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DOI: 10.1377/hlthaff.2021.01747
HEALTH AFFAIRS 41,
NO. 5 (2022): 760–768
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The People-to-People Health
Foundation, Inc.

In Medicaid Managed Care Networks, Care Is Highly Concentrated Among A Small Percentage Of Physicians

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ABSTRACT States have increasingly outsourced the provision of Medicaid services to private managed care plans. To ensure that plans maintain access to care, many states set network adequacy standards that require plans to contract with a minimum number of physicians. In this study we used data from the period 2015–17 for four states to assess the level of Medicaid participation among physicians listed in the provider network directories of each managed care plan. We found that about one-third of outpatient primary care and specialist physicians contracted with Medicaid managed care plans in our sample saw fewer than ten Medicaid beneficiaries in a year. Care was highly concentrated: 25 percent of primary care physicians provided 86 percent of the care, and 25 percent of specialists, on average, provided 75 percent of the care. Our findings suggest that current network adequacy standards might not reflect actual access; new methods are needed that account for beneficiaries’ preferences and physicians’ willingness to serve Medicaid patients.

Medicaid is the single largest source of insurance coverage in the United States, with enrollment exceeding eighty million—or almost one in four—people.^{1,2} Despite the scale of the program, concerns about access to care for beneficiaries persist. Studies show that almost a third of office-based physicians do not participate in Medicaid—far fewer than participate in Medicare or commercial insurance markets.^{3–5} Moreover, more than half of primary care practices nationally receive little to no Medicaid revenue, leading to concerns about the equitable distribution of services among “Medicaid-accepting” physicians and practices.⁶ Lower participation in Medicaid has been attributed, in part, to relatively low reimbursement rates for outpatient services and higher degrees of payment uncertainty, including time to payment and rates of claim denials.^{7–9} As a result, Medicaid beneficia-

ries report greater difficulty than their counterparts finding appointments with primary care and specialist physicians, which may compromise quality of care for this low-income and vulnerable population.^{10,11}

More than 70 percent of Medicaid beneficiaries are now enrolled in some form of managed care, in which states contract with private health plans for the provision of Medicaid benefits. Managed care plans are responsible for constructing networks of physicians from whom enrolled Medicaid beneficiaries can seek care. Recent work demonstrates that rosters of physician networks in Medicaid managed care are similar in size to those of private plans offered on the state health insurance exchanges established by the Affordable Care Act.¹² However, it is not clear whether the networks reflect true availability. For example, network directories may be out of date,¹³ listed physicians might not be willing to treat Medicaid beneficiaries,^{3–5} or Medicaid

beneficiaries may have preferences for providers not included in plans' networks.¹³⁻¹⁵ States attempt to ensure access in Medicaid by regulating these carriers and creating network adequacy standards as required by the Centers for Medicare and Medicaid Services.¹⁶ However, studies have shown that implementing network adequacy standards has not led to marked improvements in access to physicians, particularly specialists.^{17,18} If physicians are listed in networks but provide little or no care for Medicaid beneficiaries, these standards may be ineffective as a measure of true availability and as a tool for ensuring equitable access to medical services for low-income people.

In this study we examined the extent to which Medicaid managed care plan networks may overstate the availability of physicians in Medicaid, and we evaluated the implications of discrepancies in the "listed" and "true" networks for beneficiary access. First, we determined what proportion of physicians included in plans' networks did not treat any Medicaid beneficiaries in a given year and how the share of these "ghost" physicians varied across specialties and states. Second, we assessed the concentration of care for Medicaid beneficiaries among physicians actively participating within each plan. Third, we evaluated whether Medicaid managed care networks met common network adequacy standards if we removed physicians with low levels of participation. This work aims to inform state and federal regulatory efforts to ensure appropriate access to care in the Medicaid program.

Study Data And Methods

This study followed the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) reporting guidelines for cross-sectional studies.

