Report to the Utah Legislature:

Review of the Utah Statewide Immunization Information System

September, 2018

Division of Disease Control and Prevention

UTAH DEPARTMENT OF HEALTH

State of Utah

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To: Members of The Utah State Legislature

The Utah Department of Health is pleased to submit the following report describing the Utah Statewide Immunization Information System (USIIS).

This report was developed in response to questions posed by the Social Services Appropriations Subcommittee. The work was completed by a committee with representation from across our agency, including staff members from the Office of Fiscal Operations, Internal Audit, Center for Health Data and Informatics, DCP Informatics Program, USIIS Program, and Division of Disease Control and Prevention. Committee members conducted research and analysis, compiled information, and developed sections within this report. Findings and recommendations were reviewed collaboratively with the committee, and then summarized in the report. Sections were developed utilizing existing data from the USIIS Program (USIIS database queries, USIIS customer service results, USIIS foundational information and system documentation), as well as from associated IIS partners (e.g., the Utah Health Information Network (UHIN), Centers for Disease Control and Prevention (CDC) and the American Immunization Registry Association (AIRA)), and review of available literature, in addition to utilization of surveys and interviews.

If you have questions about this report, please contact Heather Borski at hborski@utah.gov.

Sincerely,

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UTAH DEPARTMENT OF HEALTH

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Executive Summary

The Utah Statewide Immunization Information System (USIIS) is a confidential, web-based information system containing immunization histories for Utah residents of all ages and is free to users. USIIS is designed to help health care providers, schools, local health departments, parents and others to track immunization information. Its goal is to consolidate immunization information into one centralized record.

Immunization Information Systems (IIS) are valuable tools to help increase and sustain high immunization coverage levels by managing patient information more efficiently. IISs consolidate vaccination records from multiple providers into a central location, maintaining a reliable immunization history for each person. Providers can easily assess the immunization status of any person "at-a-glance" and administer needed vaccines. IISs enhance clinical efficiency by providing current vaccine recommendations and information, facilitating the addition of new vaccines or changes in the immunization schedule, and managing vaccine inventories, preventing vaccine wastage.

USIIS is populated from birth records of infants (through a link with electronic birth records) and immunization records from public and private healthcare providers. The first version of USIIS was released to a limited set of healthcare providers in 1996. Since 1998, information for all persons born in Utah has been submitted to USIIS via a data interface with Vital Records. USIIS is guided by an Executive Committee comprised of members who represent private providers, local health departments, large health systems, and the Utah Department of Health (UDOH) Immunization Program as customer groups.

USIIS is recognized by the Centers for Disease Control and Prevention (CDC) and the American Immunization Registry Association (AIRA) as a fully functional IIS with a high level of interoperability, based on IIS annual reporting and AIRA-performed assessments.

Recommendations

<u>System Interoperability</u>

- There are many Electronic Health Record (EHR) systems in use in Utah, and health systems and clinics frequently change EHR systems. Additional interfaces with USIIS are in development by EHR vendors at all times, and this should remain a critical priority. Also, 504 (33%) enrolled facilities can receive immunization histories from USIIS through bi-directional interfaces. Expanding the use of bi-directional interfaces should likewise remain a top priority.

- Currently CHIE members cannot query USIIS through CHIE. UHIN is currently enhancing CHIE's Provider Portal to include USIIS in all data queries. The USIIS Program will continue to work with UHIN to enhance the CHIE Provider Portal to allow CHIE members to directly query USIIS through CHIE.

- For optimal functionality and data quality, USIIS should remain a stand-alone health information system managed by public health. Storing immunization data in a centralized location ensures the highest level of data quality and reduces redundancies and discrepancies across different data systems.

- Data sources should still be allowed to submit immunization information through CHIE, but it should not be mandated as the only option. Mandating CHIE as the sole transport method for submitting

immunization information to USIIS would likely have financial implications for providers. Providers with existing direct interfaces with USIIS would be forced to invest additional resources to redirect their data feeds. Additionally, CHIE would need the ability to expand access substantially to non-healthcare providers, including schools, pharmacies, and public health departments, all of which currently submit data to and query USIIS for immunization information. The most promising opportunity for USIIS and CHIE requires recognizing the strength and value of each system, and the ways they can provide and reinforce value to each system's participants.

- Opportunities for expanding USIIS queries to other state IISs and/or other jurisdictional HIEs should be explored.

Data Quality and Completeness

- Improvement in data quality and completeness can continue by working with providers to reduce barriers to data reporting and expand EHR interfaces.

- USIIS should continue work to automate system processes, such as facilitating error reporting to EHR vendors and healthcare providers, detecting duplicate records, and detecting aberrations in data reporting.

- USIIS should explore development of an online module to allow the public to obtain their own immunization records from USIIS. Currently immunization record requests must be submitted via email, fax, or postal mail to the USIIS Program which, in turn, delivers the records via email, fax or postal mail.

USIIS Budget

Opportunities to diversify funding sources are limited. Selling advertising on the site were explored, but ruled out given limited reach of the site and Utah.gov web standards prohibiting advertising on state-owned sites. Fees would likely disincentivize participation in this already voluntary system, and would be especially burdensome to individual providers and small clinics. Additionally, fees are not recommended by the CDC, which argues that providers contribute a "fee" with the time they invested in reporting data. Private donations are variable and an unreliable funding source, but are an area that should be explored, especially for one-time enhancement costs, and especially from pharmaceutical companies and possibly providers.

- The program should continue to seek and pursue federal grant opportunities, including the last round of money available under the Health Information and Technology for Economic and Clinical Health Act (HITECH) that will be available through the Centers for Medicare & Medicaid Services (CMS).

- Limited funds may be available from Medicaid, but requires further study.

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Section I: Summary of Work Performed

The Utah Department of Health (UDOH) convened a committee to review the Utah Statewide Immunization Information System (USIIS) in response to questions posed by the Social Services Appropriations subcommittee. The committee included representation from the Office of Fiscal Operations, Internal, Center for Health Data and Informatics, Division of Disease Control and Prevention (DCP), DCP Informatics Program, and the USIIS Program. The USIIS review committee met regularly between June and September in an effort to establish accountability, organize work, and provide input on methodology, findings, and next steps, culminating in the completion of this report.

Committee members conducted research and analysis, compiled information, and developed sections within this report. Each section lead was responsible for identifying data and resources or approaches to obtaining data and resources, to allow for a comprehensive assessment of their topic area. Findings and recommendations were reviewed collaboratively with the committee and then summarized in the report. Sections were developed utilizing existing data from the USIIS Program (e.g., USIIS customer support documentation, USIIS database queries, USIIS customer service results, USIIS foundational information and system documentation), as well as from associated IIS partners including the Centers for Disease Control and Prevention (CDC) and the American Immunization Registry Association (AIRA). Available literature was reviewed and surveys and interviews were utilized. Methodology to assess and report on specific questions and areas of interest within the audit included:

- Development, implementation, and analysis of a state survey: An online survey was developed in order to compare USIIS with systems in other states. The survey considered system characteristics, and attempted to identify innovative approaches that might improve USIIS. The USIIS review steering committee engaged AIRA to send the survey to all jurisdictions within the United States with an immunization information system (IIS). Results were analyzed, summarized, and used as a reference in sections throughout the report.
- Assessment of interoperability: Information on interoperability, electronic health records (EHRs), and health information exchanges (HIEs) was obtained from established, respected national healthcare information technology organizations. In addition, meetings were held with Utah Health Information Network (UHIN) representatives to discuss the current state of CHIE, Utah's HIE, and USIIS interoperability, and to identify opportunities to improve interoperability.
- Data quality and completeness: While information primarily came from the USIIS database queries, efforts were made to ensure data was validated by the Department of Technology Services (DTS) and UDOH Internal Audit staff. Other sources of data included USIIS customer support tickets, customer survey results, CDC IIS annual report submissions, and CDC and AIRA data quality resources. In addition, a provider site visit was initiated in order to document healthcare provider workflow and potential areas of concern within USIIS.
- Budget: Historical financial information for the Budget section was obtained through queries of the State's DataWarehouse. Additional information was taken from documentation prepared when seeking a Building Block for USIIS during the 2018 General Session with additional data obtained from the state survey. Discussions with the USIIS Program Manager, Medicaid management, as well as the Public Information Officer were also utilized for purposes of this section.

In addition, two meetings were held with the USIIS Executive Committee to review the history of USIIS and obtain suggestions related to questions posed within the review.

Section II: Introduction to Immunization Information Systems and USIIS

Immunization Information Systems

Immunization Information systems (IIS) are confidential, population-based, computerized systems that maintain records of immunizations administered to persons for the purpose of improving immunization coverage and reducing vaccine-preventable diseases.

In the U.S. there are 49 state, three city, one district, five territory, and three other jurisdictional Immunization Information Systems.[1] Across these jurisdictions varying system-related legislation exists with respect to laws authorizing IIS, laws addressing sharing of immunization information, types of consent, and provisions to opt out or limit access. Please see Appendix A for a summary of CDC's functional standards.

Utah Statewide Immunization Information System (USIIS)

The Utah Statewide Immunization Information System (USIIS) is authorized by Utah Administrative Code Rule R386-800, Immunization Coordination. It provides for the sharing of data among authorized healthcare providers, health insurers, schools, day care centers, and publicly funded programs, but does not mandate participation.[2] Immunization records of individuals may be included in the system unless an individual or parent or guardian withdraws.

USIIS is developed, operated, and supported by the Utah Department of Health (UDOH), utilizing services from the Utah Department of Technology Services (DTS). The first version of USIIS was released to a limited set of healthcare providers in 1996. Since 1998, information for all persons born in Utah has been submitted to USIIS via a data interface with Vital Records. USIIS is guided by an Executive Committee comprised of members who represent private providers, local health departments, large health systems, and the UDOH Immunization Program as customer groups.

The USIIS Program fulfills IIS functional standards outlined by the CDC, with ongoing enhancements as necessary to meet full intent. Stakeholder requested enhancements from healthcare providers, schools, and the Immunization Program are also necessitated annually. USIIS is a member of the American Immunization Registry Association (AIRA) and implements AIRA standards, adopts best practices, and participates in functional assessments.

The USIIS Program updates functionality required by the Centers for Medicare and Medicaid Services (CMS) Meaningful Use activities in support of eligible Utah hospitals and professionals and health IT goals of improving interoperability and patients' access to health information. USIIS also supports the Healthcare Effectiveness Data and Information Set (HEDIS) performance measures for health plans that operate in Utah.

USIIS plays an integral role in many Utah healthcare providers' daily work, in schools' and childcare facilities' admissions processes, and residents' school, travel, and medical management practices. Benefits gained by participants have expanded with USIIS capabilities, especially in the areas of

[1] https://www.cdc.gov/vaccines/programs/iis/contacts-locate-records.html

[2] The Utah Department of Health Immunization Program has stipulated that Vaccines for Children (VFC) providers participate in USIIS.

managing vaccine inventories, ordering federally-funded vaccines, ease of use for schools and childcare facilities, operational improvements to meet public records requests, ease of implementing interfaces, reliability of interfaces, and informing providers about vaccination coverage rates, missed vaccination opportunities, and invalid dose administrations.

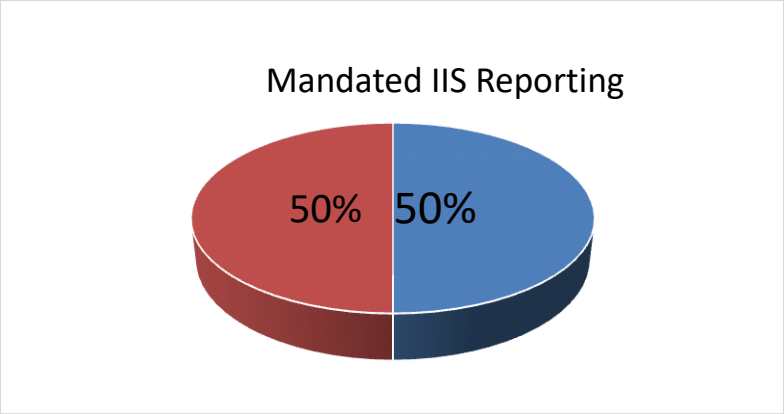
USIIS is recognized by the CDC and AIRA as a fully functional IIS with a high level of interoperability based on IIS annual reporting and AIRA-performed assessments (e.g., “gold complete” certificate of validation for Transport). USIIS user satisfaction surveys conducted in the past ten years indicated that overall satisfaction with USIIS is “good” or “excellent’ for 95.2% of survey respondents. The USIIS Executive Committee indicated that the clinical decision support functionality provided by USIIS is critical. The committee also stated that USIIS is the “gold standard”—that “you can trust USIIS”. Furthermore, they concluded the system provides a public service and should be housed within the Utah Department of Health, supported by staff dedicated to the program.

