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AMERICAN IMMUNIZATION REGISTRY ASSOCIATION
Immunization Information Systems for a New Era

CENTERS OF EXCELLENCE

2004 - 2007

Lessons learned from four years of Center of Excellence Awardees.

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INTRODUCTION

In October 2002, the AIRA PROW *Standards of Excellence* in Support of an Immunization Program document was released for distribution to all immunization information systems (IIS) and immunization programs. These standards outline concrete ways in which an IIS can more fully and effectively support the activities and goals of their jurisdiction's immunization program. The *Standards of Excellence Document is* available on the AIRA web site: http://www.immregistries.org/pdf/PROWstandardscomp1.pdf.

Each year since 2004, AIRA has presented the Center of Excellence Award to an IIS that has actively implemented the *Standards of Excellence* over the course of the previous project year. The recipient of the 2004 award was selected from among the 12 PROW demonstration sites. In 2005, 2006, and 2007, there was a call for nominations for the award from the wider IIS community. An online nomination submission process was implemented. In all years, a review panel of IIS colleagues and stakeholders evaluated all the nominees' submissions. Their evaluations were used to decide the award recipient. Innovation, effectiveness, sustainability and the potential for replication are the main criteria used to judge and evaluate the nominees.

A list of all award nominees is listed on page 11 of this document.

2007 CENTER OF EXCELLENCE

Immunization ALERT

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What issue or problem did ALERT seek to address using IIS data? Each year, participating Vaccines for Children (VFC) clinics are asked to generate a data report for their VFC profile. These profile reports project the number of children the clinic will see, by age category and vaccine eligibility category, and need to be based on a specific data source. Clinics often struggle to generate these reports from any valid data source, and health educators spend significant time and effort following up with and assisting clinics in submitting their reports. In Oregon, we sought to use the ALERT Immunization Information System (IIS) to seamlessly generate these reports as a value-added service to participating VFC clinics.

What was the outcome? In 2007, the Oregon VFC Program partnered with the ALERT IIS to use the IIS to generate pre-filled VFC profile reports. Recognizing that ALERT has 90% participation from public and private clinics, VFC staff worked together with IIS staff to develop an online template that replicated the VFC profile forms. This template was then auto-filled with current IIS data for clients seen in the past year. Clinics only had to make any needed adjustments in the numbers (potentially for patient population growth, non-reporting, etc.), before signing and resubmitting the profile reports to the VFC program. This allowed clinics to use IIS data as a readily-available starting point from which to adjust their projections for the coming year, rather than beginning the process from scratch.

In what way was the use of IIS data especially innovative? Using these IIS data to create profile reports not only provided a valuable service for clinics, but offered another opportunity to resolve undetected data issues with clinic submission to the registry. For example, if a clinic's numbers were

lower than anticipated, that suggested some issues with consistency of reporting. It also allowed the VFC program to more directly audit accountability categories. For example, a review of the reports allowed health educators to find that some clients age 19+ were being coded as VFC eligible. Finally, the reports also exposed some potential data quality issues, where data crosswalks or coding tables were not accurately transmitting data from one system to another, providing data for technical contacts on either the IIS or the clinic side to follow up for resolution. Clinics were very positive about the additional information they received via the reports, and the ALERT IIS benefited through a renewed emphasis on complete and accurate submission and coding.

We intend to replicate this process in future years for both the public and private sectors. We also hope that other IIS that track vaccine accountability will adopt this methodology as a best practice. It significantly lowered the burden for participating clinics while also promoting accurate and complete submission to the IIS.

2006 Center of Excellence

CHILD Profile Immunization Registry

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Description: The PROW Standards of Excellence were adopted by Washington State's CHILD Profile Immunization Registry and Health Promotion system in 2004. At that time CHILD Profile and the Immunization Program were separate sections within the Washington Department of Health (DOH). The CHILD Profile Management Team used the PROW document to assess the Registry's ability to meet the Standards. The assessment revealed to the Team how critical it was for the Immunization Program to fully integrate and endorse the functionality of the Registry, and led to discussions and strategies with the Immunization Program about better ways to work together. In 2005, CHILD Profile and the Immunization Program joined together into one section. The integration of these two sections was the impetus for expanded use of the PROW tool. As a combined section, the two programs utilized PROW for planning the integration of the Registry into all aspects of Washington's immunization activities. The Management Team, which included representatives from all immunization focus areas, reviewed a section of the PROW at monthly meetings, each member preparing a section corresponding to their focus area. The Team reviewed the analysis, identified priority areas, and used the results in the development of the 2007-2008 Registry Business Plan's goals and objectives.

