

CAIR²

California Immunization Registry (CAIR) System

2017 Business Plan

(for 7/1/2017-6/30/2018)

Updated June 19, 2017



California Department of Public Health

Immunization Branch

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Introduction

A fully functional immunization information system (IIS) should meet all operational guidance statements. Centers for Disease Control and Prevention (CDC) has identified four foundational IIS areas.

- Childhood data completeness (i.e., 0 to 6 years of age)
- Pediatric Clinical Decision Support (CDS) for immunizations
- Coverage estimates for childhood vaccinations (i.e., jurisdictional and provider-based)
- Bidirectional exchange with Electronic Health Record Systems (EHR-S) within the awardee's jurisdiction using published CDC standards

Where possible, activities in this Business Plan will address these priorities. This Business Plan and its planned activities are divided into three main topic areas:

- **Special Project Funding** – This section addresses associated projects and planned activities and milestones related to each.
- **Foundational Functionality** – This section uses CDC-identified priorities and current measures to develop planned activities and milestones that move California closer to IIS foundational operational guidance goals.
- **Full Functionality** – This section discusses other planned activities and milestones that reflect awardees' chosen priorities.

Vision

The California Statewide Immunization Information System, also known as the California Immunization Registry (CAIR) System, provides healthcare providers, patients, schools, child care facilities and other authorized users access to immunization records of children and adults receiving care, attending school or child care, or residing in California for the purpose of keeping patients up to date on their immunizations and for tracking their immunization status.

Mission (revised for CAIR2)

To create and maintain a fully-populated and fully-utilized interactive, confidential and secure Immunization Information System that improves immunization coverage to protect all Californians from vaccine preventable diseases. Aims include

- Establish a single, consolidated statewide Immunization Information System that is scalable and flexible
- Create a centralized view and repository of accurate, current, trusted and usable data; and foster use of the data maintained in the registry
- Engage providers, increase electronic data submission to the Registry and enhance the user experience

- Improve or replace existing support applications and ensure the ability to communicate with other applications both internal and external to California
- Automate and streamline internal and external processes to gain operational efficiency

Major Objectives for July 1,2017to June 30, 2018

CAIR is committed to ensuring that high quality and complete data is kept in accordance with NVAC standard data elements and national goals for IIS. Major objectives for the California Department of Public Health (CDPH) Immunization Branch for this period include:

1. Complete the transformation of the CAIR System from a disaggregated consortium of regional registries to a stable, centralized statewide registry. Stabilization of the CAIR2 IIS will be defined as: 1) elimination of major bugs, 2) addition of some needed enhancements, 3) elimination of large numbers of duplicates and 'pendings'. 'Pendings' are doses that have not entered the system because more than one patient exists in the database that matches an incoming patient.
2. Complete integration of data from the 2 remaining independent regional registries (CAIR San Joaquin and CAIR San Diego) and full absorption of the CAIR Imperial county registry data and users into CAIR2.(*IPOM D-1*).
3. Replace current free-standing, home-grown online IIS support applications with a single, integrated online resource that combines contact (user support) management, provider registration, training management, and data exchange (DX) activities into a single online resource. (*IPOM D-1*).
4. Develop and implement formal roles and responsibilities/policies and procedures guidance for staff in each CAIR2 Unit (Technical, Provider Support, Data Exchange, and Training/Local Support).
5. Continue to monitor and improve participation by existing provider and expand CAIR2 participation to other potential data submitters like Health Plans (*IPOM D-2*).
6. In anticipation of mandating participation in CAIR by Vaccines for Children (VFC) providers in 2020, identify all VFC providers not currently participating in CAIR2 and work with the Field Services section to develop a plan for their recruitment. To support VFC-CAIR integration, initiate software changes that allow for (*IPOM D4*):
 - a. On demand export from CAIR2 of VFC-relevant summary data to VFC recertification application, e.g. VFC population estimates.
 - b. On demand export of doses in inventory and doses administered data to the *myVFCvaccine* VFC vaccine ordering application.
 - c. Import into CAIR2 of VFC shipping logs to autopopulate inventory.
7. Expand data exchange (DX) interactions with CAIR2 to include bi-directional (BiDX) messaging and implement an ongoing DX data quality improvement process for existing DX data submitters using the HL7 message analysis Data Quality Assessment (DQA) tool and also to incorporate this tool into the new site onboarding process.

8. Choose among the various available Assessment-Feedback-Incentives-Exchange (AFIX) modules/software upgrades (e.g. STC, DXC, State of MN) and develop a plan and timeline for implementation in CAIR2.
9. Develop a plan and timeline for implementing direct patient access to CAIR2 immunization records.

Current Status/Progress

Table 1. Numbers of Patients and Doses in CAIR2, March 2017

Measure	0-5 yrs	6-18 yrs	19+ yrs	All Ages
CA Population*	2,602,739	5,731,100	26,203,887	34,537,726
Patients In	2,848,116	5,565,630	14,172,013	22,585,759
% of Pop. In	109.4%	97.0%	54.0%	65.4%
Patients w/ ≥ 2 doses	1,974,761	4,830,419	8,470,747	15,275,927
% w/ ≥ 2 doses	75.9%	84.2%	32.3%	44.2%
Vaccine Doses	37,943,137	103,789,871	66,399,164	208,135,512

* California Department of Finance 2016 population estimates for the 48 counties in CAIR2

Over the past year, 7 of the 10 regional registries in CA were consolidated into a single centralized registry called CAIR2 whose legacy software was replaced with a customized version of the Wisconsin Immunization Registry (WIR) software.

While the 9-month, 3-phase transition successfully consolidated >200M doses, 22M patients, >13,000 site accounts, and >30,000 users, there remain a large number of system bugs that need to be fixed and at least 100K duplicate patients that need to be manually resolved. In 2017, we commit resources to resolving the existing duplicate records and make adjustments to the CAIR2 matching algorithm so it works more effectively.

The CAIR2 transition process also exposed the importance of integrating our existing home-grown provider support applications (see Figure 1) as well as serious limitations in our current contact management

Figure 1. Lack of CAIR Support App Integration

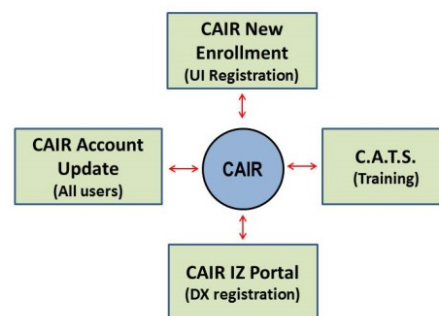


Table 2. Number and Types of DX Sites Onboarded in 2016

Provider Type	VFC(+)	VFC(-)	Total
Retail Pharmacy	0	577	577
Family Practice	61	128	189
Internal Medicine	2	133	135
Other	1	102	103
Pediatrics	54	15	69
Local Health Department	29	40	69
Fed-Qual or Rural HC	57	9	65
Multispecialty Practice	7	57	64
Community HC	21	28	49
Hospital	4	26	30
Ob/Gyn	2	14	16
Urgent Care	0	13	13
Tribal/IHS Clinic	8	2	10
Family Planning	0	4	4
Correctional Facility	0	1	1
TOTAL	246	1,149	1,394

infrastructure and processes. Significant effort in 2017 will be directed toward integrating various provider support activities and contact management into a single online resource that communicates and updates the provider and user data elements in CAIR2.

Other notable achievements in 2016 include the onboarding of 1,394 new DX sites across a range of medical specialties and settings (Table 2).

Almost half of the new DX sites onboarded in 2016 were retail pharmacy locations. Onboarding

a site usually involves testing and validating test messages before allowing the site is move to the production environment and send real patient data. CAIR can expect continuing active engagement with pharmacies because in August of 2016, pharmacists were mandated to report to their local IIS. Because of the CAIR2 transition, pharmacies in phases 2 and 3 of the transition were allowed to defer registration and engagement until phase 3 was completed in March 2017. Pharmacy data exchange onboarding and pharmacy user training will be among the CAIR DX priorities in 2017.

Table 3. DX Sites In Test by VFC Status

<i>When Enrolled for DX</i>	<i>TOTAL</i>	<i>VFC(+)</i>	<i>VFC(-)</i>
Before 10/12016	81	27	54
After 10/1/2016	525	21	504
TOTALS	606	48	558

*As of 5/1/2017

Although a large number of DX sites were onboarded in 2016, CAIR2 continues to register new sites daily. Table 3 summarizes the current number of VFC and non-VFC sites that are in test and not yet submitting data

electronically to CAIR2. In addition, while 93% of sites that were submitting data to CAIR1 successfully transitioned to CAIR2 (4,525 of 4,868), about 343 sites (including 94 VFC sites) did not make the transition. Getting all of these sites onboarded to CAIR2 will be one of our goals in 2017.

Special Project Funding

Table 4. Special Projects Activities

Type	Period	Completed and Planned Activities
PPHF Interoperability	Oct 2015- Sept 2017	<ul style="list-style-type: none"> • 2 contract staff assisted with 7 regions data migration efforts • 2 staff will also assist with data migration for 3 independent regions • 1 contract staff is responsibility for onboarding pharmacies who were recently mandated to report to CAIR (see Table 2 above)
AIRA Consultation	Completed	<ul style="list-style-type: none"> • Provided pre-launch technical assistance
California Enhanced Technical Assistance (PHII/ HLN)	Completed	<ul style="list-style-type: none"> • Analyzed existing onboarding process and made recommendations on a standard DQ process to be applied to both onboarding and ongoing submission • Analyzed existing DQ tools and made recommendations • Analyzed HL7 message validation compliance with national standards and made recommendations about improvement • Analyzed existing AMCI IIS management tool and developed long-term implementation plan • Review and recommend changes to CA's proposed bidirectional onboarding plan • Assess staffing needs to accommodate both DX onboarding and ongoing support of DX submitters
	Through 6/30/2017	<ul style="list-style-type: none"> • Continuing to assist with sequence next steps in AMCI Tool deployment, including CRM, online enrollment, and full integration of DX message testing/validation/onboarding.
CMS 90/10% Funding to Augment Data Exchange Recruitment Activities in CAIR and CALREDIE	Submitted	<ul style="list-style-type: none"> • 3 Data Quality positions in the DX Unit. • Project Lead to assist with ongoing planning and deployment of CAIR2, including integration of provider support activities into a single application • Data Analyst to run system wide data reports and to identify existing data quality issues.

Table 5. Pharmacy (RX) Onboarding by Month

Date	RX Submitter Accounts		Number of RX Sites in Production ¹
	Registered	In 'production'	
October 2016	604	579	1,882
Dec 2016	645	579	2,747
January 2017	651	599	2,767
February 2017	758	603	2,771
March 2017	789	606	2,774

¹ Chain RX feeds extrapolated to all associated RX sites in CA.

Foundational Functionality (CDC selections for CA)

CDC selected operational guidance statements to ensure that every awardee’s IIS has basic functionality, and has directed awardees to focus on children 0-5 years of age as a priority. According to CDC, all awardees should strive to achieve the operational guidance statements listed in the first column of each box in this section. Their 2017 IIS Business plan should acknowledge progress toward meeting foundational operational guidance statements along with any planned activities and milestones. CDCs Operational guidance statements are categorized by their associated program goals. The full list of IIS Operation Guidance Statements is in Appendix G.

This business plan describes progress toward meeting foundational operational guidance statements along with planned activities and milestones to accomplish by June 30, 2018.

Note: all of the ‘Current Status and Measureable Goals’ as well as most of the planned activities, except Operational Guidance 3.1.2 Planned Activity 5 pertain only to the CAIR2 registry. The CAIR2 registry is the consolidated registry formed from 7 of the 10 regional registries in California covering 48 of CA’s 58 counties. The entire CAIR System is the CAIR2 IIS plus the remaining 3-independent CA registries. To describe “Current Status”, we use either the CDPH Immunization Branch’s 2016 IIS Annual report (IISAR) or more recent baseline information.

Program Goal 1: Support the delivery of clinical immunization services at the point of immunization administration, regardless of setting.

Functional Standard 1.1

“The IIS provides individual immunization records accessible to authorized users at the point and time where immunization services are being delivered.”

Operational Guidance Statements	Current Status and Measureable Goals	
	<u>2016</u>	<u>2017 Goals</u>

Operational Guidance Statements	Current Status and Measureable Goals	
1.1.1 Provider sites that administer Advisory Committee on Immunization Practices (ACIP)-recommended pediatric and adult immunizations in the jurisdiction are enrolled in and are regularly submitting data to the Immunization Information system (IIS).	VFC Sites*:	3,357 3,357
	VFC(+) Enrolled^:	2,711 2,711
	VFC(+) Reporting#:	1,800 (66%) 2,250 (75%)
	VFC(-) Enrolled^:	6,025 6,025
	VFC(-) Reporting:	3,791 (63%) 4,300 (70%)
	VFA Sites* :	391
	VFA (+) Enrolled^:	389
VFA (+) Reporting#:	342 (88%) 358 (92%)	

*Total VFC and VFA Sites in the CAIR2 region.

^VFC (+) or VFA (+) are sites with an identified CAIR ID; VFA (-) or VFC (-) are sites without an identified CAIR ID.

≥ 1 dose submitted to CAIR either through data exchange or via the user interface during the 7/1/2016 – 12/31/2016 period.

