

Pediatric and Adult Physician Networks in Affordable Care Act Marketplace Plans

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abstract

OBJECTIVES: To describe and compare pediatric and adult specialty physician networks in marketplace plans.

METHODS: Data on physician networks, including physician specialty and address, in all 2014 individual marketplace silver plans were aggregated. Networks were quantified as the fraction of providers in the underlying rating area within a state that participated in the network. Narrow networks included none available networks (ie, no providers available in the underlying area) and limited networks (ie, included <10% of the available providers in the underlying area). Proportions of narrow networks between pediatric and adult specialty providers were compared.

RESULTS: Among the 1836 unique silver plan networks, the proportions of narrow networks were greater for pediatric (65.9%) than adult specialty (34.9%) networks ($P < .001$ for all specialties). Specialties with the highest proportion of narrow networks for children were infectious disease (77.4%) and nephrology (74.0%), and they were highest for adults in psychiatry (49.8%) and endocrinology (40.8%). A larger proportion of pediatric networks (43.8%) had no available specialists in the underlying area when compared with adult networks (10.4%) ($P < .001$ for all specialties). Among networks with available specialists in the underlying area, a higher proportion of pediatric (39.3%) than adult (27.3%) specialist networks were limited ($P < .001$ except psychiatry).

CONCLUSIONS: Narrow networks were more prevalent among pediatric than adult specialists, because of both the sparseness of pediatric specialists and their exclusion from networks. Understanding narrow networks and marketplace network adequacy standards is a necessary beginning to monitor access to care for children and families.



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WHAT'S KNOWN ON THIS SUBJECT: The Affordable Care Act health insurance marketplace plans are intended to increase coverage for individuals and families, but concerns remain about patient access under these plans because of limited or narrow physician networks.

WHAT THIS STUDY ADDS: Narrow networks were more prevalent among pediatric than adult specialists in Affordable Care Act marketplace plans, because of the sparseness of pediatric specialists and their absence from networks. These narrow networks might mean inadequate access to pediatric specialty care.

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The Patient Protection and Affordable Care Act (ACA) aims to create national network adequacy standards in health insurance plans to ensure comprehensive and affordable health care access.¹ Network adequacy is a plan's ability to provide access to a sufficient number of primary care and specialty physicians and health care services for a plan's beneficiaries.^{2,3} What constitutes network adequacy is an area of evolving research and policy, especially with the rise in narrow network plans.^{4,5} Narrowing provider networks is an insurer cost containment method that predates the ACA and is becoming more prevalent as health care costs continue to rise.⁶ However, if a plan is too narrow, patients may have inadequate access to providers or bear higher out-of-pocket costs when turning to out-of-network providers or services. At this point, no standard definition of narrow network has drawn wide acceptance.

Currently, ACA network adequacy standards do not specifically address pediatric provider networks. Although network adequacy is important for all pediatric patients, access to pediatric specialists is critical for children with chronic diseases or children with special health care needs (CSHCNs).⁷⁻⁹ Yet no studies have examined the network adequacy of pediatric providers in the ACA marketplace network plans nationally. Pediatric enrollment in the marketplace was ~500 000 children ages 0 to 18 years in 2014, but this number doubled to 1 million in 2016.^{10,11} There is also emerging evidence that pediatric providers and institutions are at risk for being left out of ACA marketplace plans.^{7,12} For example, a recent study investigating the network coverage of marketplace plans in 6 cities found that nearly one-fifth of plan networks did not include an in-network pediatric cardiologist, hematologist/

oncologist, nephrologist, neurologist, or rheumatologist.¹³

Furthermore, the limited literature evaluating marketplace network size and adequacy has focused on the inclusion of hospitals or adult providers.¹⁴ A series of reports on the configuration of hospital networks in the marketplace showed growth in narrow and ultranarrow networks over the first 2 enrollment periods (October 2013–March 2014 and November 2014–February 2015), which then stabilized in the third enrollment period (November 2015–January 2016).^{15,16} Consumers paid lower premiums for narrowed hospital networks but also reported lower plan satisfaction.¹⁵ Another study of physician networks found that nearly 15% of federal marketplace plans in each state's most populous county lacked any in-network physicians for ≥ 1 specialty.¹⁷

