

## Physician Service Use and Participation in Medicaid, 2009

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**T**here has long been concern about provider participation in Medicaid and access to care by Medicaid beneficiaries. Many reasons have been cited for low physician participation, including low reimbursement rates, payment delays, administrative burden, and difficult or noncompliant beneficiaries. This study uses data from the Medicaid Analytic eXtract Provider Characteristics (MAXPC), which links provider characteristics to MAX claims data, to examine physician service use and participation in Medicaid. Findings show that 59.0 percent of enrollees across 24 states were served by a physician at least once in 2009—ranging from 76.5 percent of enrollees in Kentucky to 21.4 percent in Delaware. Average Medicaid caseloads (enrollees served per physician) varied from 87.0 in Louisiana to 11.2 in Wyoming. The vast majority of services (93.9 percent) were delivered by in-state physicians. Of all active physicians in the states, at least 32.8 percent did not participate in Medicaid in 2009, and of the physicians who served Medicaid patients, 18.2 percent served 5 or fewer enrollees that year. Combining these results, over 50 percent of all active physicians either did not participate in Medicaid in 2009 or served 5 or fewer enrollees. These low overall participation rates suggest that more effort should be made to improve physician participation in Medicaid and to ensure adequate access within substate areas. This issue will likely come to the forefront as more than 16 million new enrollees enter Medicaid under the provisions of the Affordable Care Act (ACA).

### Background

There has long been concern about physician participation in Medicaid and enrollee access to care. Many reasons have been cited for low physician participation including low reimbursement rates (Johnson 2005; Cunningham and May 2006; Sloan et al. 1999; Mittler and Gold 2003), payment delays (Cunningham and O'Malley 2009), administrative burden (Cunningham and May 2006; Cunningham and O'Malley 2009; Sloan et al. 1999; Mittler and Gold 2003), and difficult or noncompliant beneficiaries (Mittler and Gold 2003). It has been argued that participation

### About This Series

The MAX Medicaid policy issue brief series highlights the essential role MAX data can play in analyzing the Medicaid program. MAX is a set of annual, person-level data files on Medicaid eligibility, service utilization, and payments that are derived from state reporting of Medicaid eligibility and claims data into the Medicaid Statistical Information System (MSIS). MAX is an enhanced, research-friendly version of MSIS that includes final adjudicated claims based on the date of service, and data that have undergone additional quality checks and corrections. CMS produces MAX specifically for research purposes. For more information about MAX, please visit: <http://www.cms.gov/Research-Statistics-Data-and-Systems/Computer-Data-and-Systems/MedicaidDataSourcesGenInfo/MAXGeneralInformation.html>.

decisions by physicians are negatively associated with practice costs, competition for paying patients, board certification, and the difference between marginal revenue derived from paying patients<sup>1</sup> and Medicaid patients (Tucker 2002). Some researchers argue that increasing payment schedules encourages participation. Decker (2012) found that higher Medicaid-to-Medicare fee ratios were correlated with greater acceptance of new Medicaid patients. Takach (2011) stated that modest increases in payment to physicians have improved access. However, several studies have suggested that provider participation is somewhat inelastic with respect to payment increases or decreases (Bindman et al. 2003; Cossman et al. 2006; Coburn et al. 1999; Shen and Zuckerman 2005). Some studies have been inconclusive concerning the effect that increased Health Maintenance Organization penetration has had on provider participation in Medicaid (Adams and Herring 2008; Bindman et al. 2003). One study showed that the implementation of Primary Care Case Management (PCCM) programs<sup>2</sup> was associated with reductions in the proportion of

physicians participating in Medicaid, reductions in the number of very small Medicaid practices, and declines in Medicaid visit volumes across all participating physicians (Adams et al. 2003). Another noted that concerns about provider participation and access may be exacerbated by linking Medicaid and Children's Health Insurance Program (CHIP) plans (Bronstein et al. 2004). Finally, Santerre (2002) noted that reimbursement rate variations across states affect provider participation.

When examining trends, Cunningham and May (2006) found that participation declined between 1996–1997 and 2004–2005. Another study showed that increases in Medicaid physician fees between 2003 and 2008 were below the inflation rate, resulting in a reduction in real fees (Zuckerman et al. 2009). Cunningham and Hadley (2008) observed that physicians are less willing to accept both Medicaid and uninsured patients, treating charity and Medicaid patients as substitutes for each other rather than as similar types of patients. In addition, Cunningham and May (2006) stated that Medicaid patient care is becoming increasingly concentrated among a smaller proportion of physicians who tend to practice in large groups, hospitals, academic medical centers, and community health centers. It appears that a broad range of factors must be considered to increase Medicaid enrollee access to physicians (Cunningham and Nichols 2005). These findings are particularly troubling given that the anticipated growth of Medicaid enrollment in many states, triggered by provisions of the ACA, will outpace growth in the number of primary care physicians willing to treat new Medicaid patients (Cunningham 2011).

The analyses presented here are different from many previous studies in that they use Medicaid program data from MAX, MAXPC, the National Plan and Provider Enumeration System (NPPES), and the American Medical Association (AMA) Master File to examine physician participation in Medicaid across 24 states in 2009.

