

**PRIVATE PROVIDER PARTICIPATION
IN STATEWIDE IMMUNIZATION REGISTRIES**

**FINAL REPORT
MARCH 2005**



**Vaccination Issues and Problems (VIP)
Child Health Evaluation and Research Unit
Division of General Pediatrics
University of Michigan (UM)**

UM Project Team Members:

**Sarah J. Clark, MPH
Anne E. Cowan, MPH
Gary L. Freed, MD, MPH
Laura Spera, MS**

CDC Collaborators:

**Diana Bartlett, MPH
Bobby Abdolrasulnia, MPA, MPH, CHES, CFSP
Karen Fowler
CDC/NIP Health Care Provider Workgroup**

EXECUTIVE SUMMARY

This study explored the perspectives of both participating and non-participating private providers on the benefits of and barriers to participation in immunization registries. A mailed survey was sent to a sample of 1,235 VFC-participating private practices in 15 states. Eligible surveys were returned by 756 respondents and 13 were undeliverable for an overall response rate of 62% (756/1,222). The main findings included:

- ***Physician awareness of participation status could be improved.*** For both registry participants and non-participants, 62% confirmed that their practice currently participates (374/604) or does not participate (95/152), respectively, in their state immunization registry.
- ***Message to non-participants should focus on uses/benefits of registries.*** Uses/benefits of registries were biggest influence on decision to participate, particularly consolidating records for patients who receive vaccines at multiple sites. For non-participants, easy access to records of vaccines provided at other sites was most commonly cited as a very important potential benefit of registries.
- ***Usage of registry features by participants could be expanded.*** Most participants utilize basic registry functions (e.g., inputting data on vaccines given) but few take advantage of more advanced features (e.g., 14% generate reminder/recall notices from registries).
- ***Barriers to participation do not necessarily impede participation.*** A common reason for not participating was the expected cost/staff time to participate. Similarly, the most commonly reported problem experienced by participants was the cost/staff time associated with using the registry.
- ***Ways to simplify registries should continue to be explored.*** Many suggestions for increasing provider participation focused on ways to simplify registries. One positive trend is the development of web-based systems; participants that interacted with the registry via the internet were less likely to experience problems with cost/staff time associated with using registry.
- ***There is considerable room for growth so continue to get the word out.*** Half of non-participants did not recall being contacted regarding registry participation, and about a third gave as a reason for not participating that they had not yet been told about it. Many suggestions for increasing provider participation focused on providing education regarding the registry.

TABLE OF CONTENTS

Introduction	1
Objective	1
Methods	1
Selection of Survey States	1
Sampling of Practices	3
Survey Design	4
Survey Administration	5
Data Analysis	5
Results: Descriptive Characteristics for Respondents	7
Response Rate	7
Respondent Demographics and Practice Characteristics.....	8
Results: Perspectives of Registry Participants	9
Registry Participation Status	9
Influential Factors on Participation Decision	10
Biggest Influence on Participation	10
Using and Interacting with Registry	11
Problems with Registry	12
Suggestions for Increasing Provider Participation	12
Results: Perspectives of Registry Non-Participants	14
Registry Participation Status	14
Contacts with Registry Non-Participants	14
Reasons for Non-Participation	15
Potential Benefits of Registries	15
Participation Considerations.....	16
Suggestions for Increasing Provider Participation	16
Summary and Discussion	18
Summary and Implications.....	18
Limitations.....	20
Conclusions	21
References	23
Appendix A: Registry Participant Survey Protocol	A-1
Appendix B: Registry Non-Participant Survey Protocol	B-1

INTRODUCTION

The success of immunization registries is dependent on broad participation of immunization providers and comprehensive enrollment of persons vaccinated. Based on recent data, 31% of private providers submitted data to a statewide or regional immunization registry in the last six months of 2002 and 43% of children less 6 years of age were enrolled in a registry (1). Increasing provider participation in immunization registries is critical for achieving the Healthy People 2010 objective of increasing to 95% the proportion of children less than 6 years of age with two or more vaccinations recorded in fully operational population-based immunization registries.

Officials from the National Immunization Program (NIP) at the CDC requested that the Vaccination Issues and Problems (VIP) research team at the University of Michigan (UM) assess private provider perspectives of immunization registries under their established cooperative agreement. The purpose of this effort was to assist NIP officials in developing strategies to increase private provider participation.

OBJECTIVES

To explore the perspectives of both participating and non-participating private providers on the benefits of and barriers to participation in immunization registries.

METHODS

This study involved a mailed survey of a sample of physicians in private practice settings in several states. The survey focused on the group of providers most likely targeted for registry participation – those participating in the Vaccines for Children (VFC) program. The study protocol was approved by the Institutional Review Board of the Michigan Medical School. Use of VFC provider lists was approved by NIP officials.

Selection of Survey States

The sampling frame was composed of the 31 states that had population-based, statewide immunization registries, based on data provided by NIP officials at the time of study initiation (data from CY2001). In Table 1, these states are stratified by whether there is a legislative mandate for providers to report to the registry and grouped by three levels of estimated private provider participation in the registry (defined as having reported to the registry in the last six months of 2001).

