



The Office of the National Coordinator for
Health Information Technology

Electronic Public Health Reporting

November 30, 2018 ONC Annual Meeting



CMS: Promoting Interoperability Programs (PI)

- Formerly the EHR Incentive Program also known as Meaningful Use
- Four Promoting Interoperability Programs (each administered separately):
 - » IPPS (Hospital Inpatient Prospective Payment System)-Medicare
 - » QPP (Quality Payment Program)-Medicare MIPS Eligible Providers
 - » OPPS (Hospital Outpatient Prospective Payment System)-Medicare
 - » Medicaid EHR Incentive Program or State's Medicaid Promoting Interoperability Program

Promoting Interoperability Measure Sets for 2018

- There are two Promoting Interoperability measure sets available for clinicians in 2018 (both include the Public Health and Clinical Data Registry Reporting measures):
 - » Promoting Interoperability Objectives and Measures
 - » Promoting Interoperability Transition Objectives and Measures
- The measure set a clinician or group selects will depend on the CEHRT edition.
- Clinicians and groups who exclusively report the Promoting Interoperability Measures using 2015 Edition CEHRT will earn a 10% bonus.

(Joint Public Health Forum and CDC Nationwide Webinar, *Public Health Reporting Requirements & Medicare Program; CY 2019 Updates to the Quality Payment Program (QPP)*, 11/15/2018: <https://www.cdc.gov/ehrmeaningfuluse/Joint-Public-Health-Forum--CDC-Nationwide.html>)

Promoting Interoperability Measure Sets for 2019

- For 2019, CMS has substantially revised objectives, measures, and scoring across these programs, as well as requiring use of 2015 Edition certified health IT
 - » ePrescribing
 - » Health Information Exchange
 - » Provider to Patient Exchange
 - » **Public Health and Clinical Data Exchange** (formerly Public Health and Clinical Data Registry Reporting measures)

Public Health and Clinical Data Exchange Objective

- Objective
 - » Measures that an eligible hospital, critical access hospital, or MIPS eligible clinician attests yes to being in active engagement with a public health agency (PHA) or clinical data registry (CDR) to submit electronic public health data in a meaningful way using certified electronic health record technology (CEHRT) for two measures within the objective.
- Measures
 - » **Immunization Registry Reporting**
 - » **Syndromic Surveillance Reporting**
 - » **Electronic Case Reporting**
 - » Public Health Registry Reporting
 - » Clinical Data Registry Reporting
 - » **Electronic Reportable Lab (ELR) Result Reporting (EHs and CAHs only)**

Presenters

- Mary Beth Kurilo, American Immunization Registry Association
- Logan E. Smith, Virginia Department of Health
- Josh Sol, Houston Methodist
- Wayne Loschen, Johns Hopkins University Applied Physics Laboratory



Immunization Information Systems (IIS)



AIRA
AMERICAN IMMUNIZATION
REGISTRY ASSOCIATION

Lowering Provider Burden, Increasing Value

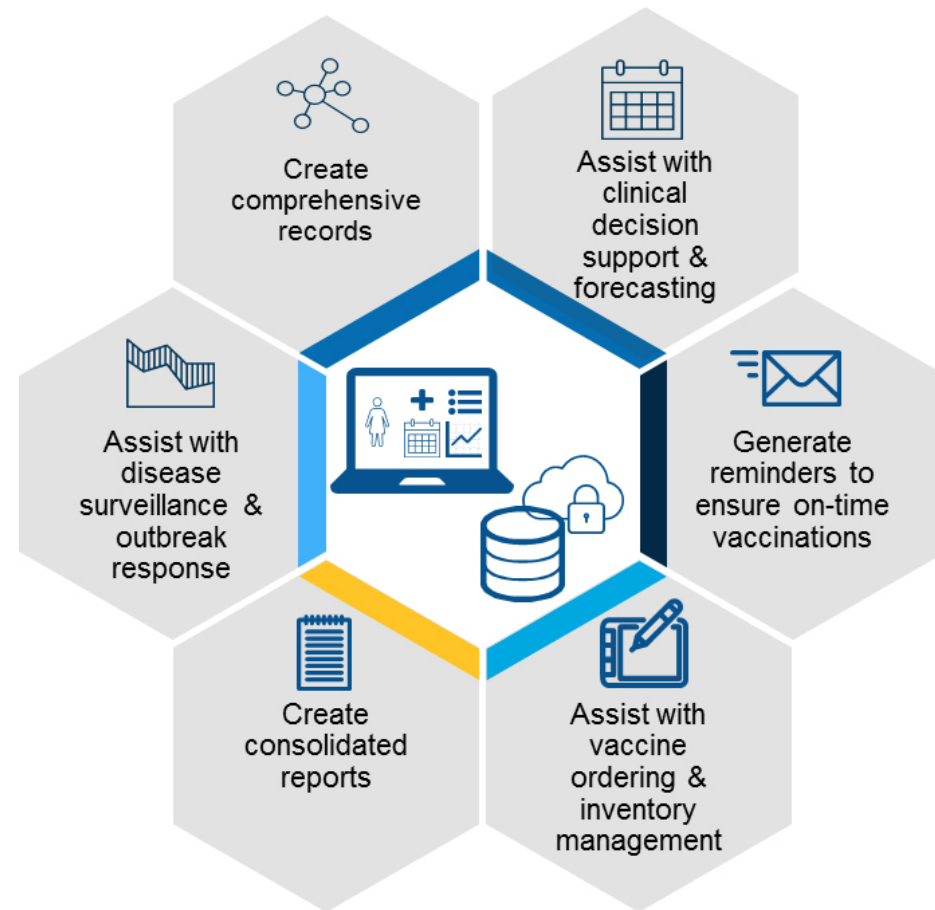
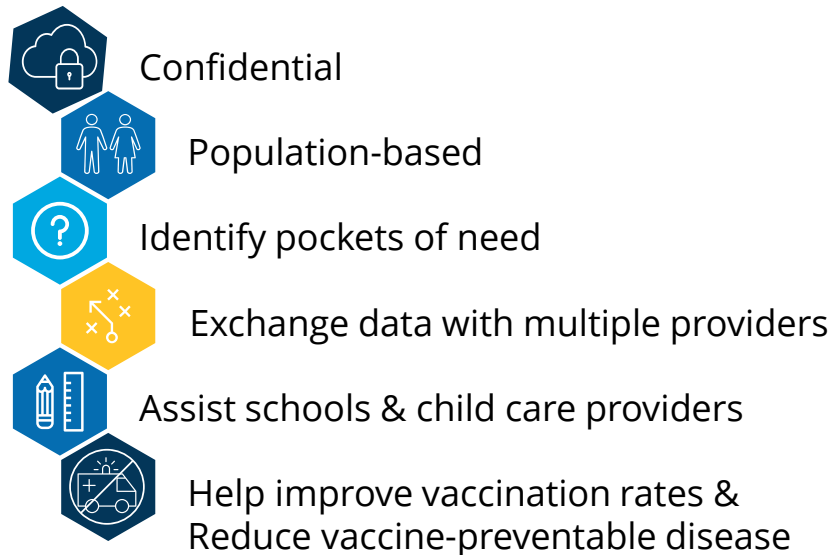
Mary Beth Kurilo, Policy and Planning Director | American Immunization Registry Association (AIRA)
Friday November 30th, 3-4pm ET, Jefferson West, Washington Hilton