DATA SOURCES AND STUDY SAMPLE The primary data sources were administrative medical claims, Medicaid eligibility and enrollment files, and provider network directories (hereafter "networks") for Medicaid managed care plans in four states (Kansas, Louisiana, Michigan, and Tennessee) from the period 2015-17. Data were obtained directly from state Medicaid agencies in these states and were blinded in this study, as required by data use agreements. Claims for all outpatient services were included to assess physicians' participation (based on Place of Service Codes). (See online appendix exhibits A1 and A2 for additional detail on the years in our analysis and Place of Service Codes used.)¹⁹ The network data included lists of physicians (based on their National Provider Identifiers) under contract with each managed care

plan annually, along with details on their primary site of practice. Physician networks (and the reporting of accurate network data) are managed by individual health plans participating in Medicaid managed care and may be audited by state agencies. Typically, Medicaid managed care plans offer only one insurance product per state, although network breadth may vary across smaller geographic areas (for example, counties).²⁰ We linked these data by National Provider Identifier to administrative claims, which allowed us to determine the number of Medicaid beneficiaries treated by each physician and the amount of care provided. We obtained additional physician demographic and organizational characteristics (for example, sex and sole-practitioner status) from the National Plan and Provider Enumeration System (NPPES), state-level characteristics from the Henry J. Kaiser Family Foundation, and ZIP code-level information on rurality from the Federal Office of Rural Health Policy.²¹⁻²³

We limited our analysis to primary care physicians, pediatricians, cardiologists, and psychiatrists, using the physician specialty listed in the NPPES data to standardize the classification of physicians across plans and states (see appendix exhibit A3 for further details on physician specialty definitions).¹⁹ We found that there was more than 80 percent agreement between the NPPES and state-specific specialty information, and we obtained similar primary results using either data source (see appendix exhibits A4 and A5 for further details on matching between network and NPPES specialty data, as well as for a comparative analysis of physician classification based on NPPES- and state-defined specialties).¹⁹ We focused our analysis on adult and pediatric primary care physicians, given evidence of their importance in mediating access to care, and on cardiologists and psychiatrists, given evidence that access to specialty cardiovascular and mental health care is particularly compromised in the Medicaid program.^{5,6,24,25} We excluded non-physicians (including nurse practitioners and physician assistants), as their National Provider Identifiers are not consistently included as the billing or servicing provider on claims for which they provided the actual treatment. We also excluded physicians not found in the NPPES (0.1 percent of physicians in network directories).

MEASURING PARTICIPATION IN MEDICAID The primary focus of our analysis was a measure of physicians' participation in managed care networks: the number of unique plan members treated by a physician in an office-based setting in a year. We identified physicians as having treated a Medicaid beneficiary if they were ever

listed as the billing, servicing, or attending physician on a claim for that beneficiary in a year. Using this method, we defined four categories of physician participation: “ghost” physicians treated 0 Medicaid beneficiaries, “peripheral” physicians treated 1–10 beneficiaries, “standard” physicians treated 11–150 beneficiaries, and “core” physicians treated more than 150 beneficiaries. The threshold for core physician participation assumed an average panel size of 1,500 patients, 10 percent of whom were enrolled in Medicaid.^{26,27}

STATISTICAL ANALYSIS First, we calculated the proportion of in-network physicians with ghost, peripheral, standard, and core status by specialty in each state. Second, we examined the concentration of care among physicians who treated at least one Medicaid beneficiary (that is, excluding ghost physicians) by counting the number of unique office-based claims attributed to each physician in each calendar year. Claims were first attributed to the servicing provider; then, if no servicing provider was recorded on the claim, to the attending provider; and then, if no servicing or attending provider was recorded, to the billing provider. We plotted the cumulative proportion of claims attributed to each physician (Lorenz curves) separately for each specialty. Third, we determined how access to care as measured by network adequacy ratio—the ratio of Medicaid beneficiaries to in-network physicians—was affected by the prevalence of ghost and peripheral physicians in each state. To do this, we calculated the ratio in each county with and without ghost and peripheral physicians. We performed independent comparisons for each specialty, as network adequacy standards are often assessed separately by specialty. Medicaid beneficiaries and physicians were assigned to counties on the basis of their county of residence and practice location, respectively. (In one state for which practice location information was not included in the network directory, we assigned office location based on the primary location listed in the NPDES registry).