## Data

States must submit person-level data on Medicaid enrollment, services, and payments to the Centers for Medicare & Medicaid Services (CMS) through MSIS (CMS 2010). Because the MSIS administrative data cannot easily be used for research, CMS developed MAX data—person-level enrollment and event-level services data for each Medicaid enrollee and each Medicaid expansion CHIP enrollee. MAX data are annual state-specific data files in which MSIS records are aggregated by calendar year. Interim MSIS transactions are adjusted to produce final-action records.

A substantial number of other edits and validation activities enhance the usefulness and quality of MAX data. Although MAX data are widely used for research and policy analysis on many topics, their utility for research on provider issues has been limited because service records contained only state-assigned provider identifiers. Beginning with fiscal year 2009, the MSIS data collection includes national provider identifiers (NPIs) on service records. Because NPIs are now available for many providers in MAX, CMS contracted with Mathematica Policy Research to design and construct the MAXPC data<sup>3</sup> (Bencio et al. 2010; Sykes and Bencio 2012).

## Methods

Using MAXPC as the primary data source, this study includes all Medicaid and Medicaid expansion CHIP enrollees who were enrolled at any time during 2009. The study is limited to providers with a primary taxonomy classification of allopathic physicians (MDs) or osteopathic physicians (DOs). It includes all active physicians who served Medicaid enrollees regardless of the place of services (physician office, clinic, or hospital emergency room<sup>4</sup>). It also includes all claims<sup>5</sup> for services delivered by those physicians, but it does not include all claims identified as physician services<sup>6</sup> because some of these services may have been provided by other medical professionals, such as physician assistants or nurse practitioners, under the supervision of a physician. It is further limited to 24 of the 25 states where the usability of the servicing provider identifier for research was determined to be “good” or “fair”<sup>7,8</sup> (Sykes and Bencio 2012).

National physician data were obtained from two sources:

1. Extract data from the AMA Master File as reported in the 2009 Area Resource File (ARF) as of December 31, 2008 (Health Resources and Services Administration 2012). For each state, data from two series were summed: active non-federal MDs and DOs.
2. NPPES data as of May 2010 (CMS 2010). Counts by state were limited to active MDs and DOs.

## Findings

Our findings are in four categories: (1) the number of physicians serving Medicaid enrollees and average physician caseload, (2) the distribution of Medicaid physician caseload across physicians, (3) enrollees served by in-state and out-of-state physicians, and (4) physician participation rates in Medicaid.

## Physicians Serving Medicaid Enrollees and the Average Physician Caseload

Among the 24 states, more than 21 million people were enrolled in Medicaid at some point in 2009 (Table 1). More than 12.5 million of them (59.0 percent) were served by a physician at least once during the year, with Kentucky reporting the highest rate (76.5 percent) of enrollees and Delaware the lowest (21.4

percent). More than 267,000 physicians served Medicaid enrollees. For these states, the average number of Medicaid enrollees per physician was 79.9 and the average caseload per physician was 47.1 enrollees. Both rates varied substantially across states. The number of enrollees per physician ranged from 15.4 (in Wyoming) to 140.8 (in Arizona); average caseload ranged from 11.2 (in Wyoming) to 87.1 (in Louisiana).

**Table 1. Number of Medicaid Enrollees and Number of Physicians<sup>a</sup> Serving Medicaid Enrollees, by State,<sup>b</sup> 2009**

State	Medicaid Enrollees <sup>c</sup>			Physicians		
	Number	Number Served by a Physician	Percent Served by a Physician	Number	Enrollees per Physician	Average Medicaid Caseload per Physician
Alabama	975,001	641,101	65.8	9,293	104.9	69.0
Alaska	133,037	89,229	67.1	3,356	39.6	26.6
Arizona	1,846,157	1,126,818	61.0	13,110	140.8	86.0
Arkansas	778,940	533,327	68.5	6,992	111.4	76.3
Colorado	728,719	392,659	53.9	8,178	89.1	48.0
Connecticut	598,844	345,688	57.7	10,508	57.0	32.9
Delaware	213,081	45,573	21.4	3,302	64.5	13.8
Florida	3,559,611	2,257,777	63.4	30,689	116.0	73.6
Indiana	1,215,609	350,438	28.8	15,709	77.4	22.3
Iowa	545,646	358,209	65.6	11,781	46.3	30.4
Kansas	381,634	196,655	51.5	7,851	48.6	25.0
Kentucky	959,195	734,144	76.5	14,613	65.6	50.2
Louisiana	1,283,056	914,930	71.3	10,499	122.2	87.1
Massachusetts <sup>d</sup>	1,520,872	564,968	37.1	19,906	87.6	28.4
Mississippi	750,166	542,252	72.3	8,385	89.5	64.7
Montana	142,182	78,170	55.0	3,870	36.7	20.2
New Jersey	1,378,957	832,658	60.4	24,649	55.9	33.8
New Mexico	623,729	338,163	54.2	7,543	82.7	44.8
North Carolina <sup>e</sup>	2,007,898	1,387,448	69.1	23,012	87.3	60.3
Oregon	629,915	380,364	60.4	11,171	56.4	34.0
South Dakota	141,690	86,773	61.2	3,451	41.1	25.1
Vermont <sup>d</sup>	182,025	132,701	72.9	4,106	46.3	32.3
West Virginia	420,455	192,622	45.8	9,696	43.4	19.9
Wyoming	84,138	61,402	73.0	5,468	15.4	11.2
<b>Total<sup>f</sup></b>	<b>21,331,229</b>	<b>12,584,069</b>	<b>59.0</b>	<b>267,138</b>	<b>79.9</b>	<b>47.1</b>

Source: MAXPC data, 2009.

