FHIR® and Public Health, Current Activities, Plans, and Future Possibilities

The Office of the National Coordinator for Health Information Technology

Welcome, Introductions, and a brief history of public health data collection

Daniel Chaput, MM

IT Specialist

Office of the National Coordinator for Health IT

The Office of the National Coordinator for Health Information Technology

Public Health Reporting in U.S.

Results of a Provider Burden Investigation

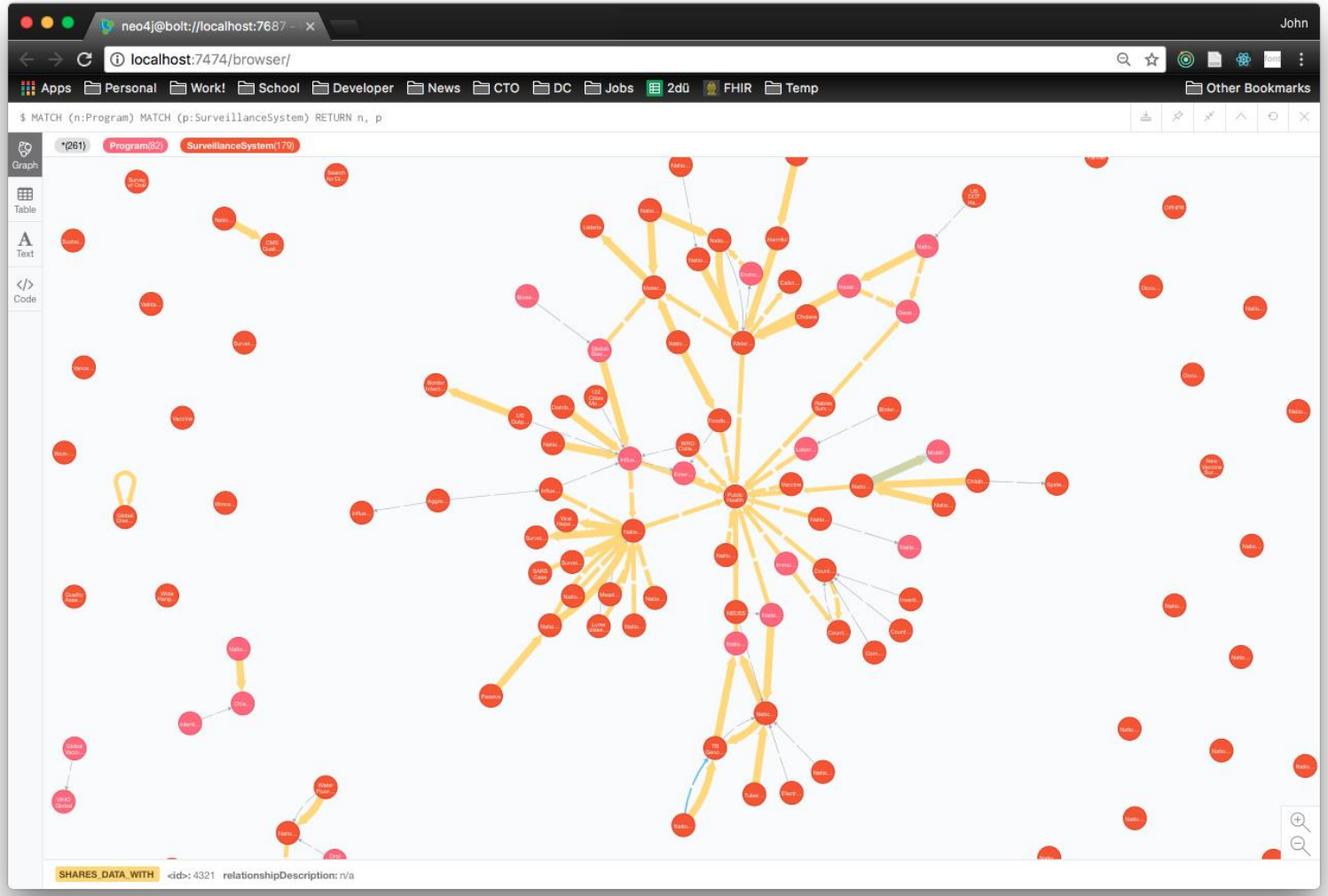
John Bender, MS, MPH (john.bender@hhs.gov)

Public Health Analyst, ONC

Methods

- Sought to understand public health reporting burden in the U.S.
- Project by CDC to catalog all programs, surveillance systems, registries tools, data assets, etc.
- In 2014, CDC committee conducted interviews and surveys to document these items
- Produced PDF “database”
- In 2015, Thomas G. Savel, MD and team from CDC Public Health Informatics Research Lab cataloged these into Neo4J graph database
- I updated the Neo4J database incrementally to usable version here
- Used the Cypher query language to identify ~500 assets
- Further filtered to 200 public health assets, and 100 that could impact provider burden

Methods



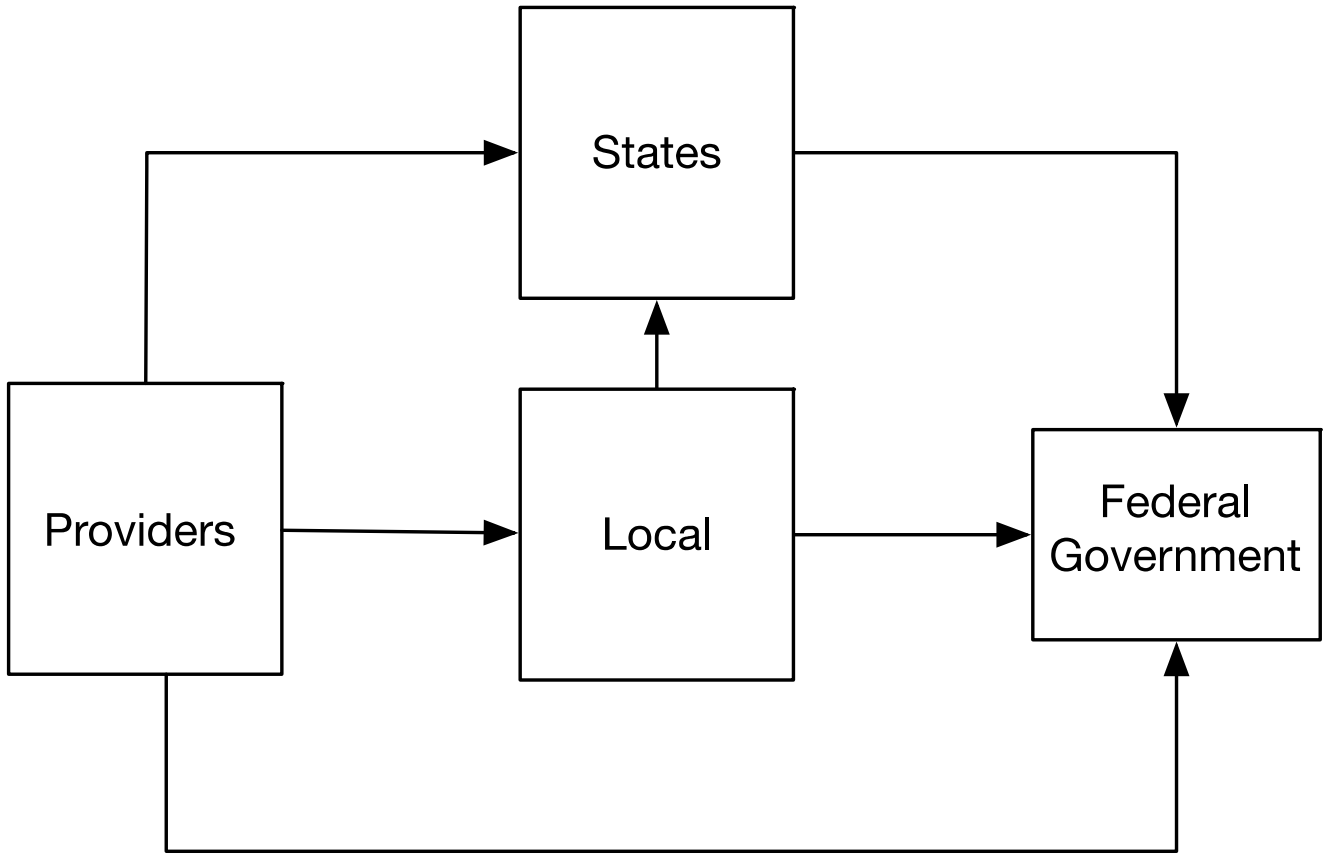
Neo4J Cypher query linking Programs to Surveillance Systems

Results

Table 1a
Catalog of public health programs that may impact provider public health reporting

Name	Agency	Data source	Public health type	Category
Medical Expenditure Panel Survey: Medical Provider Component	AHRQ	Primary data source	Surveys	HealthSurvey
Healthcare Cost and Utilization Project	AHRQ	Primary data source	Recurrent Reporting	Program
Medical Expenditure Panel Survey	CDC	Primary data source	Surveys	HealthSurvey
National Ambulatory Medical Care Survey	CDC	Primary data source	Surveys	HealthSurvey
National Hospital Ambulatory Medical Care Survey	CDC	Primary data source	Surveys	HealthSurvey
National Syndromic Surveillance Program (formerly BioSense)	CDC	Primary data source	Syndromic Surveillance	Program
Perinatal Hepatitis B Prevention Case Management Data	CDC	Primary data source	Case Reporting	Program
Vaccine Safety Datalink Project	CDC	Primary data source	Adverse Event Surveillance, Sentinel Surveillance	Program
Cardiac Arrest Registry to Enhance Survival	CDC	Primary data source	Registry	Registry
National Amyotrophic Lateral Sclerosis Registry (ALS)	CDC	Primary data source	Registry	Registry

Results



Provider-Driven
Public Health
Reporting Pathways

Results

- **Adverse Event Surveillance**
  - Monitor adverse events, like the *Vaccine Safety Datalink Project*
- **All Patient Reporting**
  - All patients who receive a service, like the *Early Hearing Detection and Intervention Program*
- **Case Reporting**
  - Morbidity reporting, like *National Electronic Disease Surveillance System*
- **Clinical Quality Measures**
  - Pre-defined clinical outcome measures, like *Million Hearts Initiative*
- **Laboratory Reporting**
  - Reporting originates from public health laboratories
- **Recurrent Programmatic Reporting**
  - Healthcare organizations report on a recurring basis to outcome being monitored, like *Ryan White Program*

Results

- **Registry**
  - Lists of patients for upkeep of longitudinal records or measures over time, like *Fragile X Registry*
- **Sentinel Surveillance**
  - Sample of organizations report to estimate national burden / emerging patterns, like *Autism and Developmental Disabilities Monitoring Network*
- **Served Patient Reporting**
  - Only patients served are reported, like *HIV Prevention Program Evaluation and Monitoring System*
- **Surveys**
  - Recorded measures to government, like *National Ambulatory Medical Care Survey*
- **Syndromic Surveillance**
  - Serves to identify diseases prior to diagnosis, like the *National Syndromic Surveillance Program*
- **Vital Statistics**
  - Birth / death records reported to health authorities, like *National Vital Statistics System*

Discussion

- Provider-driven public health reporting is complex
- Need for maintained, up-to-date catalog of federal public health reporting programs in the U.S.
- NHS England Approved Collections
  - Includes burden assessments and Data Coordination Board
- Several programs rely on sentinel surveillance or limited voluntary submission rather than seeking comprehensive or near-comprehensive reporting
- Implications of Cures Act Proposed Rule
  - Ideally more efficient public health surveillance
  - Additional surveillance capabilities

