

SPECIAL ARTICLE

Auditing Access to Specialty Care for Children with Public Insurance

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ABSTRACT

BACKGROUND

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Health care reform has expanded eligibility to public insurance without fully addressing concerns about access. We measured children's access to outpatient specialty care to identify disparities in providers' acceptance of Medicaid and the Children's Health Insurance Program (CHIP) versus private insurance.

METHODS

Between January and May 2010, research assistants called a stratified, random sample of clinics representing eight specialties in Cook County, Illinois, which has a high proportion of specialists. Callers posed as mothers of pediatric patients with common health conditions requiring outpatient specialty care. Two calls, separated by 1 month, were placed to each clinic by the same person with the use of a standardized clinical script that differed by insurance status.

RESULTS

We completed 546 paired calls to 273 specialty clinics and found significant disparities in provider acceptance of Medicaid–CHIP versus private insurance across all tested specialties. Overall, 66% of Medicaid–CHIP callers (179 of 273) were denied an appointment as compared with 11% of privately insured callers (29 of 273) (relative risk, 6.2; 95% confidence interval [CI], 4.3 to 8.8; $P < 0.001$). Among 89 clinics that accepted both insurance types, the average wait time for Medicaid–CHIP enrollees was 22 days longer than that for privately insured children (95% CI, 6.8 to 37.5; $P = 0.005$).

CONCLUSIONS

We found a disparity in access to outpatient specialty care between children with public insurance and those with private insurance. Policy interventions that encourage providers to accept patients with public insurance are needed to improve access to care.

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EXPANSIONS OF MEDICAID AND THE CHILDREN'S Health Insurance Program (CHIP) are designed to extend access to high-quality medical care to all U.S. children.¹⁻³ However, evidence suggests that the 37 million children covered by Medicaid-CHIP^{4,5} are less likely to receive specialty care than children covered by commercial insurance.⁶⁻¹³ Children covered by Medicaid-CHIP may face greater barriers to specialist care as a result of fewer resources within their families, including lower levels of income, education, language proficiency, and health literacy.¹⁴ Another possible explanation for disparities is that specialists choose not to accept public insurance.¹⁵ In contrast to patient-related or family-related barriers, which are less malleable to change, provider-related barriers are potentially modifiable through health care policies.¹⁶ To date, research on children's access to specialty care has not adequately distinguished between provider-related barriers and patient-related ones.

Unraveling the contributions of clinical need and patient-related versus provider-related barriers is a vital first step in constructing effective policies that improve children's access to specialty care. Given the association between socioeconomic disadvantage and poor health status, children covered by Medicaid-CHIP may have a greater need for specialty care.¹⁷ However, most studies to date have been unable to directly control for children's clinical need for specialty services.^{6,18} Audit methodology, traditionally used for detecting "real life" discriminatory behavior in housing and labor markets, can be used to assess insurance-related disparities in health care access.¹⁹ Using this approach in a 1994 study, the Medicaid Access Study Group found that adult patients with Medicaid had poor access to outpatient care.²⁰ Subsequent studies in which this approach was used did not sufficiently examine physicians' willingness to provide needed specialty care for publicly insured children.^{7,13,21,22} In light of the pending expansions of public insurance programs, we sought to identify whether — and if so, to what extent — provider acceptance of Medicaid-CHIP coverage is an independent barrier to outpatient specialty care for children in the current health care market, while controlling for patient factors and the clinical urgency of the referral.

METHODS

DATA COLLECTION AND STUDY DESIGN

We designed an audit study in which research assistants posing as mothers made paired calls to the same clinic and attempted to schedule an appointment for a child needing specialty care. The calls were separated by 1 month and varied only by insurance status (private vs. Medicaid-CHIP insurance). Data were gathered by the University of Chicago Survey Laboratory, where trained and supervised graduate students made calls to specialty clinics with the use of a central-computer-assisted telephone interview. (Post-call evaluation forms and the protocol flow chart for audit calls are available in the Supplementary Appendix, available with the full text of this article at NEJM.org.) Our study was conducted in Cook County, Illinois, the second most populous U.S. county (5,194,675 residents),²³ where the ratio of specialists to population is 218 to 100,000; the national median is 32 to 100,000.²⁴ Although Illinois Medicaid has historically provided care through a fee-for-service structure, it began implementing a primary care case-management program in July 2006, which serves approximately 67% of publicly insured children in Cook County.²⁵ The remaining children are served in a fee-for-service structure (16%) or voluntary commercial managed-care organizations (18%). Illinois is among 27 states that implement CHIP and Medicaid as a combined program (i.e., identical program name [All Kids] and reimbursements).²⁶

SAMPLING METHODS

We constructed an exhaustive list of providers, using state-provided physician-licensure data, cross-referenced with lists of physicians submitting specialty claims for children in Cook County and lists of specialists provided by children's hospitals and the American Academy of Pediatrics. The final sample included all specialists for whom there was any evidence that they provided care to children (0 to 18 years of age) residing in Cook County. Because several specialists may practice at the same clinic and some specialists practice at several clinics, we did not sample providers; rather, we sampled clinics, defined by unique (unduplicated) telephone numbers used for scheduling appointments. Random samples

of 40 clinics per health-condition scenario were stratified according to two key variables (provider licensure reporting acceptance vs. nonacceptance of Medicaid–CHIP and urban vs. suburban location) with the use of a computer algorithm. During the study, physicians' licensure data regarding Medicaid–CHIP acceptance were not publicly available.