Immunization Information Systems Defined

IIS...

are confidential, population-based, computerized databases that consolidate all immunization doses administered by participating providers to persons residing within a given geopolitical area.



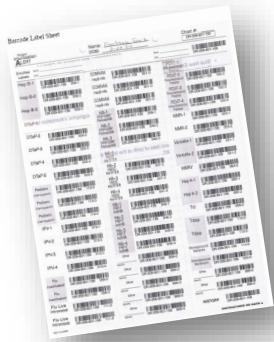
Maturity

- No national IIS; IIS operate in most states, some counties/territories
- Each system operates independently, but with unifying standards
- Newest IIS is hoping to launch early next year
- Oldest have been in existence for 25+ years



Where We've Been

- In the 1990s and early 2000s, IIS data came in through **paper** or **online entry**, and was then consolidated by the IIS and accessed via the web



Paper or scan forms were submitted by providers



These were hand-keyed by data entry staff at the IIS

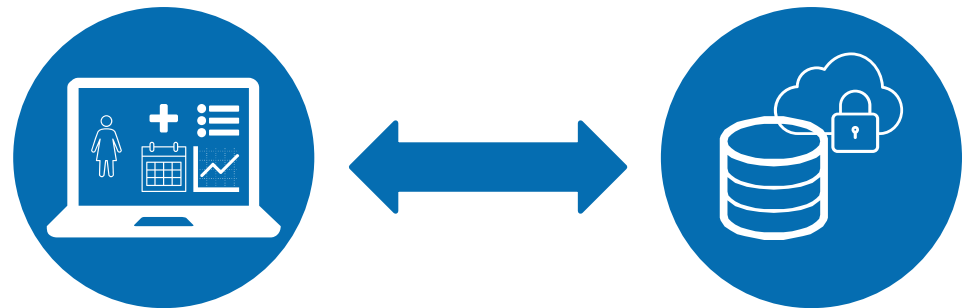


Data were then consolidated into a single record for each patient in the catchment area

- Eventually, many clinic staff entered their own data via a **web-based user interface**
- Gradually, **electronic transfer** grew as providers adopted EHRs
 - » These data were often sent through flat file, then moved to HL7 batch files in the early 2000s, and eventually shifted to real-time data submission