Table 1
Sampling Frame: States with Population-based Statewide Immunization Registries
(based on data reported by states to NIP in CY2001)

Estimated Level of Private Provider Participation	States with Registry Reporting Mandate	States with No Registry Reporting Mandate
0-25%	MD, ME, TX, WV	KS, LA, MO, MT, NV, NH, NJ, OH, PA, RI, UT, WA
26-74%	AZ, DE, MI	ND, OK, SC, WI
75-100%	AR, CT, MS, TN	AL, ID, OR, SD

NIP registry officials ranked states by the estimated percentage of private providers participating in their registry and then selected every other state for a proposed sample of 16 states (Table 2). Michigan was also included, given the commitment of the Michigan Department of Community Health to fund a parallel survey in that state.

Table 2
Proposed Survey States (February 2002)

Estimated Level of Private Provider Participation	States with Registry Reporting Mandate	States with No Registry Reporting Mandate
0-25%	MD, TX	KS, MO, NV, NJ, OH, RI
26-74%	AZ, DE, MI	WI
75-100%	AR, MS	AL, ID, SD

Immunization program officials in all states, excluding Michigan, were contacted by officials at the NIP to request their participation in the study. (In Michigan, the UM project team communicated directly with immunization program officials.) If a state agreed to participate, NIP officials forwarded the appropriate contact information to the UM project team to follow-up with the state for more information. This process took several months, with the response time varying considerably across states.

In instances where a state declined participation, another state with similar characteristics (private provider participation level, existence of registry reporting mandate) was selected and contacted. In all, 25 of the 31 states in the initial sampling frame were contacted. Reasons given by the 10 states that declined participation or were otherwise ineligible:

- No active registry (KS, MD)
- No active registry for private providers (AL, PA)
- In process of switching registry systems (OK, SC, SD)

- Unable to devote resources to preparing lists (MT, NJ)
- Survey directed to physicians will not be successful (SD)
- Recently surveyed providers about registry participation issues (OK, RI)

The final sample consisted of the 15 states listed in Table 3.

Table 3
Final Survey Sample

Estimated Level of Private Provider Participation	States with Registry Reporting Mandate	States with No Registry Reporting Mandate
0-25%	TX, WV	MO, NV, OH, UT
26-74%	AZ, DE, MI	ND, WI
75-100%	AR, MS	ID, OR

Sampling of Practices

For the 15 states that agreed to participate, state immunization program officials were asked to provide two different lists of contact information for immunization providers: (1) a list of practices enrolled in the VFC program and (2) a list of practices enrolled in the state immunization registry.

The VFC lists were used as the basis of the survey sample in each state. The samples were limited to private physician practices that provide primary care in an outpatient setting. Therefore, public health departments, Federally Qualified Health Centers, prisons, schools, hospitals, and STD clinics were excluded. The UM research team then matched private VFC sites with the registry list to identify registry participants. Private practices on the VFC list that did not appear on the registry list were assumed to be registry non-participants. Five states (AR, DE, MS, ND, UT) provided only the VFC list because they reported that all VFC providers participate in the registry. For one state (NV) our only resource was the VFC list. Without a registry list, we could not separate VFC providers into registry participants and non-participants, so we treated them all as registry participants.

From each state, the target sample was 90 practices, roughly proportional between registry participants and non-participants. If there were more practices in the sampling frame than needed for the sample, practices were then chosen to represent a range of practice size (solo versus not) and county, with an emphasis on sites that were more likely to see children, as indicated by practice name or physician specialty. Hypothetical examples of the sample calculations are as follows:

- If a state had 300 private practices on the VFC list and we identified 100 of them as registry participants and 200 as non-participants, we selected 30 ($90 \times 100/300$) of the participants and 60 ($90 \times 200/300$) of the non-participants for the survey sample.
- If a state had 300 private practices on the VFC list and all of them were considered registry participants, we selected 90 of the practices for the survey sample.
- If a state had 75 VFC private practices, with 50 participants and 25 non-participants, all 75 private practices were included in the sample.
- If a state had 100 VFC private practices, with 90 participants and 10 non-participants, we selected 80 participants and kept all 10 non-participants for the sample.

Following address verification, the state-specific samples ranged from 70 practices in Idaho to 94 practices in Texas, with a mean of 82 practices. The overall sample contained 1,235 practices, 971 identified as participants and 264 as non-participants. In Michigan, a total of 90 practices were included in this study; a larger number were selected for the separate, Michigan-specific study.

A single physician was identified for each practice for survey mailing. This physician was either the contact physician for VFC or the contact physician for the registry. In the event that neither a VFC nor a registry physician contact was listed, research staff obtained the name of a physician in the practice considered knowledgeable about vaccine issues by calling the practice or using physician directories on the internet.

Survey Design

Two different but parallel 2-page surveys were designed, one for registry participants and one for registry non-participants. The surveys were made state-specific by inserting the name of the state's registry into the title of survey and in many of the survey questions. Survey questions were pilot-tested with a convenience sample of pediatricians and family physicians in Michigan.

The survey for registry participants (Appendix A) included questions about:

- participation status,
- influences on the practice's decision to participate in the registry,
- the ways in which the practice interacts with and uses the registry,
- the extent of any problems experienced with the registry,
- suggestions for increasing / improving private provider participation, and
- respondent specialty and practice characteristics.

The survey for registry non-participants (Appendix B) included questions on:

- participation status,
- barriers to participation,
- the importance of potential benefits of a registry,
- the likelihood of participation in the near future,
- factors essential for participation,
- suggestions for increasing / improving private provider participation, and
- respondent specialty and practice characteristics.

