Colorado’s Immunization Information System (CIIS)

**CIIS Background**

Confidential, secure, population-based, web-based system that:
- Consolidates immunization records for Coloradans of all ages.
- Recommends the vaccines a patient needs based on history and age.
- Supports increase and sustainability of high immunization coverage rates.

**CIIS by the numbers (as of today Jan 17, 2019)**

- Total Patients: 6.1 million
- Total Vaccinations: 68.7 million
- Sites Submitting Data Electronically: 1780
  - Real-Time: 1065
  - Bi-Directional: 446
- Sites Submitting Data Manually: 260

![Data Submission Type Chart]

87% Electronic
13% Manual
Common Onboarding Challenges

- Lack of engagement
- Communication delays
- Discontinuity in Projects
Colorado’s Immunization Information System (CIIS)

CIIS Reason for Process Improvements

- Provider backload – sites needed an interface developed
- Variable interface timelines (from 1 month to 2 years)
- Backlog of providers continued to grow causing gaps in data contained in CIIS
**Goal:** Streamline onboarding process to reduce project timelines and waitlist
- Rollout of new products
  - Online HL7 Testing Tool
  - Project Management Module
- Data Validation process changes
  - Clinic Vaccine List
  - Lot ID Patterns
Adopted iV-5 Data Exchange Manager

Three Components of System

Provider Onboarding Management System
• Manages the Daily Operations of CIIS
• Tools and Resources based on CIIS Team Member’s User Role

Self-Serve Resource Center (One-Stop-Shop)
• Provides appropriate Tools to accomplish tasks and facilitate processes
• Resource and Tools are based on Stakeholder Role

Workflow- Collaborative Engagement and Process Facilitation
• Unique to the task at hand
• Automated to decrease time-consuming administrative tasks
DE On-boarding Results following iV-5 Adoption

CIIS Program reduces interface waitlist by nearly 50% in 7 months.

CIIS Program Received the 2016 AIMS Bull’s Award for Innovation and Excellence!
Legacy Data Exchange Onboarding Process

CIIS DE Onboarding prior to Fall 2015

- Paper-driven process, submitted by Fax or Email.
- Manual handoff to Interoperability Team

- Sites added to waitlist with no estimated time of onboarding, possibly indefinitely.
- Tracking consisted of email history and spreadsheet

- Site connected to CIIS Test Environment following successful Pre-Testing.
- Tracking in spreadsheet and email history
- No guarantee of first time load
- Message and Data Corrections based on ACK message and visual inspection of rec’d messages

- Tracking consisted of email history and spreadsheet

- Tracking consisted of spreadsheet
Legacy Data Exchange Onboarding Process

Identifying Shortcomings of the Old Process

- Paper processes are cumbersome and time consuming.
- Needs personnel to process and route.
- Immediate wait listing stops the process in its tracks & Creates discontinuity in the project.
- Tracking in spreadsheet is cumbersome and needs to be constantly managed and updated.
- Using a system to validate HL7 messaging, which cannot be monitored does not benefit the IIS
- Manual inspection of an HL7 message is time-consuming with less than desired outcomes
- Site connected to CIIS Test Environment following successful Pre-Testing.
- Tracking in spreadsheet is cumbersome and needs to be constantly managed and updated.
- First time load failure is frustrating after all the time and effort spent in Pre-Testing
- ACK messages are sometimes difficult to decipher & manual inspection is time consuming
- Tracking in spreadsheet is cumbersome and needs to be constantly managed and updated
- Tracking in spreadsheet is cumbersome and needs to be constantly managed and updated
Improving the CIIS DE Onboarding Process

Phase 1. Process Improvements

- Converted to **online enrollment with Electronic Signature**
- Manual handoff was replaced by **automated workflow to route based on “Manner of Usage”**
- Adopted a **monitored self-serve HL7 validation tool**: instant feedback for HL7 MSG correction.
- All HL7 MSG validation activity & results are monitored by CIIS and their Stakeholders
- Replaced with **pre-qualified “Onboard Eligible” queue. Only Providers Passing Pre-Testing**
- **Automatically Tracked** by system.
- Eligible site invited then connected to CIIS Test Environment following successful Pre-Testing.
- **Guaranteed first time load**
- **Tracked in system**
- **Tracked in system**
- **Tracked in system**
CIIS Improved DE On-boarding Workflow

1. CIIS Enrollment
   - CIIS Letter of Agreement
   - Links Site to EHR
   - Links Site to HIE or IDNS

2. Pre-Testing
   - HL7 Test Message
   - HL7 Validation Feedback:
     - Passed
     - Failed
     - Warning
     - How & What to Correct
     - Downloadable Code Sets