We conducted a range of sensitivity analyses to ensure the robustness of our results to alternative specifications. First, using an additional year of claims data, we determined the proportion of ghost physicians who remained contracted with the same health plan and retained that ghost classification in the adjacent year. We also assessed whether ghost physicians were more likely to operate in low-volume areas by comparing the geographic distribution of ghost physicians relative to core, standard, and peripheral physicians. In an additional analysis, we examined whether ghost physicians in our data also had low levels of participation in fee-for-service

Our findings suggest that provider network directories may overstate the availability of physicians in the Medicaid program.

Medicare, using the Medicare Public Use Files from corresponding years.²⁸ Finally, to more completely assess the full networks of physicians available to Medicaid beneficiaries, we determined the proportion of care that was delivered to Medicaid beneficiaries by physicians not listed in state Medicaid directories. Analyses were conducted using Stata/SE, version 14.

LIMITATIONS Our study had several limitations. First, our analysis was limited to four states. Although the results were qualitatively similar across states, analyses might not generalize nationally, given the extent of variation across Medicaid managed care programs. The four states included in our analysis, however, were similar to national averages across a set of relevant indicators (shown in appendix exhibit A6).¹⁹ Second, our analyses were limited to four specialties, and our results might not generalize to others. Third, our primary analyses focused on physicians’ participation in Medicaid in one year for each state, but there is evidence that this participation is not stable over time.²⁹ Although we examined the sensitivity of our primary analysis to the use of two years of data, our estimates may nonetheless have overestimated access in Medicaid managed care by failing to account for provider attrition over time. Fourth, our analysis focused on network adequacy standards defined by the number of beneficiaries per physician and did not assess whether standards based on distance or wait times were met.

Study Results

CHARACTERISTICS OF THE STUDY POPULATION

Our final analytic sample comprised 22,056 physicians in adult primary care, pediatric primary care, cardiology, and psychiatry who were included in Medicaid managed care provider network directories across the four study states

(exhibit 1). The number of unique physicians in Medicaid managed care networks in each state varied from 2,826 to 9,371. The proportion of physicians in each specialty was similar across states, with the highest proportion of physicians practicing adult primary care. The proportion of physicians located in rural areas varied by state, from a low of 1.3 percent to a high of 35.5 percent.

PARTICIPATION IN MEDICAID Overall, 16.3 percent of physicians listed in Medicaid managed care plan provider network directories in a year qualified as ghost physicians, meaning they saw zero Medicaid beneficiaries over the course of the year in an outpatient setting (exhibit 2). The share of ghost physicians ranged from 13.4 percent to 24.9 percent across states (appendix exhibit A7 shows the proportion of ghost, peripheral, standard, and core physicians by state).¹⁹ The prevalence of ghost physicians also varied by specialty (exhibit 2). Psychiatrists were the most likely to qualify as ghost physicians (35.5 percent), whereas pediatric primary care physicians were the least likely to qualify as ghost physicians (11.0 percent). Approximately 17.1 percent of physicians in the study were classified as peripheral physicians, 42.9 percent were classified as standard physicians, and 23.7 percent were classified as core physicians. Although there was limited variation across states in the proportion of physicians classified as peripheral (14.4–18.8 percent), there was substantial between-state variation in the proportion of physicians classified as standard (32.7–51.9 percent) or core (15.8–33.4 percent) (appendix exhibit A7).¹⁹

We conducted several additional analyses to further contextualize our primary results. Of the physicians who remained in the network directory for a second year, 94.6 percent remained ghost or peripheral physicians (appendix exhibit A8 shows the consistency of physician participation during a two-year period).¹⁹ Ghost physicians were also no more likely than other physicians to practice in rural or low-volume areas (appendix exhibit A9 presents characteristics of ghost, peripheral, standard, and core physicians).¹⁹ In addition, we found that 34.9 percent of nonpediatric ghost physicians in the Medicaid data were classified as standard or core in Medicare, with the remainder of physicians either not contracting with Medicare or seeing fewer than eleven patients annually (appendix exhibit A10 describes the consistency of physician participation status between Medicaid and Medicare).¹⁹ This may suggest that some physicians listed in Medicaid networks are not involved in patient care generally. There was some variation among specialties, with Medicaid-based ghost psychiatrists more likely to be standard in Medicare.