Survey Administration

Due to time lags in getting states' agreement to participate and provider lists, surveys were fielded in two phases, with the survey states for each phase as follows:

- Phase 1 states: AZ, AR, ID, MI, MS, NV, TX
- Phase 2 states: DE, MO, ND, OH, OR, UT, WV, WI

The surveys were sent via first-class mail and included a hand-signed personalized cover letter from the principal investigator, a postage-paid reply envelope, and a small monetary incentive (\$5). After the initial mailing in each state, two subsequent mailings to non-respondents were sent at approximately 3-week intervals. Within a mailing phase, mailings for each state were staggered across a 5-month time period. Mailings for Phase 1 states occurred between August 2002 and December 2002, and mailings for Phase 2 states occurred between February 2004 and June 2004.

Data Analysis

Survey responses were coded and entered into a database. We calculated frequency distributions and conducted bivariate analyses using a chi-squared test of association. P-values less than 0.05 were considered significant. All analyses were conducted using SAS v8.2.

For purposes of the bivariate analyses, states were grouped by whether there was a legislative mandate for providers to report to the registry or not:

- Registry Reporting Mandate: AR, AZ, DE, MI, MS, TX, WV
- No Registry Reporting Mandate: ID, MO, ND, NV, OH, OR, UT, WI

The states also were grouped by the estimated statewide level of private provider participation in the registry (defined as having reported to the registry in the last six months of 2001):

- Low ($\leq 25\%$): MO, NV, OH, TX, UT, WV
- Medium (26-74%): AZ, DE, MI, ND, WI
- High ($\geq 75\%$): AR, ID, MS, OR

For the registry participant survey, analyses were conducted to explore the associations between the independent variables (practice characteristics, existence of reporting mandate, statewide private provider participation level) and participation status, influences on the decision to participate, the ways in which respondents use and interact with registry, and the problems experienced. The correspondence between problems experienced with the registry and the way in which respondents use and interact with the registry also was explored.

Similar analyses were conducted for the registry non-participant survey, with associations explored between the independent variables (as mentioned above) and participation status, the importance of potential benefits of a registry, and suggestions for increasing provider participation. The correspondence between reasons for not participating and factors essential for participation also was explored.

RESULTS: Descriptive Characteristics for Respondents

Response Rate

Of the 1,235 practices selected for inclusion, 13 were unable to be contacted (i.e., mailings returned as undeliverable). From the remaining 1,222 practices, we received 756 surveys eligible for data analysis, for a response rate of 62%. Overall, the response rate for the registry participant survey was slightly higher than for the non-participant survey; response rates also varied across states (Table 4).

Table 4
Response Rate by State and Survey

State	Participant Survey (N=960)	Non-Participant Survey (N=262)
Arizona	39%	33%
Arkansas	51%	—*
Delaware	53%	—*
Idaho	66%	61%
Michigan	84%	67%
Mississippi	65%	—*
Missouri	68%	74%
Nevada	51%	—**
North Dakota	68%	—*
Ohio	83%	60%
Oregon	58%	39%
Texas	64%	41%
Utah	84%	—*
West Virginia	60%	57%
Wisconsin	78%	59%
Overall	63% (N=604)	58% (N=152)

* No non-participant survey sent in this state because state indicated that all VFC providers participate in the registry.

** No non-participant survey sent in this state because VFC list was only resource from which to draw survey sample and, therefore, we were not able to distinguish between participants and non-participants.

Respondent Demographics and Practice Characteristics

The majority of respondents were pediatricians, with the proportion slightly higher for the participant survey than the non-participant survey (Table 5). Practice characteristics were very similar between respondents to the participant survey and the non-participant survey.

Table 5
Respondent Demographics and Practice Characteristics

	Participant Survey (N=604)	Non-Participant Survey (N=152)
Specialty		
Family Practice	39%	44%
Pediatrics	58%	51%
Other	3%	5%
Practice ownership / affiliation		
Private independent office (solo or group)	76%	67%
University or hospital medical center	12%	17%
Physician network	5%	11%
Other	7%	5%
Proportion of pediatric patients covered by Medicaid		
None	2%	3%
Less than 10%	19%	16%
10-50%	56%	59%
More than 50%	23%	22%
No. of vaccines given to children in a typical week		
Less than 10 vaccines/week	15%	20%
10-25 vaccines/week	18%	17%
26-100 vaccines/week	36%	32%
More than 100 vaccines/week	31%	31%
No. of physicians in practice giving childhood vaccines		
1	37%	37%
2	18%	20%
3 or more	45%	43%

RESULTS: Perspectives of Registry Participants

Registry Participation Status

Of respondents to the registry participant survey, 62% (N=374) confirmed that their practice currently participates in their state immunization registry, while 33% (N=202) said that their practice does not participate in the registry and 5% (N=28) were unsure. The proportion of respondents confirming that their practice participates in the registry varied widely by state (Table 6).

Table 6
Proportion of Respondents to Participant Survey with Confirmed Participation Across States

Proportion of Confirmed Participants	States
More than 75%	AZ, MI, MS, ND, OR
50-74%	ID, TX, WI, WV
25-49%	AR, DE, MO, OH, UT
Less than 25%	NV

Among the 5 states that reported that all VFC private sites participate in the registry, two (MS, ND) had high confirmed participation, while 3 states (AR, DE, UT) had less than half of respondents confirming participation in the registry. Low confirmed participation was expected for Nevada, given that all practices in the Nevada sample were sent the participant survey even though the estimated level of statewide provider participation in Nevada was low.

In states with registry reporting mandates and high estimated levels of statewide private provider participation in the registry, respondents to the participant survey were more aware of their registry participation status (Table 7).

