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Vaccine Financing From the Perspective of Primary Care Physicians

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Abstract

Objectives—Because of high purchase costs of newer vaccines, financial risk to private vaccination providers has increased. We assessed among pediatricians and family physicians satisfaction with insurance payment for vaccine purchase and administration by payer type, the proportion who have considered discontinuing provision of all childhood vaccines for financial

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reasons, and strategies used for handling uncertainty about insurance coverage when new vaccines first become available.

Methods—A national survey among private pediatricians and family physicians April to September 2011.

Results—Response rates were 69% (190/277) for pediatricians and 70% (181/260) for family physicians. Level of dissatisfaction varied significantly by payer type for payment for vaccine administration (Medicaid, 63%; Children's Health Insurance Program, 56%; managed care organizations, 48%; preferred provider organizations, 38%; fee for service, 37%; $P < .001$), but not for payment for vaccine purchase (health maintenance organization or managed care organization, 52%; Child Health Insurance Program, 47%; preferred provider organization, 45%; fee for service, 41%; $P = .11$). Ten percent of physicians had seriously considered discontinuing providing all childhood vaccines to privately insured patients because of cost issues. The most commonly used strategy for handling uncertainty about insurance coverage for new vaccines was to inform parents that they may be billed for the vaccine; 67% of physicians reported using 3 or more strategies to handle this uncertainty.

Conclusions—Many primary care physicians are dissatisfied with payment for vaccine purchase and administration from third-party payers, particularly public insurance for vaccine administration. Physicians report a variety of strategies for dealing with the uncertainty of insurance coverage for new vaccines.

Keywords

vaccines; immunizations; primary care; adolescents; children

The ongoing success of immunizations in the United States in reducing morbidity and mortality is exceptional and well described.¹ However, financial considerations may be an increasing concern for primary care physicians. Although much of the supply of pediatric vaccines is purchased by the federal government through the Vaccines for Children (VFC) program, approximately half is purchased by private pediatricians and family physicians,² and these providers administer vaccines to the majority of US children.³ The cost of the vaccines needed to fully vaccinate a child through age 18 in the private sector in the mid-1980s was ~\$50; in 2000, it was ~\$600. In 2012, that cost was between and \$2250 and \$2500, depending on the products used.⁴ Children may receive as many as 35 separate vaccine administrations by early adolescence, not including influenza vaccine.⁵ For private practices, each of those administrations can be viewed as a separate financial transaction. The cost of vaccines has gone from a minor consideration in the overhead of a private pediatric practice in the 1980s to one of the top overhead expenses, largely because of new vaccines, thus magnifying the risk to private practices of uncompensated costs related to vaccines.⁶

Practices recoup the costs of vaccination in 2 ways: insurance payment for vaccine purchase and insurance payment for vaccine administration. There is wide variation in the amount practices pay to purchase vaccines and the amount they are paid by insurers for the cost of those vaccines.^{7,8} Insurance payment for administration fees also varies, from \$2 to >\$26, with an average of \$9.45 from Medicaid and \$16.62 for private payers.^{8,9} In most cases,

private providers negotiate with manufacturers or distributors for vaccine purchase prices and with insurers for payment for vaccine purchase and administration fees for privately insured patients. VFC vaccines are provided at no cost to participating providers, and insurance payments for administration fees in VFC are set by states, with matching funds from the federal government.¹⁰ It is important to note that the costs of vaccination for VFC vaccines are only recouped only through insurance payment for vaccine administration.