3. Pre-Test Passed
   - iV-5 Dashboard Tracking

4. Onboarding Invite
   - Click to Invite

5. Response Invite
   - Onboarding Invite

6. Onboarding Action Request
   - Communications

7. Go Live
   - Go Live Notification

Stakeholders
- Physician Offices
- Hospitals
- Medical Groups
- EHR Vendors
- HIE & IDNS

Onboarding Interface Project
1. Preparation
2. Config/Connection
3. Testing/Review
4. Data Quality
5. Go Live

CIIS Staff
- Interoperability Coordinator
- HL7 Gateway Administrator
- Data Quality Coordinator

DE
- Enrolled
- Pre-Testing
- DB Eligible
- Onboarding
- Production
- Non-Active
Since fall of 2015 CDPHE has achieved higher productivity coupled by reduced project durations.
iV-5 Benefits

Added Continuity & Conformance to Process

- Stakeholder Engagement
  - Self-serve tools
  - Defined process with automated status updates
  - Automated Communications
  - Kept stakeholders engaged

- Workflow
  - Defined process
  - Self-serve
  - Appropriate tools

- Automated Communications

As a result, reduced on interface Project timeline
CDPHE vs. Stakeholder Access

CIIS Interoperability Team View

Welcome to CoPHR!

Colorado Public Health Reporting portal (CoPHR) allows Colorado’s health care community to register intent for Meaningful Use for the following public health programs:

- Cancer Registry Reporting for Eligible Providers
- Electronic Lab Reporting for Eligible Hospitals and Critical Access Hospitals
- Immunization Reporting for Eligible Providers, Eligible Hospitals and Critical Access Hospitals

For providers registered for cancer reporting, electronic lab reporting or syndromic surveillance, this site provides:

- Online registration for Meaningful Use
- Self-service access to registration documents.

For Immunization Providers, CoPHR provides a full range of resources to support you in using the Colorado Immunization Information System (CIIS), including:

- Ability to complete login request forms to access the CIIS database.
- Monitor EHR Vendor HL7 pre-testing required to begin the CIIS interface process.
- Monitor progress of your organization’s interface project once the project begins.
- Access CIIS training information.
- Register intent for Meaningful Use requirements.
- Access Meaningful Use Report Card to support attestation.
- Submit online support tickets to the CIIS Help Desk.

To begin, enroll with CoPHR to create your account.

For more information concerning a particular CDPHE program, select the desired program on the menu bar at the top of the page or click on the links above.

Stakeholder View in CoPHR
Stakeholder View in CoPHR

CoPHR Registration
Specific to Stakeholder Type

Why?
• Stakeholders are different.
• Require access to different guidance documentation
• Require different tools
• Not all are Eligible for the EHR Incentive Program
Data Collection
- Facility Identification
- Facility Type
- Medical Group Affiliation
- Location
- Business Contact Information
Preventative measure to reduce duplication of stakeholder profiles.

Healthcare Provider View in CoPHR

Health Care Providers - Enroll Your Healthcare Facility

Provider Site Enrollment Request
The following provider sites were found. Please select your provider site from the list below. If your provider site is not listed below, select New Provider site and click “Continue” button.

A. ☐ Provider Site is in the list below:

<table>
<thead>
<tr>
<th>Select</th>
<th>#</th>
<th>County</th>
<th>Provider Site Name</th>
<th>Address</th>
<th>City</th>
<th>Zip</th>
<th>Organization NPI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>DENVER</td>
<td>Test Status Indicator for Pretest</td>
<td>4045 E RILEY AVE</td>
<td>Denver</td>
<td>62538</td>
<td></td>
</tr>
</tbody>
</table>

B. ☐ Provider site is not in the list above and is a New Provider Site.
Data Collection

- User Identification
- User Contact Information
- Employee Type
- Reportable Program affiliation
  - Based on Facility’s Reporting eligibility
- Credentials for CoPHR Account
CoPHR Account Confirmation

- Onscreen confirmation
- Confirmation is also emailed to registrant with next step instructions
During Enrollment, Clinics are linked to their EHR Vendor.

And when applicable,

• Medical Group
• Health Information Exchange (HIE)
• Integrated Delivery Network Service (INDs)

Linking them makes them all stakeholders for the on-boarding interface project, allowing for shared updates and communications.
Eligible Program Enrollment

Healthcare Provider View in CoPHR

CDPHE Program Enrollment

• Only eligible programs display for enrollment

Process

• User selects Program
• Follows Enrollment Wizard

Prompts

This site is eligible to participate with the CDPHE public health programs listed below. Click on the program to setup the profile for each you wish to participate in.
Healthcare Provider View in CoPHR

Data Collection

Step 1. Immunization Profile

• Provider Type
• Types Immunizations Given
• Main Contact Information
• VFC Participation
Step 2: IIS Manner of Usage

Data Collection

Step 2: Manner of Usage

- Electronic Reporting (HL7)

When selected, additional data fields appear to collect data exchange profile information.

