

Variation in Provider Vaccine Purchase Prices and Payer Reimbursement

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KEY WORDS

finance, payments, private practice, vaccine, private insurers

ABBREVIATIONS

ASP—average sales price

AWP—average wholesale price

CDC—Centers for Disease Control and Prevention

MSA—metropolitan statistical area

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abstract

OBJECTIVE: The purpose of this work was to collect data regarding vaccine prices and reimbursements in private practices. Amid reports of physicians losing money on vaccines, there are limited supporting data to show how much private practices are paying for vaccines and how much they are being reimbursed by third-party payers.

METHODS: We conducted a cross-sectional survey of a convenience sample of private practices in 5 states (California, Georgia, Michigan, New York, and Texas) that purchase vaccines for administration to privately insured children/adolescents. Main outcome measures included prices paid to purchase vaccines recommended for children and adolescents and reimbursement from the 3 most common, non-Medicaid payers for vaccine purchase and administration.

RESULTS: Detailed price and reimbursement data were provided by 76 practices. There was a considerable difference between the maximum and minimum prices paid by practices, ranging from \$4 to more than \$30 for specific vaccines. There was also significant variation in insurance reimbursement for vaccine purchase, with maximum and minimum reimbursements for a single vaccine differing from \$8 to more than \$80. Mean net yield per dose (reimbursement for vaccine purchase minus price paid per dose) varied across vaccines from a low of approximately \$3 to more than \$24. Reimbursement for the first dose of vaccine administered ranged from \$0 to more than \$26, with a mean of \$16.62.

CONCLUSIONS: There is a wide range of prices paid by practices for the same vaccine product and in the reimbursement for vaccines and administration fees by payers. This variation highlights the need for individual practices to understand their own costs and reimbursements and to seek opportunities to reduce costs and increase reimbursements. *Pediatrics* 2009;124:S459–S465

Spurred by recent national recommendations of expensive vaccines,^{1–4} anecdotal reports indicate that physicians in private practice are facing financial difficulties related to providing childhood/adolescent immunizations.^{5–9} Concerns among physician organizations (eg, the American Academy of Pediatrics) and other stakeholders have led to discussions regarding the scope of the problem and possible solutions.^{10–12} However, surprisingly little is known regarding the financial burden of providing childhood vaccines in private practices.

Understanding vaccine financing at the practice level requires data on a practice's costs of providing vaccines and the level of reimbursement that the practice receives from insurance carriers. The most readily observable cost is the direct cost of purchasing the vaccines (ie, purchase price). Published data on the prices paid for vaccines at the private-practice level are not available. However, national vaccine price data can serve as points of reference, including the public-sector price, the average sales price (ASP), and the average wholesale price (AWP). Public-sector prices are negotiated annually with vaccine manufacturers by the Centers for Disease Control and Prevention (CDC) for the federal vaccine contract,⁴ which is used by government immunization programs to purchase vaccine at reduced rates. ASPs are publicly available data collected from vaccine manufacturers by the US Centers for Medicare and Medicaid Services and are based on quarterly reports of the prices of vaccines sold in that quarter.¹³ AWP is proprietary data licensed by vendors; the AWP for each vaccine incorporates the national average price determined by its manufacturer plus a 20%–25% markup.¹⁴ How actual prices paid by private practices compare with these reference

price data are unknown. Also unknown is the extent to which practices use group purchasing organizations and other strategies to minimize the prices that they pay.

With regard to reimbursement for vaccine purchase, we did not find any existing studies documenting reimbursement levels in private practices. US Centers for Medicare and Medicaid Services uses ASPs to set Medicare vaccine payments (currently at 106% of ASP).¹⁵ Many private insurers are thought to set their reimbursement rates as a percentage of AWP or ASPs, including rates for pediatric vaccines, but contractual reimbursement levels are considered proprietary data.

In addition to the purchase of vaccines, practices face many other costs associated with providing vaccines. Personnel costs are composed of physician and other staff time for tasks such as ordering vaccines, administering vaccines, counseling patients, and entering data into registries or medical charts. Other costs include vaccine storage, insurance against vaccine loss, and medical supplies. Some studies have attempted to quantify other costs associated with provision of vaccines, but methodologic issues make such estimates difficult.^{16,17} Reimbursement for these costs is generally done as a separate vaccine administration fee. To address the lack of data regarding vaccine costs and reimbursements in private practices, this study sought to collect and compare actual price and reimbursement data from a sample of private practices.