In the current study, we wanted to assess the impact of newer child and adolescent vaccines on private physicians. We also wanted to update data on satisfaction with insurance payment for vaccine purchase and administration and to examine the level of satisfaction by payer type, because we hypothesized there would be significant variability. Finally, we wanted to obtain data about financial issues to serve as a baseline for future comparison as the Affordable Care Act (ACA) is in its early stages of implementation. Therefore, we sought to ascertain, through a national survey of pediatricians and family physicians, 1) satisfaction with insurance payment for vaccine purchase and administration by payer type, 2) the proportion who have considered discontinuing provision of all child and adolescent vaccines for financial reasons, 3) the association between dissatisfaction with insurance payment and consideration of discontinuing vaccine provision, 4) strategies used for handling uncertainty about insurance coverage when new vaccines first become available, and 5) estimates of the proportion of parents who defer or refuse new vaccines because of the costs.

Methods

Study Setting

From April to September 2011, we administered a survey to 2 national networks of primary care physicians. The human subjects review board at the University of Colorado Denver approved this study.

Population

As part of the Vaccine Policy Collaborative Initiative, national networks of physicians were recruited from the American Academy of Pediatrics (AAP) and the American Academy of Family Physicians (AAFP). A recruitment letter was sent to a randomly selected sample of physicians who were members of the AAP or AAFP requesting volunteers to be part of a network that would be surveyed up to 3 times in a 1-year period. Only pediatricians and family physicians who spent more than 50% of their time in outpatient primary care were eligible. After approximately twice the number of recruits needed for each network were obtained, a quota strategy was applied to ensure the representativeness of the samples.^{11,12} A population-based sampling matrix was constructed using demographic and practice data from randomly drawn samples of the AAP and AAFP memberships. Using population-based estimates, we created quotas for each cell of the 36-cell matrix, which crossed US regions, practice locations (urban versus rural), and practice types. Cells were then filled by randomly selecting from the pool of recruits to yield a total of ~400 physicians in each network. As described in detail elsewhere,¹¹ the representativeness of the networks has been systematically examined. Demographic characteristics, practice attributes, and reported attitudes about a range of vaccination issues were similar between network physicians and

physicians of the same specialty who were randomly sampled from the American Medical Association master physician listing.¹¹ For this study, only network physicians in private practice were included (pediatricians, 79% of network; family physicians, 73%), because physicians in private practice were more likely to be aware of financial issues than those in public, HMO, or university settings. Physicians practicing in Universal Purchase states (pediatricians, 12%; family physicians, 11%) were also excluded.¹³ These exclusions resulted in a study population of 277/413 pediatricians (67% of the network) and 260/427 family physicians (61% of the network).

Survey Design

The survey was developed collaboratively with the Centers for Disease Control and Prevention and pretested in advisory panels of US pediatricians and family physicians. It was pilot-tested in national samples of 12 pediatricians and 27 family physicians. The survey included questions about experiences with vaccine purchasing and insurance payment, satisfaction with insurance payment for vaccine purchase and administration, and strategies used when a new vaccine is first available and insurance coverage is uncertain. We used a question from a previous study¹⁴ to ask the extent to which physicians had considered stopping providing all vaccines because of costs. Questions about satisfaction with insurance payment for vaccines and administration fees were asked for each payer type using 4-point Likert scales. We defined payer as any insurer providing payment to providers for vaccines or administration fees. Private payer types included fee for service (FFS), preferred provider organization (PPO), and managed care organization (MCO) or health maintenance organization (HMO). Public payer types included Children's Health Insurance Program (CHIP), and for vaccine administration only, Medicaid. Questions about strategies used for handling the uncertainty surrounding insurance payment for new vaccines were asked about human papillomavirus (HPV) vaccine, quadrivalent meningococcal conjugate vaccine (MCV4), tetanus–diphtheria–pertussis vaccine (Tdap), and rotavirus vaccines using a series of yes/no questions. These questions were developed based on expert input and pilot testing with practicing physicians and included 5 possible strategies.

Survey Administration

The survey was administered by Internet or mail, based on physicians' preferences. The Internet survey was administered by using a web-based program (Enterprise Feedback Management, Verint Systems, Inc, Melville, NY). The Internet group received an initial e-mail with a link to the survey and up to 8 e-mail reminders to complete the survey, whereas the mail group received an initial mailing and up to 3 additional mailed surveys at 2-week intervals. The Internet nonresponders also received up to 2 paper surveys by mail in case e-mails had been blocked or sent to wrong addresses.

