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# Effect of Chronic Condition Special Needs Plan Enrollment on Outcomes for Medicare Beneficiaries with Diabetes

Avalere Health – An Inovalon Company | October 2017



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## Summary & Key Findings

Medicare beneficiaries with diabetes enrolled in chronic condition special needs plans (C-SNPs) experience better outcomes than they would in non-specialized Medicare Advantage (MA) plans. Using a claims-based approach to compare beneficiary outcomes on five clinical and utilization measures, Avalere found that enrollees in a diabetes-focused C-SNP were:

- 22 percent more likely to have a primary care visit,
- 10 percent more likely to receive appropriate diabetes testing,
- 38 percent less likely to have an inpatient hospital admission,
- 32 percent less likely to have a readmission, and
- 6 percent more likely to fill (and refill) a prescription for an antidiabetic medication.

These findings held true when controlling for expected differences in enrollees' demographics and health status. The analysis suggests that C-SNPs can improve outcomes for beneficiaries with diabetes compared to non-SNPs.

## Background & Objectives

Special needs plans are a type of MA plan that focus on, and limit enrollment to, certain groups of Medicare beneficiaries. SNPs provide targeted services to MA beneficiaries who are institutionalized, are dually eligible for Medicare and Medicaid, or have a severe or disabling chronic condition. SNPs have been offered for more than 10 years, and there are more than 2 million SNP enrollees in 2017. SNPs were originally authorized under the Medicare Modernization Act in 2003 for five years. Congress continues to refine SNP policy and must periodically re-authorize these plans; current SNP authorization expires December 31, 2018.

SNPs are designed to provide coordinated care for some of the Medicare program's most vulnerable beneficiaries, with the ultimate goal of achieving better outcomes for those with significant healthcare needs. SNPs provide their members with tailored benefit packages and provider networks, and must meet requirements beyond those that apply to other MA plans. For example, SNPs must maintain models of care that outline each plan's care coordination, care management, and quality strategies.<sup>1</sup>

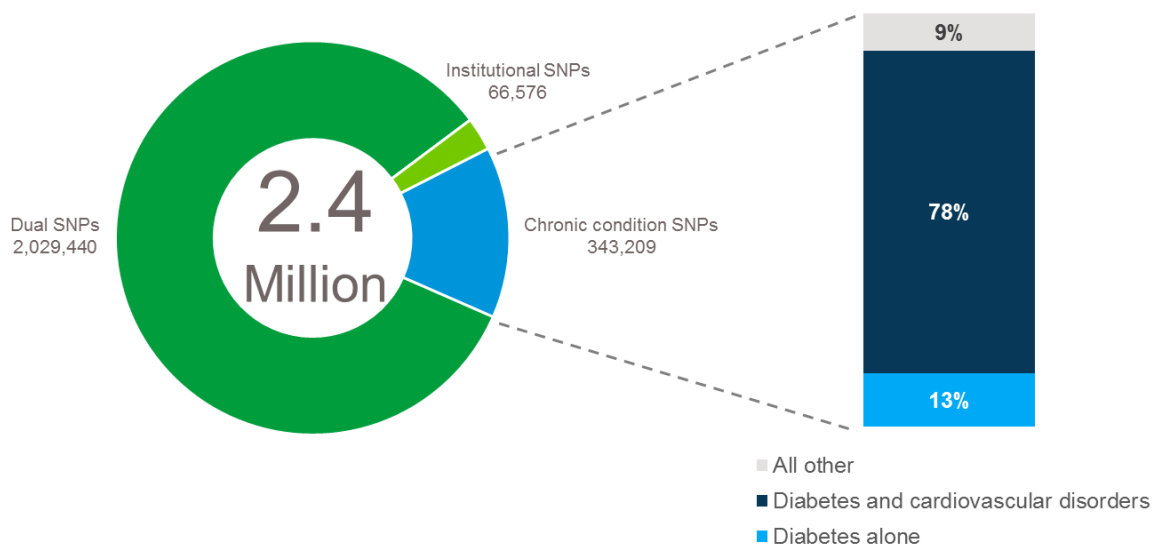
C-SNPs are offered to beneficiaries with certain specified chronic conditions or sets of co-occurring conditions. The Centers for Medicare & Medicaid Services (CMS) has defined 15 conditions and 5 multi-condition groups that C-SNPs can focus on, including common chronic