METHODS

Sample

The survey was conducted by using a convenience sample of practices in 5 states (California, Georgia, Michigan, New York, and Texas). States were selected to reflect regional variation and a mix of urban and rural areas. Ex-

cluded were states with universal purchase programs, where the vast majority of childhood vaccines are supplied to private practices by the state.

The sampling was based on physician specialty, metropolitan statistical area (MSA) status, and practice size. The goal was to achieve a sample of 15 pediatric or family physician practices (5 small, 5 medium, and 5 large practices) from both MSA and non-MSA areas of each state. Excluded were practices associated with academic medical centers and practices that do not administer vaccines to privately insured patients. In addition, only 1 practice within the same practice network could be selected for the sample.

MSA and non-MSA areas in each state were determined from US Census data.¹⁸ Publicly available business directories were used to identify pediatric and family physician practices in these areas and to collect data on the number of physicians at each practice, as well as practice contact information. Practice size was categorized as small (1–2 physicians), medium (3–5 physicians), and large (≥ 6 physicians).

A research assistant contacted each practice by telephone to determine which physician(s) was involved in decision-making for the practice (eg, “lead” physician, managing partner, or medical director). Our initial survey communication was directed to this physician.

Survey Design

We developed a 10-page, 20-question survey to collect data on a practice's vaccine purchases and the reimbursements that it receives for vaccine purchase and administration from its 3 most common, non-Medicaid payers. Question formats were a mix of open-ended and fixed-choice questions.

For vaccine purchase, a grid collected detailed data on the most recent order

for each of the universally recommended vaccines on the childhood immunization schedule, including the vaccine brand, order date, number of doses or packages, packaging type, total number of doses, total price paid, whether purchased from the manufacturer or through a distributor, the estimated ordering frequency, and availability of return privileges. Additional questions explored participation in a purchasing cooperative or buying group and other payment policies or discounts not reflected in the prices paid.

For reimbursements, respondents were asked to provide data for each of their practice's 3 most common, non-Medicaid payers; determining the "most common" payers was left to the discretion of the practices, and we did not ask for payer names. Data collected included specific reimbursement per dose for each vaccine and specific reimbursement for administration of the first and subsequent doses of vaccines per visit (based on *Current Procedural Terminology* codes 90471 and 90472). Additional questions explored recent changes in reimbursement policies, provisions included in payer contracts (eg, payment formulas for vaccine cost reimbursement), and whether vaccine reimbursement issues had ever compelled a practice to terminate a relationship with a payer or stop administering vaccines to patients enrolled in a certain plan. We made minor refinements to the instrument on the basis of pilot-test feedback; pilot-test data were included in the analyses. The institutional review board of the University of Michigan Medical School approved this study.

Survey Administration

An introductory packet was sent via priority mail to the contact physician

identified for each practice. The packet included a personalized cover letter signed by the lead investigator (Dr Freed); a personalized letter of support for the study signed by the executive director of the American Academy of Pediatrics; a confidentiality agreement signed by all of the study team members to provide written assurance that confidential data would be handled appropriately; a postage-paid postcard on which the contact physician could indicate his or her interest in participating and list the most appropriate staff person(s) within the practice for collecting vaccine purchase and reimbursement data; and a small monetary incentive. Physicians who did not return the postcard within a month were contacted by telephone to request their participation.

The persons identified by responding physicians were then contacted by telephone and the survey instrument transmitted to them, typically by fax. Participants were given the option of returning the survey by fax, followed by a telephone call to review their responses, or completing the survey by telephone. Given the detailed nature of the data collection form, practice staff had to refer to multiple data sources (eg, invoices for vaccine orders and payer billing records), and >1 staff person was typically involved (eg, nurse responsible for vaccine ordering and office manager). Practices often needed many weeks to complete the survey and were typically contacted numerous times by the study team to encourage and assist them in the data collection process. We contacted a total of 387 practices to participate in the study. Practices that were able to complete the survey were sent a gift basket in appreciation of their efforts. Data were collected from April to December 2007.

