

# Quality Regulation? Access to High-Quality Specialists for Medicare Advantage Beneficiaries in California

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## Abstract

Medicare Advantage enrollment has seen tremendous growth over the past decade. However, we know comparatively little about the experience of beneficiaries in the program. Our knowledge of Medicare Advantage provider networks is particularly limited. This article is one of the first major assessments of the issue. It seeks to answer 3 important questions. First, are Medicare Advantage plan networks made up of higher quality providers? Second, how significant are the network restrictions imposed by Medicare Advantage plans with regard to access to higher quality providers? And finally, how much provider choice are Medicare Advantage beneficiaries left with? To assess these questions, I utilize geospatial data and individual provider quality measures for cardiologists, endocrinologists, and obstetricians and gynecologists from California. I find that Medicare Advantage beneficiaries generally do well in large metropolitan areas compared to traditional Medicare. However, there are concerns for those in micropolitan and rural areas, and even those in standard metropolitan areas, at times. Crucially, the connection between provider quality and networks can only be fully understood when connected to assessments of provider access. These findings also raise questions about how we think about provider networks and the adequacy of current approaches to network regulation.

## Keywords

medicare, medicare advantage, provider networks, provider quality

### What Do We Already Know About This Topic?

There really is no work on Medicare Advantage provider networks and beneficiary access and our knowledge does not match the importance of the program.

### How Does Your Research Contribute to the Field?

This article is the first assessment of access to specialists under Medicare Advantage, particularly with a focus on quality.

### What is Your Research's Implications Toward Theory, Practice, or Policy?

My work creates a better understanding of Medicare Advantage as well as raises questions about provider network regulation more generally and how it is connected to consumer access.

## Introduction

Medicare Advantage has seen tremendous growth over the past decade.<sup>1</sup> With about one-third of Medicare beneficiaries enrolled in the program and future growth on the horizon, assessments of beneficiary experiences are crucially important. Potential for growth appears unabated and California has been spearheading these developments. With more than 40% of beneficiaries enrolled in Medicare Advantage, California has one of the highest enrollment rates in the nation.<sup>1</sup> Moreover, the state has a long history with managed care, and it has

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a large fraction of its general population enrolled in managed care products.<sup>2</sup>

By definition, managed care products restrict consumer choice by selectively contracting with a certain subset of providers. Of course, this holds for Medicare Advantage as well, and federal regulators and consumer groups alike have shared concerns about the adequacy of provider networks in Medicare Advantage plans. As a result, over the past decade or so, the issue of provider networks has been taken on by the federal government. Indeed, today Medicare Advantage has some of the most extensive, and restrictive, standards of all insurance products,<sup>3</sup> particularly when compared to the often inconsistent regulation of plans sold on the Affordable Care Act's marketplaces.<sup>4-7</sup> Medicare Advantage plans are also one of the few products that have been subjected to quantitative standards, as compared to qualitative standards, for several years. For example, plans are required to provide, depending on geographic and demographic specifications as developed by the Centers for Medicare and Medicaid Services, access to a number of specialties within certain driving and distance restrictions.<sup>8</sup>

Yet, even Medicare Advantage regulations have a number of loopholes and ambiguities. Perhaps one of the most glaring omissions is the complete lack of provider quality as a factor in adequacy standards. More generally, our overall knowledge of Medicare Advantage provider networks is rather limited.<sup>9</sup> This study serves as the first major assessments of the issue. It seeks to answer 3 important questions. First, do Medicare Advantage plans emphasize access to higher quality providers by selectively contracting with providers of above higher quality? Second, how significant are the network restrictions imposed by Medicare Advantage plans with regard to access to higher quality providers? And finally, how much provider choice are Medicare Advantage beneficiaries left with? To answer these questions, I utilize geospatial data and individual provider quality measures as developed by the California Healthcare Performance Information (CHPI) system for cardiologists, endocrinologists, and obstetricians and gynecologists (OB/GYNs) from California (note 1).

I find that Medicare Advantage beneficiaries generally do well in large metropolitan areas compared to traditional Medicare. However, there are concerns for those in metropolitan and rural areas, and even those in standard metropolitan areas, at times. Crucially, the connection between provider quality and networks can only be fully understood when connected to assessments of provider access. These findings also raise questions about how we think about provider networks and the adequacy of current approaches to network regulations generally.

## Study Data

Although Medicare Advantage enjoys general popularity in California, plans are not available in every county. Indeed, beneficiaries in 13 of the state's 58 counties do not have the option to join any Medicare Advantage plan. For the remaining 45 counties, the number of plans ranges from 1 to 34, and

averages 6 (median 3, standard deviation 8). Overall, beneficiaries in the state are provided with 283 plans offered by 22 different carriers. No carrier controls a large share of the market. Kaiser Permanente is the state's most prolific option with 46 plans, followed by HealthNet with 36. Overall, 263 plan choices are local health maintenance organizations (HMOs) and preferred provider organization (PPO), the subject of this study (note 2).

Data on provider quality have significantly improved outcomes across many medical specialties.<sup>10</sup> Yet even today, accessing quality data for many providers remains challenging for researchers and consumers alike. In California, the CHPI system (note 3), a 501(c)(4) nonprofit, public benefit corporation, offers access to at least some quality measures, all of which are process-based.<sup>11</sup> Based on claims data from 12 million Californians in private health plans, including UnitedHealthcare, Anthem Blue Cross, and Blue Shield of California, CHPI provides quality measures for a number of specialties. The quality measures have been selected by the Physician Advisory Group, a group of 12 physician experts from relevant specialties, because they measure how well a doctor score on following recommended protocols. All quality measure are relevant to consumers, rigorously developed, endorsed by the National Quality Forum, and appropriate for the types of data used.<sup>12</sup> The specific measures utilized for the purpose of this study are endorsed by the National Committee for Quality Assurance.<sup>12</sup> Data for cardiologists, endocrinologists, and OB/GYNs were obtained from the CHPI website. For each of these specialties, star ratings (1-4) and percentile rankings are available (note 4).

The CHPI system provides quality data for 1135 OB/GYNs. The only quality measure available deals with breast cancer screenings. Specifically, it accounts for appropriate screenings for breast cancer in women aged 50 to 69. Just over 50% of providers received 4 stars, while 33% received 3, 13% received 2, and 2% received 1.

Cardiologist quality is assessed via 2 measures (note 5). First, *Monitoring for Patients on Persistent Medications for Diuretics* rates 1004 physicians. Of these, just under one-quarter of providers scored 4 stars, and just under one-third scored 3 stars and 2 stars, respectively. The remaining 15% scored 1 star. The average score is 2.60 with a median of 3. The second measure is also focused on medication monitoring. It focuses on prescriptions for angiotensin-converting enzyme (ACE) inhibitors or angiotensin II receptor blockers. For the 1170 cardiologists with data, the average score is 2.60 (median of 3). The percentage distribution of star ratings is similar as for the first measure.

Compared to cardiologists and OB/GYNs, there are relatively few endocrinologists in the state. Two performance measures are available: *Testing Blood Sugar for People with Diabetes* and *Testing Kidney Function for Diabetes Patients*. The former is available for 260 physicians (the mean score is 2.41 with a median of 3), while the latter is available for 276 physicians (the mean scores is 2.41 with a median of 3). Just under one-third of endocrinologists

scored 4 stars and 3 stars, respectively, while one-quarter scored 2 stars on the blood sugar measure. Only 11% scored 4 stars on the kidney function measure, 40% of providers scored 3 stars and 30% scored 2 stars.

Medicare Advantage plan data were obtained from the Center for Medicare and Medicaid Services (CMS) and supplemented with data from the website medicarehelp.org. Physician data and Medicare Advantage plan data were matched using provider network data provided by Vericred. Vericred, under contract with the Robert Wood Johnson Foundation, obtains these data from insurers or machine readable provider directories. Although not perfect, it is the most complete provider network data available and is commonly used by researchers to assess provider networks.<sup>13,14</sup>

## Study Methods

Do Medicare Advantage plans emphasize access to higher quality providers by contracting with providers of above higher quality? Second, how significant are the network restrictions imposed by Medicare Advantage plans with regard to access to higher quality providers? And finally, how much provider choice are Medicare Advantage beneficiaries left with when it comes to higher quality providers? To answer these questions, I first analyze the composition of provider networks in Medicare Advantage. That is, I compare the mean and median quality ratings of in-network providers against the overall supply of providers in a given area. Importantly, beneficiaries of traditional Medicare would have access to this larger network under their fee-for-service plan (note 6). I further assess what percentage of each provider network is composed of providers of higher quality (ie, 3 groupings developed based on the quality metrics described below). I then compare the composition of these networks to the unrestricted “network” available to beneficiaries in traditional Medicare, that is, the alternative available to all Medicare beneficiaries. While, by definition, Medicare Advantage networks are more restrictive than those available in traditional Medicare because insurers contract selectively, some have argued that insurers may indeed improve consumer choice by focusing their networks on higher quality providers.<sup>7</sup> The analysis here evaluates that claim.

Even so, restrictions imposed by insurers may be excessive, particularly in localized areas. I hence next evaluate the restrictiveness of Medicare Advantage networks, again as compared to traditional Medicare. Specifically, I analyze whether beneficiaries have access to at least 1 provider from each of the 3 quality groupings further described below (50th percentile, 90th percentile, 4-star rating). Finally, I assess the choices offered to beneficiaries, that is, the number of providers from each of the 3 quality groupings at certain distance levels. I also assess the average network breadth. Here, I expand on common approaches<sup>6</sup> by measuring network breadth at various distance levels. This crucial adaptation provides more meaningful information to regulator and consumers alike because the distance between beneficiary and provider arguably plays a determining role for patient access.<sup>5</sup> Indeed, generally consumers are likely

to prefer providers closer to their home. However, they may be willing to accept traveling certain distances in order to access providers of higher quality. Throughout the article, I use distances of 15, 30, 60, 120, and 240 miles for all assessments. Again, in all cases, I compare the Medicare Advantage plans to traditional Medicare.

In order to assess whether Medicare Advantage beneficiaries have access of higher quality than those of traditional Medicare, I first determine the mean and median provider quality rating both in terms of star rating and percentile ranking based on the CHPI data. Next, I calculate 3 distinct indicators. First, utilizing the quality measures available for each specialty, I, respectively, determine whether a specific provider is at or above the 50th percentile, at or above the 90th percentile, or whether the provider received a perfect 4-star rating. Notably, the 50th percentile is the least restrictive indicator of the 3, while the 90th percentile indicator is the most restrictive measure, with the 4-star rating indicator falling in between the 2. This approach creates 6 indicators for cardiologists and endocrinologists each (2 quality measures, 3 indicators) and 3 measures for OB/GYNs (1 quality measure, 3 indicators).

In order to compare access between Medicare Advantage and traditional Medicare, I create a series of dyads for each specialty expanding on the approach taken by Haeder et al.<sup>5</sup> First, I establish which Medicare Advantage plans are available for each census block group in the state. Census block groups are the smallest geographical units for which the US Census Bureau publishes data. Using census block groups, each typically made up of 600 to 3000 people, allows a much more fine-grained analysis than relying on the commonly used county-level approach, which blurs the differences between Alpine County, with its 1100 residents, and Los Angeles County, with its more than 10 million residents. Similar population numbers across census block groups also make comparisons much more reasonable.

I then identified the provider network for the respective specialty by linking the CHPI quality data described above to provider, network, and plan data made available by Vericred (note 7).