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<sup>1</sup> Centers for Medicare & Medicaid Services. Model of Care. More information available at: <https://www.cms.gov/Medicare/Health-Plans/SpecialNeedsPlans/SNP-MOC.html>.

conditions like diabetes. C-SNPs enroll approximately 15 percent of all SNP beneficiaries. In 2017, nearly all C-SNP enrollees are in plans that focus on diabetes care alone or in combination with cardiovascular disorders (Figure 1).

**Figure 1—SNP Enrollment by Plan Type, 2017<sup>2</sup>**



**2.4 million beneficiaries are enrolled in SNPs as of August 2017**

**Most C-SNP enrollees are in plans that focus on diabetes care**

Research shows that enrollment in a C-SNP can have positive effects for beneficiaries; for example, one study found that SNP enrollees with diabetes use less inpatient care and more primary care than similar beneficiaries in the fee-for-service program.<sup>3</sup> However, research comparing C-SNPs to other MA plans is limited, and some stakeholders, such as the Medicare Payment Advisory Commission, have asked whether non-SNP MA plans could achieve the same outcomes for beneficiaries with chronic conditions.<sup>4</sup>

This analysis builds upon this existing research by comparing clinical and utilization metrics across C-SNP and non-SNP MA enrollees. Specifically, Avalere used Inovalon’s proprietary MORE<sup>2</sup> Registry<sup>®</sup> to compare outcomes for Medicare beneficiaries with diabetes who are enrolled in diabetes-focused C-SNPs to beneficiaries with diabetes who are enrolled in non-SNP MA plans. Avalere also performed a multivariate analysis to estimate how outcomes for C-

<sup>2</sup> Centers for Medicare & Medicaid Services, SNP Comprehensive Report. August 2017.

<sup>3</sup> Cohen, R. et al. Medicare Advantage Chronic Special Needs Plan Boosted Primary Care, Reduced Hospital Use Among Diabetes Patients. *Health Affairs*; 1 (2012): 110–119.

<sup>4</sup> Medicare Payment Advisory Commission. Report to the Congress; Chapter 14: Medicare Advantage special needs plans. March 2013.

SNP enrollees might have differed if those enrollees had been in non-SNPs. A detailed description of the data source and analytic approach is included in the Appendix.

## Profile of C-SNP & Non-SNP Enrollees

Avalere first identified MA enrollees with a diagnosis of diabetes who were enrolled in a diabetes-focused C-SNP (“C-SNP enrollees”) and, separately, who were enrolled in a non-SNP MA plan (“non-SNP enrollees”). Avalere then compared the C-SNP<sup>5</sup> and non-SNP enrollees across several key demographic and health status factors, including age, presence of comorbidities, socioeconomic characteristics and relative healthcare needs as suggested by risk scores (Table 1). As illustrated below, C-SNP enrollees were younger than non-SNP enrollees, and were slightly more likely to be female. C-SNP enrollees were less likely to be white compared to the non-SNP group and were more than twice as likely to be disabled as non-SNP enrollees (49.0% vs. 19.6%).

A significantly larger proportion of C-SNP members are dual eligible (receive both Medicare and Medicaid insurance coverage) indicating they are more likely to be low income and have other social risk factors; 22.7% of C-SNP beneficiaries have partial or full dual status compared to only 8.3% of non-SNP MA beneficiaries. The average income of C-SNP members is indeed much lower, at \$40,140 compared to \$64,108 for non-SNP members.