Using a national database of provider networks from the individual silver marketplace plans from the first open enrollment period, we describe the specialist physician networks in these plans. We compare the sizes of pediatric to adult specialist networks and explore reasons for differences in network breadth. Our findings can inform policy discussions of network size and access, which are of increasing importance as the insurance market for coverage of children and adults alike evolves under health reform.

METHODS

Data Source

In the fall of 2014, we used publicly available provider directories on the issuer Web sites of individual marketplace insurance plans to gather all physician providers listed in specified networks. These listings also included physician characteristics, such as specialty, name, sex, and address. Our goal was

to collect a complete list of physician providers for all provider networks in all the unique silver plans sold in the 2014 health insurance marketplaces across all 50 states and the District of Columbia, as identified by HIX Compare.¹⁸ Plans on the marketplace were categorized by "metal" tiers; silver tier plans covered an average of 70% of the health care costs for services, could include premium tax credits and cost-sharing reduction discounts for enrollees, and were the most common tier plan purchased on the marketplace.¹⁰ The collected data were cleaned and standardized through a multistep process detailed elsewhere.⁵ We performed data quality controls by comparing physician searches on Web sites with data collected for randomly selected zip codes for each network. From the original 395 unique identified provider networks, we excluded 53 networks found to have incomplete capture of providers. We thus included 342 provider networks in this analysis that represented 1065 plans (Supplemental Fig 4).

We defined the markets where these 1065 plans were sold by the underlying rating area. These areas were regions defined by each state and typically consisted of a collection of counties. There were 501 rating areas across the United States. Typically, issuers offered plans throughout a rating area, but there were exceptions in which an insurer offered a plan only in a subset of counties within the rating area. For these exceptions, we included only the counties within the rating area where the plan was sold. In this article when we referred to a network, it was the network serving a rating area market. There were 1836 unique networks at the rating area level.

These networks included 450 794 physicians participating in ≥ 1 network. Using data from SK&A, a national databank that provided

up-to-date telephone-verified information on >700 000 physicians, we identified an additional 237 248 physicians not participating in any marketplace network.¹⁹

Specialty Coding and Identification

The multistage cleaning process included standardizing specialties, originally listed in >6000 configurations, into 47 specialty groups. Specialty was defined as the primary specialty listed in the provider directory by issuers (eg, gastroenterology), and a second indicator was added to identify whether the listing also included a pediatric subspecialty (eg, pediatric gastroenterologist). Because physicians could be listed more than once, for having multiple practice locations in the same network and participating in multiple networks, each physician was assigned the specialty that was most often listed. A provider was considered a pediatric specialist if $\geq 25\%$ of his or her listings included a pediatric subspecialist indicator.

We examined adult and pediatric physicians for the following specialties: cardiology, hematology/oncology, gastroenterology, infectious disease, endocrinology, neurology, nephrology, and psychiatry. We also examined neonatologists, for which there was no adult counterpart. We selected specialties based on a review of the literature on physician specialty workforce and on specialties of interest derived from expert discussions.²⁰

Quantifying Physician Networks

Network sizes were calculated as the fraction of physicians in an underlying rating area who participate in the network. The method avoided double counting physicians practicing in multiple locations by weighting each location of the physician by the fraction of

times that location appeared in the data set.

