Physician Credentials and Practices Associated With Childhood Immunization Rates: Private Practice Pediatricians Serving Poor Children in New York City

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ABSTRACT *Private practice physicians in New York City's poorest neighborhoods are typically foreign trained, have generally substandard clinical practices, and have been accused of rushing Medicaid patients through to turn a profit. However, they also represent a sizable share of physician capacity in medically underserved neighborhoods. This article documents the level of credentials, systems, and immunization-related procedures among these physicians. Furthermore, it assesses the relationship between such characteristics and childhood immunization rates. The analysis utilizes a cross-sectional comparison of immunization rates in 60 private practices that submitted 2,500 or more Medicaid claims for children. Immunization data were gathered from medical records for 2,948 randomly selected children under 3 years of age. Half of sampled physicians were board certified (55%), and half were accepted by the Medicaid Preferred Physicians and Children (PPAC) program (51.7%). Of physicians, 43% saw patients only on a walk-in basis, while only 17% scheduled the next appointment while the patient was still in the office. There were 75% of the physicians who reported usually immunizing at acute care visits. Immunization rates were higher among PPAC physicians compared to others (41% vs. 29% up to date for diphtheria and tetanus toxoids and pertussis [DTP]/Haemophilus influenzae type b [Hib], polio, and measles-mumps-rubella [MMR], $P = .01$), and board-certified physicians showed a trend toward better immunization rates (39% vs. 30%, $P = .07$). Physicians who reported usually immunizing at acute care visits also had higher rates than those who did not (38% vs. 27%, $P = .05$). Scheduling a date and time for the next immunization showed a trend toward association with immunization coverage (37% vs. 28%, $P = .10$). Private practice physicians who provide high volumes of care reimbursed by Medicaid have improved their credentials and affiliations over time, thereby expanding reimbursement options. Credentials and affiliations were at least as effective in distinguishing relatively high- and low-performing physicians, as were immunization-related practices, suggesting that they are useful markers for higher quality care. The relative*

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success of the PPAC program should inform efforts to improve the capacity and quality of primary care for vulnerable children. Appointment and reminder systems that effectively manage the flow of children back into the office for immunizations and the vigilant use of acute care visits for immunizations go hand in hand. Opportunity exists for payers and plans to encourage and support these actions.

KEYWORDS Board Certification, Immunizations, Medicaid, Preferred Providers, Quality of Care.

INTRODUCTION

In the quest to ensure the quality of primary care health services, policymakers and plan managers have sought straightforward indicators to identify high-caliber physicians. The identification of physicians with high standards of care is important particularly when considering vulnerable children, such as New York City children enrolled in the Medicaid program. Health indicators for these children show them to be at risk for a number of conditions, including vaccine-preventable diseases.¹ The children live in neighborhoods inadequately supplied with physicians to provide primary care services to children.^{2,3} Opening a practice in the central city historically has been an unattractive option to new physicians. Physicians in existing private practices represent a sizable share of the existing capacity to serve children in these neighborhoods.⁴ However, these physicians are known generally to have substandard clinical practices,⁵ especially with respect to preventive services such as immunization.⁶ They sometimes are accused of rushing patients through quickly to turn a profit from Medicaid reimbursement.^{4,5} Therefore, ensuring standards of care in these practices while maintaining this present capacity to serve poor children is needed.

In 1990, the New York State Medicaid program established the Preferred Physicians and Children (PPAC) program to offer enhanced reimbursement to physicians providing comprehensive primary care to children. The PPAC program requires physicians to be board certified (or board admissible for no more than 5 years from the completion of a postgraduate training program), have active hospital admitting privileges at an accredited hospital, and provide 24-hour telephone coverage for consultation. Board certification signifies that the physician has passed a certification exam that reflects clinical competence.^{7,8} Admitting privileges and 24-hour coverage, on the other hand, are necessary for physicians to coordinate care and thereby provide a medical home for their patients.

