AIRA AMERICAN IMMUNIZATION REGISTRY ASSOCIATION
Immunization Information Systems for a New Era

SnapShots

IMMUNIZATION REGISTRY NEWS *from* AMERICAN IMMUNIZATION REGISTRY ASSOCIATION (AIRA)

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CONTENTS

Welcome to *SnapShots*, the American Immunization Registry Association's newsletter about the progress, best practices, and accomplishments of immunization information systems across the country. We invite you to share news about your registry. Email us at info@immregistries.org or call us at 202-552-0208 with information about a successful programmatic or technical innovation, major accomplishment, or milestone that your registry has reached. *SnapShots* is sent to subscribers three times a year and posted on AIRA's website: www.immregistries.org.

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PRESIDENT'S REPORT

Greetings and welcome to the next issue of *SnapShots*! Spring is in the air, and 2017 is off to a great start in regards to AIRA and immunization information system (IIS) community projects. Thank you all for your continued support and participation in AIRA-related projects and activities. Your contributions and participation are what make this organization a success, and we appreciate all that you do.

In this issue of *SnapShots,* you'll find some great updates and information on IIS transitions, meeting assessment measures, data sharing, improving data quality, CDS testing, and measuring and improving submission acknowledgements. Also included is an update on the AFIX-IIS integration project. As we continue to face challenges in maintaining and enhancing IIS functionality to meet the needs of our partners and stakeholders, we hope this issue will provide valuable highlights on some of the innovative work being done by those within our community to help support and enhance IIS nationwide.

I hope many of you have the chance to attend the AIRA 2017 National Meeting to be held April 11th–13th in Chicago, Illinois. This meeting is a great opportunity to learn more about current IIS-related projects and topics and to share information with our IIS partners. If you are unable to attend the meeting, please check the AIRA website for details on how to access presentations and other meeting materials you may find relevant following the meeting.

I'm grateful to be a part of AIRA and a part of the IIS community. I want to especially thank the AIRA staff for all the fantastic work they do. Their hard work and dedication has provided exceptional support to our community, and I look forward to continuing our work together throughout the year.

Happy spring everyone!

Michelle Hood
Administrator, Nebraska State Immunization Information System
AIRA President

California has begun the long-awaited transition to a state-wide registry. Given the size of California, the transition will occur in phases.

CAIR2 Launched in California

California has begun the long-awaited transition to a state-wide registry. Historically, California has consisted of 10 regional registries that do not share data. Of these 10 regions, seven have shared the same software (CAIR1), which has been supported by the state, while three regions continue to use their own software. The data in the seven regions supported by the state are being centralized, and the three independent regions will begin sharing data. Given the size of California, it was determined that the transition would happen in phases. Phase 1 would transition all data exchange users and active users in the Northern California and Central Coast regions. Phase 2 would consist of the Bay Area and Central Valley regions, and Phase 3 would bring over the largest region of Los Angeles/Orange counties. Once all three regions have transitioned, California will begin transitioning any of the independent regions that were interested in switching to CAIR2 and begin sharing data with the others.

California began this project in 2012. After an extensive review process, it chose the Wisconsin Immunization Registry (WIR) software to replace its current CAIR1 software. Following a competitive bid, Hewlett Packard Enterprise Services (HPE) was selected as the vendor that California staff would work with for the transition. HPE came on board in late 2014 and worked closely with the state to determine hardware and software needs. The project was delayed while the state procured additional hardware and software to support the new system. During that time, HPE and the program continued to work on the functional design documents and make changes to the software to support California's needs.

Data Migration

The task of data migration was especially daunting, given that there were over 160 million doses and close to 20 million patients that needed to be migrated, along with 40,000 users and 15,000 organizations. The data modeling and mapping process from CAIR1 to CAIR2 took 18 months to build. The actual migration began with an end-to-end migration test which took nearly 30 days to complete. Since CAIR2 is being rolled out in three phases, part of the migration plan is also keeping data synchronized between the CAIR2 live system and the CAIR1 regions that have not yet been brought on line with CAIR2.