2015 CEHRT, Interoperability Standards Advisory & TEFCA

Rachel Abbey, ONC Office of Policy

Rachel.Abbey@hhs.gov

EHR Certification Requirements

- For 2020: Everyone should be using 2015 edition of Certified Electronic Health Record Technology (CEHRT)
- Details behind the certification program are here:

  https://www.healthit.gov/topic/certification-ehrs/2015-edition-test-method
- The results of a products being tested are here:

  https://chpl.healthit.gov/#/search

Public Health Certification Requirements

Regulation Text Citation	Certification Criterion
§170.315(f)(1)	Transmission to immunization registries
§170.315(f)(2)	Transmission to public health agencies — syndromic surveillance
§170.315(f)(3)	Transmission to public health agencies — reportable laboratory tests and value/results
§170.315(f)(4)	Transmission to cancer registries
§170.315(f)(5)	Transmission to public health agencies — electronic case reporting
§170.315(f)(6)	Transmission to public health agencies — antimicrobial use and resistance reporting
§170.315(f)(7)	Transmission to public health agencies — health care surveys

ONC 2015 Edition Test Method

2015 Edition Test Method

The 2015 Edition Test Method has been constructed in an outcome-focused format with additional companion guide documents to aid stakeholder development of Health IT Modules. The Test Method provides the structure for evaluating conformance of the Health IT Module to the certification criteria defined in 45 CFR Part 170 Subpart II of the 2015 Edition Health Information Technology (Health IT) Certification Criteria, 2015 Edition Base Electronic Health Record (EHR) Definition, and ONC Health IT Certification Program Modifications final rule as published in the Federal Register on October 16, 2015. The 2015 Edition Test Method includes Test Procedures, Test Tools and Test Data and is listed below by certification criterion number.

Health IT certified under the ONC Health IT Certification Program (Program) must conform to the **full scope** of the product's required capabilities, including regulatory/conformance expectation clarifications and interpretations set forth in the applicable Certification Companion Guides. Materials prepared by ONC to support pre-certification testing, such as the 2015 Edition Test Method, should be read and understood on the basis that they have been prepared with the express purpose of evaluating a **limited subset** of the product's required capabilities in a controlled environment. As such, this type of guidance is not determinative of the full scope of a product's required capabilities.

Sign Up for Email Updates!

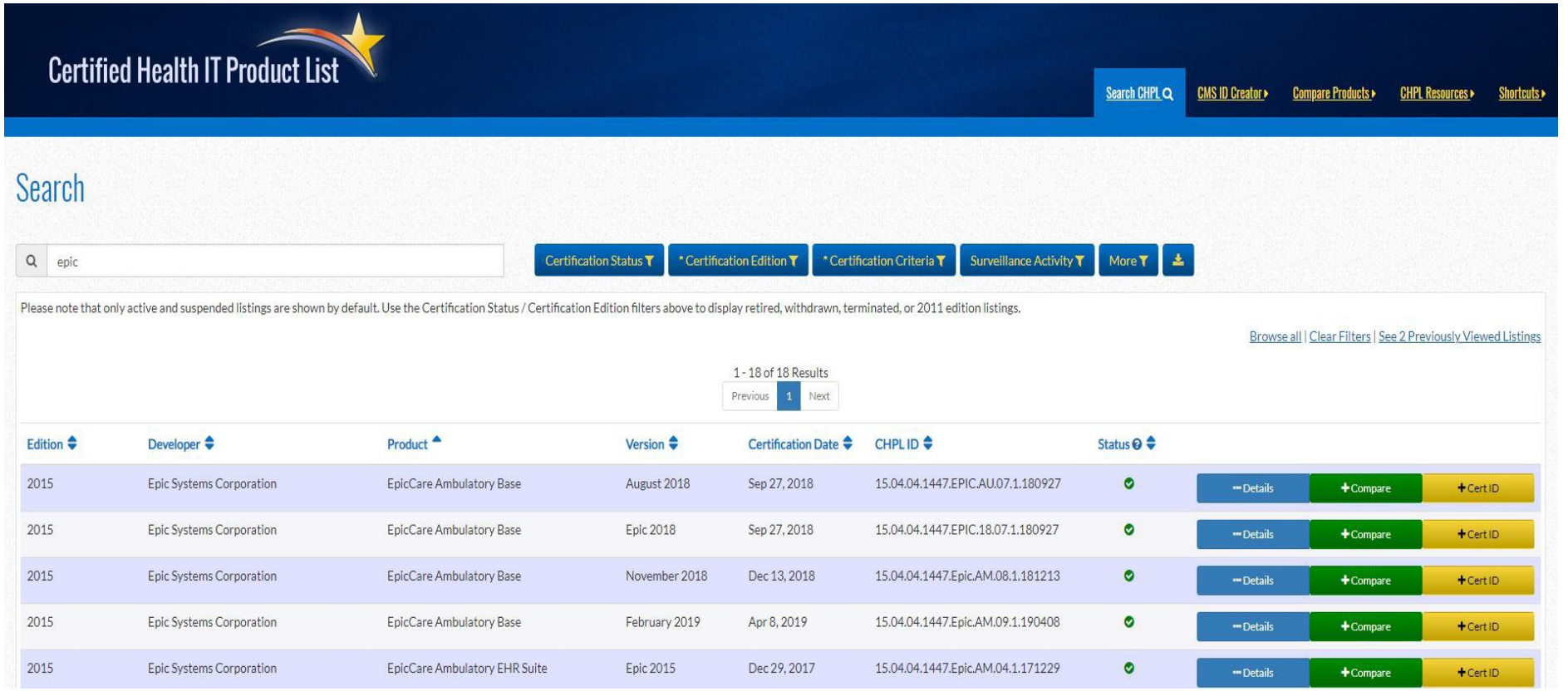
2015 Edition Test Method Feedback

Submit feedback to the Program via ONC.Certification@hhs.gov with "CCG" in the subject line for Certification Companion Guides and "2015 Edition TP" in the subject line for Test Procedures.

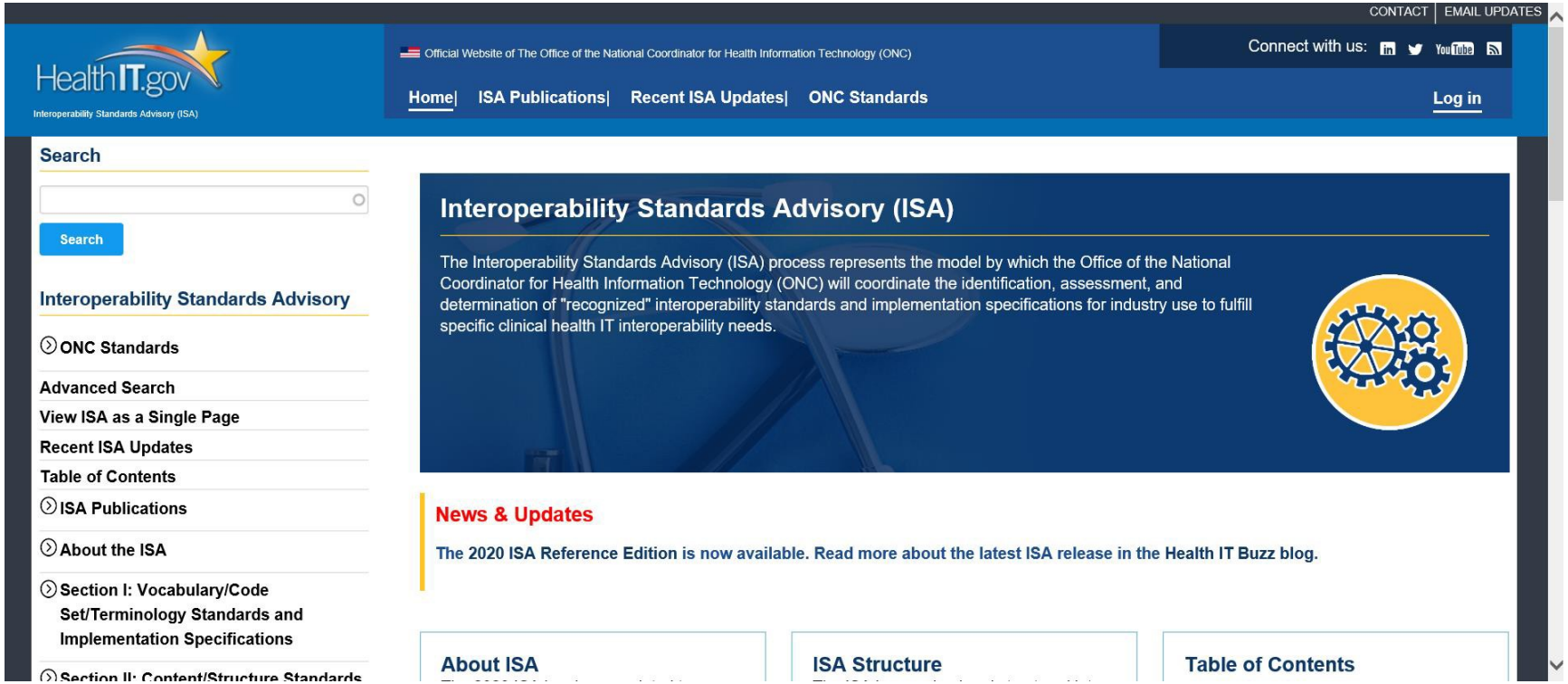
An overview of the public feedback for the 2015 Edition Draft Test Procedures can be found in the Summary of Comments for 2015 Edition NPRM Draft Test Procedures document [PDF - 493 KB].

Test Procedures

The test procedures offer objective guidance to ONC-Authorized Testing Laboratories (ONC-ATLs) as they conduct Health IT module testing in the Program, to provide traceability from the certification criterion or criteria to testing activities, and to ensure consistency throughout the certification process. The new Test Procedures format includes a grid of testing components that the ONC-ATLs would use as the test approach for that particular criterion. The key is below:


Certified Health IT Product List
Search CHPL
CMS ID Creator
Compare Products
CHPL Resources
Shortcuts
Search
epic
Certification Status
* Certification Edition
* Certification Criteria
Surveillance Activity
More
Please note that only active and suspended listings are shown by default. Use the Certification Status / Certification Edition filters above to display retired, withdrawn, terminated, or 2011 edition listings.
Browse all | Clear Filters | See 2 Previously Viewed Listings
1 - 18 of 18 Results
Previous 1 Next
Edition Developer Product Version Certification Date CHPL ID Status
2015 Epic Systems Corporation EpicCare Ambulatory Base August 2018 Sep 27, 2018 15.04.04.1447.EPIC.AU.07.1.180927 Details Compare Cert ID
2015 Epic Systems Corporation EpicCare Ambulatory Base Epic 2018 Sep 27, 2018 15.04.04.1447.EPIC.18.07.1.180927 Details Compare Cert ID
2015 Epic Systems Corporation EpicCare Ambulatory Base November 2018 Dec 13, 2018 15.04.04.1447.Epic.AM.08.1.181213 Details Compare Cert ID
2015 Epic Systems Corporation EpicCare Ambulatory Base February 2019 Apr 8, 2019 15.04.04.1447.Epic.AM.09.1.190408 Details Compare Cert ID
2015 Epic Systems Corporation EpicCare Ambulatory EHR Suite Epic 2015 Dec 29, 2017 15.04.04.1447.Epic.AM.04.1.171229 Details Compare Cert ID

Interoperability Standards Advisory (ISA)



Trusted Exchange Framework and Common Agreement (TEFCA) Update (related to public health)

- ONC Awarded a cooperative agreement to the Recognized Coordinating Entity (RCE) in September—The Sequoia Project
- The RCE website: https://rce.sequoiaproject.org/
- The RCE is planning to seek stakeholder input:
  - RCE Kick-Off Webinar (early October)
  - Interoperability Matters Public Advisory Forum (early November)
  - Government & Public Health Stakeholder Targeted Feedback Session (January 9, 2020)
  - The RCE is hosting a Stakeholder Session at the ONC Annual Meeting—healthit.gov (January 27-28, 2020 in Washington, DC)

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Innovation in Immunization

James Daniel, MPH
Director of Public Health Innovation
HHS Office of the Chief Technology Officer

Consumer Engagement for IIS Project

Goal: Increase consumer access to online immunization records and forecasts through state and regional IIS.