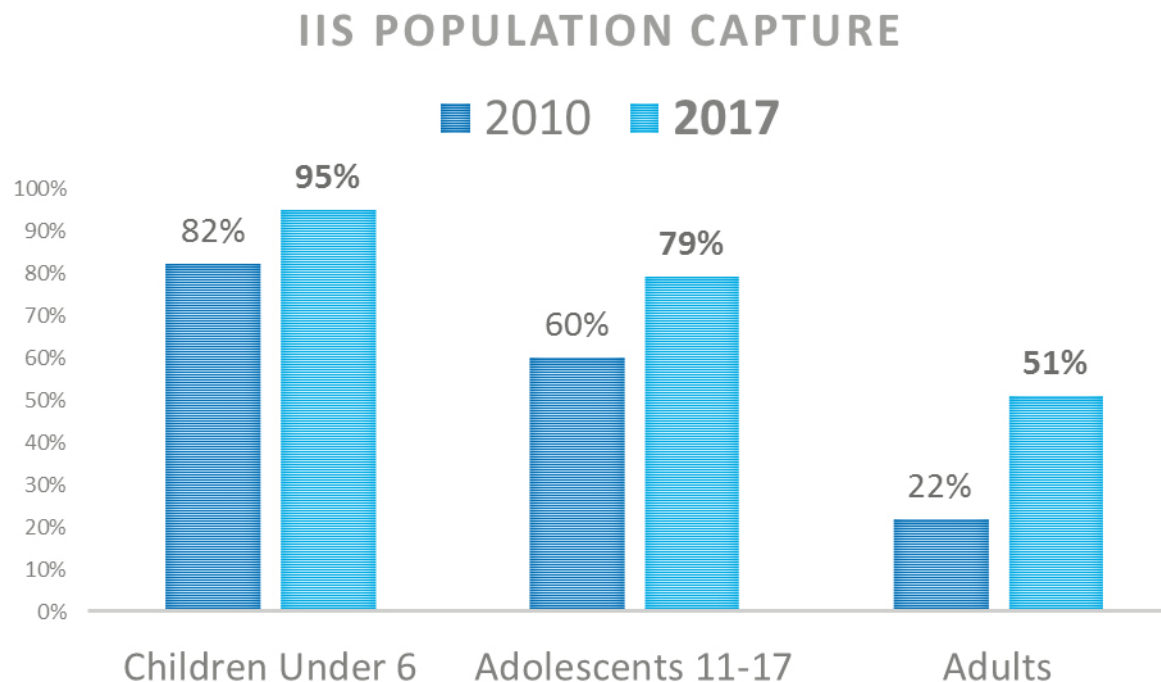
Where we are today

- Data flows bidirectionally between providers' EHR Systems and their jurisdiction's IIS
 - » Providers submit doses administered, and query IIS in real-time for consolidated records and forecasts of immunization due at the point of care
 - » Transport standards (SOAP/Web Services) and messaging standards (HL7 V2) support smooth interoperability between IIS and EHRs
 - » IIS also provide vaccine ordering and inventory management for public vaccines, reminder-recall, coverage rates, population-based analytics, and more



Progress in Data Capture

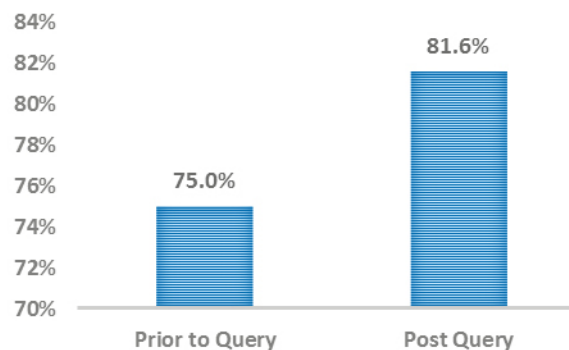
- Healthy People 2020 Goals
 - » Children >6: 95%
 - » Adolescents 11-17: 80%



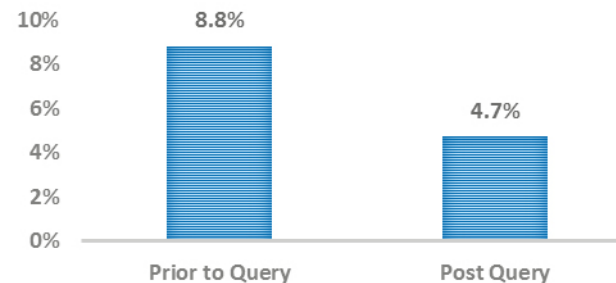
The Value of EHR-IIS Query

- Why is EHR-IIS query important?
 - » Saves providers time
 - » Increases accuracy
 - » Raises coverage
 - » Reduces patient burden and cost
- A 2016 study in Pediatrics demonstrated an increase in up-to-date status and a decrease in missed opportunities following implementation of query