Finally, 87.8 percent of physicians in the four-state sample who delivered care to Medicaid beneficiaries were contracted with Medicaid managed care plans. Of the 2,575 out-of-network physicians who saw at least one Medicaid beneficiary, 61.2 percent were peripheral physicians, 33.1 percent were standard, and 5.7 percent were core. These results suggest that some level of care is available to Medicaid beneficiaries from physicians not listed in network directories, although

EXHIBIT 1

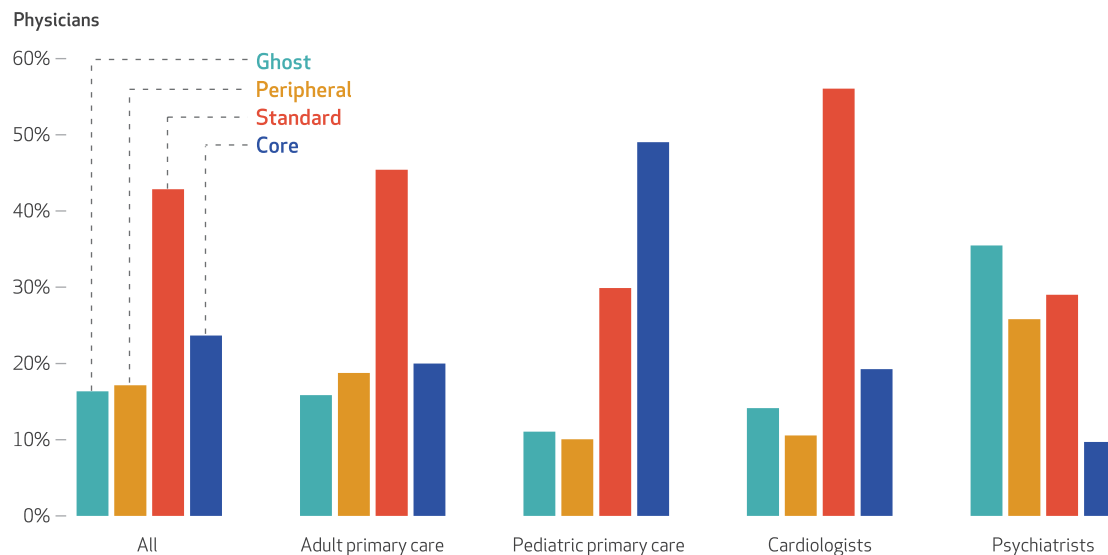
Characteristics of physicians contracted with Medicaid managed care plans in 4 states, 2015–17

	All		State 1		State 2		State 3		State 4	
	No.	%	No.	%	No.	%	No.	%	No.	%
Physicians	22,056	100.0	2,826	12.8	3,352	15.2	9,371	42.5	6,507	29.5
PHYSICIANS BY SPECIALTY										
Adult primary care	14,942	67.7	1,997	70.7	2,076	61.9	6,514	69.5	4,355	66.9
Pediatric primary care	3,406	15.4	350	12.4	666	19.9	1,338	14.3	1,052	16.2
Cardiology	2,130	9.7	251	8.9	427	12.7	807	8.6	645	9.9
Psychiatry	1,578	7.2	228	8.1	183	5.5	712	7.6	455	7.0
PHYSICIAN DEMOGRAPHICS										
Female	8,359	37.9	1,082	38.3	1,179	35.2	3,819	40.8	2,279	35.0
Sole practitioner	3,847	18.0	342	12.5	770	24.0	1,601	17.8	1,134	17.8
Rural practice	3,697	21.9	1,002	35.5	42	1.3	1,313	14.0	1,340	20.6
Claims per physician, median	68.0	— ^a	42.5	— ^a	93.5	— ^a	55.0	— ^a	105.0	— ^a
Beneficiaries per physician, median	35.0	— ^a	26.0	— ^a	41.0	— ^a	32.0	— ^a	47.0	— ^a

SOURCE Authors' analysis of Medicaid claims; managed care enrollment; network provider data from Kansas, Louisiana, Michigan, and Tennessee (1 year of data was used for each state during the period 2015–17); provider data from the National Plan and Provider Enumeration System; and the Federal Office of Rural Health Policy, Health Resources and Services Administration. **NOTES** States are blinded, as required by data use agreements. Percentages might not sum to 100 percent because of rounding. Row 1 percentages reflect numbers as a proportion of total physicians; all other percentages reflect numbers as a proportion of the state-specific columns. ^aNot applicable.