For each plan’s network, I then determine the geographic distance between the centroid of each census block group a plan is sold in, and each specialist (note 8). Next, for each census block group–Medicare Advantage plan combination, I determine mean and median quality ratings as well as the number of providers in each quality indicator grouping (50th percentile, 90th percentile, or 4 stars) that fall within 15, 30, 60, 120, and 240 miles of each census block group centroid for a specific Medicare Advantage plan (note 9). This makes up the first part of the dyad, respectively. This also allows me to assess whether there is at least 1 provider for each of the 3 quality groupings available at the various distance levels. For the second part, I repeat the steps for an unrestricted “network,” that is, a network of all providers for the specialty in the state that would be available to beneficiaries in the traditional Medicare program.

The dyads thus developed allow for comparisons between Medicare Advantage plans and traditional Medicare, at the census block group level, with regard to mean and median

**Table 1.** Mean and Median Rating for Cardiologists.<sup>a</sup>

	Miles	Large Metropolitan					Metropolitan					Micropolitan and Rural				
		15	30	60	120	240	15	30	60	120	240	15	30	60	120	240
<b>HMO</b>																
Star rating																
MA	Mean ACE score	2.75	2.74	2.74	2.72	2.69	2.57	2.57	2.58	2.64	2.63	<b>2.79</b>	1.55	2.12	2.23	2.37
TM		2.85	2.85	2.82	2.77	2.71	2.63	2.64	2.69	2.75	2.71	<b>2.79</b>	2.09	2.57	2.45	2.53
MA	Mean DIU score	2.72	2.67	2.63	2.62	2.59	2.56	2.61	2.62	2.57	2.55	<b>3.68</b>	2.25	2.19	2.31	2.38
TM		2.83	2.82	2.78	2.75	2.67	2.62	2.63	2.69	2.73	2.67	<b>3.57</b>	2.36	2.51	2.40	2.47
MA	Median ACE	2.90	2.89	2.88	2.86	2.86	2.60	2.61	2.64	2.73	2.73	<b>2.79</b>	1.10	1.98	2.14	2.25
TM	score	2.95	2.96	2.92	2.90	2.90	2.84	2.91	2.88	2.83	2.87	<b>2.82</b>	1.73	2.69	2.01	2.43
MA	Median DIU	2.75	2.80	2.83	2.87	2.83	2.50	2.54	2.70	2.75	2.73	<b>3.68</b>	<b>2.03</b>	2.00	2.14	2.25
TM	score	2.90	2.94	2.92	2.90	2.90	2.53	2.68	2.89	2.83	2.87	<b>3.57</b>	<b>2.07</b>	2.40	2.03	2.43
Percentile																
MA	Mean ACE score	56.35	55.92	55.76	55.23	54.65	52.21	52.29	52.23	53.40	53.18	58.58	25.95	43.72	45.05	48.32
TM		58.55	58.50	57.53	56.49	54.97	53.50	53.58	54.63	56.01	55.07	57.48	35.03	50.40	47.99	50.16
MA	Mean DIU score	55.59	54.24	53.38	53.07	52.33	51.53	52.64	52.73	51.57	51.16	80.63	39.85	39.78	41.88	44.87
TM		58.53	58.32	57.41	56.40	54.38	53.31	53.49	54.93	55.95	54.56	77.20	43.91	49.90	47.42	49.11
MA	Median ACE	57.77	57.29	56.44	55.43	54.83	52.12	51.83	52.11	53.52	53.24	<b>58.58</b>	16.73	42.73	45.58	49.30
TM	score	60.73	60.35	58.79	58.58	56.21	53.80	53.58	55.15	57.67	56.64	<b>58.62</b>	27.73	50.70	46.68	50.11
MA	Median DIU	54.92	53.73	52.93	52.66	51.92	50.62	51.09	51.72	50.96	50.46	80.63	34.67	41.93	43.32	45.16
TM	score	59.93	59.95	58.43	57.53	54.56	52.03	51.52	54.48	56.73	54.88	77.58	43.17	50.46	46.27	48.01
<b>PPO</b>																
Star rating																
MA	Mean ACE score	2.98	2.98	2.96	2.89	2.84	2.59	2.57	2.65	2.82	2.87					
TM		2.90	2.89	2.86	2.81	2.74	2.63	2.65	2.70	2.81	2.77					
MA	Mean DIU score	2.93	2.90	2.85	2.87	2.80	2.51	<b>2.69</b>	2.85	2.83	2.85					
TM		2.87	2.87	2.83	2.78	2.70	2.65	<b>2.69</b>	2.75	2.80	2.74					
MA	Median ACE	3.05	2.99	3.00	<b>3.00</b>	<b>3.00</b>	2.57	2.61	2.78	2.99	3.00					
TM	score	3.00	3.00	3.00	<b>3.00</b>	<b>3.00</b>	2.89	3.00	3.00	3.00	3.00					
MA	Median DIU	2.99	2.97	<b>3.00</b>	<b>3.00</b>	<b>3.00</b>	2.57	2.67	2.96	2.99	3.00					
TM	score	2.97	3.00	<b>3.00</b>	<b>3.00</b>	<b>3.00</b>	2.57	2.79	2.99	3.00	3.00					
Percentile																
MA	Mean ACE score	61.34	61.32	60.94	59.55	58.62	51.78	52.32	53.62	57.54	59.13					
TM		59.66	59.51	58.57	57.36	55.76	53.65	54.02	55.29	57.59	56.57					
MA	Mean DIU score	61.11	60.45	59.12	59.03	57.54	48.44	53.01	57.88	58.08	58.44					
TM		59.60	59.39	58.46	57.31	55.22	54.14	54.94	56.55	57.70	56.23					
MA	Median ACE	62.10	67.26	66.37	64.72	62.57	51.96	54.72	57.58	61.94	63.74					
TM	score	62.04	61.56	60.10	59.76	57.26	54.08	54.13	55.84	59.82	58.74					
MA	Median DIU	60.46	58.58	57.75	57.97	57.06	47.92	48.90	56.41	57.14	57.65					
TM	score	61.17	61.21	59.68	58.56	55.66	52.30	52.51	55.52	58.70	57.08					

Abbreviations: ACE, angiotensin-converting enzyme; DIU, diuretics; MA, Medicare Advantage; TM, traditional Medicare.

<sup>a</sup>All differences between TM and MA are significant at  $P \leq .001$ .

quality ratings (Tables 1–3), the percentage of networks made up of providers of higher quality (Tables 4–6), access to at least one provider of higher quality (Tables 7–9), and the number of providers of higher quality available (Tables 10–12), at the various distance levels. Utilizing this approach allows me to hold constant census block group characteristics and thus rely on test of proportion or  $t$  tests for the comparisons. It also resembles the standard regulatory approach, which only focuses on distance standards. Importantly, it also provides meaningful information to assess consumer access for consumers and regulators alike.

Two important factors may significantly affect beneficiary access. Local demographics may significantly shape local health-care environments. Specifically, the degree of urbanness

or ruralness of an area has important implications. Center for Medicare and Medicaid Services accounts for this possibility in its time and distance regulations by developing a typology for counties with designations including large metropolitan, metropolitan, micropolitan, rural, or counties with extreme access (CEAC), based on population and population density. I utilize the CMS typology to provide separate estimates for each category but combine micropolitan, rural, and CEAC areas because of the limited number of cases. Second, networks may differ based on whether they are developed for PPOs or HMOs. Importantly, PPO consumers may choose to go outside their network, albeit at higher out-of-pocket contributions. I hence provide separate analyses for each insurance type. Overall, this provides 5 different analyses (PPO and HMO for each

**Table 2.** Mean and Median Rating for Endocrinologists.<sup>a</sup>

	Miles	Large Metropolitan					Metropolitan					Micropolitan and Rural					
		15	30	60	120	240	15	30	60	120	240	15	30	60	120	240	
<b>HMO</b>																	
Star rating																	
MA	Mean kidney score	2.50	2.51	2.51	2.53	2.51	2.82	2.77	2.71	2.58	2.54		2.90	2.71	2.71		
TM		2.32	2.32	2.31	2.33	2.31	2.76	2.71	2.59	2.39	2.32		2.80	2.62	2.47		
MA	Mean blood sugar score	2.77	2.77	2.78	2.79	2.83	3.13	3.03	3.02	2.95	2.96		3.19	3.00	3.00		
TM		2.87	2.83	2.79	2.80	2.84	3.19	3.08	3.02	2.87	2.82		3.29	2.82	2.74		
MA	Median kidney score	2.52	2.61	2.54	2.66	2.66	2.79	<b>2.68</b>	2.75	2.73	2.71		2.83	3.00	<b>3.00</b>		
TM		2.40	2.25	2.09	2.08	2.08	2.70	<b>2.68</b>	2.66	2.25	2.09		3.00	3.00	<b>2.97</b>		
MA	Median blood sugar score	2.80	2.79	2.83	2.85	2.86	3.22	3.07	3.07	3.02	3.06		3.57	<b>3.00</b>	<b>2.99</b>		
TM		3.00	2.98	3.00	3.00	3.00	3.39	3.25	3.18	3.00	3.00		3.20	<b>3.00</b>	<b>3.00</b>		
Percentile																	
MA	Mean kidney score	47.51	48.34	48.49	48.83	48.50	57.33	55.79	53.79	50.76	49.72		54.32	54.43	54.39		
TM		44.95	45.34	44.94	45.48	45.37	56.28	54.82	51.92	46.99	45.52		56.41	52.88	48.90		
MA	Mean blood sugar score	57.64	57.76	58.30	58.70	59.29	65.30	63.45	63.72	62.10	62.29		62.70	62.29	62.22		
TM		59.64	58.63	57.48	57.73	58.38	66.83	64.43	63.04	59.50	58.12		69.60	57.94	55.84		
MA	Median kidney score	47.68	49.01	49.76	50.69	49.97	58.55	56.95	55.28	51.79	50.38		58.18	62.00	61.86		
TM		43.88	44.89	45.25	45.54	44.95	58.22	56.81	54.06	47.57	45.38		63.71	56.86	52.45		
MA	Median blood sugar score	58.63	58.86	59.51	59.93	60.62	67.18	65.25	65.38	64.54	64.80		69.55	71.00	70.59		
TM		62.49	61.80	61.13	61.70	61.88	69.86	68.11	67.16	63.60	61.77		73.80	60.60	58.96		
<b>PPO</b>																	
Star rating																	
MA	Mean kidney score	2.67	2.48	2.45	2.50	2.52	2.63	2.29	2.18	2.47	3.00						
TM		2.29	2.28	2.27	2.30	2.29	2.34	2.19	2.01	2.00	2.00						
MA	Mean blood sugar score	2.78	2.58	2.65	2.73	2.85	3.13	3.16	3.31	2.87	2.79						
TM		2.85	2.82	2.79	2.80	2.84	3.30	3.25	3.13	2.89	2.82						
MA	Median kidney score	2.63	2.29	2.18	2.47	3.00	3.05	3.00	3.07	2.81	2.75						
TM		2.34	2.19	2.01	2.00	2.00	2.90	2.79	2.74	2.20	2.00						
MA	Median blood sugar score	2.79	2.43	2.24	2.96	3.00	3.12	3.17	3.36	3.04	3.00						
TM		2.96	2.98	3.00	3.00	3.00	3.47	3.51	3.34	3.00	3.00						
Percentile																	
MA	Mean kidney score	53.04	49.58	49.41	50.86	52.22	67.85	65.81	65.83	54.68	51.67						
TM		44.05	44.32	44.19	44.76	44.82	59.87	57.89	54.47	46.90	44.81						
MA	Mean blood sugar score	60.96	54.84	55.73	57.73	59.81	67.68	68.74	73.27	61.90	58.66						
TM		59.20	58.44	57.62	57.69	58.38	68.77	67.83	65.63	60.02	58.12						
MA	Median kidney score	54.45	50.46	48.59	49.41	51.09	67.77	66.28	66.57	55.46	50.46						
TM		42.32	43.41	44.14	44.45	44.05	63.29	60.49	57.32	47.25	44.11						
MA	Median blood sugar score	60.48	52.00	48.48	59.44	61.91	67.48	68.65	74.22	63.22	60.82						
TM		61.99	61.70	61.43	61.78	62.01	69.51	71.47	69.83	64.55	62.01						

Abbreviations: MA, Medicare Advantage; TM, traditional Medicare.