Section III: Immunization Information Systems in Other States

In an effort to understand how other states are utilizing their IIS systems, we sent out a survey to all jurisdictions throughout the United States for feedback. Jurisdictions include all states, U.S. territories, Washington D.C., and a few large metropolitan cities. We utilized a variety of question types, including yes/no, multiple choice, range, fill-in the blank, and open-ended questions. A copy of the survey can be found in Appendix B. We received at least partial responses from 18 out of 61 (29.5%) jurisdictions, with only 10 fully completing the survey. Due to the low response rate, we acknowledge limitations with the data and do not present this information to be a complete representation of other states. Individual responses have not been researched or verified for accuracy. The results of the survey are summarized into sections below.

Reporting

Out of 18 respondents, half reported that use of their jurisdiction's IIS is mandatory and half indicated it is not.



For those jurisdictions that do not have mandated reporting to IIS systems, the following were listed as incentives to providers to participate:

- Required participation by Vaccines For Children (VFC) providers and pharmacists
- Meaningful Use
- EHR Incentive Program
- Promotion of interoperability/bi-directional data exchange
- Vaccine ordering and reporting
- Transparency of data between providers
- Paperless reporting
- Forecasting immunizations according to ACIP guidelines

IIS Interoperability

When asked about Health Information Exchanges (HIE), 16 out of 18 respondents stated their jurisdiction has one or more HIE. Of these, only three indicated that vaccination reporting to their HIE is mandatory, while seven indicated that their IIS is interoperable with their HIE. Six respondents further identified how their IIS is interoperable with their HIE. Key points from review of responses include:

- 100% (6/6) stated that vaccination data is passed through the HIE from providers to the IIS.
- 100% (6/6) stated that vaccination data is stored only in the IIS.
- 67% (4/6) stated the HIE queries vaccination data from the IIS, and presents or makes available data to HIE provider members.
- 33% (2/6) stated the HIE facilitates access of IIS data for HIE provider members.
- 17% (1/6) stated the HIE facilitates access of IIS data for health plans.

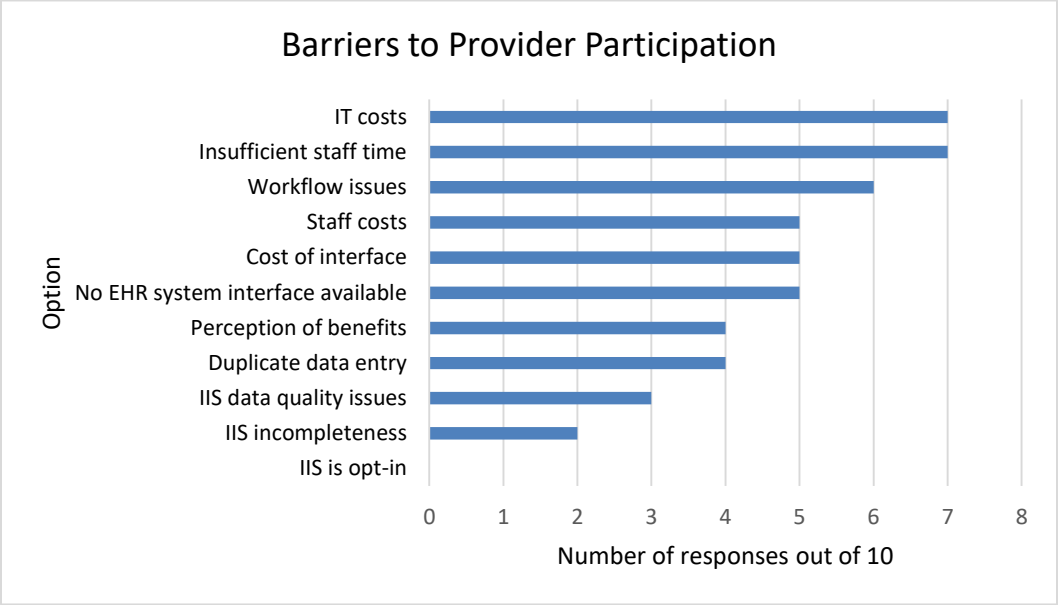
Out of 14 responses, 13 (93%) indicated their jurisdiction's IIS interfaces with Electronic Health (EHR) systems.

IIS Provider Participation

When asked about estimated participation rates of IIS for non-VFC providers, ten jurisdictions responded resulting in the following averages by provider type:

Provider Type	Estimated Participation Rate
Private Providers	69.3%
Hospitals	70.7%
Long Term Care/ Skilled Nursing / Hospice	40.0%
Federally Qualified Health Center/ Rural Health Clinic/Community Health Center	81.7%
Other Public Facilities	83.3%

Out of 10 jurisdictions, the following barriers to provider participation in IIS were reported based on the options given:



Out of ten responses, 100% of these jurisdictions have access to IIS to verify the immunization status of students. Five of these (50%) allow schools to submit data to their IIS.
We asked for open ended answers regarding how jurisdictions help providers to improve data quality and received the following responses:

- Provider training
- Provider report cards so they can monitor themselves
- Data quality tools built into IIS
- Data quality reviews by IIS staff
- Built in algorithms that captures duplicates and identifies data trends
- Reports identifying potential issues
- Regular engagement and feedback to providers

Vaccination Records

Only six jurisdictions were able to respond with an approximate percentage of vaccinations that are currently recorded in the IIS, which averaged to be 81%. Of these six, three have mandatory requirements for providers to enter the data. Of the three that are not mandatory, the average percentage of vaccinations recorded in the IIS drops to 75%.

All but one jurisdiction out of nine responses indicated that at least 75% of vaccination data is submitted to the IIS via data interface, with the remaining primarily entered manually by the provider. One outlier indicated that the IIS staff manually enters 70% of the data into their IIS.

Resources

Five jurisdictions provided an approximate overall annual budget amount for the IIS (see below), with one noting they are not allowed to disclose the amount since a portion is received from a private foundation. The average annual budget per capita for the five responding states was $0.30 per person.

Population Size[3]	Approximate Annual Budget	Annual Budget Per Capita
5,628,000	$2.02 million	$0.36
5,818,000	$1.6 million	$0.28
3,941,000	$1 million	$0.25
1,933,000	$750,000	$0.39
2,091,000	$465,000	$0.22

Funding for these six jurisdictions comes from the following sources:

- CDC Immunization Grant
- Other CDC Grants / Cooperative Agreements
- State Funds
- Medicaid Meaningful Use
- Other Medicaid
- Private Foundations
- IAPD Funding

[3] http://worldpopulationreview.com/states/

The following results were reported by nine jurisdictions about FTE staffing for IIS:

	IT Staff	IT Contractor	IT Vendor	Administration	Forecast / Immunization Schedule	System Testing / Quality Assurance	Training	Help Desk	Interface Operational Support	Data Quality	Provider Outreach	Other	Total FTEs	State Population[4]	FTE per 100,000 population
1	5	2	0	2	0	0	20	4	0	0	0	0	33	9,991,000	0.33
2	5	0	2	1	0.25	0.25	1	1.5	1	3	9.5	0	24.5	5,628,000	0.44
3	0	6	0	1	1	0	0.5	2	1.5	0.5	0	0.5	13	5,818,000	0.22
4	2	0	0	1	0	2	1	2	0	1	1	0	10	3,941,000	0.25
5	0.5	1	0	2	0	0.5	1	0	0.5	1.5	2	0	9	3,589,000	0.25
6	2	0	0	1.5	0.2	0.5	0.5	0.8	0.5	1	0	0	7	5,089,000	0.14
7	0	1	3.5	0.3	0	0	0.3	0.3	0.25	0.3	0.3	0.3	6.25	1,933,000	0.32
8	0.5	0	0	1	0	0	1	1.5	0	1.5	0	0	5.5	2,091,000	0.26
9	0	0	0	0	0	0	0	4	0	0	0	0	4	3,161,000	0.13

For the nine states reporting this information, the average was 0.26 FTE per 100,000 population.

[4] http://worldpopulationreview.com/states/

Section IV: Interoperability of USIIS

The Healthcare Information and Management Systems Society (HIMSS) defines interoperability as "the ability of different information technology systems and software applications to communicate, exchange data, and use the information that has been exchanged."[5] Interoperable systems must have secure methods for transporting data. Interoperable systems must also structure and code their data in a standardized way so the data can be interpreted and understood by the system users. Health Level 7 International (HL7) is an international organization that develops standards for how electronic health information is packaged and communicated between systems.[6]

Interoperability is influenced by the quality of the data being exchanged. Quality can be affected by compliance with standards, accuracy, completeness, and timeliness. Data that is not compliant with standards can be difficult for receiving systems to interpret and understand. Data that is not accurate will not appropriately represent the true values and may lead to inappropriate interpretations or be rejected. Data that is not complete or granular enough can be unreliable. Also, data that is not timely may not be available when it is needed.

EHR Interoperability with USIIS

An Electronic Health Record (EHR) is a digital version of a patient's paper chart.[7] EHR systems are patient-centered systems used by healthcare providers to record the medical and treatment histories of patients. There are many different EHR systems available and providers select and purchase the system they are going to use. Providers manually enter information about immunizations they administer to their patients into the EHR. USIIS works with EHR vendors to build interfaces to electronically and automatically send the immunization information that is manually entered into the EHR. USIIS supports six secure transport methods: HTTPS, SFTP, VPN, HTTP POST, SOAP web service, and CHIE web service. Additionally, USIIS supports three messaging standards: ASCII, HL7 2.3.1, and HL7 2.5.1. The HL7 standards are specifically designed for the exchange of immunization information for use in an IIS. This standard contains data fields that have been identified nationally as necessary for clinical health and public health.

As of June 8, 2018, USIIS maintains a total of 70 unique interfaces with EHR systems, healthcare entities, and school districts. These interfaces allow 1,522 facilities[8] to submit immunization information electronically to USIIS. Additionally, 15 (21%) of these interfaces are bi-directional. Bi-directional interfaces allow for the EHR system to submit data to USIIS and to electronically query USIIS for a patient's immunization history and pull that information automatically into the EHR. A total of 504 (33%) facilities can receive immunization histories from USIIS through a bi-directional interface. Additional interfaces with USIIS are in development by EHR vendors at all times.

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[5] Healthcare Information and Management Systems Society. What is Interoperability? Accessed August 2018. https://www.himss.org/library/interoperability-standards/what-is

[6] Health Level Seven International. Introduction to HL7 Standards. Accessed August 2018. http://www.hl7.org/implement/standards/

[7] Office of the National Coordinator for Health Information Technology (ONC). What is an electronic health record (EHR)? March 2018. https://www.healthit.gov/faq/what-electronic-health-record-ehr

[8] USIIS defines a facility as a single location (clinic, school, hospital). Multiple facilities may submit data to USIIS through one interface. Each of these facilities are counted individually.

IIS interoperability with EHR systems is also common in other states. Of 14 states responding to Utah's survey, 13 (93%) have an IIS that is interoperable with EHR systems. On average, 23% of EHR interfaces in other states are bi-directional, comparable to Utah's 21%.

The Utah Department of Health does not charge EHR vendors or healthcare facilities to establish an interface and exchange data with USIIS. However, costs to healthcare facilities that implement an EHR system and exchange data with USIIS may include purchasing an EHR system capable of sending immunization data electronically, programming the interface by IT staff, and maintaining quality data transmission.

Health Information Exchanges

Health Information Exchange (HIE) organizations facilitate the sharing of health information among their members, which can represent a number of different organizations, including, but not limited to, patients, inpatient and ambulatory health care providers, other care providers, care coordinators, laboratories, health insurance carriers, and local and state governments.[9] HIE organizations provide a range of services to their members, usually for a membership fee. HIEs allow for a more complete patient record by sharing health information across different organizations.

The Clinical Health Information Exchange (CHIE) functions as Utah's HIE and is operated by the Utah Health Information Network (UHIN).[10] CHIE has 126 data sources[11] representing healthcare providers, laboratories, long term care facilities, home health and hospice agencies, hospitals and healthcare payer organizations.[12] Data is submitted to the CHIE using the Continuity of Care Document (CCD) messaging standard. A CCD is designed for the exchange of patient summary information. Summaries include the most commonly needed information about a patient's current and past medical status, including immunizations.[13] Because this standard is designed specifically for the exchange of summary clinical data, it does not contain as detailed immunization information as is contained in the HL7 standard. When a CHIE member accesses CHIE for information on a patient, the CHIE Provider Portal queries all of their data sources and presents the querying CHIE member with all available clinical information on the patient within the CCD fields.

