Fewer Diabetic Amputations for Patients on Medicare Advantage Compared to Medicare; Retinopathy and A1C Change Consistent for Both Insurance Types

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Key Findings:

- Type 2 diabetic patients enrolled in Medicare fee-for-service and Medicare Advantage plans have similar A1C control and rates of diabetic retinopathy within five years of their type 2 diabetes diagnosis.
- Amputations of portions of the lower extremity are 11% less likely in type 2 diabetic patients enrolled in Medicare Advantage plans, but amputation occurs for less than 1.4% of FFS and MA patients within the first five years of diagnosis.

In the U.S., patients eligible for Medicare healthcare coverage can choose to receive their coverage through a traditional Medicare fee-for-service (FFS) plan administered by the federal government or a Medicare Advantage (MA) plan serviced by a private insurance company.[1] Enrollment in MA plans has increased over time, and as of January 2023, just under half of Medicare beneficiaries are enrolled in an MA plan.[2] MA was created with the idea that private plans could provide better, more coordinated care and improved health outcomes at lower cost than traditional FFS plans.[1]

To assess how outcomes for patients in MA plans compared to outcomes for patients in FFS models, we evaluated patients enrolled in MA and FFS plans who were diagnosed with type 2 diabetes on three measures of diabetic control: hemoglobin A1C (A1C) levels, incidence of diabetic retinopathy, and amputations of portions of the lower extremity. We measured annual A1C levels for 126,792 type 2 diabetics on FFS and 126,792 type 2 diabetics on MA for five years after their initial diabetes diagnosis to determine how A1C levels changed over time for each population. Average A1C values for both the FFS and MA patients decreased over each of the five years assessed. There was a slightly greater decrease in the average A1C for FFS patients in four of the five years assessed, but this difference was not statistically significant. Additionally, the FFS population had a higher starting A1C level than the MA population.

