Provider Attitudes Regarding Use of an Immunization Information System to Identify Children With Asthma for Influenza Vaccination

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Objectives: Despite longstanding national guidelines, many children with asthma do not receive annual influenza vaccinations. Information from Medicaid-administrative claims data was integrated into the Michigan Care Improvement Registry (MCIR) to prompt providers regarding influenza vaccination among children with high-risk conditions such as asthma. The attitudes of pediatric primary care providers regarding the implementation of this system were assessed. **Methods:** A survey was sent in February 2006 to office-based general pediatricians ($n = 300$) and family physicians ($n = 300$) in Michigan. The survey focused on influenza vaccination during the 2005–2006 influenza season and attitudes regarding a reminder system for providers using the MCIR. **Results:** Overall response rate was 67 percent. MCIR participation was high (91%) among respondents, and most (83%) had MCIR information available to them prior to visits with pediatric patients. Most physicians (75%) considered the MCIR high-risk indicator for influenza vaccination a feature that they would find helpful. Some respondents reported concerns that the reminder system is limited to Medicaid patients only (44%) and regarding the completeness of Medicaid data to identify children with asthma (24%). **Conclusions:** Physicians have a positive overall view of a statewide registry-based automated reminder system to assist in identifying children with asthma for influenza vaccination, albeit with specific areas of concern.

KEY WORDS: **asthma, automated reminder systems, immunization information systems, immunization registries, influenza vaccination, Medicaid**

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National recommendations have recently been expanded to indicate that all children 6 to 59 months of age should receive annual influenza vaccination.[1] Annual influenza vaccination has long been recommended for children with high-risk conditions[1–3] because they are at an increased risk for influenza-related morbidity and mortality[4–8]; among the most common of these conditions is asthma.[9] Although annual influenza vaccination recommendations for children with asthma have been published for decades, influenza vaccination rates among this group have been reported in recent studies to range from 7 percent to 29 percent.[10–14] Missed opportunities to vaccinate are an important factor in the under-immunization of children with asthma; reducing or eliminating missed opportunities could improve influenza vaccination rates markedly.[12,13,15,16] Missed opportunities can be mitigated through patient-targeted and provider-targeted reminders, both of which have been demonstrated to be effective methods to increase vaccination rates.[17–22] Despite this evidence, use of reminders for influenza

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vaccination of children with high-risk conditions is low.[17]

The Michigan Care Improvement Registry (MCIR) is a statewide immunization information system (IIS) that has been in operation for over a decade and is widely recognized for its completeness of data and widespread use. An important feature of the MCIR is its ability to generate automated prompts for providers to view when patient records are accessed, as well as printed reminder and recall notices that can be mailed to persons who are due or overdue for vaccinations. Although the registry is capable of generating provider and patient reminders, patient-level information on high-risk conditions has not historically been included in its database. Recent reports of low influenza vaccination rates and frequent missed opportunities among children with asthma[16] underscored the potential benefit of using the MCIR's reminder features for children enrolled in the Michigan Medicaid program. Beginning with the 2006–2007 influenza season, high-risk condition information from Medicaid-administrative claims data was integrated into the MCIR. Using methods consistent with previous studies,[15,16,23] the MCIR was modified to generate automated influenza vaccination reminders for children with asthma and other high-risk conditions enrolled in the Michigan Medicaid program. Prior to implementation of the MCIR influenza vaccination reminder system, we assessed the attitudes of primary care physicians regarding a provider reminder system for influenza vaccination of individuals with asthma, the most prevalent high-risk condition among children.

Methods

We conducted a mailed survey of office-based general pediatricians (PDs) and family physicians (FPs) in Michigan focusing on issues related to influenza vaccination among children with asthma during the 2005–2006 influenza season, prior to the implementation of the MCIR high-risk condition reminder system. The study was approved by the institutional review board at the University of Michigan.