- Clinical Contact
- Data Validation Contact
- EHR Vendor/Production/Version & Contact
- HIE and/or IDNs affiliation
Step 3. CIIS Letter of Agreement (LOA)

- Required for all reporting clinics
- Online Submission
- Electronic Signature
- Routed for approval
IIS Enrollment Approval

Healthcare Provider View in CoPHR

Process

1. User Submits Agreement
2. Agreement Routed to CIIS Manager for approval

CIIS Interoperability Team View
Clinic Identified as Data Exchange

**DE Registered Dashboard**

Comprehensive list of all Data Exchange Providers

Clinics are automatically added to dashboard when . . .

Manner of Usage = Electronic Reporting (HL7)

Replaced excel spreadsheet tracking
Internal Data Exchange Profile

CIIS Interoperability Team View

Clinic Data Exchange Profile

• Information at a glance
• IIS Identifiers
• Contact Information
• Exchange Information
• Meaningful Use Profile
• IZ On-boarding Status
• HL7 Interface Project Summary
• Expandable MU Detailed Status Summary

Data Exchange profile pre-populated based on information entered by user during Registration and Enrollment.
EHR Incentive Program

Healthcare Provider View in CoPHR

Registration of Intent
- Online Submission
- Quick status view
- Attestation Documentation
- CDPHE Messaging History

Process
- User Registers Intent
- Designated POC Receives Confirmation
- MU Report Card Updated for future access

Get Started . . .

The step-by-step Onboarding process is represented below. The status indicators provide an up-to-date status for the completion of each step based on your actions. Clicking on the step will navigate you to the area within the service to provide the necessary.
Registration of Intent Process

1. User completes form with required information
2. User identifies one or more MU Point-of-Contact
3. User agrees (on behalf of clinic) to respond within 30 days to actions requests received from CDPHE.
4. User submits registration.
Registration of Intent Confirmation

Healthcare Provider View in CoPHR

Confirmations

• On screen confirmation
• Confirmation email with next step instructions sent to MU Point-of-Contact
Attesting Provider Communications

Emailed to Healthcare Provider

Automated Messaging
- Registration of Intent Confirmation
- Invitation to On-board
- Action Request(s)
- Non-Responsive Notifications
- Ongoing Submission Notification
- Exclusion Letters (Non-Vaccinators)

CDPHE controls letter content through administration feature in application.
System monitors on-boarding status/responsiveness and sends messages automatically. Action Requests are triggered by CDPHE.
Data Exchange profile pre-populated based on information entered by user during Registration and Enrollment.
Pre-Testing can be performed for the Clinic or by any of their linked stakeholders who have registered with CoPHR.
Phased On-boarding Instructions

Healthcare Provider View in CoPHR

Get Started . . .

• Phase based tasks are defined to be completed before moving to the next phase.
• Preparation Phase is completely self-serve.
• Preparation Phase MUST be completed prior to moving to Step 2 in the process.
Preparation: Pre-Testing

Healthcare Provider View in CoPHR

Validation Status
- Displays Required # Passing MSGs
- Status updated based on associated On-boarding Stakeholder validation activity.
- No IIS Connection Required

Process
1. User clicks Upload New File
2. User follows on screen instructions
Message validation based on . . .

- CDC and local IIS Jurisdiction Requirements
- HL7 MSG Type
  - VXU (Non-Historical)
  - VXU (Historical)
  - QBP
- HL7 Version identified in MSG

Process
1. User browses for file
2. User Uploads the file for validation

Supports single message and batch file (multiple message file) validation.
Pre-Testing: Validation & Results

Healthcare Provider View in CoPHR

Validations

• Message Structure Validation
• Required vs Required May Be Empty
• Validated for Content
  • Completeness & Accuracy
• Conditional Validations
  • for example (VFC Funding Source)

Results

• Passed
• Error (Required)
  • No errors may be present for message to pass
• Warning (Required may be Empty)

Validations may be performed by any associated stakeholder (EHR Vendor, HIE, IDNs or Clinic/Hospital Technical Staff). Results are shared.
Monitored Pre-Testing Activity and Results

CIIS Interoperability Team View

Pre-Testing Dashboard

- Clinic Name & IDs
- Medical Group Affiliation
- DE Mode (Update/Query)
- MU attestation and Status
- EHR Vendor/Product-Version
- HIE/IDNS affiliation
- Latest Pre-Testing Results
- Tester Information
- Quick link to view results

Clinics added when Pre-Testing begins.
On-Board Eligible

- Clinics passing Pre-Test automatically move from Pre-Testing dashboard.
- This is the pre-qualified on-boarding queue.