Data Exchange

CAIR1 had over 4,800 active data exchange submitters operating through approximately 125 sending facilities. A communication plan to inform sites about specific changes that would be required for CAIR2 was begun in July 2016 with website updates and publication of new CAIR2 Data Exchange Specifications patterned on the national HL7 v2.5.1 Release 1.5 specifications. Within weeks of the Phase 1 launch in October 2016, about 75-80% of sites had successfully transitioned to CAIR2. The number of successfully transitioned CAIR1 sites has steadily increased so that now over 90% of CAIR1 sites are submitting to CAIR2. In addition, approximately 450 sites that were either testing holdovers from CAIR1 or newly registered sites are now submitting data to CAIR2.

California has thousands of active users that needed to be trained. It was determined that users would need to attend a webinar training prior to being issued access to CAIR2. Users were allowed to register for training beginning one month prior to their regional switch to CAIR2. California's team of 10 local CAIR representatives will have given over 400 webinars by the time Phase 3 is over.

California launched Phase 1 in early October 2016 and just recently launched Phase 2 on February 6, 2017. Phase 3 was slated to be launched on March 20, 2017. ■

– Submitted by Maria Volk, California Department of Public Health

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With AIRA's assistance, Illinois was able to revise the CDC WSDL within two weeks to reach 100% compliance with assessment standards.

Illinois IIS Works with AIRA to Meet Assessment Measures

As of January 2017, the Illinois Comprehensive Automated Immunization Registry Exchange (I-CARE) has received immunization data from more than 5,700 practices and hospitals via Health Level 7 (HL7). The majority of these health care providers are using electronic health record (EHR) vendors that utilize secure file transfer protocol (sFTP) to send HL7 files regularly to the registry. With Meaningful Use Stage 3 arriving in 2018, several EHR vendors are considering moving from sFTP to Web Services to send and query data. Illinois implemented Web Services back in 2011, shortly after the Meaningful Use measures began. The Web Service was written in-house and based upon the standard Microsoft Windows Communication Foundation (WCF) Web Services Description Language (WSDL). At that time there were only a handful of providers using our Web Service. However, over the years, that number has steadily grown.

In 2015, Illinois began participating in the American Immunization Registry Association's (AIRA's) Immunization Information System (IIS) Interoperability Testing Project. AIRA analyzed our IIS transport layer implementation for the Centers for Disease Control and Prevention (CDC) WSDL. At the time, we did not support the CDC WSDL due to the many providers already using our Microsoft-based WCF WSDL. After reviewing the IIS Transport Assessment via the Aggregate Analysis Reporting Tool (AART), we realized many EHR vendors were supporting the CDC WSDL. Our goal was to support both WSDLs. Illinois began pilot testing this service in January of 2017.

Illinois began the process of implementing the CDC WSDL late last year. We reviewed the standards as published on the CDC website and began writing the new WSDL. As technical questions were raised regarding formatting or XML structure of the CDC WSDL, AIRA was prompt in responding with answers or suggestions. Once Illinois had a working version of the new WSDL, AIRA was able to assess and identify issues where it did not quite align with the CDC WSDL. One issue was the acknowledgement (ACK) returned a simple "communication" ACK rather than an explicit ACK stating "the message was received." This was challenging for our EHR vendors, as they were unable to determine if the message was truly accepted by the IIS. The ACK did not give any information regarding the actual processing of the message, nor did it state if there were data quality problems or give the final outcome of the process. We consulted with AIRA to update the ACKs so they would return the actual outcome of processing the message. We began testing with EHR vendors such as Cerner and GE Healthcare after our CDC WSDL was in conformance with the assessment standards. We continue to test with Alliance of Chicago to verify our ACKs are returning correct error messages.