<sup>a</sup>All differences between TM and PM are significant at  $P \leq .001$  unless marked in **bold**.

typology, ie, large metropolitan, metropolitan, micropolitan, rural, and CEAC) because no PPOs plans are sold in micropolitan or rural areas of California.

## Results

### Contracting for Quality

As mentioned above, insurers may selectively contract with certain providers. They may do this along a variety of measures including quality, the focus of this study, price, or geographic coverage, to name just a few dimensions. While the various dimensions are meaningful, quality seems particularly important. Do Medicare Advantage plans thus disproportionately

contract for quality? A first approach to answering the question utilized mean and median network quality scores.

*Mean and median network quality.* With regard to cardiologists (Table 1), Medicare Advantage HMO plans consistently fare worse than traditional Medicare in terms of mean and median quality ratings for both quality measures (ie, monitoring patients for diuretics and monitoring patients for ACE inhibitors). The differences are relatively small, but not unsubstantial, in large and standard metropolitan areas. They further increase somewhat in micropolitan and rural areas. Notably, quality ratings are consistently lower in these areas as well, with the exception of very short distances. The findings for

**Table 3.** Mean and Median Rating for Obstetricians and Gynecologists.<sup>a</sup>

		Large Metropolitan					Metropolitan					Micropolitan and Rural					
		Miles	15	30	60	120	240	15	30	60	120	240	15	30	60	120	240
<b>HMO</b>																	
Star rating																	
MA	Mean score	3.30	3.34	3.34	3.33	3.32	3.45	3.43	3.37	3.38	3.38	3.00	3.00	<b>3.26</b>	3.40	3.47	
TM		3.30	3.30	3.32	3.34	3.33	3.51	3.52	3.42	3.35	3.33	3.08	3.26	<b>3.29</b>	3.36	3.32	
MA	Median score	3.41	3.41	3.54	3.64	3.65	3.66	3.73	3.74	3.77	3.80	3.00	3.00	3.24	3.28	3.69	
TM		3.45	3.27	3.46	3.95	3.98	3.87	3.94	3.86	3.93	3.94	3.13	3.36	3.29	3.79	3.56	
Percentile																	
MA	Mean score	71.05	71.99	71.90	71.72	71.52	74.76	73.87	72.76	72.88	72.71	71.00	70.84	71.95	74.51	75.72	
TM		71.55	71.38	71.74	72.03	71.83	75.69	76.14	74.18	72.55	71.87	71.86	69.97	70.55	72.71	71.38	
MA	Median score	73.29	74.69	74.87	75.20	75.14	77.70	77.84	76.55	76.13	76.00	71.00	70.84	72.49	72.71	77.01	
TM		74.60	74.15	74.60	75.29	74.98	78.83	80.24	78.09	76.19	75.15	72.47	73.73	73.06	75.02	74.31	
<b>PPO</b>																	
Star rating																	
MA	Mean score	3.25	3.32	3.35	3.36	3.34	3.80	3.68	3.45	3.36	3.35						
TM		3.32	3.30	3.31	3.33	3.33	3.56	3.53	3.43	3.36	3.33						
MA	Median score	3.29	3.24	3.68	4.00	4.00	3.87	3.89	3.99	4.00	4.00						
TM		3.49	3.25	3.42	3.94	4.00	3.97	3.99	3.91	<b>4.00</b>	<b>4.00</b>						
Percentile																	
MA	Mean score	68.47	71.84	72.82	72.64	72.35	77.34	75.22	74.35	73.22	72.71						
TM		71.88	71.43	71.57	71.92	71.83	76.69	76.38	74.62	72.81	71.90						
MA	Median score	69.42	72.62	75.15	75.86	75.08	78.58	78.05	78.20	76.17	75.71						
TM		75.14	74.34	74.47	75.20	75.00	79.96	80.37	78.60	76.71	75.30						

Abbreviations: MA, Medicare Advantage; TM, traditional Medicare.

<sup>a</sup>All differences between TM and MA are significant at  $P < .001$  unless marked in **bold**.

**Table 4.** Percentage of Networks Made Up of Higher Quality Cardiologists.<sup>a</sup>

		Large Metropolitan					Metropolitan					Micropolitan and Rural					
		Miles	15	30	60	120	240	15	30	60	120	240	15	30	60	120	240
<b>HMO</b>																	
50th percentile																	
ACE score	MA	60.31	59.79	60.00	58.94	57.75	52.59	52.92	52.87	55.39	55.24	89.47	25.00	25.06	32.44	42.60	
	TM	64.96	64.92	63.60	61.99	59.20	56.16	55.54	57.95	60.73	59.41	86.94	85.10	51.73	45.29	50.53	
DIU score	MA	56.35	54.63	53.59	53.40	52.27	47.39	51.53	52.33	51.69	51.13	89.47	47.50	30.60	39.38	46.81	
	TM	61.43	61.19	59.32	58.03	54.79	51.11	50.58	56.06	57.63	55.31	86.22	81.90	51.42	46.22	48.18	
4 stars																	
ACE score	MA	27.08	26.52	26.13	25.77	25.03	19.22	20.66	21.30	22.85	22.89	0.00	0.00	7.79	5.43	3.46	
	TM	30.26	28.96	28.92	27.95	25.97	20.93	24.63	24.84	27.11	26.12	4.08	20.04	21.45	16.64	20.07	
DIU score	MA	27.21	25.54	23.55	23.26	22.45	19.66	20.39	22.32	21.53	21.17	89.47	25.00	13.04	8.44	5.30	
	TM	31.43	29.29	29.25	28.49	26.24	21.44	25.62	25.65	27.58	26.25	81.94	16.79	16.72	14.10	18.26	
90th percentile																	
ACE score	MA	10.09	9.64	8.83	8.68	8.48	5.00	5.30	5.87	6.63	6.66	0.00	0.00	0.00	0.00	0.08	
	TM	9.84	9.70	8.74	8.01	7.46	4.59	5.11	6.28	7.52	7.39	0.00	1.09	2.15	3.04	4.78	
DIU score	MA	20.51	18.62	16.55	16.01	15.43	10.85	12.09	14.08	14.43	14.07	89.47	25.00	3.77	2.11	1.45	
	TM	22.17	21.47	19.73	18.53	16.98	12.94	13.30	16.50	18.06	16.89	80.60	11.49	9.11	8.35	10.70	
<b>PPO</b>																	
50th percentile																	
ACE score	MA	75.95	76.61	75.66	71.04	68.44	61.83	56.70	<b>59.27</b>	68.03	69.77						
	TM	67.15	67.15	65.59	63.64	60.68	56.13	56.03	<b>59.14</b>	63.59	62.22						
DIU score	MA	63.75	62.30	61.13	62.15	60.14	34.97	<b>51.40</b>	60.93	60.37	61.52						
	TM	62.91	62.86	60.71	59.17	55.86	50.67	<b>51.57</b>	57.62	59.92	57.53						
4 stars																	
ACE score	MA	32.49	31.70	29.84	28.40	26.93	11.25	15.67	19.32	25.03	27.76						
	TM	31.51	30.31	30.31	29.10	26.98	21.62	25.35	25.45	29.08	28.05						
DIU score	MA	33.55	32.00	28.45	29.29	27.83	19.83	23.38	27.11	28.32	28.93						
	TM	32.72	30.89	30.89	30.03	27.56	24.27	28.54	28.46	30.26	28.80						
90th percentile																	
ACE score	MA	6.43	6.42	5.78	6.32	6.12	6.73	7.16	7.47	6.15	6.31						
	TM	10.45	10.30	9.39	8.55	7.97	4.95	5.06	6.35	8.31	8.28						
DIU score	MA	19.01	19.05	15.93	14.83	13.91	0.00	0.00	0.00	0.00	0.00						
	TM	23.19	22.65	20.93	19.62	17.99	10.20	11.54	13.44	14.94	14.47						

Abbreviations: ACE, angiotensin-converting enzyme; DIU, diuretics; MA, Medicare Advantage; TM, traditional Medicare.

<sup>a</sup>All differences between TM and MA are significant at  $P < .001$  unless marked in **bold**.

**Table 5.** Percentage of Networks Made Up of Higher Quality Endocrinologists.<sup>a</sup>

Miles	Large Metropolitan					Metropolitan					Micropolitan and Rural						
	15	30	60	120	240	15	30	60	120	240	15	30	60	120	240		
<b>HMO</b>																	
50th percentile	Kidney score	MA	50.07	51.11	49.98	51.36	50.23	70.25	64.75	60.29	52.75	50.09	<b>0.00</b>	<b>0.00</b>	60.66	57.14	57.17
		TM	44.65	44.27	43.68	45.02	44.74	65.28	63.90	58.18	48.11	45.06	<b>0.00</b>	<b>0.00</b>	66.46	63.37	54.87
Blood sugar score	MA	50.96	53.30	53.82	54.61	55.83	70.61	67.65	66.11	61.80	62.06	<b>0.00</b>	<b>0.00</b>	60.66	57.14	56.96	
	TM	62.23	61.79	59.22	59.82	61.38	75.89	75.85	70.46	63.38	60.94	<b>0.00</b>	<b>0.00</b>	86.92	67.10	61.61	
4 stars	Kidney score	MA	10.09	10.42	11.54	11.74	11.28	<b>18.39</b>	19.41	17.75	14.40	13.86	<b>0.00</b>	<b>0.00</b>	29.21	14.29	14.13
		TM	9.44	10.47	10.45	10.86	10.09	<b>18.39</b>	14.61	14.07	11.03	10.32	<b>0.00</b>	<b>0.00</b>	21.28	10.24	10.18
Blood sugar score	MA	34.03	32.86	34.55	34.59	36.23	<b>47.43</b>	42.77	43.75	42.09	43.02	<b>0.00</b>	<b>0.00</b>	58.42	42.86	42.61	
	TM	35.46	31.79	31.78	32.15	33.43	<b>47.30</b>	38.64	37.85	34.00	32.82	<b>0.00</b>	<b>0.00</b>	47.31	26.26	25.10	
90th percentile	Kidney score	MA	0.44	0.56	0.60	0.56	0.52	0.00	0.00	0.18	0.59	0.78	<b>0.00</b>	<b>0.00</b>	0.00	0.00	0.00
		TM	0.65	0.56	0.67	0.62	0.57	0.01	0.02	0.23	0.47	0.61	<b>0.00</b>	<b>0.00</b>	4.71	1.29	1.74
Blood sugar score	MA	10.41	11.25	14.27	15.11	15.39	10.91	14.35	20.40	18.93	20.58	<b>0.00</b>	<b>0.00</b>	0.00	0.00	0.00	
	TM	15.02	13.70	13.36	13.14	13.07	13.64	13.61	15.73	13.54	12.92	<b>0.00</b>	<b>0.00</b>	19.74	8.18	7.87	
<b>PPO</b>																	
50th percentile	Kidney score	MA	54.06	46.37	46.05	49.80	52.39	81.70	75.78	78.67	55.97	51.57					
		TM	42.15	41.98	41.79	43.23	43.38	73.85	73.90	63.52	47.33	43.24					
Blood sugar score	MA	55.11	45.62	47.68	52.43	56.95	85.05	80.71	81.62	60.03	54.48						
	TM	61.00	61.01	58.95	59.24	60.82	81.85	82.46	75.41	63.47	60.13						
4 stars	Kidney score	MA	29.80	17.28	17.20	19.98	17.46	27.62	28.98	35.54	22.01	18.86					
		TM	9.33	10.36	10.34	10.73	10.06	22.87	17.23	16.95	11.41	10.37					
Blood sugar score	MA	<b>35.04</b>	21.65	23.66	26.32	33.03	27.85	35.55	51.43	32.68	29.20						
	TM	<b>34.27</b>	32.48	32.46	32.72	34.01	51.39	44.24	42.62	35.40	33.61						
90th percentile	Kidney score	MA	1.62	3.62	5.33	5.02	4.37	<b>0.00</b>	<b>0.00</b>	0.46	2.87	4.71					
		TM	0.40	0.47	0.60	0.57	0.53	<b>0.00</b>	<b>0.00</b>	0.05	0.32	0.55					
Blood sugar score	MA	9.32	11.35	17.29	21.03	19.14	27.85	34.41	47.27	26.17	20.25						
	TM	14.79	13.82	13.73	13.47	13.42	17.78	17.85	19.19	14.66	13.49						