New York has had lengthy experience with Medicaid managed care, including a mandatory enrollment demonstration approved in 1991. By 1995 (the time of this study), however, only one-quarter of eligible Medicaid enrollees were in managed-care plans.⁹ That year, New York State issued a request for proposals (RFP) for Medicaid managed-care contracts. Discussion around this RFP began with requirements similar to those for PPAC, but contract requirements actually are less stringent. At a minimum, plan physicians must be board certified or eligible, have completed an accredited residency program, or have admitting privileges at a network hospital.¹⁰ The 24-hour coverage can be handled by participant providers or by the plans. It is not known how many private practice physicians in impoverished neighborhoods currently meet credential criteria or how meeting these criteria affects their preventive care practices.

While both PPAC and Medicaid managed-care contracts have focused on physician credentials, both have said less about the process of how care is delivered. The PPAC program currently requires that physicians provide periodic health assessment examination (well care) in accordance with the standards of the Medicaid Child/Teen Health Plan, for which they receive higher reimbursement rates than physicians in the traditional fee-for-service Medicaid program. For example, at the time of this study, a PPAC physician received from \$36 to \$44 for a scheduled well child care visit,¹¹ while other physicians received from \$11 to \$29 from the Medicaid program for a similar visit.¹² The systems used to accomplish the task of providing preventive care, however, have been left to the individual physician. For example, providers are not required specifically to utilize appointment systems for their patients. Likewise, Medicaid managed-care plans monitor providers' preventive care performance as part of quality assurance reviews, but they have not required or encouraged providers to adopt particular systems or steps to ensure that care is provided.

When considering immunization, however, some specific procedures are known to influence immunization rates substantially. For example, missed opportunities to immunize, particularly at acute care visits, are known to contribute to underimmunization.¹³ Patient reminder systems have been demonstrated to improve appointment keeping¹⁴ and to increase rates of up-to-date immunizations.¹⁵ However, these and other approaches to improving immunization coverage are difficult to measure and monitor. If some easily measured indicators—like a physician credential—could serve accurately as a proxy for quality care, this would be a useful tool in screening physicians. If, however, there is no relationship between credentials and the provision of preventive care, then the strategies used by some payers and plans to bar physicians with poor credentials or reward credentialed physicians with higher reimbursement rates may be punitive. Furthermore, this might have a disproportionate impact on minority physicians, who are less likely to be board certified than their white counterparts¹⁶ and are more likely to serve poor and minority populations.^{17,18}

This article examines credentials, general office systems, and immunization-specific procedures currently in use by pediatricians in private practices serving New York City's poorest neighborhoods. First, we document the current level of credentials held by these physicians. Second, we document the use of general practices and those specifically related to immunization and comment on the ability of these physicians to provide a medical home for children. Third, we relate these credentials and practices to the immunization coverage levels as observed from the physicians' medical records and contrast their usefulness in helping payers and plans to identify physicians with high standards of care.

METHODS

Design

This study utilized a cross-sectional design to compare the immunization performance of physicians with particular credentials, affiliations, and practices with their counterparts. For example, immunization performance among board-certified physicians was contrasted with that among noncertified physicians. Physician interview and medical record review data were utilized to make these comparisons. A follow-up interview 8 months after the initial interview also was used to help clarify some ambiguous responses and to provide more detail about physician practices.

Sample

A stratified sampling strategy was employed to identify physicians caring for large numbers of Medicaid-enrolled children in central-city neighborhoods. First, the nine poorest neighborhoods in New York City with high proportions of Medicaid-enrolled children were targeted for this study. These neighborhoods serve as the strata within the sampling strategy employed. Second, pediatricians in private practice with primary service delivery sites in the targeted neighborhoods and who had submitted 2,500 or more Medicaid claims for children in 1992 were identified (83) and invited to participate. Of these, 60 physicians (72%) participated in both interviews and the chart review. (See ref. 19 for a full description of the selection process.) For each participant physician, randomly selected charts were sampled for review if (1) the child was between 3 and 35 months of age at the time of the last visit, (2) the chart showed a visit within the year prior to the chart review, and (3) the chart showed no note of the child moving or leaving the practice. These inclusion criteria were used to ensure that current immunization and screening practices among active patients were reflected. There were 2,948 charts reviewed according to Centers for Disease Control and Prevention (CDC) guidelines.²⁰ For most analyses, child-level data has been aggregated to obtain physician performance scores.