&Number of sites in the CAIR2 region that are enrolled in the CA Vaccines for Adults (VFA) program. These are mostly federally qualified health centers and other “look-alikes” that provide federally funded vaccines for un- and underinsured adults.

1.1.1 Current Status

While the CAIR2 transition was completed in March 20, 2017, a number of software bugs and other needed software enhancements remain that will need to be addressed during the next year in order stabilize the system for users. Also, because our online account and training management applications are stand alone and do not communicate, we will be implementing a plan to centralize all provider support activities, including contact management, into a single application to make it easier for our staff to manage and so that providers are better supported. Another issue that we plan to address in 2017 is CAIR’s low level of provider participation. As noted above, only 1,800 of 2,711 VFC sites with a CAIR2 ID (66%) and 3,791 of 6,035 non-VFC sites with a CAIR2 ID (63%) entered or submitted 1 or more dose of vaccine to CAIR2 between July 1, 2016 and December 31, 2016. Also, as CDPH moves toward mandating CAIR participation by VFC sites in 2020, CAIR2 will intensify efforts increase participation by VFC sites, identify non-enrolled VFC sites (currently 2,711 of 3,357 VFC sites (81%) in the CAIR2 region are enrolled in CAIR2), and develop a plan for recruiting the remaining non-CAIR2 VFC sites.

1.1.1. Planned Activities

1. Continue ongoing efforts to prioritize remaining CAIR2 software ‘bugs’ and also to prioritize ‘wish list’ enhancements that increase software stability and usability.
 - a. Convene CAIR2 staff at intervals to prioritize/re-prioritize any changes so vendor has clear direction on program priorities.
 - b. As enhancements ideas emerge, solicit feedback from User Group on priorities.

- c. If additional CMS Funding is approved, hire Project Lead to manage critical development sequence, including bugs/enhancements, integrated provider support tool, etc.
- 2. Complete hosting service-level agreement (SLA) with CDPH Information Technology Support Division (ITSD) to assure expected performance and availability and also implement standard procedure for informing CAIR2 staff and about anticipated and unanticipated service interruptions.
- 3. Enhance provider support infrastructure by implementing online tools that increase CAIR2 staff productivity and improve program efficiency.
 - a. Stabilize WSDL-based data transfer process between Account Update/ New Enrollment and CAIR2 until AMCI tool is ready.
 - b. Work with vendor to implement AMCI a centrally-located, accessible web-based contact management tool, and develop appropriate policies and procedures, for use of contact management tool by CDPH Help Desk, Data Exchange, and Local CAIR Representatives (LCRs) staff.
 - c. Work with AMCI vendor to centrally integrate a CAIR registration, user training management, and DX onboarding and MU management tool that interoperates with CAIR2.
 - d. Hire Project Lead to oversee the user support integration/AMCI project and other change management tasks as needed.
- 4. Implement needed changes to CAIR2 organization types and user roles management and training
 - a. Implement final list of org types into CAIR2 and associated apps.
 - b. Consolidate 'Power' user training content into single training and make necessary changes to associated apps to accommodate.
 - c. Implement in CAIR2, New Enrollment, and Account Update a 'School Clinic' org type as well as 'School Regular' and 'School Power' users that have access to the school module functionality.
- 5. Monitor site participation on an ongoing basis, including identifying VFC providers who are not actively participating or enrolled in CAIR.
 - a. Implement monthly doses submitted report by site to identify sites that may have stopped submitting
 - i. Define follow-up roles and responsibilities for DX and LCR staff, e.g. based on submitter type (DX vs. UI)
 - ii. Develop standard follow-up process for each submitter type
 - b. Complete VFC PIN/ CAIR ID mapping process to identify non-enrolled VFC sites
 - c. Work with CDPH Immunization Branch Field Services staff to develop a recruitment plan for non-CAIR VFC pediatric and family practice providers prioritizing larger sites.
 - d. Initiate enhancements to CAIR2 software that support VFC users, including

- i. Export on demand VFC-relevant summary data to VFC recertification application, e.g. VFC population estimates.
 - ii. Export on demand doses in inventory and doses administered data to the *myVFCVaccine* VFC vaccine ordering application.
 - iii. Import of VFC shipping logs to autopopulate inventory in CAIR2.
- e. Run a routine usage report for distribution to Health Plans and Covered CA (CA's Health Insurance Exchange) by CAIR ID so plans can monitor contracted provider usage and follow up with those who aren't reporting.
- 6. Continue to onboard new data exchange sites, including pharmacy sites that have been mandated to report, and sites that failed to successfully transition from CAIR1 to CAIR2
 - a. Continue to monitor and communicate with the 343 sites (including 94 VFC sites) that failed to successfully transition to CAIR2,
 - b. Continue testing/validating/onboarding existing DX sites in test (see Table 4)
 - c. Close non-participating DX sites with no active participation, (testing or production submission) within past 6 months.
 - d. DX Unit has assigned DX specialist to take primary responsibility for pharmacy site onboarding.
- 7. Support pharmacy mandate by assisting where needed with pharmacist training and development of training materials specifically for pharmacist.
- 8. Every 6 months, inactivate non-participating sites based on: 1) no logins or patients or doses added in past 6 months, 2) no DX testing within 6 months of registration at Portal.
- 9. Work with other child health programs as needed, e.g. Medi-Cal, Women Infants and Children (WIC), to share data.

1.1.1 Performance Measures:

- 1. 'Bug' fixes and 'wish list' enhancements are being prioritized and input from User Group is being considered as decisions are made.
- 2. Project Lead is hired (if CMS funding is approved)
- 3. Deploy contact management, provider registration, training, and onboarding as single centralized application.
- 4. Increase % of enrolled VFC sites reporting to CAIR2 from 66% to 75% and non-VFC sites from 63% to 70% and VFA sites from 88% to 92%.
- 5. Complete VFC PIN: CAIR ID mapping.
- 6. VFC-related enhancements to CAIR2 are completed.
- 7. Health Plan usage report has been developed and implemented and reports are being distributed to HPs.
- 8. Recruitment plan for non-CAIR2 VFC sites has been developed and approved.
- 6. 50% of DX sites actively in 'test' have been onboarded to production within 6 months of enrollment.

Operational Guidance Statements	Current Status and Measureable Goals		
<p>1.1.2 All enrolled immunization provider sites in a jurisdiction can query an individual's immunization history in the IIS.</p> <p>1.1.2.2 IIS accepts QBP (query by parameter). IIS returns RSP (respond by parameter) message to sender</p>	<p><u>2016 IISAR</u> <u>2017 Goals</u></p>		
	IIS accepts QBP:	No	Yes
	IIS returns RSP:	No	Yes
	QBP/RSP Sites:	0	>2,000

1.1.2 Current status:

CAIR2 fully supports bidirectional messaging and the following materials have been developed in preparation for bi-directional data exchange (BiDX) onboarding of CAIR2 users:

- An [CAIR2 BiDX Interest/Readiness Survey](#) that is to be completed by all interested sites
- A condensed [CAIR2 Bidirectional Implementation Guide](#) document based on the national guidelines.
- A self-directed [CAIR2 BiDX Test Plan](#) with 10 test patients that represent different clinical scenarios.
- A [CAIR2 Post-Testing Survey](#) to confirm the sites have completed the process.

‘Beta’ testing with 20+ sites/sending facilities has begun. Several of these sites are cloud-based sending facilities or integrated EHR allowing the onboarding/testing outcomes to be replicated to many sites. Starting in July, we will begin onboarding sites to BiDX as detailed in the [CAIR2 BiDX Onboarding Plan](#)

1.1.2 Planned Activities:

1. Complete ‘beta’ pilot and make any necessary adjustments to BiDX onboarding process / documentation based on feedback from ‘beta’ test sites/partners.
2. Begin onboarding process by distributing materials to sites that have completed the *CAIR2 BiDX Interest/Readiness Survey*.
3. Onboard >2,000 sites in 2017 (see [CAIR2 BiDX Onboarding Plan](#) for details)

1.1.2 Performance Measures:

1. >2,000 Sites performing BiDX messaging in the ‘production’ database.

Functional Standard 1.2

“The IIS has an automated function that determines vaccines due, past due, or coming due (“vaccine forecast”) in a manner consistent with current ACIP recommendations. Any deficiency is visible to the clinical user each time an individual’s record is viewed.”

Operational Guidance Statements	Current Status and Measureable Goals	
<p>1.2.1 IIS has or has access to a clinical decision support (CDS) function that evaluates the validity of adult and pediatric immunizations, based on ACIP recommendations.</p>	<p><u>Current Status</u> Yes</p>	<p><u>2017 Goal</u> Yes</p>
<p>1.2.2 IIS has or has access to a CDS function that forecasts due dates when an adult or child should be immunized, based on ACIP recommendations.</p>	<p>Yes*</p>	<p>Yes</p>
<p>1.2.3 IIS has or has access to a CDS utility function whose business rules can be updated to reflect new or revised ACIP recommendations immunizations.</p>	<p>Yes*</p>	<p>Yes</p>
<p>*See comments on PCV13 and HPV 2 dose below.</p>		

1.2.1-3 Current Status:

Because of CDS/forecaster issues discovered during the phase 1 rollout of CAIR2, CAIR2 staff began a comprehensive review of the recommendations during Jan-Feb 2017 using the standard CDC Clinical Decision Support for Immunization (CDSI) set of patients. All CDSI cases were imported into the CAIR2 test environment and used to review the vaccine algorithms.

1.2.1-3 Planned Activities

1. Work with the software vendor and the WIR user group to better document how to configure the forecaster.
2. Investigate other scheduler options, e.g. Immunization Calculation Engine (ICE), and make decision; develop plan and timeline if decision to deploy is made.
3. Complete configuration of forecaster for difficult schedules like HPV 2 dose and the ‘PCV13 recommendation at 65 yrs of age’.
4. Utilize CDSi test cases to validate and test any upcoming forecaster changes.

1.2.1-3 Performance Measures:

1. HPV 2 dose and PCV13 for adults full implemented
2. Decision on ICE deployment, plan for deployment and timeline

Functional Standard 1.4 – “When the IIS receives queries from other health information systems, it can generate an automatic response in accordance with interoperability standards endorsed by CDC for message content/format and transport.”

Operational Guidance Statements	Current Status and Measureable Goals	
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Operational Guidance Statements	Current Status and Measureable Goals		
1.4.8 IIS supports the Simple Object Access Protocol (SOAP) Standard Interface, Web Services Definition Language (WSDL), as endorsed by CDC.		<u>2016 Status</u>	<u>2017 Goal</u>
	SOAP WSDL:	Yes	Yes
	AIRA's transport assessment	Yes	Yes

1.4.8 Current Status

CAIR currently uses the CDC WSDL and SOAP for all data exchange transactions.

1.4.8 Planned Activities:

1. Actively engage as needed in discussion and support concerning CDC WSDL and make any needed changes.

1.4.8 Performance Measures:

1. Implement changes to CDC WSDL as needed.

Functional Standard 1.5 – “The IIS can receive submissions in accordance with interoperability standards endorsed by CDC for message content/format and transport.”

Operational Guidance Statements	Current Status and Measureable Goals		
1.5.1 IIS returns an acknowledgement (ACK) HL7 message for every received unsolicited vaccine update (VXU) HL7 message consistent with the CDC-endorsed HL7 Implementation guide.		<u>Current Status</u>	<u>2017 Goal</u>
	IIS returned ACK:	No*	Yes
1.5.4 IIS accepts VXU messages consistent with the current CDC-endorsed HL7 IG from authorized users and systems.	IIS accepted VXU:	Yes	Yes
	*ACKs don't fully comply with CDC guide.		

1.5 Current Status:

CAIR2 data exchange staff have developed and deployed the [CAIR2 HL7 v2.5.1 VXU Implementation Guide](#) in August of 2016 based on the national 2.5.1.Release 1.5 IG document in anticipation of the transition to CAIR2. Release 1.5 introduced several new fields including MSH-22, which is defined as the ‘Responsible Sending Organization’ as distinguishable from the ‘Sending Organization’ which could be a Health Information Exchange (HIE).

To determine the state of conformance of HL7 ‘Acknowledgement’ (ACK) messages returned to the sender by CAIR2, a methodical analysis of CAIR2 ACK message was performed and revealed significant disparity from standards. CAIR2 has also participated in the Aggregate Analysis

Reporting Tool (AART) process and is receiving monthly composite scores on IIS conformance/behavior. Efforts in 2017 will seek to bring the ACK messages and AART scores into greater conformance with accepted IIS standards.

1.5 Planned Activities

1. Improve the ‘check status’ interface so that it is more usable by clinics for monitoring ACKs and message DQ.
2. Once ‘check status’ interface is improved, market the interface to clinics for monitoring DX DQ, emphasizing it’s availability to ‘Power’ and ‘DX DQ’ user roles and the accessible training materials ([DX 101 webinar, ppt](#)).
3. Meet with Nathan Bunker to orient DX staff to AART tool and how to interpret, including major non-conformance issues found in analysis.
4. Meet with vendor to improve ACK and message conformance based on AIRA guidance ([Guidance for HL7 ACK Messages to Support Interoperability](#)), HLN analysis ([CAIR2 ACK Analysis Report](#)) and recent AART profiles.
5. Continue to participate in AIRA’s messaging assessment/AART.