<sup>a</sup> Using the MAXPC data element “Primary Taxonomy Classification” with a value of “Allopathic and Osteopathic Physicians.”

<sup>b</sup> Using 24 of the 25 states for which the OT servicing provider data element is of “good” or “fair” quality in MSIS, as determined in Sykes and Bencio (2012). The “good” states are Alabama, Arizona, Colorado, Florida, Indiana, Kansas, Mississippi, Montana, New Jersey, North Carolina, Oregon, Vermont, and West Virginia. The “fair” states are Alaska, Arkansas, Connecticut, Delaware, Iowa, Kentucky, Louisiana, Massachusetts, New Mexico, South Dakota, and Wyoming.

<sup>c</sup> Includes people for whom there were service records but not eligibility records in MAX data. These people were eligible for Medicaid but the state did not submit eligibility records.

<sup>d</sup> Excludes enrollees who were restricted to assistance with purchase of managed care coverage through a premium assistance program (222,421 enrollees in Massachusetts; 8,251 enrollees in Vermont).

<sup>e</sup> Across the states, there were 227 NPIs for physicians who served more than 5,000 enrollees, of which 113 were identified as an organizational entity type in NPES. Of the 113 NPIs, 71 served North Carolina enrollees. Records for these NPIs were not excluded from the analysis because the physicians associated with these NPIs were reported as servicing physicians.

<sup>f</sup> Total for the 24 states. A physician may be licensed and authorized to receive Medicaid reimbursement in more than one state, so the total count of physicians across these states may count an individual physician more than once.

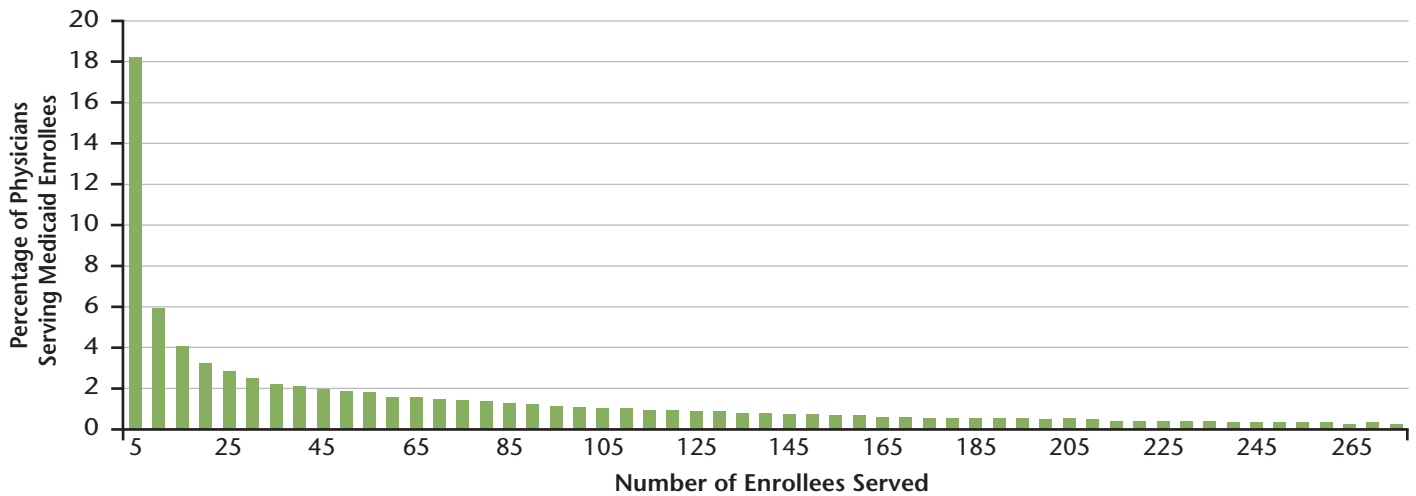
## Distribution of the Medicaid Physician Caseload

In Figure 1, we plot the percentage of physicians (y-axis) by their Medicaid caseload (x-axis). The plot shows an extremely skewed distribution: a large percentage of physicians (18.2 percent) served five or fewer enrollees, and there were fewer physicians serving Medicaid enrollees in each of the subsequent caseload categories. The figure shows that a sharply declining percentage of physicians served each of the successive groups of enrollees served: 1-5, 6-10, 11-15, and so on. The tail of the distribution becomes nearly asymptotic to the x-axis as fewer physicians served more

Medicaid enrollees. The distribution for individual states follows the pattern of Figure 1 for all states (data not shown).