Measures

The percentage of children considered up to date for diphtheria and tetanus toxoids and pertussis (DTP), *Haemophilus influenzae* type b (Hib), polio, and measles-mumps-rubella (MMR) vaccines is the primary outcome variable. Up-to-date status for immunizations was defined as receipt of the vaccine by the maximum recommended age for immunization in accordance with the 1995 “harmonized” schedule approved by the Advisory Committee on Immunization Practice (ACIP), the American Academy of Pediatrics (AAP), and the American Academy of Family Physicians (AAFP).²¹

Independent variables focus on physician credentials and affiliations, self-reported office systems, and immunization-specific procedures that may be associated with better immunization performance. Credentials and affiliations include dichotomous variables indicating (1) board certification, (2) hospital admitting privileges at a local (New York City) hospital (where presumably neighborhood children could have access), (3) status as a preferred Medicaid provider, (4) membership in a managed-care plan, and (5) only general pediatrics training (no subspecialty). Self-reported general office systems include dichotomous variables indicating (1) some type of 24-hour coverage, (2) the use of a computer in the office, (3) physician working full time in practice, and (4) the use of an appointment system. Self-reported immunization-specific procedures include (1) a usual practice to immunize during acute care visits when no contraindication exists; (2) if no immunization card is present, the provider takes some action to obtain history or to immunize the child; (3) dates and times are scheduled for the child’s next immunization; and (4) a reminder system is used to notify parents when a vaccine is due.

Statistical Analysis

Most analyses were performed with the provider as the unit of analysis. Descriptive statistics (means and percentages) were calculated for physician characteristics and practices. The percentage of children considered up to date was compared for physicians with each of the above credentials, systems, and procedures and for their counterparts without the considered attribute using *t* tests.

Finally, a series of logistic regressions were utilized to ascertain which credentials and practices predict the up-to-date status of children. For this analysis, the dependent variable was the child's up-to-date status rather than the up-to-date percentage for the physician. Unadjusted odds ratios (ORs) are reported for each credential, system, and procedure, as well as odds ratios adjusted for the child's age, number of visits, and months followed by the physician. Proportional weights were used in these regressions so that each provider was represented equally in the sample of children. Children were selected within physician offices (within clusters), yielding an effective sample that is smaller than the number of charts actually reviewed.²² SUDAAN software was used to calculate appropriate standard errors given this cluster sampling design.²³

Sample Characteristics

Consistent with prior studies of physicians in private practices serving children in New York's low-income neighborhoods,^{4,5} providers in this sample were found to be overwhelmingly foreign born (92%) and trained (95%). All the participant physicians had completed a residency program in pediatrics, generally in the US (98.3%). The vast majority of sampled children from these practices were enrolled in Medicaid (93%).

RESULTS

Current Credentials, Systems, and Procedures

Approximately half of surveyed physicians were board certified (55%), with all but one certified in pediatrics (Table 1). The majority of noncertified physicians were board admissible (40%), but had remained in that status for 6 or more years. Half were designated as preferred Medicaid (PPAC) providers (51.7%). Among those

TABLE 1. Physician credentials, self-reported practices, and observed immunization practices