Survey sample, instrument, and administration

We obtained a random sample of 300 PDs and 300 FPs practicing in Michigan from the American Medical Association Masterfile. The sampling frame included all allopathic and osteopathic physicians, self-described as general PDs or FPs, in office-based direct patient care. Physicians were sent a one-page, 14-item survey instrument (available upon request from the authors) that solicited physicians' attitudes and experiences related to influenza vaccination, MCIR use, and future implementation of a high-risk indicator for children with chronic conditions such as asthma; the survey was fielded in February 2006.

Data analysis

Univariate frequencies were generated for each survey item. Chi-square analyses were performed to explore associations between respondents' reasons for nonvaccination of children with asthma who had office visits and practice characteristics. A two-tailed α level of .05 was used as the threshold for statistical significance; all statistical analyses were conducted in September–December 2006 using SAS, Version 9.1 (SAS Inc, Cary, North Carolina).

Results

Excluding 16 surveys returned as undeliverable, the 389 surveys returned yielded a response rate of 67 percent (PDs = 70%, FPs = 63%). Of these, 49 responses were ineligible due to respondents not providing outpatient primary care to children and 20 responses were returned after data coding had been completed, yielding 320 surveys that were eligible for analysis. PDs and FPs reported similar practice size and practice affiliation, but differed in reported percentage of Medicaid patients in their practice population (Table 1). Excluding 16 surveys returned as undeliverable, the overall response rate was 67 percent (389/584 returned).

Most respondents (91%) reported currently participating in the MCIR, although the proportion was lower among FPs (84%) than among PDs (97%, $P < .0001$). Physicians reporting estimated influenza vaccination rates of less than 25 percent also reported lower MCIR participation (83%) than those reporting vaccination rates of more than 25 percent (92%, $P = .03$). Most physicians reported having the MCIR information either "usually" (66%) or "sometimes" (25%) available to them prior to or during visits with pediatric patients. The availability of MCIR information at the time of the visit was similar among PDs and FPs (68% and 64%, respectively, $P = .81$).

With regard to the implementation of a high-risk indicator in the MCIR, 48 percent believed it would be "very helpful" and another 27 percent believed it would be "helpful" for identifying children with asthma who should receive the influenza vaccine. Similar proportions of PDs indicated that the high-risk indicator would be very helpful (48%) or helpful (24%) in comparison with FPs (48% and 31%, respectively); these differences were not statistically significant ($P = .68$).

When asked about potential problems regarding the MCIR and the high-risk indicator, physicians generally

TABLE 1 ● Characteristics of survey respondents

	Pediatricians ($n = 175$), %	Family practitioners ($n = 145$), %	*P*
Number of physicians in practice			.5134
1–2	30	36	
3–5	38	37	
>5	32	27	
Ownership/affiliation			.0756
Private	70	61	
Hospital/practice network	26	32	
Other	4	7	
Proportion of Medicaid patients			.0008
<5%	19	37	
5%–10%	14	17	
11%–25%	23	19	
26%–50%	28	13	
>50%	16	15	
Influenza vaccine inventory (2005–2006)			
Stocks public vaccine	79	56	<.0001

expressed few areas of concern, although some issues were noted (Table 2). Few respondents noted significant concern regarding accessing the MCIR (5%), the overall accuracy and completeness of MCIR data (18%), and not typically using the MCIR to check patients' immunization status (15%). PDs reported significantly lower concerns regarding accessing MCIR than did FPs; other reported concerns did not differ significantly by physician type or the estimated influenza vaccination rate among their patients with asthma. The most commonly reported significant concerns were about the accuracy of Medicaid data used to identify children with asthma (24%) and the potential restriction of the MCIR high-risk indicator to only Medicaid patients (44%). However, the latter was significantly less of a concern among those who stock public vaccine, and therefore vaccinate Medicaid patients (39%), in comparison with those who do not stock public vaccine (57%, $P = .01$).