Abbreviations: MA, Medicare Advantage; TM, traditional Medicare.

<sup>a</sup>All differences between TM and MA are significant at  $P < .001$  unless marked in **bold**.**Table 6.** Percentage of Networks Made Up of Higher Quality Obstetricians and Gynecologists.<sup>a</sup>

Miles	Large Metropolitan					Metropolitan					Micropolitan and Rural					
	15	30	60	120	240	15	30	60	120	240	15	30	60	120	240	
<b>HMO</b>																
MA 50th percentile	81.39	82.78	81.97	81.35	81.49	87.36	86.52	84.17	<b>85.03</b>	84.89	100.00	97.54	79.51	91.91	91.91	
	TM	83.11	83.43	83.67	84.32	84.43	90.70	90.28	87.14	<b>84.94</b>	84.41	98.71	95.93	83.09	86.71	84.53
MA 4 stars	49.17	51.61	52.84	53.66	53.38	62.58	61.33	57.07	55.31	55.52	0.00	2.46	<b>46.95</b>	47.96	54.68	
	TM	49.05	49.89	49.88	51.33	51.21	64.71	57.27	57.35	52.40	51.12	10.41	45.59	<b>47.63</b>	51.26	49.59
MA 90th percentile	30.30	30.88	30.75	29.94	29.65	26.61	25.93	27.78	28.29	28.03	0.00	2.46	29.69	38.33	34.06	
	TM	25.19	24.26	24.55	24.30	24.15	26.24	28.57	27.40	25.31	24.11	1.93	20.62	21.51	23.44	22.46
<b>PPO</b>																
MA 50th percentile	81.65	85.03	84.81	83.81	84.14	<b>93.85</b>	90.67	84.69	84.09	83.99						
	TM	83.64	83.65	83.43	84.09	84.34	<b>92.99</b>	89.55	87.35	84.87	84.22					
MA 4 stars	43.72	47.03	50.77	53.59	51.79	87.58	79.98	64.15	53.34	52.95						
	TM	49.82	49.60	49.60	51.23	51.28	66.23	58.82	59.08	53.15	51.34					
MA 90th percentile	21.68	27.26	29.02	28.91	28.15	13.63	19.12	30.08	30.11	28.83						
	TM	26.13	24.79	24.56	24.34	24.28	24.91	28.52	28.22	26.16	24.42					

Abbreviations: MA, Medicare Advantage; TM, traditional Medicare.

<sup>a</sup>All differences between TM and MA are significant at  $P < .001$  unless marked in **bold**.

short distances may be aberrations hailing from overall limited availability of providers in these areas.

Overall scores for cardiologists in PPO plans in both large and standard metropolitan areas are slightly higher

than those for HMOs. Moreover, findings comparing Medicare Advantage plans to the overall physician supply are mixed. In large metropolitan areas, Medicare Advantage networks tend to do slightly better than the overall supply

**Table 7.** Results for Tests of Proportion for Access to At Least 1 Higher Quality Cardiologists.<sup>a</sup>

	Miles	Large Metropolitan					Metropolitan					Micropolitan and Rural					
		15	30	60	120	240	15	30	60	120	240	15	30	60	120	240	
<b>HMO</b>																	
50th percentile	ACE score	MA	0.90	0.95	0.99	1.00	1.00	0.72	0.82	0.89	0.95	0.99	0.30	0.30	0.31	0.53	1.00
		TM	1.00	1.00	1.00	1.00	1.00	0.93	0.98	0.99	1.00	1.00	0.67	0.88	1.00	1.00	1.00
	DIU score	MA	0.90	0.94	0.96	0.96	0.96	0.70	0.81	0.87	0.90	0.93	0.30	0.30	0.31	0.53	1.00
		TM	1.00	1.00	1.00	1.00	1.00	0.93	0.98	0.99	1.00	1.00	0.53	0.87	1.00	1.00	1.00
4 stars	ACE score	MA	0.87	0.92	0.96	0.97	0.97	0.58	0.74	0.83	0.88	0.92	0.00	0.00	0.30	0.31	0.31
		TM	0.99	1.00	1.00	1.00	1.00	0.90	0.97	0.99	1.00	1.00	0.13	0.86	1.00	1.00	1.00
	DIU score	MA	0.86	0.92	0.93	0.93	0.93	0.51	0.71	0.80	0.84	0.85	0.30	0.30	0.31	0.31	0.31
		TM	0.99	1.00	1.00	1.00	1.00	0.89	0.97	0.99	1.00	1.00	0.37	0.77	0.99	1.00	1.00
90th percentile	ACE score	MA	0.76	0.87	0.90	0.90	0.92	0.27	0.55	0.69	0.75	0.78	0.00	0.00	0.00	0.00	0.01
		TM	0.94	1.00	1.00	1.00	1.00	0.52	0.86	0.96	1.00	1.00	0.04	0.35	0.95	1.00	1.00
	DIU score	MA	0.80	0.89	0.93	0.93	0.93	0.33	0.62	0.76	0.83	0.84	0.30	0.30	0.31	0.31	0.31
		TM	0.99	1.00	1.00	1.00	1.00	0.83	0.95	0.99	1.00	1.00	0.37	0.66	0.99	1.00	1.00
<b>PPO</b>																	
50th percentile	ACE score	MA	0.98	0.99	<b>1.00</b>	<b>1.00</b>	<b>1.00</b>	0.83	0.92	0.99	0.99	1.00					
		TM	1.00	<b>1.00</b>	<b>1.00</b>	<b>1.00</b>	<b>1.00</b>	0.96	0.99	0.99	1.00	1.00					
	DIU score	MA	0.99	<b>1.00</b>	<b>1.00</b>	<b>1.00</b>	<b>1.00</b>	0.42	0.87	0.99	0.99	1.00					
		TM	1.00	1.00	<b>1.00</b>	<b>1.00</b>	<b>1.00</b>	0.96	0.99	0.99	1.00	1.00					
4 stars	ACE score	MA	0.96	0.99	<b>1.00</b>	<b>1.00</b>	<b>1.00</b>	0.46	0.88	0.99	0.99	<b>1.00</b>					
		TM	1.00	1.00	<b>1.00</b>	<b>1.00</b>	<b>1.00</b>	0.93	0.99	0.99	1.00	<b>1.00</b>					
	DIU score	MA	0.90	0.98	<b>1.00</b>	<b>1.00</b>	<b>1.00</b>	0.37	0.67	0.97	0.99	<b>1.00</b>					
		TM	1.00	1.00	<b>1.00</b>	<b>1.00</b>	<b>1.00</b>	0.94	0.98	0.99	1.00	<b>1.00</b>					
90th percentile	ACE score	MA	0.50	0.84	<b>1.00</b>	<b>1.00</b>	<b>1.00</b>	0.36	0.60	0.95	0.99	<b>1.00</b>					
		TM	0.99	1.00	<b>1.00</b>	<b>1.00</b>	<b>1.00</b>	0.60	0.95	0.99	0.99	<b>1.00</b>					
	DIU score	MA	0.82	0.98	<b>1.00</b>	<b>1.00</b>	<b>1.00</b>	0.36	0.66	0.97	0.99	<b>1.00</b>					
		TM	0.99	1.00	<b>1.00</b>	<b>1.00</b>	<b>1.00</b>	0.90	0.98	0.99	1.00	<b>1.00</b>					

Abbreviations: ACE, angiotensin-converting enzyme; DIU, diuretics; MA, Medicare Advantage; TM, traditional Medicare.

<sup>a</sup>All differences between TM and MA are significant at  $P < .001$  unless marked in **bold**.

of providers. In standard metropolitan areas, the opposite tends to hold. Overall, quality is higher in large than in standard metropolitan areas.

The findings for endocrinologists (Table 2) are inconsistent across the 2 quality measures used (kidney testing and blood sugar testing). Consistently, Medicare Advantage plans do better as compared to the overall supply of providers based on the *Kidney Testing* measure but often do worse when using the *Blood Sugar Testing* measure. Again, in large and standard metropolitan areas, PPOs fare better than HMOs. Interestingly, for endocrinologists, network quality is worst in large metropolitan areas. With a limited number of providers statewide, it appears that insurers are more selective in standard metropolitan areas and micropolitan and rural areas while contracting more broadly in large metropolitan areas. However, it is worth noting that micropolitan and rural areas lack endocrinologists at short distances.

When it comes to OB/GYNs (Table 3), quality is rather similar between HMOs and PPOs. Moreover, they are similar across different degree of rurality, albeit lowest in micropolitan and rural areas. Overall, comparisons between Medicare Advantage and the overall physician supply are mixed. However, the findings can be explained by the similarity of scores across the 2 networks.

*Percentage of networks made up of providers of higher quality.*

A second approach comparing provider quality focused on the percentage of networks made up of providers of higher quality. As described above, here this refers to providers scoring in the 50% percentile or above, the 90th percentile or above, or those who received a 4-star rating.

For cardiologists (Table 4), the overall provider supply again generally does better than Medicare Advantage HMO plans. However, substantively, the differences are rather small in large metropolitan and standard metropolitan areas. For the most restrictive quality indicator, providers falling in the 90th percentile or above, the differences are smallest. Overall, large metropolitan areas do slightly better at all distance levels than standard metropolitan areas. However, in micropolitan and rural areas, significant differences emerge. Although access is similar or even better in Medicare Advantage plans at very short distances, Medicare Advantage plans do significantly worse at distances of 30 miles and above. These differences are persistent across all 3 quality measure groupings.