Table 7
Participation Status and State-Level Characteristics for Participant Survey

	Participate in Registry?			p-value
	Yes (N=374)	No (N=202)	Unsure (N=28)	
State registry reporting mandate				
Mandate	69%	27%	4%	0.0015
No mandate	55%	39%	6%	
Estimated statewide level of private provider participation				
Low (0-25%)	39%	56%	6%	<0.0001
Moderate (25-74%)	74%	21%	5%	
High (75-100%)	77%	21%	2%	

Among the 374 confirmed registry participants, 48% had been participating in the registry for ≥ 3 years, 30% for 1-2 years, and 13% for < 1 year; 9% were unsure. Results varied by state, consistent with whether the registry had included private providers in the registry for a longer (e.g., DE) versus shorter (e.g., OH, WV) period of time.

Influential Factors on Participation Decision

Confirmed registry participants were asked the extent to which certain factors were influential in their practice's decision to participate in the registry, and almost all cited as being influential the need to consolidate records for patients who receive vaccines at multiple sites (Table 8).

Table 8
Influence of Factors on Decision to Participate in Registry (N=374)

	Not Influential	Somewhat Influential	Very Influential
Need to consolidate records for patients who receive vaccines at multiple sites	9%	28%	63%
State mandates participation*	19%	26%	55%
Nursing/administrative staff in favor of participation	25%	35%	40%
Ability to use registry to monitor immunization rates	31%	36%	33%
Expected cost/staff time required for data input	34%	45%	21%
Availability of technical assistance/training from state	35%	40%	25%
Compatibility of registry technology with office computers	36%	37%	27%
Medicaid/health plan mandates participation	37%	30%	33%

* Asked only in states with existing mandate.

Biggest Influence on Participation Decision

The survey included an open-ended question regarding the biggest influence on a practice's decision to participate in the registry. The categories of influences reported, in descending order, were:

- 48% *uses / benefits of immunization registries*, such as consolidating records for patients seen at multiple sites, monitoring immunization rates, reviewing the immunization status of individual patients, and decreasing duplicate immunizations.
- 25% *stakeholder influences*, either due to outside parties (e.g., state, Medicaid, health plan) that mandated or highly recommended participation or to internal support by staff or other physicians.

- 11% *characteristics of particular registries*, including the compatibility of the registry with office computers, the technical assistance or training provided by registry staff, specific features of the registry (e.g., automated input or output), and convenient access to the registry.
- 10% *broader good*, with respondents noting that participation was good for kids, parents, or public health, or that it contributed to better patient care or good customer service.
- 6% *other*, miscellaneous reasons.

Using and Interacting with the Registry

Respondents reported the following registry uses:

- 84% input data on vaccines given into the registry (results ranged from 44%-100% across states)
- 78% review immunization records of individual patients (43%-91%)
- 58% print immunization records for patients (26%-77%)
- 28% assess immunization coverage for the practice (0%-44%)
- 14% generate reminder/recall notices (0%-26%)
- 2% use it in other ways (0%-16%)
- 6% have no active uses (0%-33%)

For 80% of practices, nurses are responsible for reporting data to the registry, while for 23% clerical or billing staff report data. Another 5% reported other personnel input data or that it is automated; 2% said data are not reported. The type of staff responsible for reporting data did not differ by the number of vaccines administered in a typical week. There was some state variation, with 3 states (AZ, OH, WV) showing a higher proportion of reporting by clerical and billing staff (and lower for nursing staff) relative to the other states.

Almost half of respondents interact with the registry by internet connection (49%), 37% utilize hard copy data sent by mail or fax, 19% interact by modem, and 5% by other means. This varied by state, with <10% using the internet in 2 states (AR, MS), and ≥75% using the internet in 5 states (MO, ND, OH, UT, WI). Over 75% reported using hard copy data in 3 states (AR, DE, MS).

With regard to the amount of time spent by staff each week reporting data to the registry, 40% estimated <2 hours/week, 35% estimated 2-5 hours/week, 12% said >5 hours/week, and 13% were unsure. The more vaccines administered to children in a typical week, the more hours/week staff spent reporting data to the registry (p<0.0001).

Problems with Registry

When asked the extent to which their practice has experienced problems with the registry, the main concerns were related to the cost or staff time associated with using the registry and with accuracy or completeness of the data (Table 9). Technical support and confidentiality concerns were not problems for most respondents.

Table 9
Problems Experienced with Registry Among Registry Participants (N=374)

	Not a problem	A small problem	A significant problem
Cost/staff time associated with using registry	44%	36%	20%
Concerns with accuracy or completeness of data	47%	37%	16%
Difficulty in accessing registry (e.g., busy phone lines)	58%	30%	12%
Problems with software/computer compatibility	61%	24%	15%
Inadequate technical support or training	72%	18%	10%
Confidentiality concerns	81%	14%	5%

Specific to problems with the cost/staff time associated with using registry:

- The more time that staff spent reporting data to the registry, the more likely that respondents reported having significant problems with the cost/staff time associated with using the registry ($p < 0.0001$).
- The proportion of those experiencing significant problems with the cost/staff time associated with using the registry did not vary by the number of vaccines administered to children in a typical week or uses of the registry.
- Respondents that interact with the registry via the internet were more likely to report having no problems with the cost/staff time associated with using the registry ($p = 0.023$).

Specific to problems with data accuracy or completeness, the proportion of respondents experiencing significant problems with data accuracy or completeness did not vary by uses of the registry or the estimated statewide level of private provider participation in the registry.