Figure 2 is similar to Figure 1 except that the percentage of physicians (y-axis) is plotted against the number of services that physicians delivered (x-axis). The plot is the percentage of physicians by the number of services they provided: 1-10, 11-20, 21-30, and so on. This plot also shows a highly skewed distribution in that 15.8 percent of physicians delivered 10 or fewer services. The right-most portion of the tails of the two distributions has been truncated for ease of viewing.

**Figure 1. Percentage of Physicians Serving Medicaid Enrollees by Number of Enrollees Served, 2009**



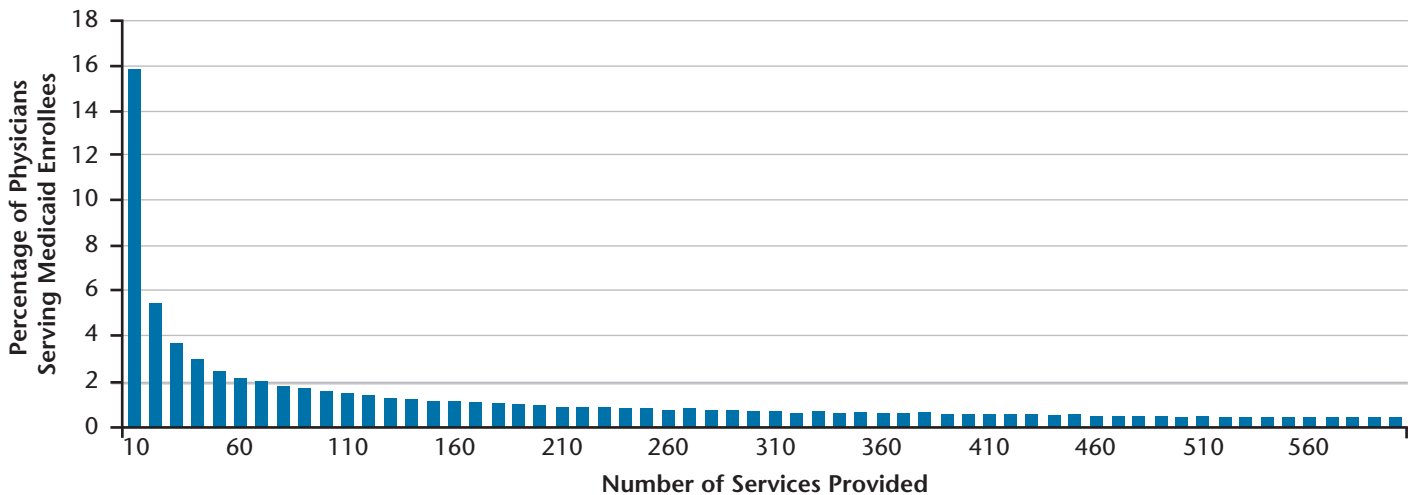
Source: MAXPC data, 2009

Notes: Using the MAXPC data element “Primary Taxonomy Classification” with a value of “Allopathic and Osteopathic Physicians.”

Using 24 of the 25 states for which the OT servicing provider data element is of “good” or “fair” quality in MSIS as determined in Sykes and Bencio (2012).

The “good” states are Alabama, Arizona, Colorado, Florida, Indiana, Kansas, Mississippi, Montana, New Jersey, North Carolina, Oregon, Vermont, and West Virginia. The “fair” states are Alaska, Arkansas, Connecticut, Delaware, Iowa, Kentucky, Louisiana, Massachusetts, New Mexico, South Dakota, and Wyoming.

**Figure 2. Percentage of Physicians Serving Medicaid Enrollees by the Number of Services Provided, 2009**



Source: MAXPC data, 2009

Notes: Using the MAXPC data element “Primary Taxonomy Classification” with a value of “Allopathic and Osteopathic Physicians.”

Using 24 of the 25 states for which the OT servicing provider data element is of “good” or “fair” quality in MSIS as determined in Sykes and Bencio (2012).

The “good” states are Alabama, Arizona, Colorado, Florida, Indiana, Kansas, Mississippi, Montana, New Jersey, North Carolina, Oregon, Vermont, and West Virginia. The “fair” states are Alaska, Arkansas, Connecticut, Delaware, Iowa, Kentucky, Louisiana, Massachusetts, New Mexico, South Dakota, and Wyoming.

In Table 2, we present further analysis of the tails, by the number of enrollees served and services provided. Among physicians who were defined as nominal Medicaid participants,<sup>9</sup> relatively high percentages served one, two or three, or four or five enrollees (8.3, 6.3, and 3.6 percent, respectively). There was substantial variation across the states, from a low in Massachusetts (2.1, 2.8, and 1.9 percent, respectively) to a high in Wyoming (30.4, 18.2, and 9.2 percent, respectively).

Table 2 also contains details on physicians defined as having a practice concentration in Medicaid if they provided services to 500 or more enrollees<sup>10</sup> or delivered 2,000 or more services. Across the states, 10.9 percent of physicians served 500 or more enrollees; percentages ranged from 2.0 percent of physicians in Wyoming to 18.5 percent in Louisiana.