EXHIBIT 2

Number of Medicaid beneficiaries seen per year by physicians contracted with Medicaid managed care plans in 4 states, by specialty and extent of physician participation, 2015-17



SOURCE Authors' analysis of Medicaid claims and network provider data from Kansas, Louisiana, Michigan, and Tennessee (1 year of data was used for each state during the period 2015-17) and provider data from the National Plan and Provider Enumeration System. **NOTES** "Ghost" is 0 beneficiaries, "Peripheral" is 1-10 beneficiaries, "Standard" is 11-150 beneficiaries, and "Core" is more than 150 beneficiaries.

it is a small proportion of total care (appendix exhibit A11 presents characteristics of out-of-network physicians).¹⁹ Overall, 1.8 percent of claims were filed by out-of-network physicians.

DISTRIBUTION OF CARE AMONG PHYSICIANS

Among primary care physicians (both pediatric and adult) who treated at least one Medicaid beneficiary in the year, 25 percent of physicians accounted for 86.2 percent of claims (exhibit 3). Among specialist physicians who treated at least one Medicaid beneficiary in the year, 25 percent of cardiologists accounted for 69.2 percent of claims, and 25 percent of psychiatrists accounted for 86.5 percent of claims. Similar results were evident across states (appendix exhibit A12).¹⁹ Core primary care physicians (29.9 percent) were responsible for 88.1 percent of outpatient care; among specialists, core cardiologists (22.5 percent) were responsible for 63.2 percent of outpatient care, and core psychiatrists (15.3 percent) were responsible for 70.6 percent of outpatient care (appendix exhibit A13).¹⁹ There were slightly higher levels of care concentration in urban, as compared with rural, areas (appendix exhibit A14).¹⁹