Collaborative project between CTO, ONC, CDC, Audacious Inquiry (Ai), and Scientific Technologies Corporation (STC).

Marketing Activities

- Posters/Brochures
- Mailings
- Pilot Ad Campaigns
  - Seattle Metro
  - Baton Rouge Metro
  - Caregiver bloggers
  - Paid Social Media and Advertising
- Marketing Evaluation

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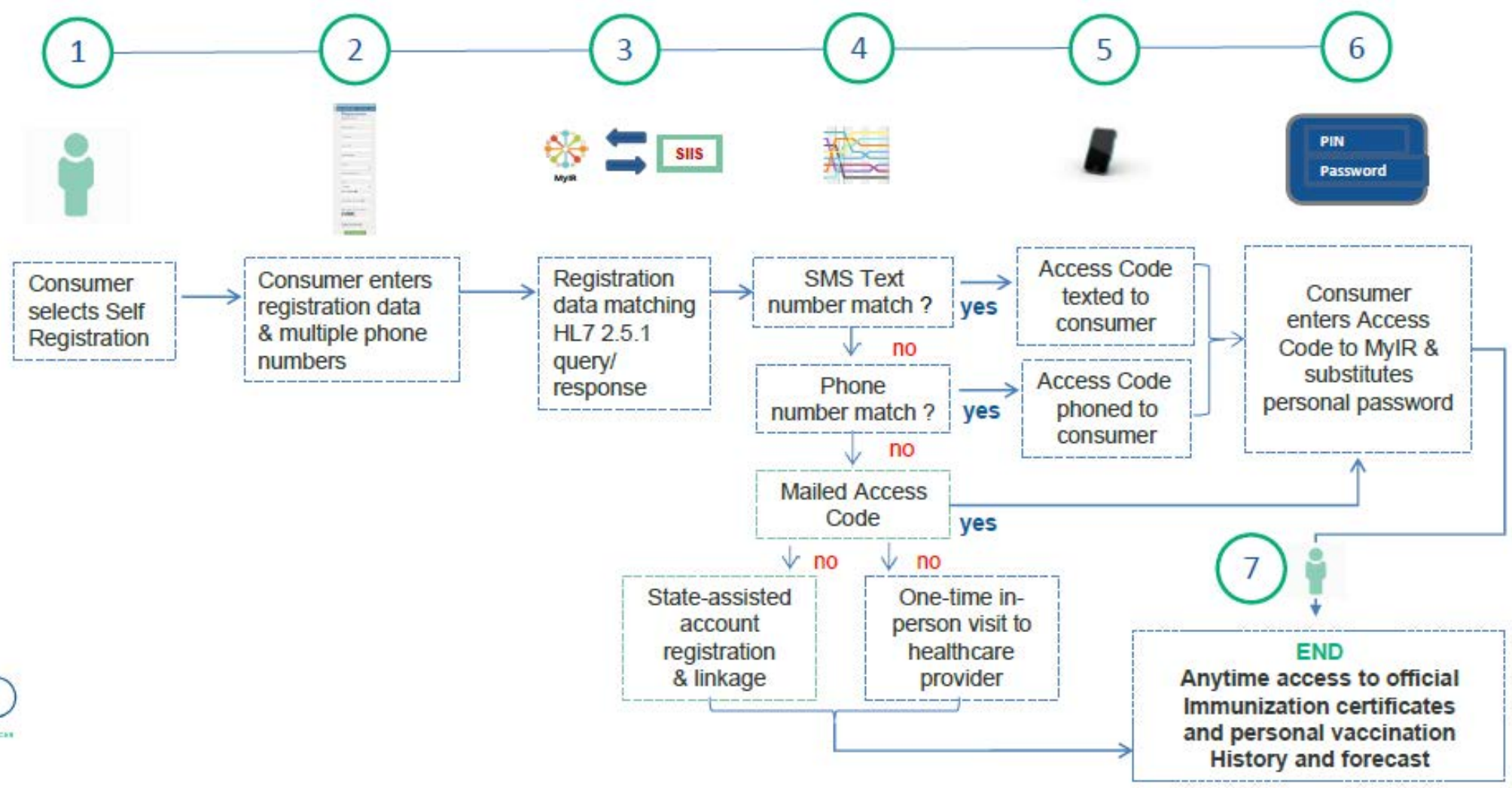
Online Authentication Workflow



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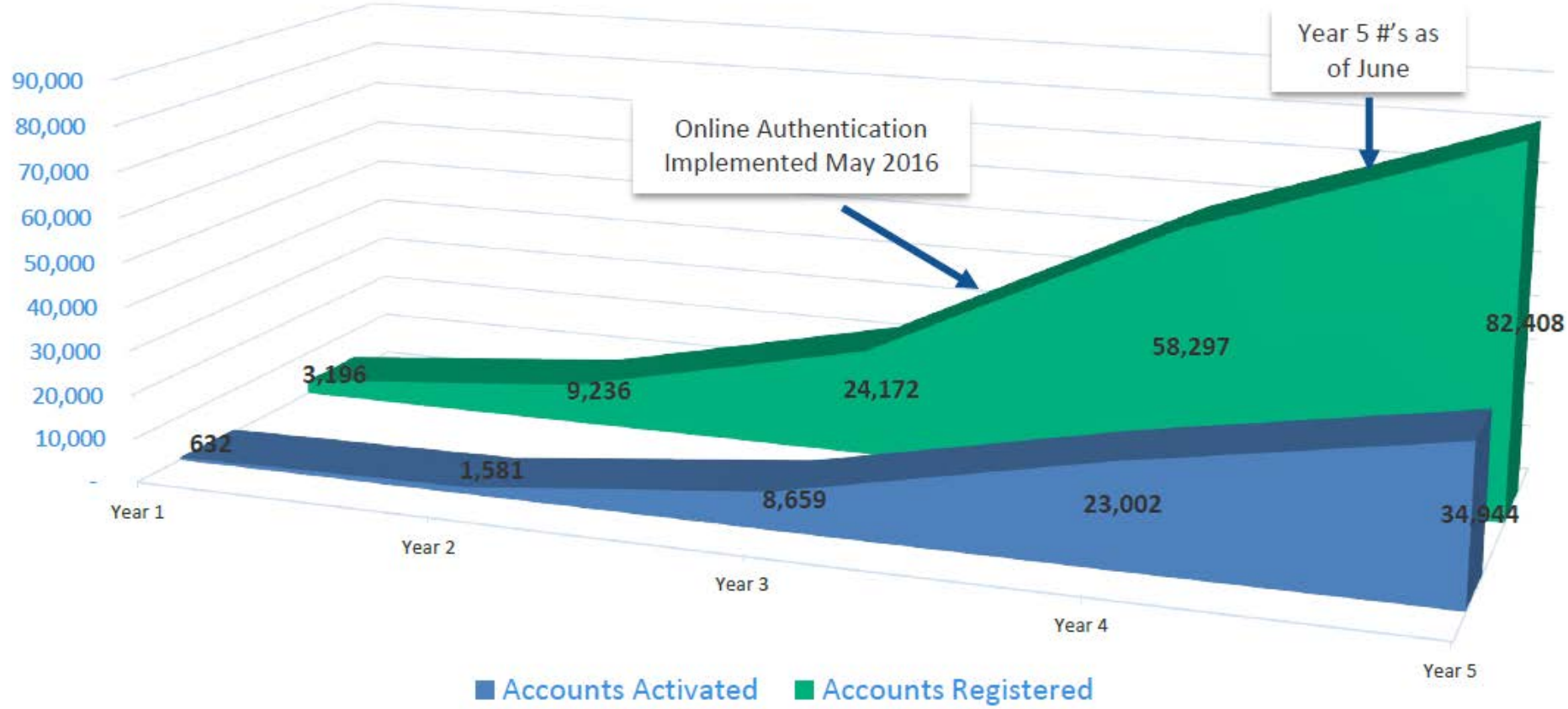
Evaluation: MyIR Accounts Registered and Fully-Activated in WA and LA (2013 – 2018)



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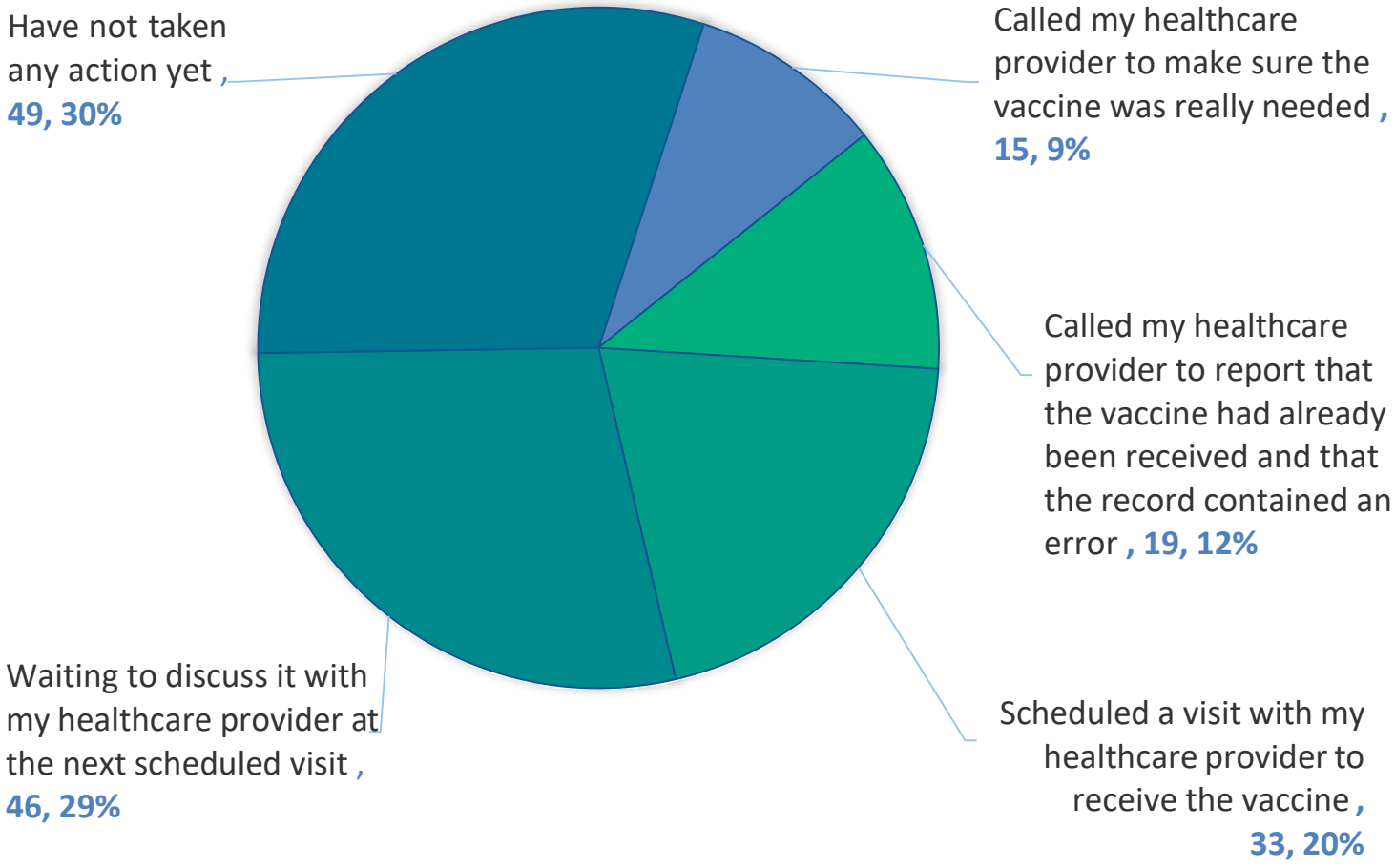
Informed Decision Making

- **28%** (n=163) of survey respondents that viewed their record learned they needed a vaccine
- **41%** took action
- **74%** of those that took action received the needed vaccine

WHAT ACTION DID YOU TAKE AFTER YOU LEARNED THAT A VACCINE WAS NEEDED?