Now that our CDC WSDL is ready for production use, we face another issue. Since many of our trading partners are currently using the Microsoft-based WCF WSDL, switching to the CDC WSDL will not be easy. The existing transport sends back ACKs that are not as explicit as the CDC WSDL, and the providers are familiar with them. If an existing interface suddenly starts receiving different ACKs, it could cause confusion and problems. In addition, with our WCF WSDL we do not offer real-time ACKs. The ACKs are placed in a queue to be processed later, although the majority of the time they are processed within a few minutes. Rather than move existing partners to the CDC WSDL, we are offering both WSDLs. New trading partners can begin using the CDC WSDL while existing partners can switch to the CDC WSDL at their own pace when deemed advantageous.

With AIRA's assistance, Illinois was able to revise the CDC WSDL within two weeks to reach 100% compliance with assessment standards. We now have roughly 20 providers using our new CDC WSDL to transfer Vaccination Update (VXU) messages and run Query by Parameter (QBP) queries. We still have more than 3,300 providers transferring VXU messages and 80 provider groups running QBP queries with our Microsoft-based WCF WSDL. We expect many of these providers will begin migrating to the CDC WSDL this year. Work is continuing to ensure our ACKs are 100% compliant with release 1.5 of the HL7 Version 2.5.1: Implementation Guide for Immunization Messaging. Overall, this will lead to improved data completeness and data quality in the IIS. ■

– Submitted by Robin Holding, Illinois Department of Public Health

Public Health Interfaces: Data Sharing in Oregon

■ The proposed interface would allow for real-time access to up-to-date immunization records, within Orpheus, for use by local state public health nurses and epidemiologists. It was time to share data in a more meaningful and efficient way.

Collaborating with the Acute & Communicable Disease Program (ACDP) at Oregon Public Health is an important part of our work here in the Oregon Immunization Program. Back in 2012 we started conversations with Michelle Barber, Interoperability Director, about developing an interface between Oregon's IIS (ALERT) and Orpheus. Orpheus is ACDP's integrated electronic disease surveillance system, hosted and managed by the Communicable Disease program at Oregon Public Health. The system is utilized by local and state public health nurses, epidemiologists, and disease investigators to efficiently manage communicable disease reports.

The proposed interface would allow for real-time access to up-to-date immunization records, within Orpheus, for use by local and state public health nurses and epidemiologists. Everyone agreed that the current process of file sharing and importing/extracting data to match active cases to immunization histories was cumbersome and often led to data issues. It was time to share data in a more meaningful and efficient way.

In 2015, the interface between Orpheus and ALERT IIS went live. With the new functionality embedded in Orpheus, users are now able to access up-to-date vaccine histories with the click of a button. The application is set up to enable the "Query ALERT IIS" button for users who have access to vaccine-preventable disease profiles. Orpheus users who are not assigned to any vaccine-preventable disease profiles in the system are not able to use the query button. The query is processed in real time on the ALERT IIS side and the Orpheus side, providing data to the epidemiologist within a matter of seconds.

Our primary challenge was coordinating with the Office of Information Services to get support for installing certificates. We also had to compete with other public health program priorities. This contributed to the duration of the project. We continue to work with Michelle Barber, Interoperability Director for Public Health, and the Orpheus team to improve on matching results, and we recently upgraded the interface from an HL7 2.4 VXQ message to an HL7 2.5.1 QBP message.

Overall this project has been a great success. In 2016, 6,255 queries were performed for 4,566 unique persons representing 3,487 cases of possible vaccine-preventable disease and 782 contacts.

In 2016, Juventila Liko, MD, MPH, epidemiologist for Oregon Immunization Program, presented at the Council of State and Territorial Epidemiologists Conference on an evaluation of the utility of Orpheus to ALERT IIS interoperability. The study concluded that ALERT IIS is 95% complete for vaccination records relevant to reported pertussis in Oregon. The Orpheus-ALERT IIS interface significantly increased the timeliness of vaccination data for reported cases and high-risk contacts.