Outcomes: Use of the PROW tool focused attention on the need to build Registry functionality that would eliminate stand-alone systems within the Immunization Program, with the goal to manage all immunization-related transactions through the Registry. An extraordinary example of this was the decision to expand the Registry to manage vaccine inventory, process vaccine orders, and automatically export vaccine order data to VACMAN, thus

facilitating implementation of third party vaccine distribution. This module will increase the efficiency of the Vaccine Management process for providers, local public health, and the Department of Health. It will provide an incentive for more providers to participate in the Registry, since all their vaccine-related work can be housed within one application. The collaboration on this functionality has enhanced working relationships between Registry and Immunization Program staff, as well as with local public health. The PROW assessment led to many additional changes including: •implementation of an official school immunization status form, •increased use of Registry data during AFIX visits, •increased use of Registry by providers for the annual VFC Benchmarking requirement, •integration of the Hepatitis B system within the Registry,and •use of Registry to assist with VPD surveillance activities.

Conclusion: Future expansion plans resulting from PROW include: •implementation of statewide recall system •improving adolescent/adult immunization tracking functionality •development of interface designs with Communicable Disease applications •elimination of stand-alone information systems containing provider data (VFC and AFIX databases) through addition of functionality to CHILD Profile and change in workflows. The CHILD Profile Management Team has made PROW discussions a regular part of monthly team meetings. The PROW assessment work will continue to be incorporated into the annual strategic planning work. In 2007, strategic planning meetings will be collaborative sessions that include all CHILD Profile and Immunization Program staff.

2006 Center of Excellence

Citywide Immunization Registry (CIR)

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Description: The PROW standards for vaccine management (Level II - 3,4,6,7) were implemented to improve vaccine accountability, reduce paperwork for providers and the VFC program, and increase registry completeness. A program workgroup, including VFC, registry, AFIX, and Improvement Project staff, collaborated on implementation, and the NYC Childhood Immunization Coalition provided guidance throughout the process. The NYC DOHMH's VFC program ships 2.6 million vaccine doses a year to over 1,600 providers. Before September 2006, providers were required to submit hard-copy aggregate doses administered reports (DARs) to order vaccine. These self-reported DARs were burdensome for providers to complete, unverifiable by the program, and required duplicative reporting since providers were also mandated to report childhood immunizations to the registry. To make this initiative possible, the registry was first integrated with VACMAN. Functionality was added for providers to report VFC eligibility status, for every child vaccinated, and to generate their own registry-generated DARs online. A shared "provider profile" database was built for VFC to access registry-generated DARs and facilitate registry outreach to improve reporting. In January, DOHMH notified providers that beginning September, only registry-generated DARs would be accepted, and that 90% of shipped doses must be reported or shipments may be reduced.

Outcomes: Dramatic increases in reporting to the registry, particularly by high volume providers, resulted. The percent of VFC doses shipped (to all providers) reported to the registry increased from 74% in May to 90% in September, improving accountability and reducing wastage. In the same period, the percent of providers reporting to the

registry > 90% of VFC doses shipped increased from 21% to 40%. In 2006, 4,097,434 immunizations were added to the registry, an increase of 1,700,722 over 2005. With more complete data, the registry is effectively tracking uptake of new vaccines and recommendations. Also, provider Online Registry use increased from 24,513 average look-ups per month in 2005 to 66,066 in 2006. Providers embraced the initiative, appreciating relief from DARs. VFC staff now views registry-generated DARs every time providers order vaccine. Since September, VFC decreased shipments to 450 providers, and technical assistance was given to providers to improve registry reporting. VFC staff (1.5 FTE), who manually entered DAR data into VACMAN before, were freed up for provider quality assurance visits. The provider profile database, initiated by linking VFC and registry databases, was expanded to include registry-generated coverage, dates and results of VFC and AFIX visits, birth dose reporting (hospitals), and Improvement Project notes. Accessible to program staff and management from their desktops, the provider profile is used to inform and coordinate interventions, target low performing providers, improve resource allocation, and monitor impact of interventions on coverage.

Conclusion: Implementing PROW standards for vaccine management through a registry not only gave the program a verifiable method of vaccine accountability, but also resulted in more efficient program operations and a substantial increase in registry completeness. In 2007 this initiative will be expanded to allow online vaccine ordering and inventory management. Further, registry-generated AFIX assessments will be implemented for 300 providers, doubling the number of providers assessed last year.