As expected, C-SNP enrollees had poorer health status than non-SNP enrollees, as indicated by an average CMS Hierarchical Condition Category (HCC) risk score of 1.6 versus 1.4.<sup>6</sup> In addition, C-SNP enrollees were more likely to have certain chronic conditions including pulmonary conditions (26.7% vs. 19.8%), renal disease (14.2% vs. 10.0%), and behavioral health conditions (13.9% vs. 8.6%).

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<sup>5</sup> For the remainder of this memo, “C-SNP” refers to diabetes-related C-SNPs, and all beneficiaries included in the analysis were identified as having diabetes based on have a diagnosis or prescription drug use for diabetes medications consistent with the CMS HEDIS definition.

<sup>6</sup> The CMS-HCC risk score reflects a beneficiary’s expected healthcare spending relative to the average, based on demographic and diagnosis characteristics. Higher risk scores indicate higher expected healthcare needs and spending.



**Table 1—Demographic & Health Status Comparison of C-SNP & Non-SNP Enrollees, 2015**

		C-SNP Enrollees with Diagnosis of Diabetes <sup>†</sup>		Non-SNP Enrollees with Diagnosis of Diabetes* <sup>†</sup>	
		N	%	N	%
<b>Group Size</b>		<b>5,100</b>	<b>100.0%</b>	<b>449,581</b>	<b>100.0%</b>
<b>Age</b>	<b>Mean</b>	68	--	72	--
<b>Gender</b>	<b>Female</b>	2,818	55.3%	243,110	54.1%
	<b>Male</b>	2,282	44.7%	206,471	45.9%
<b>Race</b>	<b>White</b>	3,726	73.1%	355,361	79.0%
	<b>Black</b>	1,213	23.8%	69,243	15.4%
	<b>Asian</b>	≤10	‡	4,419	1.0%
	<b>Hispanic or Latino</b>	89	1.7%	6,855	1.5%
	<b>Unknown/Other Race</b>	62	1.2%	13,703	3.0%
<b>Disability Status</b>	<b>Aged</b>	2,588	50.7%	360,801	80.3%
	<b>Disability</b>	2,501	49.0%	88,081	19.6%
	<i>Disability &amp; ESRD</i>	≤10	‡	96	0.0%
	<i>ESRD</i>	≤10	‡	529	0.1%
	<b>Unknown</b>	≤10	‡	74	0.0%
<b>Dual Eligibility Status</b>	<b>Dual - Full</b>	168	3.3%	11,798	2.6%
	<b>Dual - Partial</b>	987	19.4%	25,728	5.7%
	<b>Non-Dual</b>	3,945	77.4%	412,055	91.7%
<b>Household Income</b>	<b>Mean</b>	\$40,140	--	\$61,108	--
<b>HCC Risk</b>	<b>Mean Risk Score</b>	1.6	--	1.4	--
<b>Co-occurring Conditions</b>	<b>Cardiovascular Disease</b>	2,339	45.9%	201,153	44.7%
	<b>Pulmonary Conditions</b>	1,364	26.7%	89,160	19.8%
	<b>Renal Disease</b>	722	14.2%	45,073	10.0%
	<b>ESRD</b>	61	1.2%	2,718	0.6%
	<b>Behavioral Health Conditions</b>	708	13.9%	38,494	8.6%
	<b>Unknown/Other</b>	0	0.0%	72,983	16.2%

\*Comparison group excludes SNPs of all types.

†Based on presence of diabetes diagnosis on inpatient or outpatient claim, or prescription for an antidiabetic agent.

‡Counts and percentages of population for subgroups with 10 or fewer enrollees are suppressed.

ESRD: End-Stage Renal Disease

HCC: CMS Hierarchical Condition Category

## Clinical & Utilization Analysis

The objective of this analysis was to determine whether enrollees with diabetes in diabetes-focused C-SNPs experience different outcomes than beneficiaries with diabetes who were enrolled in non-SNP MA plans. Avalere compared C-SNP and non-SNP enrollees' experience across a number of clinical metrics, including use of primary care, use of inpatient care, and diabetes-specific care.