We could not have accomplished this without the partnership between the Oregon Immunization Program and ACDP and the endless support of Michelle and Juventila. Thank you! ■

– Submitted by Tracy Little, Interoperability & Data Exchange Lead, ALERT IIS, Oregon Immunization Program

■ The Joint Development and Implementation Advisory Workgroup plans to offer a no-cost data quality intervention to the full IIS community in the coming months.

Coming Soon! Improve Your IIS Data Quality with a No-Cost Address-Cleansing Service

The Joint Development and Implementation (JDI) Advisory Workgroup plans to offer a no-cost data quality intervention to the full IIS community in the coming months. The need for uniform address cleansing is an issue that plagues every IIS; it is a challenge to ensure millions of addresses from thousands of submitters remain accurate and complete. The JDI Advisory Workgroup recognizes this need and embarked on a project to evaluate, select, and roll out a service to provide address cleansing functionality.

A consultant conducted a lengthy evaluation of several candidate services, considering services offered, technical support options, licensing costs, ease of use, detail included with address metadata, and other customers/clientele that use the product. Results of the evaluation were presented to the JDI Advisory Workgroup who, in conjunction with AIRA staff, selected the SmartyStreets service for pilot testing. SmartyStreets provides address standardization, validation, and geocoding for addresses submitted through a manual or automated batch process, through a real-time user interface API (application program interface), or through real-time data exchange.

AIRA purchased five million record validations from SmartyStreets to evaluate the service and developed a pilot plan and evaluation criteria to assess the success of address validation both quantitatively and qualitatively. AIRA then reached out to the awardees engaged in the JDI Advisory Workgroup to select pilot participants. Pilot participants were evaluated to ensure a representative mix of diverse platforms and sizes. Four jurisdictions were selected to evaluate the batch component, and two additional jurisdictions were added to test select aspects of connectivity:

Jurisdiction	Pilot Program
Washington (using the STC platform)	Batch
Florida (using an awardee-developed platform)	Batch
Delaware (in partnership with the Envision product)	Batch
New York State (using the Wisconsin Immunization Registry [WIR] platform)	Batch
Michigan (using an awardee-developed platform)	User Interface API and Real-time HL7
Kansas (in partnership with the Envision product)	User Interface API

The pilots all reported great success, with address deliverability rates increased to 88% from 71% on average. Best of all, the initial connection to the service took less than 30 minutes to set up in most jurisdictions. Given that the selected service has been proven to be a valuable and cost-effective resource through pilot testing, AIRA has applied for supplemental funding that would allow for expanded access to this service as a no-cost member benefit to all member IIS throughout the country. AIRA believes that access to this service will help programs to meet the many IIS Functional Standards focused on data quality through complete, accurate demographics capture, and we are excited to offer this service to the full IIS community with CDC's assistance.

An announcement about funding and rollout will be forthcoming, but in the meantime, please contact Mary Beth Kurilo, AIRA policy and planning director, at mbkurilo@immregistries.org with any comments or questions related to this service. ■

– Submitted by Mary Beth Kurilo, AIRA

■ Four projects IIS should be aware of as they work to maintain and improve their own Clinical Decision Support engines.

Testing Resources for CDS Engines

A key function of Immunization Information Systems (IIS) is to provide Clinical Decision Support (CDS) to evaluate immunizations a patient has received and recommend when the next vaccinations should be given. Here are four projects that IIS should be aware of as they work to maintain and improve their own CDS engines:

■ Clinical Decision Support for Immunizations (CDSi)

The Centers for Disease Control and Prevention (CDC) established the Clinical Decision Support for Immunization (CDSi) project to translate guidance from the Advisory Committee on Immunization Practices (ACIP) into computable logic that CDS engines can confidently and consistently implement. This project provides the following essential CDS resources:

- Logic Specification
- Supporting Data
- Test Cases

Of particular interest for all CDS projects are the CDSi Test Cases; these test cases represent the first attempt to create a national test case set based on the ACIP schedule. All CDS projects should already be leveraging these resources as part of their regular CDS engine maintenance and upkeep.