2005 Center of Excellence

Houston/Harris County Immunization Registry

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Description: As Hurricane Katrina devastated New Orleans and much of the Gulf Coast, the Houston-Harris County Immunization Registry (HHCIR) in Houston, Texas created an electronic interface to the Louisiana immunization registry, Louisiana Immunization Network for Kids Statewide (LINKS). They aimed to assist relief efforts by enabling providers to access immunization records in LINKS for children evacuated to the greater Houston area. During this process, HHCIR implemented several PROW Standards of Excellence.

Consumer Information Level I, number 1: Generate official immunization records for consumer use.

Service Delivery Level II, number 1: Use registry data to identify seriously immunization-delayed individuals so that outreach can be conducted.

Service Delivery Level II, number 2: Identify children without a medical home and conduct/refer for outreach.

Service Delivery Level I, number 2: Enable school access to the registry for assessing student compliance with immunization laws.

Provider Quality Assurance Level II, number 5: Use the registry log-in or home screen to convey new or urgent immunization messages and materials.

The Situation — As Hurricane Katrina ravaged New Orleans and the Gulf Coast, the Medical Director for HHCIR contacted Scientific Technology Corporation (STC) about connecting the Registry to LINKS. Because STC provides technical support for both registries, the programmers were able to build a bridge between the two systems in less than 24 hours. Staff from HHCIR, STC and LINKS tested the connection over Labor Day weekend, and the

system went live September 7, 2005. By this time, the Harris County Hospital District, Baylor College of Medicine, Houston Department of Health and Human Services and the University of Texas Health Science Center had set up medical clinics for the evacuees in the Astrodome, Reliant Arena and George R. Brown Convention Center. These clinics evaluated more than 24,000 evacuees over a span of 16 days. An assortment of medical services were provided, including medical triage, vision care, TB skin testing, wound management, dispensing of pharmaceuticals, and immunization. The administration of Td vaccine took priority, but other vaccines were also available.

The Problem — Healthcare workers at these shelters needed to assess evacuees for Td/DTaP and other immunizations. Few families, however, had shot records with them. Parents told healthcare workers that they thought they were leaving their homes for just a few days and brought a minimum amount of personal belongings. Often in tears, they told stories of their homes and schools covered in water, mud and debris. With no access to their medical homes, obtaining shot records was impossible.

The Solution — HHCIR Response and Implementation of PROW Standards — Because HHCIR rapidly established an interface with LINKS, healthcare workers at shelters and in the community were readily able to access immunization records for children. Immunization program staff immediately implemented several PROW Standards for Excellence. For example, providers in shelters and physician offices throughout the area utilized PROW Standard Consumer Information Level I, number 1: providing official immunization records. Through HHCIR, immunization staff at shelters generated official immunization records on-site for grateful parents who had lost nearly everything. Relief efforts also led to the unprecedented expansion of access to HHCIR, and thus an unprecedented expansion of the PROW Standards across the state of Texas. As evacuees went to other cities, the Director of the Houston Department of Health and Human Services (HDHHS) decided to give public health entities across Texas access to HHCIR and LINKS. Registry staff granted access to providers at ten local health departments across the state, some as far away as 350 miles, and trained them by telephone. Providers in these remote areas were also able to utilize PROW Standard Consumer Information Level I, number 1 by generating official immunization records for Katrina evacuees. In addition, as they reviewed LINKS records on-site at shelters, immunization program staff utilized PROW Standard Service Delivery Level II, number 1, which refers to identifying immunization-delayed individuals. Providers assessed the up-to-date status of displaced children and recommended and administered needed vaccinations. For immunization-delayed children and those needing subsequent doses, staff educated their parents or guardians and referred them to Houston-area clinics. Healthcare workers also used the Registry to identify children without a medical home and conduct necessary outreach, which is PROW Standard Service Delivery Level II, number 2. Because displaced families would not be returning to their homes for several months, they would need to establish medical homes in their new city. Immunization staff at shelters referred them to clinics throughout the area. PROW Standard Service Delivery Level I, number 2 (enable school access to the registry for assessing student compliance with immunization laws) was implemented prior to Hurricane Katrina. Before Hurricane Katrina, school nurses at elementary schools in the Houston Independent School District (HISD) and in other local school districts had access to students' immunization records in HHCIR. Following the hurricane, HHCIR granted access to an additional 147 school nurses at middle and high schools in HISD and other local public and private schools that were not previously participating in the Registry. As a result, these school nurses were able to look up immunization records for displaced students from Louisiana enrolling in area schools. Furthermore, HHCIR providers in the community were able to offer displaced families the same services. HHCIR staff utilized PROW Standard Provider Quality Assurance Level II, number 5: using the registry log-in or home screen to convey new or urgent immunization messages and materials. Registry staff emailed all providers news of the LINKS interface and placed the information on the HHCIR home

screen. Information regarding interim vaccine recommendations from the Centers for Disease Control and Prevention and the Texas Department of State Health Services was also available on the Registry web site.