### Specifically, Avalere analyzed the:

- Percent of enrollees with one or more primary care physician (PCP) visits
- Percent of enrollees receiving one or more HbA1c test<sup>7</sup>
- Percent of days covered with antidiabetic medications<sup>8</sup>
- Percent of enrollees with one or more inpatient hospital admissions
- Percent of enrollees with one or more readmissions within 30 days of a hospital discharge

Avalere then conducted a detailed (i.e., multivariate) analysis of these five measures in order to control for baseline population differences.

### Observed (Actual) Outcomes for C-SNP & Non-SNP Enrollees

As illustrated below (Table 2), C-SNP enrollees were more likely to have a primary care visit than non-SNP enrollees (91.6% vs. 81.5%). C-SNP enrollees were also less likely to use inpatient care, including lower likelihood of hospital admissions (24.4% vs. 25.0%) and lower rates of readmissions (16.3% vs. 17.1%).

C-SNP enrollees were significantly more likely to receive evidence based care as indicated by significantly higher rates of blood sugar levels being evaluated via an HbA1c test (88.1% vs. 69.7%); additionally, C-SNP enrollees were more likely to be adherent to their prescriptions for antidiabetic medications than non-SNP enrollees (82.9% of days covered with a prescription vs. 72.8%). These outcomes are prior to controlling for enrollees' baseline demographic and health status differences, and illustrate that C-SNP enrollees are more likely than non-SNP enrollees to receive diabetes-specific care. For example, the rate of HbA1c testing among C-SNP enrollees was nearly 20 percentage points higher than among non-SNP enrollees before adjusting for demographic and other factors.

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<sup>7</sup> HbA1c testing is used to determine how well patients' diabetes is being controlled

<sup>8</sup> The percent of days covered rate reflects the percentage of days on which a beneficiary had a prescription for an antidiabetic agent, and is used as a proxy for medication adherence.

**Table 2—Comparison of C-SNP & Non-SNP Enrollees on Selected Clinical & Utilization Metrics, 2015**

Measure Domain	Measure	C-SNP Enrollees with Diagnosis of Diabetes†	Non-SNP Enrollees with Diagnosis of Diabetes*†
Physician Care	Percent of enrollees with one or more PCP visits	91.6%	81.5%
Inpatient Care	Percent of enrollees with one or more inpatient hospital admissions	24.4%	25.0%
	Percent of enrollees with one or more readmissions within 30 days of a hospital discharge (for those with at least one inpatient admission)	16.3%	17.1%
HbA1C Testing	Percent of enrollees receiving one or more HbA1c tests	88.1%	69.7%
Medication Adherence	Average percent of days covered with antidiabetic medications	82.9%	72.8%

\*Comparison group excludes SNPs of all types.

†Based on presence of diabetes diagnosis on inpatient or outpatient claim, or prescription for an antidiabetic agent.

## Effect of C-SNP Enrollment on Clinical & Utilization Outcomes

While the above unadjusted comparison of C-SNP and non-SNP enrollees offers insight into beneficiary experiences and outcomes, the two groups differed across important demographic, socioeconomic and other risk factors that could impact outcomes and utilization. To provide a more consistent and rigorous comparison between the two populations, Avalere conducted a regression analysis of each of the five outcome measures, controlling for key differences between the two groups.