The findings differ somewhat with regard to PPO plans. Here, in large metropolitan areas, Medicare Advantage plans outperform the overall physician supply with regard to the percentage of providers above the 50th percentile and those with 4-star ratings. This only holds for the former in standard



**Table 8.** Results for Tests of Proportion for Access to At Least One Higher Quality Endocrinologists.<sup>a</sup>

Miles		Large Metropolitan					Metropolitan					Micropolitan and Rural					
		15	30	60	120	240	15	30	60	120	240	15	30	60	120	240	
HMO																	
50th percentile	Kidney score	MA	0.78	0.90	0.93	0.93	0.93	0.55	0.70	0.78	0.83	0.85	0.00	0.00	0.30	0.31	0.31
		TM	0.98	0.99	1.00	1.00	1.00	0.80	0.92	0.97	1.00	1.00	0.06	0.60	0.99	1.00	1.00
	Blood sugar score	MA	0.78	0.93	0.97	0.97	0.97	0.51	0.66	0.81	0.89	0.92	0.00	0.00	0.30	0.31	0.31
		TM	0.99	1.00	1.00	1.00	1.00	0.84	0.94	0.99	1.00	1.00	0.09	0.72	0.99	1.00	1.00
4 stars	Kidney score	MA	0.52	0.70	0.83	0.84	0.84	0.30	0.52	0.68	0.75	0.78	<b>0.00</b>	0.00	0.30	0.31	0.31
		TM	0.95	0.99	1.00	1.00	1.00	0.58	0.79	0.89	0.99	1.00	<b>0.00</b>	0.13	0.58	1.00	1.00
	Blood sugar score	MA	0.68	0.87	0.96	0.97	0.97	0.14	0.37	0.63	0.74	0.82	<b>0.00</b>	<b>0.00</b>	0.00	0.00	0.00
		TM	0.98	1.00	1.00	1.00	1.00	0.53	0.72	0.87	0.99	1.00	<b>0.00</b>	<b>0.01</b>	0.45	0.90	1.00
90th percentile	Kidney score	MA	0.02	0.09	0.25	0.28	0.28	0.00	0.00	0.03	0.22	0.36	<b>0.00</b>	<b>0.00</b>	0.00	0.00	0.00
		TM	0.10	0.32	0.89	1.00	1.00	0.00	0.02	0.14	0.67	1.00	<b>0.00</b>	<b>0.00</b>	0.30	0.88	1.00
	Blood sugar score	MA	0.46	0.65	0.78	0.79	0.83	0.43	0.58	0.78	0.88	0.92	0.00	0.00	0.30	0.31	0.31
		TM	0.94	0.98	1.00	1.00	1.00	0.73	0.87	0.97	1.00	1.00	0.06	0.58	0.99	1.00	1.00
PPO																	
50th percentile	Kidney score	MA	0.91	<b>0.99</b>	<b>1.00</b>	<b>1.00</b>	<b>1.00</b>	0.37	0.74	0.95	0.99	<b>1.00</b>					
		TM	0.98	<b>0.99</b>	<b>1.00</b>	<b>1.00</b>	<b>1.00</b>	0.85	0.96	0.99	1.00	<b>1.00</b>					
	Blood sugar score	MA	0.90	0.98	<b>1.00</b>	<b>1.00</b>	<b>1.00</b>	0.37	0.74	0.95	0.99	<b>1.00</b>					
		TM	1.00	1.00	<b>1.00</b>	<b>1.00</b>	<b>1.00</b>	0.88	0.96	0.99	1.00	<b>1.00</b>					
4 stars	Kidney score	MA	0.46	<b>0.99</b>	<b>1.00</b>	<b>1.00</b>	<b>1.00</b>	0.13	0.50	0.91	0.99	<b>1.00</b>					
		TM	0.98	<b>0.99</b>	<b>1.00</b>	<b>1.00</b>	<b>1.00</b>	0.66	0.89	0.97	<b>0.99</b>	<b>1.00</b>					
	Blood sugar score	MA	0.39	0.84	0.99	<b>1.00</b>	<b>1.00</b>	0.13	0.53	0.91	<b>0.99</b>	<b>1.00</b>					
		TM	0.98	1.00	1.00	<b>1.00</b>	<b>1.00</b>	0.78	0.90	0.98	1.00	<b>1.00</b>					
90th percentile	Kidney score	MA	<b>0.07</b>	<b>0.30</b>	<b>0.89</b>	<b>1.00</b>	<b>1.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.07</b>	<b>0.55</b>	<b>1.00</b>					
		TM	<b>0.07</b>	<b>0.30</b>	<b>0.89</b>	<b>1.00</b>	<b>1.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.07</b>	<b>0.55</b>	<b>1.00</b>					
	Blood sugar score	MA	0.11	0.28	0.90	<b>1.00</b>	<b>1.00</b>	0.13	0.52	0.91	<b>0.99</b>	<b>1.00</b>					
		TM	0.96	0.98	1.00	<b>1.00</b>	<b>1.00</b>	0.67	0.89	0.97	<b>0.99</b>	<b>1.00</b>					

Abbreviations: MA, Medicare Advantage; TM, traditional Medicare.

<sup>a</sup>All differences between TM and MA are significant at  $P < .001$  unless marked in **bold**.

**Table 9.** Results for Tests of Proportion for Access to At Least 1 Higher Quality Obstetricians and Gynecologists.<sup>a</sup>

Miles		Large Metropolitan					Metropolitan					Micropolitan and Rural				
		15	30	60	120	240	15	30	60	120	240	15	30	60	120	240
HMO																
MA	50th percentile	0.86	0.97	1.00	<b>1.00</b>	<b>1.00</b>	0.66	0.80	0.91	0.98	<b>1.00</b>	0.30	0.33	0.46	<b>1.00</b>	<b>1.00</b>
		TM	1.00	1.00	1.00	<b>1.00</b>	<b>1.00</b>	0.93	0.98	0.99	1.00	<b>1.00</b>	0.74	0.90	1.00	<b>1.00</b>
MA	4 stars	0.82	0.95	0.99	1.00	<b>1.00</b>	0.62	0.78	0.89	0.96	1.00	0.00	0.01	0.45	<b>1.00</b>	<b>1.00</b>
		TM	1.00	1.00	1.00	1.00	<b>1.00</b>	0.92	0.98	0.99	1.00	1.00	0.36	0.89	1.00	<b>1.00</b>
MA	90th percentile	0.77	0.92	0.99	0.99	<b>1.00</b>	0.49	0.62	0.80	0.94	0.99	0.00	0.01	0.45	<b>1.00</b>	<b>1.00</b>
		TM	0.99	1.00	1.00	1.00	<b>1.00</b>	0.89	0.97	0.99	1.00	1.00	0.09	0.79	1.00	<b>1.00</b>
PPO																
MA	50th percentile	1.00	1.00	1.00	<b>1.00</b>	<b>1.00</b>	0.61	0.97	0.99	<b>1.00</b>	<b>1.00</b>					
		TM	1.00	1.00	1.00	<b>1.00</b>	<b>1.00</b>	0.94	0.99	0.99	<b>1.00</b>	<b>1.00</b>				
MA	4 stars	0.99	1.00	1.00	<b>1.00</b>	<b>1.00</b>	0.61	0.97	0.99	<b>1.00</b>	<b>1.00</b>					
		TM	1.00	1.00	1.00	<b>1.00</b>	<b>1.00</b>	0.94	0.99	0.99	<b>1.00</b>	<b>1.00</b>				
MA	90th percentile	0.71	0.99	1.00	<b>1.00</b>	<b>1.00</b>	0.17	0.48	0.91	<b>1.00</b>	<b>1.00</b>					
		TM	1.00	1.00	1.00	<b>1.00</b>	<b>1.00</b>	0.94	0.99	0.99	<b>1.00</b>	<b>1.00</b>				

Abbreviations: MA, Medicare Advantage; TM, traditional Medicare.

<sup>a</sup>All differences between TM and MA are significant at  $P < .001$  unless marked in **bold**.

metropolitan areas. When it comes to the highest quality providers, Medicare Advantage beneficiaries consistently fare worse.

The findings for endocrinologists (Table 5) are again inconsistent across the 2 quality measures used. Although findings

are mixed, generally, Medicare Advantage plans outperform traditional Medicare based on the *Kidney Testing* measure but often do worse when using the *Blood Sugar Testing* measure. However, at times, particularly at distances of 60 miles and