Outcomes: Utilizing these PROW Standards has impacted the Registry's ability to rapidly access immunization records in emergency situations, to prevent overimmunization of children, and to provide cost-savings for vaccines and vaccine administration. Because HHCIR was able to quickly link to the Louisiana registry and set up computers in shelters, the immunization staff was more effective in providing needed immunizations to displaced children. In the months following the relief efforts, PROW Standards continue to be utilized and children, parents and providers continue to benefit. For example, a state provision initially allowed children displaced by Hurricane Katrina to enroll in Texas schools without proof of immunizations. As this provision expired October 31, 2005, students are now required to provide documentation of immunizations or begin receiving required vaccinations to attend school. Through HHCIR, schools and providers can look for students' immunization records. Every LINKS record recovered by them represents vaccinations and money saved from having to revaccinate these children. As of December 31, 2005, providers have found immunization records for 13,377 children. If these children had to receive the vaccines recorded in LINKS again, the cost for the vaccines alone would be $1,586,845 (using VFC price list).

Conclusion: The HHCIR/LINK interface demonstrates first-hand the vital role immunization information systems play in the wake of a major disaster with serious healthcare implications. As a result of Hurricane Katrina, several PROW Standards were utilized and continue to impact the effectiveness of HHCIR. School nurses, HHCIR providers in the community, and providers in ten other local health departments in Texas continue to provide parents official immunization records from LINKS. In addition, immunizations given to children at the shelters have been entered into HHCIR. Providers caring for displaced children continue to enter vaccinations administered in their clinics into the Registry. With the click of a button, records from LINKS may be seamlessly transferred directly into HHCIR so that providers may edit and add immunizations. HHCIR will soon have a transfer function that will transmit immunizations entered into HHCIR back to LINKS. As a result, patients will have complete records available to them whether they return to Louisiana or establish their medical home in Texas. In addition, the HHCIR website will continue to post new or urgent immunization messages. One significant outcome that endures is the increased confidence in public health from parents and providers. Five months after Katrina, the Federal Emergency Management Agency (FEMA) continues to refer families to HHCIR staff for their immunization records. HHCIR serves as a model for other registries for responding to critical events. Utilizing PROW Standards in such circumstances enhances the utility and significance of the services provided by the registry. Such standards should be included in emergency preparedness planning and funds provided to implement them.

2004 Center of Excellence

San Diego Regional Immunization Registry

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The San Diego Regional Immunization Registry (SDIR) has been serving the county's public health centers, community clinics and a limited number of private health care providers in the San Diego County area since its inception in 1997. In 2003, San Diego and neighboring Imperial County joined together as one of nine regional registries in California. In April of 2004, SDIR went from being a client-server application to a web-based registry. Imperial County initiated with a web-based registry since its establishment on July of 2001. Like a number of California's regional registries, SDIR is a locally developed software application.

SDIR wanted to be a PROW demonstration site in order to invite comparison with other registry development efforts around the country. We realized that we would be starting the PROW assessment in the midst of a major change in our registry application, but felt that we couldn't pass up the opportunity to assess our current registry's core functions and to project and plan for the web application. About six months prior to the joining the PROW assessment, SDIR and the Immunization Program underwent a major contractual change with the County's Health and Human Services Agency and a reorganization of registry management. With new leadership, we believed that undertaking the PROW assessment would bring the immunization program staff-public health nurses, AFIX and evaluation teams and the support personnel together to evaluate not only the current status but also the potential of the registry as a tool for all in the program to use.

Approach: As a regional registry that has immunization information from San Diego and Imperial Counties, we decided to approach the PROW assessment process separately for each county. Our two county registries use distinct computer applications and are at different stages of development. San Diego County's registry has just completed a transition from a closed client-server system to a web-based system. Imperial County's web-based registry is a subset of their public health department's integrated information system. This information system includes the following modules: Immunization Registry, CHDP-Gateway, TB Case Management, TB Clinic, TB Screening and Community Healthcare Access. Under development, Imperial County has a Communicable Disease, HIV, and STD module.