Analytic Methods

Internet and mail surveys were pooled for all analyses, because provider attitudes have been found to be comparable by either method.¹⁵ The 2 specialties were combined where results were similar. χ^2 and Wilcoxon rank-sum tests were used for comparisons of characteristics of respondents and non-respondents and Kolmogorov–Smirnov tests for comparisons of

overall distributions of responses between respondents in the 2 specialties. A dissatisfaction scale was created by using 6 questions about insurance payment for vaccines from FFS, PPO, and MCO/HMO payers, 3 about satisfaction with insurance payment for vaccine purchase, and 3 about satisfaction with insurance payment for vaccine administration. Responses of “very dissatisfied” received a score of 2, “mostly dissatisfied” 1, and all other responses 0. Responses for each of the 6 questions were summed for a possible range of 0 to 12. Wilcoxon rank-sum tests were used to determine the association between the scale and consideration of discontinuing vaccine provision. All analyses were performed by using SAS 9.2 (SAS Institute, Inc, Cary, NC).

Results

Response Rates and Study Sample

The response rates were 69% (190/277) for pediatricians and 70% (181/260) for family physicians. Respondents were similar to nonrespondents (Table 1). Eighty-three percent of pediatricians and 59% of family physicians reported participating in VFC. Ten percent of family physicians reported not administering vaccines to patients <18 years old and did not answer any more questions related to vaccine financing.

Satisfaction With Insurance Payment

Physicians' levels of satisfaction with insurance payment for vaccine purchase and vaccine administration are shown in Fig 1. One-quarter of respondents across payer types responded “don't know” and were excluded from the calculations of satisfaction with payment. Few physicians reported being “very satisfied” with any payer for vaccine purchase, and large proportions reported dissatisfaction (“mostly” and “very”) with every payer (MCO/HMO payers, 52% dissatisfied; CHIP, 47% dissatisfied; PPO, 45% dissatisfied; FFS payers, 41% dissatisfied; $P = .11$). With the exception of CHIP, family physicians reported higher levels of satisfaction for each payer for insurance payment for vaccine purchase than pediatricians ($P < .01$).

Similar to insurance payment for vaccine purchase, few providers reported being “very satisfied” with any payer for insurance payment for vaccine administration. The lowest reported level of satisfaction with insurance payment for vaccine administration was from Medicaid payers (63% dissatisfied), followed by CHIP (56% dissatisfied) and MCO/ HMO (48% dissatisfied), with higher reported levels of satisfaction for PPO (38% dissatisfied) and FFS payers (37% dissatisfied) ($P < .001$ for difference in level of satisfaction between payers). There were no significant differences between the specialties in level of satisfaction with insurance payment for vaccine administration.

Consideration of Discontinuing Provision of Childhood Vaccines

Overall, 10% of physicians reported that they had seriously considered in the last year discontinuing provision of all childhood vaccines to privately insured patients because of costs, 24% had considered the possibility but not seriously, and 66% had never considered it ($P = .06$ for difference between specialties). For both pediatricians and family physicians, those who had considered discontinuing childhood vaccines had higher scores on the

dissatisfaction scale of insurance payment for vaccines than those who had never considered discontinuing vaccines (pediatricians, mean score 4.5 vs 2.2; family physicians, 3.8 vs 1.6; $P < .001$ for both specialties).