SPECIALTY CONDITIONS AND PROTOCOL

From January through May 2010, we investigated eight specialties (allergy–immunology, pulmonary diseases, dermatology, endocrinology, neurology, orthopedics, otolaryngology, and psychiatry) in which providers treat seven pediatric specialty health conditions (Table 1). Allergists–immunologists and pulmonary disease specialists were audited together and sampled in proportion to their representation in the population, because both treat persistent, uncontrolled asthma. Clinical scenarios (involving a diagnosis and symptoms in a patient of a specified age) were chosen by pediatric primary care providers (PCPs) and specialist consultants with the use of an iterative review process to identify conditions that affect a large number of children, warrant timely outpatient specialty evaluation and treatment to achieve optimal health outcomes, are urgent situations but not emergencies, and have a known effective treatment. A pilot study of these scripts with standardized responses to possible questions was conducted between November 2009 and January 2010. (Scripts are available in the Supplementary Appendix.)

Every caller reported having a referral from the child's PCP; three scenarios also involved referral by an emergency department. To avoid geographic discrimination, we geocoded all specialty clinics and generated fake patient and PCP addresses that were in the vicinity of (but more than 1.6 km [1 mi] from) each clinic with the use of ArcGIS software (version 9.3). If asked, callers reported an emergency department located in the general area, cross-checked against specialists' hospital affiliations (from licensure data) to avoid the potential for shared electronic medical records.

We obtained dummy Medicaid–CHIP identification numbers from the state that would appear in the online system as “active” and that were

linked to the demographic characteristics (e.g., name, sex, and race or ethnic group) corresponding to each caller's identity. If asked for the PCP's name, callers gave 1 of the top 10 physician surnames from Medicaid–CHIP claims data for fiscal year 2008. For questions that the caller was unable to answer (e.g., Social Security number or private insurance number), standardized “work-arounds” were developed. To control for the racial or ethnic characteristics of a caller's name and voice, all samples were randomly assigned to one of three groups of callers (black, white, or Hispanic) with the use of a computer algorithm. Clinics were deemed “out of scope” if they reported that they did not provide care for the clinical condition or for children of the reported age (before knowing the child's insurance status). Out-of-scope clinics and nonfunctional telephone numbers were replaced with the next randomly selected clinic providing care for the condition. After three calls without reaching a live person, callers left a voice-mail message with their assigned name, telephone number, and insurance type. If voice mail was not returned, callers placed six additional calls, leaving voice-mail messages.

The same caller called the same clinic twice. The order of reported insurance type, the only variable differing between the two calls, was randomly assigned. If asked, there were minor variations in the patient's and caller's names, the patient's address and date of birth, and the PCP's name and address. For private insurance, callers reported Blue Cross Blue Shield coverage because it has the largest market share in Illinois.²⁷ Callers did not volunteer their insurance status, but if an appointment was granted without a request for insurance status, callers confirmed the acceptance of their assigned insurance. All calls were kept as short as possible, and all appointments were canceled at the end of the call. Prepaid cell phones allowed callers to provide telephone numbers, leave voice-mail messages, and receive returned calls. Outcomes were the percentage of callers according to insurance status who successfully scheduled an appointment and the wait time (number of days) between the call and the scheduled appointment date. Descriptive data about medical and insurance-related questions asked were collected.

Table 1. Specialties and Health-Condition Scenarios Included in the Study.*

Specialty Type	Medical Condition	Age	Referral Source	Symptoms
Dermatology	Severe atopic dermatitis	9 mo	PCP	Severe, itchy rash for 7 months on face, legs, and arms; PCP has tried glucocorticoids
Otolaryngology	Obstructive sleep apnea and chronic bilateral otitis media	5 yr	PCP	Snores every night but getting worse, fluid in both ears, frequent infections
Endocrinology	Type 1 diabetes	7 yr	PCP	Tired, constantly thirsty, PCP tested fasting blood sugar (approximately 200 mg/dl)
Neurology	New-onset afebrile seizures	8 yr	PCP and ED	Had a seizure last week, did not have fever, seen in ED
Orthopedics	Forearm fracture through growth plate	12 yr	PCP and ED	Radiograph in ED showed possible fracture, but doctors were not sure
Psychiatry	Acute, severe depression	13 yr	PCP	Withdrawn, depressed, grades have slipped
Allergy-immunology and pulmonary diseases	Persistent, uncontrolled asthma	14 yr	PCP and ED	Takes many medications but still wheezes, uses inhaler daily, seen in ED

* Referral source and symptoms were reported by callers only if asked. Standardized responses to questions were prepared through piloting and iterative review to indicate that the conditions were urgent (but not emergencies), common, and warranted specialty care. ED denotes emergency department, and PCP primary care provider.