Suggestions for Increasing Provider Participation

The survey included an open-ended question for all respondents on what they considered the most important thing that registry officials could do to increase or improve provider participation in the registry. The categories of responses reported (missing in 40% of surveys) were:

- 23% *changes to particular registry*, such as improving access (e.g., to address login problems), providing access online, entering legacy data, increasing or improving registry tools, and improving the quality of the data entered.
- 22% *education*, such as increasing or providing education about the registry (its existence and benefits) to providers, office staff, or parents.
- 19% *simplification*, such as simplifying or automating data input or output, reducing paperwork, or generally making it simpler or less time consuming.
- 13% *compatibility*, including improving or making the registry compatible with office computers and providing or updating the appropriate hardware, software, or internet access.
- 12% *technical assistance*, which includes providing, increasing, or improving the technical assistance or training provided.
- 4% *mandates*, either to mandate reporting by everyone or to enforce an existing mandate.
- 7% *other*, miscellaneous responses.

RESULTS: Perspectives of Registry Non-Participants

Registry Participation Status

Of respondents to the registry non-participant survey, 62% (n=95) confirmed that their practice does not participate in their state immunization registry, 29% (n=44) said that their practice actually does participate in the registry, and 9% (n=13) were unsure. As with respondents to the participant survey, participation status differed by existence of a state registry reporting mandate and estimated statewide level of private provider participation in the registry (Table 10).

Table 10
Participation Status and State-Level Characteristics for Non-Participant Survey

	Participate in Registry?			p-value
	No (N=95)	Yes (N=44)	Unsure (N=13)	
State registry reporting mandate				
Mandate	50%	48%	2%	0.04
No mandate	68%	21%	11%	
Estimated statewide level of private provider participation				
Low (0-25%)	71%	18%	11%	0.004
Moderate (25-74%)	38%	62%	0%	
High (75-100%)	52%	40%	8%	

The proportion of respondents confirming their non-participant status varied widely across states from $\leq 10\%$ in 2 states (AZ, MI) to over 75% in 3 states (OH, TX, WI). In other words, in states like AZ, most respondents sent the non-participant survey actually do participate in their state registry, while respondents in states like OH were correctly targeted as registry non-participants.

Contacts with Registry Non-Participants

Among the 95 confirmed non-participants, 48% did not believe that their practice had been contacted about participating in the registry, 29% had been contacted, and 23% were unsure.

Of those that had been contacted, almost all (96%) were contacted by state immunization program staff, 4% by a managed care organization, 4% by a professional association, and 8% by another party. Methods of contact were 60% personal contact, 52% letter, 24% meetings/conferences, and 8% other means.

Less than half (44%) said their practice had received information regarding the practice’s childhood immunization rate in the past two years, 38% had not, and 18% were unsure. Of those that had, the information sources were:

- 47% internal audit using practice records
- 36% external audit (e.g., HEDIS)
- 27% health department assessment
- 16% internal audit using registry data

Reasons for Non-Participation

Reasons given for not participating in the registry were as follows:

- 37% too much staff time or cost to participate
- 37% practice has own system for recording and monitoring immunizations
- 28% practice has not yet been told about or recruited for the registry
- 20% registry was not compatible with the practice’s computer system
- 15% confidentiality concerns
- 14% small number of pediatric patients
- 9% insufficient technical assistance available
- 14% other, miscellaneous responses

Potential Benefits of Registries

When asked about the importance of potential benefits of an immunization registry, the majority of respondents reported that easy access to records of vaccines provided to patients at other sites and printable immunization records were very important benefits (Table 11). The ability to document vaccines for HEDIS or managed care organizations was considered the least important benefit overall.

**Table 11
Importance of Potential Benefits of Registry by Non-Participants (N=95)**

	Not Important	Somewhat Important	Very Important
Easy access to records of vaccines provided at other sites	7%	25%	68%
Printable immunization records for patients	10%	35%	55%
Ability to assess practice’s immunization coverage	14%	43%	43%
Ability to generate reminder/recall notices	15%	43%	42%
Ability to document vaccines given for HEDIS, managed care organizations	28%	41%	31%

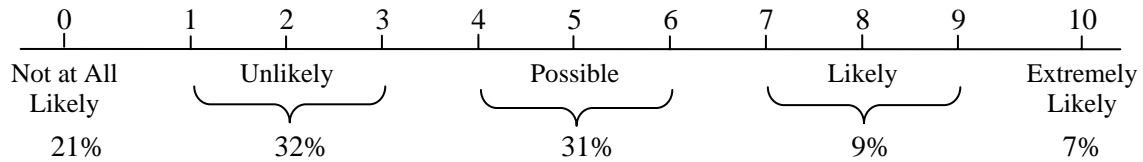
Participation Considerations

Factors cited as being essential to participation were:

- 59% compatibility of registry technology and office computers
- 48% automated data entry
- 45% state law mandating participation (only asked in states with an existing mandate)
- 35% on-site technical assistance from registry staff
- 28% increased participation from other providers in the community
- 27% legal advice or expertise to address confidentiality concerns
- 19% support for the registry from the state medical or specialty society
- 17% more support for participation from the practice’s nursing or administrative staff

There was no clear correspondence between the factors reported as essential for participation and the reasons given for not participating.