	Number	Percentage (N = 60)
Credentials		
Board certified	33	55.0
Admitting privileges in New York City	44	73.3
Medicaid preferred provider	31	51.7
Member of managed-care plan(s)	34	56.7
Only general pediatrics residency	46	76.7
Office systems		
24-Hour coverage	52	86.7
Computer in office	12	20.0
Full time in practice	32	53.3
Uses appointment system	34	56.7
Immunization-specific procedures		
Usually immunizes at acute care visits	43	71.7
If no immunization card, takes action	20	33.9
Schedules date and time for next immunization	43	71.7
Uses an active immunization reminder system	4	6.7

who were not PPAC providers, board certification (or board admissibility for 5 or fewer years) was often the only required credential or affiliation they lacked (16 physicians, or 55% of the non-PPAC physicians). Only slightly more physicians in the sample belonged to a managed-care plan (56.7%); these plans generally do not require board certification.

The majority of physicians (87%) reported some type of 24-hour coverage for patients who need care outside office hours—almost always telephone access to an answering service. There were 12 physicians (20%) who reported having a computer in their office; the computer always was used for billing and only occasionally used to keep track of patient information. There were 2 physicians who kept computerized immunizations records, and 2 maintained lists of their managed care patients. Of the practices, 26 (43%) saw patients only on a walk-in basis. In the follow-up interview, 16 of these physicians reported that they operated their practices solely on a walk-in basis because patients “don’t keep appointments anyway.” Physicians who do use an appointment system were asked how they encourage patients to make appointments. Of the 30 physicians who responded to this question, 23 (77%) reported that they tell patients to make an appointment at a later date; generally, this meant that the patient was told to call on the day that they wanted to come. Only 5 physicians (17%) reported that they schedule the next appointment when the patient is still in the office for the current visit. There were 2 physicians (7%) who reported that they telephone patients to remind them of upcoming appointments.

Immunization strategies among participant physicians varied. All physicians reported usually immunizing at well child care visits, but fewer (72%) reported usually immunizing at acute care visits. All physicians reported asking parents for the immunization card at the time of the visit. However, 12 physicians (20%) reported that parents rarely bring the card. When no card is presented, only one-third reported taking any steps other than waiting for a card to become available. Actions included calling the child’s previous provider to get information (7 physicians), recording information provided verbally by the parent (5 physicians), and commencing the immunization series from the start (11 physicians). Almost three-quarters of physicians reported scheduling a date and a time for a child’s next immunization. This self-reported information contradicts the finding that only 60% of physicians had any discernible appointment system for patients. Few physicians (7%) reported any type of active immunization reminder system.

Markers for Better Immunization Coverage

In considering credentials as potential markers for better immunization coverage, acceptance in New York State’s Medicaid preferred provider program markedly distinguished relatively high- and low-performing physicians (Table 2). PPAC physicians had 41% of their patients up to date for DTP/Hib, polio, and MMR vaccines, in contrast to 29% among non-PPAC physicians ($P = .01$). To be eligible for preferred provider status, a physician must have two of the other noted credentials—board certification (or board admissibility for 5 or fewer years) and admitting privileges. A direct comparison of board-certified and other physicians shows a trend of better performance among certified physicians (39% vs. 30%, $P = .07$). Likewise, general pediatrics training (with no other subspecialty training) suggests a trend toward better performance when compared to physicians with specialist training (37% vs. 27%, $P = .06$).

General office systems did not distinguish high- and low-performing physicians

TABLE 2. Mean percentage of children up to date for immunizations* by physician credentials

Credential	N	Mean	P
Board certified			
No	27	30.1	.07
Yes	33	38.9	
Admitting privileges			
No	16	31.8	.44
Yes	44	36.1	
Preferred medicaid provider			
No	29	28.9	.01
Yes	31	40.6	
Member of managed-care group			
No	26	32.7	.43
Yes	34	36.7	
Only general pediatrics residency			
No	14	26.9	.06
Yes	46	37.4	

*DTP/Hib, polio, and MMR.