STUDY OVERSIGHT

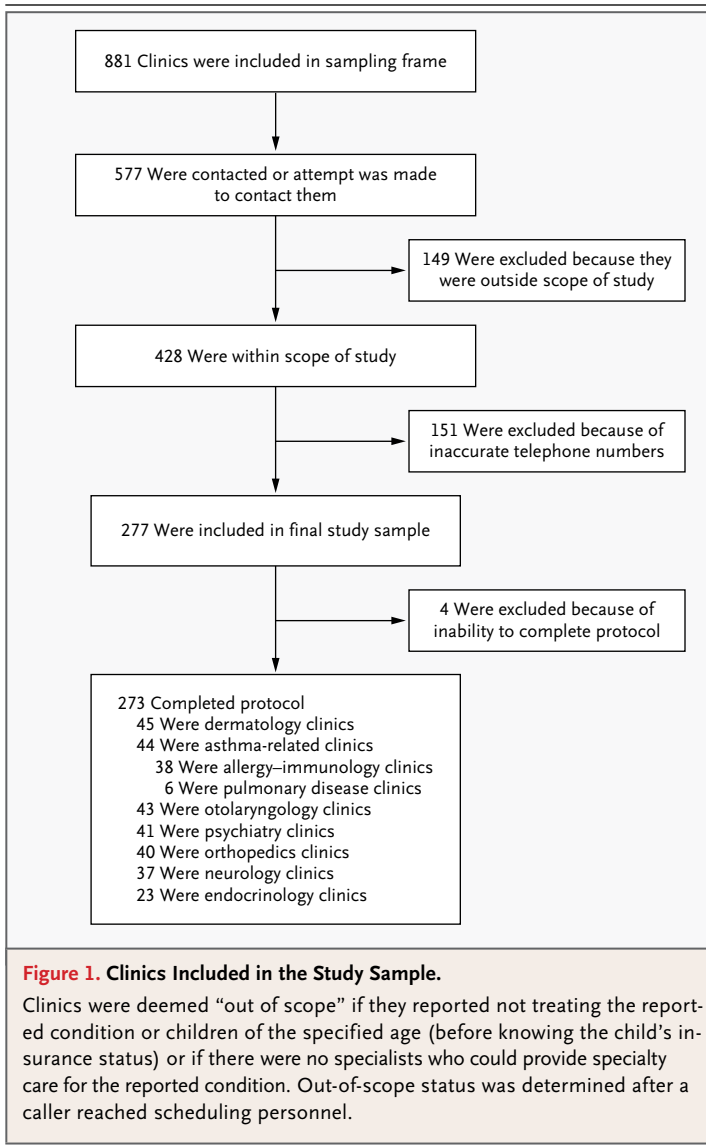
The study was approved, with a waiver of the requirement for informed consent, by institutional review boards at two institutions, with the caveat that debriefing letters be sent to all clinics in the entire sampling frame at the conclusion of the study. The deceptive design was considered necessary to accomplish the primary objective of the study: to identify the existence and extent of any disparities in children's access to specialty care according to insurance status by measuring the real-life behavior of specialty practices contacted for outpatient appointments. The debriefing letters clearly stated that the purpose of the study was to monitor the system rather than individual providers, that individual clinics may or may not have been randomly selected to be studied, and that the identity of those selected will never be disclosed.

STATISTICAL ANALYSIS

For all calls, we calculated the relative risk that children with Medicaid-CHIP coverage, as compared with those who had commercial insurance, would not receive a specialty care appointment. For paired calls, we calculated the log-odds probability of a scheduled appointment, using McNemar's test to assess the symmetry of dis-

cordant pairs (i.e., pairs of calls in which public and private insurance were not treated equally), holding constant all other patient and clinical characteristics. For subanalyses according to specialty type, we anticipated extreme splits on the dependent variable and used exact conditional (fixed-effects) logistic regression, which is a generalization of McNemar's test. Sample-size calculations for McNemar's test before the study were based on previous data from audit studies.²¹ We calculated that a sample of 20 clinics would provide 80% power to detect a 34% difference and that 32 clinics would be needed to detect a 20% difference in the rate of clinics accepting public versus private insurance, at an alpha level of 0.05.

For specialty clinics that scheduled appointments for both insurance types, we calculated the difference between appointment wait times (in number of days) with the use of paired t-tests. We did not test the significance of wait-time disparities by specialty type because of the small number of clinics that scheduled appointments for both insurance types. All tests were two-sided, and P values of less than 0.05 were considered to indicate statistical significance. All statistical analyses were performed with the use of Stata/SE software (version 11.0).