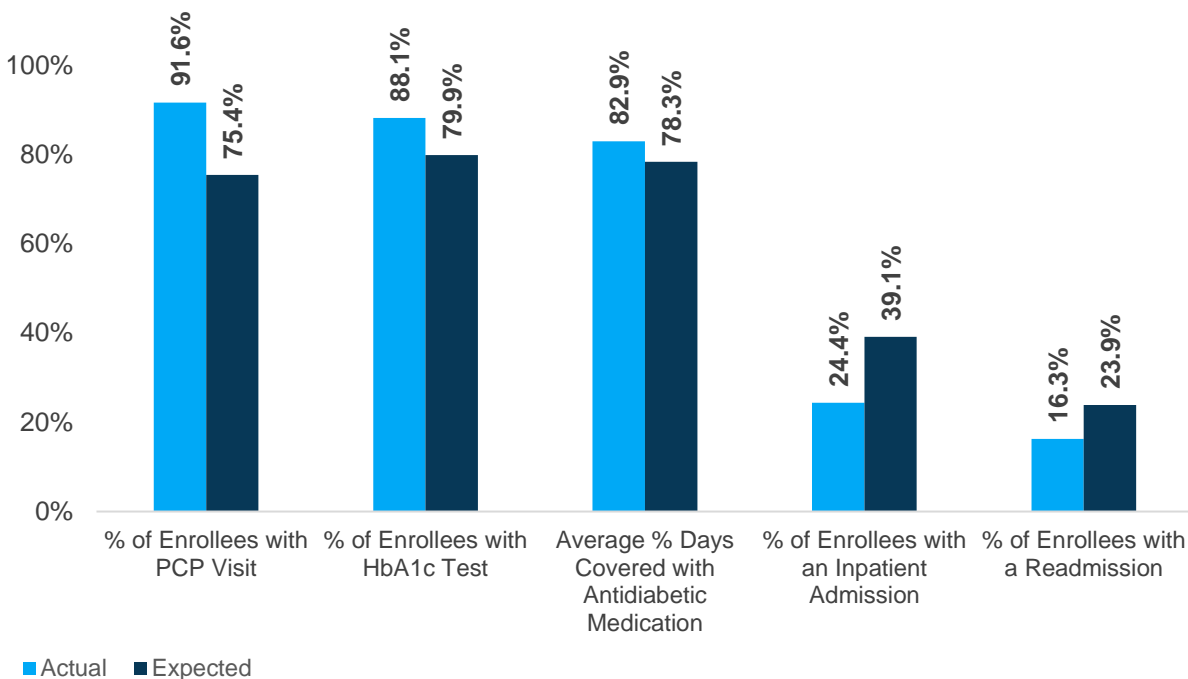
For each of these five measures, Avalere estimated what the C-SNP enrollees’ outcomes would have been if they were enrolled in non-SNP plans. First Avalere modeled the relationship between risk factors and outcomes using the larger non-SNP enrollee group. Avalere then applied these models to the C-SNP enrollees, using their risk factors and characteristics to predict expected outcomes for the C-SNP enrollees – effectively estimating what C-SNP enrollee outcomes with similar profiles would have been in non-SNP plans. The percent



difference between C-SNP enrollees' actual outcomes in their C-SNP plan, and what we estimated as their expected outcomes in the non-SNP plan, measures the impact of the C-SNP plan.

The results of the regression analysis show that C-SNP enrollees' outcomes were consistently better when enrolled in the C-SNP than they would have been if they were enrolled in a non-SNP MA plan (Figure 2). Note that for inpatient admissions and readmissions, lower rates are better.