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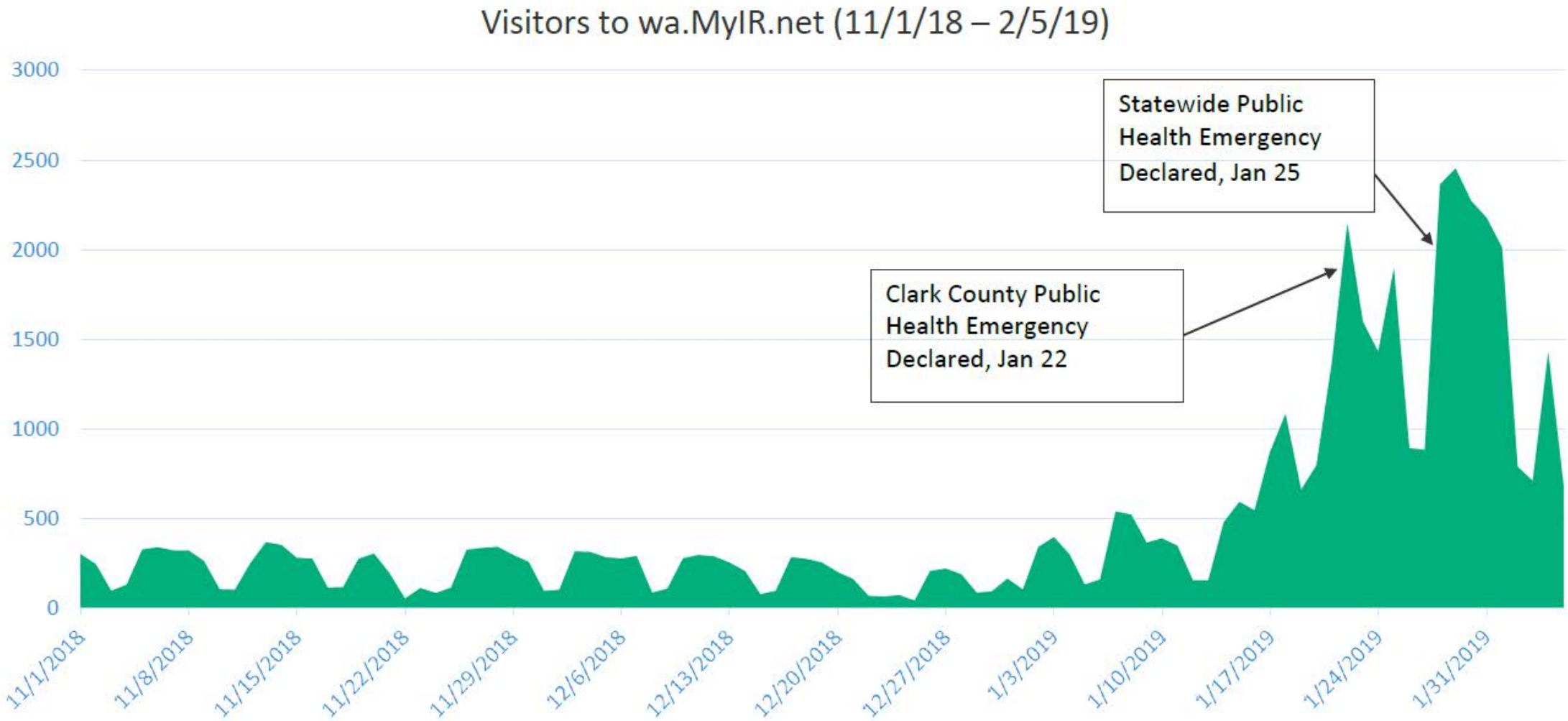
MyIR Visitors during WA Measles Outbreak



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Next Steps

- Improve consumer registration process (STC)
- Explore alternative methods for consumer access through PHRs
- Implement refined marketing approach
- Formal evaluation of MyIR

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Cross-jurisdictional Immunization Data Exchange

Goal: To enhance cross-jurisdictional immunization data exchange by:

- Providing participating pilot sites with a data hub via which they can exchange immunization data
- Committing pilot sites to implement the HL7 Immunization Implementation Guide V1.5 and use the adapted CDC WSDL

Collaborative project between CTO, ONC, CDC, JBS International, and ESAC

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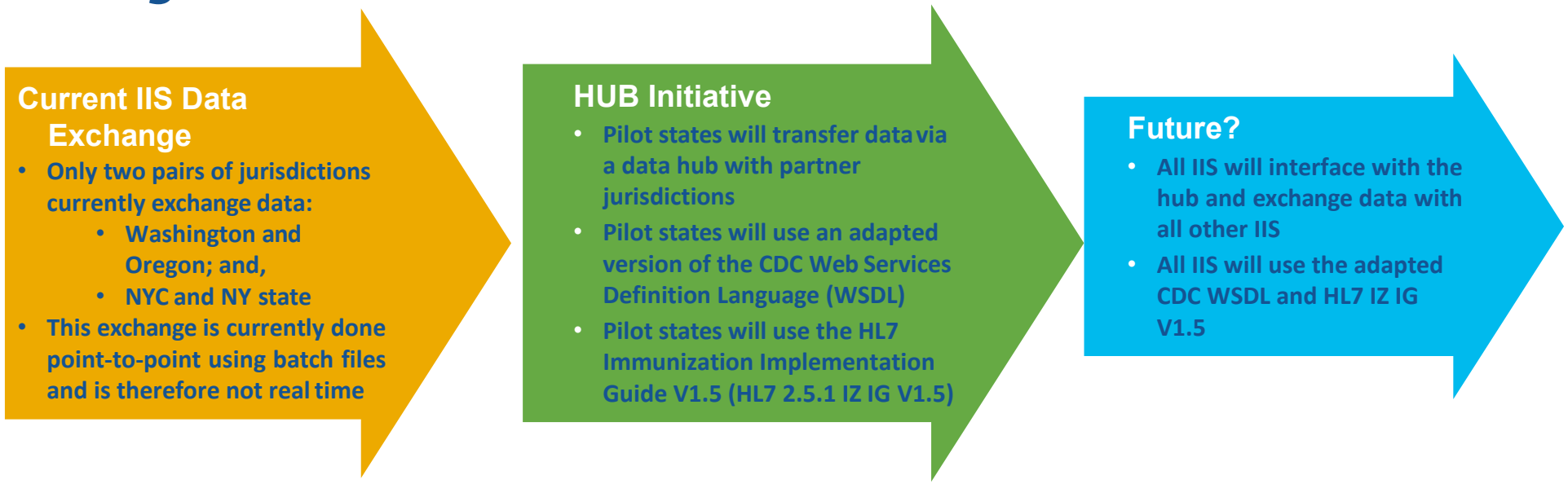
CDC

JBS INTERNATIONAL
A CELERIAN GROUP COMPANY

ESAC
Enterprise Science And Computing

Cross-jurisdictional Goals and Objectives



Advantage of HUB solution:

Promotes use of adapted CDC WSDL and HL7 IZ IG V1.5 which will drive interoperability

Will improve use of bidirectional querying by IIS

Scalable solution

- More IIS can easily be added to the hub
- IIS will be able to theoretically communicate with any other IIS on the hub

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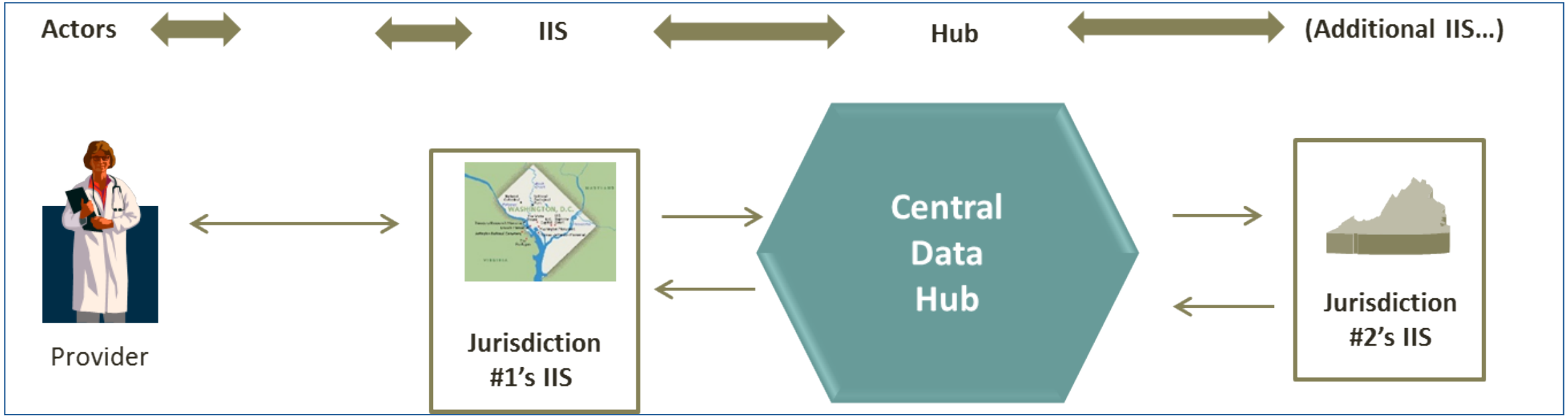
Over immunization

- A 2000 study published in JAMA found that 1 in 5 US children had received at least 1 extra vaccine dose by age 19 to 35 months.
- Annual costs associated with extra-immunization were conservatively estimated to be $26.5 million.