We categorized “narrow networks” based on the definitions in Fig 1. Narrow networks represented our umbrella category for networks with no or limited numbers of physicians. Among narrow networks, we distinguished between networks in which no doctors were available in the underlying area, called “none available networks,” and those that included <10% of the available doctors in the underlying area, defined as “limited networks.” Limited networks were classified as “none in network” if no potential doctors in the underlying area were included. Excluding “none available networks,” we also defined medium networks as those with 10% to 60% of available doctors and large networks as those with >60% of available doctors in the underlying rating area. The threshold for narrow networks was set at <10% and large networks at >60% of available doctors in the underlying area based on previous work because there was no nationally accepted measure.⁵ We selected our cutoffs with the assumption that they might provide meaningful information to consumers.^{4,5,17}

Analysis

We compared the proportions of narrow networks between adult and pediatric specialty providers by using 1- and 2-sample z tests. We used 2-sample z tests whenever proportions from independent groups were compared. We also examined these comparisons by types of narrow network (ie, none available networks and none in network) as well as by high- and low-population rating areas. The high- and low-population rating areas were defined as those in the highest and lowest quartiles by absolute population size according to 2010 census data. Our comparisons excluded neonatologists, because

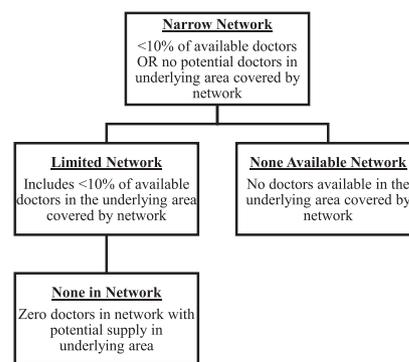


FIGURE 1
Network category definitions.

no adult comparison existed, but we included them in the analysis because neonatology was the largest subspecialty group in pediatrics. The significance level was set at $P < .05$. Stata version 13.1 (Stata Corp, College Station, TX) was used to conduct all analyses.

RESULTS

Among the 1836 unique silver plan networks, the proportions of narrow networks were greater in pediatric (65.9%) than adult (34.9%) specialist networks ($P < .001$ for all specialties; Table 1). The pediatric specialties with the highest proportion of narrow networks were infectious disease (77.4%), nephrology (74.0%), and neonatology (69.1%). Specialties with the highest proportion of narrow networks for adults were psychiatry (49.8%), endocrinology (40.8%), and infectious disease (40.6%). The largest differences in proportion of narrow networks between pediatric and adult specialists were in hematology/oncology and nephrology, and the smallest difference was in psychiatry.

Figure 2 displays the distributions of narrow networks for pediatric and adult specialists, distinguishing between the categories of limited networks, none in networks, and none available networks (categories defined in Fig 1). Overall, a larger proportion of pediatric networks (43.8%) had no available specialists in

TABLE 1 Narrow Networks for Pediatric and Adult Specialists (*N* = 1836)

	Pediatric	Adult
	<i>N</i> (%)	<i>N</i> (%)
Overall narrow networks, %**	65.9	34.9
None available network, %**	43.8	10.4
None in network, %*	19.8	15.4
Cardiology narrow networks**	950 (51.7)	432 (23.5)
None available network**	450 (24.5)	67 (3.6)
None in network**	423 (23.0)	173 (9.4)
Hematology/oncology narrow networks**	1264 (68.8)	543 (29.6)
None available network**	875 (47.7)	140 (7.6)
None in network**	359 (18.5)	251 (13.7)
Gastroenterology narrow networks**	1164 (63.4)	569 (31.0)
None available network**	748 (40.7)	148 (10.0)
None in network**	377 (20.5)	249 (13.6)
Infectious disease narrow networks**	1421 (77.4)	746 (40.6)
None available network**	1157 (63.0)	357 (19.3)
None in network*	253 (13.8)	305 (16.6)
Endocrinology narrow networks**	1183 (64.4)	749 (40.8)
None available network**	764 (41.6)	317 (17.3)
None in network*	382 (20.8)	320 (17.4)
Neurology narrow networks**	1151 (62.7)	590 (32.1)
None available network**	802 (43.7)	153 (8.3)
None in network*	314 (17.1)	265 (14.4)
Nephrology narrow networks**	1359 (74.0)	588 (32.0)
None available network**	1030 (56.1)	199 (10.8)
None in network	317 (17.3)	277 (15.1)
Psychiatry narrow networks**	1187 (64.7)	914 (49.8)
None available network**	611 (33.3)	120 (6.5)
None in network*	507 (27.6)	429 (23.4)
Neonatology narrow networks	1269 (69.1)	N/A
None available network	695 (37.9)	
None in network	472 (25.7)	