1.5 Performance Measures:

1. Improvements to ‘check status’ screen have been implemented.
2. AART training of staff has taken place and major findings have been assembled and shared with software vendor.
3. Meetings with software vendor have occurred and improvements in ACK conformance have been implemented.
4. Improved pentagram scores in the AART measure have been achieved.

Program Goal 3: Maintain data quality (accurate, complete, timely data) on all immunization and demographic information in the IIS.

Functional Standard 3.1

“The IIS provides consolidated demographic and immunization records for persons of all ages in its geopolitical area, except where prohibited by law, regulation, or policy.”

Operational Guidance Statements	Current Status and Measureable Goals	
<p>3.1.1 The IIS contains a demographic record for every child, adolescent, and adult residing in the jurisdiction.</p> <p><small>*Based on Department of Finance population estimates in the 48 counties in CAIR2.</small></p>	2016 IISAR	2017 Goals
	Children 4 mos to 5 yrs*:	104% >100%
	Birth records captured:	112% 137%
	Records - vital records:	57% 90%
	Records - other sources:	55% 10%

3.1.1 Current Status

California currently gets birth loads from vital record (VR) at monthly intervals. A request for update files, including adoption/name change updates and death data is in process. We hope

to begin receiving these update files in 2017. Adult doses have been steadily increasing but the majority of the adults doses were administered to adolescents who have then matured into adulthood.

3.1.1 Planned Activities

1. Follow-up on pending agreement to provide birth updates and death data.
2. Determine which birth hospitals are enrolled, how many participate, and recruit if not enrolled/participating.

3.1.1 Performance Measures

1. Updated agreement is in place and CAIR2 is receiving birth and death updates.
2. # of birth hospitals enrolled and participating in CAIR.
3. # of new birth hospitals recruited to CAIR2

Operational Guidance Statements	Current Status and Measureable Goals												
<p>3.1.2 <i>The IIS contains a complete history of vaccination for every child, adolescent, and adult currently residing in the jurisdiction.</i></p>	<p>Age 19-35 months of age, Up to Date (UTD) for 7-vaccine series:</p> <table border="0"> <thead> <tr> <th><u>2016 IISAR</u></th> <th><u>2017 Goal</u></th> </tr> </thead> <tbody> <tr> <td>CAIR: 30%</td> <td>50%</td> </tr> <tr> <td>NIS Estimate: 75%</td> <td>75%</td> </tr> <tr> <td>Percentage point: 45</td> <td>25</td> </tr> <tr> <td colspan="2">difference</td> </tr> <tr> <td colspan="2">(NIS%-IISAR%)</td> </tr> </tbody> </table>	<u>2016 IISAR</u>	<u>2017 Goal</u>	CAIR: 30%	50%	NIS Estimate: 75%	75%	Percentage point: 45	25	difference		(NIS%-IISAR%)	
<u>2016 IISAR</u>	<u>2017 Goal</u>												
CAIR: 30%	50%												
NIS Estimate: 75%	75%												
Percentage point: 45	25												
difference													
(NIS%-IISAR%)													

3.1.2 Current Status

A large disparity continues to exist between National Immunization Survey (NIS)-derived coverage estimates and those obtained using CAIR data, indicating that CAIR is probably not capturing all vaccination activity in the state. To reduce this disparity, CAIR2 will implement several strategies designed to obtain more complete and higher quality data.

3.1.2 Planned Activities

1. Revise internal CDPH quarterly reports process to include distribution of monthly ‘total doses submitted’ /participation reports by CAIR2 ID so that LCR and DX staff can monitor participation and identify sites that have slowed or have stopped submitting.
2. Implement an ongoing DQ improvement process for existing DX submitters to identify and troubleshoot sites with DQ issues (See [CAIR2 DX Site Onboarding and Maintenance](#)).

- a. Daily review of message logs to identify sites with >20% message rejections, diagnosis of error patterns, and communication with sites to fix.
 - b. When available, implement DQA tool and begin site-specific analysis of 10% of submitting sites.
 - c. Establish minimal DQ score expectation to guide subsequent new DX onboarding and existing submitter DQ improvement process, including prioritization based on
 - i. Low DQA scores (TBD)
 - ii. Larger VFC size (using VFC ordering status as a surrogate measure for size).
 - d. Hire and train 3 additional DX Unit staff to carry out DQ improvement activities that would involve communicating with data submitters identified as having DQA scores below the minimal scores established in b. and c. and asking them to improve.
 - e. Hire Data Analyst to begin analyzing existing data to identify data quality issues and to develop strategies for improvement.
 - f. Engage vendor in HL7 message management improvement process based on HLN consultant and AART analysis results.
 - g. Implement provider report card for general use that measures reporting continuity and quality, e.g. volume of patients and doses entered, duplicates entered or created; if DX, number of errors and error significance using standard HL7 error codes (e.g. AE-E, AE-W, AE-I, and AR).
 - h. Incorporate DQ process into DX onboarding plan to ensure new submitters have sufficient data completeness and quality to begin submission.
3. Implement a more active historical data communication plan by DX staff that encourages submitters to submit full active patient histories (see [CAIR2 Historical Data Upload Plan](#) document). This will be emphasized during bidirectional (BiDX) onboarding as return recommendations will be inaccurate unless CAIR2 has the patient's full immunization history.
 4. Implement a Health Plan (HP) user role that allows HPs to submit administrative (secondary source) data to CAIR2 to increase doses coming into CAIR2.
 - a. DX staff will test HP import process, finalize [CAIR2 Flat File Specs](#) document, implement pilot test, implement (See [CAIR2 Health Plan Onboarding Plan](#) for details).
 - b. DX staff will develop HP interface training content and schedule trainings.
 5. Fully implement data sharing with the 3- independent registry regions
 - a. Finalize and sign the MOAs with the CAIR San Joaquin and CAIR San Diego regional registries.
 - b. Test data, including bidirectional query/response.

- c. Begin data sharing with the CAIR San Joaquin and CAIR San Diego regional registries.
- d. Develop plan, timeline for transition of Imperial County users and data.
- e. Discuss the planned VFC mandate and whether CAIR San Joaquin and CAIR San Diego have accountability reports to support the mandate.

3.1.2 Performance Measures

1. Increased number and percentage of enrolled sites reporting each month (see 1.1.1 Performance Measure #4).
2. Additional staff hired to assist with DQ improvement efforts.
3. Increased DQA scores among sites engaged in QI
4. Successful implementation of data sharing with independent regions.
5. Increase numbers of sites uploading histories of their active patients.

Functional Standard 3.2

“The IIS can regularly evaluate incoming and existing patient records to identify, prevent, and resolve duplicate and fragmented records.”

Operational Guidance Statements	Current Status and Measureable Goals	
3.2.1 <i>The IIS prevents and resolves duplicate and fragmented patient-level records at the time of submission to the IIS, regardless of the method of submission.</i>	<u>Current Status</u> Yes*	<u>2017 Goal</u> Yes
3.2.2 <i>The IIS regularly identifies and resolves duplicate and fragmented patient records existing in the IIS database.</i>	Yes	Yes
*Has matching algorithm but see below for discussion of issues.		

3.2.1 Current Status

CAIR2 currently is estimated to have >120K duplicate pairs of patients based on the number of ‘pending’ records in queue. Many of these duplicated records can be traced to a particular error that occurred during data migration. The presence of these duplicates generates additional ‘pendings’ (unmerged records) because the incoming DX messages are unable to merge with the either existing duplicate. We have initiated a manual deduplication process to reduce the numbers of duplicate /‘pending’ patient records. We will also do some ‘under the hood’ investigation of the current matching algorithm for potential adjustment to improve its performance in 2017.

3.2.1 Planned Activities

1. Engage staff to complete a manual deduplication process to resolve existing duplicate/'pendings' groups.
2. Monitor the rate of creation of duplicates and 'pendings'
3. Implement a standard process for the Help desk to:
 - a. Resolving reported dups either in real time or by fixed date.
 - b. Resolving dups/'pendings' queue
4. Review CAIR2 matching algorithm weighting with vendor and adjust if necessary.

3.2.1 Performance Measures

1. Manual deduplication process has been completed
2. Creation rate of 'pendings' is being actively monitored.
3. Help Desk merge process policies and procedures are implemented
4. Revised matching algorithm has been implemented that maximizes matches while minimizing creation of 'pendings'.

Functional Standard 3.4

"The IIS can store all IIS Core Data Elements."

Operational Guidance Statements	Current Status and Measureable Goals																													
<p>3.4.2 At least 90% of child, adolescent and adult demographic records currently submitted to and stored in the IIS contain complete information on all of the following core data elements:</p> <p>3.4.2.1 Patient Name: First</p> <p>3.4.2.2 Patient Name: Last</p> <p>3.4.2.3 Patient Date of Birth</p> <p>3.4.2.11 Mother's Name: First (child and adol. only)</p> <p>3.4.2.12 Mother's Name: Last (child and adol. only)</p> <p>3.4.2.13 Mother's Maiden Name: Last (child and adolescent only)</p>	<table border="0"> <thead> <tr> <th></th> <th style="text-decoration: underline;">2016 IISAR</th> <th style="text-decoration: underline;">2017 Goals</th> </tr> </thead> <tbody> <tr> <td>Patients in IIS</td> <td>100%</td> <td>100%</td> </tr> <tr> <td>Patients in IIS</td> <td>100%</td> <td>100%</td> </tr> <tr> <td>Patients in IIS</td> <td>100%</td> <td>100%</td> </tr> <tr> <td>Patients in IIS</td> <td>82%</td> <td>90%</td> </tr> <tr> <td>DX Messages^{&}</td> <td>11%</td> <td>40%</td> </tr> <tr> <td></td> <td>NA*</td> <td>NA</td> </tr> <tr> <td>Patients in IIS</td> <td>23%</td> <td>50%</td> </tr> <tr> <td>DX Messages^{&}</td> <td>69%</td> <td>80%</td> </tr> </tbody> </table>				2016 IISAR	2017 Goals	Patients in IIS	100%	100%	Patients in IIS	100%	100%	Patients in IIS	100%	100%	Patients in IIS	82%	90%	DX Messages^{&}	11%	40%		NA*	NA	Patients in IIS	23%	50%	DX Messages^{&}	69%	80%
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	<p>*CAIR2 captures maiden instead.</p> <p>^{&}All DX message received during April 2017.</p>																													

3.4.1 Current Status

Mother's Maiden Last and First Name are important variables in the CAIR2 matching algorithm, therefore having these associated with patient records improves data quality. The user interface of the new CAIR2 software does have a soft requirement for Mother's First and Maiden Last Name for 0-18 yr old patients so the proportion of the children's cohort with this information should naturally increase over time. Since the majority of data entering CAIR2 now is via DX, activities in 2017 will promote more data completeness in DX submissions, paying special attention to Mother's First (PID-6.2) and Mother's Maiden Name (PID-6.1).

3.4.2 Planned Activities

1. Reinforce with DX submitters the importance of data completeness in incoming DX messages, emphasizing Mother's First Name (PID-6.2) and Mother's Maiden Last Name (PID-6.1) as critical variables to populate so that duplicate record are not created.
2. Work with vendor to better optimize the CAIR2 matching algorithm (Run Match) for DX perhaps by choosing additional variables for matching such as sender medical record number (MRN).
3. Monitor incoming DX message for complete reporting of Mother's Maiden Last and First Name (PID-6).

3.4.2 Performance Measures

1. Increase the percentage of DX messages for children 0-18 yrs of age that contain Mother's Maiden Name from 69% to 80% and the percentage that contain Mother's First from 11% to 40%.

Operational Guidance Statements	Current Status and Measureable Goals																
<p>3.4.3 At least 90% of child, adolescent and adult vaccination records currently submitted to and stored in the IIS contain complete information on all of the following core data elements:</p> <p>3.4.3.1 Vaccine product type administered</p> <p>3.4.3.2 Vaccination administration date</p> <p>3.4.3.5 VFC/grantee program vaccine eligibility at dose level (child and adolescent only) (excluding historical data)</p>	<table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="border-bottom: 1px solid black;"></th> <th style="border-bottom: 1px solid black; text-align: center;"><u>2016</u></th> <th style="border-bottom: 1px solid black; text-align: center;"><u>2017 Goals</u></th> </tr> </thead> <tbody> <tr> <td style="text-align: right;">100%</td> <td style="text-align: center;">100%</td> <td style="text-align: center;">100%</td> </tr> <tr> <td style="text-align: right;">100%</td> <td style="text-align: center;">100%</td> <td style="text-align: center;">100%</td> </tr> <tr> <td style="text-align: right;">Doses sent by VFC Sites (0-18 yrs, IISAR)</td> <td style="text-align: center;">74%</td> <td style="text-align: center;">80%</td> </tr> <tr> <td style="text-align: right;">DX messages*</td> <td style="text-align: center;">54%</td> <td style="text-align: center;">75%</td> </tr> </tbody> </table>		<u>2016</u>	<u>2017 Goals</u>	100%	100%	100%	100%	100%	100%	Doses sent by VFC Sites (0-18 yrs, IISAR)	74%	80%	DX messages*	54%	75%	
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DX messages*	54%	75%															
	* All DX messages received in April 2017.																