CHIE Interoperability with USIIS

Fourteen (11%) data sources submit immunization information to the CHIE using the structured immunization section of the CCD, utilizing the CCD messaging standard. Immunization information submitted to CHIE through CCDs is not shared with USIIS. It is critical to note that all of these sources submit immunization record information to USIIS using HL7 messaging standards through direct EHR vendor interfaces.

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[9] Office of the National Coordinator for Health Information Technology (ONC). Connecting Public Health Information Systems and Health Information Exchange Organizations. September 2017. https://www.healthit.gov/sites/default/files/FINAL_ONC_PH_HIE_090122017.pdf

[10] Utah Health Information Network. About Us. Accessed August 2018. https://uhin.org/about-us/

[11] UHIN counts data sources by unique interfaces. A large health care organization with multiple facilities would be counted as one data source if all data from their facilities were submitted through one interface with the CHIE.

[12] Utah Health Information Network. The CHIE's Data Sources. Accessed August 2018. https://uhin.org/the-chies-data-sources/

[13] SearchHealthIT. Continuity of Care Document (CCD). May 2010. https://searchhealthit.techtarget.com/definition/Continuity-of-Care-Document-CCD

Healthcare facilities and EHR vendors may use the CHIE as a secure transport method for submitting immunization data to USIIS. In this case, the data simply passes through the CHIE to USIIS, and utilizes the HL7 messaging standard. Currently, two healthcare facilities are using CHIE as a transport method for submitting data to USIIS.

IIS interoperability with HIEs in other states is variable. Of 19 state respondents, 13 (84%) have one or more HIEs in their jurisdiction. Of 12 respondents, seven (58%) have an IIS that is interoperable with a jurisdictional HIE. Of states with HIE interoperability who provided additional descriptive information, 100% use the HIE simply as a secure transport method, meaning the HIE is used to pass immunization information from EHRs to the IIS, and immunization information is stored only in the IIS.

Beyond being a CHIE member, there is no cost to a healthcare facility to submit data to the CHIE. However, an annual fee is charged for facilities to access CHIE data. The fee structure varies depending on the size of the organization and what data the organization uses from the CHIE.

Considerations for Interoperability

USIIS functions optimally as a stand-alone public health information technology system.
USIIS is a centralized system that consolidates a patient's entire immunization history into one record. As a centralized system, all data sources extract and send their data to USIIS, where the information is organized, integrated, and stored in a common standard. One benefit to a centralized data system is improved data quality. Centralized systems allow for a primary record, which aids in maintaining data as accurately and consistently as possible.

As a public health information system, USIIS is free of charge to users, which come from a variety of different agencies and organizations, including those outside the traditional healthcare realm, such as schools, pharmacies and local public health departments. USIIS is not just a data repository, it also provides clinical decision support to users through vaccination forecasting, provision of individual patient record reports and facility reports, and assisting users with vaccine inventory and vaccine ordering. USIIS is managed by knowledgeable staff at the Utah Department of Health exclusively allocated for USIIS management. This ensures that immunization information consolidation and quality remains a priority in the state of Utah and provides the resources necessary to maintain and improve data quality, and enhance system performance.

Flexibility in messaging standards and transport methods lowers barriers to USIIS interoperability.
USIIS supports three messaging standards and six secure transport methods, including the CHIE web service. No EHR vendors have requested immunization data be routed to USIIS via CHIE. In order for an EHR vendor to route immunization data through CHIE to USIIS, they must be able to distinguish which of their customers are CHIE members and be able to route to two different connections depending on whether the customer is a CHIE member or not. To date, EHR vendors do not have this capability and express no interest in developing this capability. Mandating all USIIS reporting through CHIE would require EHR vendors and data providers to reprogram their interfaces, which would involve additional resources, both financially and in personnel, from both healthcare providers and EHR vendors. This could potentially result in the loss of data to USIIS, if providers and vendors are unable or unwilling to make a quick change. Providing healthcare providers and EHR vendors multiple options for exchanging data with USIIS allows providers and vendors to select the configuration that works best with existing resources.

Continuing to enhance USIIS interoperability with other healthcare technology systems will improve USIIS data quality and lower barriers to provider utilization.

USIIS currently manages 70 unique interfaces and additional interfaces are always in development. Continuing to work with healthcare providers and EHR vendors to develop interfaces will improve the completeness of immunization information in USIIS and improve access to USIIS for healthcare providers.

One challenge for assuring complete immunization histories is accessing immunizations administered outside of Utah. Expanding USIIS interoperability to other state IISs and HIEs would improve data completeness. This could be accomplished by establishing direct interfaces between USIIS and other IISs to share immunization information for persons who receive services and whose home addresses are in a different state. Another service could be provided by establishing interfaces between CHIE and other state HIEs. In this scenario, a provider in another state serving a Utah resident could query that state's HIE, which would query CHIE, which would query USIIS, and supply the USIIS history of the Utah resident to the provider. Utah should work with AIRA and other states, especially neighboring states, to explore ways to improve data sharing between states.

Currently, CHIE members cannot query USIIS through CHIE. However, UHIN is currently enhancing CHIE's Provider Portal to include USIIS in all data queries. This means a CHIE member will be able to access USIIS immunization histories from CHIE or from their EHR system queries. A single query through CHIE will search for appropriate records in all of the CHIE's data sources and USIIS and will display the consolidated results through CHIE. This project should remain a priority for completion to enhance CHIE usability and eliminate the need for separate querying of different systems for CHIE members.

While it is tempting to think of the CCD as a record from which data could be extracted and sent to USIIS, this idea should be considered with caution. While there is overlap in some fields captured within each, CCDs and the immunization record within USIIS have separate, though related, purposes, and are anchored to different data standards. As such, there are a few key points to consider:

- Since USIIS has exclusive staff, data quality and data accuracy are well assessed and monitored. This level of management does not occur through the CHIE.
- To accomplish this type of extraction, the CHIE would need to transform the CCD message into a USIIS compliant HL7 message. Additional transformations of the data could introduce more errors and affect the data accuracy.
- The CCD may not contain certain data fields necessary for Utah public health. A 2017 report from the Office of the National Coordinator noted that "two states report the need to collect immunization data on injection site and dose in the event of recall notices, but these fields are not supported by the available CCDs within certified health IT".[5]

Receiving immunization information through standards developed specifically for immunization information exchange (HL7 messaging) is preferred. While extracting immunization information from the CCDs in CHIE could be explored, ensuring data accuracy and completeness should be a focus in determining the viability of this option. Currently, all data providers who use the immunization portion of the CCDs submit immunization information directly to USIIS through EHR vendors, so there is no information in the CCDs in CHIE that is not also available in USIIS. Further pursuit of extraction of data from CCDs would impact a small number of providers, requiring additional resources, and likely would not provide additional value given existing processes. Maintaining focus on enhancing the ability of CHIE

participants to query USIIS through the CHIE would be the best option in improving interoperability between the two.

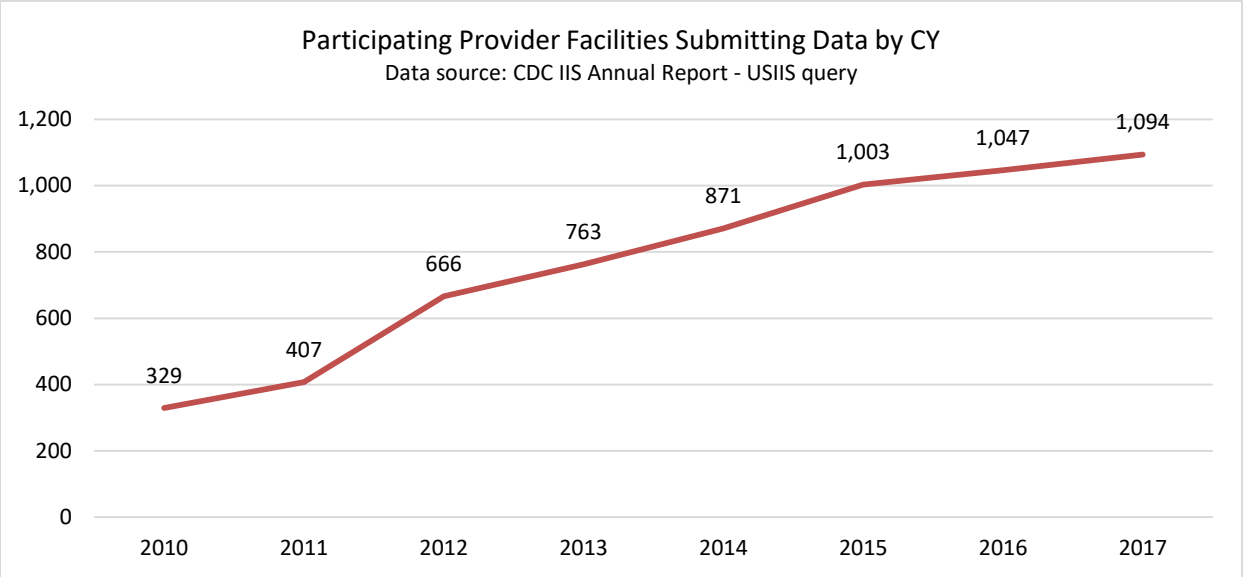
Section V: Data Quality, Completeness, and Accuracy

Background information on considerations for data quality and accuracy can be found in Appendix C.

USIIS Participation and Data Completeness

The following tables and graphs characterize the use of USIIS:

Participation in USIIS has grown consistently since its inception. The following graph illustrates the number of participating Utah healthcare provider facilities that submitted data by year, 2010-2017. USIIS participation was advanced by Utah providers' participation in the CMS Meaningful Use incentive program. (Note: due to challenges with determining the total number of potential USIIS participants in Utah, it is not possible to estimate USIIS participation rate.)



To describe organizations that utilize USIIS, the following table lists the primary types of healthcare facilities enrolled as participating provider facilities, and those that submitted data between January 1, 2017 and December 31, 2017. There is a high level of provider data submission to USIIS, with 82% of these enrolled facilities submitting data in 2017.

Provider Facility Type	*Count of Enrolled Facilities*	*Count that Submitted Data to USIIS*	*% Enrolled Facilities Who Submitted Data to USIIS*
FQHC/RHC/CHC[1]	55	55	100
Hospital	52	48	92
Indian Health Service	5	5	100
Local Health Department	41	41	100
Other Public[2]	57	31	54
Pharmacy	465	412	89
Private Provider	651	495	76
Total	**1,326**	**1,087**	**82**

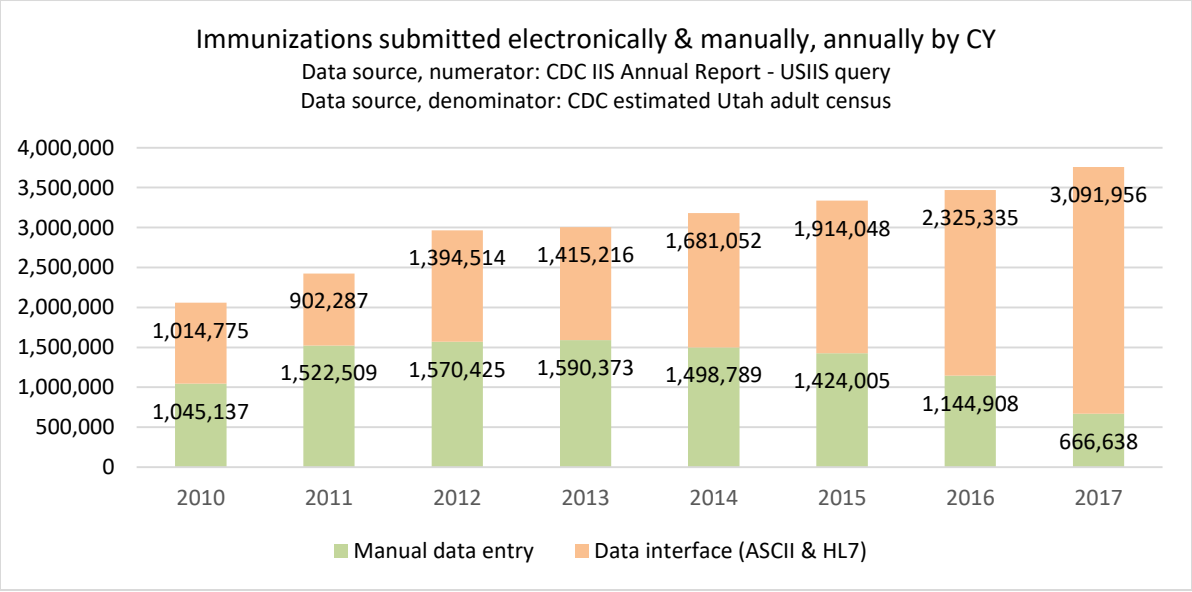
[1] Federally Qualified Health Center/Regional Health Center/Community Health Center

[2]Other Public = Fostering Health Children, Juvenile Justice Services, Job Corp, Youth Centers, UDOH programs, Health Clinics of Utah, Planned Parenthood, Detention Centers, etc.