Feikema, SM, Klevens, RM, Washington, ML, Barker, L. Extra-immunization Among US Children. JAMA 2000;283:1311-1317

PHIZ Data Flow



Transactions may be automatically triggered by the IIS recognizing the patient's address or manually initiated by a provider. The 3 HL7 message types involved are:

- QBP (Query)
- RSP/ACK (response)
- VXU (Unsolicited Update)

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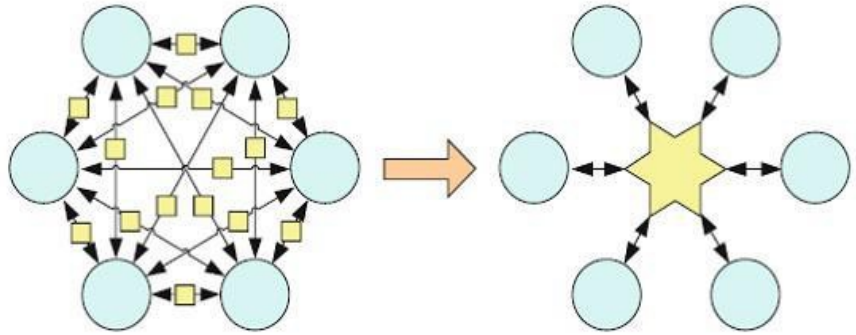
Immunization Gateway

- Pragmatic approach emulating a National Registry: Centralized Hub to link local IIS, Providers, and Consumers
- Addresses operational, technical, and legal challenges via centralized shared services



- Linking 6 systems requires 15 interfaces; but linking 64 Immunization Information Systems (IIS) requires 2,016 interfaces
- Accounting for providers, the Hub reduces connections from thousands to dozens
- *Diagram has been adapted from "Principles of Health Interoperability. HL7 and SNOMED" by Tim Benson*

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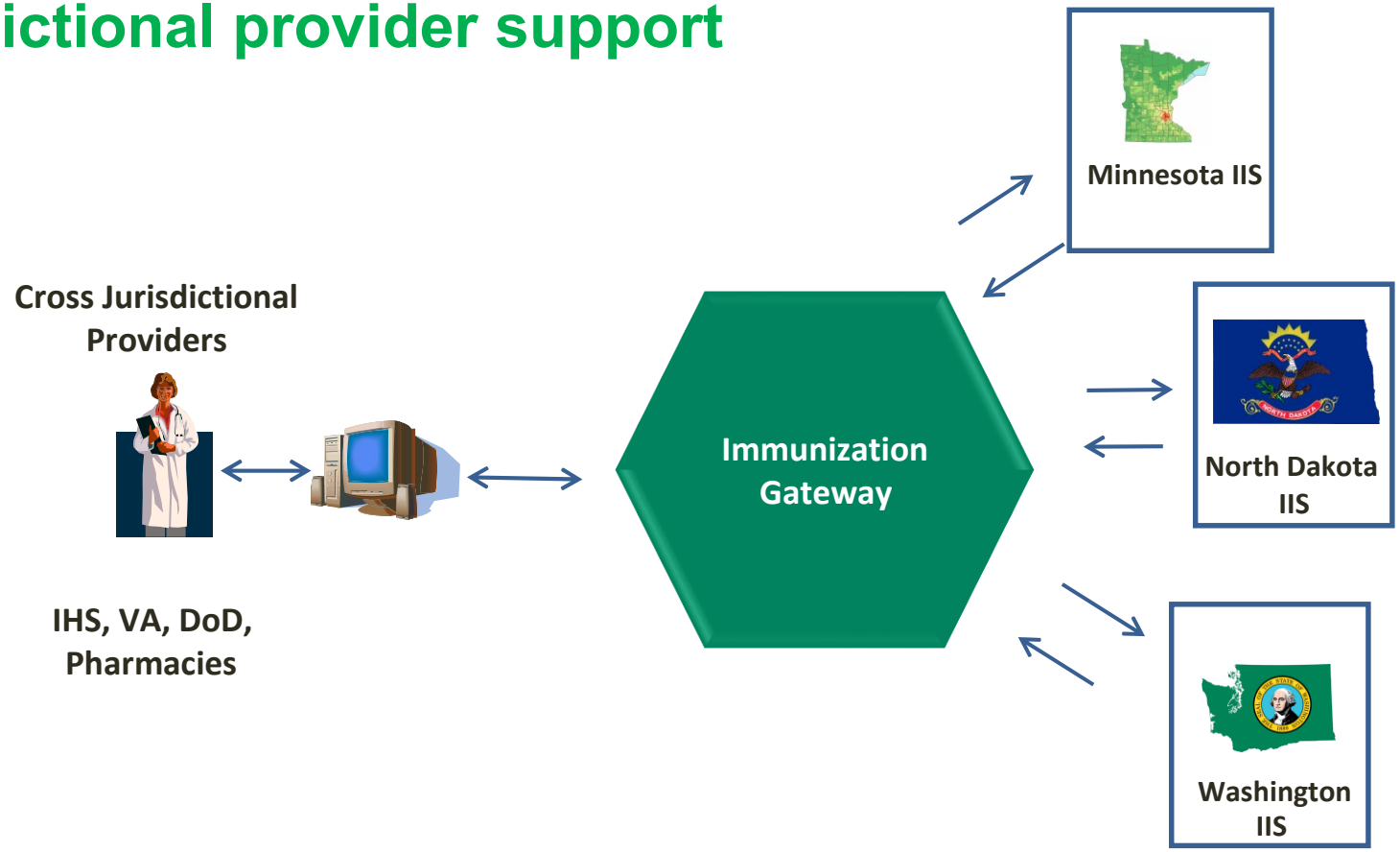
IZ Gateway

Cross-jurisdictional provider support



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Centralized Business Processes

Collaborate with provider organizations and IIS to develop a common, mutually agreeable onboarding process, policy and legal agreements

Analyze onboarding IIS-specific processes to identify core business needs

- Collaboratively develop more efficient process and tools for onboarding
- Centralized testing procedures and testing tools
- Centralized policy documents
- Centralized business agreements

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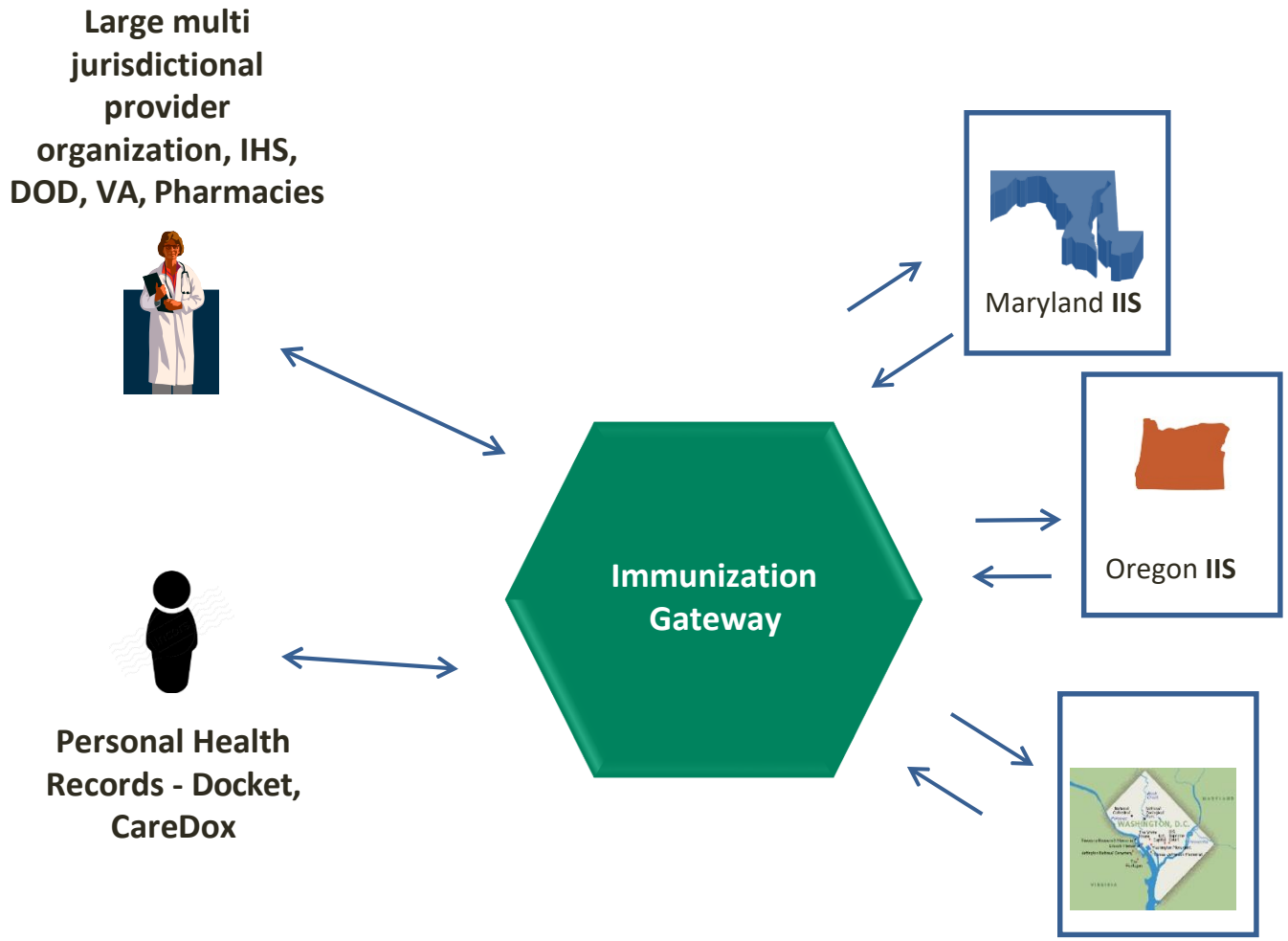
Bringing it all together



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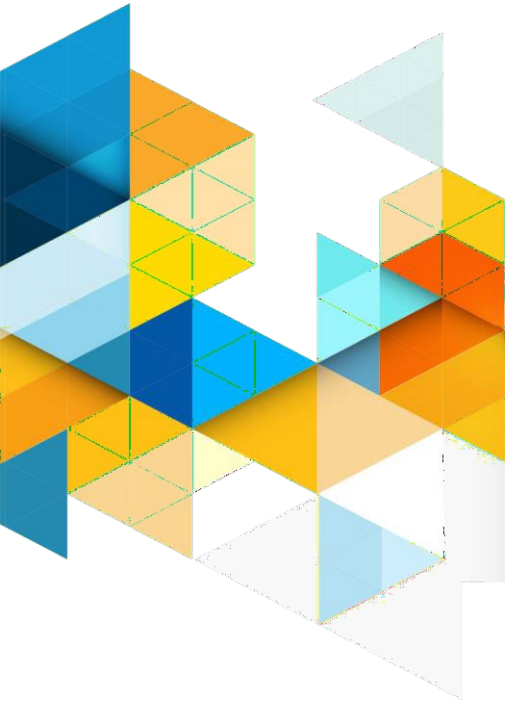


Is Public Health Ready to “Play with FHIR”?

