# Providers' Perceptions of an Immunization Registry

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**Objective:** To determine providers' perceptions of a statewide immunization registry.

**Design:** Mail survey.

**Setting:** King County, Washington.

**Methods:** A random sample of 700 pediatricians, family physicians, and RN/NPs were surveyed. In addition to their perceptions of registries, respondents reported their immunization procedures in the absence of immunization histories.

**Results:** Of 544 eligible participants, 344 returned surveys (63% response rate). Seventy-seven percent of RN/NPs, 60% of pediatricians and 47% of family physicians ($p < 0.001$) responded that they thought that electronic immunization registries represented the "best chance to solve the lack of documentation problem." Fifty-seven percent of RN/NPs, 61% of pediatricians, and 43% of family physicians reported that the incompleteness of registry data presented a barrier to their using one ($p < 0.01$). Fewer than 14% of all specialties had concerns about potential compromises of patient confidentiality as a result of registries, although RN/NPs were more concerned about this possibility than both pediatricians and family physicians ($p = 0.02$). In a multivariate analysis, pediatricians were 43% less likely ($p = 0.15$) and family physicians were 73% less likely ($p < 0.01$) than RN/NPs to think registries are the solution to the lack of documentation problem. Familiarity with the existing registry was associated with a significant decrease in the likelihood of thinking that registries are the solution (OR .49 [.26–.90]) and an increase in the likelihood of thinking that registries will take a long time to become of practical value (OR 2.21 [1.09–4.29]).

**Conclusions:** Specialties differ with respect to their opinions regarding the promise immunization registries hold. Immunization registries appear to be well regarded in theory but may disappoint in practice. Incompleteness of immunization data may be the largest obstacle for registries to overcome.

**Medical Subject Headings (MeSH):** health care providers, immunizations, immunization schedule, registries (Am J Prev Med 1999;17(2):147–150) 

## Introduction

Absence of reliable documentation of immunization histories either during acute or well visits can lead to missed opportunities to immunize.[1–3] Immunization registries have been devised in part to circumvent the problems that lack of documentation can pose. Thirteen states presently have operational registries in all public sites; 30 additional states have them in more than one public site.[4] Despite the rise of immunization registries, little has been done to evaluate providers' perceptions of them. Many potential barriers to implementation of registries have been posited including funding, access, patient confidentiality, and time constraints.[5–7] How important each of these factors is for practitioners is not currently known.

We recently surveyed providers in King County WA to determine their opinions of immunization registries in general and WA state's registry in particular. This paper presents our findings in the hope that others may benefit from our experience.

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## Methods

### Registry

The CHILD (Children's Health, Immunization, Linkages, and Development) Profile registry was started in 2 counties of Washington State in 1993. It is currently active in regions representing 40% of Washington State's annual births, and within those counties approximately 30% of children have some immunization information recorded in CHILD.[8] Presently, all children born in participating counties are loaded into the registry using birth certificate data. Any provider can access CHILD Profile using a modem connection and standard office-based desktop computers. CHILD Profile will not only report patients' immunization records, it will make recommendations as to what immunization should be administered at a given visit if a child is not up to date.

We limited our survey to King County because it has been involved with the CHILD Profile registry the longest and is the most populated of the participating counties.

### Participants

Survey recipients were identified from a list of pediatricians, family physicians, nurse practitioners, and public health registered nurses compiled by the King County Department of Public Health. This list includes 1342 providers and is estimated to represent 90% of providers in King County who immunize children.[8] We randomly selected 700 providers. The RNs we sampled are immunization providers in public health clinics in King County. Together with NPs, they were intended to represent the opinions of "non-physician" immunization providers in King county. We over-sampled RNs, NPs and pediatricians, each of whom made up a disproportionately small sample of the original list, to ensure adequate and equal representation of all specialties.

### Survey

The survey included (1) demographic and practice characteristics of the providers (e.g., type of practice, percent of patients on Medicaid), and (2) opinions about immunization registries (e.g., are they the solution to documentation problems; are they unrealistic; will they compromise patient confidentiality; how should they be funded).

Survey recipients who did not respond to the first mailing were sent a second copy. The entire questionnaire is available from the authors. The survey was reviewed and approved by the University of Washington Institutional Review Board.