N/A, not applicable.

* Comparisons of networks for pediatric and adult specialists significant at *P* < .05.

** Comparisons of networks for pediatric and adult specialists significant at *P* < .001.

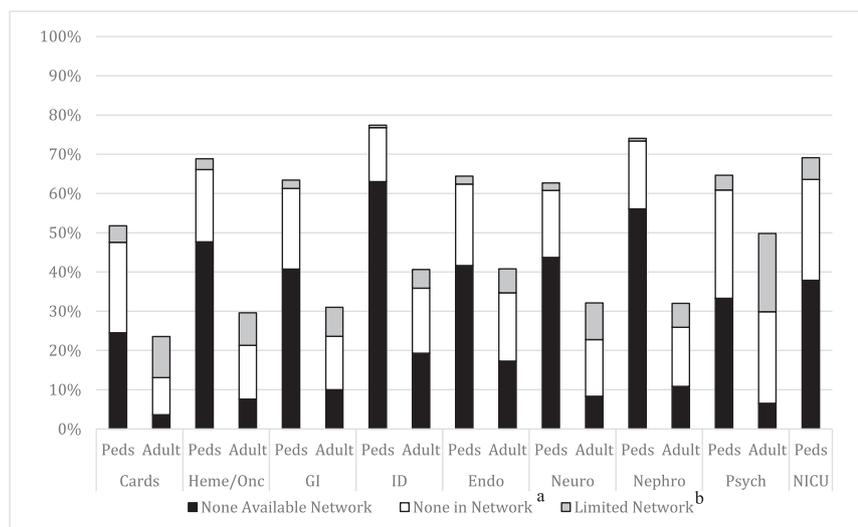


FIGURE 2

Types of narrow networks for pediatric versus adult specialists (*N* = 1836). Cards, cardiology; Endo, endocrinology; GI, gastroenterology; Heme/Onc, hematology/oncology; ID, infectious disease; Nephro, nephrology; Neuro, neurology; NICU, neonatology; Peds, pediatrics; Psych, psychiatry. ^a Comparisons of pediatric and adult specialist none in networks are all significant at *P* < .05 except for nephrology. ^b Comparisons of pediatric and adult specialist none available networks are all significant at *P* < .001.

the underlying area (ie, none available network) when compared with adult networks (10.4%); this pattern was significant at *P* < .001 for all specialties (Table 1). The proportions of networks with no coverage of existing specialists in the rating area (ie, none in network) were significantly higher for all pediatric than adult specialties, except in nephrology and infectious disease (Table 1).

Table 2 describes the proportions of networks that are limited, medium, and large, by specialty. Among networks with available specialists in the underlying area, a higher overall proportion of pediatric (39.3%) than adult (27.3%) specialist networks were limited; proportions of pediatric limited networks were significantly higher (*P* < .001) for all pediatric than adult specialties except psychiatry. Large networks (ie, those that included >60% of available specialists) were also significantly more common among pediatric than adult specialties (*P* < .05 or *P* < .001 for all specialties; Table 2), whereas medium networks (ie, those that included 10%–60% of available specialists) were more common for adult specialists (*P* < .001 for all specialties; Table 2).