3.4.3 Current Status

According to the 2016 IISAR, 74% of administered doses submitted by VFC sites to CAIR2 in 2016 had vaccine eligibility information. Since VFC web interface users were required to submit VFC eligibility info for each dose, these data indicate that doses without VFC eligibility information are being provided by DX submitters. This is consistent with the finding that only 654% of DX messages contain the OBX-5 HL7 segment that indicates the patient’s VFC eligibility status. Efforts in 2017 will focus on identifying VFC sites not sending OBX-5 and to increase the number and percentage sending VFC eligibility information in OBX-5 when sending administered doses.

3.4.3 Planned Activities

1. Determine the number and percentage of VFC DX sites sending OBX-5 when sending administered doses.
2. Develop a directed communication plan to VFC DX submitters not currently sending OBX-5/Vaccine eligibility that as of a certain date, OBX-5 will have to be sent. We will allow sufficient lead time so that clinics have time to work with their EHR vendors to make the needed upgrades.

3.4.3 Performance Measures

1. OBX-5 communication plan has been developed and deployed.
2. Increase the percentage of VFC DX sites sending values in OBX-5 from 74% to 80% and the proportion of all DX sites sending values in OBX-5 from 54% to 75%.

Functional Standard 3.7

The IIS documents active/inactive status of individuals at both the provider organization/site and geographic levels.

Operational Guidance Statements	Current Status and Measureable Goals	
	<u>2016 IISAR</u>	<u>2017 Goals</u>
3.7.1 <i>The IIS has an indicator to designate patient active/inactive status (PAIS) at the provider site level.</i>	Yes	Yes
3.7.2 <i>Provider sites can update PAIS in the IIS through the UI or via an HL7 message.</i>	Yes	Yes
3.7.4 <i>The IIS has the ability to assign PAIS to a patient for a provider site based on information contained in the IIS.</i>	Yes	Yes

3.7 Current Status

CAIR2 staff have reviewed the latest guidance and will seek to implement the MIROW suggested simplification of patient active/ inactive status choices down from the current 8 in CAIR2 to the MIROW suggested 5 choices.

3.7 Planned Activities

1. Work with staff and leadership to establish priorities for MIROW-recommended PAIS changes.
2. Work with vendor to implement changes.

3.7 Performance Measures

1. MIROW PAIS changes implemented.

Program Goal 5: Provide immunization information to all authorized stakeholders.

Functional Standard 5.2

The IIS can generate predefined and/or ad hoc reports (e.g., immunization coverage, vaccine usage, and other important indicators by geographic, demographic, provider, or provider groups) for authorized users without assistance from IIS personnel.

Operational Guidance Statements	Current Status and Measureable Goals	
5.2.1 The IIS produces AFIX assessments that adhere to all published operational and technical guidelines for producing IIS-based AFIX assessments for reporting to CDC's AFIX Online Tool.	<u>2016 IISAR</u> No	<u>2017 Goals</u> Yes

5.2.1 Current Status

CAIR2 already has coverage assessments and benchmark reports but these do not meet the CDC AFIX requirements since they do not assess adolescent coverage.

5.2.1 Planned Activities

1. Work with CDPH Immunization Branch Field Services as needed to support the interim AFIX process, including training to do CoCASA extracts.
2. Minimize duplicates in CAIR so they do not confuse AFIX assessments (See *Section 3.2.1 Planned Activity 1*)
3. As needed, train and deploy LCR staff to perform AFIX duties.

4. Discuss with VFC and Field Services staff various available options for required AFIX functionality, make decision, and develop plan and timeline for implementation in compliance with CDC timeline.
5. Implement Health Plan use role (see Section 3.1.2, Planned Activity 5) to assist Health Plans, Independent Practice Associations (IPAs), and Medical Groups (MGs) in carrying out independent quality improvement activities based on CAIR2 data.

5.2.1 Performance Measures

1. Developed plan and timeline for AFIX integration into CAIR2, including plan for data export to AFIX Online Tool.
2. HP user role has been implemented.

Operational Guidance Statements	Current Status and Measureable Goals	
<i>5.2.2 IIS can generate vaccination coverage assessments for geographic areas (e.g. county, zip code, etc.) to identify under immunized populations.</i>	<u>2016</u> No	<u>2017</u> Yes

5.2.2. Current Status

The legacy CAIR software was only capable of generating coverage reports per provider site. CAIR2, however, is capable of running coverage reports by county.

5.2.2. Planned Activities

1. Train county staff to run ‘Assessment’, ‘Benchmark’, and Countywide vaccine-specific ad hoc reports report as way to monitor county coverage status.
2. With input from counties, CDPH Immunization Branch staff will run selected standard child, adolescent, and adult coverage reports on all 48 county jurisdictions using a standard assessment date and distribute to counties for county to county comparison.
3. If funding or priority allows, implement zip code and/or GIS mapping functionality into CAIR2 software so that reporting can more granular.

5.2.2 Performance Measures

1. Countywide child combo, adolescent, and adult coverage rates from CAIR are run once per year and results are shared with county health officers.
2. If priority and funding, plan and timeline for Zip code/GIS implementation is developed.

Full Functionality (Additional CAIR2 Priorities)

This section specifies CAIR2 goals, planned activities, and milestones for additional operational guidance statements, beyond those CDC selected for CA as “foundational.” We have selected several additional priorities for June 2017-June 2018.

CDC states that awardees that have achieved foundational functionality are encouraged to review all operational guidance statements to take a systematic approach to developing their IIS business plan. IIS business plans should include planned activities and milestones that reflect awardees’ chosen priorities. Possible approaches are:

- Plan on maintenance activities for the operational guidance statements already achieved.
- Focus on foundational operational guidance statements, but for areas such as adult data completeness, adult CDSi, coverage for adolescent and adult populations, and data exchange between jurisdictions.
- Focus on additional operational guidance statements, starting with those related to functional standards 1 and 3.

Program Goal 2: Support the activities and requirements for publicly purchased vaccine, including the Vaccines for Children (VFC) and state purchase programs.

Functional Standard 2.1

“The IIS has a vaccine inventory function that tracks and decrements inventory at the provider site level according to VFC program requirements.”

Operational Guidance Statements	Current Status and Measureable Goals												
<i>2.1 The IIS has a vaccine inventory function that tracks and decrements inventory at the provider site level</i>	Yes												
<i>2.3 The IIS vaccine inventory function automatically decrements as vaccine doses are recorded.</i>	Yes, # of CAIR2 Sites Using Inventory/ Inventory Decrementing <table border="1"> <thead> <tr> <th></th> <th><u>2016</u></th> <th><u>2017 Goal</u></th> </tr> </thead> <tbody> <tr> <td>Total Clin Sites</td> <td>8,736</td> <td>8,736</td> </tr> <tr> <td>Clin Sites w/Inv</td> <td>1,585 (18%)</td> <td>1,900 (22%)</td> </tr> <tr> <td>DX Sites using ID</td> <td>21</td> <td>200</td> </tr> </tbody> </table>		<u>2016</u>	<u>2017 Goal</u>	Total Clin Sites	8,736	8,736	Clin Sites w/Inv	1,585 (18%)	1,900 (22%)	DX Sites using ID	21	200
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Total Clin Sites	8,736	8,736											
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DX Sites using ID	21	200											

2.1-3 Current Status

As shown above, only about 18% of clinical sites enrolled in CAIR2 are using inventory. Furthermore, because inventory decrementing has to be turned on for DX users, CAIR2 is now inviting DX submitters to sign up to be onboarded to inventory decrementing. Activities in 2017 will seek to increase the number and percentage of sites managing vaccine inventory in CAIR2, and to focus more effort on increasing ID participation among DX submitters

2.1-3 Planned Activities

1. Promote the use of inventory functionality by all clinical sites using CAIR2, with special emphasis on VFC sites.
 - a. Market benefits of CAIR2 inventory management and reporting during 'Regular' user trainings.
 - b. LCRs and DX staff promote use during all site contact activities
 - c. Work with Branch Information and Education (I&E) staff to develop marketing to promote the use of inventory
 - i. Include VFC-targeted language about coming mandate.
 - ii. Develop specific communications for DX providers promoting adoption of inventory decrementing.
2. Continue to market ID to DX submitters
 - a. On cairweb.org [Inventory Decrement](#) webpage.
 - b. Implement formal [ID onboarding process](#) for DX users.
3. Track progress by running periodic queries to determine inventory usage/inventory decrementing among non-DX and DX sites.

2.1-3 Performance Measures

1. Increase the percentage of clinical sites using inventory in CAIR2 from 18% to 22%, prioritizing VFC providers, and number of DX sites using inventory decrementing to >200 sites.

Program Goal 5: Provide immunization information to all authorized stakeholders

Functional Standard 5.3

“The IIS has user access controls and logging, including distinct credentials for each user, least-privilege access, and routine maintenance of access privileges.”

Operational Guidance Statements	Current Status and Measureable Goals	
<p><i>5.3.2 Individuals or parents / guardians with custodial rights can access and print immunization records directly from the IIS web interface or consumer portal/app, as allowed by law or policy.</i></p>	2016 IISAR	2017 Goals
	User access:	Yes
Patient Access:	No	No

4.2 Current Status

While the CAIR2 software does not currently allow patients to directly access their own or their child’s immunization record, this is an option being pursued by many states and would be a useful feature for California residents.

4.2 Planned Activities

1. Investigate direct patient access options and choose approach suitable for California.
2. Determine priority and options for completion, e.g. as part of M&O or non-M&O enhancement
3. Solicit feedback from User Group/stakeholders to determine enhancement priority.
4. If determined to be priority, work with vendor plan and implement.

4.2 Performance Measure

1. Decision on patient direct access, including approach, priority, and funding mechanism has been made.
2. Deployment plan and timeline for direct access developed.

Table 4: 2017 CAIR Business Plan with Responsible Staff (*BL refers to Branch leadership staff, e.g.

Sarah Royce, Branch Chief, and Maria Volk, Asst. Branch Chief)

Objective	Key Milestones	Planned Activities	Responsible Parties
<p>1.1.1 Provider sites that administer ACIP-recommended pediatric and adult immunizations in the jurisdiction are enrolled in and are regularly submitting data to the IIS</p>	<ol style="list-style-type: none"> 1. 'Bug' fixes and 'wish list' enhancements are being prioritized and input from User Group is being considered as decisions are made. 2. WSDL-based data flow between AU/NE apps and CAIR2 is working. 1. SLA with CDPH ITSD is in place. 2. Project Lead is hired (f CMS funding is approved) 3. Deploy contact management, provider registration, training, and onboarding as single centralized application. 4. Increase % of enrolled VFC sites reporting to CAIR2 from 63% to 75% and non-VFC sites from 63% to 70% 	<ol style="list-style-type: none"> 1. Continue ongoing efforts to prioritize remaining CAIR2 software 'bugs' and also to prioritize 'wish list' enhancements that increase software stability and usability. <ol style="list-style-type: none"> a. Convene CAIR2 staff at intervals to prioritize/re-prioritize any changes so vendor has clear direction on program priorities. b. As enhancements ideas emerge, solicit feedback from User Group on priorities. c. If additional CMS Funding is approved, hire Project Lead to manage critical development sequence, including bugs/enhancements, integrated provider support tool, etc. 2. Complete hosting service-level agreement (SLA) with CDPH Information Technology Support Division (ITSD) to assure expected performance and availability and also implement standard procedure for informing CAIR2 staff and about anticipated and unanticipated service interruptions. 3. Enhance provider support infrastructure by implementing online tools that increase CAIR staff productivity and improve program efficiency. <ol style="list-style-type: none"> a. Stabilize WSDL-based data transfer process between Account Update/ New Enrollment and CAIR2 until AMCI tool is ready. b. Work with vendor to implement AMCI a centrally-located, accessible web-based contact management tool, and appropriate policies and procedures, for use by Help Desk, Data Exchange, and Local CAIR Representatives (LCRs) staff. c. Work with AMCI vendor to centrally integrate a CAIR2 registration, user training management, and DX onboarding and MU management tool that interoperates with CAIR2. 4. Implement needed changes to CAIR2 organization types and user roles management and training <ol style="list-style-type: none"> a. Implement final list of org types into CAIR2 and associated apps. b. Consolidate 'Power' user training content into single training 	<p>BL*, Steve Nickell, Michael Powell, Cecilia Sandoval , Robyn Davis</p> <p>BL*, Steve Nickell, Michael Powell</p> <p>Michael Powell</p> <p>Michael Powell</p> <p>Michael Powell</p> <p>Michael Powell</p> <p>Michael Powell</p> <p>Robyn Davis</p>