Newer Vaccines

For all vaccines queried (HPV, MCV4, Tdap, rotavirus), the most common strategy for handling uncertainty about insurance payment when new vaccines are first available was to inform patients and parents that their health plan may not cover the vaccine, and therefore they may be billed for it (Table 2). Ninety-five percent of physicians reported using at least 1 strategy, and 67% reported using 3. For all strategies, higher percentages of physicians reported using each strategy for HPV than for the other vaccines. For all 4 vaccines, pediatricians were more likely than family physicians to delay offering the vaccine when insurance coverage was uncertain ($P < .01$). Family physicians more often reported asking the parents to determine whether their health plan would cover the vaccine for Tdap and rotavirus vaccine and, for HPV, to ask patients to sign a statement indicating they will pay for the vaccine if their insurance denies it ($P < .01$). Sixty percent of physicians reported that at least some parents in their practices had deferred or refused a vaccine because of cost or insurance coverage: 31% reported 1% to 2% of parents, 19% reported 3% to 5%, 6% reported 6% to 10%, and 4% reported >10%.

Discussion

We found that many physicians were dissatisfied with insurance payment for both vaccine purchase and vaccine administration; satisfaction with insurance payment for vaccine administration varied significantly by payer. The highest level of dissatisfaction in both specialties was for insurance payment for vaccine administration from Medicaid. We also found that 10% of physicians reported that in the last year they had seriously considered discontinuing provision of all childhood vaccines to privately insured patients because of costs; those who had considered such a move reported more dissatisfaction with insurance payment than those who had not. Finally, we found that most providers were using a variety of strategies to handle uncertainty related to insurance coverage for new vaccines, the most common being to inform parents that they may be billed for the vaccine and to delay offering the vaccine until most insurance plans are covering it.

In 2008, Freed et al^{8,14} reported on the level of satisfaction among providers for insurance payment for vaccine purchase and vaccine administration and showed that most providers thought that reimbursement for vaccine administration and purchase in general was inadequate. These previous articles did not report whether providers' satisfaction with reimbursement varied by type of payer. Knowing which payers drive dissatisfaction with reimbursement could help providers and professional organizations in future negotiations and guide policymakers regarding Medicaid and CHIP. Our data demonstrate significantly higher levels of dissatisfaction from Medicaid payers for administration fees, which is unsurprising because reimbursement for vaccine administration is as low as \$2.⁹ However, we were surprised that the level of dissatisfaction for payment for vaccine purchase was similar across payers; high percentages of providers were dissatisfied with payment from all

payers. Such dissatisfaction across payers suggests that private providers feel they are on the losing end of business negotiations related to vaccination in general, regardless of payer type.

There was also wide variability in physicians' satisfaction with insurance payment for both purchase and administration, with about half of physicians reporting satisfaction and half dissatisfaction. This variability suggests a complex marketplace, with room for movement in either direction. It will be important to monitor the impact of the ACA on physicians' levels of satisfaction with insurance payment for immunizations. The ACA mandates that non-grandfathered private insurance plans provide first dollar coverage (no cost sharing or copays) for all vaccines recommended by the Advisory Committee on Immunization Practices (ACIP) in the benefit plan year that begins on or after 1 year after adoption of the recommendation by the Centers for Disease Control and Prevention.¹⁶ However, insurance payment levels to providers for vaccine purchase and administration fees are not addressed. Decreasing satisfaction with levels of insurance payment for vaccines could affect physicians' willingness to continue to provide vaccines; our study showing the prominent role of dissatisfaction with insurance payment in this consideration supports this idea. The proportion of physicians considering discontinuing provision of vaccines because of cost appears to have remained stable since 2008,^{8,14} at about 10% of providers. Although this stability could be viewed as positive because most vaccine providers have not considered such a move, any decrease in the number of providers offering vaccines to children is of concern. It is notable that 10% of the family physician respondents in our study already do not provide vaccines, although they still see children.