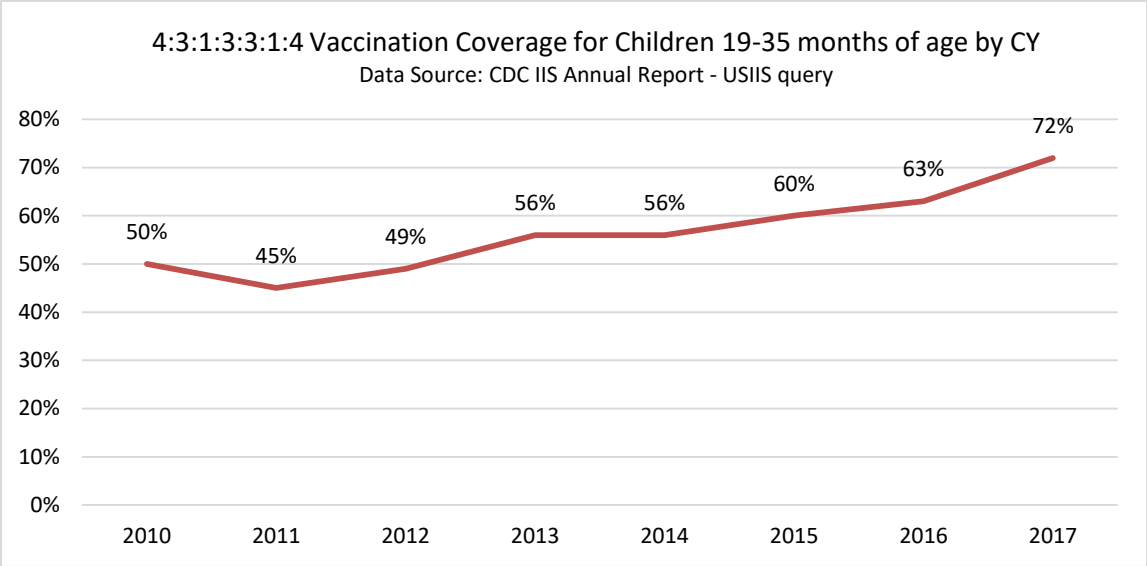
The following table lists the types of school and childcare facilities enrolled as participating facilities in USIIS between January 1, 2017 and December 31, 2017. It is important to note that more than half of enrolled schools and childcare facilities do not enter data into USIIS, but query USIIS regularly and rely on it to obtain Utah School Immunization Records.

School Types	***Count of Enrolled Facilities***
Charter School	122
Daycare	228
Head Start	30
Other Early Childhood Program	38
Private School	51
Public School	599
School District	40
Total	**1,108**

The growth in numbers of immunization records processed into USIIS reflects facility participation. The following graph shows this growth for 2010-2017. This graph also shows the mix of immunization data submitted to USIIS by manual data entry using the USIIS web application and via electronic data interfaces with Electronic Health Record (EHR) systems used by Utah healthcare providers. As Utah healthcare providers adopted EHR systems and EHR vendors developed interfaces with USIIS, submission by data interface became the dominant method of data submission by 2014.

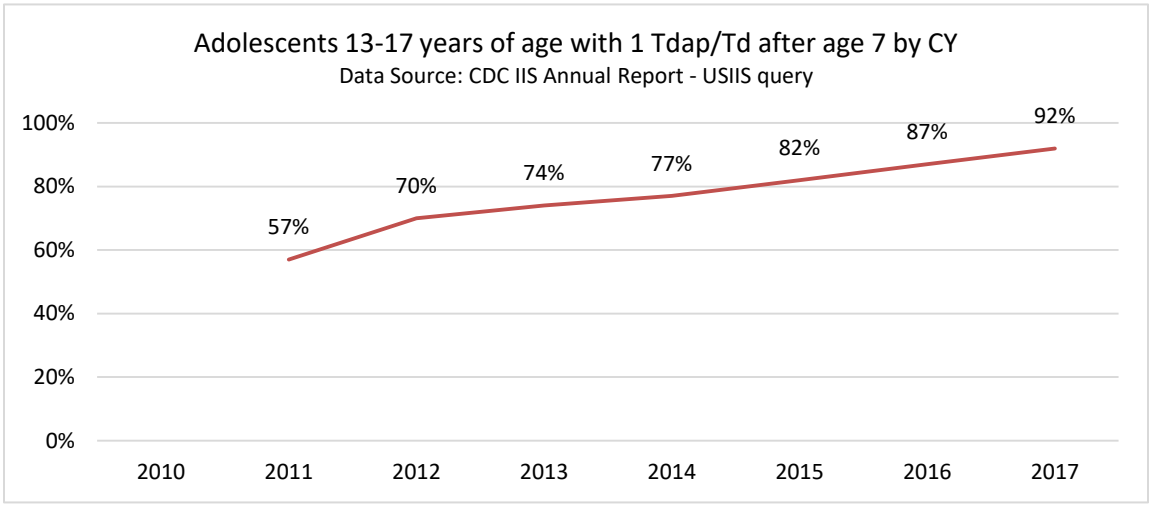


A common measure the CDC uses to estimate the completeness of immunization histories of children 19-35 months of age in IIS's is the 4:3:2:3:3:1:4 immunization series coverage rate. The following graph reports USIIS 4:3:1:3:3:1:4 coverage rates for 2010-2017, indicating an increase in record completeness.



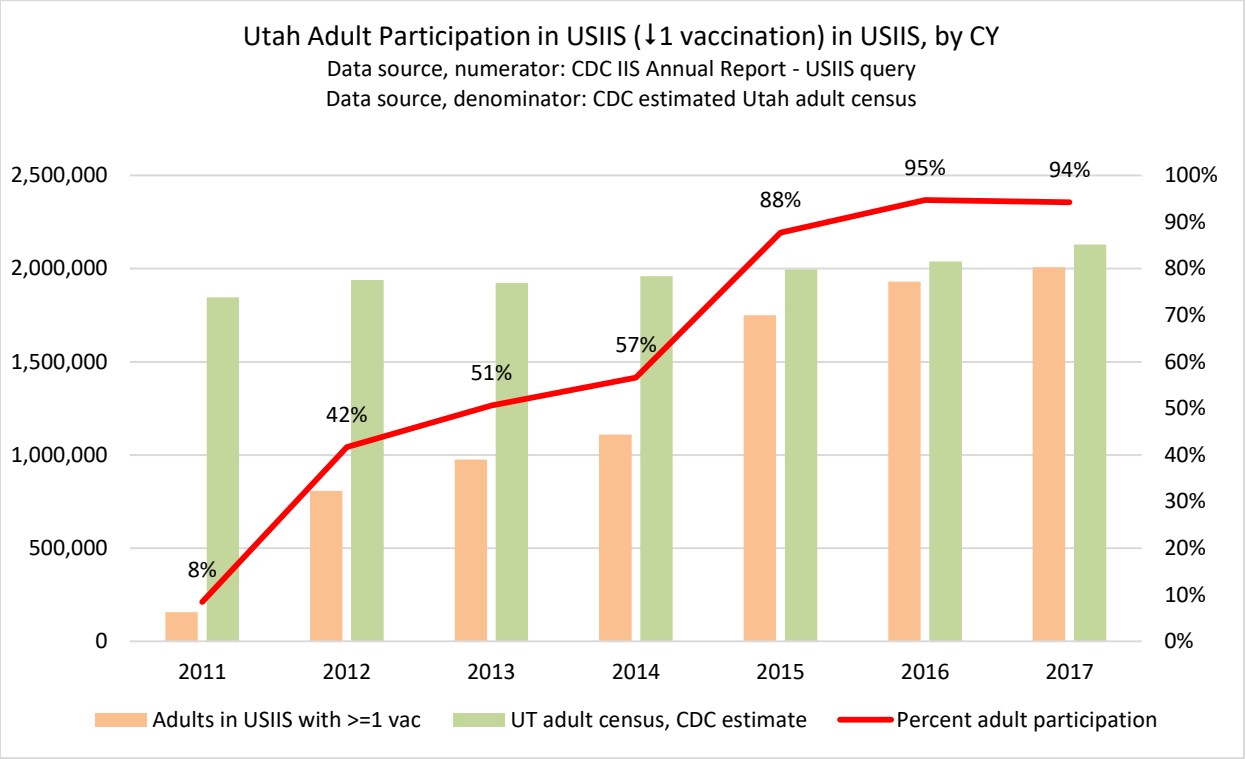
Note: 4:3:1:3:3:1:4 means 4 DTaP/DTP/DT, 3 Polio, 1 MMR, 3 Hepatitis B, 3 or 4 Hib, 1 Varicella, and 4 pneumococcal.

A common measure the CDC uses to estimate the completeness of immunization histories of adolescents 13-17 years of age in IISs is 1 TDaP/Td vaccination administered after the age of 7 years. The following graph reports this measure for 2011-2017, indicating an increase in record completeness.



Note: the CDC did not collect this information until 2011.

Another measure of USIIS utilization is the percentage of adult participation in USIIS, defined as an adult record with one or more immunizations. An adult is defined as a person 19 years of age and older. The following graph illustrates the growth in adult records in USIIS between 2011, when the CDC began reporting this measure, and 2017. USIIS now maintains records for nearly all Utah adults.



USIIS captures information on required vaccines for different age groups, as shown in Appendix D.

USIIS Data Accuracy

The methods by which immunization information is reported to USIIS impacts data accuracy. There are two sources of USIIS data:

1. Manual data entry using the USIIS web application.
   Approximately **17% of immunization information reported to USIIS is entered manually.**
2. Data submitted via numerous different Electronic Health Record (EHR) system-USIIS interfaces. An EHR-USIIS interface is developed by the EHR vendor in collaboration with the USIIS Program, tested and approved for use by the USIIS Program. Approximately **83% of immunization information reported to USIIS is submitted via EHR-USIIS interfaces.**

When data is manually entered into the USIIS web application, there are edit checks on data fields that help ensure data is complete and accurate before the record can be saved.

When data is submitted by an EHR-USIIS interface, the quality of data processed into USIIS is dependent on numerous factors including data entry errors, EHR connectivity and capacity issues, and USIIS processing issues. These factors are described in more detail below:

Provider staff data entry into their EHR system: Patient and immunization data entered into EHR systems are the data submitted to USIIS by EHR-USIIS interfaces. If provider staff do not enter complete patient information into their EHR system, e.g., middle name, or parent/next-of-kin, or address, it cannot be reported to USIIS. If provider staff enter erroneous immunization information into their EHR system, e.g., lot number or vaccine type, the data reported to USIIS will not reflect the vaccination work conducted at the clinic.

A review of data provided during CY2017 found that, for records reported by all providers, 47% were missing a middle name or initial, 21% were missing a parents' name for minors, 17% were missing a phone number, and 10% were missing patient address. Looking at vaccination data elements, the most commonly missing data element was Vaccine Information Statement (VIS) version date, with 18% of records from all providers missing this data point.

EHR system capabilities: EHR systems may not contain data elements recommended by the CDC for immunizations, e.g., VFC eligibility by vaccination dose or VIS dates. As well, EHR systems may not contain edit checks on data elements. An example of this is an EHR system allowing entry of a vaccination date that is before the patient's birth date; such data submitted to USIIS will be deemed invalid and will and not processed into USIIS.

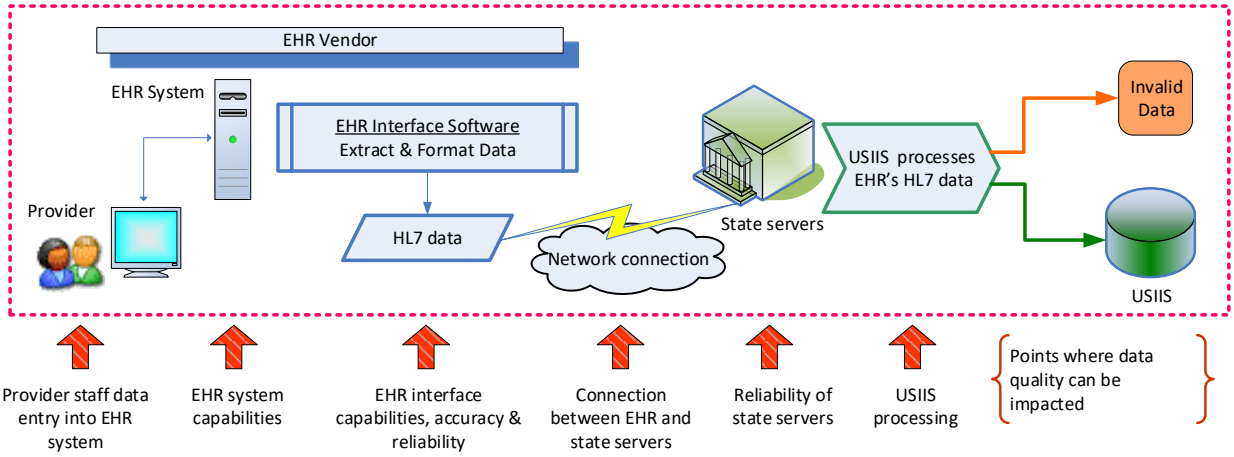
EHR interface capabilities, accuracy and reliability: EHR vendor interfaces are distinct from their EHR systems, i.e., different software applications developed by vendor teams. Data may be collectable in the EHR system, but not included in the vendor's interface. As well, EHR interfaces may not format all information according to CDC-specified interoperability standards, and USIIS may reject the data as invalid. Additionally, EHR interfaces may not be reliable, i.e., servers or software may fail or go out of service.