**Table 2. Percentage of Physicians<sup>a</sup> with Nominal Practice Participation or Practice Concentration in Medicaid, by Number of Enrollees Served and by Number of Services Provided by State,<sup>b</sup> 2009**

State	Physicians with Nominal Practice Participation in Medicaid						Physicians with Practice Concentration in Medicaid	
	Number of Enrollees Served			Number of Total Services			Served More than 500 Enrollees	Provided More than 2,000 Total Services
	1	2 or 3	4 or 5	1	2 to 5	6 to 10		
Alabama	7.5	5.6	3.4	3.2	5.3	3.2	14.8	20.3
Alaska	21.9	14.2	6.0	11.7	17.7	9.2	5.1	2.6
Arizona	10.0	6.0	2.7	5.5	8.2	3.6	16.1	9.0
Arkansas	9.9	6.6	3.1	5.2	8.3	4.5	16.5	13.0
Colorado	13.5	6.3	3.7	5.2	9.6	5.3	8.2	10.3
Connecticut	19.4	8.5	4.3	11.2	13.2	5.9	4.8	2.5
Delaware	15.1	9.6	4.2	0.1	11.1	6.9	13.0	19.0
Florida	4.6	4.6	3.2	2.0	4.4	3.1	16.2	19.2
Indiana	9.5	7.8	4.1	5.3	9.7	5.1	3.9	2.5
Iowa	13.8	10.7	5.9	6.1	10.3	6.1	6.0	9.7
Kansas	18.6	8.4	3.7	6.6	11.5	6.5	5.0	5.4
Kentucky	9.7	9.0	5.2	3.0	8.7	6.4	14.0	17.1
Louisiana	6.6	5.3	3.0	4.0	6.4	3.8	18.5	13.4
Massachusetts	2.1	2.8	1.9	1.5	3.3	2.7	7.4	2.3
Mississippi	10.1	8.8	4.3	5.5	10.0	6.0	16.8	13.0
Montana	23.6	15.1	6.4	12.4	20.8	8.7	3.2	1.1
New Jersey	20.6	10.6	5.3	11.9	15.9	7.7	5.7	3.7
New Mexico	26.4	10.7	4.7	13.4	18.2	6.9	5.3	4.5
North Carolina	4.6	4.2	4.8	2.0	4.7	3.2	11.2	8.6
Oregon	15.6	6.4	3.4	7.7	9.4	4.6	7.2	8.6
South Dakota	22.8	11.6	4.3	11.9	17.9	6.5	3.6	2.8
Vermont	19.7	10.1	3.6	12.5	14.5	5.1	7.8	10.4
West Virginia	17.1	14.6	6.7	8.7	17.1	9.6	5.2	3.7
Wyoming	30.4	18.2	9.2	12.5	19.7	11.6	2.0	3.6
<b>Total</b>	<b>8.3</b>	<b>6.3</b>	<b>3.6</b>	<b>4.0</b>	<b>7.4</b>	<b>4.4</b>	<b>10.9</b>	<b>10.2</b>

Source: MAXPC data, 2009.

<sup>a</sup> Using the MAXPC data element “Primary Taxonomy Classification” with a value of “Allopathic and Osteopathic Physicians.”

<sup>b</sup> Using 24 of the 25 states for which the OT servicing provider data element is of “good” or “fair” quality in MSIS as determined in Sykes and Bencio (2012). The “good” states are Alabama, Arizona, Colorado, Florida, Indiana, Kansas, Mississippi, Montana, New Jersey, North Carolina, Oregon, Vermont, and West Virginia. The “fair” states are Alaska, Arkansas, Connecticut, Delaware, Iowa, Kentucky, Louisiana, Massachusetts, New Mexico, South Dakota, and Wyoming.

## In-State Versus Out-of-State Physicians

For the study states, 69.3 percent of physicians served Medicaid enrollees who resided in the same state as the physician's business practice location; the remaining 30.7 percent had practice locations outside the state (Table 3). However, the percentage of in-state physicians varied substantially across the states, from 92.8 percent (Florida) to 18.0 percent (Wyoming). Despite this

variation, the vast majority of claims (93.9 percent) were for in-state physicians in all of the study states. This is because the average number of claims per physician was much lower for out-of-state physicians than for in-state physicians in all states (data not shown). The range of claims per physician by in-state physicians across the states was fairly narrow, from 97.0 percent (Louisiana) to 81.3 percent (Wyoming).