Objective	Key Milestones	Planned Activities	Responsible Parties
	<p>and VFA sites from 89% to 93%.</p> <p>5. Complete VFC PIN: CAIR ID mapping.</p> <p>6. VFC-related enhancements to CAIR2 are completed.</p> <p>7. Recruitment plan for non-CAIR VFC sites has been developed and approved.</p> <p>8. Health Plan usage report has been developed and implemented and reports are being distributed to HPs.</p> <p>9. Site inactivation has occurred.</p> <p>10. 50% of DX sites actively in 'test' have been 'onboarded' to production within 6 months of enrollment.</p>	<p>and make necessary changes to associated apps to accommodate.</p> <p>c. Implement in CAIR2, New Enrollment, and Account Update a 'School Clinic' org type as well as 'School Regular' and 'School Power' users that have access to the school module functionality.</p> <p>5. Monitor site participation on an ongoing basis and identify VFC provider who are not actively participating or enrolled in CAIR2</p> <p>a. Implement monthly doses submitted report by site to identify sites that may have stopped submitting</p> <p>i. Define follow-up roles and responsibilities for DX and LCR staff, e.g. based on submitter type (DX vs. UI)</p> <p>ii. Develop standard follow-up process for each submitter type</p> <p>b. Complete VFC PIN/ CAIR ID mapping process to identify non-enrolled VFC sites</p> <p>c. Work with Field Services staff to develop a recruitment plan for non-CAIR VFC pediatric and family practice providers prioritizing larger sites.</p> <p>d. Initiate enhancements to CAIR2 software that support VFC users, including</p> <p>i. Export on demand VFC-relevant summary data to VFC recertification application, e.g. VFC population estimates.</p> <p>ii. Export on demand doses in inventory and doses administered data to the <i>myVFCVaccine</i> VFC vaccine ordering application.</p> <p>iii. Import of VFC shipping logs to autopopulate inventory in CAIR2.</p> <p>e. Run a routine usage report for distribution to Health Plans and Covered CA (CA's Health Insurance Exchange) by CAIR ID so plans can monitor contracted provider usage and follow up with those who aren't reporting.</p> <p>6. Continue to onboard new data exchange sites, including pharmacy sites that have been mandated to report, and sites that failed to</p>	<p>Michael Powell</p> <p>Robyn Davis, Eric Dansby</p> <p>Steve Nickell</p> <p>Karen Turner, Robyn Davis</p> <p>Michael Powell</p> <p>Mark Foster</p> <p>Eric Dansby</p>

Objective	Key Milestones	Planned Activities	Responsible Parties
		<p>successfully transition from CAIR1 to CAIR2</p> <ol style="list-style-type: none"> a. Continue to monitor and communicate with the small number of sites that failed to successfully transition to CAIR2, b. Continue testing/validating/onboarding existing DX sites in test (see Table 4) c. Close non-participating DX sites with no active participation, (testing or production submission) within past 6 months. d. DX Unit has assigned DX specialist to take primary responsibility for pharmacy site onboarding. <ol style="list-style-type: none"> 7. Support pharmacy mandate by assisting where needed with pharmacist training and development of training materials specifically for pharmacist. 8. Every 6 months, inactivate non-participating sites based on: 1) no logins or patients or doses added in past 6 months, 2) no DX testing within 6 months of registration at Portal. 9. Work with other child health programs as needed, e.g. Medi-Cal, Women Infants and Children (WIC), to share data. 	<p>Steve Nickell</p> <p>Eric Dansby</p> <p>Steve Nickell</p> <p>Iris Cheever</p> <p>Robyn Davis</p> <p>Steve Nickell</p> <p>Steve Nickell</p>
<p>1.1.2 All enrolled immunization provider sites in a jurisdiction can query an individual's immunization history in the IIS.</p> <p>1.1.2.2 IIS accepts QBP query. IIS returns RSP response,</p>	<ol style="list-style-type: none"> 1. >2,000 Sites 'onboarded' to BiDX by end of 2017. 	<ol style="list-style-type: none"> 1. Complete 'beta' pilot and make any necessary adjustments to BiDX onboarding process / documentation based on feedback from 'beta' test sites/partners. 2. Begin onboarding process by distributing materials to sites that have completed the <i>CAIR2 BiDX Interest/Readiness Survey</i>. 3. Onboard >2,000 sites in 2017 (see CAIR2 BiDX Onboarding Plan for details) by end of 2017. 	<p>Eric Dansby</p>
<p>1.2.1 IIS has or has access to a CDS function that evaluates the validity of adult and pediatric immunizations, based on ACIP recommendations.</p> <p>1.2.2 IIS has or has access to a CDS function that forecasts due dates when an adult or</p>	<ol style="list-style-type: none"> 1. HPV 2 dose and PCV13 for adults fully implemented 2. Decision on ICE deployment, plan for deployment and timeline. 	<ol style="list-style-type: none"> 1. Work with DXC and the WIR user group to better document how to configure the forecaster. 2. Investigate other scheduler options, e.g. ICE/NYCIR, and make decision; develop plan and timeline if decision to deploy is made. 3. Complete configuration of forecaster for difficult schedules like HPV 2 dose and the 'PCV13 recommendation at 65 yrs of age'. 4. Utilize CDSi test cases to validate and test any upcoming forecaster changes. 	<p>Cecilia Sandoval</p> <p>BL*, Steve Nickell, Michael Powell</p> <p>Cecilia Sandoval</p> <p>Cecilia Sandoval</p>

Objective	Key Milestones	Planned Activities	Responsible Parties
<p><i>child should be immunized, based on ACIP recommendations.</i></p> <p><i>1.2.3 IIS has or has access to a CDS utility function whose business rules can be updated to reflect new or revised ACIP recommendations immunizations.</i></p>			
<p><i>1.4.8 IIS supports the SOAP Standard Interface, Web Services Definition Language (WSDL), as endorsed by CDC.</i></p>	<p>1. Implement WSDL changes as needed</p>	<p>1. Actively engage as needed in discussion and support concerning CDC WSDL and make any needed changes.</p>	<p>Eric Dansby</p>
<p><i>1.5.1 IIS returns an ACK for every received VXU message consistent with the CDC-endorsed HL7 IG.</i></p> <p><i>1.5.4 IIS accepts VXU (unsolicited immunization record) consistent with the current CDC-endorsed HL7 IG from authorized senders.</i></p>	<p>1. Improvements to ‘check status’ screen have been implemented.</p> <p>2. AART training of staff has taken place and major findings have been assembled and shared with vendor.</p> <p>3. Meetings with vendor have occurred and improvements in ACK conformance have been implemented.</p> <p>4. Improved pentagram scores in the AART measure have been</p>	<p>1. Improve the ‘check status’ interface so that it is more usable by clinics for monitoring ACKs and message DQ.</p> <p>2. Once ‘check status’ interface is improved, market the interface to clinics for monitoring DX DQ, emphasizing it’s availability to ‘Power’ and ‘DX DQ’ user roles and the accessible training materials (DX 101 webinar, ppt).</p> <p>3. Meet with Nathan Bunker to orient DX staff to ARRT tool and how to interpret, including major non-conformance issues found in analysis.</p> <p>4. Meet with vendor to improve ACK and message conformance based on AIRA guidance (Guidance for HL7 ACK Messages to Support Interoperability), HLN analysis (CAIR2 ACK Analysis Report) and recent AART profiles.</p> <p>5. Continue to participate in AIRA’s messaging assessment/AART.</p>	<p>Eric Dansby</p> <p>Eric Dansby, Nat Preas</p> <p>Eric Dansby, Larry Bates</p> <p>Eric Dansby, DX Staff</p> <p>Eric Dansby</p>

Objective	Key Milestones	Planned Activities	Responsible Parties
	achieved.		
<p>3.1.1 The IIS contains a demographic record for every child, adolescent, and adult residing in the jurisdiction.</p>	<ol style="list-style-type: none"> 1. Reduced number and percentage of sites not reporting each month. 2. Additional staff hired to assist with DQ improvement efforts. 3. Increased DQA scores among sites engaged in QI 4. Successful implementation of data sharing with independent regions. 5. Increase numbers of submitters interested in uploading active patient histories. 	<ol style="list-style-type: none"> 1. Develop monthly participation reports so staff can monitor ongoing site participation and reach out to sites showing lower than normal submission rates (see 1.1.1 Planned Activity 2.a). 2. Implement an ongoing DQ improvement process for existing DX submitters to identify and troubleshoot sites with DQ issues (See CAIR2 DX Site Onboarding and Maintenance). <ol style="list-style-type: none"> a. Daily review of message logs to identify sites with >20% message rejections, diagnosis of error patterns, and communication with sites to fix. b. When available, implement DQA tool and begin site-specific analysis of 10% of submitting sites. c. Establish minimal DQ score expectation to guide subsequent new DX onboarding and existing submitter DQ improvement process, including prioritization based on <ol style="list-style-type: none"> i. Low DQA scores (TBD) ii. Larger VFC size (using VFC ordering status as a surrogate measure for size). d. Hire and train 3 additional DX Unit staff to carry out DQ improvement activities that would involve communicating with data submitters identified as having DQA scores below the minimal scores established in b. and c. and asking them to improve. e. Hire Data Analyst to begin analyzing existing data to identify data quality issues and to develop strategies for improvement. f. Engage vendor in HL7 message management improvement process based on HLN and AART analysis results. g. Implement provider report card for general use that measures reporting continuity and quality, e.g. volume of patients and doses entered, duplicates entered or created; if DX, number of errors and error significance using the ACK MSA-2 and ERR-4 fields (AE-E, AE-W, AE-I, and AR). h. Incorporate DQ process into DX onboarding plan to ensure 	<p>Steve Nickell</p> <p>Eric Dansby</p> <p>Eric Dansby</p> <p>Eric Dansby</p>

Objective	Key Milestones	Planned Activities	Responsible Parties
		<p>new submitters have sufficient data completeness and quality to begin submission.</p> <ol style="list-style-type: none"> 3. Implement a more active historical data communication plan by DX staff that encourages submitters to submit full active patient histories (see CAIR2 Historical Data Upload Plan document). This will be emphasized during bidirectional (BiDX) onboarding as the value of return recommendations increases if CAIR2 has full history. 4. Implement a Health Plan user role that allows HPs to submit data to CAIR2 to increase doses coming into CAIR2. <ol style="list-style-type: none"> a. Develop materials, test HP import process, beta test, implement. See CAIR2 Health Plan Onboarding Plan 5. Fully implement data sharing with the 3- independent registry regions <ol style="list-style-type: none"> a. Finalize and sign MOA with SJ and SD regions. b. Test data, including bidirectional query/response. c. Begin data sharing d. Develop plan, timeline for transition of Imperial County users and data. 	Steve Nickell
<p>3.2.1 <i>The IIS prevents and resolves duplicate and fragmented patient-level records at the time of submission to the IIS, regardless of the method of submission.</i></p> <p>3.2.2 <i>The IIS regularly identifies and resolves duplicate and fragmented patient records existing in the IIS database.</i></p>	<ol style="list-style-type: none"> 1. Manual dedup process completed 2. Creation rate of ‘pendings’ is being actively monitored. 3. HD merge process policies and procedures are implemented. 4. Revised matching algorithm has been implemented that maximizes matches while minimizing creation of ‘pendings’. 	<ol style="list-style-type: none"> 1. Engage staff to complete a manual deduplication process to resolve existing duplicate/pendings groups. 2. Monitor the rate of creation of duplicates and ‘pendings’ 3. Implement a standard process at Help desk for: <ol style="list-style-type: none"> a. Resolving reported dups either in real time or by fixed date. b. Resolving dups/pendings queue 4. Review CAIR2 matching algorithm weighting with vendor and adjust if necessary. 	<p>Steve Nickell</p> <p>Michael Powell Cecilia Sandoval</p> <p>Steve Nickell, Michael Powell, Larry Bates</p>

Objective	Key Milestones	Planned Activities	Responsible Parties
<p>3.4.2 At least 90% of child, adolescent and adult demographic records currently submitted to and stored in the IIS contain complete information on all of the following core data elements:</p> <p>3.4.2.1 Patient Name: First 3.4.2.2 Patient Name: Last 3.4.2.3 Patient Date of Birth 3.4.2.11 Mother's Name: First (child and adol only) 3.4.2.12 Mother's Name: Last (child and adol only) 3.4.2.13 Mother's Maiden Name: Last (child and adolescent only)</p>	<p>1. Increase the percentage of DX messages for children 0-18 yrs of age that contain Mother's Maiden Name from 69% to 80% and the percentage that contain Mother's First from 11% to 40%.</p>	<p>1. Reinforce with DX submitters the importance of data completeness in incoming DX messages, emphasizing Mother's First Name (PID-6.2) and Mother's Maiden Last Name (PID-6.1) as critical variables to populate so that duplicate record are not created.</p> <p>2. Work with vendor to better optimize RunMatch for DX perhaps by choosing additional variables for matching such as sender MRN.</p> <p>3. Monitor incoming DX message for PID-6 improvement.</p>	<p>Eric Dansby</p> <p>Steve Nickell, Michael Powell, Larry Bates Larry Bates</p>
<p>3.4.3 At least 90% of child, adolescent and adult vaccination records currently submitted to and stored in the IIS contain complete information on all of the following core data elements:</p> <p>3.4.3.5 VFC/grantee program vaccine eligibility at dose level (child and adolescent only) (excluding historical data)</p>	<p>1. OBX-5 communication plan has been developed and deployed.</p> <p>2. Increase the percentage of VFC DX sites sending values in OBX-5 from 74% to 80% and the proportion of all DX sites sending values in OBX-5 from 54% to 75% (administered doses only).</p>	<p>1. Determine the number and percentage of VFC DX sites sending OBX-5 when sending administered doses.</p> <p>2. Develop a directed communication plan to VFC DX submitters not currently sending OBX-5/Vaccine eligibility that as of a certain date, OBX-5 will have to be sent.</p>	<p>Eric Dansby</p> <p>Eric Dansby, Nat Preas</p>

