

# Financial Evaluation of the Centers for Medicare & Medicaid Services (CMS) End-Stage Renal Disease (ESRD) Disease Management (DM) Demonstration

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## 1. Objective

The aim of this study was to evaluate the financial impact of disease management in the setting of Medicare Advantage (MA) plans for ESRD as follows: 1) Did CMS pay more or less for Disease Management Organization (DMO) enrollees than it would have paid if beneficiaries had remained in the traditional fee-for-service (FFS) setting and 2) what are the estimated savings or costs to the DMOs from any differences in service utilization?

## 2. Background

• Management of ESRD is associated with significant costs for the Medicare program. In 2007, although ESRD patients accounted for 1.2% of the Medicare primary payor population, the ESRD program accounted for a disproportionate 5.8% of the entire Medicare budget (USRDS 2009 ADR).

• The ESRD Disease Management Demonstration was implemented by CMS to evaluate whether disease management in the setting of MA Plans could improve clinical outcomes and reduce Medicare expenditures.

• The demonstration included three ESRD-specific disease management organizations (DMO A, B, and C) in nineteen geographic areas.

• The DMOs accepted capitation payments from CMS in return for full or partial risk for the costs of rendering Medicare's covered services.

## 3. Methods

**Data sources:** DMO patient enrollment data, demographic data, and date of death from the CMS Member Beneficiary Database. Capitated payments by Medicare for each DMO enrollee were obtained from the CMS Monthly Membership Report.

### Sample:

• The sample was restricted to patients who were enrolled in a DMO between January 1, 2006 and December 31, 2008. Patient months where the patient was not on hemodialysis the entire month or where Medicare was the secondary payor were excluded.

• Patients included in the analyses were also required to meet the following baseline data criteria – during the baseline month the patient must have ESRD, receive hemodialysis, reside in a DMO state, and have Medicare as the primary payor with record of a payment by Medicare during the month.

**Comparison Group:** Patients in traditional Medicare FFS in the states in which the Demonstration operated with Medicare as their primary payer were considered for the comparison groups. Patient-months where the patient was not hemodialysis the entire month, or where Medicare was the secondary payor were excluded. The baseline criteria used to define the sample were also used to define the comparison group.

### Outcomes:

- 1) The difference between the Medicare capitated payments made to the DMOs and the estimated FFS costs.
- 2) Estimated savings derived from differences in utilization rates between the DMOs and FFS.

### Methods

• Propensity score matching was used to identify a comparison FFS population to minimize the impact of selection bias that may have influenced enrollment in the Demonstration.

• Logistic regression was used to predict enrollment based on demographic, coverage, utilization, and clinical variables, and state of residence. The variables were defined at a baseline of January for each year.

• FFS and DMO patients were matched to create a FFS control group with a distribution of propensity scores similar to each DMO. The propensity score matching was conducted separately for each year.

• FFS costs for each DMO enrollee were estimated using Medicare claims data from the FFS comparison group. Linear regression was used to calculate the effects of demographic, coverage, utilization, and clinical variables on FFS costs. The parameter estimates from this regression were applied to the DMO patients to estimate the FFS costs had they remained in FFS instead of enrolling in the Demonstration.

• Utilization rates for the DMOs and propensity-score matched FFS population were calculated for the following metrics: hospital admissions, skilled nursing facility (SNF) stays, emergency department (ED) visits, and physician visits. To account for residual differences remaining after the propensity-score methodology, a second-stage multivariate regression adjustment was performed using a negative binomial regression model. Estimated savings or costs to the DMOs for each metric were estimated by multiplying the utilization rate differential by the cost per unit observed in the FFS group.

## 4. Results

### Costs to the Medicare Program, Difference between Capitated Payments to the DMOs and Estimated FFS Costs, by DMO and Year