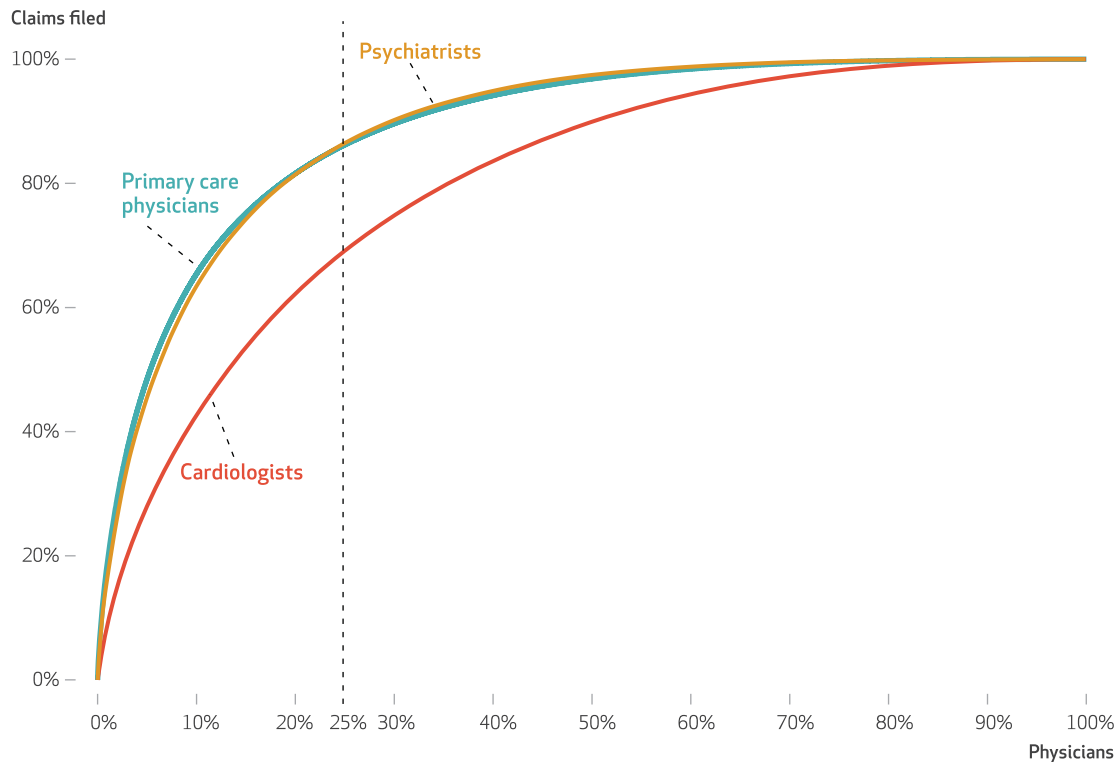
NETWORK ADEQUACY

Exhibit 4 shows the distribution of network adequacy across all counties. According to the provider network directory data, there was, on average, one primary care physician for every 440 Medicaid beneficiaries, one cardiologist for every 4,543 Medicaid bene-

ficiaries, and one psychiatrist for every 5,382 Medicaid beneficiaries across the counties included in our four-state sample (calculated from data in exhibit 4). When we excluded ghost and peripheral physicians, the average ratios rose to one primary care physician for every 654 beneficiaries, one cardiologist for every 4,777 beneficiaries, and one psychiatrist for every 8,834 beneficiaries (appendix exhibit A15).¹⁹

Looking beyond our four study states, twenty states have a network adequacy requirement that limits the number of beneficiaries per primary care provider, although these requirements vary widely: Some states require that plans contract with a minimum of one primary care provider for every 100 beneficiaries, whereas others only require one primary care provider for every 2,500 beneficiaries.³⁰ According to data from the provider network directory, 94.2 percent of the counties in our four-state sample had sufficient access to primary care physicians based on the mean of the provider-to-beneficiary network adequacy standards across the twenty states (one primary care provider for every 1,400 beneficiaries). After ghost and peripheral physicians were excluded, 84.7 percent of counties met this standard (exhibit 4).

Only a few states overall had network adequacy standards for specialists. In these states, the average specialty requirement was one specialist per 1,750 beneficiaries. According to data from

EXHIBIT 3**Distribution of unique claims billed by physicians contracted with Medicaid managed care plans in 4 states, by specialty, 2015-17**

SOURCE Authors' analysis of Medicaid claims and network provider data from Kansas, Louisiana, Michigan, and Tennessee (1 year of data was used for each state during the period 2015-17) and provider data from the National Plan and Provider Enumeration System.
NOTE Primary care physicians included both adult and pediatric primary care physicians.

the provider network directories of our four-state sample, 12.4 percent of counties met the standard for cardiologists, and 10.4 percent of counties met the standard for psychiatrists. After ghost and peripheral physicians were excluded, 9.2 percent of counties met the standard for cardiologists, and 2.3 percent of counties met the standard for psychiatrists (appendix exhibit A15).^{19,30}