**Table 1.** Demographic data on survey respondents

| Characteristic | Number ($N = 325$) |
|---|---|
| **Specialty** | |
| Pediatrician | 111 (34%) |
| Family Practice | 90 (28%) |
| RN/NP | 106 (32%) |
| Other | 18 (5%) |
| **Male** | 128 (39%) |
| Years in Practice (Mean) | 18 (SD 10) |
| Percent Clinical Time (Mean) | 76 (SD 30) |
| Practice Setting | |
| Pediatric Group | 87 (27%) |
| Family Practice Clinic | 82 (25%) |
| Public Health Clinic | 68 (21%) |
| Staff model HMO | 38 (12%) |
| Solo | 11 (3%) |
| University | 9 (3%) |
| Other | 36 (11%) |

### Statistical Analysis

Chi square was used for comparing categorical variables; ANOVA was used for comparing continuous variables. Because no clinically significant difference was identified between the responses of RNs and NPs, data from them were combined. Multivariate logistic regression was used to assess the independent relationships between demographic characteristics, immunization practices, and attitudes about immunization registries. All variables identified as nominally significant in tabular analysis ($p < 0.10$) were evaluated in the regression model. Variables were retained in the final multivariate model for clarity if they were statistically significant or if they demonstrated confounding effects by changing the odds ratios of other variables in the model by more than 10%.

## Results

Of 700 surveys mailed, 29 were returned by the post office with no forwarding address, 2 were duplicates, and 125 were excluded because we learned that they did not see children, were retired, or did not administer immunizations. Of the 544 eligible participants, 344 returned surveys (response rate 63%). Nineteen of these respondents were subsequently excluded by us either because they were resident physicians ($n = 4$) or because they do not make immunization decisions for children ($n = 15$). The total number of participants therefore was 325. Demographic data on respondents are summarized in Table 1.

There was no difference in response rates ($p = 0.22$), years in practice ($p = 0.84$), or percent clinical time ($p = 0.32$) among the specialties. RN/NPs were more likely than both family physicians and pediatricians to be female ($p < 0.001$).

**Table 2.** Multivariate model of predictors of attitudes about immunization registries

| Variable | Electronic registries represent the best chance for a solution OR [95% C.I.] | Electronic registries will take a long time to become of practical value OR [95% C.I.] | Electronic registries are a good idea but unrealistic OR [95% C.I.] |
|---|---|---|---|
| Specialty | | | |
| RN/NP | 1.0 [Reference] | 1.0 [Reference] | 1.0 [Reference] |
| Pediatrician | 0.47 [0.21–1.0] | .88 [0.35–2.22] | 3.02 [1.38–6.82] |
| Family Physician | 0.26 [0.10–0.63] | 0.43 [0.14–1.32] | 4.04 [1.64–9.90] |
| Male | 1.04 [.53–2.03] | 1.04 [.53–2.03] | 1.24 [.67–2.30] |
| Years in Practice | 1.00 [0.97–1.04] | .97 [0.94–1.00] | 1.02 [.99–1.05] |
| % Patients on Medicaid | 1.00 [0.98–1.00] | .99 [0.98–1.00] | 1.00 [.98–1.02] |
| % Clinical Time | 0.99 [0.98–1.0] | 0.99 [0.98–1.0] | 1.00 [.99–1.01] |
| Public Health Clinic Practice | 1.09 [.43–2.77] | 1.56 [.75–3.97] | 1.95 [.82–4.62] |
| Familiar with CHILD | .49 [.26–.90] | 2.21 [1.09–4.29] | .91 [.51–1.62] |

## Attitudes About Registries

Seventy-seven percent of RN/NPs, 60% of pediatricians and 47% of family physicians ($p < 0.001$) responded that they thought immunization registries represented the "best chance to solve the documentation problem." Only 15% of respondents reported that they preferred parental record keeping to registries. Fewer than 14% of all specialties had concerns about potential compromises of patient confidentiality as a result of registries although RN/NPs as a group were more concerned about this possibility than both pediatricians and family physicians ($p = 0.02$). Approximately 20% of all specialties felt that immunization registries will not be of practical value in the near future. Twenty-six percent of RN/NPs and 43% of pediatricians and family physicians reported that registries were "unrealistic" ($p < 0.01$).

## Funding of Registries

Seventy-two percent of pediatricians compared with 59% of RN/NPs and 60% of family physicians felt registries should be funded by the state ($p = 0.08$). Approximately 20% of all specialties felt that they should be funded by health plans. Fewer than 15% felt that they should be funded by users though RN/NPs were more likely to report that than other providers ($p = 0.04$). Thirty-three percent of RN/NPs, 14% of pediatricians, and 22% of family physicians reported that registries should be funded by grants ($p = 0.01$). Less than 1% of all respondents felt that registries should not be funded.