Connection between the EHR system and Utah state servers: USIIS supports six distinct secure connection methods for EHR vendors to submit EHR-USIIS interface data. All these methods rely on network technologies and internet services which may fail or go out of service.

Reliability of Utah state servers: The USIIS interface, application components, and database are hosted on state servers and dependent on the reliability and "up time" of those servers.

USIIS processing: Processing of data submitted by EHR-USIIS interfaces is completed by several software components and is dependent on those components not failing or going out of service.

The following figure illustrates the components of an EHR-USIIS interface and the points where data quality can be impacted as described above.



USIIS Design and Operational Practices

The USIIS Program cannot know what vaccination work a provider facility completes, nor can it know if all applicable vaccination information is reported to USIIS by provider facilities. Furthermore, the majority of data reported to USIIS is via EHR-USIIS data interfaces, which involves multiple components and opportunities for failure. To minimize the impact of these factors on USIIS data quality, the USIIS Program has implemented the following operational processes:

Patient matching and processing: The USIIS algorithm is used to assess patient consolidation for each patient/student reported to USIIS, i.e., to determine if the patient reported is already in USIIS or if it is a new patient in USIIS. The USIIS patient-matching algorithm includes deterministic and probabilistic components, and was initially designed using CDC and AIRA guidance materials. At that time, the USIIS Program also used CDC-supplied data sets to test its algorithm. The algorithm has been updated periodically based on specificity and sensitivity analyses to identify improvements.

In preparation for this report, the USIIS Program used a 2016 CDC-supplied data set to test its algorithm. Specificity, or the ability to correctly determine records that appear to be duplicates are really separate individuals, scored 96%. Sensitivity, or the ability to correctly determine records are duplicates, scored 76%. From this analysis, the USIIS Program identified two likely enhancements and four possible enhancements that will help reduce the number of duplicate records created in USIIS.

IT infrastructure servers, database and application: USIIS uses servers hosted by the Utah State Department of Technology Services (DTS). USIIS test and production servers are located in Richfield and Salt Lake City, respectively, in order to best utilize system recovery/resumption options. The USIIS Program also uses DTS Oracle database services for optimal database reliability and support. The USIIS applications are supported by DTS for specified extended hours with a Service Level Agreement that targets 99% application availability, excluding scheduled maintenance.

Interface Software: The USIIS Program has built numerous features into its interface software to minimize the impact of failures derived from EHR system and interface issues, network connection issues, and USIIS interface issues, including:

- The USIIS interface automatically reprocesses all submitted records that fail to process into USIIS regardless of error type. This helps mitigate any issues related to USIIS server or interface downtime.
- The USIIS interface, per standards, sends a response to the source of each record it processed, or attempted to process, from an EHR-USIIS interface. When applicable, these responses include error and data quality information so EHR vendors can follow-up with appropriate actions.
- The USIIS interface software logs all incoming records in three places, each in a different format and storage duration. The USIIS Program uses these logs to troubleshoot EHR interface issues, assist providers in understanding their data in USIIS, and in identifying and resolving USIIS interface issues.
- The USIIS interface creates an error report each day that identifies records submitted the previous 24 hours that could not be processed due to invalid data or USIIS processing issues. This report also identifies records that could be processed but contained data quality issues or errors. This report is reviewed most days by USIIS staff who can follow-up with providers and/or EHR vendors. A review of data reported to USIIS from August 1 – September 17, 2018, demonstrated a low fatal error rate; the fatal error rate within 25,299 total patient records created during that time was 0.0949%, while the fatal error rate within 677,165 records created during that time was 0.0406%.

EHR Vendor Profiles: The USIIS Program maintains profiles of EHR vendor systems and their interfaces. This enables the program to understand each EHR system, and interface capabilities and operational practices. In turn, the USIIS Program is better able to support providers in understanding their data in USIIS and how they can improve the quality of their data in USIIS.

The USIIS Program also identifies EHR systems from which data quality is lower and works with those EHR vendors and their Utah provider customers to:

- Improve provider staff knowledge about how to accurately enter information into the EHR system,
- Fix or enhance EHR systems to facilitate more accurate data collection, and
- Fix or enhance the EHR interfaces to improve the accuracy of data reporting.

Data Quality Reports and Consulting: To help reveal data quality issues, as well as to acknowledge high data quality, the USIIS Program delivers periodic data quality reports to many healthcare providers and consults with those providers about how they can improve the quality of their data in USIIS. In 2017, 1,590 data quality reports were supplied to 245 private and public provider facilities. The USIIS Program delivers these data quality reports on a frequency requested by facilities, usually monthly, quarterly, or semi-annually.

USIIS data quality reports include information about the completeness of important data elements, invalid data that was submitted and possibly rejected, data issues that could cause vaccine inventory errors, and a summary of all records submitted so the facility can compare with their EHR records and office practices. Data quality reports have revealed issues leading providers to improve data entry into their EHR systems, EHR vendors to enhance their EHR systems, EHR vendors to repair and enhance EHR interfaces, and USIIS to repair and enhance its interface.

Since the USIIS Program cannot know what vaccination work a provider facility completes and therefore cannot know if it receives all data that an EHR interface should report, these data quality reports can

also help providers determine if all vaccinations that should have been reported to and processed into USIIS are in USIIS.

A sample data quality report can be found in Appendix E.

The following are limitations in assessing USIIS data quality:

- Although USIIS obtains Vital Records information for persons born in Utah, there is no resource for identifying persons who live in Utah, but were born outside of Utah.
- After extensive review, we were unable to find resources to allow for identifying the number of healthcare and pharmacy facilities that administer immunizations in Utah, so it is not possible to characterize USIIS participation rate.
- There is no way, outside of chart review, to know if healthcare providers or pharmacy facilities report complete or accurate immunization information to USIIS, i.e., information that represents immunization work actually performed in those facilities. Increasing efforts in this area is cost-prohibitive.

The USIIS Program regularly considers ways to improve data quality in conjunction with EHR vendors and provider facilities, and based on continual review of data errors. As noted previously, the Program works with providers to assess data quality, providing information as requested to support improvements. For example, the USIIS Program recognized an opportunity to improve completeness in data elements that are used to match records, including patient middle name, and patient next-of-kin information. Efforts made to address these elements with 50 provider facilities resulted in an increase in reporting of these elements by the majority of providers, with 74% increasing reporting of patient middle name by an average of 28%, and 54% increasing reporting of next-of-kin by an average of 73%. Improving completeness within these elements is critical for accurate record matching and helps the USIIS Program avoid creating duplicate records.

Based on the work completed to create this report, the USIIS Program has also recognized an opportunity to consider creation of an online module to allow the public to obtain records from USIIS, where currently record requests must be submitted via email, fax, or postal mail to the USIIS Program, that then delivers the records via email, fax, or postal mail. This effort would result in better customer access to these records, and also may cause the public to encourage providers who do not participate in USIIS to do so in order to ensure records are complete and accurate.

Section VI: Budget

Funding History

State Funding

General Funds received by the state have remained relatively constant in supporting the USIIS Program over the past seven years. The program received $328,400 in State Fiscal Year (FY) 2012, which increased slightly to $344,100 in FY 2018. During the 2018 General Legislative Session, the program received an increase of $230,000 through a Building Block to help offset discontinued federal funding.

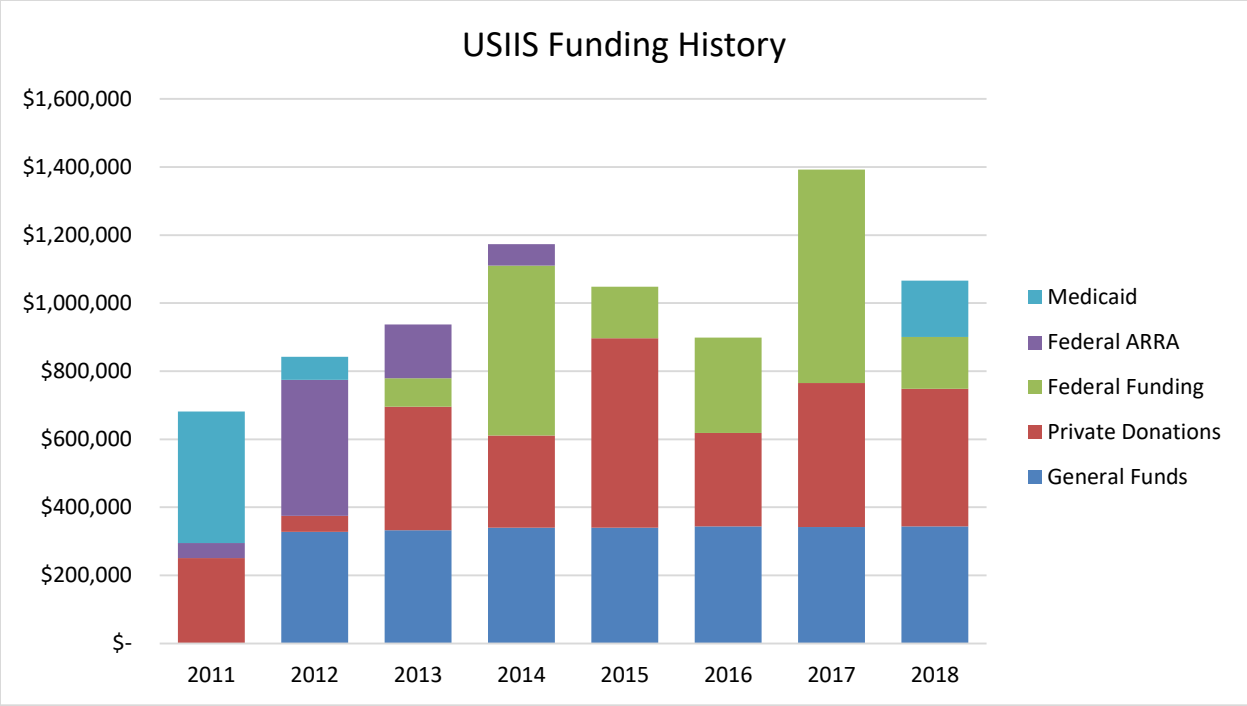
Federal Funding

During the years of American Recover and Reinvestment Act of 2009 (ARRA) funding, some federal funds were used to supplement other sources of funding. ARRA funding discontinued during FY 2014. The CDC had offered, and the program received, several one-time cooperative agreements aimed at adding specific functionality to USIIS. Funding utilized by fiscal year ranged from a high of $627,000 in FY 2017 to a low of $83,000 in 2013. During FY 2018, the program expended the remaining federal funds available. The CDC has specifically said that no additional grants or cooperative agreements will be offered to support IIS's. In order to maintain the newly expanded functionality of USIIS, the program sought the Building Block during the 2018 General Legislative Session mentioned above.

Funding from Medicaid was provided in prior years, but more recently, when federal funding spiked, the Medicaid funding was not needed and has dropped off although USIIS received funding for Meaningful Use during FY2018. Medicaid provided funding based on USIIS-provided information related to children on Medicaid, and helped keep track of their immunizations, as well as helped to prevent duplicate immunizations.