As a general gauge of non-participant interest in the registry, the survey asked the likelihood that the practice would participate in the registry in the next 2 years on a scale of 0 (not at all likely) to 10 (extremely likely). Responses were distributed as follows:



There was no difference by existence of a state registry reporting mandate. Respondents in states with medium to high levels of private provider participation were more likely than states with a low participation rate to report responses of 4 or less, while those in states with a low level of participation were more likely to report responses of 7 or higher, though a statistically significant difference could not be detected. This result likely reflects that in states where private provider participation is low, there is a larger pool of willing-to-participate providers yet to be recruited, while in medium to high participation states, a larger proportion of the willing-to-participate providers are already participating.

Suggestions for Increasing Provider Participation

As with the registry participant survey, the registry non-participant survey included an open-ended question for all respondents on what they considered the most important thing that registry officials could

do to increase or improve provider participation in the registry. The categories used to group responses were the same as those used for the registry participant survey (responses missing in 46% of surveys):

- 39% simplification
- 29% education
- 7% compatibility
- 7% technical assistance
- 5% mandates
- 2% changes to particular registry
- 11% other, miscellaneous responses

For the non-participant survey, responses to this question were more general in nature rather than directed to the registry specifically, as reflected in both:

- (1) the distribution of responses across categories. For example, changes to a particular registry was the highest ranked category of responses for the participant survey, but the lowest for the non-participant survey, and
- (2) the tenor of responses within a category. For example, in the simplification category, responses from the non-participant survey were often more general (e.g., make sure that it is simple to use) than those from the participant survey (e.g., automate data input so that it is simpler to use).

SUMMARY AND DISCUSSION

Summary and Implications

There was good, but not great, consistency (62% in both surveys) between state records and provider perception of their registry participation status. This may, in part, reflect the following:

- Some of the respondents may not have been the most knowledgeable physician within the practice regarding immunization registry issues.
- Other staff persons (e.g., nurses) are often more involved in the day-to-day logistics of registry participation.
- Some providers may link to the registry through other systems and therefore not recognize participation as it relates to the immunization registry specifically.
- For the non-participant survey, some survey states may have been conducting provider recruitment efforts in the time between the UM project team obtained provider contact lists and mailed the surveys (thus underestimating registry participation).
- The complexities surrounding a practice's various affiliations, which may be different for ordering and obtaining vaccine than for determining registry participation, may affect whether registry participation status is well understood at the physician level. It also complicates the process of matching VFC provider lists with registry records, which was the basis for determining participation status in the mailing samples.

For the participant survey, consistency between state records and provider perception of participation was higher in states with registry reporting mandates, implying a heightened sense of awareness due to the mandate. In addition, consistency between state records and provider perception of participation was significantly higher in states with moderate to high statewide levels of private provider participation. This result may reflect that respondents in states where registries have been in existence longer or that conducted broader recruitment efforts are more familiar with their participation status, while there may be a delay in awareness of participation status by respondents in states with relatively new registries or newer recruitment efforts due to delays inherent in the start-up/roll-out process.

For the non-participant survey, consistency between state records and provider perception of participation was higher in states without registry reporting mandates and in states with low statewide levels of private provider participation. This result may indicate changes in participation status that occurred between sample selection and survey administration or possible misidentification of practices as non-participants in the process of matching state VFC records with registry records.

Overall, the biggest influence on participants' decision to participate related to uses and benefits of the registry. Consolidating records for patients who receive vaccines at multiple sites was the factor most commonly cited as being very influential for participants in their participation decision, and for non-participants, was the benefit most commonly cited as being very important. Therefore, uses of the registry, and consolidation of records in particular, should be (or continue to be) a strong marketing point when recruiting providers.

In states with a registry reporting mandate, mandates were an important, but not the biggest, influence on participation. (We do not have data for respondents in states without an existing mandate.) Also, almost half of non-participants in states with an existing mandate said a "state law mandating private practice participation" would be essential to their participation, suggesting that these providers do not realize that such a mandate already exists and that registry officials should more broadly publicize this fact.

We found a high level of "any use" among registry participants. However, features like assessment of a practice's immunization coverage and generation of reminder/recall notices are not being utilized by the majority of respondents. Note that the actual capabilities of each state's registry (e.g., whether actually has the ability to generate reminder/recall notices) are not compared with providers' perceptions of registry uses. In states where registries are equipped with more advanced features, registry officials should explore the extent to which practices are taking advantage of these features and provide additional education and training to expand their use.

There were few significant problems for participants. Problems with the cost/staff time associated with using the registry were mitigated by access to the registry via the internet. While this was the mode of access for almost half of the participants, over a third still report via hard copy. There is some evidence, then, supporting the trend to move to web-based registry systems. Registry officials will need recruiting strategies specific to those practices that do not already have an internet connection and may be hesitant or unwilling to establish and pay for internet access. One idea would be to promote other resources available on the internet, in addition to the registry, that would be valuable to a clinical practice.

Barriers reported by non-participants were relatively consistent with the problems experienced by participants, implying that these problems may not go away completely but also do not inhibit participation. The cost/staff time associated with using the registry was the main concern for both non-participants and participants, while technical assistance and confidentiality issues were not problems for either. Registry recruitment and marketing needs to emphasize that problems can be (and have been)

overcome. Testimony from current participants to demonstrate how perceived problems were overcome might be helpful. In addition, registry officials should continue to look for ways to reduce the burden on physician offices. Also, further studies regarding the cost and time burden to practices related to registry participation should be conducted.

One of the two most common reasons given by respondents for not participating was already having their own system for recording and monitoring immunizations. While the specifics of such a system are unknown, they certainly would not have the breadth of a statewide system, providing further evidence that using the registry to access records for patients that receive vaccines at other sites across the state should be particularly emphasized. Registry officials should continue to explore linkages with physician billing and patient management systems as ways to increase participation and to reduce the cost and time burden to practices of participating.