TABLE 2 ● Michigan Care Improvement Registry (MCIR) high-risk indicator potential areas of physician concern

	% Reporting significant concern		
Areas of potential potential concern	Pediatricians	Family practitioners	*P*
Practice has difficulty in accessing MCIR	2	9	.01
Accuracy or completeness of MCIR data	20	16	.72
MCIR records not typically used to check for immunizations	15	15	.97
Accuracy of Medicaid data to create indicator	28	18	.11
Limited to Medicaid patients only	40	49	.22

● Discussion

Our findings indicate that three fourths of primary care physicians in Michigan have a positive view of a registry-based mechanism to assist with the identification of children with asthma who should receive influenza vaccine. This is consistent with previous studies that have found that missed opportunities to administer influenza vaccination occur frequently among children with asthma and other high-risk conditions.[12–16] The results of this study illustrate that primary care physicians have a positive overall view of a statewide registry-based indicator of high-risk conditions, underscoring the potential that exists to improve vaccination rates among this vulnerable group of children. Providers' optimism is not without some level of concern; the chief concerns reported are the limited scope of the indicator to children enrolled in Medicaid (the population for which administrative claims data are currently available) and the potential accuracy of using administrative claims data to identify high-risk conditions.

The US Task Force on Community Preventive Services found that reminder systems that prompt health providers to review a child's vaccination status can help reduce missed opportunities.[24] Reminder systems integrated within larger, automated information systems (eg, practice-based electronic records, IISs) are optimal because they help minimize the time and the commensurate cost burden on the practice.[25] Such automated

reminder systems have typically been used in conjunction with the primary childhood vaccination series, because eligibility can be determined on the basis of a child's birth date and prior vaccination history.

In contrast, automated reminder systems for influenza vaccination cannot be determined entirely on the basis of age. Although eligibility can be determined using age-based recommendations for influenza vaccination (eg, 6–59 months of age), eligibility determination due to a high-risk condition such as asthma requires additional information. Influenza vaccination reminder systems must identify whether a high-risk condition is present for each individual; this requirement may be difficult to satisfy using either practice-based information systems or IISs alone. A recent study indicates that only 21 percent of primary care pediatricians currently have electronic health records in their practices[26] and IISs are rarely integrated with patient clinical information.[25,27] Consequently, information on high-risk conditions, such as asthma, is typically unavailable in IISs, precluding their use for influenza vaccination reminder systems. Although IISs have not historically been designed to track the presence of asthma or other high-risk conditions, this information can be obtained from administrative claims data[23] and integrated into IISs. This approach has been successfully applied on a limited scale to improve influenza vaccination rates among children with high-risk conditions.[17]

There are limitations to this study. The potential of nonresponse bias exists as these results are based on a physician survey. However, the response rate is consistent with that of other published studies of physician practice patterns.[28] The study sample was limited to providers in Michigan given the availability of the MCIR statewide IIS and its widespread use. Lastly, these findings reflect physician attitudes prior to completion of the MCIR influenza vaccination reminder system and do not reflect the actual practice following implementation.

In sum, we found that primary care providers have a positive overall view of a state registry–based high-risk indicator, albeit with specific areas of concern. Understanding these concerns is an important step to more widespread use of IISs to increase influenza vaccination rates among children with high-risk conditions. Further studies are needed to assess the availability and feasibility of other sources of information for high-risk conditions in addition to children enrolled in Medicaid, such as private insurers and health plans. Evaluating subsequent physician usage of the MCIR influenza vaccination reminder system and the impact on vaccination rates among those with high-risk condition will be instrumental to more clearly understand the potential issues and benefits associated with use on a statewide basis. For example, the potential benefits of incorporating high-risk condition information into IISs may be especially evident among children 5 years and older who are not included in age-based influenza vaccination recommendations. Importantly, children with high-risk conditions are considered a priority group in times of vaccine shortages and could be identified in this manner using IISs.

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