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SNAPSHOTS

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

PRESIDENT'S REPORT

Dear Colleagues,

We've reached the halfway point of the year, and summer is officially here. The days are getting longer, and the weather is getting warmer. I hope this time of year finds you able to get outside with loved ones (even the four-legged kind!), breathe in some fresh summer air, and do something active to clear your mind before getting back to the hard work I know is on all of our plates.

Speaking of hard work, this edition of *SnapShots* features great articles from the Connecticut Immunization Program about its data quality assessment pilot project and from Minnesota about its journey toward using data visualization software to visualize IIS data in new and interactive ways. You can also read about the history of IIS and learn how four different jurisdictions implemented vaccine credentialing.

I hope you have a lovely summer!

Regards,
Christy Gray
AIRA Board President
Director, Division of Immunization
Virginia Department of Health

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Welcome to *SnapShots*, the American Immunization Registry Association's newsletter about the progress, best practices, and accomplishments of immunization information systems (IIS) across the country. We invite you to share news about your IIS. Email us at info@immregistries.org with information about a successful programmatic or technical innovation, major accomplishment, or milestone that your IIS has reached.

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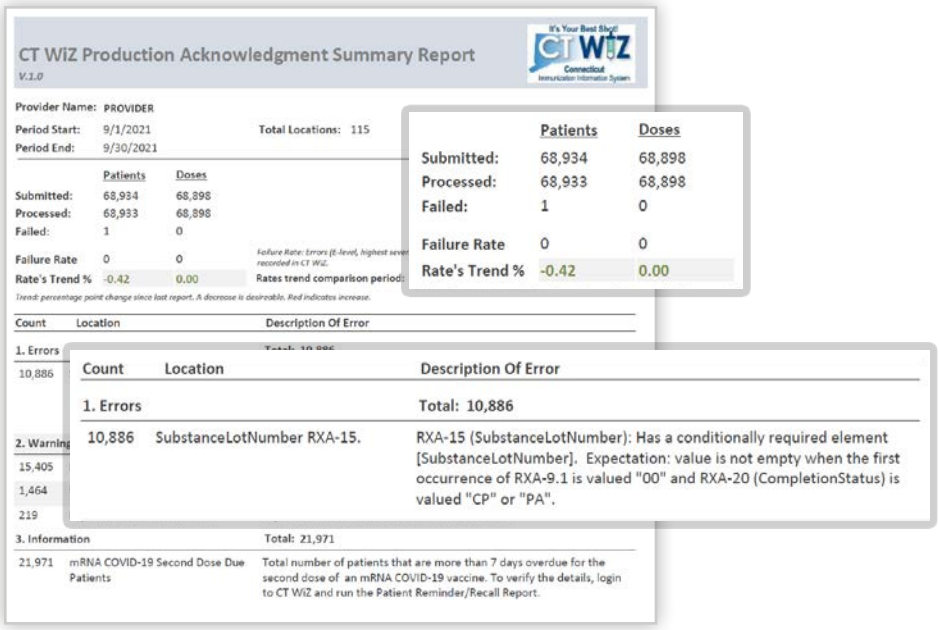
CT WIZ PILOT PROJECT IMPROVES DATA QUALITY AND COMMUNICATION WITH IMMUNIZATION PROVIDERS

What is your procedure to communicate data quality assessments with your providers? Did your program rapidly onboard providers during the COVID-19 pandemic? Now is the time to reassess your data-quality procedures. The Connecticut Immunization Program is excited to share its own data-quality assessment pilot project experience.

In fall 2021, Connecticut's immunization information system (IIS), CT WiZ, implemented a new data quality report and communication procedure with providers and vendors to improve data quality. After implementing the new procedure, the immunization record failure rate decreased by more than 93%. Now, 99.98% of patients' immunization records submitted are accepted without issue. Another example of the project's positive impact is related to incoming immunization records that are missing race and/or ethnicity, which was reduced by 2.3%.