(Table 3). Immunization-specific procedures, however, did help to separate physicians according to performance (Table 4). Most notably, physicians who reported usually immunizing during acute care visits had a higher coverage rate (38%) than physicians for whom this is not the usual practice (27%, $P = .05$). The only other approach to immunization for which a trend in performance is observed is the use of an appointment system. Physicians who scheduled a date and a time for the next immunization show a trend toward higher coverage than those without this practice (37% vs. 28%, $P = .10$). Given the appointment system most often reported by physicians (to tell patients to make an appointment at a later date), this is notewor-

TABLE 3. Mean percentage of children up to date for immunizations* by office systems

Office systems	N	Mean	P
Some type of 24-hour coverage			
No	8	27.6	.23
Yes	52	36.1	
Computer in office			
No	48	34.4	.56
Yes	12	37.4	
Full time in practice			
No	28	37.8	.27
Yes	32	32.5	
Uses appointment system			
No	26	35.4	.86
Yes	34	34.6	

*DTP/Hib, polio, and MMR.

TABLE 4. Mean percentage of children up to date for immunizations* by immunization-specific procedures

Immunization-specific procedures	n	Mean	P
Usually immunizes at acute care visits			
No	17	27.4	.05
Yes	43	37.9	
If no card presented, takes some action			
No	39	34.4	.74
Yes	20	36.0	
Schedules date and time for next immunization			
No	16	28.1	.10
Yes	43	37.0	
Uses active immunization reminder system			
No	56	34.4	.42
Yes	4	42.3	

*DTP/Hib, polio, and MMR.

thy. Perhaps the appointment practices for immunizations are different from the regular appointment system used in some offices.

When considering the ability of each credential, system, and immunization procedure to predict children's up-to-date status after controlling for individual differences such as the child's age, number of visits, and time followed by the physician, similar patterns emerged (Table 5). The odds that a child cared for by a PPAC

TABLE 5. Odds ratio of child being up to date for immunizations* for particular credentials and practices

	Unadjusted OR (N = 2,948)	P	Adjusted† OR (N = 2,948)	P
Credentials				
Board certified	1.48	.07	1.36	.14
Admitting privileges in New York City	1.21	.50	1.27	.39
Medicaid preferred provider	1.68	.02	1.53	.05
Member of managed-care plan(s)	1.20	.45	1.20	.44
Only general pediatrics residency	1.63	.05	1.70	.03
General practices				
24-Hour coverage	1.48	.36	1.43	.41
Computer in office	1.14	.54	1.10	.64
Full time in practice	.79	.29	.75	.19
Uses appointment system	.96	.86	1.00	.98
Immunization practices				
Usually immunizes at acute care visits	1.62	.06	1.61	.06
If no immunization card, takes action	1.08	.75	1.11	.65
Schedules date and time for next immunization	1.51	.16	1.54	.13
Uses an active immunization reminder system	1.40	.24	1.55	.14

*DTP/Hib, polio, and MMR.

†Odds ratios in this column are adjusted for the child's (1) age at last visit, (2) total number of visits, and (3) time followed by participant physician.

physician would be up to date are 1.5 times greater than the odds of being up to date for a child cared for by a non-PPAC physician ($P = .05$). The absence of subspecialty training, however, emerged as a strong predictor of up-to-date status after controlling for individual children's differences. The odds of being up to date for immunizations for a child cared for by a physician with only primary care training were 1.7 times greater than for a child cared for by a physician with subspecialty training ($P = .03$).

DISCUSSION

More than half of physicians were board certified (55%), up from 30% in 1988,⁵ but still lower than the 89% of pediatricians certified in New York State (New York State Department of Health, Immunization Program, New York State Physician Immunization Survey, unpublished, 1993) or the 86% of pediatricians certified nationally.²⁴ This is particularly noteworthy given that board certification was most often the only credential physicians lacked for eligibility in PPAC. While the majority of physicians reported seeking board certification due to personal beliefs about excellence, 8 physicians said they did it to join a managed-care plan that required certification, 3 to obtain hospital admitting privileges, and 1 to join PPAC. Given their enhanced credentials and their motivation for seeking them, it is not surprising that the percentage of physicians with Medicaid preferred provider status grew among this group of physicians (from 24% in 1993 [see ref. 4] to 52% in 1995), as did participation in managed care (from 15% in 1993 [see ref. 4] to 57% in 1995) (see ref. 25 for a full discussion of the changes in managed-care participation among these physicians).