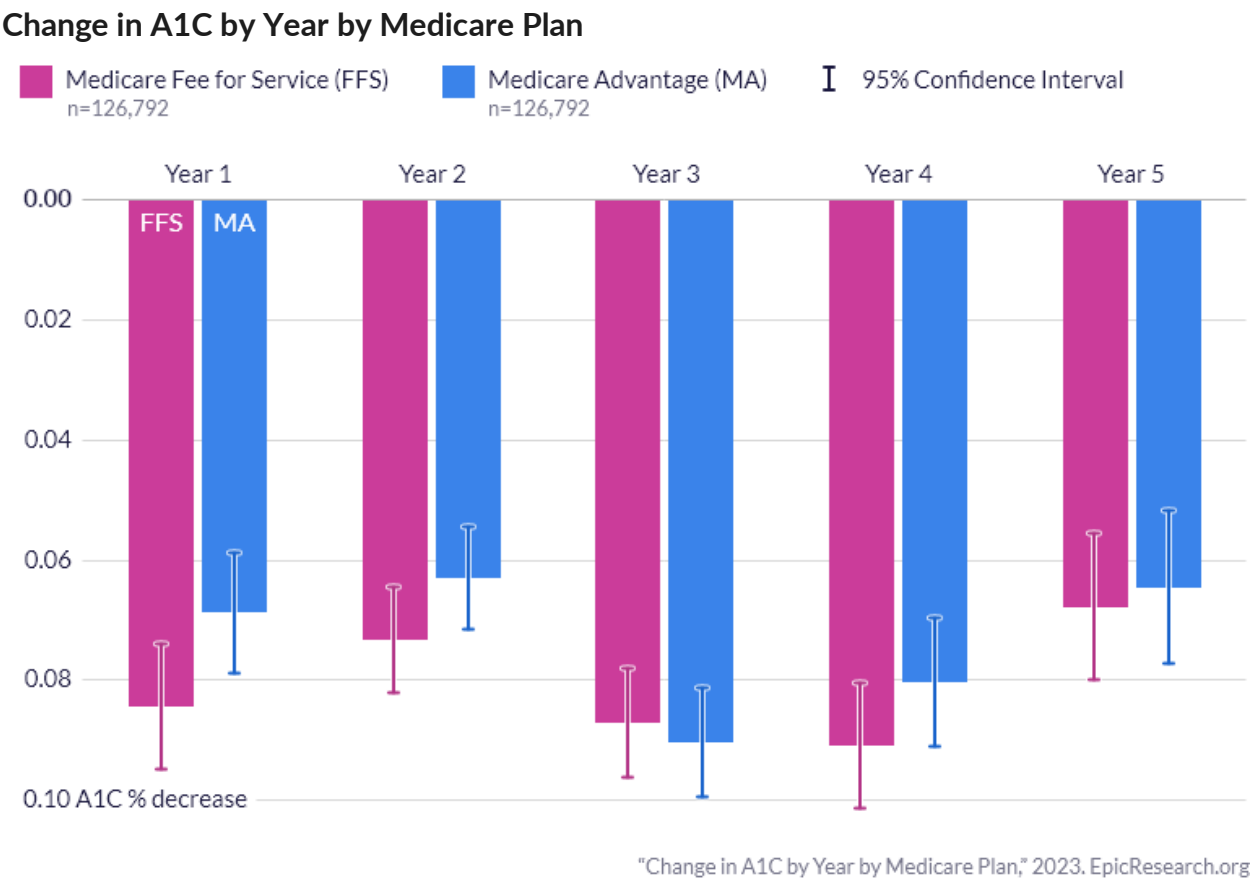

Figure 1. The average change in A1C value by year for Medicare fee-for service and Medicare Advantage type 2 diabetic patients. Each year's change is relative to year 0.

In addition to assessing A1C control, many value-based care arrangements in MA plans track quality measures for diabetic eye screenings and foot exams as preventive measures against diabetic retinopathy or amputations related to diabetes.[3] As a measure for comparing diabetic outcomes, we evaluated the rates of these two conditions in 938,007 type 2 diabetic MA and FFS patients.

We found that, five years after diabetes diagnosis, 4.8% of FFS patients were diagnosed with diabetic retinopathy compared to 4.7% of MA patients. After adjusting for duration of coverage, sex, race, ethnicity, social vulnerability index, rural or urban classification, and hypertension diagnosis, MA patients were no more or less likely to be diagnosed with diabetic retinopathy. Comparatively, 1.4% of FFS patients and 1.3% of MA patients had an amputation of a portion of a lower extremity five years after their diabetes diagnosis. After adjusting for sex, race, ethnicity, social vulnerability index, rural or urban classification, and hypertension diagnosis, MA patients were 11% less likely to have an amputation than FFS patients.