CDSi resources can be accessed at www.cdc.gov/vaccines/programs/iis/cdsi.html.

■ TCH Forecast Tester

Prior to the establishment of the CDSi project, Texas Children's Hospital (TCH) created the TCH Forecast Tester to support testing of CDS engines. This system is in use by several organizations to support testing efforts, including some limited support to the AIRA IIS Testing and Discovery project. This open source tool is open for use by the community for testing their own CDS engines.

TCH Forecast Tester information and registration can be accessed at http://tchforecasttester.org.

■ Aggregate Analysis Report Tool (AART)

As part of the IIS Testing and Discovery process, AIRA has created a discovery report that IIS can use evaluate adherence of their HL7 interface with national standards. While AIRA is not yet directly assessing CDS, the Query Response (RSP) message does include CDS evaluation and recommendations. AIRA is using this information to do preliminary and limited analysis on CDS results in preparation for more formal measurement later. This information can be found in AART as part of the IIS Testing and Discovery report. Contact AIRA if you would like discuss or ask questions about your IIS report.

To login or register for AART, visit http://ois-pt.org/dqacm/home.

■ Forecast for Immunization Testing Suite (FITS)

The National Institute of Standards and Technology (NIST) is working to create a new software system for testing CDS engines called the Forecast for Immunization Testing Suite (FITS). This work is being done in coordination with CDC and AIRA. FITS is expected to support the following functions:

- Creation and maintenance of test cases
  - — CDSi Test Cases
  - — User defined test cases
  - — Assessment test cases (to be defined by AIRA community)
- Connection to CDS engines using several standards
  - — HL7 FHIR real-time interface (preferred)
  - — HL7 QBP/RSP messages (with some limitations)
  - — Other legacy real-time services (those currently supported by the TCH Forecast Tester)
- Execution and validation of test cases against connected CDS engines

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NIST is planning to present on the progress of its work and to demonstrate an early version of FITS at the AIRA National Meeting in Chicago this April. We encourage IIS program and vendor staff to attend NIST's presentation at the meeting and stay tuned for more updates. ■

– Submitted by Nathan Bunker, AIRA

■

The goal of these first phases of IIS Assessment is to help streamline onboarding and interoperability efforts as a community through standards alignment and improvement.