The improved credentials and affiliations among these physicians expand their reimbursement options to include PPAC (and its higher Medicaid reimbursement rates) and managed care (which is a growing component of Medicaid enrollment in New York). In so doing, some of the capacity to provide medical care to children in these neighborhoods is maintained, at least in the short run.

Ability to Provide a Medical Home

Providing a medical home to children includes being accessible to patients outside office hours, coordinating specialty and hospital care, and providing general primary care, including preventive care services. Increases in admitting privileges, 24-hour coverage, and physicians working in their city practices full time all suggest that access to coordinated care is improving for children in the central city. A study by Brellocks and colleagues provides a point of comparison from 1988.⁵ Among this group of pediatricians, hospital admitting privileges have more than doubled since 1988 (from 34% to 82% in 1995). Five of these physicians, however, had privileges only at a hospital outside New York City, where presumably their patients within the city would have difficulty seeking care. The percentage of pediatricians and family practice physicians in these neighborhoods who provide some type of 24-hour coverage has risen sharply (from 17% in 1988 to 87% in 1995). Finally, more physicians are working full time in their neighborhood practices (from 23% in 1988 to more than half in 1995). Given that most sampled physicians operated in solo practices or group practices with no other pediatricians, working there full time may improve the likelihood that they can provide a medical home to children.

Some basic systems for managing the flow of patients seemed lacking in physi-

cian offices. For example, the fact that 26 practices (43%) had no appointment system is alarming. Furthermore, among offices with an appointment system, three-quarters reported that their “system” involved recommending to patients that they make an appointment at a later date rather than at the time they were in the office. Patient reminders for upcoming appointments and needed immunizations are even less likely to be used. Only 4% of physicians reported using reminders, in contrast to 55% of all pediatricians nationwide who reported using a reminder system for well care visits.²⁶ These techniques are most needed in practices in which patient no-show rates are high. While many physicians reported that they do not use appointment systems because patients don’t keep appointments anyway, this may reflect, in part, their traditional role as providers primarily of sick care.^{4,5} The lack of effective appointment and reminder systems could have a negative effect on their ability to provide a medical home to children.

While even fewer physicians utilized a computer to maintain patient information, like immunizations, this is not uncommon among pediatricians and family practice physicians. Szilagyi and colleagues²⁶ found that only 6% of pediatricians nationwide had a computerized system to track immunizations, in contrast to 3% in our sample. This technology seems to be spreading slowly among pediatricians. Furthermore, a few of our sampled physicians reported that the theft from the office of other valuable equipment, like air conditioners, kept them from considering a computer for their office.

Indicators of Higher Immunization Coverage Levels

Enrollment in the Medicaid preferred physicians program (PPAC) significantly differentiated relatively high- and low-performing physicians. Board certification—one of the requirements for PPAC enrollment—showed a trend toward association with immunization performance ($P < .07$). It should be emphasized, however, that PPAC physicians are not simply better credentialed than non-PPAC physicians, but also receive higher reimbursement rates from Medicaid. In our follow-up interview, the vast majority of PPAC physicians (81%) reported joining for the enhanced fees they would receive.

None of the office systems considered in this study differentiated high- and low-performing physicians, and the immunization-specific procedures did not differentiate immunization performance much better. The only immunization-specific practice that appeared related to physician’s immunization performance was the practice of usually immunizing at acute care visits. Those physicians who reported using sick visits to immunize had coverage levels more than 10% higher than other physicians.