Objective	Key Milestones	Planned Activities	Responsible Parties
<p>3.7.1 <i>The IIS has an indicator to designate patient active/inactive status (PAIS) at the provider site level.</i></p> <p>3.7.2 <i>Provider sites can update PAIS in the IIS through the UI or via an HL7 message.</i></p> <p>3.7.4 <i>The IIS has the ability to assign PAIS to a patient for a provider site based on information contained in the IIS.</i></p>	<p>1. MIROW PAIS changes implemented.</p>	<p>1. Work with staff and leadership to establish priorities for MIROW-recommended PAIS changes.</p> <p>2. Work with vendor to implement changes.</p>	<p>BL*, Steve Nickell, Michael Powell Michael Powell</p>
<p>5.2.1 <i>The IIS produces AFIX assessments that adhere to all published operational and technical guidelines for producing IIS-based AFIX assessments for reporting to CDC's AFIX Online Tool.</i></p>	<p>1. Developed plan and timeline for AFIX integration into CAIR2, including plan for data export to AFIX Online Tool.</p> <p>2. HP user role has been implemented.</p>	<p>1. Work with Field Services as needed to assist with interim AFIX process, including training to do CoCASA extracts.</p> <p>2. Minimize duplicates in CAIR so they do not confuse AFIX assessments (See <i>Section 3.2.1 Planned Activity 1</i>)</p> <p>3. As needed, train and deploy LCR staff to perform AFIX duties.</p> <p>4. Discuss with VFC and Field Services staff various available options for required AFIX functionality, make decision, and develop plan and timeline for implementation in compliance with any CDC timeline.</p> <p>5. Implement Health Plan use role (see Section 3.1.2, Planned Activity 5) to assist Health Plans, Independent Practice Associations (IPAs), and Medical Groups (MGs) in carrying out independent quality improvement activities based on CAIR2 data.</p>	<p>Robyn Davis</p> <p>Steve Nickell</p> <p>BL*, Steve Nickell, Michael Powell, Karen Turner, Betty Tran Michael Powell</p> <p>Eric Dansby, Mark Foster</p>

Objective	Key Milestones	Planned Activities	Responsible Parties
<p>5.2.2 IIS can generate vaccination coverage assessments for geographic areas (e.g. county, zip code, etc.) to identify under immunized populations.</p>	<ol style="list-style-type: none"> Countywide child combo, adolescent, and adult coverage rates from CAIR are run once per year and results are shared with county health officers. If priority and funding available, plan and timeline for Zip code/GIS implementation is developed. 	<ol style="list-style-type: none"> Train county staff to run ‘Assessment’, ‘Benchmark’, and Countywide vaccine-specific ad hoc reports report as way to monitor county coverage status. Branch staff will run coverage reports for all 48 county jurisdictions, e.g. child, adolescent, and adult, on a standard assessment date and distribute to counties for internal comparison. If funding or priority allows, implement zip code and/or GIS mapping functionality into CAIR2 software so that reporting can more granular. 	<p>Robyn Davis, Cecilia Sandoval</p> <p>Mark Foster</p> <p>BL*, Steve Nickell, Michael Powell</p>
<p>2.1 The IIS has a vaccine inventory function that tracks and decrements inventory at the provider site level.</p> <p>2.3 The IIS vaccine inventory function automatically decrements as vaccine doses are recorded.</p>	<ol style="list-style-type: none"> Increase use of inventory among all CAIR2 sites by 20% and inventory decrementing among DX sites to >100 sites. 	<ol style="list-style-type: none"> Promote the use of inventory functionality by clinical sites using CAIR2. <ol style="list-style-type: none"> Market benefits of CAIR2 inventory management and reporting during ‘Regular’ trainings. LCRs and DX staff promote use during all site contact activities Work with I&E to develop marketing to promote the use of inventory <ol style="list-style-type: none"> Include VFC-targeted language about coming mandate. Develop specific communications for DX providers promoting inventory decrementing (ID) Continue to market ID for DX submitters <ol style="list-style-type: none"> On cairweb.org Inventory Decrement webpage. Implement formal ID onboarding process for DX users. Track progress by running periodic queries to determine inventory usage/inventory decrementing among non-DX and DX sites. 	<p>Robyn Davis , Eric Dansby</p> <p>Steve Nickell, Nat Preas</p> <p>Eric Dansby</p> <p>Steve Nickell</p>
<p>5.3.2 Individuals or parents / guardians with custodial rights can access and print immunization records directly from the IIS web interface or consumer portal/app, as allowed by law or policy.</p>	<ol style="list-style-type: none"> Decision on patient direct access, including approach, priority, and funding mechanism has been made. Deployment plan and timeline for direct access 	<ol style="list-style-type: none"> Investigate direct patient access options and choose approach suitable for California. Determine priority and options for completion, e.g. as part of M&O or non-M&O enhancement Solicit feedback from User Group/stakeholders to determine enhancement priority. If determined to be priority and funding, develop plan/ timeline. 	<p>Steve Nickell</p> <p>Michael Powell</p> <p>Steve Nickell</p> <p>Michael Powell</p>

Objective	Key Milestones	Planned Activities	Responsible Parties
	developed.		

Table 5: 2017 CAIR Monitoring & Evaluation Plan with Responsible Staff (*BL refers to Branch leadership staff, e.g. Sarah Royce, Branch Chief, and Maria Volk, Asst. Branch Chief)

Objective	Performance Measures	Responsible Parties
<p>1.1.1 <i>Provider sites that administer ACIP-recommended pediatric and adult immunizations in the jurisdiction are enrolled in and are regularly submitting data to the IIS</i></p>	<ol style="list-style-type: none"> 1. 'Bug' fixes and 'wish list' enhancements are being prioritized and input from User Group is being considered as decisions are made. 2. WSDL-based data flow between AU/ NE apps and CAIR2 is working. 3. SLA with CDPH ITSD is in place. 4. Project Lead is hired (f CMS funding is approved) 5. Deploy contact management, provider registration, training, and onboarding as single centralized application. 6. Increase % of enrolled VFC sites reporting to CAIR2 from 63% to 75% and non-VFC sites from 63% to 70% and VFA sites from 89% to 93%. 7. Complete VFC PIN: CAIR ID mapping. 8. VFC-related enhancements to CAIR2 are completed. 9. Recruitment plan for non-CAIR VFC sites has been developed and approved. 10. Health Plan usage report has been developed and implemented and reports are being distributed to HPs. 11. Site inactivation has occurred. 12. 50% of DX sites actively in 'test' have been 'onboarded' to production within 6 months of enrollment. 	<p>BL*, Steve Nickell, Michael Powell, Cecilia Sandoval, Robyn Davis</p> <p>BL*, Steve Nickell, Michael Powell Michael Powell Michael Powell</p> <p>Robyn Davis, Eric Dansby</p> <p>Steve Nickell Michael Powell Robyn Davis, Karen Turner</p> <p>Mark Foster</p> <p>Steve Nickell Eric Dansby</p>
<p>1.1.2 <i>All enrolled immunization provider sites in a jurisdiction can query an individual's immunization history in the IIS.</i></p> <p>1.1.2.2 <i>IIS accepts QBP query. IIS returns RSP response,</i></p>	<ol style="list-style-type: none"> 1. >2,000 Sites 'onboarded' to BiDX by end of 2017. 	<p>Eric Dansby</p>

Objective	Performance Measures	Responsible Parties
<p><i>1.2.1 IIS has or has access to a CDS function that evaluates the validity of adult and pediatric immunizations, based on ACIP recommendations.</i></p> <p><i>1.2.2 IIS has or has access to a CDS function that forecasts due dates when an adult or child should be immunized, based on ACIP recommendations.</i></p> <p><i>1.2.3 IIS has or has access to a CDS utility function whose business rules can be updated to reflect new or revised ACIP recommendations immunizations.</i></p>	<ol style="list-style-type: none"> 1. HPV 2 dose and PCV13 for adults fully implemented 2. Decision on ICE deployment, plan for deployment and timeline. 	Cecilia Sandoval BL*, Steve Nickell, Michael Powell, Cecilia Sandoval
<p><i>1.4.8 IIS supports the SOAP Standard Interface, Web Services Definition Language (WSDL), as endorsed by CDC.</i></p>	<ol style="list-style-type: none"> 1. Implement WSDL changes as needed 	Eric Dansby
<p><i>1.5.1 IIS returns an ACK for every received VXU message consistent with the CDC-endorsed HL7 IG.</i></p> <p><i>1.5.4 IIS accepts VXU (unsolicited immunization record) consistent with the current CDC-endorsed HL7 IG from authorized senders.</i></p>	<ol style="list-style-type: none"> 1. Improvements to ‘check status’ screen have been implemented. 2. AART training of staff has taken place and major findings have been assembled and shared with vendor. 3. Meetings with vendor have occurred and improvements in ACK conformance have been implemented. 4. Improved pentagram scores in the AART measure have been achieved. 	Eric Dansby
<p><i>3.1.1 The IIS contains a demographic record for every child, adolescent, and adult residing in the jurisdiction.</i></p>	<ol style="list-style-type: none"> 1. Reduced number and percentage of sites not reporting each month. 2. Additional staff hired to assist with DQ improvement efforts. 3. Increased DQA scores among sites engaged in QI 4. Successful implementation of data sharing with independent regions. 5. Increase numbers of submitters interested in uploading active patient histories. 	Robyn Davis, Eric Dansby Eric Dansby Eric Dansby Steve Nickell Eric Dansby

Objective	Performance Measures	Responsible Parties
<p>3.2.1 <i>The IIS prevents and resolves duplicate and fragmented patient-level records at the time of submission to the IIS, regardless of the method of submission.</i></p> <p>3.2.2 <i>The IIS regularly identifies and resolves duplicate and fragmented patient records existing in the IIS database.</i></p>	<ol style="list-style-type: none"> Manual dedup process completed Creation rate of ‘pendings’ is being actively monitored. Help desk merge process policies and procedures are implemented. Revised matching algorithm has been implemented that maximizes matches while minimizing creation of ‘pendings’. 	<p>Steve Nickell Michael Powell Cecilia Sandoval Steve Nickell, Michael Powell, Larry Bates</p>
<p>3.4.2 <i>At least 90% of child, adolescent and adult demographic records currently submitted to and stored in the IIS contain complete information on all of the following core data elements:</i></p> <p>3.4.2.1 Patient Name: First 3.4.2.2 Patient Name: Last 3.4.2.3 Patient Date of Birth 3.4.2.11 Mother's Name: First (child and adol only) 3.4.2.12 Mother's Name: Last (child and adol only) 3.4.2.13 Mother's Maiden Name: Last (child and adolescent only)</p>	<ol style="list-style-type: none"> Increase the percentage of DX messages for children 0-18 yrs of age that contain Mother's Maiden Name from 69% to 80% and the percentage that contain Mother's First from 11% to 40%. 	<p>Eric Dansby, Larry Bates</p>
<p>3.4.3 <i>At least 90% of child, adolescent and adult vaccination records currently submitted to and stored in the IIS contain complete information on all of the following core data elements:</i></p> <p>3.4.3.5 VFC/grantee program vaccine eligibility at dose level (child and adolescent only) (excluding historical data)</p>	<ol style="list-style-type: none"> OBX-5 communication plan has been developed and deployed. Increase the percentage of VFC DX sites sending values in OBX-5 from 74% to 80% and the proportion of all DX sites sending values in OBX-5 from 54% to 75% (administered doses only). 	<p>Eric Dansby, Nat Preas Eric Dansby</p>
<p>3.7.1 <i>The IIS has an indicator to designate patient active/inactive status (PAIS) at the provider site level.</i></p>	<ol style="list-style-type: none"> MIROW PAIS changes implemented. 	<p>Michael Powell</p>

Objective	Performance Measures	Responsible Parties
<p><i>3.7.2 Provider sites can update PAIS in the IIS through the UI or via an HL7 message.</i></p> <p><i>3.7.4 The IIS has the ability to assign PAIS to a patient for a provider site based on information contained in the IIS.</i></p>		
<p><i>5.2.1 The IIS produces AFIX assessments that adhere to all published operational and technical guidelines for producing IIS-based AFIX assessments for reporting to CDC's AFIX Online Tool.</i></p>	<ol style="list-style-type: none"> 1. Developed plan and timeline for AFIX integration into CAIR2, including plan for data export to AFIX Online Tool. 2. HP user role has been implemented. 	<p>BL*, Steve Nickell, Michael Powell, Karen Turner, Betty Tran</p> <p>BL*, Steve Nickell, Eric Dansby</p>
<p><i>5.2.2 IIS can generate vaccination coverage assessments for geographic areas (e.g. county, zip code, etc.) to identify under immunized populations.</i></p>	<ol style="list-style-type: none"> 1. Countywide child combo, adolescent, and adult coverage rates from CAIR are run once per year and results are shared with county health officers. 2. If priority and funding available, plan and timeline for Zip code/GIS implementation is developed. 	<p>Mark Foster</p> <p>BL*, Steve Nickell, Michael Powell</p>
<p><i>2.1 The IIS has a vaccine inventory function that tracks and decrements inventory at the provider site level.</i></p> <p><i>2.3 The IIS vaccine inventory function automatically decrements as vaccine doses are recorded.</i></p>	<ol style="list-style-type: none"> 1. Increase use of inventory among CAIR2 VFC sites by 20% and inventory decrementing among DX sites to >100 sites. 	<p>Robyn Davis, Eric Dansby</p>
<p><i>5.3.2 Individuals or parents / guardians with custodial rights can access and print immunization records directly from the IIS web interface or consumer portal/app, as allowed by law or policy.</i></p>	<ol style="list-style-type: none"> 1. Decision on patient direct access, including approach, priority, and funding mechanism has been made. 2. Deployment plan and timeline for direct access developed. 	<p>BL*, Steve Nickell, Michael Powell</p> <p>Michael Powell</p>

CAIR2 Management and Staffing Plan -2017

The core CAIR2 management team are the Immunization Branch Program Manager who provides general oversight (0.1 FTE), the Immunization Branch Registry and Assessment Section Chief (0.50 FTE), the CAIR2 Technical Lead (1.0 FTE), the CAIR2 interoperability Coordinator (1.0 FTE), the CAIR2 Provider Support Coordinator (1.0 FTE), and the CAIR2 Training Coordinator (1.0 FTE).