It is interesting to note that the reasons that non-participants gave for not participating did not correspond to the factors that they said would be essential for them to participate, implying that it is better to focus on what will get them on board rather than trying to ameliorate the barriers to participation. Compatibility of registry technology and office computers was the factor most commonly cited as essential to participation. Registry officials should seek input from physicians as they develop their registries to ensure that the factors physicians believe will influence their participation are being addressed as much as possible.

A common theme was that there is certainly room for growth in private provider participation. Only half of non-participants recalled being contacted about registry participation, and almost a third gave as the reason for not participating that they have not heard about it. In addition, just about half were “on the fence” or better regarding possible participation in the next 2 years. Both participants and non-participants emphasized education as one of the biggest things that registry officials can do to continue to get private providers to participate.

Limitations

There are few limitations of the study to highlight. First, because the sample was limited to VFC providers, this study may not be generalizable to non-VFC providers. However, the VFC provider population is a logical target for initial immunization registry recruitment efforts, so the findings of this study are generalizable in this respect.

The survey was intended to collect information on physician perspectives of immunization registries and was targeted to physicians in VFC private practices that were knowledgeable about vaccine issues. However, we cannot verify that the intended physician is the person who completed the survey. In addition, this person may not have been the most knowledgeable physician in the practice regarding registry participation. Surveys of other types of providers within physician practices, such as nurses, regarding immunization registries would provide an additional, valuable perspective.

The sample design was intended to provide a national perspective; results of the study cannot be used for comparing results across individual states other than in a descriptive manner. Individual states should consider conducting comprehensive surveys of their immunization providers to more fully describe provider perspectives regarding their own registry specifically.

Because registry development is continuous and dynamic, the state groupings based on estimated level of provider participation in the registry do not necessarily reflect current levels of participation. The information used to assign states to these groups was taken from data provided to NIP for calendar year 2001 and may have changed significantly since then (e.g., due to the timing of a state's private provider recruitment efforts). As for the state groupings based on existence of a registry reporting mandate, some states may not have legislative mandates for providers to report to the registry, but they may have programmatic requirements that serve the same purpose (e.g., ND does not have a legislative mandate, but providers must participate in the registry to get free vaccine from the state).

Conclusions

This survey provides a national overview of the perspective of both participating and non-participating private providers on immunization registries. Because each state's registry is unique, adoption of the recommendations outlined in this report should be tailored to each state's specific situation.

As would be expected, physicians that are not yet participating in their state registry want a system that is simple and that does not require a lot of time or money to implement or maintain. Based on the experience of registry participants and the suggestions from both participants and non-participants, as described above, registry officials should continue to search for different avenues to demonstrate the value of registry functions to non-participants and to facilitate access to their system. In particular:

- Registry officials should continue to work toward simpler and integrated systems.
- Marketing of the registry to non-participants should focus on the benefits of participation.

- Further studies of the time and cost required to participate as well as the efficiencies realized from participation should be conducted.

Communication between registry officials and physician practices does not stop with their agreement to participate. Just as registry development is continuous and dynamic, registry officials must continue to educate and train participants, as well as solicit their feedback. Positive experiences by current participants will only serve to enhance the efforts to recruit non-participating providers.

References

1. CDC. Immunization Registry Progress – United States, January-December 2002. MMWR 2004; 53(20):431-433.

APPENDIX A: Registry Participant Survey Protocol

VACCINE PROVIDER UTILIZATION OF THE [insert state registry name]

This brief survey explores benefits, barriers, and influences on vaccine providers' participation in the [insert state registry name]. All responses will be kept confidential. To complete the survey, please circle the number of your response, unless otherwise directed.

1. Do you (or does your practice) currently participate in [insert state registry name]?

- 1 Yes 2 Unsure 3 No ⇒ **GO TO Question 10 on back**

2. How long have you participated in [insert state registry name]?

- 1 Less than 1 year 2 1 to 2 years 3 More than 3 years 4 Unsure

3. How do you use [insert state registry name] in your practice? (circle all that apply)

- 1 Input data on vaccines given
- 2 Review immunization records of individual patients
- 3 Print immunization records for patients
- 4 Generate reminder/recall notices for patients due for vaccines
- 5 Assess immunization coverage for practice
- 6 Other (*specify*) _____
- 7 Not actively using registry

4. How influential were the following factors in your practice's decision to participate in [registry name]?

	<i>Not Influential</i>	<i>Somewhat Influential</i>	<i>Very Influential</i>
1 Need to consolidate records for patients who receive vaccines at multiple sites	1	2	3
2 Compatibility of registry technology with office computers	1	2	3
3 Ability to use registry to monitor immunization rates	1	2	3
4 State law mandating registry participation*	1	2	3
5 Medicaid/health plan mandates participation	1	2	3
6 Availability of technical assistance/training from state	1	2	3
7 Nursing/administrative staff in favor of participation	1	2	3
8 Expected cost/staff time required for data input	1	2	3

* Asked only in states with existing mandate

5. Overall, what was the biggest influence on your practice's decision to participate in [state registry name]?

6. Which staff are responsible for reporting your practice's immunization data to [insert registry name]?

- 1 Nurses
- 2 Clerical/billing staff
- 3 Other (*specify*) _____
- 4 NA – Data not reported ⇒ **SKIP TO Question 9**