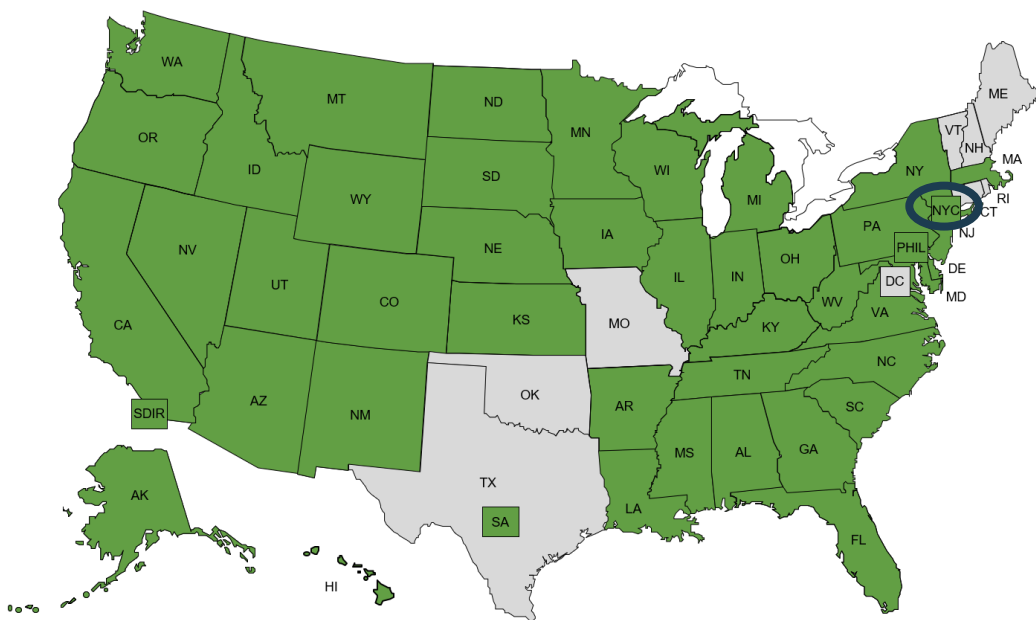
UP-TO-DATE RATE



MISSED OPPORTUNITIES

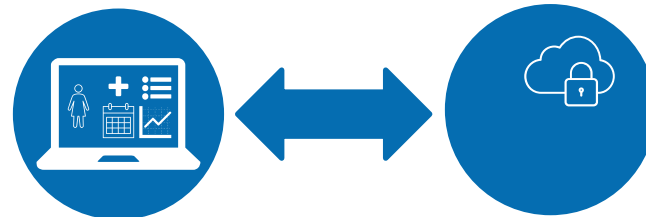


Which IIS are currently supporting query?



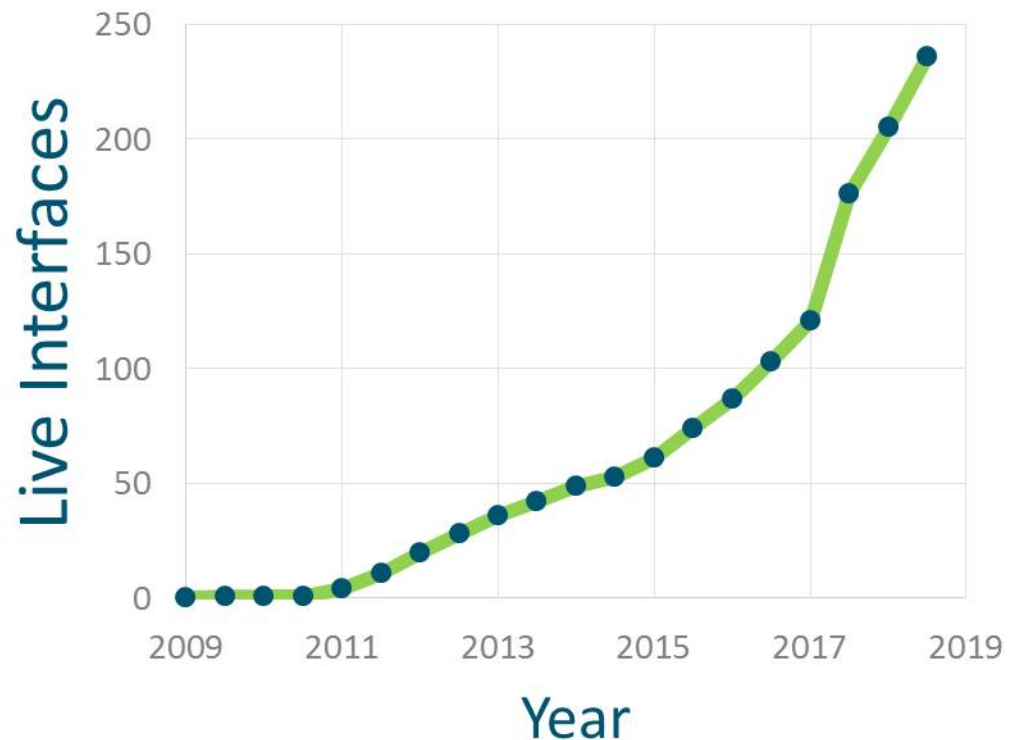
In **New York City** alone (population 8.5 million):

- 1,314 clinic sites currently query the NYC Citywide Immunization Registry
 - IIS receives **2.2 million queries/month**
 - 1.8 million/month (82%) from clinics
 - 400,000/month (18%) from schools



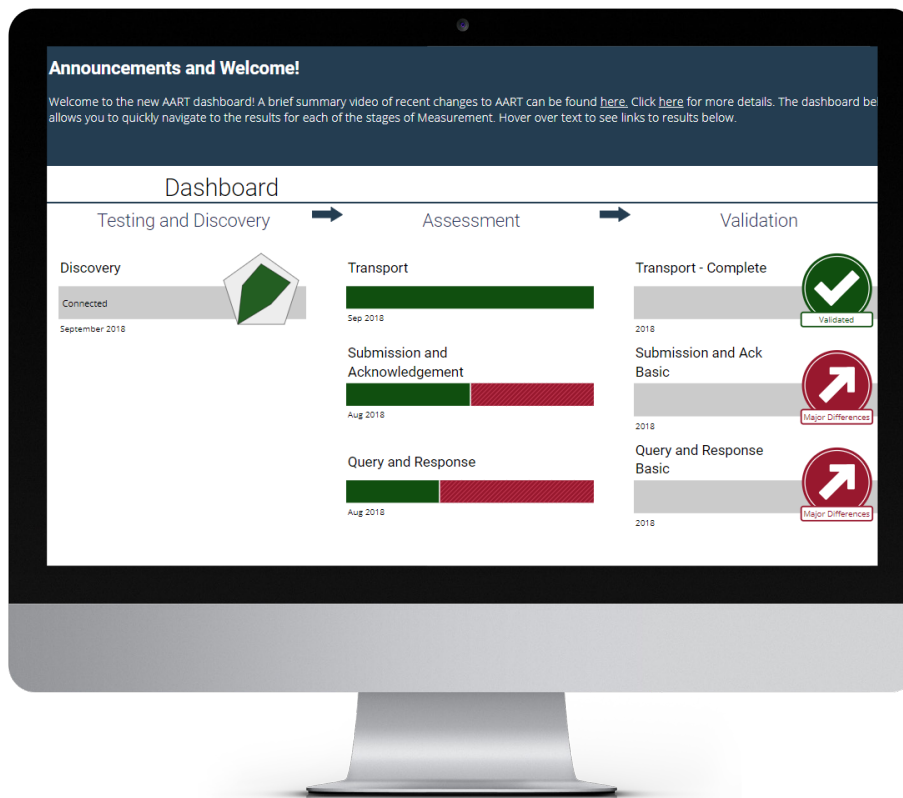
EHR-IIS Query is Growing Exponentially

- » 236 Live Interfaces
- » 35 State Registries and 1 City Registry
- » >200 million queries sent a year