**Table 10.** Results for t Test for the Number of Higher Quality Cardiologists.<sup>a</sup>

Miles		Large Metropolitan												Metropolitan						Micropolitan and Rural																																																					
		15				30				60				120				240				15			30			60			120			240																																							
		MA	TM	%		MA	TM	%		MA	TM	%		MA	TM	%		MA	TM	%		MA	TM	%		MA	TM	%		MA	TM	%		MA	TM	%		MA	TM	%		MA	TM	%		MA	TM	%																									
HMO	50th percentile	29.14	90.04	32.36	22.87	72.03	31.75	13.22	44.54	29.68	10.77	38.55	27.94	5.20	15.64	33.25	8.28	28.04	29.53	9.97	97.1	10.27	6.75	77.6	8.70	4.38	48.35	9.06	3.76	42.00	8.95	0.99	17.15	5.77	2.21	30.65	7.21	29.14	90.04	32.36	22.87	72.03	31.75	13.22	44.54	29.68	10.77	38.55	27.94	5.20	15.64	33.25	8.28	28.04	29.53	9.97	97.1	10.27	6.75	77.6	8.70	4.38	48.35	9.06	3.76	42.00	8.95	0.99	17.15	5.77	2.21	30.65	7.21
	ACE score	67.33	206.08	32.67	51.69	161.47	32.01	29.14	97.62	29.85	10.77	38.55	27.94	16.77	32.14	33.23	17.28	58.64	29.47	25.21	222.93	11.31	16.12	174.31	9.25	10.57	106.17	9.96	8.52	90.86	9.38	2.13	35.22	6.05	5.08	64.12	7.92	67.33	206.08	32.67	51.69	161.47	32.01	29.14	97.62	29.85	10.77	38.55	27.94	16.77	32.14	33.23	17.28	58.64	29.47	25.21	222.93	11.31	16.12	174.31	9.25	10.57	106.17	9.96	8.52	90.86	9.38	2.13	35.22	6.05	5.08	64.12	7.92
	DIU score	98.28	313.14	31.39	88.25	241.15	31.12	41.46	143.45	28.90	32.3	120.72	26.76	14.27	43.91	32.50	23.03	81.56	28.24	43.59	337.41	12.92	28.17	258.32	10.91	17.12	155.85	10.98	13.03	131.38	9.92	3.33	48.27	6.90	7.29	89.00	8.19	98.28	313.14	31.39	88.25	241.15	31.12	41.46	143.45	28.90	32.3	120.72	26.76	14.27	43.91	32.50	23.03	81.56	28.24	43.59	337.41	12.92	28.17	258.32	10.91	17.12	155.85	10.98	13.03	131.38	9.92	3.33	48.27	6.90	7.29	89.00	8.19
	ACE score	114.24	401.25	28.47	91.43	309.83	28.48	48.79	181.84	26.83	38.52	153.79	25.05	16.4	52.61	31.17	26.7	100.17	26.65	53.95	426.52	12.65	36.91	326.56	11.30	21.56	195	11.06	17.40	165.76	10.50	4.81	57.29	8.40	8.81	108.32	8.13	114.24	401.25	28.47	91.43	309.83	28.48	48.79	181.84	26.83	38.52	153.79	25.05	16.4	52.61	31.17	26.7	100.17	26.65	53.95	426.52	12.65	36.91	326.56	11.30	21.56	195	11.06	17.40	165.76	10.50	4.81	57.29	8.40	8.81	108.32	8.13
	DIU score	117.71	432.51	27.22	94.3	335.03	27.29	49.56	190.47	26.02	39.44	161.59	24.41	16.77	55.19	30.39	27.35	104.78	26.10	55.90	456.47	12.25	38.90	350.54	11.10	22.00	202.94	10.84	18.00	172.93	10.41	5.00	59.94	8.34	9.00	112.89	7.97	117.71	432.51	27.22	94.3	335.03	27.29	49.56	190.47	26.02	39.44	161.59	24.41	16.77	55.19	30.39	27.35	104.78	26.10	55.90	456.47	12.25	38.90	350.54	11.10	22.00	202.94	10.84	18.00	172.93	10.41	5.00	59.94	8.34	9.00	112.89	7.97
	ACE score	102.54	333.15	33.53	36.61	261.6	33.05	30.61	43.13	26.73	34.72	127.5	25.53	14.08	42.75	32.94	23.93	84.04	28.47	46.83	375.42	12.47	32.02	291.15	11.00	17.48	172.11	10.16	15.06	147.55	10.21	4.28	49.87	10.61	8.58	98.29	8.13	102.54	333.15	33.53	36.61	261.6	33.05	30.61	43.13	26.73	34.72	127.5	25.53	14.08	42.75	32.94	23.93	84.04	28.47	46.83	375.42	12.47	32.02	291.15	11.00	17.48	172.11	10.16	15.06	147.55	10.21	4.28	49.87	10.61	8.58	98.29	8.13
	DIU score	47.26	140.93	33.53	36.61	261.6	33.05	30.61	43.13	26.73	34.72	127.5	25.53	14.08	42.75	32.94	23.93	84.04	28.47	20.36	146.83	13.87	14.68	113.84	12.90	6.52	65.05	10.02	6.19	54.77	11.30	1.92	18.10	10.61	3.14	36.66	8.57	47.26	140.93	33.53	36.61	261.6	33.05	30.61	43.13	26.73	34.72	127.5	25.53	14.08	42.75	32.94	23.93	84.04	28.47	20.36	146.83	13.87	14.68	113.84	12.90	6.52	65.05	10.02	6.19	54.77	11.30	1.92	18.10	10.61	3.14	36.66	8.57
	ACE score	0.30	1.33	22.56	0.30	1.10	27.27	0.00	0.00	0.17	0.00	0.44	68.18	0.00	0.04	0.00	0.30	0.41	73.17	1.87	16.6	11.27	11.95	9.54	0.51	6.01	8.49	0.70	5.88	11.90	0.36	1.20	30.00	0.36	0.70	3.76	9.57	0.30	1.33	22.56	0.30	1.10	27.27	0.00	0.00	0.17	0.00	0.44	68.18	0.00	0.04	0.00	0.30	0.41	73.17	1.87	16.6	11.27	11.95	9.54	0.51	6.01	8.49	0.70	5.88	11.90	0.36	1.20	30.00	0.36	0.70	3.76	9.57
	DIU score	2.68	34.51	7.77	2.74	31.2	10.14	8.78	13.39	6.35	1.16	1.67	12.73	0.00	0.00	0.00	0.30	0.41	26.32	5.56	42.18	3.41	31.26	10.91	1.37	15.69	8.73	1.48	14.06	10.53	0.62	3.43	18.08	0.70	8.85	7.91	2.68	34.51	7.77	2.74	31.2	10.14	8.78	13.39	6.35	1.16	1.67	12.73	0.00	0.00	0.00	0.30	0.41	26.32	5.56	42.18	3.41	31.26	10.91	1.37	15.69	8.73	1.48	14.06	10.53	0.62	3.43	18.08	0.70	8.85	7.91		
	ACE score	119.81	426.71	28.08	93.76	332.63	28.19	50.32	188.23	26.73	40.47	158.53	25.53	16.56	53.7	30.84	27.61	102.23	27.01	55.27	446.11	12.39	38.27	341.71	11.20	21.99	201.06	10.94	17.99	170.99	10.52	5.00	59.33	8.43	9.00	111.61	8.06	119.81	426.71	28.08	93.76	332.63	28.19	50.32	188.23	26.73	40.47	158.53	25.53	16.56	53.7	30.84	27.61	102.23	27.01	55.27	446.11	12.39	38.27	341.71	11.20	21.99	201.06	10.94	17.99	170.99	10.52	5.00	59.33	8.43	9.00	111.61	8.06
	DIU score	119.81	426.71	28.08	93.76	332.63	28.19	50.32	188.23	26.73	40.47	158.53	25.53	16.56	53.7	30.84	27.61	102.23	27.01	55.27	446.11	12.39	38.27	341.71	11.20	21.99	201.06	10.94	17.99	170.99	10.52	5.00	59.33	8.43	9.00	111.61	8.06	119.81	426.71	28.08	93.76	332.63	28.19	50.32	188.23	26.73	40.47	158.53	25.53	16.56	53.7	30.84	27.61	102.23	27.01	55.27	446.11	12.39	38.27	341.71	11.20	21.99	201.06	10.94	17.99	170.99	10.52	5.00	59.33	8.43	9.00	111.61	8.06
PPO	50th percentile	9.97	97.1	10.27	6.75	77.6	8.70	4.38	48.35	9.06	3.76	42.00	8.95	0.99	17.15	5.77	2.21	30.65	7.21	9.97	97.1	10.27	6.75	77.6	8.70	4.38	48.35	9.06	3.76	42.00	8.95	0.99	17.15	5.77	2.21	30.65	7.21	9.97	97.1	10.27	6.75	77.6	8.70	4.38	48.35	9.06	3.76	42.00	8.95	0.99	17.15	5.77	2.21	30.65	7.21																		
	ACE score	25.21	222.93	11.31	16.12	174.31	9.25	10.57	106.17	9.96	8.52	90.86	9.38	2.13	35.22	6.05	5.08	64.12	7.92	25.21	222.93	11.31	16.12	174.31	9.25	10.57	106.17	9.96	8.52	90.86	9.38	2.13	35.22	6.05	5.08	64.12	7.92	25.21	222.93	11.31	16.12	174.31	9.25	10.57	106.17	9.96	8.52	90.86	9.38	2.13	35.22	6.05	5.08	64.12	7.92																		
	DIU score	43.59	337.41	28.17	28.17	258.32	10.91	17.12	155.85	10.98	13.03	131.38	9.92	3.33	48.27	6.90	7.29	89.00	8.19	43.59	337.41	12.92	28.17	258.32	10.91	17.12	155.85	10.98	13.03	131.38	9.92	3.33	48.27	6.90	7.29	89.00	8.19	43.59	337.41	12.92	28.17	258.32	10.91	17.12	155.85	10.98	13.03	131.38	9.92	3.33	48.27	6.90	7.29	89.00	8.19																		
	ACE score	53.95	426.52	12.65	36.91	326.56	11.30	21.56	195	11.06	17.40	165.76	10.50	10.41	195	11.06	17.40	165.76	10.50	53.95	426.52	12.65	36.91	326.56	11.30	21.56	195	11.06	17.40	165.76	10.50	10.41	195	11.06	17.40	165.76	10.50	10.41	53.95	426.52	12.65	36.91	326.56	11.30	21.56	195	11.06	17.40	165.76	10.50	10.41																						
	DIU score	33.23	32.50	31.17	26.7	100.17	26.65	26.65	26.10	30.39	27.35	104.78	26.10	16.77	55.19	30.39	27.35	104.78	26.10	33.23	32.50	31.17	26.7	100.17	26.65	26.65	26.10	30.39	27.35	104.78	26.10	16.77	55.19	30.39	27.35	104.78	26.10	33.23	32.50	31.17	26.7	100.17	26.65	26.65	26.10	30.39	27.35	104.78	26.10	16.77	55.19																						

**Table 11.** Results for t Test for the Number of Higher Quality Endocrinologists.<sup>a</sup>

	Miles	Large Metropolitan					Metropolitan					Micropolitan and Rural							
		15	30	60	120	240	15	30	60	120	240	15	30	60	120	240			
HMO	50th percentile	Kidney score	MA	3.90	10.24	16.36	20	20.35	1.21	3.13	9.45	19.43	21.95	0.00	0.00	0.64	1.25	1.27	
		TM	14.17	37.3	59.32	73.72	79.43	3.10	9.01	30.05	65.02	79.61	0.06	0.76	7.66	35.5	73.71		
	Blood sugar score	MA	27.52	27.45	27.58	27.13	25.62	39.03	34.74	31.45	29.88	27.57	0.00	0.00	8.36	3.52	1.72		
		TM	4.09	10.75	17.50	20.85	21.53	1.37	3.73	10.29	20.81	23.42	0.00	0.00	0.64	1.25	1.26		
	4 stars	Kidney score	MA	20.02	49.66	77.60	94.45	103.71	3.65	10.98	36.76	81.91	101.87	0.21	1.75	9.27	35.93	82.54	
		TM	20.43	21.65	22.55	22.08	20.76	37.53	33.97	27.99	25.41	22.99	0.00	0.00	6.90	3.48	1.53		
	PPO	50th percentile	Kidney score	MA	0.88	2.55	4.5	5.43	5.44	0.38	1.08	2.81	5.64	6.34	0.00	0.00	0.3	0.31	0.31
			TM	2.79	7.97	14.43	17.97	18.07	0.96	2.62	7.09	15.21	18.22	0.00	0.13	1.82	6.28	13.68	
		90th percentile	Blood sugar score	MA	31.54	31.99	31.19	30.22	30.11	39.58	41.22	39.63	37.08	34.80	0.00	0.00	16.48	4.94	2.27
			TM	2.68	6.38	10.52	12.35	12.97	0.95	2.28	6.24	12.54	14.07	0.00	0.00	0.61	0.94	0.94	
4 stars		Blood sugar score	MA	11.42	26.73	42.21	51.29	56.96	2.36	6.00	19.57	44.28	54.83	0.12	0.93	4.44	14.67	35.63	
		TM	23.47	23.87	24.92	24.08	22.77	40.25	38.00	31.89	28.32	25.66	0.00	0.00	13.74	6.41	2.64		
PPO		50th percentile	Kidney score	MA	0.02	0.09	0.25	0.28	0.28	0.00	0.00	0.03	0.22	0.37	0.00	0.00	0.00	0.00	0.00
			TM	0.1	0.32	0.89	1.00	1.00	0.00	0.02	0.14	0.67	1.09	0.00	0.00	0.3	0.88	1.83	
		90th percentile	Blood sugar score	MA	20.00	28.13	28.09	28.00	28.00	0.00	0.00	21.43	32.84	33.94	0.00	0.00	0.00	0.00	0.00
			TM	0.88	2.12	3.6	4.47	4.54	0.17	0.69	2.55	4.87	5.29	0.00	0.00	0.00	0.00	0.00	
	4 stars	Blood sugar score	MA	4.73	11.08	17.81	21.02	22.34	0.64	2.15	8.3	18.03	21.57	0.00	0.01	1.29	4.41	12.46	
		TM	18.60	19.13	20.21	21.27	20.32	26.56	32.09	30.72	27.01	24.52	0.00	0.00	0.00	0.00	0.00		
	PPO	50th percentile	Kidney score	MA	1.30	3.78	7.58	9.93	12.00	0.42	1.47	4.37	8.97	11.00	0.00	0.00	0.00	0.00	0.00
			TM	14.75	39.23	62.08	76.13	81.9	3.61	10.1	31.44	71.7	79.26	0.00	0.00	0.00	0.00	0.00	
		90th percentile	Blood sugar score	MA	8.81	9.64	12.21	13.04	14.65	11.63	14.55	13.90	12.51	13.88	0.00	0.00	0.00	0.00	0.00
			TM	1.27	3.69	7.44	9.93	11.91	0.47	1.66	4.59	9.26	10.8	0.00	0.00	0.00	0.00	0.00	
4 stars		Kidney score	MA	21.38	53.31	82.96	99.58	108.75	4.18	12.22	38.86	92.48	104.79	0.00	0.00	0.00	0.00	0.00	
		TM	5.94	6.92	8.97	9.97	10.95	11.24	13.61	11.81	10.01	10.31	0.00	0.00	0.00	0.00	0.00		
90th percentile		Blood sugar score	MA	0.46	1.34	2.83	3.98	4.00	0.13	0.55	1.78	3.52	4.00	0.00	0.00	0.00	0.00	0.00	
		TM	2.95	8.46	15.38	18.9	19.00	1.11	3.03	7.89	17.3	19.00	0.00	0.00	0.00	0.00	0.00		
PPO		50th percentile	Kidney score	MA	0.57	1.55	3.71	4.98	6.91	0.13	0.79	2.93	4.96	5.81	0.00	0.00	0.00	0.00	0.00
			TM	12.23	28.96	45.7	55.01	60.82	2.92	7.03	21.27	51.55	58.57	0.00	0.00	0.00	0.00	0.00	
	90th percentile	Blood sugar score	MA	4.66	5.35	8.12	9.05	11.36	4.45	11.24	13.78	9.62	9.92	0.00	0.00	0.00	0.00	0.00	
		TM	0.07	0.30	0.89	1.00	1.00	0.00	0.00	0.07	0.55	1.00	0.00	0.00	0.00	0.00	0.00		
	4 stars	Blood sugar score	MA	0.07	0.30	0.89	1.00	1.00	0.00	0.00	0.07	0.55	1.00	0.00	0.00	0.00	0.00	0.00	
		TM	100.00	100.00	100.00	100.00	100.00	0.00	0.00	100.00	100.00	100.00	0.00	0.00	0.00	0.00	0.00		
	90th percentile	Blood sugar score	MA	0.25	0.72	2.72	3.98	4.00	0.13	0.73	2.52	3.97	4.00	0.00	0.00	0.00	0.00	0.00	
		TM	5.07	12.03	19.34	22.64	24.00	0.82	2.59	9.35	21.35	23.5	0.00	0.00	0.00	0.00	0.00		
	4 stars	Blood sugar score	MA	4.93	5.99	14.06	17.58	16.67	15.85	28.19	26.95	18.59	17.02	0.00	0.00	0.00	0.00	0.00	
		TM	18.60	19.13	20.21	21.27	20.32	26.56	32.09	30.72	27.01	24.52	0.00	0.00	0.00	0.00	0.00		