Prior to implementation of the new data quality report, most CT WiZ data-quality efforts were focused on onboarding. After moving a provider to production, CT WiZ relied upon individual Acknowledgment (ACK) messages sent to provider organizations and reviewed and notified only high-volume clinics with critical issues in production, such as rejected messages or missing core fields. The volume of ACK messages can be overwhelming and difficult to prioritize. For example, in March 2022, CT WiZ sent 1,361,616 individual ACK messages containing 80,561 error segments noting errors and 1,113,854 error segments noting warnings. Today, in addition to individual ACK messages, the CT WiZ onboarding team emails monthly production data quality reports to the provider and vendor that summarize ACK messages, including instructions on how to generate the patient details in CT WiZ, if needed. The report displays the most common and serious issues first, followed by less serious or less frequent errors. These reports distill millions of ACK messages down to user-friendly reports to allow provider organizations to better monitor their data quality and trends.

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CT WIZ PILOT PROJECT IMPROVES DATA QUALITY AND COMMUNICATION WITH IMMUNIZATION PROVIDERS

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To develop the new reports, CT WiZ worked closely with the Immunization Integration Program (IIP), a collaboration between AIRA, the Centers for Disease Control and Prevention (CDC), and the Healthcare Information and Management Systems Society (HIMSS), on a technical assistance and pilot project. The IIP project team reviewed CT WiZ's current processes and data quality reports and shared the newly developed ACK summary report best practice guidance with CT WiZ. Next, the IIP team mocked up an ACK-based data quality report that listed errors from most to least common. The CT WiZ team then drafted the report, received feedback from the IIP, made changes, recruited pilot immunization providers to test the new report, and revised the reports based on feedback from providers (Figure 1).

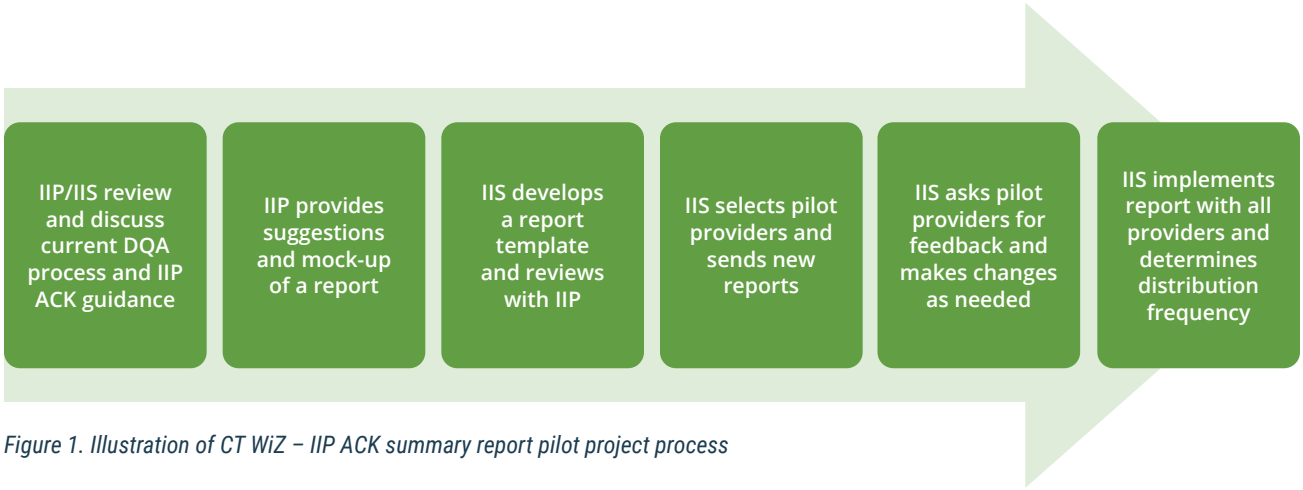

Figure 1. Illustration of CT WiZ – IIP ACK summary report pilot project process

IIS data quality not only affects those who rely on IIS data but can also directly impact IIS teams. As consumers are provided access to their immunization records, IIS receive requests for records and questions as to why data is incomplete, inaccurate, or not accessible. In August 2021, Connecticut launched a CT WiZ public portal that allows the public to access their vaccination records. When patients are not able to access their records, patients must contact the Connecticut submissions portal for support. Since implementing the new data-quality report process, our rate of successful records accessed from the public portal increased by 14%, thereby reducing the requests to the submissions portal.