None available networks were more common for both pediatric and adult networks in low-population areas compared with high-population areas (*P* < .001 for all specialties) (Fig 3). In high-population areas, more networks were none in networks for pediatric than adult specialists (*P* < .001 for all specialties; Supplemental Table 3). In low-population areas, proportionally more networks were none available networks for pediatric than adult specialists (*P* < .001 for all specialties; Supplemental Table 3).

DISCUSSION

Narrow networks were more prevalent among pediatric specialists than adult specialists. The difference in proportions of narrow

networks was largely caused by the low overall supply of pediatric physicians across the United States. However, even in rating areas where pediatric specialists were available, pediatricians were not covered under insurer networks more often than their adult counterparts, resulting in more pediatric specialty limited networks.

Large proportions of narrow networks for pediatric and adult specialists in our study had no specialists. Narrow pediatric networks were, in part, caused by the lack of available specialists in the underlying rating area, or none available networks, that might result from fewer pediatric specialists than adult specialists across the United States.²⁰ Although the lack of specialists was more pronounced for pediatrics, few adult specialists were available in low-population areas also. Plans covering low-population or rural areas will be challenged to provide strong networks within the constraints of rural delivery systems while remaining attractive as Qualified Health Plans.²¹

Although none available networks reflected a limitation of the pediatric workforce and could be an issue for insurance networks outside the marketplace (eg, Children's Health Insurance Program [CHIP] and employer-sponsored plans), the number of limited networks was a matter amendable by policies directed at network adequacy. The causes behind the disparity in the proportion of limited networks between adult and pediatric specialists were probably varied and based on decisions by both providers and insurers. Health systems and physicians might choose not to participate in networks because they value their services at a higher rate than that reimbursed by the insurer. Conversely, insurers might eliminate expensive providers or health systems from networks to reduce

TABLE 2 Provider Network Sizes in the ACA Marketplace by Specialty

		Limited	Medium	Large (>60%)	Denominator for Network Sizes
		(<10%)	(10%–60%)		
		N (%) ^a	N (%) ^a	N (%) ^a	
Cardiologist	Pediatric	500 (36.1)**	321 (23.2)**	565 (40.8)*	1386
	Adult	365 (20.6)	779 (44.0)	625 (35.3)	1769
Hematologist/oncologist	Pediatric	389 (40.5)**	167 (17.4)**	405 (42.1)**	961
	Adult	403 (23.8)	700 (41.3)	593 (35.0)	1696
Gastroenterology	Pediatric	416 (38.2)**	249 (22.9)**	423 (38.9)**	1088
	Adult	385 (23.3)	614 (37.2)	653 (39.5)	1652
Infectious disease	Pediatric	264 (38.9)**	117 (17.2)**	298 (43.9)**	679
	Adult	392 (26.5)	481 (32.5)	609 (41.1)	1482
Endocrinologist	Pediatric	419 (39.1)**	219 (20.4)**	434 (40.5)**	1072
	Adult	432 (28.4)	531 (35.0)	556 (36.6)	1519
Neurologist	Pediatric	349 (33.8)**	288 (27.9)**	397 (38.4)**	1034
	Adult	437 (26.0)	691 (41.1)	555 (33.0)	1683
Nephrologist	Pediatric	329 (40.8)**	126 (15.6)**	351 (43.5)**	806
	Adult	389 (23.8)	632 (38.6)	616 (37.6)	1637
Psychiatrist	Pediatric	576 (47.0)	340 (27.8)**	309 (25.2)**	1225
	Adult	794 (46.3)	810 (47.2)	112 (6.5)	1716
Neonatologist		574 (50.3)	297 (26.0)	270 (23.7)	1141

^a Denominator for percentages excludes none available networks that are in areas covered by the network where there are no existing specialists.

* Comparisons of networks for pediatric and adult specialists significant at $P < .05$.