Data Analysis

For each vaccine, we calculated the price per dose paid for each practice and then calculated the mean, median, maximum, and minimum prices across practices. We also calculated the mean, median, maximum, and minimum reimbursements for vaccine purchase from the most common payer and for the 3 most common payers across practices. Next, we calculated a "net yield" for each vaccine at each practice (ie, the reimbursement for vaccine purchase minus the price per dose paid) and calculated the mean, median, maximum, and minimum net yields across practices. The mean, median, maximum, and minimum administration fee reimbursements for the first and subsequent doses were also calculated across practices.

Prices per dose and vaccine purchase reimbursement levels that were >2 SDs from the mean were considered "outliers." We recontacted practices to verify or correct these data; in the few cases where outliers could not be verified, the data were excluded from the analyses. Across all of the price and payer data points per vaccine, an average of 4 were excluded (range: 0–9 data points).

For each vaccine, stratified analyses also were conducted. Price and net yield data were stratified according to practice size, MSA status, and participation in a purchasing cooperative or buying group, whereas reimbursement data were stratified according to practice size and MSA status. Means were calculated and differences across strata observed.

All of the analyses were conducted using Microsoft Excel 2002 SP3 (Redmond, WA). Although data calculations included both the mean and the median, the numbers were consistently similar, so only the mean is reported here. Similarly, only results of the

TABLE 1 Respondent Characteristics

Characteristic	% (n)
MSA	68 (52)
Practice size	
Small (1–2 physicians)	21 (16)
Medium (3–5 physicians)	41 (31)
Large (>5 physicians)	38 (29)
Single specialty practice	82 (62)
Specialties represented within practice	
Pediatric	89 (68)
Family practice	20 (15)
Other specialty	18 (14)
Practice ownership/affiliation	
Private, independent	87 (66)
Hospital/medical center	8 (6)
Other ownership/affiliation	5 (4)
Participate in purchase cooperative/buying group	54 (41)

reimbursement-related calculations for the most common payer (versus also presenting results for the 3 most common payers) are provided be-

cause of space constraints and to illustrate the most frequent financial situation encountered by practices.

RESULTS

Respondent Characteristics

Eligible surveys were received from 76 practices. The majority of practices were located in MSA areas and included ≥ 3 physicians (Table 1). The majority reported participating in a purchasing cooperative or buying group for vaccines for at least some of the vaccines that they purchase.

Vaccine Purchase Prices

Price-per-dose data are shown in Table 2. The difference between the maximum and minimum price per dose across practices ranged from \$4 for

Boostrix to more than \$30 for Pediarix, Havrix, and ProQuad.

For purposes of comparison, data on the public-sector price, ASP, and AWP are shown in Table 2. The public-sector price was higher than the minimum price per dose for 7 vaccines and higher than the mean price per dose for 1 vaccine. The ASP was higher than the mean price per dose for all but 4 vaccines, whereas the AWP was higher than the mean private-practice price per dose for all of the vaccines. On the basis of stratified calculations, mean private-practice prices were lower in medium and large practices for all of the vaccines, those located in MSAs for 16 of 21 vaccines, and in practices participating in purchasing cooperatives or buying groups for 17 of 21 vaccines.

TABLE 2 Private-Practice Price-per-Dose Data

Vaccine	Brand	No. of Practices	Private-Practice Price Per Dose, \$			Public-Sector Price, \$ ^a	ASP, \$ ^b	AWP, \$ ^c
			Mean	Maximum	Minimum			
Recommended childhood vaccines								
DTaP	Daptacel	52	16.13	21.40	12.63	13.25	31.080	22.04
	Tripedia	9	18.31	22.40	13.40	12.65		21.40
	Infanrix	19	17.11	21.60	8.77	13.25		20.96–21.44
IPV	IPOL	72	18.99	26.34	14.29	11.06	26.122	22.8–26.34
MMR	MMRII	67	42.23	51.86	37.50	17.60	43.217	44.84
Hib	ActHIB	41	16.47	21.76	13.87	8.12	21.782	21.78
	PedvaxHIB	30	22.06	26.42	20.26	10.83	21.426	22.77
Hep B	Recombivax	42	12.23	23.20	8.25	9.50	24.360	23.20
	Engerix	17	10.32	13.06	4.26	9.10		21.37
Varicella	Varivax	73	72.34	87.00	66.14	59.15	75.320	74.56
	Havrix	31	26.69	47.12	14.23	12.25	26.248	28.74
Hep A	VAQTA	48	24.79	30.22	21.00	12.25		30.37
	Prevnar	73	73.62	80.25	67.00	62.14	78.803	78.44
Rotavirus	RotaTeq	60	66.39	76.55	62.50	55.05	NA	66.94
Related combination vaccines								
Hep B-Hib	Comvax	25	27.72	32.08	21.02	27.75	NA	43.56
DTaP-Hep B-IPV	Pediarix	35	57.85	77.09	43.60	47.25	NA	70.72
MMR-V	ProQuad	47	118.29	134.99	103.15	77.75	NA	124.37
Recommended adolescent vaccines								
HPV	Gardasil	70	120.06	129.57	116.00	96.75	NA	120.50
MCV4	Menactra	70	86.61	93.43	80.36	73.09	86.100	89.43
TdaP	Adacel	61	33.23	36.34	29.20	30.75	35.171	37.43
	Boostrix	23	35.80	38.61	34.41	30.75		36.25