Using Technology to Address the Opioid Crisis

Bryant Thomas Karras, MD
Chief Informatics Officer

Office of the State Health Officer, Chief Science Officer
Washington State Department of Health

www.doh.wa.gov/healthit

Partnering with the University of Washington

The Office of the National Coordinator for Health Information Technology

FHIR - Training and Certifications

- Rhapsody Training
- Microsoft FHIR Dev Days
- Seattle On-FHIR Summit
- HL7 Workgroup Meeting

FHIR – Getting Engaged

- ONC Annual Meeting
- HIMSS – attend sessions and showcase
- MESC
- Comment and Review on proposed federal rules
- Educate State Legislature on new interoperability direction

Standards development organizations

- HL7 Public Health WG weekly calls
  - High value, excellent agendas and meeting notes
  - https://confluence.hl7.org/display/PHWG
  - In-progress work on several FHIR standards
    - Occupational data
    - Bidirectional e-referral (BSER)
    - eICR
    - Others

FHIR – Build Infrastructure

- Engage state HIE to prepare
- Begin review of internal needs for interoperability engine to connect to HIE
- Systematically informing programs and IT about new requirements that are coming
- Deveop plans for FHIR enableing data elements from Foundational Public Health Service and individual Systems

- WA was first state awarded funding under this act
  - Approval letter from CMS - 7/9/19
- What DOH included in the application:
  - Start the PMP Request for Proposal.
  - Continue PMP/EHR integration TA via UW/Comagine
  - UW for PMP query and CDS Hooks for Rx Rules (FHIR)
  - UW to evaluate and consult to improve agency Opioid Tableau Dashboard (required performance metrics)
  - $ to assist with Opioid data linkage projects
- HCA also included requests in the application
  - Additional data sources for clinical and case management
  - Consent management solution

UW School of Nursing

- Develop Fast Healthcare Interoperability Resources (FHIR) Module for EHR integration – engage clinical community
  - Includes CDS Hooks based on WA State Opioid Prescribing Regulations
- Healthcare Information and Management Systems Society Demonstration – March 2020
- Promote Seattle on FHIR and UW FHIR Events
- Evaluation/improvement of the DOH Tableau Opioid Dashboard

UW School of Public Health

- Provide technical assistance to an additional 60 to 80 practice sites for PDMP integration
- Comprehensive evaluation on PDMP integrations – facilitators/barriers
- Evaluation/improvement of the DOH Tableau Opioid Dashboard
- Environmental scan of up to 4 comparison state PDMPs for integration facilitators/barriers

Prescriber Challenges in Using Opioid data

- ❑ Quickly accessing patient prescriptions
- ❑ Having EHR workflow follows local prescribing rules vs national recomendations
- ❑ Difficulty in effectively implementing CQL guidelines
- ❑ Difficulty in Population Management
- ❑ Lack of access to easily viewed metrics
- ❑ Quickly accessing contextual data
- ❑ Calculating risk assessments
- ❑ Alerts
- ❑ EHR integration

Scope of Work

1. Technical Capacity Building
2. Data interoperability
3. Reference Implementation
4. Early Adopters in WA
5. Tech support for DOH Opioid Dashboard

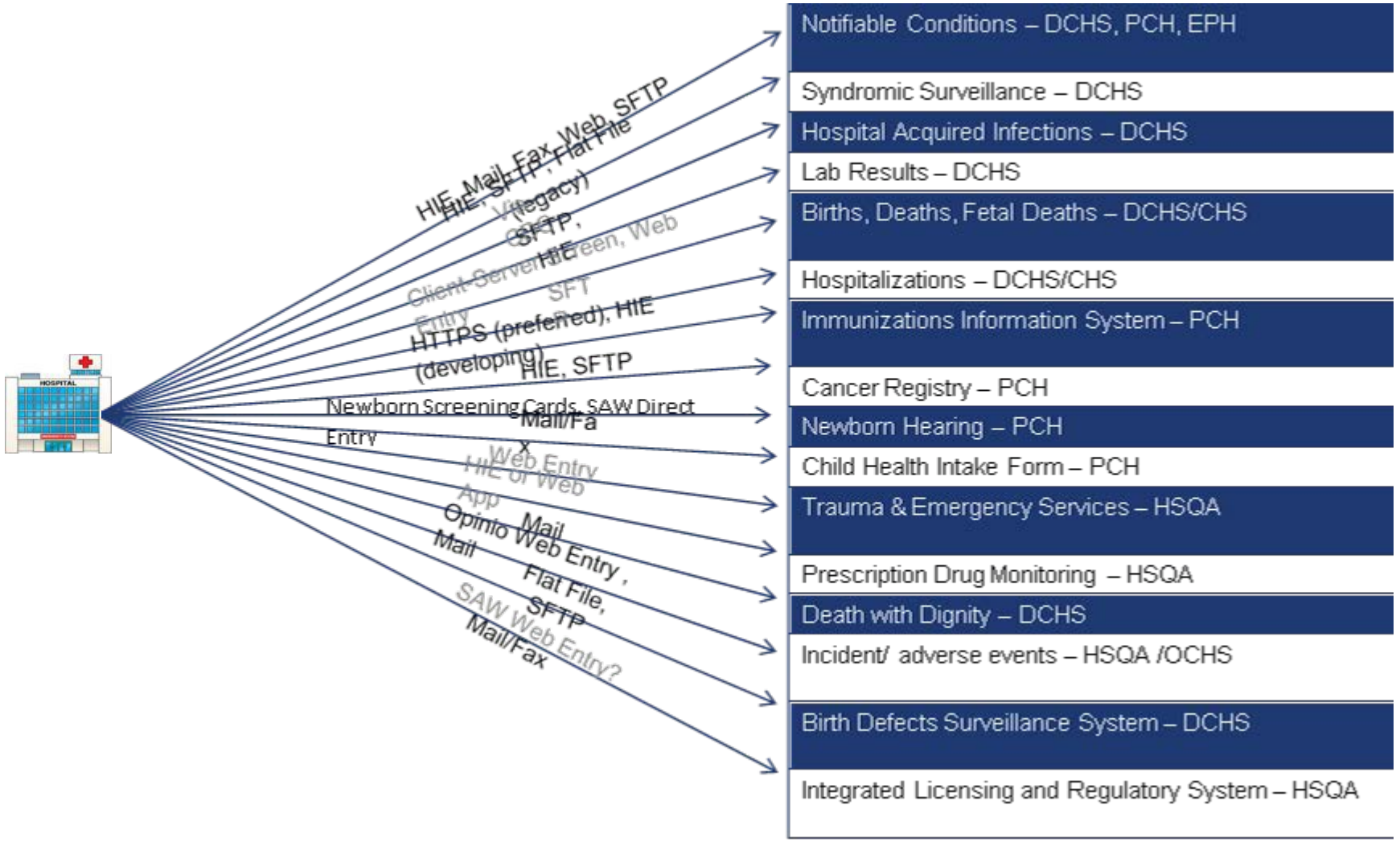
Deploy Opioid CDS through a Smart on FHIR Application

Opioid Rx CDS Feature Summary

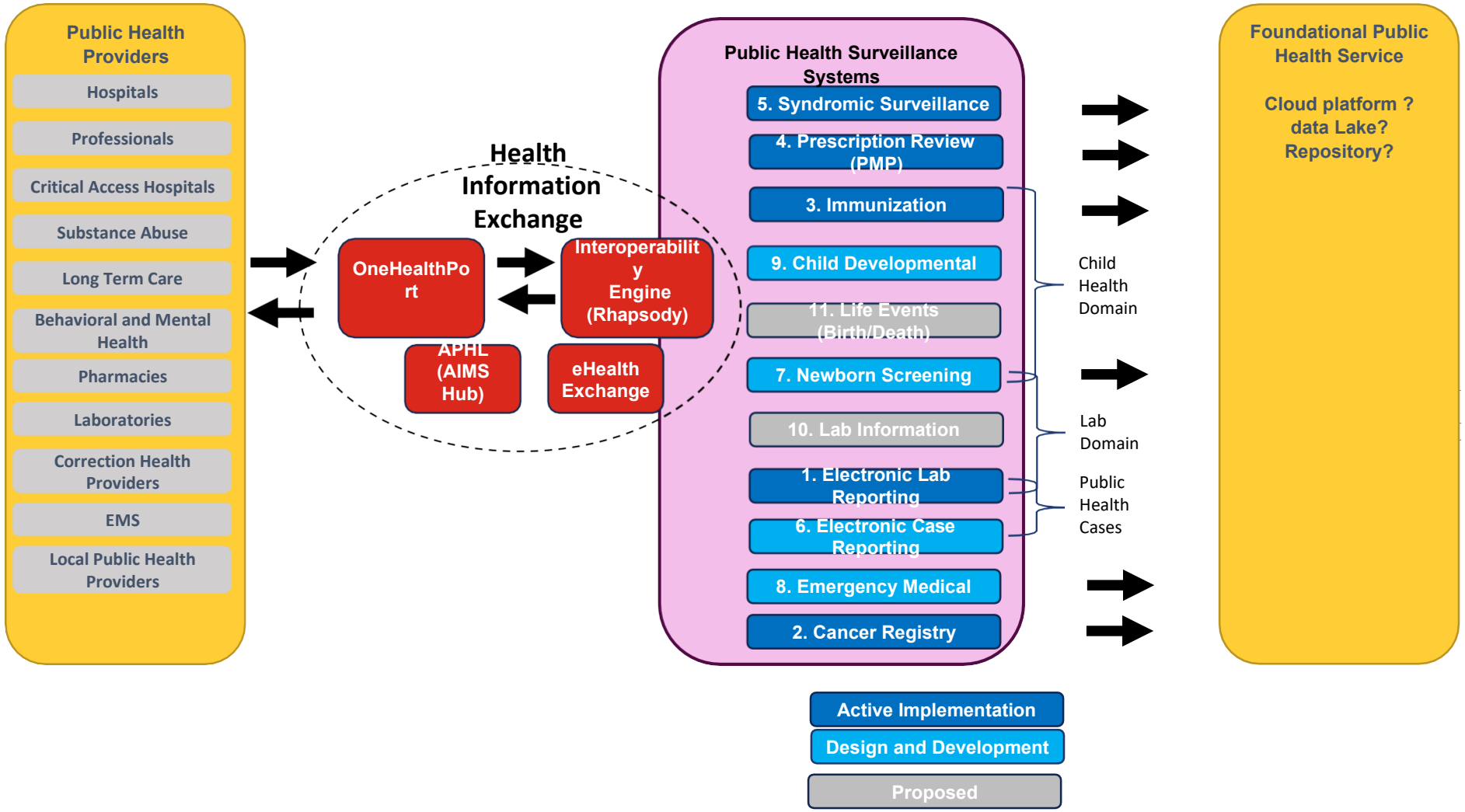
- Standards-based approach to data and computable logic (FHIR and CQL)
- Improve PDMP functionality and connectivity through the WA State HIE
- SMART on FHIR App
  - Uses modern web technologies (javascript, html5, etc) with FHIR and CQL
  - Deployable in both standalone and EHR-integrated settings
- Implement CDC guidelines and jurisdiction-specific rules

- Looking forward:
  - Demonstration at HIMSS 2020 Interoperability Showcase
  - Refinement
  - Early adopter use case in Washington State