** Comparisons of networks for pediatric and adult specialists significant at $P < .001$.

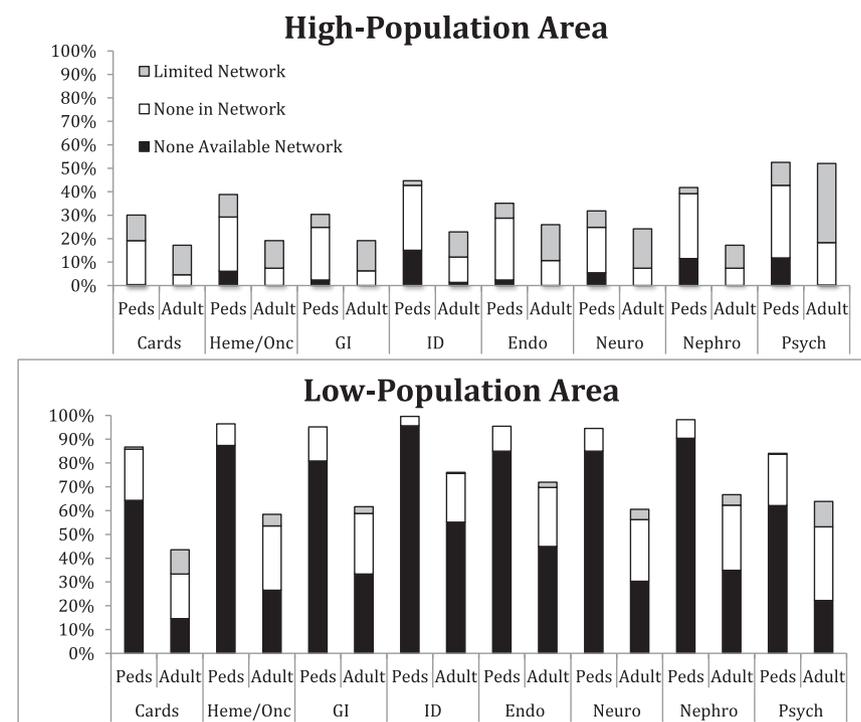


FIGURE 3

Narrow networks for pediatric versus adult specialists, by population. ^a Analysis included 459 high-population areas and 459 low-population areas. Cards, cardiology; Endo, endocrinology; GI, gastroenterology; Heme/Onc, hematology/oncology; ID, infectious disease; Nephro, nephrology; Neuro, neurology; NICU, neonatology; Peds, pediatrics; Psych, psychiatry.

costs or direct patients to providers with higher-quality care.^{14,22} For example, academic medical centers

have been excluded from narrow plans because of cost.¹⁶ Network coverage of pediatric specialists

could be subject to the same decision process if they delivered expensive services as members of children's hospitals, whose payer mix, provision of uncompensated care, and affiliation with academic centers might contribute to their higher costs.^{7,12,23} Early evidence suggested that children's hospitals might have limited coverage within marketplace silver plans.²⁴ Concerns were also raised that insurers could intentionally exclude certain providers to make plans disproportionately attractive to healthy patients, and patients might not even be aware that they are using out-of-network physicians.^{4,25}

The definition and measures of narrow network and the impact of narrow networks on patient care are open to debate, but patients and families who have no in-network specialist options could suffer from poor access. This scenario was common in our study; up to three-quarters of pediatric specialist networks and one-third of adult specialist networks lacked specialists. In these networks, beneficiaries would have to travel to other markets to seek care, possibly at long distances, if in-network providers even existed for them in those other markets. If these distances were unreasonable, or if there were no in-network providers across the entire network, patients would probably be forced to seek care out of network at a higher out-of-pocket cost.^{4,26} These burdens could disproportionately affect families with CSHCNs, who were more likely to use pediatric specialty care.⁷⁻⁹ Paying for care for a CSHCN could mean out-of-pocket costs twice that of a child without special needs, and low-income families with CSHCNs experienced a greater risk for high expenses even with insurance coverage.²⁷ The potential financial consequences highlighted the importance of developing insurance networks with enough depth and

breadth of pediatric specialist coverage so that families with CSHCNs would not need to seek out-of-network care.