The Connecticut ACK report experience is a good reminder for IIS to implement regular data quality processes beyond their onboarding and into production processes.

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When IIS analyze and summarize production system data quality issues from ACK messages, then providers and their electronic health record (EHR) vendors can prioritize fixes to common and serious errors. These efforts also improve engagement with and communication between IIS, providers, and vendors. Providers and vendors are glad to know that the data they submit is reviewed and used to make public health decisions. These efforts can also reduce the burden on IIS staff responding to requests and questions from consumers who now have real-time access to IIS data. As shown in Table 1, even while the number of providers reporting to IIS increases and the number of records submitted to IIS increases, IIS can implement processes to improve data quality.

Measure	September 2021	March 2022	Change	% Change
Total Clinics Exchanging Data	1,207	1,386	179	15%
Messages Submitted	548,368	1,361,616	813,248	148%
Messages Failed	894	256	-638	-71%
Immunizations (RXA) Failed	7,128	1,212	-5,916	-83%
% Failure of Messages	0.16%	0.02%	-0.14%	-88%
% Failure of Immunizations	1.30%	0.09%	-1.21%	-93%

Table 1. Comparison of CT WiZ data quality pre/post implementation of production ACK summary reports

Despite the strain that the pandemic put on CT WiZ's resources, Connecticut decided to participate in the IIP pilot project and invest the time to improve data quality. The experience was well-organized and worth the time, consisting of only five meetings over a three-month period, and the improvements noted above demonstrate the return on investment. IIS can rely on consensus-based resources developed by AIRA and other IIP partner organizations' workgroups rather than creating them from scratch. Connecticut continues to improve the report according to feedback from providers and vendors. Connecticut plans to automate the report distribution and add more variables to the report, such as the number of duplicate patients and data timeliness.

Those interested in ACK summary report technical assistance can email iip@himss.org.

- Submitted by Alejandra Arias and Nancy Sharova, MPH, *CT WiZ*

JUST THE BEGINNING: MINNESOTA'S JOURNEY TO USING DATA VISUALIZATION SOFTWARE AND IIS DATA

It was late summer 2020, and Minnesota was ramping up its COVID-19 vaccine response team. This included preparing to use and share IIS data once a COVID-19 vaccine was ready.

We knew from the experience of working with the case and lab daily reporting teams that we would have five basic data needs. First, we knew we would need a daily data extract that could be used to ensure internal and external data sharing was done with consistent numbers. Second, the team and data would need to be agile enough to be able to quickly create data visualizations. Third, the team would need to be able to create multiple types of outputs: tables, graphs, and maps. Fourth, we needed dashboards that could be interactive for stakeholders to get the data they needed. Lastly, we needed to identify a software that could meet the first four needs and would be easy onboarding for new staff. From these data needs, we have built an entirely new process that uses data visualization software to visualize IIS data in new and interactive ways.

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In the past year, most of our work has been concentrated on COVID-19 vaccine. The use of data visualization software to accomplish this work has made it far easier and faster to ensure internal and external stakeholders have access to the data visualizations that they need to conduct their COVID-19 vaccination work.

Our journey has also included working on how to visualize all IIS data as well. We have developed a series of data visualization products to assist stakeholders. This includes some IIS staff-specific products that allow them to monitor and identify providers that need follow-up on issues such as data exchange or user accounts. We've also created a series of products specifically for helping stakeholders monitor childhood and adolescent immunization coverage rates. These can be used to identify immunization coverage gaps and then monitor them as outreach is conducted.