**Table 3. Number of Physicians<sup>a</sup> Serving Medicaid Enrollees and Number of Services Provided by Physician Business Practice Location and State<sup>b</sup>, 2009**

State	Physicians by Practice Location <sup>c</sup>			Claims by Practice Location <sup>c</sup>		
	Number In-State	Number Out-of-State	Percent In-State	Number In-State	Number Out-of-State	Percent In-State
Alabama	6,838	2,431	73.6	12,303,206	765,756	94.1
Alaska	1,322	2,034	39.4	911,578	111,342	89.1
Arizona	10,264	2,833	78.3	9,997,051	543,536	94.7
Arkansas	4,830	2,147	69.1	6,216,458	343,979	94.7
Colorado	6,682	1,492	81.7	6,184,508	285,912	95.6
Connecticut	7,543	2,957	71.8	3,015,159	145,585	95.0
Delaware	1,963	1,334	59.4	3,627,346	346,279	91.3
Florida	28,468	2,136	92.8	44,502,205	1,641,300	96.3
Indiana	11,710	3,869	74.5	7,417,981	384,242	95.1
Iowa	5,716	6,043	48.5	7,229,144	843,487	89.5
Kansas	4,359	3,490	55.5	3,277,260	461,197	87.7
Kentucky	7,773	6,791	53.2	15,509,070	1,626,815	90.2
Louisiana	8,611	1,888	82.0	11,468,112	354,211	97.0
Massachusetts	17,726	2,124	89.0	6,991,275	430,767	93.9
Mississippi	4,366	3,987	52.1	6,901,208	578,553	92.0
Montana	1,646	2,219	42.5	895,658	75,729	92.2
New Jersey	17,074	7,516	69.3	8,770,658	539,370	94.1
New Mexico	3,728	3,799	49.4	3,258,926	291,655	91.7
North Carolina	19,011	3,808	82.6	19,848,791	641,967	96.9
Oregon	7,712	3,437	69.0	6,422,436	596,297	91.4
South Dakota	1,903	1,529	55.1	1,052,871	50,653	95.3
Vermont	1,566	2,523	38.1	2,988,461	489,241	85.9
West Virginia	3,453	6,226	35.6	2,925,678	490,357	85.5
Wyoming	984	4,471	18.0	1,211,155	263,247	81.3
<b>Total<sup>d</sup></b>	<b>185,248</b>	<b>81,084</b>	<b>69.3</b>	<b>192,926,195</b>	<b>12,301,477</b>	<b>93.9</b>

Source: MAXPC data, 2009.

<sup>a</sup> Using the MAXPC data element "Primary Taxonomy Classification" with a value of "Allopathic and Osteopathic Physicians."

<sup>b</sup> Using 24 of the 25 states for which the OT servicing provider data element is of "good" or "fair" quality in MSIS as determined in Sykes and D. Bencio (2012). The "good" states are Alabama, Arizona, Colorado, Florida, Indiana, Kansas, Mississippi, Montana, New Jersey, North Carolina, Oregon, Vermont, and West Virginia. The "fair" states are Alaska, Arkansas, Connecticut, Delaware, Iowa, Kentucky, Louisiana, Massachusetts, New Mexico, South Dakota, and Wyoming.

<sup>c</sup> Physician business practice location was unknown for less than 1 percent of physicians and less than 0.4 percent (except Wyoming, 1.06 percent) of claims in each state (data not shown).

<sup>d</sup> Total for the 24 states. A physician may be licensed and authorized to receive Medicaid reimbursement in more than one state, therefore the total count of physicians across these states may count a physician more than once.

## Physician Participation Rates

In Table 4, we show physician participation rates in Medicaid using alternative sources as denominators. The numerators are the number of physicians serving Medicaid enrollees in each state.<sup>11</sup> The first denominator uses AMA Master File physician counts. Medicaid participation rates for most states using AMA data ranged between 50.2 percent (Colorado) and 87.7 percent (Alaska). However, South Dakota (106.9 percent) and Wyoming (96.3 percent) were notable outliers. It is likely that the finding for South Dakota is incorrect because of a problem with the number of physicians in the AMA data, which is much

lower than the number of physicians reported in the NPPES data for the state. Based on the AMA data, the participation rate was 66.9 percent across the states. Five states had participation rates below 60 percent: Colorado, Connecticut, Florida, Massachusetts, and New Jersey.

The second denominator uses NPPES physician counts.<sup>12</sup> Using this source, participation rates ranged between 46.5 percent (Colorado) and 86.8 percent (South Dakota). Based on these data, the participation rate was 62.2 percent across the study states. Four states had participation rates below 60 percent (Arizona, Colorado, Florida, and Massachusetts).