NA indicates not available; DTaP, diphtheria-tetanus-acellular pertussis; IPV, inactivated polio vaccine; MMR, measles-mumps-rubella; Hib, *Haemophilus influenzae* type b; Hep, hepatitis; PCV7, heptavalent pneumococcal conjugate vaccine; V, varicella; HPV, human papillomavirus; MCV4, meningococcal conjugate vaccine; TdaP, tetanus-diphtheria-acellular pertussis.

^a Data show the public-sector price from the CDC vaccine price list⁴ dated January 14, 2008 (end of study period).

^b ASPs for 2007 were from Centers for Medicare and Medicaid Services.¹³

^c AWP were from the CDC vaccine price list⁴ dated January 14, 2008 (end of study period).

TABLE 3 Reimbursements for Vaccine Purchase According to Most Common Payer

Vaccine	Brand	No. of Practices	Vaccine Cost Reimbursement Per Dose, \$		
			Mean	Maximum	Minimum
Recommended childhood vaccines					
DTaP	Daptacel	52	26.05	43.05	20.60
	Tripedia	9	24.95	30.50	22.26
	Infanrix	19	26.29	37.14	21.00
IPV	IPOL	72	26.53	34.65	21.00
MMR	MMR11	67	46.48	59.02	16.77
Hib	ActHIB	41	25.25	45.32	15.33
	PedvaxHIB	30	24.84	34.29	21.23
Hep B	Recombivax	42	25.95	35.94	15.97
	Engerix	17	25.19	34.33	16.00
Varicella	Varivax	73	78.78	103.38	57.69
Hep A	Havrix	31	31.27	39.91	23.91
	VAQTA	48	32.23	45.47	24.27
PCV7	Prevnar	73	79.89	108.58	61.65
Rotavirus	RotaTeq	60	72.37	92.27	61.52
Related combination vaccines					
DTaP-Hep B-IPV	Pediarix	35	81.90	103.30	69.50
Hep B-Hib	Comvax	25	51.22	59.48	43.56
MMR-V	ProQuad	47	132.75	180.06	96.00
Recommended adolescent vaccines					
HPV	Gardasil	70	135.81	177.67	119.25
MCV4	Menactra	70	95.68	121.95	82.00
Tdap	Adacel	61	39.80	50.84	29.74
	Boostrix	23	39.79	46.23	33.83

DTaP indicates diphtheria-tetanus-acellular pertussis; IPV, inactivated polio vaccine; MMR, measles-mumps-rubella; Hib, *Haemophilus influenzae* type b; Hep, hepatitis; PCV7, heptavalent pneumococcal conjugate vaccine; V, varicella; HPV, human papillomavirus; MCV4, meningococcal conjugate vaccine; Tdap, tetanus-diphtheria-acellular pertussis. Data show the vaccine purchase reimbursement for most common payer summarized across practices.

Some practices described other types of discounts or rebates that are available to them. Two thirds of the practices ($n = 54$) reported a “prompt-pay” discount, in which a small percentage discount is applied if the practice pays within a certain time frame. Others included small percentage discounts for placing vaccine orders online (16% [$n = 13$]), promotional pricing such as at “back-to-school” time (23% [$n = 18$]), and volume discounts (35% [$n = 28$]). Discounts and rebates applied after an order was filled (eg, prompt-pay discounts) are typically not reflected in the data on prices paid.