7. On average, how many hours per week does staff spend reporting data to [insert state registry name]?
 1 Less than 2 hrs/wk 2 2-5 hrs/wk 3 5-10 hrs/wk 4 >10 hrs/wk 5 Unsure

8. How does your practice interact with [insert state registry name] to input and retrieve data?
 1 Via internet connection 3 Hard copy of data sent by mail or fax
 2 Via modem 4 Other (specify) _____

9. To what extent has your practice experienced any of the following problems with [insert registry name]?

	<i>Not a problem</i>	<i>A small problem</i>	<i>A significant problem</i>
1 Cost/staff time associated with using registry	1	2	3
2 Problems with software/computer compatibility	1	2	3
3 Difficulty in accessing registry (e.g., busy phone lines)	1	2	3
4 Concerns with accuracy or completeness of data	1	2	3
5 Confidentiality concerns	1	2	3
6 Inadequate technical support or training	1	2	3
7 Other (specify) _____	1	2	3

10. What is the **most important** thing registry officials could do to increase/improve provider participation in [insert state registry name]?

Please tell us about your practice.

11. What is your specialty?

1 Pediatrics 2 Family Practice 3 Other _____

12. How many physicians in your practice provide childhood vaccines? _____

13. In a typical week, how many vaccines are administered to children?

1 <10 vaccines/wk 2 10-25 vaccines/wk 3 26-100 vaccines/wk 4 >100 vaccines/wk

14. What proportion of your practice's pediatric patients are covered by Medicaid (including fee-for-service and managed care Medicaid plans)?

1 None 2 Less than 10% 3 10%-50% 4 More than 50%

15. What is the practice's ownership/affiliation?

1 University or hospital medical center 4 Physician network
 2 Private, independent office 5 Public clinic
 3 Managed care organization 6 Other (specify) _____

Thank you for your time. Please return this survey in the prepaid envelope provided.

APPENDIX B: Registry Non-Participant Survey Protocol

VACCINE PROVIDER PERCEPTIONS OF THE [insert name of state registry]

This brief survey explores barriers to and influences on vaccine providers' participation in the [insert name of state registry]. All responses will be kept confidential. To complete the survey, please circle the number of your response, unless otherwise directed.

1. Do you (or does your practice) currently participate in [insert state registry name]?

- 1 No
- 2 Unsure
- 3 Yes ⇒ *GO TO Question 6 on back*

2. Have you/your practice ever been contacted about participating in [insert state registry name]?

1 No 2 Unsure 3 Yes

2a. Who contacted you? (circle all that apply)

- 1 State immunization program staff
- 2 Managed care organization
- 3 Other physicians/administrators in practice
- 4 Professional association
- 5 Other _____

2b. How were you contacted? (circle all that apply)

- 1 Letter
- 2 Personal contact in practice
- 3 Meeting/conference
- 4 Other _____

3. In your opinion, why does your practice not participate in [registry name]? (circle all that apply)

- 1 Registry not compatible with practice's computer system
- 2 Too much staff time / cost to participate
- 3 Confidentiality concerns
- 4 Small number of pediatric patients
- 5 Practice has its own system for recording and monitoring immunizations
- 6 Insufficient technical assistance available
- 7 Other (*specify*) _____

4. Which of the following would be essential to gaining your participation in [registry name]?

- 1 Automated data entry
- 2 Technology compatible with office computers
- 3 On-site technical assistance from registry staff
- 4 Support for registry from state medical/specialty society
- 5 More support for participation from practice's nursing/administrative staff
- 6 State law mandating private practice participation in the registry [*only for states with existing mandate*]
- 7 Legal advice/expertise to address confidentiality concerns
- 8 Increased participation among other vaccine providers in my community

5. On a scale of 0 to 10, how likely are you to begin participating in [insert state registry name] in the next two years? _____

6. How important to your practice are the following potential benefits of an immunization registry?

	<i>Not Important</i>	<i>Somewhat Important</i>	<i>Very Important</i>
1 Easy access to records of vaccines provided to my patients at other sites	1	2	3
2 Ability to generate reminder/recall notices	1	2	3
3 Ability to assess practice's immunization coverage	1	2	3
4 Printable immunization records for patients	1	2	3
5 Ability to document vaccines given for HEDIS, managed care organizations	1	2	3

7. In the past 2 years, have you received information regarding your practice's childhood immunization rate?

- 1 No 2 Unsure 3 Yes ⇒ 7a. What was data source for this information?
- 1 Internal audit using practice records
 - 2 HEDIS, other external audit
 - 3 Internal audit using registry data
 - 4 Health department assessment
 - 5 Other _____

8. What is the most important thing registry officials could do to increase/improve provider participation in [insert state registry name]?

Please tell us about your practice.

9. What is your specialty?

- 1 Pediatrics 2 Family Practice 3 Other _____

10. How many physicians in your practice provide childhood vaccines? _____

11. In a typical week, how many vaccines are administered to children?

- 1 <10 vaccines/wk 2 10-25 vaccines/wk 3 26-100 vaccines/wk 4 >100 vaccines/wk

12. What proportion of your practice's pediatric patients are covered by Medicaid (including fee-for-service and managed care Medicaid plans)?

- 1 None 2 Less than 10% 3 10%-50% 4 More than 50%

13. What is the practice's ownership/affiliation?

- 1 University or hospital medical center
- 2 Private, independent office
- 3 Managed care organization
- 4 Physician network
- 5 Public clinic
- 6 Other (*specify*) _____

Thank you for your time. Please return this survey in the prepaid, addressed envelope provided.