Most providers who participated in the VFC program were dissatisfied with insurance payment for vaccine administration from Medicaid and CHIP. The ACA may help address this issue as it increases Medicaid payment for primary care physician services to 100% of Medicare payment rates for 2013 to 2014 (to ~\$21 for vaccine administration). Although the change is temporary, it is intended to show that increased payment will lead to increased provider participation in Medicaid. Such an increase could be very important, because practices can recoup costs of immunization delivery of VFC vaccines only through insurance payment for administration fees, whereas for private vaccine stocks, they at least have the potential of recouping costs through insurance payments for both vaccine purchase and administration. Although it is not clear whether this change in Medicaid payment will become permanent, in the short term it could address much of the dissatisfaction we found surrounding insurance payment for administration fees, making participation in Medicaid and VFC more attractive.

Since 2005, 2 rotavirus vaccines, 2 HPV vaccines, 2 MCV vaccines, and 2 Tdap vaccines have been introduced, with costs ranging from \$38 for Tdap to \$135 for HPV vaccine.^{4,17} Because of the cost of these vaccines and uncertainty about insurance coverage when they were first introduced, primary care physicians have had to deal with issues related to the cost of vaccines in the office setting in ways that were unheard of a few decades ago. Physicians face potentially uncomfortable financial discussions with parents about whether their child can receive a vaccine. How physicians handle this uncertainty with patients and parents has not been described previously. Physicians reported using a variety of strategies to deal with

the uncertainty, with most using multiple strategies and almost all using at least 1 strategy. Pediatricians were significantly more likely than family medicine physicians to report that they delayed offering vaccines when insurance coverage was uncertain. Given that pediatricians generally take care of children and adolescents only, and most ACIP-recommended vaccination encounters over a lifetime are in childhood and adolescence, pediatricians may be much more concerned about the specific financial risks of vaccination than family physicians because vaccinations represent a larger proportion of their financial bottom line. The delay in offering a vaccine represents an important missed opportunity, particularly because 3 of the 4 newer vaccines are for adolescents, who tend to visit health care providers less frequently.^{18,19} For adolescents, a missed opportunity may represent the only opportunity. To avoid delayed vaccination and missed opportunities to vaccinate, payers should adopt contract benefit language that is flexible enough to permit coverage and reimbursement for new or recently altered ACIP recommendations and for vaccine price changes that occur in the middle of a contract period.²⁰

This study has several strengths and limitations. It was from a nationally representative sample of pediatricians and family physicians, and there was a high response rate. The study also focused on private practice physicians, because we hypothesized that they would be more involved in the decisionmaking processes surrounding vaccination than publicly employed physicians. However, respondents' attitudes and practices may have differed from those of nonrespondents, and physicians in our survey network may differ from physicians overall, although previous work suggests they do not.¹¹ We also asked questions about Medicaid and CHIP as separate entities, and for many states there is overlap in these categories, so such questions may have confused some respondents. It is also possible that some respondents may not have been familiar enough with vaccine financing in their practice to respond accurately.

Conclusions

Private practices are the backbone of childhood immunization delivery. To continue to maintain high levels of immunization coverage, policymakers must pay close attention to the financial impact of immunization delivery on private practices. Ten percent of family physicians in our study already do not give vaccines to children, and 10% of primary care physicians who do give vaccines have seriously considered discontinuing because of costs. Most physicians report at least some patients refusing vaccines because of financial concerns. Many physicians delay offering new vaccines until most payers are covering them. All of these findings taken together represent an important threat to immunization delivery in the United States. Furthermore, many private physicians are dissatisfied with insurance payment for vaccine purchase and administration, a finding that could reduce access to recommended childhood vaccines in the future. The ACA does not address insurance payment to providers for the cost of vaccines, nor does it address insurance payment for vaccine administration from private payers. So although the ACA addresses some of the financial issues of immunization delivery, private practices must remain savvy in their business practices surrounding immunizations, and professional organizations and policymakers must continue to address the complex nature of vaccine financing.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Abbreviations

AAFP	American Academy of Family Physicians
AAP	American Academy of Pediatrics
ACA	Affordable Care Act
ACIP	Advisory Committee on Immunization Practices
CHIP	Children's Health Insurance Program
FFS	fee for service
HMO	health maintenance organization
HPV	human papilloma virus
MCO	managed care organization
MCV4	quadrivalent meningococcal conjugate vaccine
PPO	preferred provider organization
VFC	Vaccines for Children

What's Known on this Subject

Because of high costs of newer vaccines, financial risk to private vaccination providers has increased. Previous studies have shown general dissatisfaction with payment for the cost of vaccines and administration fees, with some providers considering no longer providing childhood vaccines.