The new CAIR2 software will be managed by the implementation vendor, Digital Xchange Corporation (DXC, formerly HPE). However, members of the CAIR2 Technical Team under the CAIR2 Technical Lead will be retained to support external web applications that continue to support CAIR2 users, namely *CAIR2 New Enrollment* for registering new site and their users, *CAIR2 Account Update* for account management, and the CAIR Automated Training System (C.A.T.S) for users training scheduling and management. In addition, online applications used by the CA VFC Program for online registration, recertification, and VFC vaccine ordering are also managed by these technical staff. Positions in the Technical Unit are supervised by the CAIR2 Technical Lead.

Centralized phone/email support CAIR2 web interface users is provided by 4 Help Desk staff under the supervision of the CAIR2 Provider Support Coordinator.

User training and local user support for web interface users is provided by 10 local CAIR representatives (LCRs) who take direction from the CAIR2 Training Coordinator/LCR Liaison. These positions are actually supervised buy Sr. Field staff in the Field Services section of IZB (see Appendix D: CAIR2 Staff Org Chart).

Data Exchange (DX) support is provided by 4 staff, including 3 DX Specialist and 1 HL7 Analyst, under the supervision of the CAIR2 Interoperability Coordinator.

Additionally, the 3 independent regional registries that don't use the CAIR2 software are mostly funded regionally but are also allocated some assistance for user support.

CAIR2 staff are organized into the following categories/units:

- Management
- Technical Unit
- Provider Support Unit
 - Centralized User Support (Help Desk)
 - Local User Support/Training (In Field Services Section of IZB, see Appendix D: Org Chart)
- Data Exchange User Support

The narrative below describes the duties of each position.

Table 6: CAIR Staffing Plan-2017

Position/Function	Current FTE
State positions	0.3
Branch Chief	0.1
Health Program Specialist (RO)	0.2
Contract Positions	
Management	5.0
Registry Section Chief (SN)	1.0
CAIR Technical Lead (MP)	1.0
CAIR Provider Support Coordinator (CS)	1.0
CAIR Training Coordinator/LCR Liaison (RD)	1.0
CAIR2 Interoperability Coordinator (ED)	1.0
Project Coordinator (TBNx1)*	1.0
Technical	9.0
Database Administrator (NS)	1.0
Data Quality Analyst (CS)	1.0
Data Exchange Tech Support (JN)	1.0
Programmer (JT,DV,AT,AR)	4.0
Web Developer (MM)	1.0
Data Analyst (MF)	1.0
Data Quality Lead	1.0
Provider Support	14.0
Centralized User Support/ Help Desk (DS,PV,AH,CH)	4.0
Local User Support/Training (10 FTE)	10.0
Data Exchange	4.0
DX Specialist (AA, IC, TBN)	3.0
HL7 Analyst (LB)	1.0
DQ Analyst (TBN x3)*	3.0
Data Analyst (TBNx1)*	1.0
Total (current)	32.3
TOTAL (if CMS funding occurs)	38.3

*To be added if CMS Funding is approved.

Contracted UCSF Budget Narrative

All CAIR CDPH positions will be contracted through the University of California San Francisco Institute for Global Health.

Management Positions

Registry & Assessments Section Chief: 1 FTE (Steve Nickell)

This position gives general direction and provides oversight to the CAIR registry effort, including implementing statewide policies and priorities.

CAIR2 Technical Lead: 1 FTE (Michael Powell)

This position will continue to have day-to-day responsibility for CAIR software and hardware operations. Mr. Powell will also be responsible for supervising the technical team that manage existing provider support applications. Currently, this position directly supervises 9 technical staff.

CAIR2 Provider Support Coordinator: 1 FTE (Cecilia Sandoval)

This supervisory position will manage CAIR user support activities relating to the CAIR2 user interface, particularly those involving customer support/Help Desk, provider enrollment, account creation and management. This position also works with the CAIR2 Training Coordinator to align all local and centralized user interface support activities. This position directly supervises 4 customer service staff.

CAIR2 Training Coordinator/LCR Liaison: 1 FTE (Robyn Davis)

This position is in the Field Services section and coordinates user interface training activities and local user interface user support and retention activities, including standardizing user interface training and Local CAIR Rep (LCR) staff training content and materials. This position provides direction to 10 local CAIR Reps (LCRs) but does not directly supervise these staff.

CAIR2 Interoperability Coordinator: 1 FTE (Eric Dansby)

This supervisory position manages CAIR data exchange onboarding, user support, and quality improvement activities and supervises 4 staff. 4 additional staff will be added short term to address data quality issues if the CMS funding is approved.

CAIR2 Project Lead: 1FTE (TBN, only if CMS funding is approved)

This position will manage and organize critical staff members to ensure the CAIR2 Transition Plan gets completed. Aspects include, managing and prioritizing 'bug' fixes, enhancements, implementation of the integrated provider support AMCI tool, governance, user groups, etc.

Technical Unit Staff

CAIR Technical Consultant/ Lead Programmer: (Jag Talluri)

This position performs regular software engineering duties as well as assist other programming staff in day to day operations.

- Leads new development efforts;

- Writes requirements and specification documents;
- Works with staff and customers to build data solutions;
- Responsible for security and keeping version control up to date;

CAIR Database Administrator: 1 FTE (Newton Sambajon)

This position is database administrator for a number of CAIR2 applications, including

- New Enrollment;
- Account Update;
- CAIR Automated Training System (CATS);
- School Reporting;
- VFC Online Ordering;
- Monitor ongoing database performance;
- Make adjustments or change configurations to ensure that systems and components maintain efficient operations.

Database Management Systems include:

- SQL Server;
- MySQL;
- Oracle;

CAIR Programmer/Web Developer. 4 FTE (Jason Narine, D.J. Visbal, Andrey Rashidov, Ayumi Taniguchi)

These positions build and deploy web based applications for use by the Immunization Branch.

- Gather requirements;
- Develop code;
- Perform unit and functional testing; generate standard metrics and ad hoc reports;
- Support VFC and other Branch staff in using CAIR data;
- Communicate with and runs reports for regional staff;
- Maintains School Assessments application
- Maintains VFC Ordering and admin systems
- Maintain code using Team Foundation Server for version control;

CAIR Quality Assurance Lead; 1 FTE (TBN)

This position is responsible for all managing software/web app testing to ensure that changes/enhancements implemented work correctly. This position will be hired if CMS funding is approved.

- Write detailed test plans;
- Perform functional testing;
- Perform Regression testing;
- Log all results in tracking system;
- Provide regular QA reports to management;

CAIR Quality Assurance Analyst; 1 FTE (Cheryl Scott)

This position is responsible for software/web app testing to ensure that changes/enhancements implemented work correctly.

- Implement test plans;
- Perform functional testing;
- Perform Regression testing;

- Log all results in tracking system;

CAIR Web Developer: 1 FTE (Megan Mojica)

This position has taken responsibility for building and maintaining the web apps for the CAIR Account Update, CAIR New Enrollment, and CAIR Automated Training System (CATS).

- Gather requirements;
- Develop code;
- Perform unit and functional testing;
- Maintains registration, account update, and training tools and connectivity to CAIR2
- Maintain code using Team Foundation Server for version control;

CAIR Data Analyst: 1 FTE (Mark Foster)

This position manages CAIR reporting activities including HEDIS patient match queries and the annual IISAR report.

Data Exchange Unit Staff

CAIR Data Exchange/Interface Specialist: 3 FTE (Arlisha Adams, Iris Cheever, TBN)

These positions focus on data exchange support activities, notably testing/validating new submitters and troubleshooting data exchange issues. One position (IC) is the primary contact for pharmacies wanting to use data exchange

CAIR HL7 Analyst: 1 FTE (Larry Bates)

CAIR Data Quality Analyst: 3 (TBN, if CMS funding only)

These positions will extract site-specific messages and use the DQA evaluator to record site-specific DQ scores and then follow up/implement quality improvement among all sites with insufficient DQ.

CAIR Data Analyst: 1 FTE (TBN, if CNS funding only)

This position will run queries on the CAIR2 database to identify existing data quality issues and develop strategies for improvement.

Program Support Unit Staff

CAIR Help Desk Specialist: 4 FTE (Danielle Hodge, Pong Vilaisouk, Amy Hogan, TBN)

These positions will assist providers with questions/issues around participation and use of CAIR.

Duties include:

- Assist end users to solve problems accessing the registry,
- Communicate effectively (orally and in writing) in dealing with the public and/or other employees and the community of immunization registry stakeholders,
- Develop and maintain knowledge and skills related to CAIR, and
- Maintain a user contact log that includes the name of practice, contact name, contact email or phone, region, date and time, issues needing resolution, and resolution status.

Local CAIR Support – Local CAIR Representatives Staff

CAIR NorCal Provider Relations Specialist: 1 FTE (Jennifer Toten)

CAIR Bay Area Provider Relations Specialist: 2 FTE (Jeannette Chapman, Jerad Timmons)

CAIR Central Valley Provider Relations Specialist: 1 FTE (Giselle Garcia, Monica Hernandez)

CAIR Los Angeles Provider Relations Specialist: 3 FTE (Monique Crespo, Janet Ajao, TBN)

CAIR SoCal Provider Relations Specialist: 3 FTE (Heather Murphy, Twila Crook-Lindsey)

These 10 positions support provider recruitment, retention, training and support activities for CAIR2 users. These staff are locally supervised by VFC Sr. Field Staff in the 5 VFC Regions in the state who will take general direction and guidance around registry issues from the CAIR Training Coordinator/LCR Liaison.

Table 7. Local Registry Staff by VFC Region

<i>CAIR Region</i>	<i>VFC Region</i>	<i>Local Staff</i>
CAIR2	NorCal	Jennifer Toten
	Bay	Jerad Timmons
		Jeanette Chapman
	Central Valley	Heather Murphy
		Monica Hernandez
	SoCal	Twila Crook-Lindsay
		Heather Murphy
	LA	Monique Crespo
		Janet Ajao
		TBN

Appendix A: Challenges and Risk

Key Challenges Addressed by this Business Plan

Seven challenges have been identified which are likely to be barriers to reaching the *Healthy People 2010* objective in California and to fully realizing the California CAIR vision. These are listed below.

<i>Challenges</i>	<i>Current Status</i>	<i>Being Address in Plan</i>
<ul style="list-style-type: none"> • Current stability and usability of CAIR2 software needs improvement 	Ongoing	1.1.1 1.2.1-3
<ul style="list-style-type: none"> • Poor integration of IIS software with existing IIS provider support tools 	Ongoing	1.1.1
<ul style="list-style-type: none"> • Poor integration of IIS with VFC components, including recertification and vaccine ordering online applications. 	Ongoing	1.1.1 5.2.1
<ul style="list-style-type: none"> • Continuing low provider utilization of CAIR, including low levels of participation/data submission rates, and low use of features such as coverage reports, R/R for quality improvement. 	Ongoing	1.1.1 2.1 2.3 3.1.2 3.7 5.2.2
<ul style="list-style-type: none"> • Potential data quality issues among DX submitters. 	Ongoing	1.5 3.1.2 3.2.1 3.2.2 3.4.2 3.4.3
<ul style="list-style-type: none"> • Full integration with 3 independent regions 	Ongoing	3.1.2
<ul style="list-style-type: none"> • Implementation of bidirectional messaging capability in preparation for MU Stage 3 	Ongoing	1.1.2

CAIR did receive PPHF funding to incorporate VFC vaccine ordering into CAIR. This funding has also helped CAIR develop online tools to carry out an annual CAIR account update as well as enroll providers. Both of these systems automate new account creation and account upgrade processes as well as communication to updaters and registrants.

SWOT Analysis

Some of the challenges to fully executing this Business Plan include:

- Maintaining high levels of vendor and hosting participation and engagement (AMCI, DXC, and ITSD);
- Ambitious agenda, so staff assigned to tasks will need to manage responsibilities.

The advantages and strengths of 2017 Business Plan:

- Both users and CAIR2 staff will greatly benefit from planned stabilization of current IIS software and improvements to supporting infrastructure;
- Activities targeted toward improving data submission quantity and quality should increase the value of the CAIR2 data for all users.