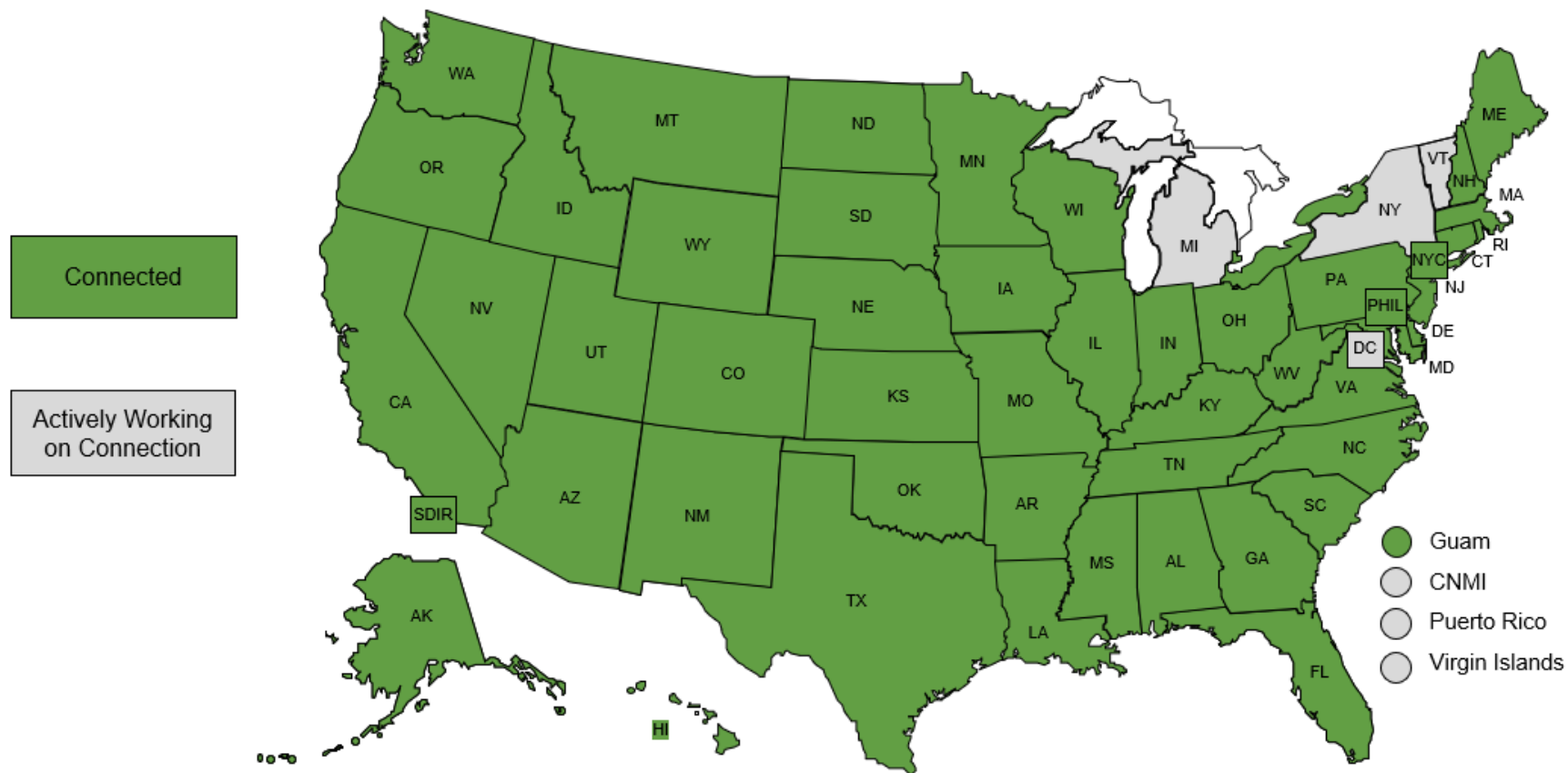
How Do We Know IIS Are Exchanging Data in Accordance with Standards?