Measurement and Improvement Expands with Submission/Acknowledgement

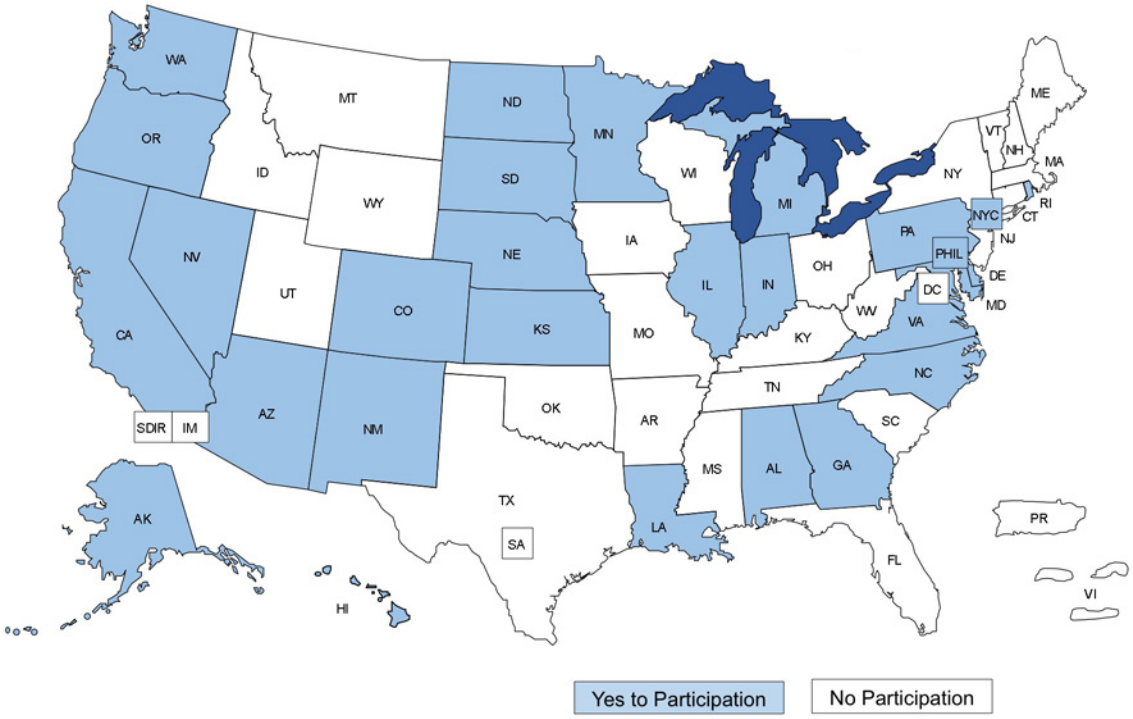
In early 2016, the Measurement for Assessment and Certification Advisory Workgroup (MACAW) was initiated to systematically research and formulate key IIS assessment components, develop metrics, and implement the IIS assessment and certification process. MACAW is a representative group of community members that identifies and develops assessment metrics for particular IIS components. Those measures are then vetted by the IIS community and approved by the AIRA Board of Directors. The first three phases of IIS assessment (transport, submission/acknowledgement, and query/response) all focus on alignment with interoperability standards. The goal of these first phases of IIS Assessment is to help streamline onboarding and interoperability efforts as a community through standards alignment and improvement, saving critical time and improving data quality in the process.

Submission/acknowledgement assessment is the next official measurement area for IIS Assessment, and a baseline report is now available that contains the aggregate results of the initial measurement completed in January 2017. This process will be repeated in April 2017 to determine the level of progress being made to align with standards across the community.

It is important to keep in mind that this phase of measurement looks at IIS alignment with the HL7 2.5.1 release 1.5 Implementation Guide and many IIS are in the midst of the planning or implementation process of enhancing their systems to align with this guide. This makes the testing process especially useful to inform and test enhancements but may artificially suppress results while IIS are testing and rolling out their updates.

Twenty-eight IIS are participating in measurement for submission/acknowledgement:

Participating/Not Participating



Last Updated: February 6, 2017

Continued on the next page >

Of the 28 IIS participating in the submission/acknowledgement assessment baseline, 26 were able to be measured. AIRA was unable to connect to two IIS at the time of the baseline report, and they are not included in the aggregate results.

The full results can be accessed here, but to summarize the high-level findings:

- Most participating IIS met submission measures assessing receipt of historical data, consent, refusals, adverse events, and timely processing of data.
- Many IIS deviated or did not pass measures focused on only "R" fields being present in the message, contraindications/immunity, or receipt of barcoded VIS data.
- Very few IIS conformed to acknowledgement (ACK) message guidance.

The aggregate results and individual reports also contain concrete recommendations, including:

1) continued education and development on ACK messaging
2) development on standards and/or capture of VIS information
3) improvement of National IG guidance on refusals, adverse events, contraindications, and immunities
4) exploration of the cost/benefit of local variations
5) increased coordination with interface partners to ensure enhancements don't disable existing interfaces
6) utilization of NIST conformance tools

We encourage all IIS to review the aggregate report, as well as their own individual report in AART. Results for query and response will be coming soon and will also be posted on AIRA's measurement web page.