As the data visualization journey in Minnesota continues, we are excited by the future possibilities. We are currently working on a new data visualization product that will enhance our data-quality monitoring using lessons learned from COVID-19. We are also working on creating a strategic plan for how to continue implementing data visualizations using IIS data to enhance Minnesota's immunization programming and inform decision-making

EXPLORING THE HISTORY OF IIS WITH PHII

At the recent virtual AIRA 2022 National Meeting, Dr. Dave Ross, president and CEO of The Task Force for Global Health and former director of the Public Health Informatics Institute (PHII), highlighted in his keynote speech the importance of the IIS community remembering its storied past while also looking to the future.

Several years ago, with funding from the Centers for Disease Control and Prevention (CDC) and in collaboration with AIRA, PHII developed five history spotlights. These spotlights were created to mark the 25th anniversary of the initial creation of IIS and to provide context on the evolution of IIS over time related to key work areas such as collaboration, technology and funding. The intention of these historical artifacts was to shine a light on the path forward for the IIS community by better illuminating the past. The spotlights delve into the history of IIS through five key lenses:

- **Origin Story: Creating a Culture of Collaboration >**
- **Balancing Autonomy and Collaboration: The Evolution of IIS Standards >**
- **IIS Technology Over Time: Impact and Changing Roles >**
- **Funding: The Pursuit of Sustainability for IIS >**
- **Enduring Legacies: Lessons for the Future >**

These historical accounts were drawn from numerous first-hand interviews with IIS experts who were present for the inception of immunization registries—or, as they're known today, IIS. The interviews were conducted and synthesized by Dr. Barbara Canavan, a Harvard University-educated medical historian with experience leading an IIS.

Other IIS resources from PHII

The history spotlights and other IIS-related resources can be found on the IIS Learning Hub, which also provides trainings, guidance, and toolkits on working within an IIS. Most recently, PHII revamped and relaunched the Welcome to IIS email course, an 18-day orientation to IIS conducted through bite-sized lessons delivered to participants' email inboxes each day. The Requirements Traceability Matrix was also recently updated to help jurisdictions assess their current IIS functionality or plan for future updates.

Historical accounts were drawn from numerous first-hand interviews with IIS experts who were present for the inception of immunization registries—or, as they're known today, IIS.

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EXPLORING THE HISTORY OF IIS WITH PHII *Continued from page 6*

Additionally, the IIS Learning Hub features toolkits that provide step-by-step deep-dive guidance into processes such as procuring a new IT solution for an IIS or migrating an IIS to a new platform. Visitors can also benefit from more general guidance on day-to-day IIS operations and management, as well as stories from the world of IIS, including podcast interviews with IIS experts Therese Hoyle and Mary Beth Kurilo.

The IIS Learning Hub regularly undergoes updates and refreshes to remain current and relevant in a rapidly evolving immunization world. PHII is grateful for ongoing collaborations with the CDC, AIRA, and jurisdictional IIS teams from around the United States in developing and refining these tools. Any questions or follow-up comments on any resources in the IIS Learning Hub can be directed to iis@phii.org.

VACCINE CREDENTIALING: PUBLIC HEALTH VALUES IN ACTION

The final plenary of the AIRA 2022 National Meeting explored the experiences of four jurisdictions that implemented vaccine credentials. The jurisdictions that presented were California, Louisiana, Oregon, and Washington state. A commonality in the stories was the central role of two key public health values: accessibility and collaboration.

Dr. Christopher Longhurst, from the University of California San Diego Health, moderated the session as a representative of the Vaccination Credential Initiative (VCI). The session highlighted the value of SMART Health Cards, which are paper or digital versions of an individual's vaccine information. SMART Health Cards have become a simple and secure way for Americans to maintain, own, and share their health information as they see fit. AIRA recently developed a one-page resource on SMART Health Cards that defines what they are (and are not), how they can empower individuals to take control of their health information, and how they can provide ongoing consumer access to immunization information systems using QR codes.