RESULTS

CLINICS

During the 5-month study period, the survey center attempted to contact 577 specialty clinics. As shown in Figure 1, 149 clinics (26%) did not treat patients with the given age or clinical condition, and 151 clinics (26%) were excluded because of nonfunctional telephone numbers. For the 277 clinics in the final sample, callers were unable to complete the study protocol with 4 clinics (1%), which required more medical documentation than we could provide. Two completed calls were made to each of the remaining 273 clinics (546 total calls). Because of the low number of endo-

crinology and neurology clinics with evidence of providers seeing pediatric patients (30 and 66, respectively), we randomly sampled from the broader pool of specialty clinics (68 endocrinology clinics and 99 neurology clinics) in an attempt to identify additional specialists willing to see children.

OUTCOMES

Of the 546 calls to clinics, 297 (54%) involved a request for information about the child’s insurance type before the caller was told whether an appointment could be scheduled. For 153 (52%) of these 297 calls, the type of insurance coverage was the first question asked. Figure 2 shows the proportions of specialty clinics that scheduled appointments for children with public insurance and for those with private insurance, according to type of specialty. As shown in Table 2, 66% (179) of the callers reporting Medicaid–CHIP coverage were denied an appointment for specialty care, as compared with 11% (29) of the callers reporting Blue Cross Blue Shield insurance (relative risk, 6.2; 95% confidence interval [CI], 4.3 to 8.8; $P < 0.001$). When calls to the same clinic were analyzed as matched pairs, there were 5 discordant pairs (2%) in which children with Medicaid–CHIP obtained an appointment but those with private insurance did not, and 155 discordant pairs (57%) in which the clinic accepted privately insured children but not Medicaid–CHIP enrollees (odds ratio for appointment denial with public insurance, 31.0; 95% CI, 13.0 to 96.8). All relative risks (when calculable) and exact conditional logistic-regression analyses showed that, across all tested specialties, children with Medicaid–CHIP were significantly more likely to be denied an appointment than privately insured children. Among 173 clinics with any providers whose license indicated acceptance of Medicaid–CHIP, 43% scheduled Medicaid–CHIP appointments. Of 100 clinics without licensure-reported Medicaid–CHIP acceptance, 19% granted these appointments.

Among the 89 specialty clinics that scheduled appointments for both Medicaid–CHIP enrollees and privately insured children, children with Medicaid–CHIP had greater delays in obtaining needed specialty care (Table 3). On average, children with public insurance waited 42 days for an appointment with a specialist, whereas privately insured children waited 20 days (mean difference, 22.1 days; 95% CI, 6.8 to 37.5; $P = 0.005$).

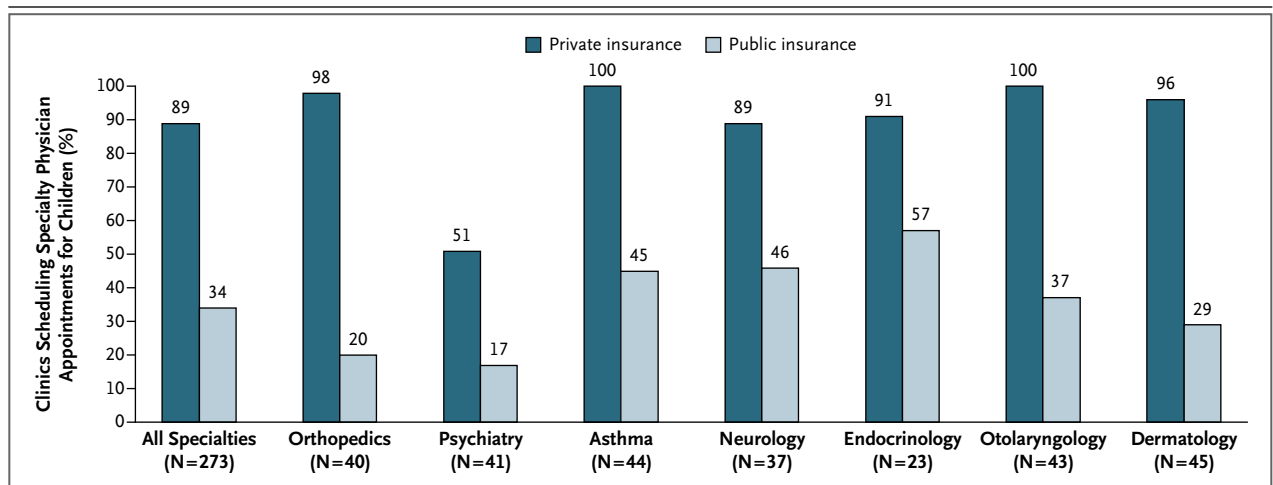


Figure 2. Clinics Scheduling Specialty Care Appointments for Children, According to Type of Insurance.