	DMO Enrollees		Mean Cost per Month		Difference (DMO-FFS)				P-value
	N	Months	DMO <sup>a</sup>	FFS	Mean	% of FFS	95% CI		
							Lower	Upper	
<b>All DMOs</b>									
Total	3,604	30,476	\$6,551	\$5,776	\$774	13.4%	\$714	\$835	< 0.01
2006	849	5,572	\$6,388	\$5,704	\$685	12.0%	\$548	\$821	< 0.01
2007	1,538	13,472	\$6,521	\$5,587	\$934	16.7%	\$843	\$1,025	< 0.01
2008	1,217	11,432	\$6,665	\$6,036	\$630	10.4%	\$529	\$730	< 0.01
<b>DMO A</b>									
Total	1,065	9,114	\$6,872	\$6,179	\$693	11.2%	\$562	\$824	< 0.01
2006	242	1,836	\$6,678	\$5,769	\$909	15.8%	\$642	\$1,176	< 0.01
2007	408	3,505	\$6,788	\$6,119	\$669	10.9%	\$459	\$879	< 0.01
2008	415	3,773	\$7,044	\$6,279	\$765	12.2%	\$548	\$983	< 0.01
<b>DMO B</b>									
Total	439	4,048	\$5,739	\$5,176	\$563	10.9%	\$413	\$714	< 0.01
2006	78	552	\$5,304	\$4,982	\$322	6.5%	-\$20	\$664	0.07
2007	170	1,607	\$5,694	\$4,978	\$716	14.4%	\$502	\$930	< 0.01
2008	191	1,889	\$5,905	\$5,458	\$448	8.2%	\$194	\$701	< 0.01
<b>DMO C</b>									
Total	2,100	17,314	\$6,571	\$5,728	\$844	14.7%	\$768	\$919	< 0.01
2006	529	3,184	\$6,409	\$5,555	\$854	15.4%	\$690	\$1,018	< 0.01
2007	960	8,360	\$6,568	\$5,510	\$1,058	19.2%	\$953	\$1,163	< 0.01
2008	611	5,770	\$6,666	\$6,105	\$561	9.2%	\$417	\$705	< 0.01

• Across all DMOs and all years, the monthly mean capitated payment for patients in the Demonstration was higher when compared to the estimated cost if they had remained in FFS.

### Utilization Differences between DMOs and Matched FFS as a Percent of Matched FFS, by DMO, with Second-Stage Regression Adjustment

	DMO A				DMO B				DMO C				All DMOs			
	2006	2007	2008	All	2006	2007	2008	All	2006	2007	2008	All	2006	2007	2008	All
Hospital Admissions	+5%	+6%	+17%	+9%	+7%	+0%	+24%	+12%	-2%	+2%	-8%	-3%	+1%	+4%	+4%	+3%
Total Hospital Days	-13%	+20%	+29%	+16%	+42%	+29%	<b>+60%</b>	<b>+47%</b>	+14%	+16%	+12%	<b>+15%</b>	+12%	<b>+20%</b>	<b>+27%</b>	<b>+20%</b>
Readmissions <sup>1</sup>	+23%	+15%	+37%	+21%	<b>+119%</b>	+16%	+65%	<b>+57%</b>	<b>+37%</b>	+6%	-11%	+6%	<b>+41%</b>	+11%	+13%	<b>+16%</b>
Length of Stay	+3%	+7%	+4%	<b>+6%</b>	+11%	<b>+15%</b>	<b>+13%</b>	<b>+14%</b>	<b>+11%</b>	<b>+9%</b>	<b>+12%</b>	<b>+11%</b>	<b>+8%</b>	<b>+10%</b>	<b>+11%</b>	<b>+10%</b>
Physician Visits	<b>-51%</b>	<b>-31%</b>	-11%	<b>-29%</b>	-14%	<b>-20%</b>	-10%	<b>-15%</b>	<b>-15%</b>	<b>-16%</b>	<b>-19%</b>	<b>-18%</b>	<b>-26%</b>	<b>-20%</b>	<b>-16%</b>	<b>-20%</b>
Emergency Department Visits	-20%	+2%	-10%	-8%	+3%	-17%	-14%	-12%	+2%	+2%	-4%	-1%	-3%	-1%	-7%	-4%
Skilled Nursing Facility Stays	<b>-36%</b>	<b>-48%</b>	-3%	<b>-34%</b>	-43%	<b>-70%</b>	+20%	-28%	<b>-49%</b>	<b>-59%</b>	<b>-43%</b>	<b>-53%</b>	<b>-42%</b>	<b>-55%</b>	-24%	<b>-45%</b>

Positive number mean higher utilization in the Demonstration; negative numbers mean lower utilization in the Demonstration (relative to the matched FFS control group).

<sup>a</sup>Bold text in red font indicates significant difference from FFS (p < 0.05).

<sup>1</sup>Readmissions were defined as within 30 days.

