study and related analytics can help plans understand their own quality outcomes, and how they compare to those of peers, particularly after adjusting for underlying characteristics of the health plan's members. Our analytics can offer very specific insights to pinpoint where a health plan is over or underperforming, by supporting fine-grained benchmarking, including benchmarking focused on socioeconomically disadvantaged populations to identify health disparities. This can offer plans actionable insights that can then drive operational and design improvements to deliver better health outcomes. This can also help health plans promote health equity and reduce SDOH-based quality disparities, in line with CMS's newly released framework.

How Can This Research Help Policymakers?

For policymakers, our study sheds new light on the quality improvements that MA delivers for beneficiaries, relative to FFS. The study underscores the role that care management and coordination can play in promoting quality within the Medicare program. Furthermore, the study indicates that the lack of care management in the FFS program has negative ramifications for beneficiaries, and that recent reforms to FFS – such as the introduction of accountable care organizations and value-based initiatives – have clearly not brought sufficient care management to the FFS program.

Future white papers in this series will leverage Inovalon's data to pinpoint specific, actionable opportunities for improving quality and care outcomes, from both a policy and plan design perspective. These insights can drive policy actions and create meaningful improvements for tens of millions of Medicare beneficiaries.

Table 1. Quality Measure Summary Statistics During Follow-up Period: MA vs. FFS

		Unmatched Samples		Matched Samples	
		MA	FFS	MA	FFS
Readmissions and Preventable Hospitalizations per 1,000					
30-day Readmissions		2.34	8.48	2.33	8.75
Hospitalizations for Potentially Preventable Complications	Overall	3.69	5.73	3.52	5.82
	Acute	0.82	2.05	0.91	1.72
	Chronic	2.99	3.80	2.74	4.21
# of Individuals		23,971	172,717	21,487	110,736
Medication Adherence					
Hypertension (RAS antagonists)		84.5%	84.0%	84.6%	85.6%
# of Individuals		6,983	49,468	6,254	32,374
Diabetes		85.6%	86.5%	85.6%	85.4%
# of Individuals		2,646	17,742	2,367	11,960
Cholesterol (Statins)		82.2%	81.8%	82.2%	83.2%
# of Individuals		8,292	61,100	7,421	39,257
Medication and Treatment Appropriateness					
High-risk Medications Usage		16.5%	25.8%	16.7%	22.8%
Alcohol and Other Drug treatment	Initiation	81.8%	78.6%	81.1%	84.7%
	Engagement	10.9%	11.9%	11.2%	10.2%
# of Individuals		23,971	172,717	21,487	110,736

Table 2. Regression Analysis: Effects of MA on Readmissions and Preventable Complications Relative to FFS

		Preventable Complications		
	30-Day Readmissions	Overall	Acute	Chronic
Effect of MA Relative to FFS (Standard Deviation)	-6.13	-1.40	-1.01	-0.360
	(0.850)	(0.759)	(0.436)	(0.639)
Post-65 FFS Baseline per 1,000 Beneficiaries	8.75	5.82	1.72	4.21
Effect of MA (as Percentage of FFS Baseline)	-70%	-24%	-59%	-8.6%

Table 3. Regression Analysis: Effects of MA on Medication Adherence Relative to FFS

	Medication Adherence		
	Hypertension	Diabetes	Cholesterol
Effect of MA (%)	0.652	0.800	-1.144
(Standard Deviation)	(0.851)	(2.087)	(0.844)
Post-65 FFS Baseline (%)	85.6	85.4	83.2
Effect of MA (as Percentage of FFS Baseline)	0.76%	0.94%	-1.38%

Table 4: Regression Analysis: Effects of MA on Medication and Treatment Appropriateness Relative to FFS

	High-Risk Medication Use	Alcohol and Other Drug Abuse Treatment	
		Initiation	Engagement
Effect of MA (%)	-4.74	-6.15	-2.18
(Standard Deviation)	(0.473)	(3.431)	(3.278)
Post-65 FFS Baseline (%)	22.8	78.6	11.9
Effect of MA (as Percentage of FFS Baseline)	-20.8%	-7.8%	-18.4%

The Harvard-Inovalon four-part Medicare study will continue to pinpoint opportunities for quality improvement.

[Learn More About the Study](#)

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About us

Inovalon is a leading provider of cloud-based SaaS solutions empowering data-driven healthcare. The Inovalon ONE® Platform brings together national-scale connectivity, real-time primary source data access, and advanced analytics into a sophisticated cloud-based platform empowering improved outcomes and economics across the healthcare ecosystem. The company's analytics and capabilities are used by over 50,000 active, licensed customers. For more information, visit www.inovalon.com.

Inovalon
4321 Collington Road
Bowie, MD 20716
(301) 809-4000

www.inovalon.com

Authors

[Christie Teigland, Ph.D.](#)
[Zulkarnain Pulungan, Ph.D.](#)

Yalun Su

Zarek Brot-Goldberg

[Scott Bilder, Ph.D.](#)

[Barton Jones](#)

[Iman Mohammadi, Ph.D](#)

Boris Vabson