Public insurance was reported by callers as the Illinois Medicaid–Children's Health Insurance Program (CHIP) umbrella program; private insurance was reported by callers as Blue Cross Blue Shield. Each of the 273 clinics was called twice (for a total of 546 calls) by the same caller, with only insurance coverage varying between the two calls: once reporting Medicaid–CHIP coverage and once reporting private coverage. Calls were made 1 month apart, and the order of the reported insurance status was randomly assigned. Asthma clinics included 38 allergy–immunology clinics and 6 pulmonary disease clinics.

DISCUSSION

With the use of an experimental study design involving simulated requests for specialty care, we measured real-world scheduling behavior in an urban area with a high density of medical specialists.²⁴ The results showed significant disparities in children's access to needed outpatient specialty care, attributable to specialists' reluctance to accept public health insurance. These results held across all audited specialties. Moreover, even when children with Medicaid–CHIP were not denied appointments outright, the appointments were, on average, 22 days later than those obtained for privately insured children with identical health conditions. Notably, even callers claiming to have a privately insured child faced an average wait time of 20 days when urgently requesting an appointment. These findings signal a need to consider refining specialty care delivery processes to more efficiently use the specialist workforce.^{28,29}

Two previous audit studies of pediatric specialty care have shown even lower Medicaid acceptance rates: 4%¹³ and 8%.⁷ However, both studies investigated only one specialty type (orthopedics), and both had weaknesses in their sampling strategies that may have biased their results, including failure to exclude ineligible providers,⁷ sampling at the physician level rather than the clinic level (i.e.,

possibly calling the same clinic multiple times),⁷ and the exclusion of physicians practicing at tertiary pediatric referral centers,¹³ which are key sources of outpatient orthopedic care.³⁰

A recent population-based survey by Kogan et al. showed that parents whose children had Medicaid–CHIP coverage were more likely to report that insurance did not allow their child to see needed providers.³¹ Our results corroborate and add to this important finding by measuring the real-life experience of attempting to schedule an appointment when all other factors besides insurance status (e.g., parental persistence or savvy and the child's clinical symptoms) are held constant. The strength of the current study stems from its ability to isolate the effect of one dimension of access. Our results indicate that increasing the number of providers who accept public insurance will increase access opportunities. Without correcting this dimension, it is unlikely that disparities in access between public and private insurance can be fully eliminated, even if all other barriers to access (e.g., out-of-pocket costs, referral requirement, and need for language proficiency, transportation, and health literacy) could be addressed.^{15,16}

The Affordable Care Act represents an opportunity to remold health care delivery processes in the United States.^{32,33} It is well established that

Table 2. Likelihood of Being Denied a Scheduled Specialty Care Appointment According to Type of Insurance.*

Specialty	Total Clinics Called†		Both Insurance Types		Public Insurance Accepted and Denied		Public Insurance Accepted and Private Insurance Denied		Odds Ratio for Appointment with Public Insurance (95% CI)‡		Relative Risk of Appointment with Public Insurance (95% CI)‡	
	Types Denied	Types Accepted	Both Types	Types Accepted	Types Accepted	Types Denied	Accepted	Denied	Public Insurance Accepted and Private Insurance Denied	Public Insurance Denied	Private Insurance Denied	Public Insurance Denied
	number	percent	number	percent	number	percent	number	percent	percent	percent	percent	percent
All specialties	24 (8.8)	89 (32.6)	155 (56.8)	5 (1.8)	31.0 (13.0–96.8)	65.6	10.6	6.2 (4.3–8.8)				
Orthopedics	1 (0.4)	8 (2.9)	31 (11.4)	0	44.2 (7.9–∞)§	80.0	2.5	32.0 (4.6–223.0)				
Dermatology	2 (0.7)	13 (4.8)	30 (11.0)	0	42.8 (7.6–∞)§	71.1	4.4	16.0 (4.1–62.8)				
Otolaryngology¶	0	16 (5.9)	27 (9.9)	0	38.5 (6.8–∞)§	62.8	0	—				
Asthma¶	0	20 (7.3)	24 (8.8)	0	34.1 (6.0–∞)§	54.5	0	—				
Neurology	2 (0.7)	15 (5.5)	18 (6.6)	2 (0.7)	9.0 (2.2–79.9)	54.1	10.8	5.0 (1.9–13.2)				
Endocrinology	1 (0.4)	12 (4.4)	9 (3.3)	1 (0.4)	9.0 (1.2–394.5)	43.5	8.7	5.0 (1.2–20.4)				
Psychiatry	18 (6.6)	5 (1.8)	16 (5.9)	2 (0.7)	8.0 (1.9–71.7)	82.9	48.8	1.7 (1.2–2.4)				

* Public insurance was reported by callers as the Illinois Medicaid–Children’s Health Insurance Program (CHIP), umbrella program; private insurance was reported by callers as Blue Cross Blue Shield.

† All 273 clinics were called twice (for a total of 546 calls), once reporting Medicaid–CHIP coverage and once reporting private coverage.