Process

1. CIIS Team invites Clinic
2. Clinic responds
3. CIIS Team Moves Clinic to On-boarding
Creating the Project

Once on the on-boarding dashboard, a new interface project can be created for the clinic or it can be added to an existing project for . . .

- Medical Group
- HUB-based EHR
- OR IDNS
Workflow Status: On-boarding
On-boarding: Interface Project

- Defined Process
  - Phase based task list
- Pre-populated with provider Preparation activity.
- Single location to . . .
  - Handle CDPHE staff assignments
  - Contact Management
  - Schedule Meetings
  - Manage Action Request
    - Generation, Tracking & Response
  - Overall Project Status Tracking
Interface Project: Project & Task Assignments

CDPHE Staff Assignments

- Staff are notified via email
- Project displays on personal homepage

Process

1. Select Staff Member
2. Add Comment & Save
3. CDPHE Staff member notified of new assignment
Interface Project: Action Requests

**Action Request**

- Generated via Project
- Sent to person identified as contact for associated phase

**Process**

1. CDPHE Generates Action Request
2. Request is logged
3. Response Tracker begins 30 day countdown.

Auto-Reminder sent to Contact upon 15th day with no response received. At 30 days, Non-Responsive Letter auto-sent to Clinic.
Shared Statuses based on Project

CIIS Interoperability Team View

- Preparation
  - Completed
  - KickOff - Completed
  - Contacts Established
  - LOA on File

- Configuration/Connection
  - Completed

- Testing/Review
  - Completed

- Data Validation
  - Record Validation: 01/16/2019
  - Current: 0 of 2
  - Historical: 0 of 1

- Go Live Status:
  - Completed

Healthcare Provider View in CoPHR

- Preparation
  - Requires completing prior to moving forward to the next phase of the CIIS Data Exchange on-boarding process.
  - Submit CIIS Letter of Agreement (LOA)
  - Review and Update Data Exchange profile
  - HL7 Message Pre-Testing: Requirements and status are displayed below:
    - VHU MSG Validation: 0 of 1 valid historical VHRs and 0 of 2 current VHRs have passed validation.
    - QPB MSG Validation: 0 of 1 valid query VHRs have passed validation.

- Connection & Test Review
  - Follow the steps below to establish and interface with the CIIS Test system. Once connected, begin submitting messages. The system will automatically track and update your success status below. Use ACS messages received to contact any issue messaging and data issue identified.
  - Download WSDL to connect to the CIIS Test environment
  - Establish Test Interface: Install the WSDL in your EHR and Connect to CIIS Test
  - Submit HL7 Messages to CIIS Test for validation: Achieve a 90% Success Rate
    - VHU MSG Validation: Successful VHU Message Count (AA Acknowledgements): 99.35% Rate: 95.01%
    - QPB MSG Validation: Successful Query/Response (RSP Acknowledgements): 0

- Data Validation
  - Validation Round: 1
    - Records Received: 100
    - Records Reviewed: 100 (100%)
    - Total # of Vaccine Svcs: 1000
    - Total # of Discrepancies: 10
    - Accuracy Rate: 99%

- GoLive Status
  - The CIIS Data Exchange Team has been notified that your organization has passed Pre-Production Validation. A CIIS team member will contact you to schedule the first round of data review. If your clinic achieves a 95% or higher quality rating another round will not be required.
Shared Statuses based on Project

CIIS Interoperability Team View

MU Report Card

• Updated automatically
  • Based on-boarding status

Post Go Live Report Card Example

1. Attesting Site Info
2. Registration of Intent Date
3. Reporting Period
4. Major Milestone Dates
5. Current Status
Spring 2019: CIIS Real-Time ACK Monitoring

OnBoarding
- Generates CIIS Clinic Code (IIS Site ID)
- Generates Prefilled SOAP WSDL for CIIS Test
- Monitors & Confirms Test Connection
- Sets & Confirms Pass Rate to begin Pre-Production
- Generates Prefilled SOAP WSDL for CIIS Production

Production
- Monitors CIIS Production Interface
- Monitors Submission Frequency
- Monitors Error and Rejection Rate
- Monitors Query Frequency

Meaningful Use
- Monitors Ongoing Submissions
- Monitors Bi-Directional Exchange
Real-Time Data Quality Monitor

• Identifies sites for 6 Month DQ Review
• Provides Proactive Data Quality Alerts
• Prioritizes Providers for Data Quality Review
• Provides MSG drilldown detail
• Provides Data Quality Reporting
  • CIIS Data Quality Coordinator
  • Provider Site
  • Medical Group

Meaningful Use

• Monitors Prioritized Data Element Submission
  • For example: NDC
Colorado’s PHASE 3

Thank you