SMART Health Cards have become a simple and secure way for Americans to maintain, own, and share their health information as they see fit.

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VACCINE CREDENTIALING:
PUBLIC HEALTH VALUES IN ACTION *Continued from page 7*

Michael Powell, from the California Department of Public Health, provided an overview of the development of the state's SMART Health Card. The SMART Health Card developed by California was available in eight languages, allowing for greater accessibility for non-English speakers. California made the source code available to other jurisdictions to streamline creation of SMART Health Card technology and allow for collaboration between jurisdictions. The source code has been leveraged by Oregon, Washington, D.C., and Washington state. California has also shared lessons learned with several additional jurisdictions.

Jeff Chorath and Dr. Bryant Karras, from Washington state, started their presentation by thanking California for sharing source code. Washington state made enhancements to the SMART Health Card and shared those improvements with other jurisdictions. Two of the enhancements included:

- Developing relaxed matching logic, which was used if strict match logic did not return a result
- Expanding the languages for the technology from 8 to 43

The enhancements from Washington state increased the functionality and accessibility of SMART Health Cards.

Liz Hunt, from the Oregon Health Authority, described the state's recent launch of SMART Health Cards and expressed appreciation for being able to build on the work other jurisdictions have done. Oregon was also able to make several improvements to the accessibility of the cards, including providing access in 13 languages and creating an accessible web platform. Along with development of additional functionality to support accessibility, Oregon's process to create a SMART Health Card involved significant community outreach and engagement. Liz stated that "how we roll things out is just as important as what we roll out."

The final speaker of the session was Quan Le, from the Louisiana Department of Health. Quan described how his department was able to offer SMART Health Cards through the state's digital driver's license service. This collaboration between state agencies allowed for early availability of digital vaccination cards. Since the launch of SMART Health Cards in Louisiana, the Louisiana Department of Health has worked to expand accessibility by creating processes to allow persons without credentials (e.g., a driver's license) to access their vaccination information.

All the presenters described their process of developing SMART Health cards as benefiting from collaboration and being driven by the goal of accessibility for users. The slides for this presentation are available in the AIRA repository.

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WHAT IS THE CDC WSDL?

Health Level Seven (HL7) version 2 was created in the 1980s to define how two health systems could exchange information using a defined set of messages.

The "seven" in the name indicated an organizational commitment to create standards at the seventh layer of the Open Systems Interconnection model, which was being used to guide the creation of the internet. This meant that HL7 would not define standards for transport and that HL7 v2 would require local implementers to select their preferred transport technology.

Fast-forward to the 2000s. As immunization information systems (IIS) implemented these standards, they created local and incompatible solutions to transport HL7 v2 messages. This caused large delays for IIS working to onboard providers who needed additional time and money to adapt to local transport requirements. To solve this problem, CDC convened a community panel in 2011 to select a single transport mechanism. Several technologies in use by the community were considered, and Simple Object Access Protocol (SOAP) was selected.

As part of this effort, the group defined a common Web Services Description Language (WSDL) which is now referred to in our community as the CDC WSDL. The CDC WSDL is a machine computable contract that defines exactly which functions the IIS interface will support. (Check out these AIRA training videos to see a further explanation of the CDC WSDL.) IIS and IIS submitters who create interfaces to work with the CDC WSDL can exchange data without local software modifications. This transport standard is now widely adopted by IIS and has reduced technical integration times.

The CDL WSDL defines two functions:

1 Connectivity Test
The submitter can send a simple "hello" message to verify that the end point they have is correct and is ready to receive HL7 v2 messages.

2 Submit Single Message
The submitter can send a single HL7 v2 message and a set of three identification and authentication parameters: username, password, and facilityid. The IIS then responds with a single HL7 v2 message in response.

The "AIRA Tech Corner" is published as a blog. Read more on the AIRA website.