‡ P<0.05 for all comparisons. Odds ratios were calculated with the use of McNemar’s test to compare proportions of appointments for paired calls to the same clinic for children with public insurance versus those with private insurance. Relative risks, which were calculated for unpaired calls, are based on the overall appointment rates for children with public insurance versus those with private insurance.

§ Because of an extreme split on the dependent variable for orthopedics, asthma, otolaryngology, and dermatology, exact conditional (fixed-effects) logistic-regression odds ratios are medium unbiased estimates with no upper limit of the 95% confidence interval.

¶ Relative risks could not be calculated because there were no denials of care for children with private insurance.

|| The asthma clinics included 38 allergy–immunology clinics and 6 pulmonary disease clinics.

Table 3. Wait Times for Appointments for Children with Public versus Private Insurance among Clinics Accepting Both Insurance Types.*

Specialty	No. of Clinics Accepting Both Insurance Types†	Wait Time with Public Insurance	Wait Time with Private Insurance	Difference	95% Confidence Interval‡	P Value‡
		<i>number of days</i>				
All specialties	89	42.0±75.1	19.9±34.0	22.1±72.9	6.8–37.5	0.005
Endocrinology	12	103.4±145.4	47.3±68.8	56.1±148.7		
Otolaryngology	16	52.7±82.9	5.8±5.3	46.9±82.8		
Dermatology	13	47.5±46.8	29.5±42.8	18.0±37.1		
Neurology	15	38.8±60.6	23.3±22.2	15.5±63.5		
Asthma§	20	16.2±19.1	11.3±11.7	4.9±19.7		
Psychiatry	5	12.8±15.7	8.4±9.9	4.4±19.9		
Orthopedics	8	8.5±10.4	13.4±14.7	–4.9±16.7		

* Plus–minus values are means ±SD. Public insurance was reported by callers as the Illinois Medicaid–Children's Health Insurance Program (CHIP) umbrella program; private insurance was reported by callers as Blue Cross Blue Shield.

† All 89 clinics were called twice.

‡ We did not calculate 95% confidence intervals or P values according to specialty type because of the small number of clinics for each specialty type that scheduled appointments for both types of insurance.

§ Asthma clinics included 38 allergy–immunology clinics and 6 pulmonary disease clinics. Of the 20 clinics that accepted both types of insurance, 15 were allergy–immunology clinics and 5 were pulmonary disease clinics.

reimbursement levels influence providers' decisions about whether to accept public insurance.^{8,34–36} In Illinois, an office consultation visit for a problem of moderate severity (Healthcare Common Procedure Coding System code 99243) is reimbursed at \$99.86 by Medicaid–CHIP,³⁷ whereas the average reimbursement for the same code by a commercial preferred-provider organization is approximately \$160. Although disparities in insurance-reimbursement rates are important, the literature indicates that additional variables affect physicians' decisions about whether to accept public insurance, such as delays in payment and hassles of payment procedures,^{35,36} personal characteristics of providers (e.g., credentials or experience,^{34,38,39} race or ethnic group,^{34,38–41} and underlying attitudes or prejudices^{39,42}), and structural features of the system in which they provide care (e.g., institutional affiliations,^{34,43,44} location,^{34,38,41} and practice size or type^{22,34,38,44}). Further research on the multiple underlying variables associated with provider behavior in our current system can help with workforce planning and inform innovations in service delivery.

More work is needed to understand the benefits or opportunity costs of potential policy changes. For example, is it better to raise reimbursement rates globally for all specialists or to provide targeted incentives to specialists or medical centers

located in low-resource neighborhoods and committed to serving as safety-net specialty providers? Do we need more specialists or should we reorganize the manner in which we provide specialty care? Such information is fundamental to the formation of integrated delivery systems and the configuration of payment methods that can optimize access and decrease disparities.

Caution is needed in generalizing our results to specialists other than those in the specific specialties and region that were audited in this study. In particular, there is no evidence that pediatric specialists working in inpatient or rural settings are unwilling to accept Medicaid–CHIP. Nonetheless, our experimental design affords high internal validity within the context of understanding specialist behavior relative to our simulated children's insurance status, with adequate controls for clinical urgency and other patient-level factors. Our study only assessed access to specialty care for publicly and privately insured children, and it should be noted that access to specialty care may be different for uninsured children and for publicly insured or uninsured adults.

Our study was powered to measure appointment denials and delays across a number of outpatient specialty types, but it was not powered to identify the effect of specific provider or clinic characteristics associated with appointment de-

nials or delays. In addition, we did not identify the causes of interspecialty variation. Nor did we assess whether acceptance of public insurance varies between specialists who provide cognitive consultations and procedural or surgical specialists, who may be more dependent on their affiliated hospitals to provide technologically advanced diagnostic and surgical resources.²⁹ Finally, although we used the literature and experts in both primary and specialty care to inform the urgency and importance of our clinical scenarios, more work is needed to clarify whether identified disparities are clinically meaningful for children's long-term health and safety.