The Aggregate Analysis Reporting Tool (AART)

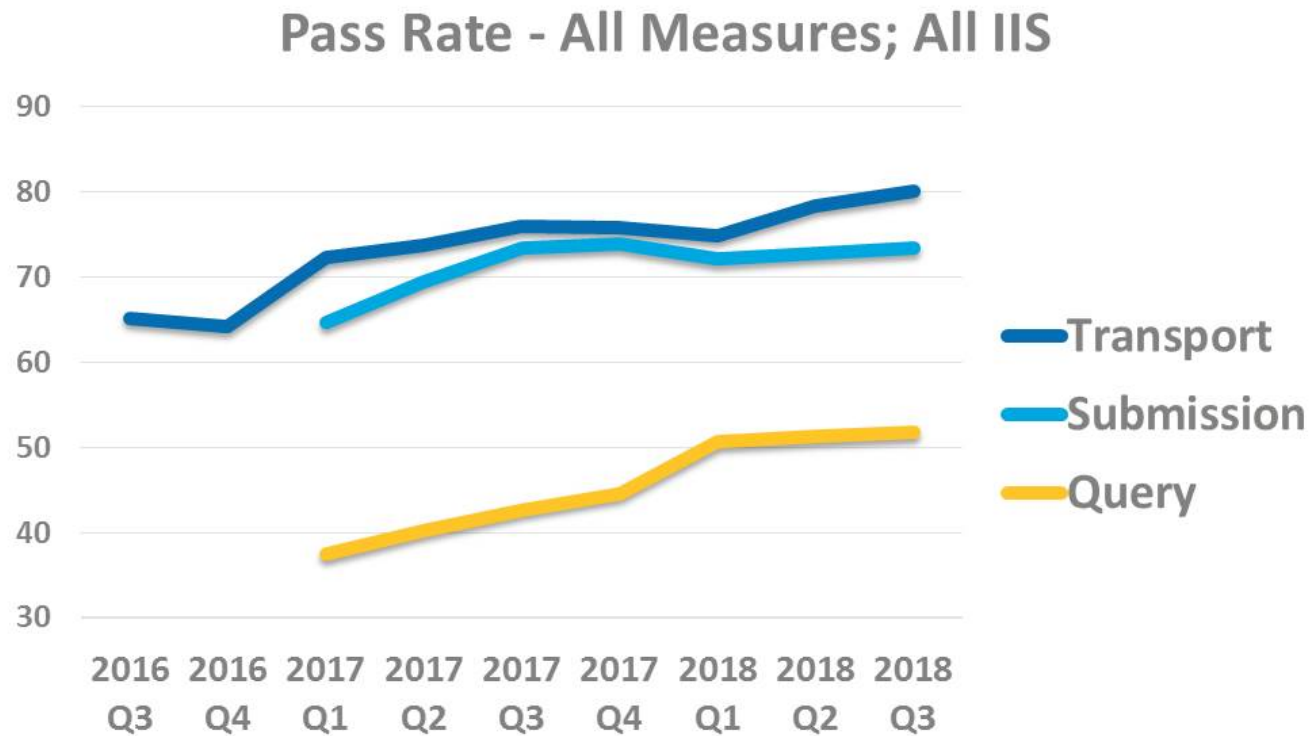


- AIRA Developed Measurement Tool
- Testing is performed a regular basis
- Each IIS has a Dashboard of their individual results
- Quarterly National Aggregate Reports are developed and published

Great Participation in IIS Testing Nationwide



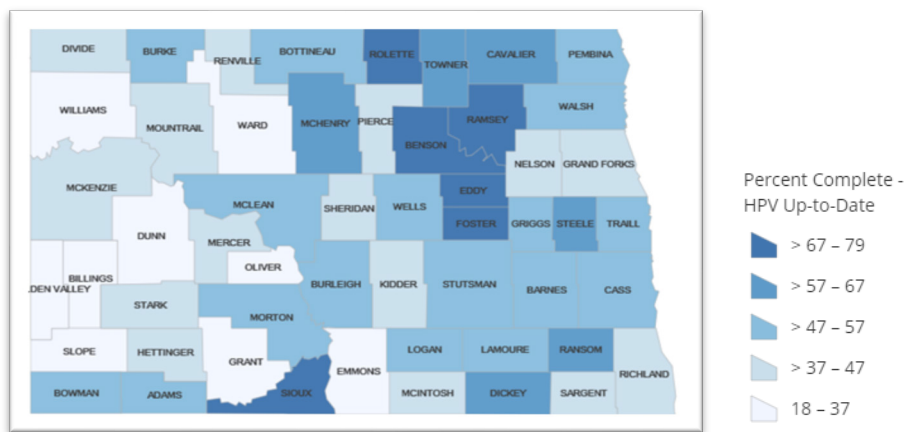
Improvements 2016-2018: Setting The Bar High



Beyond Interoperability, What Else Are IIS Doing With These Data?

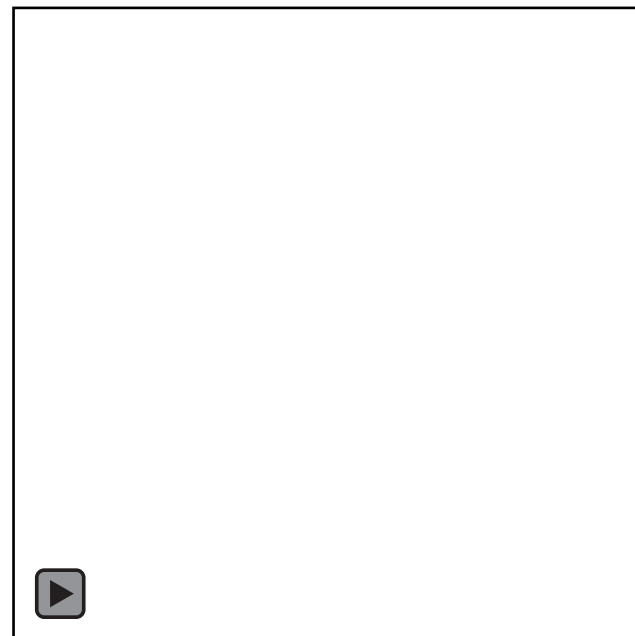
Population-Based Approaches

Mapping HPV Coverage Rates in North Dakota



HPV Up-to-Date Coverage by County, Female and Male Adolescents, Quarter 1, 2018

Exploring Zoster Vaccine Uptake in Michigan



Fitzsimmons, Kimmins, AIRA National Meeting 2018

In Conclusion



Standardization activities have directly improved interoperability with EHRs and IIS, as well as improved the quality of data within IIS



This has strengthened IIS as important analytic tools that support a wealth of population health needs



Providers can access these data seamlessly through EHR query at the point of care, which:

- supports clinical decisions
- ensures appropriate immunization
- lowers burden

**improves
care
overall**



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Discussion/Questions?
Thank you!