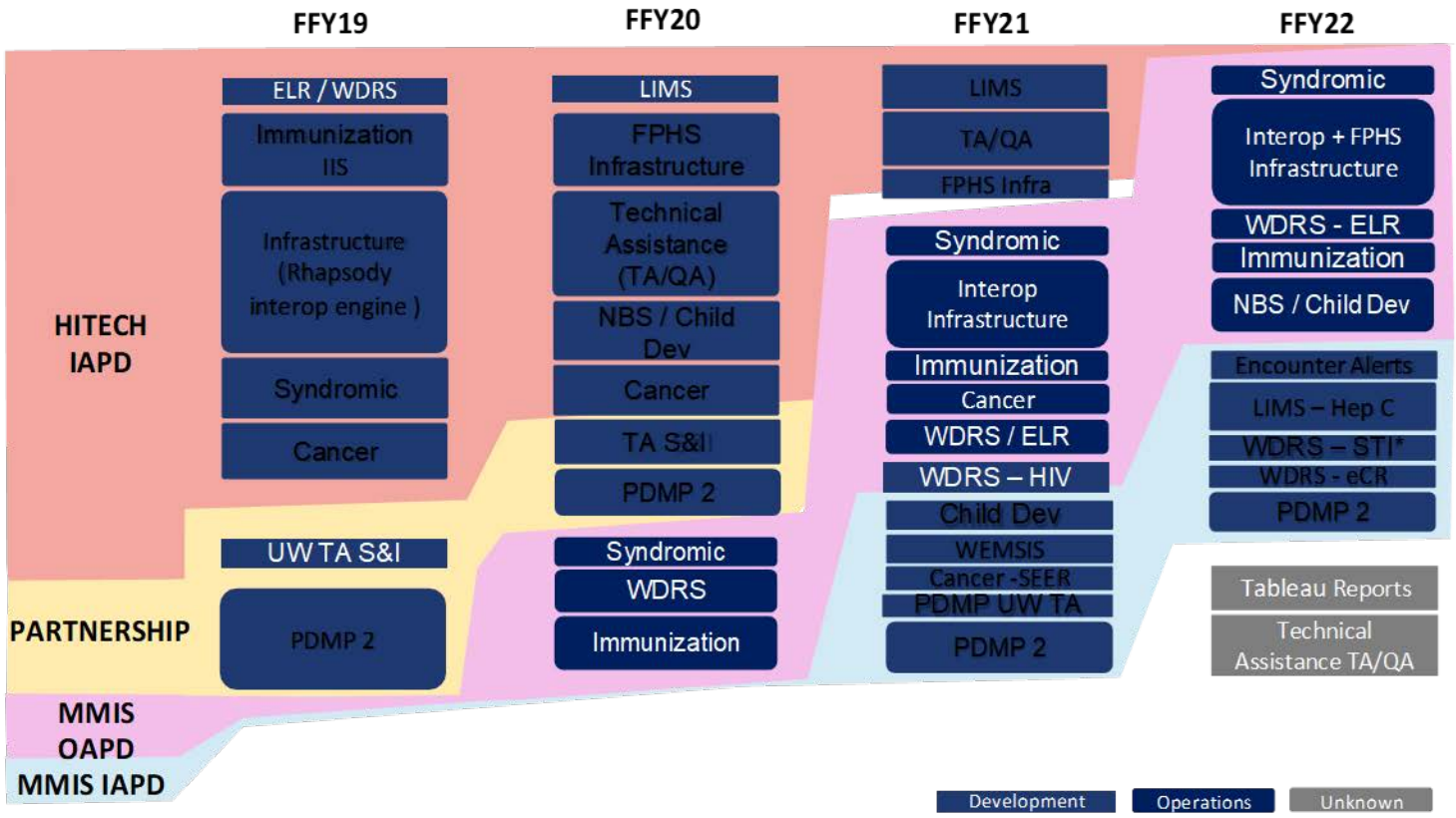
Healthcare Providers Perspective



Interoperability Diagram



Funding Change from HITECH to MMIS (Ex: **Washington**) concept not approved



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Special Thanks to our
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Bill Lober MD and
Maggie Dorr MPH

And funding from SUPPORT /
PARTNERSHIP Act and HITECH


Washington State Department of
Health

Interoperability & Public Health

ONC Annual Meeting

Paula Braun, Entrepreneur-in-Residence, CDC

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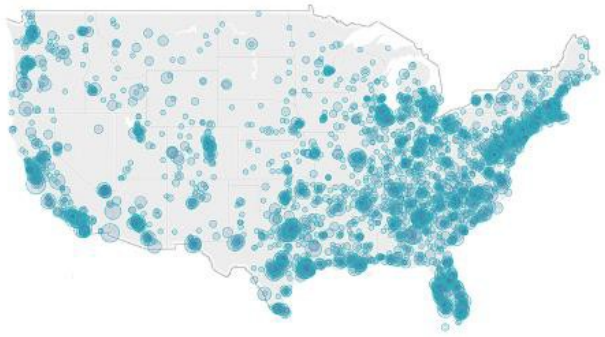
Policy and Technical Requirements for Data Exchange



This map illustrates the sites of care supported by current Carequality implementers, once they achieve full rollout.

Carequality Enables
Nationwide Care Coordination

600K	40,000	1,400
Care Providers	Clinics	Hospitals

Learn More

Supports Data Exchange for

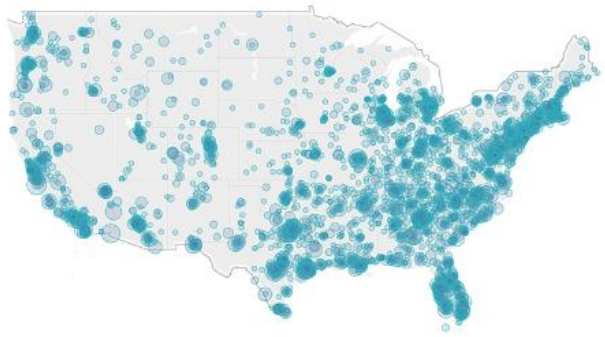
- Treatment
- Payment
- Healthcare Operations
- **Public Health**
- Patient Requests
- Coverage Determinations
- Other Authorizations

https://carequality.org/get-involved/


Georgia Institute
of Technology

Public Health Data Modernization Initiative

Policy and Technical Requirements for Data Exchange



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Georgia Institute
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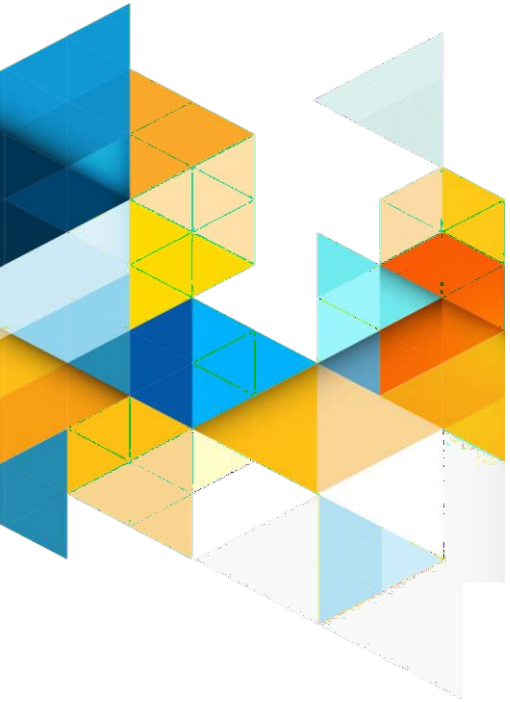
Public Health Data Modernization Initiative



Public Health Data Exchange

Adi V. Gundlapalli, MD, PhD, MS

Chief Public Health Informatics Officer

Center for Surveillance, Epidemiology, and Laboratory Services

Centers for Disease Control and Prevention

The Office of the National Coordinator for Health Information Technology

Public health surveillance

The ongoing systematic collection, analysis, and interpretation of data, closely integrated with the timely dissemination of these data to those responsible for preventing and controlling disease and injury (Thacker and Berkelman 1988).

Data is moving slower than the disease…

“The nation’s public health data systems are antiquated and in dire need of security upgrades - paper records, phone calls, spreadsheets and faxes requiring manual data entry are still are in widespread use and have significant consequences including delayed detection and response, lost time, missed opportunities and lost lives.”

Testimony of Janet Hamilton, Director of Science and Policy at CSTE, speaks at Public Witness Day, April 9, 2019
Labor, Health and Human Services, Education, and Related Agencies (116th Congress)

CDC collaboration: Digital Bridge

Digital Bridge Principles

- ✓Embrace **partnership** and **enterprise solutions**
- ✓Keep it **seamless** for providers and **simple** for health IT developers
- ✓**Standards-based** approach—use existing standards
- ✓**Long-term thinking**—beyond communicable disease
- ✓Avoid perfectionism—**Implement, Evaluate,** and **Evolve**
- ✓**Feedback useful information**
- ✓**Address the elephants**—legal and sustainability

Digital Bridge Partners

CSTE
COUNCIL OF STATE AND TERRITORIAL EPIDEMIOLOGISTS

APHL

astho™

Cerner

CDC
CENTERS FOR DISEASE CONTROL AND PREVENTION

eClinicalWorks

Epic

AMA

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National Association of County & City Health Officials
The National Connection for Local Public Health

Funders

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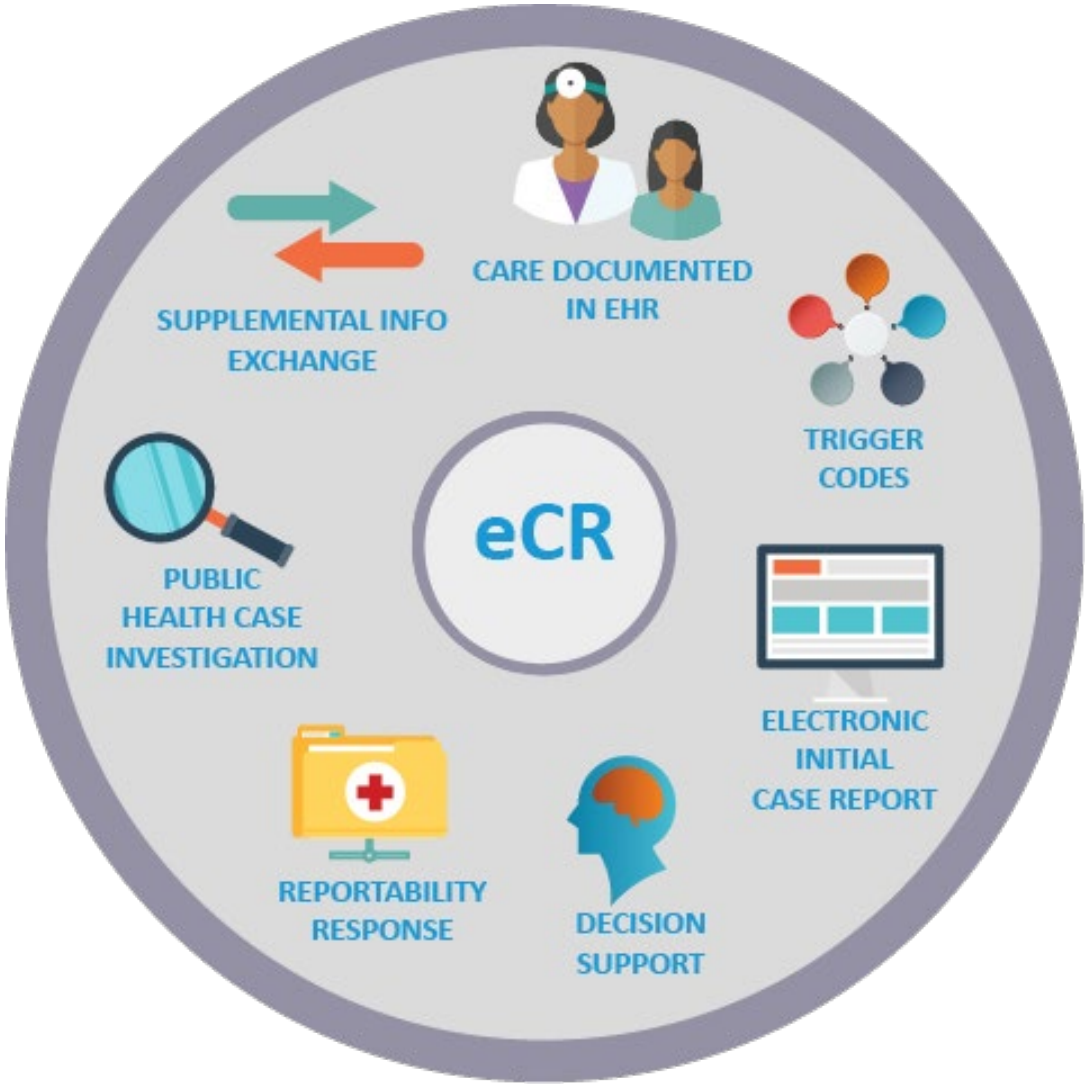
Project Management Office

Deloitte.