What this Study Adds

We show that many providers are dissatisfied with payment for vaccine purchase and administration from all types of payers and that, for new vaccines, providers are using a variety of strategies with parents to handle uncertainty about insurance coverage.

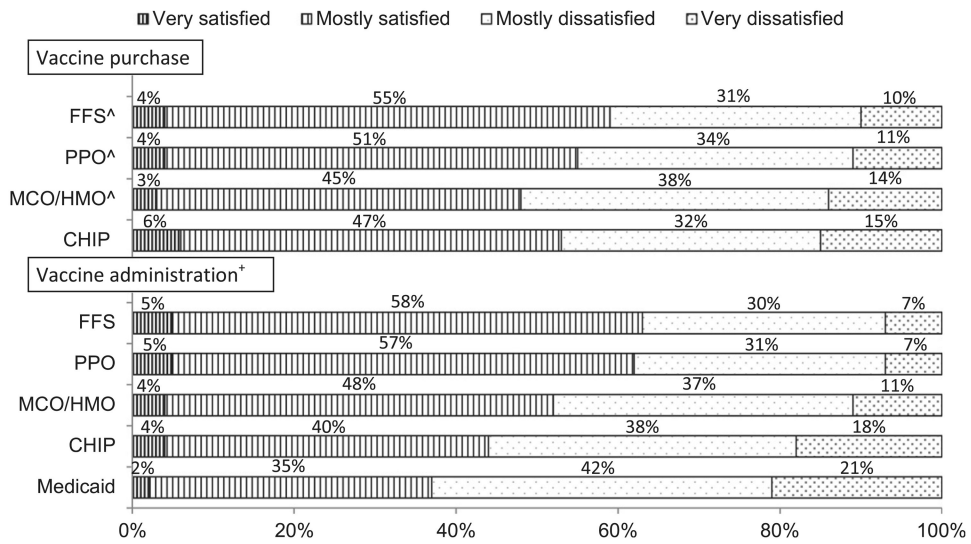


Figure 1. Satisfaction with payment for vaccine purchase and administration by type of payer (*n* = 301)

Twenty-five percent of respondents for questions about both vaccine purchase and vaccine administration responded “don't know,” and their responses are not shown in this figure. [^]*P* < .01 for comparison between specialties, with pediatricians more likely to report dissatisfaction, Mantel–Haenszel χ^2 . ⁺*P* < .001 for overall difference in levels of satisfaction between payers, Mantel–Haenszel χ^2 .

Table 1
Comparison of Survey Respondents With Nonrespondents and Additional Characteristics of Respondents (n = 537)