Discussion

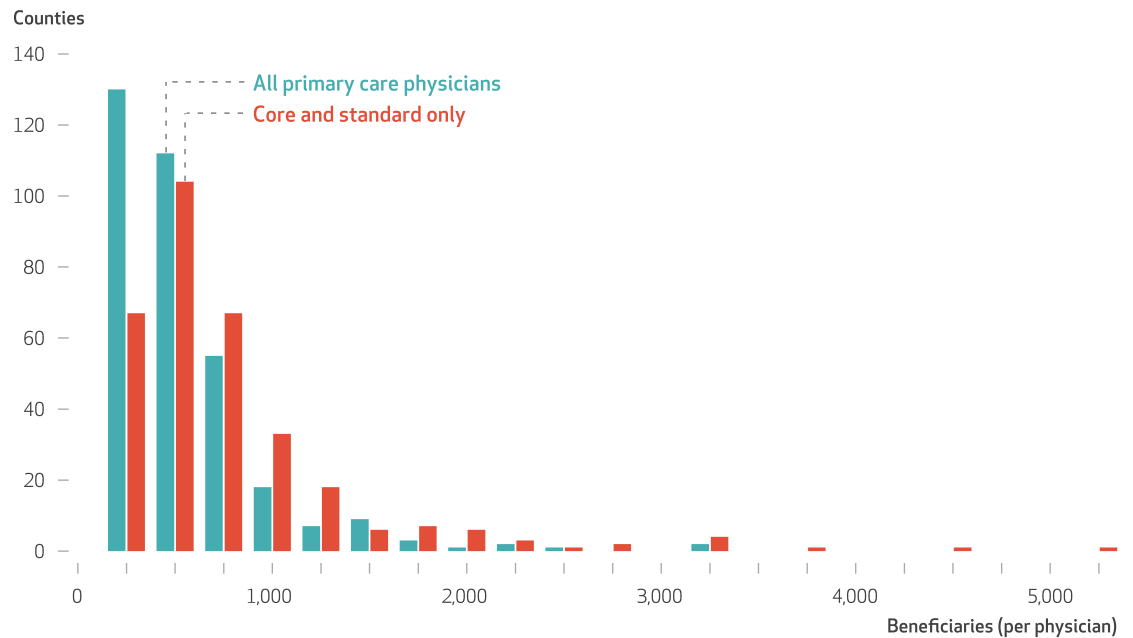
Across the four states and four specialties in this study, more than a third of the physicians listed in provider network directories for Medicaid managed care plans treated ten or fewer Medicaid beneficiaries in a year. The share of these low-volume physicians varied little across states, suggesting a widespread mismatch between the physicians listed in provider network directories and those actively seeing Medicaid managed care beneficiaries. Among the set of contracted physicians who saw Medicaid beneficiaries, care was highly concentrated: The top quartile of primary care physicians, cardiologists, and psychia-

trists were responsible for 86.2 percent, 69.2 percent, and 86.5 percent of claims, respectively. Taken together, our findings suggest that provider network directories may overstate the availability of physicians in the Medicaid program; many states' reliance on directories to ensure network adequacy may be insufficient to ensure satisfactory access to physicians who are both valued by Medicaid managed care beneficiaries and willing to treat them.

Physician participation has been a long-standing concern in the Medicaid program. Using survey data, another study found that 17 percent of primary care practices receive no Medicaid revenue.⁶ We found that a similar portion (15.9 percent) of adult primary care physicians within Medicaid managed care networks did not file any Medicaid claims in a year, which raises concerns that private insurers may be "padding" the Medicaid managed care networks with physicians irrespective of their willingness to treat Medicaid beneficiaries.⁶ As most states have transitioned the bulk of Medicaid beneficiaries to managed care, our analysis also highlights the difficulties in ensuring access to services

EXHIBIT 4

Distribution of Medicaid managed care network adequacy ratios for primary care across counties in 4 states, by extent of physician participation, 2015–17



SOURCE Authors’ analysis of Medicaid claims, managed care enrollment, and network provider data from Kansas, Louisiana, Michigan, and Tennessee (1 year of data was used for each state during the period 2015–17) and provider data from the National Plan and Provider Enumeration System. **NOTES** There were seven counties with beneficiaries, but no primary care physicians; these counties were excluded from the analysis. Network adequacy ratio is the number of Medicaid beneficiaries per Medicaid-contracted physician in each county. When the ratio is calculated only for physicians who saw more than 10 patients (core and standard physicians), the number of counties with lower ratios (indicating greater access) declines.

via third-party intermediaries.

Under federal regulations, states are required to demonstrate the adequacy of their managed care networks.¹⁶ The federal government, however, has been less explicit about how they should do so. States vary widely in the requirements of their network adequacy standards, oversight of those standards, and penalties for overstating the breadth of networks.^{14,16,30} Many states have network adequacy standards that set minimum provider-to-enrollee ratios for each managed care plan. Some states also simultaneously require adequacy based on distances (that is, at least one primary care provider within thirty minutes or ten miles of any beneficiary residence).³⁰ For example, of the four states we analyzed, one had only distance and time standards; among the other three, standards varied from 750 to 2,500 beneficiaries per primary care physician and from no standard to 20,000 enrollees per specialist.^{30–32} Based on our study and others, any measure used that is not subject to consistent oversight may have limited effectiveness in ensuring access. Our findings also suggest that network adequacy standards might not enhance access to specialists,¹⁸ as cardiology and

psychiatry networks were far more likely to have ghost physicians than primary care networks.