**Figure 2—Outcomes for C-SNP Enrollees: Actual Outcome in C-SNP vs. Expected Outcome if Enrolled in Non-SNP MA Plans**



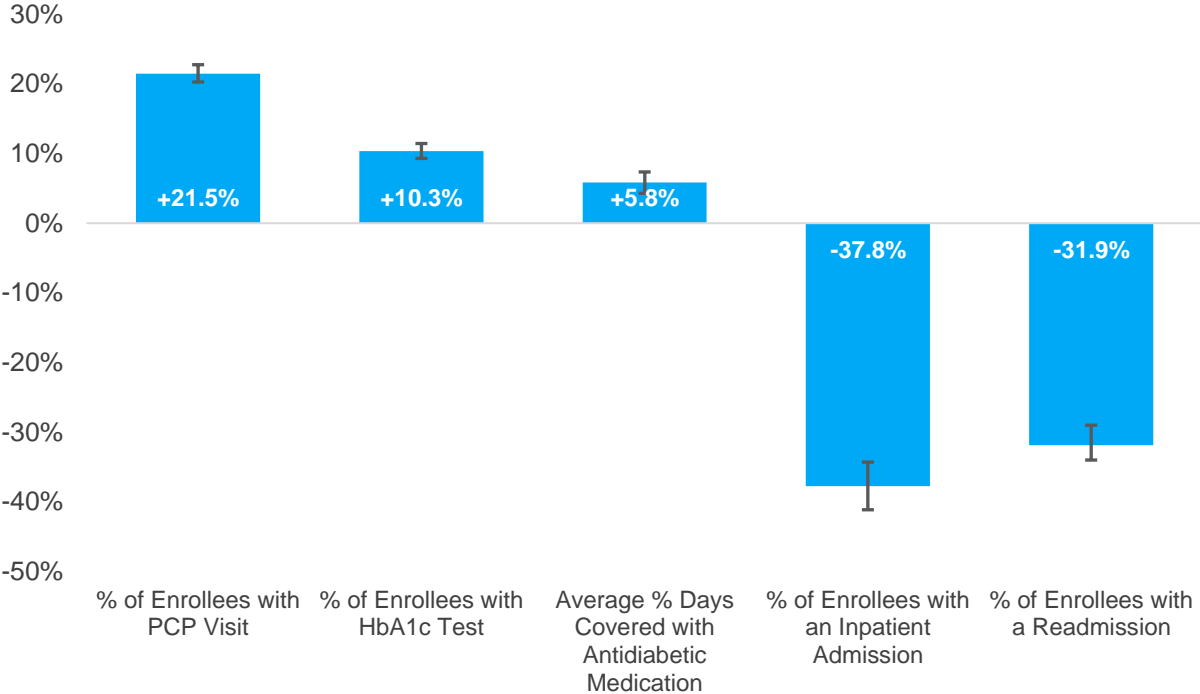
Avalere Heath analysis of Inovalon MORE<sup>2</sup> Medicare Advantage enrollees with diabetes enrolled in C-SNPs in 2015. “Actual” is the average actual outcome for C-SNP enrollees; “expected” is the average predicted outcome for C-SNP enrollees in a non-SNP plan.

In addition, Avalere calculated a “C-SNP effect” by comparing actual versus expected outcomes for C-SNP enrollees (Figure 3). Avalere estimated that, compared to what it would have been in non-SNP MA plans:

- The percent of C-SNP enrollees with a PCP visit was 22% higher
- The number of enrollees who had an HbA1c test was 10% higher;
- The percent of days covered by antidiabetic medications was 6% higher than similar patients in non-SNP MA plans;

- The rate of inpatient admissions was 38% lower;
- The rate of readmissions was 32% lower in C-SNP beneficiaries.

**Figure 3—Effect of C-SNP Enrollment on Beneficiary Outcomes (estimated increase or reduction relative to non-SNP MA plans)**



Avalere Heath analysis of Inovalon MORE<sup>2</sup> Medicare Advantage enrollees with diabetes enrolled in C-SNPs in 2015. C-SNP effect is calculated as the percent difference between actual and expected performance (actual less expected, divided by expected). Bracketed lines indicate 95% confidence interval for each C-SNP effect.

## Conclusion

Our analysis demonstrates that outcomes for Medicare beneficiaries with diabetes who are enrolled in a C-SNP are significantly better than would have been realized had those individuals enrolled in a non-SNP MA plan. These findings are based on a multivariate analysis controlling for baseline demographic, socioeconomic, and health status factors. Additionally, these findings are consistent across several domains of care – primary care, inpatient utilization, and diabetes management. As policymakers continue to evaluate and refine the SNP program, this paper offers insight into the value that specialized plans, with models of care tailored to specific chronic conditions, can provide for Medicare beneficiaries with chronic conditions.