Private Donations

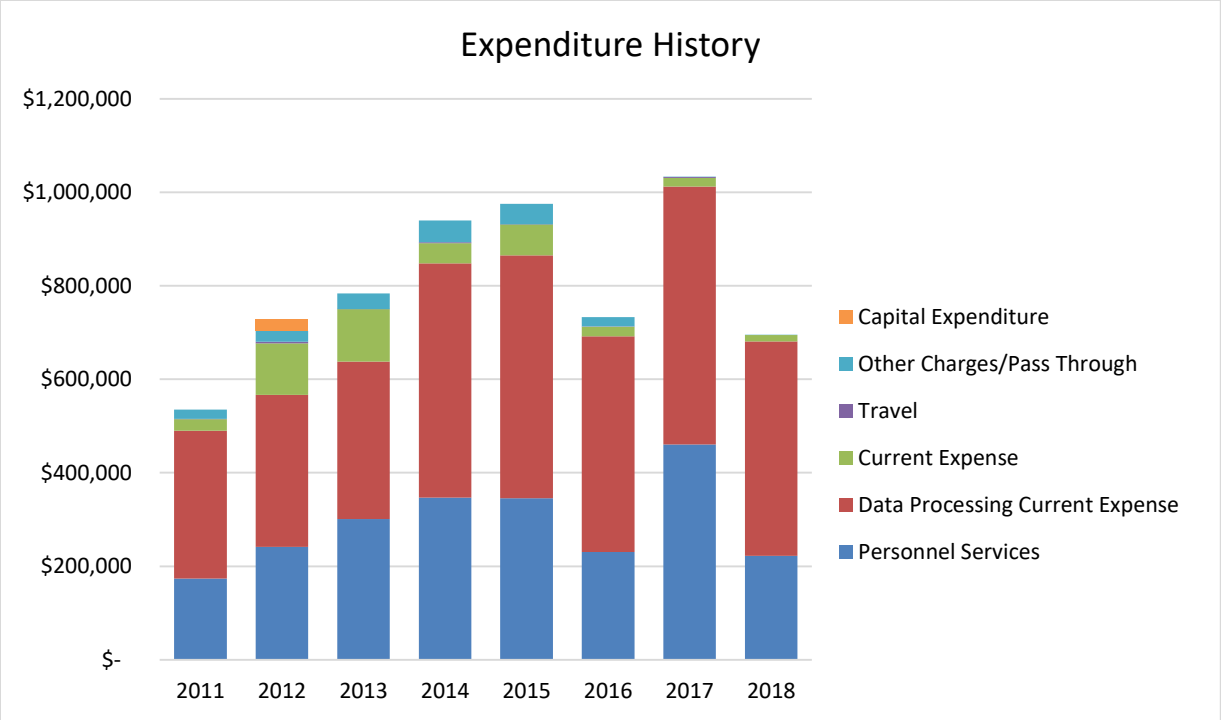
Various amounts of private donations have been received over the years. USIIS was started as a public/private partnership and, initially, about 10 insurance companies were contributing to USIIS. These donations were completely voluntary and a recommended donation amount was calculated using births per insurance company and total births in the state. Over time, many insurance companies have dropped out as economic downturns hit, high-level political support has diminished, insurance company management has turned over, and the health care financial environment has changed. Insurance companies are still encouraged to donate, however, and incentives such as Healthcare Effectiveness Data Information Sets (HEDIS) reports are provided at no cost to those companies that donate (companies that do not donate are charged for these reports). The amount of funding per recent fiscal years has ranged from a low of $47,000 in FY 2012 to a peak of $556,000 in FY 2015. The program received a total of $401,000 in donations during FY 2018.



Expenditures

Since FY 2011, specific types of expenditures have varied depending upon the availability of funding. However, in FY 2018, with the knowledge that federal funding was coming to an end and the success of a building block was uncertain until more than halfway through the year, activities were pared down to essential functions only. The principal expenditures are for personnel services and data processing. The program has funded about 3.5—4 FTEs. This includes the program manager, business analysts, and a data analyst. Data processing expenditures include charges for data processing equipment maintenance by DTS, as well as DTS employee time (approximately 3 FTE). Other expenses include basic costs of running an office such as office supplies, phone charges, etc. Minimal but necessary travel has been charged to this program, with the majority of it being charged to federal funding.

The FY 2019 budget includes 3.5 program FTEs and 2.5 DTS FTEs, an essential-function only level. USIIS staff must configure access, manage authorized access, train and support all organizations that use the system, including each individual user at each organization. They develop, test, and deploy system enhancements as part of ongoing maintenance and needed improvement of the system. They are responsible for data management and record consolidations. They work with electronic health record (EHR) vendors to develop, test and approve EHR-USIIS interfaces. The CDC has mandated new, vigorous standards for IIS's with required implementation through 2022. See also Appendix A for a summary of functional standards from the CDC.



As part of our survey of other states' systems, we inquired how many FTE's each IIS employed. Activities of what each state considered their IIS will vary and that is reflected in the numbers we received. Nine states responded to this particular question, and the FTE values ranged from a low of four to a high of 33, with a median value of nine FTEs. Looking at FTE's per 100,000 population, Utah is currently below the average value reported by other states, 0.26 FTE per 100,000, with Utah funding 0.19 FTEs/100,000 population. This would indicate that the USIIS FY 2019 FTE staffing level of six FTEs is reasonable, if not a little understaffed.

Also as a part of the survey, we inquired about the approximate overall annual budget. Only five states provided a response. The lowest budget provided was $465,000 and the highest was $2,022,500. Looking at budget per capita to aid with comparison, on average, these states reported an annual budget of $0.30 per person for their IIS (range: $0.22-$0.39), while Utah currently has a budget of $0.34 per person. Again, knowing that there will be some variance in activities of an IIS, this gives us reasonable assurance that the USIIS budget is within a sensible range.

Options Explored for Additional Non-State Funding

Advertising on USIIS site

Online advertising uses a measurement called CPM (cost per mile or cost per 1,000 impressions). Based on discussions with a local marketing and advertising agency, the going rate per CPM is between $2.50 and $8.00. For every 1,000 visits to the USIIS page, UDOH would be able to recover $2.50 - $8.00 from an advertiser. Considering as of June 6, 2018, USIIS had 2,527 enrolled facilities/schools and entry/query activities are often done in batches, traffic to the site would not be significant enough to generate a meaningful amount of revenue. An additional consideration is the cost involved to redesign the site to allow for advertising, finding advertisers, and for billing and collecting the revenue.

Furthermore, the Utah.gov web standards developed by DTS state specifically, "Advertising of specific products and services is generally prohibited on State Web sites. The State does not endorse specific products or services. An acknowledgement of specific vendor products is appropriate if used in a nonintrusive manner, and if it adds credibility to site services."

Private Donations

Because these donations are voluntary and are dependent upon a number of different circumstances (including economic and market conditions), they have not been, and will not be, a reliable funding source. The program will continue to encourage such donations and use those donations to help meet one-time needs.

The USIIS Executive Committee indicated that pharmaceutical companies were approached when USIIS was first developed to see if they were willing to donate as well. At that time they were only willing to provide "in-kind support" such as advertising (see disposition regarding advertising above). Since the USIIS system has grown, however, and more pharmaceutical activities (such and inventory tracking and vaccine ordering) have been integrated into the system, pharmaceutical companies are now a key beneficiary of the system. It may be of benefit to the program to explore the possibility of receiving donations from pharmaceutical companies again.

Fees

It would be possible to charge fees to both users and providers of USIIS. This may improve data quality and completeness as both users and providers would have a more vested interest in getting accurate information. Also, it may provide a relatively steady source of income for USIIS. However, because participation in USIIS is currently voluntary, it is expected that any type of fee would act as a disincentive to participation (especially for smaller clinics and providers). This disincentive may lead to providers and users dropping out of USIIS. If participation in USIIS dropped, this potentially would lead to more incomplete histories, an increase in unnecessary immunization, a loss of data for school immunization records, and an increased burden on individuals to keep their own records.

In addition, the CDC FAQ's[14] indicate that participation in an IIS is free to the provider and that the cost of such service is in the time and effort spent to enter the data into the system.

If providers are willing to assist with the cost of the program, they would be able to participate in private donations.

Federal Funds

As noted above in the Funding History section, all CDC funding specifically for IIS's has been distributed and no further funding is expected. The USIIS program is not aware of any additional grants available for this use, but will continue to watch for such opportunities. Currently federal funding from one of the Department's immunization grants is funding approximately 1.5 Full Time Equivalent (FTE) employee. This employee provides customer and website support and works on improving data quality. But because of the objectives of the immunization grants, funding from those grants is limited, and funding for USIIS has been completely explored and tapped.

[14] https://www.cdc.gov/vaccines/programs/iis/resources-refs/faq.html#Q2, Q: What will participation [sic] in an IIS cost a provider practice?

We questioned Medicaid program management regarding the possibility of receiving ongoing Medicaid funding. Their response was as follows:

"There is CMS guidance that would allow the state to draw down admin match at 50% to cover a proportionate share of USIIS. We would likely use the number of Medicaid eligibles compared with total population in the state. We are using a similar method with the mental health crisis lines. HITECH funds can be used to design, program and implement. However they are scheduled to expire in 2021."

As the HITECH program is scheduled to expire in a short amount of time and previous CDC grants were used for similar activities as the HITECH funding, exploration of such funding will require further study. However, Medicaid admin match is something that we will explore further as an ongoing source of funding. Medicaid eligible compared with total population in the state is relatively low, and USIIS would be required to provide the state match for any Medicaid funding drawn, so it is not likely that this amount would be a very large source of funding, despite being a good option to explore.

When the issue of possible additional funding sources was brought up with the USIIS Executive Committee, they indicated that perhaps we should look into funding from different types of federal grants such as HPV grants, Preparedness grants (including one-time emergency funding), and Epidemiology-related grants as all of these programs receive benefits from USIIS in one form or another. The USIIS program will look into these potential opportunities further to see if they are viable sources of funding.

Survey Results

As part of our survey of other states, we asked where they received their funding. Nine states responded and no new sources of funding, other than those that are already received by USIIS or that will be explored as described above, were noted. Only one of the states received funding from private contributions, and none of the states imposed fees on participants in the system.

Section VII: Acknowledgements

The Division of Disease Control and Prevention gratefully acknowledges those who contributed to the development of this report.

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Appendix A:

CDC Functional Standards for Immunization Information Systems

The Centers for Disease Control and Prevention (CDC) issues IIS functional standards that describe the operations, data quality, and technology needed by IISs to support vaccination providers, immunization programs and other immunization stakeholders.

The following is a summary of functional standards an IIS should strive to attain to fully support program and stakeholder immunization-related goals.[15]

- Contain complete and timely data for children, adolescents and adults residing in the jurisdiction. Collect data elements endorsed by the CDC. Establish timely birth records via data exchange with Vital Records. Consolidate demographic records and vaccination histories across data suppliers.
- Identify, prevent, and resolve duplicated and fragmented patient and immunization records using an automated process, at time of submission and periodically. Evaluate and test de-duplication method periodically.
- Protect the privacy of data. Secure data physically and digitally. Maintain a confidentiality policy. Manage site and individual user accounts.
- Support users with help desk and training services.
- Exchange data with health information systems in accordance with CDC interoperability standards of content, format, and transport.
- Support healthcare providers in delivering age and risk-appropriate immunization services. Process Immunization records in a timely fashion for healthcare provider access availability. Forecast pediatric, adolescent, and adult immunizations consistent with the Advisory Committee on Immunization Practices recommendations. Support vaccine recall activities.
- Support control and management of vaccine preventable disease outbreaks, to include public health response during disease outbreaks, immunization-related efforts in school and childcare settings, and immunization activities during public health emergencies.
- Support and inform stakeholder efforts to improve immunization rates by producing CDC-specified Assessment, Feedback, Incentive, and eXchange (AFIX) reports, providing predefined and ad hoc reports including reminder-recall, and providing immunization records to authorized individuals, parents, or custodial guardians.
- Support healthcare providers in meeting Vaccines for Children (VFC) federal and state requirements by providing provider site level vaccine ordering, provider site level vaccine inventory management, collecting VFC eligibility at the vaccine dose level, and producing VFC and vaccine inventory-related reports.

[15] https://www.cdc.gov/vaccines/programs/iis/functional-standards/func-stds-v4-0.html

Appendix B:
State Survey

We need your help as your jurisdiction's Immunization Information System (IIS) contact! The Utah State Legislature has asked the Utah Department of Health (as the administrators of Utah's IIS) to perform an audit of our state's Immunization Information System. The request includes reviewing how other jurisdictions are utilizing similar databases for efficient and effective use. This survey is critical to helping us gather useful information so we can respond adequately to the legislative request. As your jurisdiction's IIS contact, we are asking for your help and are willing to share our results with anyone that completes the survey. You will have the option at the end of the survey to make this request. Keep in mind all questions apply to both pediatrics and adults.

We anticipate this survey should not take more than 15 or 20 minutes to complete.

We are requesting responses be submitted by August 10, 2018.

What jurisdiction do you represent?

_____

Is reporting of vaccination records by providers to your IIS mandatory?

- ○ Yes
- ○ No

Display This Question:

If Is reporting of vaccination records by providers to your IIS mandatory? = No

What incentives are available to providers to participate in the IIS?