**Table 4. Share of Physicians Serving Medicaid Enrollees, by State,<sup>a</sup> 2009**

State	Number of Physicians Serving Medicaid Enrollees <sup>d</sup>	AMA Physicians <sup>b</sup>		NPPES Physicians <sup>c</sup>	
		Number of Physicians	Percent Serving Medicaid Enrollees <sup>e</sup>	Number of Physicians <sup>d</sup>	Percent Serving Medicaid Enrollees <sup>e</sup>
Alabama	6,838	10,241	66.8	10,995	62.2
Alaska	1,322	1,507	87.7	2,022	65.4
Arizona	10,264	14,762	69.5	17,688	58.0
Arkansas	4,830	5,848	82.6	6,393	75.6
Colorado	6,682	13,309	50.2	14,365	46.5
Connecticut	7,543	13,430	56.2	11,840	63.7
Delaware	1,963	2,398	81.9	3,255	60.3
Florida	28,468	47,967	59.3	54,702	52.0
Indiana	11,710	14,385	81.4	17,322	67.6
Iowa	5,716	6,669	85.7	7,865	72.7
Kansas	4,359	6,750	64.6	7,042	61.9
Kentucky	7,773	10,053	77.3	11,896	65.3
Louisiana	8,611	11,556	74.5	11,901	72.4
Massachusetts	17,726	30,811	57.5	30,322	58.5
Mississippi	4,366	5,278	82.7	6,779	64.4
Montana	1,646	2,161	76.2	2,484	66.3
New Jersey	17,074	29,622	57.6	28,316	60.3
New Mexico	3,728	4,764	78.3	5,590	66.7
North Carolina	19,011	23,482	81.0	25,585	74.3
Oregon	7,712	10,756	71.7	10,655	72.4
South Dakota	1,903	1,781	106.9	2,193	86.8
Vermont	1,566	2,326	67.3	2,086	75.1
West Virginia	3,453	4,764	72.5	5,168	66.8
Wyoming	984	1,022	96.3	1,291	76.2
<b>Total</b>	<b>185,248</b>	<b>275,642</b>	<b>66.9<sup>f</sup></b>	<b>297,755</b>	<b>62.2</b>

Source: MAXPC, 2009; AMA data extracted from the Area Resource File, December 2009; and NPPES, May 2010.

<sup>a</sup> Using 24 of the 25 states for which the OT servicing provider data element is of “good” or “fair” quality in MSIS as determined in Sykes and Bencio (2012). The “good” states are Alabama, Arizona, Colorado, Florida, Indiana, Kansas, Mississippi, Montana, New Jersey, North Carolina, Oregon, Vermont, and West Virginia. The “fair” states are Alaska, Arkansas, Connecticut, Delaware, Iowa, Kentucky, Louisiana, Massachusetts, New Mexico, South Dakota, and Wyoming.

<sup>b</sup> American Medical Association (AMA) Master file, 2009, summing active nonfederal MDs and DOs, by state.

<sup>c</sup> Physicians, as of December 2008, as reported in the National Plan and Provider Enumeration System (NPPES), 2009.

<sup>d</sup> Using the MAXPC data element “Primary Taxonomy Classification” with a value of “Allopathic and Osteopathic Physicians.” Excluding physicians with an out-of-state business practice location or unknown location. Physician business practice location was unknown for less than 1 percent of physicians serving Medicaid enrollees in each of the study states.

<sup>e</sup> Although Tennessee was excluded from the analysis, the Office of Health Care Informatics, Bureau of TennCare reported a rate of 81.4 percent.

<sup>f</sup> Because of the data artifact for South Dakota, the state is excluded from the calculation of this outcome measure.

## Limitations

Readers should exercise caution in interpreting the findings presented here due to several limitations of this study. For example, the study was limited to an analysis of allopathic or osteopathic physicians in 2009 in 24 states, so findings do not necessarily represent other years, other types of providers, or states that were not included in the study. Inasmuch as physicians identified in the MAX OT file were not linked to NPPES records in the process of creating the MAXPC data, numbers of Medicaid enrollees served by a physician and physician participation rates may be understated. Also, because Medicaid enrollees may receive care from other providers, such as nurse practitioners and physician assistants, differences between average caseload and average number of enrollees per physician does not necessarily reflect met or unmet need across the states.

In the participation-rate analysis, we counted only Medicaid physicians with practice locations in the state in the numerator to correspond with the AMA and NPPES physician counts for the states. Because we used aggregate totals of physicians from the AMA Master File, we were not able to verify that a provider counted in the numerator was also counted in the AMA rate denominator. These data include only active nonfederal physicians. Because NPPES data count physicians as of May 2010, these data may have included small numbers of new physicians who were not yet active in 2009, may have included federal physicians who do not have active practices and did not reflect physician practice locations as of 2009 for physicians who may have moved between the end of 2009 and May 2010. For these reasons, participation rates based on NPPES data as denominators may slightly understate true participation rates. Using the MAXPC data as numerators may also understate true participation rates (and other rates as well) to the extent that encounter claim reporting for Medicaid enrollees in prepaid plans is incomplete. The MAXPC, AMA and NPPES data may include hospital-based physicians, but it should not lead to bias in counting physicians who served Medicaid enrollees, though the physicians who served Medicaid enrollees only in a hospital emergency room may or may not be willing to accept Medicaid patients in other care delivery settings. As there is no required update of data in NPPES, physician location may be inaccurate for some physicians.

The distributional analysis shows that there were small numbers of physicians in several of the states who served an unusually large number of enrollees or delivered unusually large numbers of services.<sup>13</sup> Because some of these physicians were identified as an organizational entity type in NPPES, true participation rates may have been slightly higher had we been able to separately identify members of the group who actually delivered services. Even though state provider files and crosswalks add

tremendous value to the MAXPC file, we were unable to obtain them for many states because of concerns about added reporting burden on the states (Bencio et al. 2010). Because reporting of NPIs is incomplete at this time, use of state provider files and crosswalks would be likely to increase the number of provider IDs that are linked to NPPES, increase the accuracy of the linkage process and enhance provider characteristics.