## Appendix: Methodology

Avalere used Inovalon's proprietary MORE<sup>2</sup> Registry to analyze data for C-SNP and non-SNP enrollees with diabetes. This database contains information on demographics, enrollment, and individual medical encounters and prescription drug fills for over 159 million unique individuals from 2000 through 2017, including Medicare Advantage, managed Medicaid, and commercial (including Affordable Care Act-associated) plans. For this analysis, Avalere created a HIPAA-compliant safe harbor version of the MORE<sup>2</sup> Registry that included data for Medicare Advantage plan enrollees for 2015 augmented with two additional sets of information. One source of information is the type of Special Needs Plan (SNP), if any, in which each beneficiary is enrolled, using the Medicare Advantage contract number and plan benefit package indicator. Plans were identified as being: (1) a SNP specializing in diabetes, alone or in combination with other conditions; (2) some other type of SNP; or (3) a non-SNP. Avalere restricted this analysis to enrollees in diabetes-focused C-SNPs or non-SNPs (i.e., groups 1 and 3 from above). The second additional source of information is an extract of data from the Acxiom Infobase® Geo database that provides the median household size and mean household income for each ZIP+4 (nine-digit) ZIP code in the U.S.; residential ZIP+4 codes typically comprise roughly 10 households. These very specific socioeconomic data have been shown to be strongly associated with the socioeconomic status of individual households as well as strongly associated with medical spending in Medicare.<sup>9</sup>

### Cohort Selection Criteria

The study focuses on beneficiaries with diabetes enrolled either in diabetes-focused C-SNPs or in MA plans that are not SNPs. To be eligible for the study, a member/beneficiary must satisfy the following inclusion criteria:

1. Had ≥1 pharmacy claim with an NDC for antidiabetic medication (i.e., alpha-glucosidase inhibitors, amylin analogs, antidiabetic combinations, insulin, meglitinides, GLP1 agonists, SGLT2 inhibitor, sulfonylureas, thiazolidinediones, or DDP-4 inhibitors) or ≥1 medical claim/encounter (inpatient or outpatient) with a diagnosis for diabetes between January 1, 2015 and December 31, 2015.
2. Had Medicare Advantage as their primary insurance in 2015 and were continuously enrolled in the health plan with claims and pharmacy coverage/benefits with no gap of more than 30 days.
3. Resided in United States (i.e., did not live in the U.S. territories) in 2015

Eligible members (those who met the inclusion criteria above) were assigned to one of the two mutually exclusive cohorts (C-SNP diabetes/C-SNP diabetes and other chronic conditions and Non-SNP). The Non-SNP cohort excluded all special needs plans including D-SNPs (dual eligible members who are also eligible to receive benefits from Medicaid), I-SNPs

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<sup>9</sup> Teigland, et al. "An Investigation of Medicare Advantage Dual Eligible Enrollee-Level Performance on CMS Five-Star Quality Measures." Bowie, MD: Inovalon, 2015

(institutionalized members who resided or are expected to reside for 90 days or more in LTC facility), and C-SNPs. Members in the C-SNP diabetes/C-SNP diabetes and other chronic conditions cohort were identified using contract and plan combinations from the December 2015 CMS C-SNP file. Applying these criteria to the MORE<sup>2</sup> Registry yielded 5,100 diabetes C-SNP enrollees and 449,581 non-SNP enrollees with diabetes in 2015.