Vaccine Purchase Reimbursement

Data on reimbursement for vaccine purchase from respondents’ most common, non-Medicaid payer demon-

strate a wide range of reimbursements across practices (Table 3). Differences between the maximum and minimum reimbursement amounts across participating practices ranged from \$8 to more than \$80. Mean reimbursements ranged from ~80% of ASP for all of the diphtheria-tetanus-acellular pertussis brands and $\leq 123\%$ of ASP. Mean reimbursements for all vaccines were at or above AWP. Mean reimbursements for vaccine purchase by the most common payer were higher in larger practices for 17 of 21 vaccines and those located in MSAs for 17 of 21 vaccines.

Net Yield for Vaccine Purchase

Table 4 presents data for the net yield (reimbursement minus price paid) per dose for the participating practices.

Mean net yield varied across vaccines from a low of approximately \$3 to more than \$24 for. The range of net yield across practices varied widely, from \$10 to \$90. For 15 of the 21 specific vaccines analyzed, ≥ 1 practice reported that the vaccine purchase price exceeded the most common payer reimbursement; this situation was most common. On the basis of stratified calculations, mean net yield was higher in practices that were larger for all but 1 vaccine, those located in MSAs for all but 2 vaccines, and those participating in purchasing cooperatives for 14 of 21 vaccines.

Administration Fee Reimbursement

Reimbursement from the most common payer for first dose vaccine administration ranged from \$0.00 to \$26.55, with a mean of \$16.39 (Table 5). Reimbursement for subsequent doses was typically lower, with a mean of \$11.17.

Other Reimbursement Issues

Most respondents reported that their contract with their most common payer includes separate payments for vaccine purchase and administration (Table 6) and that the majority of these contracts contain specific language addressing the method and time frame for payment. Twenty-four percent of practices ($n = 18$) have either discontinued a relationship with a payer because of its level of payment for vaccine purchase or administration fees or stopped administering vaccines to patients in a certain plan because of the plan’s level of payment for vaccine purchase or administration fees.

DISCUSSION

The key finding from this study is the wide range in both the purchase price and reimbursement for vaccines. This study is the first to document this vari-

TABLE 4 Net Yield for Vaccine Purchase Across Practices

Vaccine	Brand	No. of Practices	Net Yield Per Dose, \$		
			Mean	Maximum	Minimum (Percent < 0)
Recommended childhood vaccines					
DTaP	Daptacel	52	10.08	27.80	0.36 (0)
	Tripedia	9	6.67	12.78	0.55 (0)
	Infanrix	19	9.41	12.78	1.99 (0)
IPV	IPOL	72	7.75	18.48	-3.59 (4)
MMR	MMRII	67	4.31	18.92	-25.77 (16)
Hib	ActHIB	41	9.02	31.45	-1.86 (2)
	PedvaxHIB	30	2.90	13.20	-1.19 (10)
Hep B	Recombivax	42	13.65	25.77	-1.99 (2)
	Engerix	17	14.46	23.27	4.53 (0)
Varicella	Varivax	73	6.61	35.13	-29.31 (21)
Hep A	Havrix	31	5.61	22.16	-3.21 (26)
	VAQTA	48	7.49	22.15	-5.49 (13)
PCV7	Pevnar	73	6.15	38.96	-11.30 (11)
Rotavirus	RotaTeq	60	6.35	26.66	-8.09 (10)
Related combination vaccines					
DTaP-Hep B-IPV	Pediarix	35	24.34	47.10	2.34 (0)
Hep B-Hib	Comvax	25	23.62	35.58	15.35 (0)
MMR-V	ProQuad	47	14.73	64.76	-25.40 (15)
Recommended adolescent vaccines					
HPV	Gardasil	70	15.95	57.92	-0.94 (3)
MCV4	Menactra	70	8.97	38.58	-5.66 (13)
TdaP	Adacel	61	6.81	17.19	-1.12 (2)
	Boostrix	23	4.00	11.31	-2.08 (9)

DTaP indicates diphtheria-tetanus-acellular pertussis; IPV, inactivated polio vaccine; MMR, measles-mumps-rubella; Hib, *Haemophilus influenzae* type b; Hep, hepatitis; PCV7, heptavalent pneumococcal conjugate vaccine; V, varicella; HPV, human papillomavirus; MCV4, meningococcal conjugate vaccine; TdaP, tetanus-diphtheria-acellular pertussis. Data show the vaccine purchase reimbursement for most common payer summarized across practices.