Abbreviations: MA, Medicare Advantage; TM, traditional Medicare.

<sup>a</sup>All differences between TM and MA are significant at P < .001 unless marked in bold.

**Table 12.** Results for t Test for the Number of Higher Quality Obstetricians and Gynecologists.<sup>a</sup>

Miles	Large Metropolitan					Metropolitan					Micropolitan and Rural					
	15	30	60	120	240	15	30	60	120	240	15	30	60	120	240	
<b>HMO</b>																
50th percentile	MA	17.68	44.66	71.7	86.38	91.97	4.16	12.69	41.63	85.51	101.72	0.30	0.33	5.21	9.18	13.08
	TM	94.46	232.92	376.84	493.67	567.67	18.33	50.61	176.55	417.81	561.95	2.85	16.02	62.8	256.34	574.4
	%	18.72	19.17	19.03	17.50	16.20	22.70	25.07	23.58	20.47	18.10	10.53	2.06	8.30	3.58	2.28
4 stars	MA	10.15	25.65	42.74	53.14	56.86	2.98	8.86	26.8	52.72	62.48	0.00	0.01	3.20	5.16	7.82
	TM	53.78	133.97	224.33	300.63	344.47	12.63	34.61	112.62	257.47	340.19	1.39	8.84	36.08	152.46	336.11
	%	18.87	19.15	19.05	17.68	16.51	23.59	25.60	23.80	20.48	18.37	0.00	0.11	8.87	3.38	2.33
90th percentile	MA	6.14	15.42	25.44	30.06	31.83	1.23	4.42	14.94	29.2	34.35	0.00	0.01	1.90	3.28	4.77
	TM	26.58	66.97	110.66	142.44	162.6	5.08	16.48	55.95	124.4	160.54	0.52	3.97	16.66	70.18	152.41
	%	23.10	23.03	22.99	21.10	19.58	24.21	26.82	26.70	23.47	21.40	0.00	0.25	11.40	4.67	3.13
<b>PPO</b>																
50th percentile	MA	8.11	23.79	52.81	65.95	74.46	1.36	6.70	28.78	60.38	70.8					
	TM	99.11	246.72	395.29	509.9	581.75	21.18	55.19	178.29	445.58	550.37					
	%	8.18	9.64	13.36	12.93	12.80	6.42	12.14	16.14	13.55	12.86					
4 stars	MA	4.48	13.29	31.74	42.17	45.83	1.23	5.02	19.55	38.32	44.61					
	TM	56.34	141.78	235.06	310.72	353.73	14.77	38.47	115.64	277.38	335.47					
	%	7.95	9.37	13.50	13.57	12.96	8.33	13.05	16.91	13.81	13.30					
90th percentile	MA	2.56	8.00	18.16	22.75	24.91	0.34	2.60	11.11	21.52	24.28					
	TM	27.98	71.35	116.4	147.57	167.5	5.66	17.91	57.73	135.77	159.54					
	%	9.15	11.21	15.60	15.42	14.87	6.01	14.52	19.24	15.85	15.22					

Abbreviations: MA, Medicare Advantage; TM, traditional Medicare.

<sup>a</sup>All differences between TM and MA are significant at  $P < .001$ .

above, Medicare Advantage plans outperform traditional Medicare. These discrepancies may hail from an overall limited number of endocrinologists in the state, which means that the inclusion or exclusion of even a small number of providers may significantly alter network composition. Additionally, again note the complete lack of access at close distances to endocrinologists in micropolitan and rural areas. These findings are consistent for both quality measures. When available, Medicare Advantage beneficiaries appear to be subject to networks with significant restrictions when it comes to the most restrictive quality indicators, while they do better when using the medium-restrictive quality grouping.

Finally for OB/GYNs (Table 6), HMO plans in Medicare Advantage in large and standard metropolitan areas fare slightly worse for the least restrictive quality indicators but generally better in the more restrictive quality indicators. In micropolitan and rural areas, although results are similar, there are significantly worse results for Medicare Advantage plans for distances up to 60 miles for the star ratings measure and the 90th percentile measure. Medicare Advantage beneficiaries in PPO plans are more mixed but generally similar to HMOs.

Overall, these initial analyses indicate several important findings. Generally, there appear to be only limited differences in overall network composition, that is, the percentage of providers in a network of higher quality, in large and standard metropolitan areas between Medicare Advantage and traditional Medicare in both HMOs and PPOs. However, when it comes to the most restrictive quality grouping, particularly at distances up to 30 and perhaps 60 miles at times, traditional Medicare beneficiaries appear to have networks of somewhat

better quality, particularly for cardiologists and endocrinologists. That is, Medicare Advantage plans do at times not include the providers of the highest quality. Most importantly, there are significant concerns for Medicare Advantage beneficiaries in micropolitan and rural areas, where higher quality providers close to home are consistently excluded from networks. A significant degree of restrictions appears to linger well into farther distance levels, as well. In short, there appears to be no selective contracting for *higher* quality in Medicare Advantage when it comes to the 3 specialties under consideration in California.

### Contracting and Minimum Access

One of the detriments of selective contracting may be that beneficiaries in certain areas may be left without access to a provider closer to home because the insurers and the provider could not agree on a contract amenable to both parties. Although this may contain overall costs for insurers and consumers, it may result in problems for consumers when they try to access services. The proportion of census block groups left without access to at least 1 provider of higher quality at various distance levels thus captures a potential downside of selective contracting in Medicare Advantage as compared to traditional Medicare.

For cardiologists (Table 7), the findings are consistent across both PPOs and HMOs in large metropolitan areas. In both cases, Medicare Advantage and traditional Medicare plans generally provide almost universal access, while there are some limitations at very short distance levels. This holds

particularly for access to providers in the 90th percentile and above. In standard metropolitan areas, findings are similar across HMO and PPOs plans up to 60 miles. In both cases, Medicare Advantage plans leave a significant proportion of census block groups without access at distances up to 60 miles. However, for HMOs, this persists up to 120 miles. While some of this is the result of a general lack of providers, particularly at the 15-mile distance level, a significant proportion of the restriction hails from insurers' network decisions. In all cases, most access levels deteriorate relatively as quality groupings become more restrictive.

Again, access is particularly challenging in micropolitan and rural areas. Lack of providers accounts for much of the limitations at 15 miles but insurers' network decisions bear the brunt at 30 miles and above. Generally, a majority of census block groups in Medicare Advantage plans are without access. These restrictions are persistent even at distances up to 120 miles for all quality indicators and up to 240 miles for the 4-star rating and 90th percentile groupings. The restrictions on providers of highest quality (4 stars or 90th percentile) are particularly concerning. The findings are generally similar for both endocrinologists (Table 8) and OB/GYNs (Table 8). However, access to the highest quality endocrinologists close to home is often limited. Moreover, access levels for OB/GYNs in micropolitan and rural areas in Medicare Advantage plans catch up to those in traditional Medicare by 120 miles.

These second set of findings raise concerns about the restrictiveness of Medicare Advantage plans in both standard metropolitan areas, and even more so in micropolitan and rural areas. Restrictions in the former are clearly present up to 30 and 60 miles, respectively, and up to even larger distances for the latter. As mentioned previously, these limitations are not an artifact of the distribution of providers in general, as access for beneficiaries in traditional Medicare, at worst, reaches generally close to universal levels at 30 miles in standard metropolitan areas or 60 distance in micropolitan and rural areas.

### **Selectively Contracting and Beneficiary Choice**

One of the most evident results of selective contracting is, by definition, the reduction in consumer choice among providers. The absolute number of providers offers important insights. Moreover, a subsequent comparison in percentage terms between Medicare Advantage and traditional Medicare provides a good indication about the degree of network constriction. Notably, here I am only interested in providers of higher quality.

With regard to cardiologists (Table 10), Medicare Advantage beneficiaries of HMOs in large and standard metropolitan areas have access to networks that include about 25% to 35% of the number of providers of traditional Medicare. While the overall number of providers, particularly at shorter distances, is much larger in metropolitan areas, the absolute percentage value is larger in the latter. The findings hold across both quality measures. For micropolitan and rural areas, access to providers for Medicare Advantage beneficiaries is decidedly

limited. While some of this is again an artifact of provider locations, this only accounts for access limitations at short distances. Not surprisingly, percentage values are rather large at shorter distances. However, consumer choice is significantly limited by insurers at 60 miles and even more so at larger distances. For PPOs, the absolute number of providers in network as well as the percentage value is significantly lower as compared to HMOs, generally hovering around 10%.