Public Health Informatics Institute

Electronic Case Reporting (eCR)



The automated generation and transmission of case reports from the electronic health record (EHR) to public health agencies for review and action.

Digital Bridge Demonstration Sites

Houston

Utah

NYC

NY State

California

Michigan

Kansas

FHIR opportunities in public health

Electronic Case Reporting and HL7 FHIR

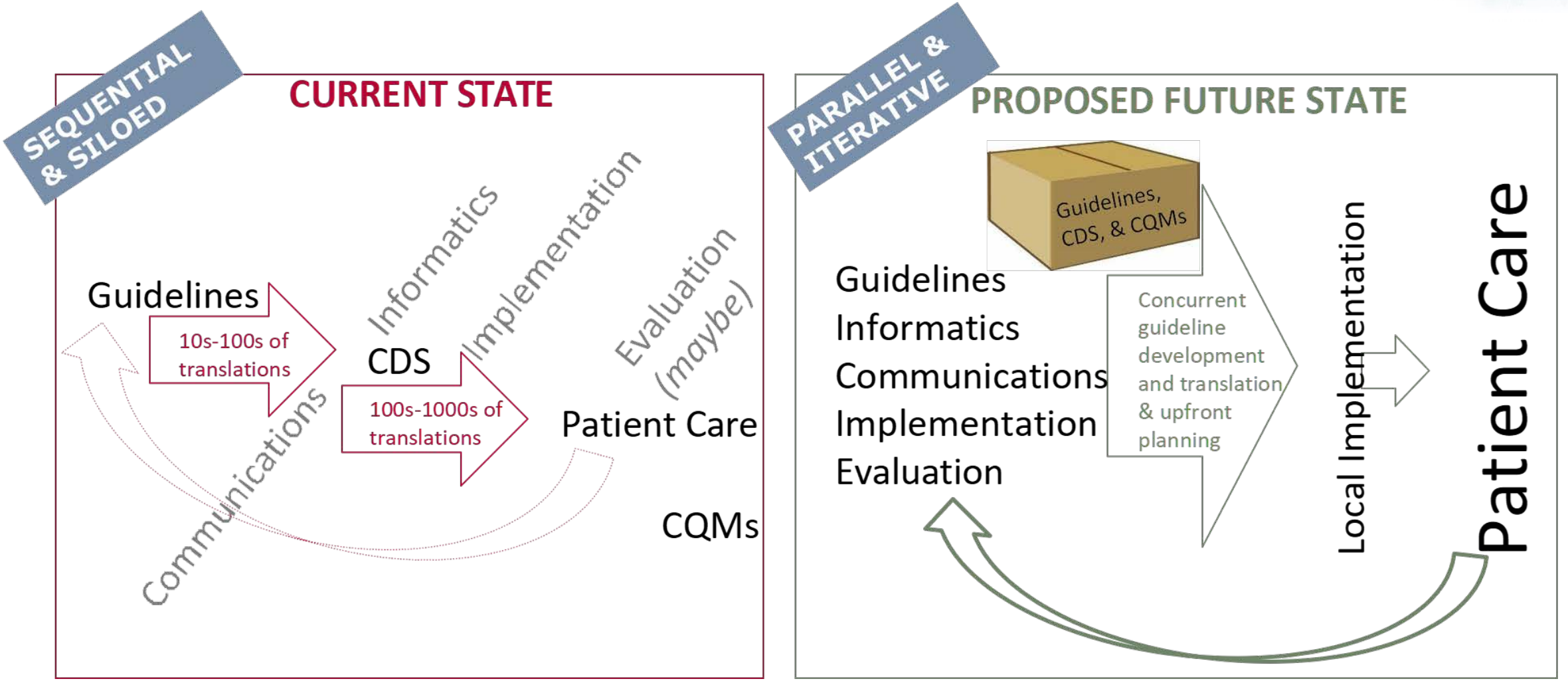
Public health efforts in FHIR are focused on developing population health capabilities, reducing provider burden, and increasing value to healthcare providers

The HL7 FHIR eCR FHIR Implementation Guide includes:

- The electronic Initial Case Report (eICR) - helps automate case reporting and reduces jurisdictional and program variability implementation asks inside of healthcare
- The Reportability Response (RR) - increases information flow from public health back to health care
- The electronic Reporting and Distribution Service (eRSD) – allows implementers to receive a machine processable set of knowledge resources (trigger codes and reporting guidance) to support efficient implementation
- HL7 FHIR and CDA standards for eCR are harmonized and transforms between these standards are available

Adapting Clinical Guidelines for the Digital Age:

Redesigning Guideline Development and Implementation



https://www.cdc.gov/ddphss/clinical-guidelines/index.html

Making EHR Data More Available for Research and Public Health

Technical Expert Panel:

End Users, Data Recipients, Stakeholders – Including representatives of additional use cases

Foundation of standards supported by health IT certification (CCDS/USCDI, APIs, FHIR)

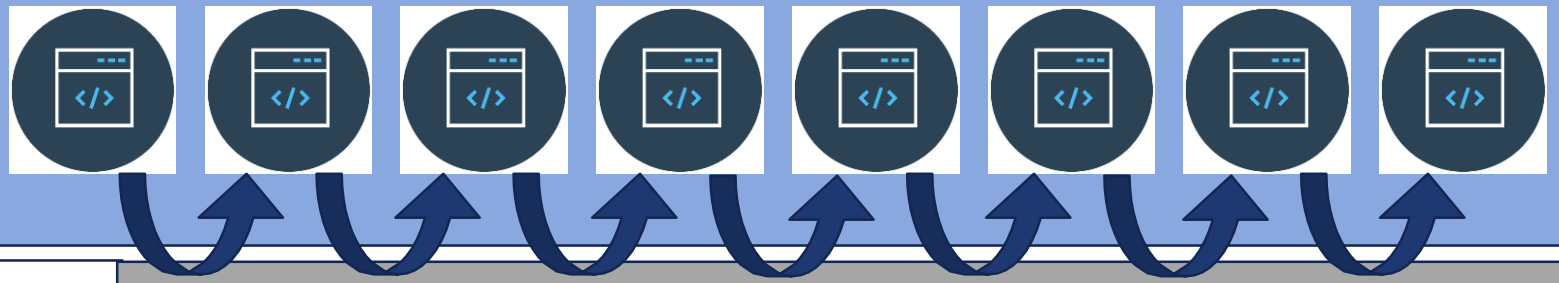
Fully Modeled Uses Cases
Hepatitis C, Cancer, Healthcare Surveys

Implementation Guides
For general use and for each use case

Technological Strategies
To develop scalable and extensible architecture application

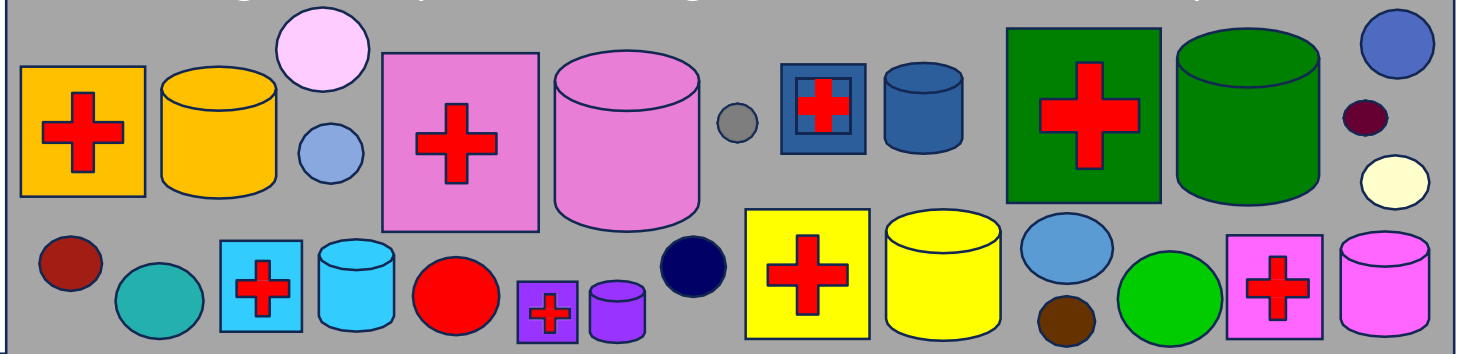
CCDS: Core Clinical Data Set
USCDI: US Core Data for Interoperability
APIs: Application Programming Interfaces
FHIR: Fast Healthcare Interoperability Resources

Agile Development: Iterative Design-Build-Test Cycles (test case: Hepatitis C)



- Software
- Clinical organization
- EHR platform
- Other testing partners (e.g., public health departments, registries, health IT developers, etc.)

National Test Collaborative
Including a variety of clinical organizations and their EHR platforms



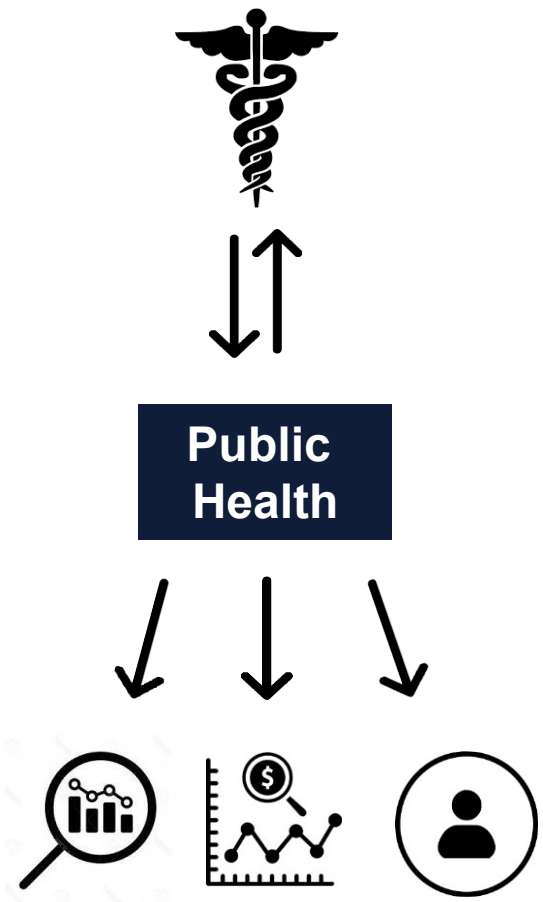
Evaluation Planning

Measure and Evaluate

PRODUCTS: Reference Architecture, Reference Implementation (Open Source Software) & Balloted Implementation Guides, Roadmap for Scalability and Sustainability

Bulk FHIR

Goal: Facilitate a Standards-Based Approach for Access to, Using, and Re-using Clinical Data



Opportunities and Potential High-Level Use Cases

- Bi-directionality of data exchange between health care and public health
- Patient-initiated access to data in public health registries
- Making data in public health systems available for analytics, research, evaluation, and other authorized uses throughout the data life cycle

Possible Extensions and Considerations for Public Health

- Variation in public health authority at local, state, and CDC level for access to personally identifiable information
- Ability to select cohorts of patients and data per case definitions (type filter)
- Real-time and standardized data needed during public health emergencies

CDC currently has several FHIR projects underway at varying levels of maturity

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