This study focused on narrow networks, but our results also showed that at least one-third of most specialist networks for adults and children included $\geq 60\%$ of potential doctors. Broader networks increased consumer choice of providers and might lead to higher satisfaction.¹⁵ However, networks that were too broad could ultimately drive costs higher.¹⁵ These costs might eventually include more expensive premiums, an area of concern as average premiums had risen substantially across the health insurance landscape.²⁸ The cost of premiums in the marketplace was passed on to taxpayers, in part, because the majority of ACA marketplace enrollees received premium subsidies.¹⁰

Although this was 1 of the first studies to our knowledge that comprehensively examined provider networks nationally, our study should be interpreted in the context of several limitations. First, we defined networks by using provider ratio thresholds that were selected at the rating area level and limited to state lines. Our findings of limited or no pediatric specialists were therefore conditioned by the geographic boundary of rating areas rather than the state or other defined geographic areas. However, setting the analysis at the rating area level provided a granular and consumer-based perspective to network access because it looked at available doctors who were close to the patients.

Another limitation was that inaccuracies probably existed in health plan provider directories, and steps are currently being taken nationally to improve data quality.^{29,30} Although there were no systematic geographic differences between areas with missing networks,

the exclusion of the 53 networks with incomplete data might not be random and represented an important information gap for parents who were making insurance decisions.^{29,30} We did not verify whether pediatric physicians in provider directories were board certified or trained in pediatric care, because we recognized that correctly determining the number of pediatric specialists could be a complex task.³¹ Also, our analysis was limited to silver plans, but because the networks also applied to other metal tier plans, we captured $>90\%$ of all networks offered in the marketplace plans. Finally, our data were limited to the ACA's first open enrollment period; tracking how these networks change over time will be important to understanding how networks influence patient access.

CONCLUSIONS

Provider networks for pediatric specialists differ substantially from adult specialist networks, with more narrow pediatric than adult specialist networks. These differences underscore the importance of considering child health, especially for CSHCNs, who have the greatest demand for specialists, when developing and evaluating network adequacy standards for marketplace-based, employer-sponsored, or public insurance plans. Network adequacy standards should account for the smaller number and distinct geographic distribution of pediatric physicians to accommodate children's health needs.³² The adequacy standards in CHIP can be used as a framework for assessing marketplace plan networks.³³ The implications of pediatric network adequacy regulations for access may become more pronounced if the landscape of pediatric health insurance coverage changes. For example, if state or national legislatures decide to not reauthorize

CHIP funding in 2017, more families will seek coverage elsewhere for their children.³⁴

Besides developing standards, improved indicators of network size and access should be more transparent to families when they are shopping for insurance plans.³⁵ Network breadth metrics and tools, both overall and potentially pediatric specific, will be important as beneficiaries reenroll in marketplace plans or move in and out of different coverage sources.¹³ Families will also benefit from clear information on the financial consequences of seeking out-of-network care. Tiered networks may be 1 way to include more specialists while containing costs,

and they have been increasingly used in some regions of the country.⁶ Offering multistate plans may also mitigate the effects of limited pediatric specialists in a given area. Examining how these types of plans affect network size and access for children and adults is a future area of research.

The supply and geographic distribution of pediatric compared with adult specialty physicians can make it challenging to design robust provider networks that meet children's health needs. As health reform evolves and narrow network plans continue to be offered, families' access to needed providers for child

and adult members of the household will remain important. Monitoring the effects of narrow networks and network adequacy standards in the marketplace, employer-sponsored insurance, Medicaid, and CHIP managed care is essential for understanding families' access to care.^{22,36,37}

ABBREVIATIONS

ACA: The Patient Protection and Affordable Care Act
CHIP: Children's Health Insurance Program
CSHCN: children with special health care needs

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