Overall, we found considerable disparities in access to outpatient pediatric specialty care that were attributable to providers' nonacceptance of public insurance. These findings speak to the imperative for policymakers to identify regulatory mechanisms and incentives that target provider behavior and to explore innovative models of specialty care delivery that have the potential to in-

crease access to specialty expertise.⁴⁵⁻⁴⁷ As we encounter new opportunities for restructuring the U.S. health care delivery system, there is a need for empirical data on policy mechanisms that can minimize disparities in access to care and deliver on health care reform's commitment to the provision of high-quality care for all Americans.

Supported by the state of Illinois, which provided funding, detailed physician-licensure data, data regarding Medicaid and state-employee health insurance claims, and dummy Medicaid identification numbers as a result of a court-ordered consent decree stemming from class-action litigation on behalf of Cook County children enrolled in Medicaid.

No potential conflict of interest relevant to this article was reported.

Disclosure forms provided by the authors are available with the full text of this article at NEJM.org.

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REFERENCES

1. Sebelius K. Ensuring success: must focus on patients, eliminating inefficiencies. New York: Commonwealth Fund, July 2010. (<http://www.commonwealthfund.org/Content/Blog/Jul/Ensuring-Success.aspx>.)
2. *Idem*. CHIPRA one year later: connecting kids to coverage. Washington, DC: Department of Health and Human Services. (<http://www.insurekidsnow.gov/chip/report.html>.)
3. Newacheck PW, Pearl M, Hughes DC, Halfon N. The role of Medicaid in ensuring children's access to care. *JAMA* 1998;280:1789-93.
4. CHIP ever enrolled in year, FY 2009. Baltimore: Centers for Medicare & Medicaid Services, 2010. (<https://www.cms.gov/NationalCHIPPolicy/downloads/CHIPEverEnrolledYearGraph.pdf>.)
5. Medicaid children, title XIX SEDS report. Baltimore: Centers for Medicare & Medicaid Services, 2009. (<https://www.cms.gov/NationalCHIPPolicy/downloads/MedicaidChildrenSEDSReportFY2008.pdf>.)
6. Ferrer RL. Pursuing equity: contact with primary care and specialist clinicians by demographics, insurance, and health status. *Ann Fam Med* 2007;5:492-502.
7. Iobst C, King W, Baitner A, Tidwell M, Swirsky S, Skaggs DL. Access to care for children with fractures. *J Pediatr Orthop* 2010;30:244-7.
8. Decker SL. Medicaid physician fees and the quality of medical care of Medicaid patients in the USA. *Rev Econ Household* 2007;5:95-112.
9. Skaggs DL, Lehmann CL, Rice C, et al. Access to orthopedic care for children with Medicaid versus private insurance: results of a national survey. *J Pediatr Orthop* 2006;26:400-4.
10. Hwang AH, Hwang MM, Xie HW, Hardy BE, Skaggs DL. Access to urologic care for children in California: Medicaid versus private insurance. *Urology* 2005;66:170-3.
11. Wang EC, Choe MC, Meara JG, Koempel JA. Inequality of access to surgical specialty health care: why children with government-funded insurance have less access than those with private insurance in Southern California. *Pediatrics* 2004;114(e):e584-e590.
12. Ortega AN, Belanger KD, Paltiel AD, Horwitz SM, Bracken MB, Leaderer BP. Use of health services by insurance status among children with asthma. *Med Care* 2001;39:1065-74.
13. Skaggs DL, Clemens SM, Vitale MG, Femino JD, Kay RM. Access to orthopedic care for children with Medicaid versus private insurance in California. *Pediatrics* 2001;107:1405-8.
14. Skinner AC, Mayer ML. Effects of insurance status on children's access to specialty care: a systematic review of the literature. *BMC Health Serv Res* 2007;7:194.
15. Institute of Medicine, Committee on Monitoring Access to Personal Health Care Services. Access to health care in America. Washington, DC: National Academy Press, 1993:229.
16. Gold M, Kuo S, Taylor EF. Translating research to action: improving physician access in public insurance. *J Ambul Care Manage* 2006;29:36-50.
17. Dubay L, Guyer J, Mann C, Odeh M. Medicaid at the ten-year anniversary of SCHIP: looking back and moving forward. *Health Aff (Millwood)* 2007;26:370-81.
18. Porterfield SL, McBride TD. The effect of poverty and caregiver education on perceived need and access to health services among children with special health care needs. *Am J Public Health* 2007;97:323-9.
19. Fix M, Struyk RJ. Clear and convincing evidence: measurement of discrimination in America. Washington, DC: Urban Institute Press, 1993.
20. The Medicaid Access Study Group. Access of Medicaid recipients to outpatient care. *N Engl J Med* 1994;330:1426-30.
21. Asplin BR, Rhodes KV, Levy H, et al. Insurance status and access to urgent ambulatory care follow-up appointments. *JAMA* 2005;294:1248-54.
22. Galbraith AA, Grossman DC, Koepsell TD, Heagerty PJ, Christakis DA. Medicaid acceptance and availability of timely follow-up for newborns with Medicaid. *Pediatrics* 2005;116:1148-54.
23. Census Bureau. 2010 census data: redistricting data (interactive map). (<http://2010.census.gov/2010census/data>.)