Rates of Diabetic Retinopathy and Lower Extremity Amputation by Medicare Plan

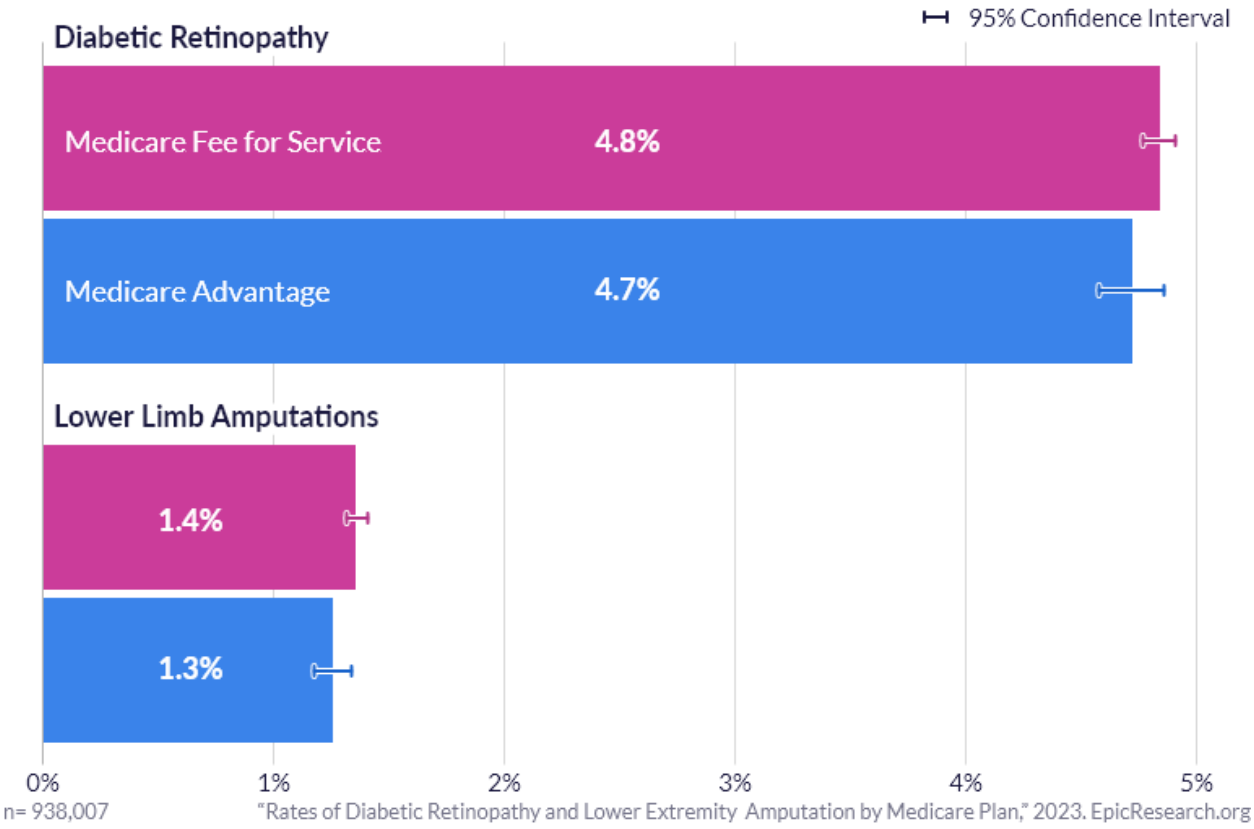

Figure 2. Unadjusted rates of diabetic retinopathy and amputations for Medicare fee-for-service and Medicare Advantage type 2 diabetic patients. For adjusted hazard ratios, see the data tables in the PDF version of the brief.

There are a few limitations to our study that require further exploration. First, this study does not assess potential differences in the cost of care provided between MA and FFS populations. Second, while we did adjust for many potential confounders in our analysis, there may be additional differences in the underlying populations that chose an MA plan or remained on an FFS plan that may contribute to the differences in rate of these complications.

These data come from Cosmos, a HIPAA-defined Limited Data Set of more than 203 million patients from 208 Epic organizations including 1,187 hospitals and more than 25,400 clinics, serving patients in all 50 states and Lebanon. This study was completed by two teams that worked independently, each composed of a clinician and research scientists. The two teams came to similar conclusions.

References

1. U.S. Department of Health and Human Services – Assistant Secretary for Planning and Evaluation: Office of Health Policy. HP-2023-06 Medicare Advantage Overview: A Primer on Enrollment and Spending. https://aspe.hhs.gov/sites/default/files/documents/14a262cfc2979b8cc1a9dffaee06b022/medicare-advantage-enrollment-spending-overview.pdf. Published March 7, 2020. Accessed July 28, 2023.
2. Bailey V. How 2023 Medicare Advantage Enrollment Growth Has Shifted. *Health Payer Intelligence.* https://healthpayerintelligence.com/news/how-2023-medicare-advantage-enrollment-growth-has-shifted. Published April 7, 2023. Accessed July 28, 2023.

3. U.S Centers for Medicare & Medicaid Services. Traditional MIPS – Explore Measures & Activities. Quality Payment Program. https://qpp.cms.gov/mips/explore-measures. Accessed on July 3, 2023.