Scheduling a date and a time for the next immunization was the other practice that showed a trend toward association with coverage. It is puzzling, however, that 70% of physicians reported this practice, while only 60% appeared to have any sort of appointment system. It is clear that there was considerable uncertainty about who had an actual appointment system, and there was much gray area between having an appointment system and using it rigorously. It may be that making appointments for immunizations (at the visit rather than later) may have some relationship to coverage in those practices with real appointment systems in place. Among the entirely walk-in practices, however, the importance of using acute care visits to vaccinate is highlighted.

Limitations

There are several limitations of this study that deserve note. First, the sample is comprised of a small number of physicians. While the sample is considered representative of doctors in private practice in New York's central city, the small sample size made statistical significance of differences in immunization performance difficult to achieve. Nevertheless, some statistical differences were noted, as well as some trends that deserve further study. Second, physician credentials, affiliations, and practices were all self-reported. Credentials are relatively concrete and therefore less prone to bias. However, physicians may have over-reported the use of "good" office systems and immunization procedures. Given this bias, therefore, findings such as the low number of physicians using an immunization reminder system become even more compelling. Furthermore, the over-reporting of good immunization practices would lead to downward bias in performance differences between physicians using the good system or procedure and those not using it. Finally, this study focused on a subset of foreign-trained, historically poor-performing physicians serving large numbers of high-risk children enrolled in Medicaid. Results cannot be generalized to all pediatricians or other primary care providers.

CONCLUSIONS

We examined the capacity of pediatricians in existing private practices to serve Medicaid-enrolled children in the central city and found that these physicians are changing to fit into an evolving health care delivery system with varying methods of reimbursement. Such physicians are improving their credentials and expanding their options to include managed care and PPAC participation at an astounding rate. Their actions preserve some of the much-needed capacity to provide primary care to children in low-income neighborhoods. Furthermore, PPAC enrollment emerged as the most potent predictor of immunization performance among these physicians—better than any single general or immunization-specific practice considered. Whether this better performance is due to the higher standards of enrolled physicians, including their adherence to the Child/Teen Health Plan guidelines, the incentives created by the higher reimbursement they receive, or some combination of these factors remains unknown. It is clear, however, that efforts to improve the capacity and quality of primary care for vulnerable children should be informed by the success of the PPAC program. Notably, managed-care enrollment did not show a similar positive effect on children's receipt of preventive care.

Despite the evidence that these physicians improved their credentials, there is still cause for concern about their ability to provide a medical home to children. Perhaps the most striking evidence of this concern is the lack of appointment systems in almost half of the practices and their weak application in many offices that do have systems. Handling patients only on a walk-in basis may increase the chances that needed preventive care will not be rendered and that other concerns may not be addressed—patients are more likely to be ill at the time they seek care, and physicians are more likely to be pressed for time. While no differences were observed in the immunization performance of physicians with and without appointment systems, it was difficult to discern which physicians actually used an appointment system on a routine basis, thereby blurring this comparison. This is an area in which payers and plans might encourage or require providers to install, maintain, and use appointment systems and to schedule children's next well care appointment

at the time of their current visit. If (as many physicians reported) patients do not keep appointments, reminder systems may also be needed.

Finally, the importance of immunizing children at acute care visits is vital to improving immunization coverage rates among children in these practices. The US Department of Health and Human Services Standards for Pediatric Immunization Practices state that all providers should "utilize all clinical encounters to screen and, when indicated, immunize children."²⁷ The reliance on walk-in patients intensifies the need for utilizing sick visits for immunization in these practices. Again, perhaps payers and plans should become involved more actively in educating providers about the importance of this action and encouraging them to utilize sick visits for immunization. Appointment and reminder systems that effectively manage the flow of children back into the office for a series of immunizations and the vigilant use of acute care visits for immunizations go hand in hand. Both are needed to improve immunization performance among physicians in private practices serving the central city and, more broadly, to enhance their ability to provide a medical home to children.

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