TABLE 5 Vaccine Administration Fee Reimbursement From Most Common Payer

Variable	Administration Fee Reimbursement	
	First Dose (CPT 90471)	Subsequent Doses (CPT 90472)
Mean reimbursement, \$	16.39	11.17
No. of 0 values	1	3
Mean without 0 values, \$	16.62	11.63
Maximum reimbursement, \$	26.55	37.20
Minimum without 0 values, \$	3.87	3.36

CPT indicates Current Procedural Terminology.

ation, and the study team found the extent and multimodal nature of the variation to be surprising. The variation in prices paid across practices for the

TABLE 6 Proportion of Respondents Reporting Inclusion of Certain Provisions in Contract With Most Common Payer

Provision	Included, % (n)
Separate payments for vaccine purchase and administration	84 (64)
Payment formulas for vaccine purchase (eg, AWP + certain %)	33 (25)
Payment formula for vaccine administration	26 (20)
Specific language addressing method of and timeframe for reimbursement	51 (39)
Specific language addressing timely response to new vaccines	17 (13)
Specific language addressing timely response to vaccine price increases	17 (13)
Specific language addressing timely response to revised vaccine recommendations	17 (13)

same vaccine was >100% in several cases, and a few practices reported paying less than the public-sector

price for some vaccines. The difference in reimbursements across practices was also >100% in some instances for the same vaccine. We found significant variation in the administration fees paid by private insurers as well.

In comparing reimbursements to prices paid, we found variation across vaccines within a practice and across practices for the same vaccine. For example, some practices in our study had a positive net yield of up to almost \$39.00 per dose on the purchase of heptavalent pneumococcal conjugate vaccine, whereas 11% of the practices in our study had a negative net yield on the same vaccine.

These data cannot be used to say whether practices are making a profit or losing money on vaccines. We did not collect data on overall costs to the practice of purchasing and administering vaccines, on reimbursements from all payers, or on the proportion of children insured by each payer. However, these data do illustrate the complexity of vaccine financing at the private-practice level. The variation is the product of many factors, some of which individual practices may be able to influence and some they may not.

One implication of this study is that it is important for individual practices to get a detailed understanding of their own costs and reimbursements for vaccines, particularly given the expanding schedule of vaccines recommended for children and adolescents and increasing vaccines prices. On the vaccine purchase side, practices should explore opportunities to achieve discounts off the price of vaccines, such as participating in a purchasing cooperative, as 54% of the practices in this study do for at least some of the vaccines that they purchase. For reimbursements, practices should look across their entire payer

mix and identify low reimbursements for a particular vaccine or payers with low reimbursements overall. Although more economic impact will be felt by a practice as a consequence of reimbursement rates from their most common payer, the overall financial impact will be the sum of all of the payers. With an understanding of how reimbursements vary across payers and vaccines, practices will be in a better position to negotiate higher rates.

Clearly, significant improvements in payment and reimbursement policies cannot be achieved solely through the efforts of individual practices, and vaccine financing issues are receiving significant attention from physician organizations at the national level. These groups also have advocated in individual states to increase reimbursement rates for vaccines (R. Rzewnicki, MD, letter from Medical Mutual of Ohio to

Jay E. Berkelhamer, MD, March 20, 2008).

Our sample was not randomly selected and may not be representative of all private practices administering childhood/adolescent vaccines. Therefore, these results may not be broadly generalizable. In addition, practices that responded to the survey may be more interested in vaccine finance issues or have other unmeasured characteristics that differ from nonrespondents that could affect interpretation of the data. However, our findings clearly demonstrate a broad range of prices paid and reimbursements received for vaccines in private practices. This range of prices and reimbursements exists regardless of the overall generalizability of the sample.

CONCLUSIONS

This study was designed to collect basic descriptive data on the prices paid

by private practices for vaccines and the reimbursements they receive from payers. Our results indicate that there is a wide range of prices paid by practices for the same vaccine product and in the reimbursement for vaccines and administration fees by payers. At the practice level, this variation underscores the need for practices to be cognizant of their own costs and reimbursements for vaccines and to actively seek opportunities to lower their expenditures and to increase their reimbursements. On a broader level, these data should help inform the continuing discussions by immunization policy-makers and other stakeholders to address vaccine financing concerns.

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