24. Area Resource File. Washington, DC: Health Resources and Services Administration, 2008. (<http://arf.hrsa.gov/arfwebtool/HRCCTDataSources.pdf>)
25. Coughlin TA, Cohen M. A race to the top: Illinois's All Kids Initiative. Report for the Kaiser Commission on Medicaid and the Uninsured, 2007. (<http://www.kff.org/uninsured/upload/7677.pdf>)
26. Children's Health Insurance Program, plan activity as of April 23, 2010. Washington, DC: Centers for Medicare and Medicaid Services, 2010. (<http://www.cms.gov/LowCostHealthInsFamChild/downloads/CHIPStatePlanActivityMap.pdf>)
27. Market Share Reports. 2008 Illinois premium for HMO, LHSO, dental, and voluntary type companies. Springfield: Illinois Department of Insurance, 2008. (http://insurance.illinois.gov/Reports/Market_Share/2008/08HealthPremiumReport.xls)
28. McManus M, Fox H, Limb S, et al. New workforce, practice, and payment reforms essential for improving access to pediatric subspecialty care within the medical home. *Arch Pediatr Adolesc Med* 2009;163:200-2.
29. Forrest CB. A typology of specialists' clinical roles. *Arch Intern Med* 2009;169:1062-8.
30. Kasser JR. Location of treatment of supracondylar fractures of the humerus in children. *Clin Orthop Relat Res* 2005;434:110-3.
31. Kogan MD, Newacheck PW, Blumberg SJ, et al. Underinsurance among children in the United States. *N Engl J Med* 2010;363:841-51.
32. Rosenbaum S. A "customary and necessary" program — Medicaid and health care reform. *N Engl J Med* 2010;362:1952-5.
33. Iglehart JK. Medicaid expansion offers solutions, challenges. *Health Aff (Millwood)* 2010;29:230-2.
34. Cunningham PJ, Nichols LM. The effects of Medicaid reimbursement on the access to care of Medicaid enrollees: a community perspective. *Med Care Res Rev* 2005;62:676-96.
35. Berman S, Dolins J, Tang SF, Yudkowsky B. Factors that influence the willingness of private primary care pediatricians to accept more Medicaid patients. *Pediatrics* 2002;110:239-48.
36. Coburn AF, Long SH, Marquis MS. Effects of changing Medicaid fees on physician participation and enrollee access. *Inquiry* 1999;36:265-79.
37. Illinois Department of Healthcare and Family Services. Physician fee schedule key revised 7-01-09. (<http://www.hfs.illinois.gov/assets/070109fee.pdf>)
38. Perloff JD, Kletke P, Fossett JW. Which physicians limit their Medicaid participation, and why. *Health Serv Res* 1995;30:7-26.
39. Backus L, Osmond D, Grumbach K, Vranizan K, Phuong L, Bindman AB. Specialists' and primary care physicians' participation in Medicaid managed care. *J Gen Intern Med* 2001;16:815-21.
40. Komaromy M, Grumbach K, Drake M, et al. The role of black and Hispanic physicians in providing health care for underserved populations. *N Engl J Med* 1996;334:1305-10.
41. Greene J, Blustein J, Weitzman BC. Race, segregation, and physicians' participation in Medicaid. *Milbank Q* 2006;84:239-72.
42. Margolis PA, Cook RL, Earp JA, Lannon CM, Keyes LL, Klein JD. Factors associated with pediatricians' participation in Medicaid in North Carolina. *JAMA* 1992;267:1942-6.
43. Association of American Medical Colleges. Teaching hospitals and medical school faculty practice groups are major healthcare providers for Medicaid beneficiaries and the uninsured. (<http://www.aamc.org/advocacy/library/teachhosp/051810.pdf>)
44. Cunningham PJ, Hadley J. Effects of changes in incomes and practice circumstances on physicians' decisions to treat charity and Medicaid patients. *Milbank Q* 2008;86:91-123.
45. Bodenheimer T. Coordinating care — a perilous journey through the health care system. *N Engl J Med* 2008;358:1064-71.
46. Stille CJ, McLaughlin TJ, Primack WA, Mazor KM, Wasserman RC. Determinants and impact of generalist-specialist communication about pediatric outpatient referrals. *Pediatrics* 2006;118:1341-9.
47. Chen AH, Kushel MB, Grumbach K, Yee HF Jr. A safety-net system gains efficiencies through 'eReferrals' to specialists. *Health Aff (Millwood)* 2010;29:969-71.

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