We appreciate the community's ongoing support and engagement in these efforts. If you are not yet participating in IIS assessment, we encourage you to join in! Please contact Mary Beth Kurilo, AIRA policy and planning director, at mbkurilo@immregistries.org with any comments or questions related to IIS Assessment or to explore getting connected to the process. ■

– Submitted by Mary Beth Kurilo, AIRA

New CDC Lot Number Brief

CDC has recently posted a brief on different lot numbers of the unit of sale (package or box) vaccine products and the corresponding unit of use (vial or syringe). The brief covers the background, challenges, current tools, and ongoing efforts and requests help keeping the information updated. The brief is located at the following link: https://www.cdc.gov/vaccines/programs/iis/2d-vaccine-barcodes/providers.html under the section titled, "Brief: Different Vaccine Lot Numbers." ■

– Submitted by Kenneth Gerlach, CDC/NCIRD/ISD/IISSB

The AFIX-IIS Integration Project

■ PPHF Awardee Projects

CDC completed the fourth quarter of PPHF calls with individual awardees. Awardee project staff and CDC staff (POB Project Officers, and IIS and AFIX project leads) discussed work plan implementation progress, possible changes to the timeline, and other issues including awardee concerns, budget questions, and staffing changes. CDC's project team followed up on each call by sending meeting minutes and a list of action steps.

– Submitted by Bobbie Strickland and Hanan Awwad, CDC/NCIRD/ISD

■ STC Building SMaRT AFIX Consortium

Following the initial release in November 2016 to STC's IIS (IWeb) awardees, STC has been working diligently to connect independent partner awardees to CDC SMaRT AFIX, an IIS-agnostic application designed to bring standardization and efficiency to the AFIX assessment process. The application program interface (API) has been made available to awardees on the ISD All Awardee SharePoint Portal, while work on user management components is underway.

STC plans to release functionality to integrate with the CDC's AFIX Online Tool and logic to support the new two-dose HPV recommendation from the ACIP in time to support AFIX field work that begins in April. STC will then begin development on enhancements and new functionality, prioritized by CDC and informed by feedback from the state awardee consortium.

There is an opportunity for additional awardees to join this project. A fully functional and integrated build of CDC SMaRT AFIX can be made available to those who wish to participate. Interested parties should contact Michelle Korrell at michelle_korrell@stchome.com. More information is also available at www.smartafix.com.

– Submitted by Scientific Technologies Corporation (STC)

■ Envision Awardees

Five Envision awardee customers received PPHF 2015 funding for implementing the AFIX assessment functions into their IIS. Those funds are being used to build the AFIX functionality for 15 awardees using the Envision product suite. Envision split the project over three releases, with the first release covering the AFIX report; the second release covering the AFIX Online Tool upload and the Master Rate Comparison Report; and the third release, which will include the Single Antigen Assessment Report, Invalid Dose Patient Listing, Not Up to Date/Missing Immunization Patient Listing, Missed Opportunities Patient Listing, and Patient Roster reports. The project is on schedule, and the Patient Active/Inactive Status, updated forecasting algorithms, and report specifications have been completed. The first deployments to the 15 awardees are currently underway. The Envision project team continues to host biweekly meetings with a group of awardees to gather feedback.

– Submitted by Envision Technology Partners

■ HPE Awardees Update

HPE is developing the AFIX Product, a single stand-alone IIS-agnostic product, deployed locally, with minimal system requirements necessary to run the tool. Many states have differing hardware environments, network security rules, and privacy policies, so the AFIX Product minimizes the exposure of data collected from an IIS during the assessment process. Long term, HPE can offer a web service to states with policies that allow web services. Integration testing commences in March with deployments starting May. For more information, contact Katie Reed at catherine.reed@hpe.com.

– Submitted by Hewlett Packard Enterprise (HPE)

■ Additional Information

Resources for the AFIX-IIS integration project can be found on the ISD Awardee SharePoint Portal. For access to the ISD Awardee SharePoint Portal or for any questions related to AFIX-IIS integration, please email AFIXIIS@cdc.gov. We are also interested in hearing about your progress implementing AFIX into IIS. If you would like to be featured in a future *SnapShots* update, please email a short description (one to three paragraphs) to AFIXIIS@cdc.gov. ■