Policy Implications

Our findings indicate that states’ common practice of relying on the physicians listed in network directories to ensure network adequacy may be insufficient for several reasons. First, it is well documented that these directories are often outdated or inaccurate.^{13,14} This may partly explain why such a large share of the listed physicians were not actively engaged in caring for Medicaid managed care beneficiaries in our study. Our research complements prior, audit-based studies of provider network directories, demonstrating that inadequacies in network directories can be identified at scale with administrative data.^{11,33}

Second, our results suggest that all providers should not be counted equally when measuring access in Medicaid. We found that care was highly concentrated among a small set of physicians; these findings may reflect either beneficiaries’ preferences for particular physicians (for example, because of cultural competence) or the unwillingness of some physicians to see significant

numbers of Medicaid beneficiaries. Under either circumstance, networks that include the small subset of Medicaid-focused physicians are effectively broader than provider networks that contain larger shares of ghost or peripheral physicians. By counting all physicians the same way, network adequacy standards only incentivize plans to include a sufficient number of physicians, instead of encouraging plans to contract with physicians who both are valued by Medicaid beneficiaries and are willing to treat them. Failure to distinguish those standard and core physicians from ghost and peripheral physicians in network directories further exacerbates access challenges for beneficiaries, many of whom are making plan choices on the basis of the information in the directories.

Based on our findings, we propose two policy solutions to improve the oversight of provider networks in state Medicaid programs. First, we propose that states devote resources to regularly evaluating Medicaid managed care networks via a combination of more complex, yet effective, audit studies (for example, secret shoppers) and the use of broader administrative claims data to assess which physicians are actively en-

gaged in treating the Medicaid beneficiaries in each plan. Claims-based assessments could inform audit studies, making them more efficient by identifying ghost and peripheral physicians and focusing audit efforts on this group. Second, states should pair regular evaluation of managed care plan networks with strict penalties for non-compliance. Some states have started to fine plans that do not comply with network adequacy standards.³⁴ If plans are penalized for contracting with physicians who are listed as being in-network but do not see Medicaid beneficiaries, they may be incentivized to self-assess the true adequacy of their own networks and improve access to care for Medicaid beneficiaries.

Conclusion

Our findings suggest that relying on the physicians listed in Medicaid managed care network directories to measure access is insufficient. Enforcement of network adequacy standards should evolve to ensure that plan networks are evaluated on the basis of whether they include physicians who are both valued by Medicaid beneficiaries and willing to treat them. ■

An earlier version of this article was presented at the Annual National Clinician Scholars Conference (virtual), November 5-18, 2021. Avital Ludomirsky is supported by the Yale National Clinician Scholars Program and by Clinical and Translational Science Awards Program Grant No. TL1TR001864 from the National Center for Advancing Translational Science, a component of the National Institutes of Health (NIH). Jacob Wallace reports having a spouse who is the associate director for Medicaid policy at a consulting firm. Susannah Bernheim reports currently receiving salary support from the Centers for Medicare and Medicaid Services to develop, implement, and maintain performance

outcome measures that are publicly reported. Joseph Ross and Chima Ndumele received financial support from the National Heart, Lung, and Blood Institute, NIH (Grant No. R01 HL144644-01). Ross also currently receives research support through Yale University from Johnson & Johnson to develop methods of clinical trial data sharing; from the Medical Device Innovation Consortium as part of the National Evaluation System for Health Technology; from the Food and Drug Administration for the Yale-Mayo Clinic Center for Excellence in Regulatory Science and Innovation program (Grant No. U01FD005938); from the Agency for Healthcare Research and Quality (Grant No. R01HS022882); from the National

Heart, Lung, and Blood Institute, NIH (Grants Nos. R01HS025164 and R01HL144644); and from Arnold Ventures to establish the Good Pharma Scorecard at Bioethics International. In addition, Ross is an expert witness at the request of Relator's attorneys, the Greene Law Firm, in a *qui tam* suit alleging violations of the False Claims Act and Anti-Kickback Statute against Biogen Inc. Ndumele receives compensation as a member of the Academic Advisory Board of FAIRHealth.org. This article's contents are solely the responsibility of the authors and do not necessarily represent the official view of the National Institutes of Health.

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