Similarly, with regard to endocrinologists (Table 11), Medicare Advantage beneficiaries in HMO plans have a larger number of providers to choose from as compared to PPO plans in absolute and percentage terms. Again, the absolute number of providers is larger in large metropolitan areas as compared to standard metropolitan areas. However, the reverse holds in percentage terms with a difference of about 10% to 15% points. For both PPOs and HMOs, percentages are lower with regard to the *Blood Sugar Testing* measure as compared to the *Kidney Testing* measure. Again, in micropolitan and rural areas, access limitations are the result of provider locations at shorter distances and insurers at distances of 60 miles and above. Overall, it is noteworthy that there is a limited number of endocrinologists in the state with 4-star ratings or in the 90th percentile and above.

For OB/GYNs (Table 12), the results are once again similar. Better access in HMOs in absolute and percentage terms, better access in absolute terms in large metropolitan areas than in standard metropolitan areas, but vice versa in percentage terms. And again, significant access limitations in micropolitan and rural areas as a result of provider location and network decisions.

### **Accounting for the Particularities of the California Market**

While utilizing the CMS typology for urbanity allows for controlling of important characteristics, concerns may arise about the significant market position of Kaiser Permanente and its unique provider model. As a result, I reestimated all previous analyses without Kaiser Permanente plans included (omitted). As Kaiser Permanente plans are only sold as HMOs, this does not affect the findings presented above for PPOs. Although overall access numbers improve across the board, due to the concentrated nature of its operations on campuses, the exclusion of Kaiser Permanente Medicare Advantage plans has no substantive influence on findings in large and standard metropolitan regions. However, there are substantive differences for micropolitan and rural areas. Here, large improvements in access are apparent for the star ratings measures and the 50th percentile measures, particularly at distances of 60 miles and above, while the effect on the 90th percentile measure is rather moderate in absolute terms. Overall, the findings are thus by-and-large consistent.

### **Discussion and Limitations**

Medicare Advantage plans have seen remarkable enrollment growth over the past decade. However, an assessment of the

implications for beneficiaries, particularly when it comes to provider access, has been rare. This study addresses this lack of research by looking at 3 important specialties in the nation's largest state whose Medicare Advantage penetration rate also exceeds the national average. The findings equally provide comfort and raise alarms for those concerned about network restrictions in Medicare Advantage.

When focusing solely on provider quality, and using the approaches presented above, there appears to be little cause for concern. Depending on the specialty, findings with regard to quality are mixed. Importantly, substantive differences are generally small. This holds for mean and median network quality as well as the percentage of networks made up of higher quality providers. However, at times concerns are apparent with regard to the inclusion of the providers of the highest quality, that is, those in the 90th percentile or above. Insurers may be hesitant to include these providers as they are likely to demand a premium to enter into contracts.

However, these quality findings must be understood in connection to access to providers. That is, while quality in Medicare Advantage as compared to traditional Medicare may be comparable, perhaps even better in some cases, this may be an artifact of the network restrictions imposed by insurers. As a result, even beneficiaries in standard metropolitan areas often see themselves constricted in their access to higher quality providers. Choices in terms of the number of available providers are often rather limited. At times, a significant proportion of them may have to travel 30, 60, or even 120 miles to remedy these access limitations. Some of this is foreshadowed in the presentation of findings focusing solely on quality described in the previous paragraph, particularly in metropolitan and rural areas.

These restrictions may cause problems for seniors. Yet, the most persistent and substantively large problems are faced of Medicare Advantage beneficiaries in metropolitan and rural areas. Here lack of providers is exacerbated by often very restrictive networks that often make travel of 120 miles, even 240 miles or more, necessary. Traveling at those distances to see a doctor may be prohibitive for many seniors. The findings of restricted access to specialists in Medicare Advantage seem to be in line with several findings from the Affordable Care Act when it comes to specialists access.<sup>15-17</sup> Particularly, the analysis here also adds to findings from research on the Affordable Care Act that shows rural areas as particularly challenged when it comes to network access.<sup>5,18</sup>

More generally, the findings here indicate that current approaches to thinking about provider network breadth, as well as the way provider networks are regulated, may be inadequate. For one, current approaches fail to take into account provider quality in general.<sup>7</sup> This appears to discourage insurance carriers from seeking out provider of the highest quality. Excessive price demands by providers, particularly when in a monopolistic position, may play an important role here, too, particularly outside large metropolitan areas, where significant number of providers are competing with each other. Yet, provider access is the crucial step that connects insurance coverage

with treatment, and assessments of provider quality can only be meaningful in connection with assessments of provider access. Arguably, beneficiaries are likely to value provider networks more that offer access closer to home. Similarly, they may be relatively indifferent about larger choices hundreds of miles away from their home. However, they may be willing to travel certain distances in order to obtain higher quality care. Again, current regulatory approaches, as well as scholarly assessment, fail to take this important characteristic into consideration. As findings here indicate, accounting for the distance between beneficiaries and providers is crucially important as network breadth is dynamic. Trade-offs are apparent at the individual level and hard to holistically regulate. However, regulating these complex systems is challenging and bottom-up approach, and providing additional transparency and information for consumers may be the first tangible step forward.<sup>10</sup> Nonetheless, creative solution to improve access in rural America is crucially moving forward.

There are limitations to this study. For one, it is limited to only 1 state, California. Naturally, this raises concerns about how generalizable the findings are. Differentiating by urbanity alleviates some concerns, as does the fact that the results hold with and without Kaiser Permanente included. Nonetheless, the Medicare Advantage market in California differs from other states such as New York, with many more plans and carriers present. The study is also focused only on 3 specialties and relies only limited measures of quality focusing on process and not outcomes. However, the specialties are crucial for seniors,<sup>16</sup> and various patterns are consistent across specialties and measures. Moreover, the underlying drivers of health care and insurance markets are not unique to California. I may also not be able to capture all of the state's providers. However, given the market share of the insurers providing data for the quality measures, I am nonetheless confident that the vast majority of providers are included. Similarly, I focus here on local and not regional plans. Given detailed enrollment numbers at the census tract level, I also cannot directly include the number of beneficiaries per plan and area. Again, this does not diminish the overall patterns that have become apparent. Finally, network data were not available for all plans offered in California. This is unfortunate, but it is worth reiterating that underlying market forces are consistent for all carriers. In addition, no apparent pattern emerges with regard to the missing plans, and a significant majority of plans and beneficiaries are included here. Finally, I am restricted to the quality measures available. However, the measures are vetted and deemed appropriate for the specialties by prominent national entities.

Overall, there appears to be no evidence for selective contracting for higher quality in Medicare Advantage when it comes to the 3 specialties under consideration in California. Nonetheless, beneficiaries in large metropolitan areas seem to fare similar or only slight worse than their peers in traditional Medicare in terms of quality and there are no concerns about provider access. However, in metropolitan and rural areas, and to a degree even in standard metropolitan areas, significant concerns become apparent, and network decisions by insurers

and providers significantly contribute the access limitations. Notably, PPOs do not necessarily outperform HMOs in terms of access and quality. Perks in Medicare Advantage may make up for the need to incur longer driving time for some. Yet, others may find themselves unable to access vital services due to transportation issues. With growth in Medicare Advantage continuing, more scrutiny of the consequences becomes imperative. For now, consumers are best served by diligently assessing provider networks on their own before making purchasing decisions.

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### Notes

1. All 3 specialties are subject to time and distance regulations by the Centers for Medicare and Medicaid Services (CMS).<sup>8</sup>
2. Unfortunately, the network data provided by Vericred do not include all Medicare Advantage networks. However, it provides data for the vast majority of enrollees. In California, plans included provide coverage to about 1.13 million beneficiaries. Data for 170 000 beneficiaries (22%) are not available. Similarly, data are available for 230 of the state's 263 distinct Medicare Advantage plans.
3. For details, see <http://www.chpis.org/>.
4. For a technical explanation of the ratings approach, see [https://caqualityratings.org/attachments/Cycle2Rating\\_Methods.pdf](https://caqualityratings.org/attachments/Cycle2Rating_Methods.pdf).
5. Not all quality measures are available for all physicians. A certain minimum amount of data is required for CHPI to establish a quality rating.
6. The terms overall physician supply and traditional Medicare are henceforth used interchangeably where appropriate.
7. Vericred was funded by the Robert Wood Johnson Foundation to provide these data to researchers.
8. The distances were established using ArcGIS 10.5. The distances were chosen because of their prevalence in network regulations.
9. I utilize these distances because they are frequently used by regulators.

### References

1. Kaiser Family Foundation. *Medicare Advantage*. Menlo Park, CA: Kaiser Family Foundation; 2017.
2. Institute for the Future. *The History of California's Health Care: The History of the Health Safety Net, the Rise of Managed Care, the Role of Public Policy*. Menlo Park, CA: Institute for the Future; 1997.
3. Hall MA, Ginsburg PB. *A Better Approach Regulating Provider Adequacy*. Washington, DC: The Brookings Institution; 2017.
4. Giovannelli J, Lucia K, Corlette S. *Regulation of Health Plan Provider Networks*. Bethesda, MD: Health Affairs; 2016.
5. Haeder SF, Weimer DL, Mukamel DB. California hospital networks are narrower in marketplace than in commercial plans, but

- access and quality are similar. *Health Aff (Milwood)*. 2015;34(5):741-748.
6. Polsky D, Weiner J. *The Skinny on Narrow Networks in Health Insurance Marketplace Plans*. Philadelphia, PA: Leonard Davis Institute of Health Economics; 2015.
  7. Haeder SF, Weimer DL, Mukamel DB. Narrow networks and the affordable care act. *JAMA*. 2015;314(7):669-670.
  8. Centers for Medicare & Medicaid Services. *Contract Year (CY) 2017 Medicare Advantage Health Service Delivery (HSD) Provider and Facility Specialties and Network Adequacy Criteria Guidance and Methodology*. Baltimore, MD: Centers for Medicare & Medicaid Services; 2016.
  9. Jacobson G, Damico A, Neuman T. *Medicare Advantage 2018 Data Spotlight: First Look*. Menlo Park, CA: Kaiser Family Foundation; 2017.
  10. Mukamel DB, Haeder SF, Weimer DL. Top-down and bottom-up approaches to health care quality: the impacts of regulation and report cards. *Annu Rev Public Health*. 2014;35(1):477-497.
  11. Gormley WT Jr, Weimer DL. *Organizational Report Cards*. Cambridge, MA: Harvard University Press; 1999.
  12. California Healthcare Performance Information System. *Methods for Rating Physicians and Practice Sites – Cycle 2*. San Francisco, CA: California Healthcare Performance Information System; 2017.
  13. Zhu JM, Zhang Y, Polsky D. Networks in ACA marketplaces are narrower for mental health care than for primary care. *Health Aff (Milwood)*. 2017;36(9):1624-1631.
  14. Polsky D, Weiner J, Zhang Y. Narrow networks on the individual marketplace in 2017. 2017;21(8):1-6.
  15. Schleicher SM, Mullangi S, Feeley TW. Effects of narrow networks on access to high-quality cancer care. *JAMA Oncol*. 2016;2(4):427-428.
  16. Dorner SC, Jacobs DB, Sommers BD. Adequacy of outpatient specialty care access in marketplace plans under the affordable care act. *JAMA*. 2015;314(16):1749-1750.
  17. Yasaitis L, Bekelman JE, Polsky D. Relation between narrow networks and providers of cancer care. *J Clin Oncol*. 2017;35(27):3131-3135. doi:10.1200/JCO.2017.2073.2040.
  18. Haeder SF, Weimer DL, Mukamel DB. Secret shoppers find access to providers and network accuracy lacking for those in marketplace and commercial plans. *Health Aff (Milwood)*. 2016;35(7):1160-1166.

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