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HealthIT.gov



ELR in Virginia

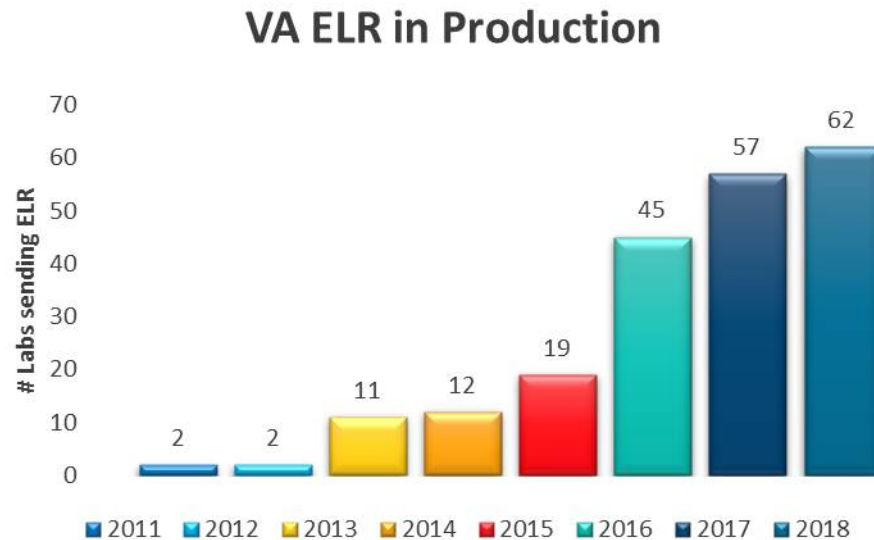
Positive Impact, Increased Opportunities

Logan Smith, MPH, MT (ASCP) | VEDSS ELR Analyst | Virginia Department of Health



Introduction

- Virginia Department of Health began receiving ELR in 2011
- Two facilities in Production in 2011, now have 59* facilities sending ELR to VDH Production Data systems.



*3 facilities replaced their LIMS in 2018, and ceased sending ELR to our Production systems. They have restarted the onboarding process with VDH.

Introduction

- In 2017, VDH received nearly 400,000 ELRs
 - » 31% of ELR in VEDSS (General Communicable Disease)
 - » 69% of ELR in eHARS/MAVEN (HIV/STI)
- Lag Time Decreases
 - » YTD 2018 averages <1 day
 - » Manual Labs average 9 days (for all conditions)
- ELR Provides More Comprehensive Reporting
 - » ELR onboarding process reveals gaps in paper reporting: as much as 80% of paper reporting was missing from 2 known systems.

Workflow Prior to ELR

- Lab Reports received by fax or mail
 - » Delays common
 - » One Central Office(CO) staff member responsible for distribution of lab reports(LRs) faxed or mailed to CO.
 - » District staff responsible for entry of LR, morbidity reports, and investigations
- Manual Data Entry
 - » Central Office- high volume of lab reports meant only high priority labs were entered, the rest faxed to districts
 - » Field staff- districts prioritized LR data entry, some conditions were entered and investigated only when time allowed.
- Limitations
 - » Data entry errors
 - » Time constraints, staffing challenges

Preparation For ELR

- Epidemiology and Laboratory Capacity (ELC) Grant- source of funding for ELR activities
- VDH ELR implementation guide- based on national implementation guide
- Design, build and implementation of Meaningful Use Registration System
- Creation of Meaningful Use informational webpage (added to agency site)
- Human resources & training
 - » Shared use of Office of Information Management (OIM) IT teams (VEDSS and Messaging)
 - » Currently have 2 full time informatics positions (1 ELR Analyst, 1 ELR Validator)
 - » Training in LOINC/SNOMED standardized vocabulary & HL7

Workflow changes with ELR

- Data entry & review changes
 - » Central Office staff
 - No longer needed to create multiple copies of lab reports for different program & district staff
 - Ability to enter LR from facilities not yet sending ELR
 - Faster receipt of reports, ultimately sped up approval process for notifications
 - » District staff
 - Shift workflow priorities to investigations, prevention
 - VEDSS User Survey in July 2018
 - District respondents rated ELR as “Very useful (**70.7%**)” and “Moderately useful (15.4%)”

Workflow changes with ELR, continued.

- Data Entry & Review changes, continued.

- » District staff

- VEDSS User Survey in July 2018

- Open-ended responses included: “Getting electronic lab reports is wonderful and usually very timely.”, “ELR is awesome... wish all laboratories were on it.”
- This is reflective of other responses in the survey where users expressed appreciation of the time-savings of ELR as well as its facilitation of timely public health follow-up.
- In the top 75% of responses to “Aspects of VEDSS that are working well”, the highest rated was “ELR”.