## Barriers to Using Registries

Fifty-seven percent of RN/NPs, 61% of pediatricians and 43% of family physicians reported that the incompleteness of registry data presented a barrier to their using one ($p < 0.01$). Forty-one percent of RN/NPs, 30% of pediatricians, and 18% of family physicians reported that lack of training was a barrier ($p < 0.01$). Twenty-two percent of RN/NPs, 42% of pediatricians, and 29% of family physicians reported that costs were a barrier ($p = 0.01$) Time was a barrier for 41% of respondents.

## Familiarity with the Washington State CHILD Profile Registry

Seventy-one percent of RN/NPs, 48% of pediatricians and 30% of family physicians reported that they were "familiar with the CHILD Profile registry" ($p < 0.01$). Overall, 50% of respondents were familiar with it.

## Multivariate Analysis

To identify independent predictors of attitudes about registries we built 3 separate logistic regression models—one for each of the following statements about registries: (1) Electronic registries represent the best chance to solve the lack of documentation problem; (2) Electronic registries will take a long time to become of practical value; (3) Electronic registries are a good idea but might be unrealistic. The variables retained in the final models are shown in Table 2. Pediatricians and family physicians were less likely than RN/NPs to think that registries are the solution to the lack of documentation problem. Familiarly with the CHILD registry was associated with a significant decrease in the odds of thinking registries are the solution (OR .49 [.26–.90]). Similarly, being familiar with CHILD was associated with a significant increase in the odds of endorsing the statement that immunization registries will take a long time to become of practical value (OR .2.21 [1.09–4.29]). Pediatricians (OR 3.02 [1.38–6.82]) and family physicians (OR 4.04 [1.04–9.90]) were more likely than RNs/NPs to report that registries were a good but unrealistic idea.

## Discussion

This study found that the majority of immunization providers in one county think both that immunization registries are the solution to the lack of documentation problem in pediatric vaccination and that they should be funded by the state.

That only 50% of respondents were familiar with the CHILD Profile registry is disconcerting given 5 years of efforts to publicize it.

More disconcerting still is our finding that providers familiar with the CHILD Profile registry was associated with a significantly decreased odds of believing that registries are the solution to the lack of documentation problem. This may reflect the difference between theoretically supporting a registry as a potential (albeit ideal) solution and being too keenly aware of its "real world" shortcomings (such as the difficulty in getting the registry sufficiently populated to have significant value) once it is experienced. This is borne out as well by our finding that familiarity with CHILD was associated with a twofold increase in the odds of believing that registries will take a long time to become of practical value. Both of these findings bode poorly for our registry and perhaps for others as well as proponents of registries will have to contend with the disenchantment people will feel as they grow more familiar with a system's inevitable growing pains.

The principal barrier to our registry's utility appears to be the incompleteness of its data, with 53% of respondents identifying this as a limitation. While this is in theory a surmountable obstacle, it represents a critical "Catch-22" for developers of immunization registries here and elsewhere. Registries are only as complete as providers make them, but providers are reluctant to use them until they are more complete. Here is where grant funding may be crucial, particularly in the formative stages of registry development. An unresolved but important question is what proportion of a practices' children's immunizations would constitute such a "critical mass."

This study has limitations that warrant consideration. First, it was conducted in one region of the country and hence must be conservatively generalized. The extent to which other county's experiences may mirror ours is not known. Second, as with any survey, there is a concern about nonresponse bias. Our response rate of 63% is above average for surveys using physicians[9] and our response rate did not differ across specialties (Young A, Marcuse E. Utilization of health department-supplied vaccine in 1995 among primary care physicians in King County Washington. Unpublished manuscript. 1997).

Despite these limitations some meaningful conclusions can be drawn from this work. First, local efforts at publicizing registries are paramount. Registry developers in other regions of the country may wish to assess their community's awareness of their effort as we were surprised by how poor ours was. Second, alternative benefits to registry participation need to be touted [e.g., gains in efficiency from moving to "paperless" immunization, the benefits of a having a real time reminder system, the ability to efficiently generate immunization reports for plans or to comply with Health Plan Employer Data and Information Set (HEDIS) reports]. Programs designed to solicit providers' cooperation need to be piloted and evaluated. Finally, because early experiences with a registry can significantly color providers' enthusiasm for it, efforts should be made to ensure that registries are well-populated and function efficiently before practitioners are encouraged to use them, as early negative experiences may be formative and hard to counteract.

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