• Although there were apparent differences in hospital admission rates between the DMOs and FFS, none of these differences were statistically significant. DMOs A and B appeared to have non-statistically significant higher hospital admission rates whereas DMO C appeared to have non-statistically significant lower rates by 2008

• Physician visits and skilled nursing facility stays were generally lower in the DMOs as compared to FFS.

• Total hospital days and length of stay were generally longer in the DMOs as compared to FFS. However, it should be noted that DMOs were likely to have negotiated a flat hospitalization payment rate so that reducing number of hospital days may not have been a focus of disease management. Estimated savings associated with hospital admissions were based on the total number of admissions and not total hospital days.

### Estimated Savings to DMOs due to Differences in Utilization from FFS

Service	DMO A				DMO B				DMO C				All DMOs			
	2006	2007	2008	2006-2008	2006	2007	2008	2006-2008	2006	2007	2008	2006-2008	2006	2007	2008	2006-2008
Hospital Admission	-\$1,311	-\$1,945	-\$5,040	-\$3,098	-\$1,486	-\$21	-\$5,962	-\$2,993	\$376	-\$408	\$2,521	\$712	-\$209	-\$955	-\$1,141	-\$888
Skilled Nursing Facility Stays	\$819	\$2,203	\$108	\$1,057	\$1,101	\$1,948	-\$320	\$774	\$968	\$2,247	\$1,354	\$1,714	\$837	\$1,984	\$639	\$1,270
Emergency Department Visits	\$131	-\$14	\$109	\$66	-\$28	\$355	\$151	\$208	-\$13	-\$20	\$59	\$7	\$26	\$6	\$90	\$41
Physician Visits	\$337	\$224	\$81	\$188	\$57	\$99	\$59	\$75	\$86	\$104	\$130	\$109	\$150	\$131	\$106	\$125
Est. Total Savings	-\$24	\$469	-\$4,742	-\$1,788	-\$355	\$2,382	-\$6,071	-\$1,936	\$1,417	\$1,922	\$4,064	\$2,543	\$804	\$1,166	-\$306	\$547
Est. Total Savings %	0.0%	0.6%	-5.6%	-2.2%	-0.6%	3.5%	-8.6%	-2.8%	1.8%	2.4%	5.1%	3.2%	1.0%	1.5%	-0.4%	0.7%

• Results of the utilization analyses and cost analyses revealed that hospitalization metrics differed by DMO.

• Overall, both DMO A and DMO B experienced losses relative to FFS based on differences in service utilization while DMO C experienced savings throughout all three years of the Demonstration, with the magnitude of savings appearing to increase over time.

• These findings should be interpreted with caution since they are estimates of cost-savings or losses and not actual savings or losses. In addition these estimates were driven by non-statistically significant differences in hospital admissions in some cases and, to a lesser extent, the difference in SNF stays.

## 5. Summary

• Overall the Demonstration cost Medicare 13.4% more than FFS. This translates to an additional monthly cost of \$774 per patient and a total additional cost of approximately \$23.5 million. This overpayment may have been, in part, designed to attract DMO participation.

• The excess cost of the Demonstration is consistent with what has been found in other studies. A Medicare Payment Advisory Commission (MedPAC) report estimated that CMS pays 11% more for Medicare Advantage enrollees than it would have paid had enrollees remained in traditional Medicare FFS. Private-fee-for-service plans (PFFS) are paid even more relative to traditional FFS at 19%.

• DMO C's use of treatment interventions may explain its reduced hospital admission rates and reduced estimated costs associated with hospitalization and use of other costly services.

• Other potential explanations for the limited financial impact in DMOs A and B include the following:

- 1) operational changes in DMO A and DMO B's programs may have limited their potential impact,
- 2) the structure of the DMO interventions with an emphasis on improving processes of care measures and care coordination may not translate to reduction in hospitalization-related costs,
- 3) differences in program design and their impact on degree of interaction between patients and members of the Disease Management team may have resulted in variations in reduction in hospitalization rates among the DMOs.

• Limitations:

- The DMO populations for some analyses were relatively small and the FFS sample was limited to the number of patients in the Demonstration. This can lead to insufficient statistical power to detect differences.
- The propensity score methodology may not balance DMO and FFS groups with respect to unmeasured confounders.
- Calculation of savings to the DMOs due to differences in utilization included utilization differentials that were often not statistically significant.

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