Risks and Risk Mitigation

This section identifies the major risks to successfully implementing this Business Plan.

Risks	Likelihood	Negative Impact	Mitigation/Response
Reductions in federal funding/PPHF	Medium	High	Continue efforts to supplement IAP funding when made available by CDC or ONC/CMS.
Unsatisfactory vendor and/or CDPH Information Technology Support Division (ITSD) support	Medium	High	Maintain active communication with vendor to ensure necessary changes are being implemented and timelines are met. Develop hosting service level agreement (SLA) with ITSD so program/vendor/hosting responsibilities are well defined.
Critical software features like the vaccine forecaster and the matching algorithm need modernization	Medium	High	Work with vendor and WIR user group to modernize matching algorithm. Implement open source vaccine forecaster (ICE) when available
Staffing turnover or burnout	Medium	Medium	Ensure staffing resources are sufficient that existing staff are not overtaxed.

Communications

Effective communications are particularly important in California because of:

- Need to keep stakeholders across the state informed about status and direction;

Given the many stakeholders and the size of the state, communications must be targeted where they will have most impact. For this communications plan, stakeholders are divided into four tiers:

<p>High Interest, High Influence <i>Strategy: Maintain support, refine communications to align with project goals, leverage stakeholder influence</i> CDPH Leadership Health Plans CDC Other 3 CA IISs Immunization Coalitions Professional Orgs Local Health Departments and Officers</p>	<p>High Interest, Low Influence <i>Strategy: Provide information, status updates</i> WIC program</p>
<p>Low Interest, High Influence <i>Strategy: Actively engage, target communications to align with project goals, leverage stakeholder influence</i> California Legislature County and State Vital Records</p>	<p>Low Interest, Low Influence <i>Strategy: Passive relationship Management</i></p>

High Interest, High Influence are those that must be kept fully engaged. For these stakeholders, communications must be active; that is, their input must be solicited and acted upon, and they must receive feedback.

Low Interest, High Influence are where communications are aimed at “keeping stakeholders satisfied.” They have influence on the future of CAIR2, so must be kept fully informed. However, their direct involvement is more periodic than constant, and will tend to occur when CAIR goals align with their own.

High Interest, Low Influence are those who are kept informed. They tend to require limited communications, typically more to inform than to fully engage. The WIC program would be a welcome partner, but they would need to initiate a system upgrade to receive CAIR2 data.

Low Interest, Low Influence stakeholders (of which none are identified at this point) will not be part of the CAIR communications plan.

Appendix B: 2017 Status of IIS Functional Standards, by CAIR Region

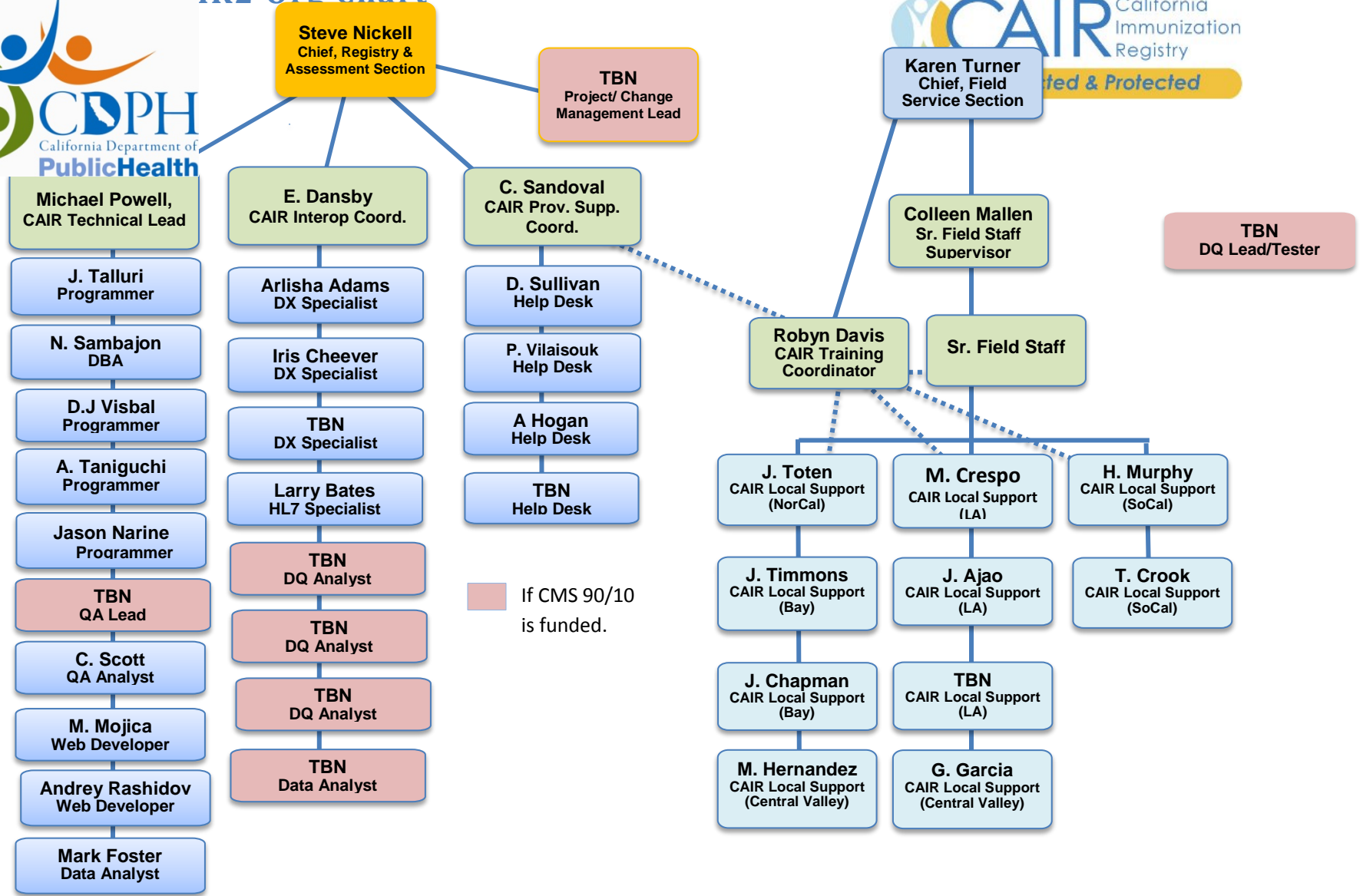
Standard #	1.1	1.2	1.3	1.4	1.5	2.1	2.2	2.3	2.4	2.5	2.6	3.1	3.2
IIS Standard	Point and time access to IZ records	Automated vaccine forecaster for due, past due, coming due.	Can list and notify by various means patients due (Reminder/recall)	Receive and respond to standard interoperable (HL7) queries.	Submissions via interoperable standards	Inventory decrements provider inventory consistent with VFC reqs.	Inventory interoperates with EHRs	Automatically decrements inventory as vaccine doses are recorded	Vaccine eligibility tracked at dose level.	Interfaces with VTRcks	Produces appropriate management reports for VFC.	Records for all demographics except where prohibited.	Evaluates and resolved incoming patient data for duplicates
CAIR2	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
CAIR S. Joaquin	YES	YES	YES	YES	YES	YES	YES	YES	NO ¹	NA	YES	YES	YES
CAIR San Diego	YES	YES	YES	YES	YES	YES	NO	YES	YES	NA	YES	YES	YES
Standard #	3.3	3.4	3.5	3.6	4.1	4.2	4.3	5.1	5.2	5.3	5.4	6.1	6.2
IIS Standard	Evaluates and resolved incoming vaccination data for duplicates	Can store IIS Core Data Elements	Establish record in timely manner via birth loads	Records and makes available vaccinations and patient info in a timely manner	Has confidentiality and privacy practice consistent with state law	Has user access controls, distinct access for user, and routine maintenance of access	Secure hardware, industry standard for PHI, with security/ encryption, uptime and disaster recovery.	IIS can provide IZ data access to all authorized users.	Ability to produce predefined and/or ad hoc reports for users	With authentication, can provide records to individuals or parents.	Can produce official IZ record (e.g. for school, day care, camp)	Reports to facilitate vaccine recall, lot #, manu, provider.	Facilitate adverse events reporting.
CAIR2	YES	NO	YES	YES	YES	YES	YES	YES	YES	NO	YES	YES	YES
CAIR S. Joaquin	YES	NO	NO ²	YES	YES	YES	YES	YES	YES	NO	YES	YES	YES
CAIR San Diego	YES	NO	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

1. Patient level rather than dose level.
2. Some but not all counties

Appendix C: PHIN Compliance Statement

CAIR2 will use the Public Health Information Network (PHIN) standards and specifications that are specific to Immunization Information Systems. Currently this includes the use of the existing messaging implementation guides as referenced at <http://www.cdc.gov/nip/registry/tech.htm#st>, and relevant specifics to countermeasure and response preparedness requirements as listed at <http://www.cdc.gov/phin/preparedness/cra.html>. The evolving PHIN standards and specifications will be accommodated as applicable throughout the CAIR lifecycle.

Ap... IR2 Org Chart



■ If CMS 90/10 is funded.

Appendix E: Acronyms Used

<i>Acronym</i>	<i>Definition</i>
AART	Aggregate Analysis Reporting Tool – online application that measures an IISs conformance with national data exchange standards
ACIP	Advisory Committee on Immunization Practices – federal advisory group that establishes immunization policy for the US.
AIRA	American Immunization Registry Association - supports IIS activities in the US
AFIX	Assessment, Feedback, Incentives, Exchange – CDC quality improvement process that currently involves running CoCASA reports that measure coverage rates and clinic immunization behavior and reporting these back to the clinic to encourage quality improvement . IIS will be mandated to incorporate defined AFIX reporting components into IIS by 2019/2020.
BiDX	Bi-directional data exchange – this involves the submission of an HL7
AMCI	Atlantic Management Center Incorporated - company that has built IIS provider management tool for Kansas and Colorado and has been contracted by CA to build a tool.
CAIR	Name for the California Immunization Registry System. Besides CAIR2, it includes the 3-independent regional registries (CAIR San Diego, CAIR San Joaquin, and CAIR Imperial)
CAIR2	State-sponsored registry consolidated from 7 former CAIR regional registries, comprising 87% of state’s population. CAIR2 plus CAIR San Diego, CAIR San Joaquin, and CAIR Imperial make up the CAIR System.
CALREDIE	California Reportable Disease Information Exchange – software that many counties use to report reportable diseases to CDPH.
CDC	Centers for Disease Control and Prevention – federal agency that funds Immunization Branch activities and systems
CDPH	California Department of Public Health
CDS	Clinical Decision Support – part of IIS that validates vaccine doses and makes recommendations on upcoming doses. Also, called the scheduler or forecaster.
CDSI	Clinical Decision Support for Immunization - CDC program that supports IIS clinical decision support by providing test cases to use when implementing new ACIP recommendations.
CoCASA	Comprehensive Clinical Assessment Software Application – external CDC software program that runs coverage and other reports using a patient file exported by an IIS (so-called CoCASA extract)
DQA	Data Quality Assessment – public domain software that is able to analyze HL7 immunization messages for compliance with national standards.
DX	Data Exchange – the process of submitting doses or patient queries to CAIR electronically
EHR-S	Electronic Health Record System – these systems are able to send data electronically to an IIS
HLN	Company that provides expertise on issues related to immunization information systems
I&E	Information and Education section of Immunization Branch
ICE	Immunization Calculation Engine - open source forecaster.

IG	Implementation Guide
IIS	Immunization Information System - another name for an immunization registry.
ITSD	CDPH Information technology Support Division – provides hosting to the CAIR2 infrastructure hardware and software.
LCR	Local CAIR Representative – local staff providing assistance and web interface training to CAIR2 users.
Medi-Cal	California’s Medicaid program
MRN	Medical Record Number
NIS	National Immunization Survey – phone survey carried out by CDC to estimate vaccine coverage rates.
PAIS	Patient Active/Inactive Status – status of patient with given provider. Impacts coverage rates since only active patients at each site are included in coverage estimates.
PHII	Public Health Informatics Institute – institute that provides consultation /expertise to support public health agencies.
PPHF	Prevention and Public Health Fund – competitive targeted funding offered by CDC
QBP	Query by Parameter – HL7 query message sent to an IIS that solicits patient immunization information be returned from an IIS
RSP	Response by Parameter - HL7 query message that returns patient immunization information from an IIS to the query submitter
SOAP	Simple Object Access Protocol – transport mechanism favored by CDC for immunization messaging.
SLA	Service Level Agreement – agreement that defines what services will be provided.
UTD	Up to Date
VFC	Vaccines for Children – federal program that supplies free vaccine to CA providers for the immunization of several categories of children.
VR	Vital Records
WIC	Women, Infants, and Children – federal program that provides food vouchers to indigent families.
WIR	Wisconsin Immunization Registry – baseline software that CAIR2 is built on. CA has a license with the State of Wisconsin to use and modify the software and also has access to code produced by any of the other states using the WIR software.
WSDL	Web Services Definition Language - CDC has recommended use of a defined web service language for use by IISs