Characteristics	Pediatrics (n = 277)		Family Medicine (n = 260)		p ^a
	Nonrespondent (n = 87)	Respondent (n = 190)	Nonrespondent (n = 79)	Respondent (n = 181)	
Age in years, mean (SD)	50.1 (10.7)	50.2 (9.8)	53.8 (9.9)	52.0 (9.8)	.17
Male, % (n)	42.5 (37)	43.6 (82)	68.4 (54)	61.3 (111)	.28
Region, % (n)					
Midwest	20.7 (18)	22.6 (43)	35.4 (28)	29.8 (54)	
Northeast	27.6 (24)	20.5 (39)	12.7 (10)	13.8 (25)	
South	36.8 (32)	38.4 (73)	43.0 (34)	34.3 (62)	
West	14.9 (13)	18.4(35)	8.9 (7)	22.1 (40)	.07
Location of practice, % (n)					
Urban	46.0 (40)	41.1 (78)	22.8 (18)	24.9 (45)	
Suburban	44.8 (39)	47.9 (91)	55.7 (44)	44.8 (81)	
Rural	9.2 (8)	11.1 (21)	21.5 (17)	30.4 (55)	.22
VFC participation		83.4(156)		58.5 (93)	
Proportion of patients with Medicaid, % (n)					
<10%		38.9 (68)		56.1 (97)	
10%–24%		29.1 (51)		26.6 (46)	
25%–49%		18.9 (33)		11.6 (20)	
50%		13.1 (23)		5.8 (10)	
Proportion of patients with CHIP, % (n)					
<10%		65.6 (107)		78.6 (132)	
10%–24%		23.3 (38)		14.9 (25)	
25%–49%		7.4(12)		4.8 (8)	
50%		3.7 (6)		1.8(3)	
Proportion of patients of Hispanic race/ethnicity % (n)					
<10%		56.8 (104)		63.0 (109)	
10%–24%		27.3 (50)		22.5 (39)	
25%		15.9 (29)		14.5 (25)	
Proportion of patients of black race/ethnicity % (n)					

Characteristics	Pediatrics (n = 277)		Family Medicine (n = 260)		p ^a
	Nonrespondent (n = 87)	Respondent (n = 190)	Nonrespondent (n = 79)	Respondent (n = 181)	
<10%		46.7 (85)		69.0 (120)	
10%–24%		32.4 (59)		17.2 (30)	
25%		20.9 (38)		13.8 (24)	
Proportion of patients <6 mo old					
<10%		15.9 (29)		88.1 (140)	
10%–29%		63.7 (116)		9.4 (15)	
30%–49%		20.3 (37)		2.5 (4)	
50%		0 (0)		0 (0)	
Proportion of patients 6–24 mo old					
<10%		2.8 (5)		76 (120)	
10%–29%		72.8 (131)		20.1 (33)	
30%–49%		22.8 (41)		3.2 (5)	
50%		1.7 (3)		0 (0)	
Proportion of patients 2–10 y old					
<10%		0.6 (1)		48.1 (76)	
10%–29%		52.8 (96)		48.1 (76)	
30%–49%		44.5 (81)		3.8 (6)	
50%		2.2 (4)		0 (0)	
Proportion of patients 11–18 y old					
<10%		7.7 (14)		32.9 (52)	
10%–29%		71.3 (129)		58.2 (92)	
30%–49%		19.9 (36)		6.3 (10)	
50%		1.1 (2)		2.5 (4)	

^a P value represents comparison between respondents and nonrespondents within each specialty; statistical analyses used: χ^2 , t test, Wilcoxon test (for age).

Table 2
Physicians' Reported Use of Payment Strategies When Vaccines Are First Available

Strategy	HPV		MCV4		Tdap		Rotavirus	
	Peds	FM	Peds	FM	Peds	FM	Peds	FM
Inform patients that their health plan may not cover it, and therefore they may be billed for it	76%	80%	62%	67%	48%*	59%	50%	55%
Ask patients to determine whether their health plan will cover the vaccine before administering the vaccine	49%*	63%	33%*	47%	23%*	36%	23%*	37%
Delay offering the vaccine to any patients until most health plans are covering it	64%*	47%	50%*	34%	35%*	16%	49%*	33%
Ask patients to sign a statement indicating that they will pay for the vaccine if their health plan denies coverage	41%*	55%	32%*	44%	27%	41%	25%*	39%
Check whether each patient's health plan will cover the vaccine before offering the vaccine to the patient	41%	43%	36%	32%	30%	33%	32%	29%

FM, family medicine physicians; Peds, pediatricians.

* Significantly different from FM; *P* .05 using Mantel-Haenszel χ^2 test for comparison between specialties.