Data Definitions

Term	Definition
Medicare Advantage/ Fee-for-Service Medicare Events	Periods of time in which contiguous encounters on a patient aged 65+ were linked to Medicare Advantage coverage or were linked to Fee-for-Service Medicare coverage. A new coverage event for the form of Medicare coverage a patient moved to starts at the time a patient changes from one form of Medicare coverage to another. Organizations were limited to those that had sufficiently completed data contribution to distinguish Medicare Advantage from Traditional Medicare coverage.
Study Population (A1C)	Time period: All Time The first Medicare Advantage/Traditional Medicare event where a patient was diagnosed with **type 2 diabetes** during said event with at least one **A1C reading** within one year before or after the index date. The **A1C reading** closest to the patient's type 2 diabetes diagnosis represents the patient's baseline. Future readings are calculated relative to the baseline reading. Events of interest require at least two additional A1C readings in the five years following a patient's **type 2 diabetes diagnosis**.
Study Population (Diabetic Retinopathy)	Time Period: All Time Patients whose first **type 2 diabetes** diagnosis occurred during their first Medicare Advantage/Traditional Medicare event and after the initial encounter within that coverage. Outcomes were tracked until the patient stopped receiving care or switched to the other form of Medicare.
Study Population (Diabetic Amputation)	Time Period: All Time Patients whose first **type 2 diabetes** diagnosis occurred during their first Medicare Advantage/Traditional Medicare event and after the initial encounter within that coverage. Outcomes were tracked until the patient stopped receiving care or switched to the other form of Medicare. Patients with any history of **Congenital Malformations** or **Traumatic Amputations** were excluded. Patients with **Diabetic Amputations** prior to their coverage event were excluded.
A1C Lab	A lab associated with any of the following LOINC codes: 17856-6, 17855-8, 41995-2. 4548-4, 4549-2, 55454-3, 59261-8, 86910-7
Type 2 Diabetes	Diagnoses associated with an ICD-10-CM code of E11*
Congenital Malformations	Diagnoses associated with an ICD-10-CM code of Q*

Traumatic Amputations	Procedures associated with an ICD-10-PCS code of: S78011A, S98011A, S78012A, S98012A, S78019A, S98019A, S78021A, S98021A, S78022A, S98022A, S78029A, S98029A, S78111A, S98111A, S78112A, S98112A, S78119A, S98119A, S78121A, S98121A, S78122A, S98122A, S78129A, S98129A, S78911A, S98131A, S78912A, S98132A, S78919A, S98139A, S78921A, S98141A, S78922A, S98142A, S78929A, S98149A, S88011A, S98211A, S88012A, S98212A, S88019A, S98219A, S88021A, S98221A, S88022A, S98222A, S88029A, S98229A, S88111A, S98311A, S88112A, S98312A, S88119A, S98319A, S88121A, S98321A, S88122A, S98322A, S88129A, S98329A, S88911A, S98911A, S88912A, S98912A, S88919A, S98919A, S88921A, S98921A, S88922A, S98922A, S88929A, or S98929A
Diabetic Amputations within the Lower Extremity	A diagnosis associated with ICD-10-CM code Z89.41*, Z89.42*, Z89.43*, Z89.44*, Z89.51*, or Z89.61* A procedure associated with ICD-9-CM Volume 3 code 84.10, 84.12, 84.13, 84.14, 84.15, 84.16, 84.17, 84.18, or 84.19 A procedure associated with ICD-10-PCS code 0Y6*
Diabetic Retinopathy	A diagnosis associated with an ICD-10-CM code E08-E13 with a subcode of .31-.35

Table 1: Change in A1C by Year by Medicare Plan

	Medicare FFS				Medicare Advantage			
Year	N	FFS A1C % Change	Lower CI	Upper CI	N	MA A1C % Change	Lower CI	Upper CI
Year 1	60,101	-0.084%	-0.094%	-0.074%	62,515	-0.069%	-0.079%	-0.059%
Year 2	94,752	-0.073%	-0.082%	-0.064%	95,945	-0.063%	-0.072%	-0.054%
Year 3	92,027	-0.087%	-0.096%	-0.078%	93,445	-0.090%	-0.099%	-0.081%
Year 4	76,608	-0.091%	-0.101%	-0.081%	67,664	-0.080%	-0.091%	-0.069%
Year 5	55,646	-0.068%	-0.080%	-0.056%	48,058	-0.064%	-0.077%	-0.051%

Table 2: Rates of Diabetic Retinopathy and Lower Extremity Amputation by Medicare Plan

	Medicare FFS				Medicare Advantage			
	N	FFS Rate (%)	CI low	CI High	N	MA Rate (%)	CI low	CI High
Diabetic Retinopathy	178,851	4.84%	4.77%	4.91%	38,188	4.72%	4.58%	4.86%
Lower Limb Amputations	155,377	1.36%	1.32%	1.41%	33,470	1.26%	1.18%	1.34%