_____

_____

IIS Interoperability

Does your jurisdiction have one or more Health Information Exchanges (HIEs)?

- ○ Yes
- ○ No

Skip To: Q9 If Does your jurisdiction have one or more Health Information Exchanges (HIEs)? = No

Is use of your jurisdiction's HIE(s) mandatory for vaccination reporting?

- ○ Yes
- ○ No

Is your jurisdiction's IIS interoperable with the HIE(s) in the jurisdiction?

- ○ Yes
- ○ No

Display This Question:

If Is your jurisdiction's IIS interoperable with the HIE(s) in the jurisdiction? = Yes

Please identify all that apply:

- ☐ Vaccination data is passed through the HIE from providers to the IIS.
- ☐ The HIE queries vaccination data from the IIS and presents or makes available to HIE provider members.
- ☐ The HIE facilitates the access of IIS data for HIE provider members.
- ☐ The HIE facilitates the access of IIS data for health plans.
- ☐ The HIE facilitates the access of IIS data for the public.
- ☐ Vaccination data is stored only in the HIE.
- ☐ Vaccination data is stored only in the IIS.
- ☐ Vaccination data is duplicated and stored in both the IIS and the HIE.
- ☐ Vaccination data is stored in both the IIS and the HIE but is not duplicated.
- ☐ The HIE is certified by the ONC as a Certified EHR Technology.
- ☐ Other (please describe): _____

Does your jurisdiction's IIS interface with Electronic Health Record (EHR) systems?

- ○ Yes
- ○ No

Display This Question:

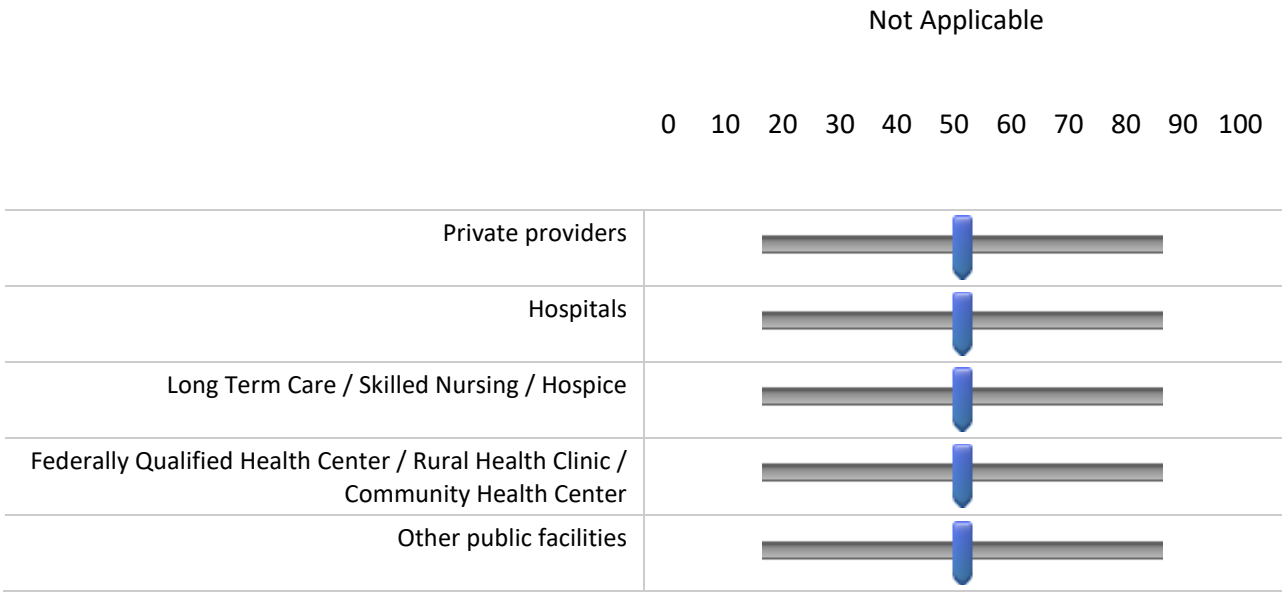
If Does your jurisdiction's IIS interface with Electronic Health Record (EHR) systems? = Yes

Please estimate the number of interfaces in Production of the types below. Do not estimate the number of facilities implemented with such interfaces, but the interfaces you have approved for implementation at facilities.

	Number of interfaces
Number of vendor-supported EHR system interfaces	
Number of data integration company-supported interfaces	
Number of practice, practice group or health system-supported interfaces	
Bi-directional interfaces	
Other (please describe):	

IIS Provider Participation

What are the estimated participation rates of non-VFC providers (facilities) for your IIS?



What are barriers to provider participation in your IIS? Please select all that apply:

- [ ] No EHR system interface available
- [ ] Duplicate data entry
- [ ] Cost of interface
- [ ] Insufficient staff time
- [ ] Staff costs
- [ ] IT costs
- [ ] IIS is opt-in
- [ ] Workflow issues
- [ ] Perception of benefits
- [ ] IIS incompleteness
- [ ] IIS data quality issues
- [ ] Other (please describe): _____

What has your jurisdiction done to minimize barriers for providers in using your jurisdiction's IIS? Please explain.

_____

Do schools in your jurisdiction have access to the IIS to verify immunizations status for students?

- ○ Yes
- ○ No

Display This Question:

If Do schools in your jurisdiction have access to the IIS to verify immunizations status for students? = Yes

Are schools allowed to submit data to your IIS?

- ○ Yes
- ○ No

Display This Question:

If Are schools allowed to submit data to your IIS? = Yes

How does your jurisdiction address privacy concerns related to FERPA?

_____

_____

What methods do you use to help providers to improve data quality?

_____

_____

Vaccination Records

If known, approximately what <u>percentage</u> of vaccinations given in your jurisdiction are currently recorded in the IIS.

	Unknown 0 10 20 30 40 50 60 70 80 90 100
1	

What percentage of vaccination data is submitted via:

Unknown

0 10 20 30 40 50 60 70 80 90 100

Manual data entry by provider	
Manual data entry by IIS staff	
Data interfaces	
Other (please describe):	

Resources

What is your jurisdiction's approximate overall annual budget for the IIS?

_____

Please indicate your jurisdiction's IIS funding sources.

	Check if current IIS funding source	Approximate percentage of funding (optional)

CDC Immunization grant	☐	
Other CDC grants/cooperative agreements	☐	
State funds	☐	
Medicaid Meaningful Use / HITECH	☐	
Other Medicaid	☐	
Other Federal grants (besides CDC grants or Medicaid)	☐	
Fees: Health system/provider groups	☐	
Fees: Individual providers/facilities	☐	

Fees: Immunization record requests	☐	
Private Contributions: Health systems/provider groups	☐	
Private Contributions: Payers/health plans	☐	
Private Contributions: Foundations	☐	
Private Contributions: Nonprofit organizations	☐	
EHR vendor advertising	☐	
Other (please describe)	☐	

How is your jurisdiction's IIS staffed? Please indicate approximate FTE of each, as applicable (decimals are allowed when time is split between multiple functions).

_____ IT Staff
_____ IT Contractor (cost if can't identify FTEs)
_____ IT Vendor (cost if can't identify FTEs)
_____ Administration
_____ Forecast / Immunization Schedule
_____ System Testing/Quality Assurance
_____ Training
_____ Help Desk
_____ Interface operational support
_____ Data Quality
_____ Provider Outreach
_____ Other

IIS Issues and Solutions

Have you come up with creative solutions to address any of the following potential issues? (Check all that apply)

- ☐ Challenges with provider participation
- ☐ Lack of funding
- ☐ Improved data accuracy / improved completeness / reduced duplicates
- ☐ Increased EHR interfaces
- ☐ Improved reliability of EHR interfaces
- ☐ Provider outreach / training
- ☐ Other (please describe): _____

Display This Question:

If If Have you come up with creative solutions to address any of the following potential issues? (Check... q://QID24/SelectedChoicesCount Is Not Empty

Please describe what creative solutions you have used to address the issues indicated in the previous question.

_____

_____

How has your jurisdiction made your IIS system more efficient and effective over time?

_____

_____

Is there any other information you want to share with us?

_____

_____

Follow up

Are you willing to talk a few minutes if we have a follow-up question or point to clarify?

- ○ Yes
- ○ No

Would you like a copy of our survey report?

- ○ Yes
- ○ No

Display This Question:

If Are you willing to talk a few minutes if we have a follow-up question or point to clarify? = Yes

Or Would you like a copy of our survey report? = Yes

Please provide the following:

- ○ Name: _____
- ○ Title: _____
- ○ Organization: _____
- ○ Phone: _____
- ○ Email: _____

Appendix C:

Background Information on Data Quality and Data Accuracy

USIIS Data Quality

IISs were developed to improve healthcare delivery by moving immunization histories from paper medical records to electronic records and by consolidating immunization histories into a centralized source. The benefits of IISs are well documented and IISs are supported/endorsed by many organizations.[16] However, benefits depend on the quality of information in an IIS. The information in an IIS should be a true reflection of what actually transpired in the medical practice. [17] For an IIS to be useful to providers, providers must have confidence in the data it contains.

Accurate and complete data in IISs promote participation among healthcare providers. Higher participation results in more complete records for patients. The benefits of higher data quality include:

- Increased provider trust
- Increased use of the data
- Improvements in clinical practices
- Improved health of patients
- Improved public health

The CDC cites in its Modeling of Immunization Registry Operations Workgroup's "Data Quality Assurance of IIS: Incoming Data" guide that it is the responsibility of an IIS and its data submitters to ensure the reliability of data held in the IIS. This dual responsibility is necessary for IIS data to be trusted, for increased use of IIS, and for improved public health.

Background

We will define USIIS data quality in terms of completeness and accuracy. Data completeness addresses how USIIS data is used in a healthcare provider's workflow. Data accuracy addresses characteristics of data reported to USIIS from providers.

Data Completeness

USIIS data completeness relates to two steps in a provider's immunization workflow:

1. Finding a patient in USIIS
2. When found, the completeness of a patient's immunization history

Reasons a provider (or school) might not be able to find a patient/student in USIIS include:

- Patient was born in Utah prior to 1998 and patient information was never submitted to USIIS.
- Patient was born outside Utah and patient information was never submitted to USIIS.
- Patient information was submitted to USIIS but was not processed into USIIS due to invalid data or violation of a USIIS business rule.
- Patient is in USIIS but the user does not conduct an effective patient search.
- Patient is in USIIS but patient search information submitted by the user does not match the patient information in USIIS--e.g., name or birth date includes a typo or unmatchable alias.
- Patient information was not received by or was not processed into USIIS due to a failure.

Reasons a USIIS patient immunization history may not be complete include:

[16] https://www.cdc.gov/vaccines/programs/iis/resources-refs/partner-org-support.html

[17] http://repository.immregistries.org/files/resources/5835adc2dbbe4/data_quality_assurance_in_immunization_information_systems__incoming_data_.pdf

- Patient received immunization(s) from a provider who does not participate in USIIS.
- Provider who administered past immunization(s) to the patient participates in USIIS now but did not when the immunizations were administered.
- An authorized user deleted the immunization(s) from USIIS.
- USIIS has duplicate records for the patient, with immunizations split among the two records.
- Immunizations were reported to USIIS but not received by or processed into USIIS due to a failure.

Some of the reasons why USIIS data may not be complete stem from data accuracy issues—that is, the accuracy of data reported to USIIS.

Data Accuracy

USIIS data accuracy relates to the truth of data reported, i.e., "reporting vs. reality." Ideally, the name of the person and immunization information reported to USIIS should reflect vaccination work conducted at provider facilities. Data accuracy is reliant on the specific data elements provider facilities report to USIIS. If data reported to USIIS does not include complete patient information or does not reflect actual vaccination work carried out in a healthcare provider's facility, the data in USIIS will not be accurate. Specifically, the data described below should represent the provider's practice.

- *Patient information should be complete, accurate and unambiguous*.
  This includes a unique patient identifier and patient demographic information such as patient's first, middle, and last names, suffix, birth date, parent/guardian/next-of-kin, address, phone number and email.
  The impact of incomplete or inaccurate patient information reported to USIIS is that USIIS may create a duplicate record for the patient with the patient's immunizations split among the records—neither record being complete.

- *Vaccination information should be complete and accurate.*
  This includes vaccine type, vaccination date, vaccine manufacturer, vaccine lot number, vaccinator's name, vaccination route, vaccination site, vaccine information statement published date, and vaccine information statement presented date. Furthermore, each vaccination event must be specified as administered or historical (provider reporting the information did not administer the vaccination but is reporting the information as part of the patient's immunization history).
  The impact of incomplete or inaccurate vaccination event information reported to USIIS is varied and multi-faceted. First and foremost, if a patient's immunization information is inaccurate the patient may receive inappropriate vaccinations or may not receive appropriate vaccinations. Also, if there is a vaccine recall, USIIS reports may not include patients who need revaccination.