## Implications

From Table 1, we see that there was nearly a four-fold difference in the percentage of Medicaid enrollees served by a physician in 2009 across the study states, from 21.4 percent in Delaware to 76.5 percent in Kentucky. To what extent do these differences reflect the delivery of care in different settings, such as physician offices, clinics (including federally qualified health centers and rural health clinics), outpatient departments, and different providers, such as nurse practitioners and physician assistants? What are the benefits and costs of treatment in different settings and by different providers? What percentage of enrollees should be served by a physician?

In Table 3, we show that most enrollees were served by in-state physicians. However, percentages varied widely across the study states. Six states were above 75 percent (Arizona, Colorado, Florida, Louisiana, Massachusetts, and North Carolina) and seven states below 50 percent (Alaska, Iowa, Montana, New Mexico, Vermont, West Virginia, and Wyoming). These findings may reflect the need for out-of-state providers to deliver services for enrollees who live in rural areas or they may be the result of enrollees who live near state borders and choose providers in the other state.<sup>14</sup> This table shows that even for states such as Wyoming, where a large percentage of enrollees are served by out-of-state providers, most services were provided by in-state providers. This is a positive finding in that individual states are most likely to be able to influence physician behavior for physicians whose business practice location is within the state and who provide a substantial number of services to state enrollees.

We found that a large percentage of physicians who participated in Medicaid were “nominal” participants, raising concern about their commitment to serve Medicaid enrollees (Figures 1 and 2 and Table 2). Will they continue to provide Medicaid services to the enrollees they currently serve? Will they be willing to accept new Medicaid patients? Should “true” participation rates be reduced given these findings? To what extent will physicians who serve Medicaid enrollees in emergency rooms be unwilling to accept Medicaid patients in other practice settings? What is the likelihood that Medicaid enrollees will have difficulties obtaining access to care? What are the implications for new Medicaid enrollees under ACA provisions? These findings confirm results



from Cunningham and May (2006) that Medicaid patient care is becoming increasingly concentrated among a smaller proportion of physicians. What are the potential benefits and risks of having Medicaid patient care concentrated in this way?

Under the scenarios presented in Table 4, 33.1 percent or more of all physicians did not participate in Medicaid in 2009. Combining this finding with another finding—that 18.2 percent of participating physicians served five or fewer enrollees (nominal participation)—the net result is that more than 50 percent of all physicians either did not participate in Medicaid or participated nominally. These low overall rates suggest that continued vigilance should be given to improving physician participation in Medicaid. Furthermore, variation in participation rates across states should lead state administrators to pursue policies to ensure adequate access to physician care and avoid the risks associated with unmet need across the state and in substate areas. Future research should address many of the questions raised above to provide guidance to policymakers as they develop those policies. This issue will likely come to the forefront as a large number of new enrollees enter Medicaid under the ACA provisions.

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## Endnotes

<sup>1</sup> “Paying patients” refers to commercially insured patients.

<sup>2</sup> PCCM programs pay medical professionals a small monthly fee to coordinate care for program enrollees. However, the care provided is usually reimbursed on a fee-for-service basis.

<sup>3</sup> A set of annual files, by state, containing a record for each provider with MAX claims (including physicians in the MAX Other Services file) and linked provider characteristics from NPPES.

<sup>4</sup> Physicians who served Medicaid enrollees in an emergency room may or may not have served Medicaid enrollees in other care settings.

<sup>5</sup> In MAX, the term “claims” refers to the result of a process where interim claims are adjusted to produce a “final action” event record for the service provided.

<sup>6</sup> Physician services are identified by MAX Type of Service=8.

<sup>7</sup> Servicing provider identifier is the “unique number to identify the provider who treated the recipient” not the billing provider (CMS 2012).

<sup>8</sup> Tennessee was excluded from this study because group identifier was reported instead of servicing provider identifier when servicing physician identifier was unavailable.

<sup>9</sup> Physicians who served five or fewer enrollees or who delivered 10 or fewer services.

<sup>10</sup> We make the following assumptions: a physician works 250 days per year, works 8 hours per day and schedules 3 visits per hour, resulting in 6,000 visits per year. If 1/3 of the visits are for unique individuals, the physician serves 2,000 individuals per year. If this caseload is 100 percent Medicaid, the physician serves 2,000 enrollees per year. In contrast, if the caseload is 25 percent Medicaid, the physician serves 500 enrollees per year. We define a caseload of 25 percent or more enrollees per year as a concentration because Medicaid represents about 20 percent of the U.S. population.

<sup>11</sup> Physicians with out-of-state or unknown business practice location were excluded to remove the possibility of double counting of physicians who delivered services to enrollees in more than one state.

<sup>12</sup> Two methods were used to count NPPES physicians: (1) primary taxonomy classification (e.g. primary specialty) or (2) at least one specialty code in any of the listed taxonomy classifications. Differences between the methods were small (less than 4 percent for each state and about 2 percent for all states). Only rates based on the first method are reported here.

<sup>13</sup> 227 physicians served over 5,000 enrollees, 113 of which (71 in North Carolina) were included in the analysis because they served enrollees despite being identified as organizational entities in NPPES.

<sup>14</sup> This may result from established doctor/patient relationships, care preferences or travel distances.

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