## Study Measures

The analysis focused on five measures related to a range of primary care and inpatient outcomes:

1. Percent of enrollees with one or more PCP visits
2. Percent of enrollees receiving one or more HbA1c tests
3. Percent of days covered with antidiabetic medications
4. Percent of enrollees with one or more inpatient admissions
5. Percent of enrollees with one or more readmissions among those with one or more admissions

For eligible members, quality measure scores were calculated based on the Healthcare Effectiveness Data and Information Set (HEDIS) and Pharmacy Quality Alliance (PQA) definitions at the member level. The following quality metrics were assessed in this study:

### Physician Care Measures

1. Primary Care rates were measured as the percent of eligible members (denominator) who had seen a primary care physician in 2015 (numerator).

### Inpatient and Urgent Care Measures

1. Acute Care Hospitalization rates were measured as the percent of eligible members (denominator) who were discharged from an acute care hospital (identified by a claim/encounter) in 2015 (numerator).
2. All-Cause Readmission rates were measured as the percent of members discharged from an acute care hospital (denominator) in 2015 and were readmitted to an acute care hospital (identified by a claim/encounter) for any diagnosis within 30 days (numerator).

### Other Measures

1. HbA1c Testing rates were measured as the percent of eligible members (denominator) who had  $\geq 1$  HbA1c test performed (identified by a claim/encounter) during 2015 (numerator).
2. Medication Adherence rates for members who had  $\geq 1$  pharmacy claim with an NDC for antidiabetic medication were measured using Proportion of Days Covered (PDC). PDC is the ratio of the medication days' supply filled on pharmacy claims (numerator) divided by the number of days between the first dispensed date and the last dispensed date plus the days' supply dispensed in the last fill (denominator).

To identify an average “C-SNP effect” (the average change in each outcome due to enrollment in a diabetes C-SNP) for beneficiaries with diabetes, Avalere adopted an approach in which the actual average performance of diabetes C-SNPs is compared to an estimate of what the plan’s enrollees would have achieved on these outcomes were they instead enrolled in a non-SNP MA plan. To do this, we first estimated logistic regression models of each outcome on a set of baseline demographic, socioeconomic, and diagnostic factors using only the non-SNP plan enrollees. Specifically, the models included the following factors:

- Age (19–64; 65–69; 70–74; 75–79; 80+)
- Sex
- Dual status (non-dual; partial dual; full dual)
- Original reason for Medicare entitlement (aged versus disability with or without ESRD)
- Census region (Midwest; Northeast; South; West)
- Household size (1; 2; 3; 4; 5; 6+)
- Household income (\$0-\$20K; \$20K-\$40K; \$40K-\$60K; \$60K-\$80K; \$80K-\$100K; \$100K+)
- Race/ethnicity (black; Hispanic or Latino; white; other)
- Version 22 CMS-HCCs

The model specifically included combinations of the demographic and regional factors; combinations of dual status with Medicare entitlement; and combinations of dual status with each HCC. Full dual eligibility (partial or full) was generally associated with fewer primary care visits, fewer HbA1c tests, and more hospital admissions. Partial dual eligibility was generally associated with lower antidiabetic agent percent days covered and higher admissions and readmissions. Furthermore, these effects were amplified by partial duals having one or more of a broad range of comorbid conditions (as identified by CMS-HCCs).

There were few consistent regional patterns in effects on outcomes, but enrollees in the South Census region tended to have higher scores on all five measures, perhaps reflecting greater healthcare utilization in that region. The effects of household characteristics were not generally consistent, except that larger households tended to have lower readmission rates and higher antidiabetic agent percent days covered. Avalere applied these models to the diabetes C-SNP population and calculated the percent difference in average actual versus expected outcomes among this population. The 95 percent confidence intervals for the C-SNP effects were computed through bias-corrected bootstrapping with 500 replications.

## About Us

Avalere is a vibrant community of innovative thinkers dedicated to solving the challenges of the healthcare system. We deliver a comprehensive perspective, compelling substance, and creative solutions to help you make better business decisions. As an Inovalon company, we prize insights and strategies driven by robust data to achieve meaningful results. For more information, please contact [info@avalere.com](mailto:info@avalere.com). You can also visit us at [avalere.com](http://avalere.com).

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