  Additionally, the USIIS Clinic History Report—used to manage clinic resources and help reconcile vaccine inventory - may be inaccurate, hindering clinic practices. If the facility uses USIIS Vaccine Inventory, inventory may not reduce and inventory counts will be inaccurate. If the provider is a Vaccines for Children (VFC) provider the USIIS Doses Administered Report will be inaccurate, adding extra work for clinic VFC staff and possibly impacting the approval of future VFC vaccine orders

- *Immunities, contraindications and reactions should be reported when they exist for a patient.*
  The impact of non-reported or inaccurate immunities, contraindications, or reactions is that the patient's immunization history is inaccurate and the patient may receive inappropriate vaccinations.

Appendix D:
Vaccine types supported by USIIS, and those most commonly reported, in CY2017

Vaccine CVX Code	Vaccine Name	VFC Vaccine	Y = Allowed for Administered N = Allowed only for Historical	Most Common in 2017, 1 = most common
Top 71 vaccines reported				
150	Influenza, injectable, quadrivalent, preservative free	Y	Y	1
120	DTaP-Hib-IPV (Pentacel)	Y	Y	2
133	PCV-13 Pneumococcal	Y	Y	3
110	DTaP-Hep B-IPV (Pediarix)	Y	Y	4
115	Tdap (Boostrix & Adacel)	Y	Y	5
8	Hep B, adolescent or pediatric	Y	Y	6
158	Influenza, injectable, quadrivalent	Y	Y	7
83	Hep A, ped/adol, 2 dose	Y	Y	8
116	rotavirus, pentavalent (Rotateq)	Y	Y	9
135	Influenza, injectable, high dose	Y	Y	10
94	MMRV	Y	Y	11
3	MMR	Y	Y	12
48	Hib PRP-T (ActHIB & Hiberix)	Y	Y	13
20	DTaP	Y	Y	14
21	varicella	Y	Y	15
10	IPV	Y	Y	16
165	HPV9	Y	Y	17
130	DTaP-IPV	Y	Y	18
141	Influenza, seasonal, injectable	Y	Y	19
114	MCV4P meningococcal (Menactra)	Y	Y	20
104	Hep A-Hep B (Twinrix)	Y	Y	21
140	Influenza, seasonal, injectable, preservative free	Y	Y	22
33	PPSV23 pneumococcal (Pneumovax)	Y	Y	23
161	Influenza, injectable, quadrivalent, preserv free, pediatric	Y	Y	24
49	Hib PRP-OMP (PedvaxHIB)	Y	Y	25
106	DTaP, 5 pertussis antigens (DAPTACEL)	Y	Y	26
17	Hib, NOS	Y	N	27
107	DTaP, NOS	Y	N	28

121	zoster live (ZOSTAVAX)	Y	Y	29
43	Hep B, adult	Y	Y	30
52	Hep A, adult	Y	Y	31
100	PCV-7 pneumococcal	Y	Y	32
88	Influenza, seasonal, NOS	Y	N	33
171	Influenza, injectable, MDCK, preservative free, quadrivalent	Y	Y	34
89	Polio, NOS	Y	N	35
45	Hep B, NOS	Y	N	36
168	Influenza, trivalent, adjuvanted	N	Y	37
136	MCV4O meningococcal (Menveo)	Y	Y	38
62	HPV, quadrivalent (Gardasil)	Y	Y	39
109	Pneumococcal, NOS	Y	N	40
85	Hep A, NOS	Y	N	41
101	typhoid, ViCPs	N	Y	42
163	Meningococcal B OMV (Bexsero)	Y	Y	43
31	Hep A, pediatric, NOS	Y	N	44
113	Td, adult preservative free (Decavac)	Y	Y	45
122	rotavirus, NOS	Y	N	46
2	OPV	N	Y	47
47	Hib HbOC (HIBTITER)	Y	Y	48
97	TST-PPD tine test	N	Y	49
162	Meningococcal B recombinant (Trumenba)	Y	Y	50
119	rotavirus, monovalent (Rotarix)	Y	Y	51
149	Influenza, live, quadrivalent, intranasal (FluMist)	Y	Y	52
37	yellow fever	N	Y	53
51	Hib-Hep B (Comvax)	Y	Y	54
132	DTaP-IPV-HIB-HEP B (historical only)	N	Y	55
9	Td, adult absorbed	Y	Y	56
50	DTaP-Hib (TriHIBIT)	N	Y	57
1	DTP	N	Y	58
153	Influenza, injectable, MDCK, preservative free	Y	N	59
102	Non-US: DTP-HIB-Hep B	N	N	60
15	Influenza, split (incl. purified surface antigen)	Y	N	61
137	HPV, NOS	Y	N	62
96	TST-PPD intradermal	N	Y	63
108	Meningococcal, NOS	Y	N	64

111	Influenza, live, intranasal (FluMist)	Y	Y	65
139	Td, adult NOS	Y	N	66
152	Pneumococcal Conjugate, unspecified	N	N	67
19	BCG	N	Y	68
22	DTP-Hib (TETRAMUNE)	N	Y	69
18	rabies, intramuscular injection	N	Y	70
185	Influenza, recombinant, quadrivalent, inject, preserve free	N	Y	71
Other vaccines, alphabetical				
82	adenovirus, NOS	N	N	
54	adenovirus, type 4	N	Y	
55	adenovirus, type 7	N	Y	
143	adenovirus, types 4 and 7	N	Y	
24	anthrax	N	Y	
181	anthrax immune globulin	N	Y	
27	botulinum antitoxin	N	Y	
26	cholera	N	N	
174	cholera, live attenuated	N	Y	
29	CMVIG	N	Y	
12	diphtheria antitoxin	N	Y	
28	DT (pediatric)	Y	Y	
30	HBIG	N	Y	
84	Hep A, ped/adol, 3 dose	Y	Y	
943	Hep B, adolescent , 2 dose	Y	Y	
42	Hep B, adolescent/high risk infant	Y	Y	
189	Hep B, adult, 2 dose, CpG adjuvanted (HEPLISAV-B)	N	Y	
44	Hep B, dialysis	Y	Y	
46	Hib PRP-D (ProHIBIT)	Y	Y	
118	HPV, bivalent (Cervarix)	Y	Y	
86	IG	N	Y	
14	IG, NOS	N	N	
87	IGIV	N	Y	
151	Influenza nasal, unspecified	Y	N	
123	Influenza, H5N1-1203	N	Y	
186	Influenza, injectable, MDCK, quadrivalent	N	Y	
166	Influenza, quadrivalent, intradermal, preservative free	N	Y	

155	Influenza, recombinant, injectable, preservative free	Y	Y	
140	Influenza, seasonal, intradermal, preservative free	Y	Y	
16	Influenza, whole	Y	Y	
39	Japanese Encephalitis SC	N	Y	
129	Japanese Encephalitis, NOS	N	N	
134	Japanese Encephalitis-IM	N	Y	
66	Lyme disease	N	Y	
4	M/R	N	Y	
5	measles	N	Y	
164	Meningococcal B, unspecified	Y	N	
103	Meningococcal C conjugate	N	Y	
148	Meningococcal C/Y-HIB PRP (MenHibrix)	Y	Y	
147	Meningococcal MCV4, unspecified	Y	N	
167	Meningococcal, unknown serogroups	N	Y	
32	MPSV4 meningococcal (Menomune)	N	Y	
7	Mumps	N	Y	
170	Non-US: DTaP-IPV-HIB	N	N	
169	Non-US: HEP A, live attenuated	N	N	
178	Non-US: OPV bivalent	N	N	
179	Non-US: OPV monovalent, unspecified	N	N	
177	Non-US: PCV10	N	N	
127	Novel influenza-H1N1-09	N	Y	
128	Novel influenza-H1N1-09, all formulations	N	Y	
125	Novel Influenza-H1N1-09, nasal	N	Y	
126	Novel influenza-H1N1-09, preservative-free	N	Y	
182	OPV, unspecified	N	N	
69	parainfluenza-3	N	Y	
11	Pertussis	N	Y	
23	plague	N	Y	
175	rabies - IM Diploid cell culture	N	Y	
176	rabies - IM fibroblast culture	N	Y	
40	rabies, intradermal injection	N	Y	
90	rabies, NOS	N	N	
156	Rho(D) - IG	N	Y	
157	Rho(D) - IG IM	N	Y	

159	Rho(D) - Unspecified	N	N	
34	RIG	N	Y	
74	rotavirus, tetravalent (Rotashield)	N	Y	
71	RSV-IGIV	N	Y	
93	RSV-MAb	N	Y	
6	rubella	N	Y	
38	rubella/mumps	N	Y	
76	Staphylococcus bacterio lysate	N	Y	
138	Td, adult not absorbed	Y	Y	
180	Tetanus immune globulin	N	Y	
35	tetanus toxoid, adsorbed	N	Y	
112	tetanus toxoid, NOS	N	N	
142	tetanus toxoid, not adsorbed	N	Y	
77	tick-borne encephalitis	N	Y	
13	TIG	N	Y	
98	TST, NOS	N	N	
95	TST-OT tine test	N	Y	
78	tularemia vaccine	N	Y	
91	typhoid, NOS	N	N	
25	typhoid, oral	N	Y	
41	typhoid, parenteral	N	Y	
53	typhoid, parenteral, AKD (U.S. military)	N	Y	
131	Typhus, historical	N	Y	
75	vaccinia (smallpox)	N	Y	
105	vaccinia (smallpox) diluted	N	Y	
79	vaccinia immune globulin	N	Y	
81	VEE, inactivated	N	Y	
80	VEE, live	N	Y	
92	VEE, NOS	N	N	
36	VZIG	N	Y	
117	VZIG (IND)	N	Y	
183	yellow fever vaccine - alt	N	Y	
184	Yellow fever, unspecified	N	N	
187	zoster recombinant (SHINGRIX)	N	Y	
188	Zoster, unspecified	N	N	

Appendix E:
Sample Data Quality Report

Sample Clinic (USIIS ID: XXXX)

Vaccination date range: 8/1/2018 – 8/31/2018

Immunization Information

1. Number of **administered immunizations**: 100
   Number of **non-administered immunizations***: 11

   ***** *Immunization record is based on a historical record, meaning it was not administered by your clinic.*

2. **1%** of your records did not include a **manufacturer code**.
   It is important to record this information in your system.

3. **1%** of your records did not include a **VIS version date**.
   It is important to record this information in your system.

4. **Financial Class Code** values (aka VFC Eligibility or Funding Source) and counts of immunizations you administered to patients with those values follow:

   Non-VFC – private or other insured patient (V01): 11
   VFC Medicaid (V02): 30
   VFC Uninsured (V03): 67
   VFC Under-insured (V05): 3

   Do these counts reflect your patient mix? This is important for dose accountability.

   Important notes:
   - Immunizations with no value are not counted at all in USIIS Doses Administered Reports.
   - Immunizations with invalid values are not counted at all in USIIS Doses Administered Reports.
   - Immunizations with codes V01, H01, H02 and H03 are counted as Private doses in USIIS Doses Administered Reports.

5. It appears that your clinic uses the **USIIS vaccine inventory** module. In checking the vaccine lot information submitted to USIIS we found the following issues.
   a. Lot numbers submitted which are not in USIIS inventory - with a sample of Patient IDs administered those lots:
      i. 69H24 – Patient ID: 32663
      ii. T52790 – Patient ID: 12901, 12988
      iii. U5854AA – Patient ID: 06081976TDO, 12988, 32109
      iv. U5839AA – Patient ID: 10159, 20608

Important notes:

- USIIS inventory will decrement only if the *Lot Number & Financial Class (VFC Eligibility*) entered into your system matches the *Lot Number & Funding Category* in USIIS inventory.
- Doses of vaccines submitted with blank Financial Class codes will not decrement from USIIS inventory.
- Doses of vaccines submitted with invalid Financial Class codes will not decrement from USIIS inventory.

Demographic Data Quality Incompleteness

The data elements listed below are important to enter into your system so USIIS can link your patients with other records they may have in USIIS, to maintain complete immunization histories. They are likely also useful to have in your system to assist with patient care and communication.

1. **94%** of your patients do not include **Middle Name/initial**.
   If possible, please have your staff enter middle name/initial into your system.

2. **66%** of your child patients do not include **Mother/Father/Guardian information**.
   If possible, please have your staff enter Mother/Father/Guardian information for child patients.

3. **7%** of your records did not include a **phone number.**
   It is important to record this information in your system.

4. **7%** of your records did not include an **address**.
   It is important to record this information in your system.