In San Diego County, we included key staff from each Immunization program "team" area—AFIX, Evaluation, Clinical Services, Hepatitis B, Flu, School Reporting and VFC in the PROW assessment. We also invited staff from outside the Immunization Program such as the STD and TB programs to participate. Imperial County also followed a similar process in the assessment.

With this in mind, we decided to complete the PROW assessment separately, prioritize and then combine the results to find common areas for improvement. This process was achieved via telephone conferences since our county seats are distant. Our common ground was found in prioritized "could meet" standards—those components that could be achieved with a relatively small infusion of funds. Using PROW, we are mobilizing our resource development experts to pursue funding to implement additional PROW standards.

Challenges: As a regional registry with a relatively local focus, it was challenging to understand some of the definitions and terminology of the standards in our context. For example, PROW contains standards that depend on state or federal legislative jurisdiction; electronic interfaces with VFC and WIC that are not available to us at this time. We were sometimes hampered by our lack of familiarity with the Immunization Program Operations Manual (IPOM) standards for activity areas referenced in the PROW assessment. (The IPOM standards are directed at state health departments receiving Section 317 funds.) In the course of the assessment process,

it became clear that as a regional registry we were unable to attain some IPOM standards that could only be addressed at the state level.

For San Diego County, another challenge in undertaking the PROW assessment was that our registry was in transition between the client/server system and the new web application. Because of this major transition, we decided to evaluate our registry based on both. Features or functions that would soon be in place were categorized in the "fully-meet" category.

Some PROW standards combine several criteria. This meant that our answers could fit in more than one category of the self-assessment. For example, one of the level 2 standards under the Vaccine Management section, states that registries "allow providers to re-enroll in VFC online, with necessary practice profile data generated from the registry." Our registry currently generates a VFC practice profile, however, there is no state or federal means to accept a VFC provider online re-enrollment.

Undertaking the PROW assessment was programmatically invigorating, bringing our staff together to talk, plan, challenge and dream of how the registry is and could be. Nonetheless, as the case for all local public health entities, we had to come back to reality to measure how much can be tackled in the short term given the context of local, state, and federal registry funding.

Conclusions: We are excited to have the first annual PROW standards of excellence assessment as a guide for growth and improvement. We have already tackled the standards that are achievable with our present funding. We also now have a document that can be used as a foundation to orient our agency's leaders and funding organizations with a current picture of our registry and a vision of where it needs to go. We will re-assess our progress next year in order to identify and prioritize functions that still need to be met.

PROW gave our immunization team a framework to look inward to see what our registry already had achieved and a vision of what national experts believe a registry should be. In the case of SDIR, many immunization staff had heard about what the web-based registry would offer users, but had not been involved in the development process. Working methodically through all the standards on the PROW assessment process made us question and research our assumptions.

SDIR believes that the implementation of the PROW standards should continue to be a voluntary process that is highly recommended, but not required, as a condition for funding. Immunization registries throughout the nation are diverse, with different state laws, and at various stages of development. PROW standards will change as our registries become more sophisticated and tied to other electronic health systems. Therefore, the Standards of Excellence should be reviewed periodically to ensure that they address appropriate and attainable functions as technology and public health needs change.

We would recommend several steps for getting PROW standards known to the immunization program and registry communities. First, states that operate a statewide registry should let their county or district immunization programs know what standards of excellence their registry has already attained and which are in the works. They can develop and distribute an annual document that describes the PROW "State of the Immunization Registry." Regional registries can use information from PROW assessment as a marketing and promotional tool so that public health and community leaders in the region are aware of how their local immunization registry relates to other core public health functions. To quote one of our staff: "Learning how our registry meets the PROW standards makes it clear that SDIR is more than just a database."

2007 Nominees

Michigan
Oregon
Rhode Island
South Dakota

2006 Nominees

Florida
New Jersey
New York City
South Dakota
Vermont
Washington
Washington DC

2005 Nominees

California
Houston/Harris County
Louisiana
Massachusetts
Pennsylvania
Vermont
Washington DC

2004 Demonstration Sites

Alabama
San Diego County
Central Valley — CA
Georgia
Houston/Harris County
Massachusetts
Minnesota
New York City
Oregon
Puerto Rico
Utah
Wisconsin

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