Current Impact- Substantial and Positive

- **ELR Use**
 - » Nationally, ELR use is at 79% (CDC, 2017)
 - » In 2017 ELR for VDH was at 84% for all systems, and 96% for our NBS system.
- **Faster and more complete reporting**
 - » Lag Time reduction (YTD 2018 avg. <1 day)
 - » Timelier and more completed investigations
 - » Influenza ELRs now allow near real-time assignment of seasonal Influenza activity level, versus a near two week delay with paper.

Current Impact, continued.

- Increased Accuracy
 - » Corrected Reporting
 - » Better understanding of performed testing
- Decreased Data Entry Burden
 - » Public Health staff
 - » Hospital IP and Laboratory staff
- More Opportunities
 - » Data analysis
 - » District services
 - » Supporting data infrastructure projects (Message Tracking System application, SQL Server and Tableau, REDCap Data System User Management)

Limitations

- Minimal
- ELR onboarding requires much time and effort, benefits outweigh resource input
- Post-Production monitoring and troubleshooting- requires sustained resources
- Laboratories update and replace LIMS, add new testing and instrumentation
- Laboratories rarely able to report all test types via ELR- some paper reporting unavoidable currently
- High standards for data quality

Future Projects

- Remaining Eligible (VA) Hospitals and Reference Laboratories
 - » 41 facilities (15 Health Systems)
 - » Quest QLS and Non-Standard Laboratories
 - » Sunrise Medical Labs
- Maintaining Production ELR
- Post-Production Quality Assurance
 - » Reviewing possible Automated ELR Validation
- Interstate Messaging (ELR Redirects) onboarding currently underway (MD), DC and TN beginning soon.



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Contributors:

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Electronic Case Reporting (eCR)

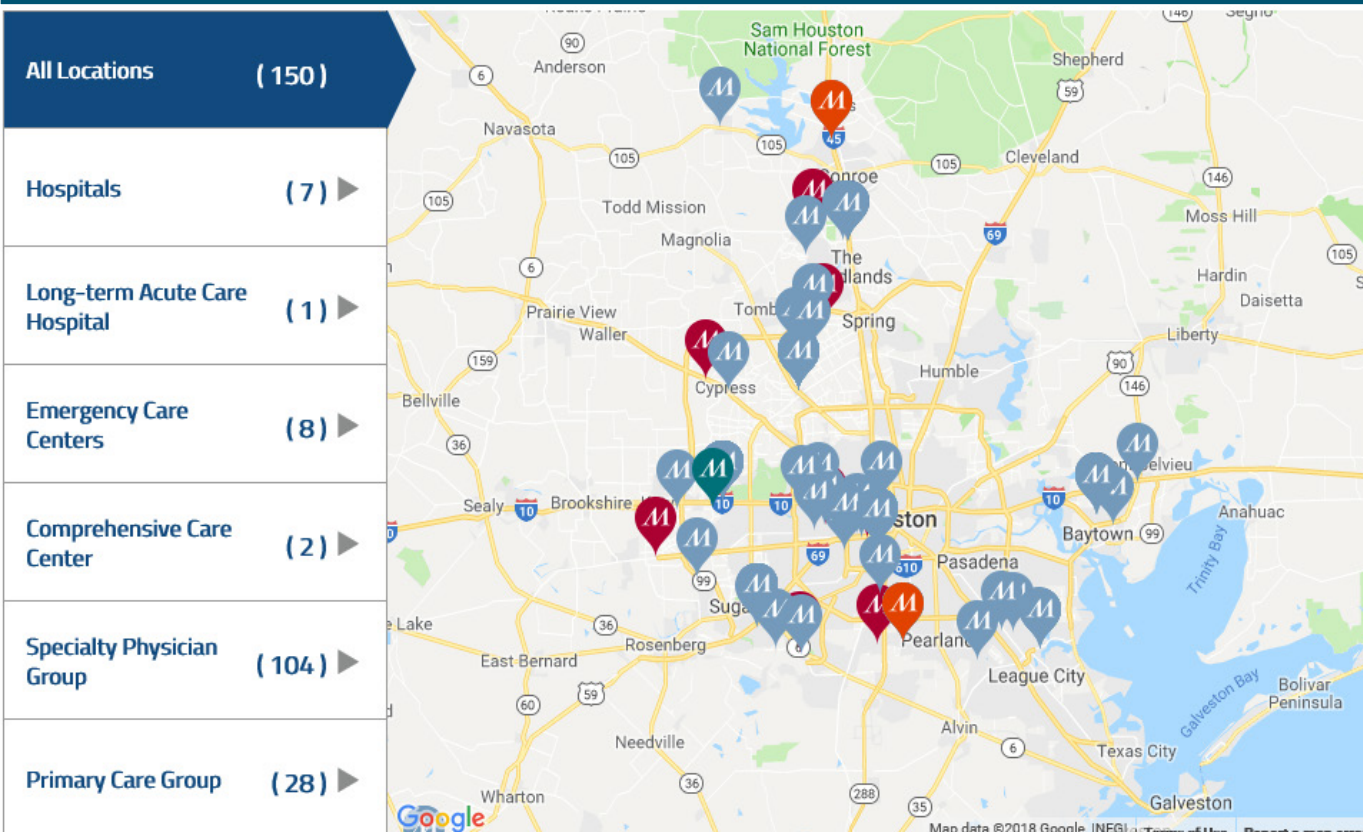
Success of the Digital Bridge Pilot at Houston Methodist

Josh Sol, Director, Ambulatory Clinical Systems and Innovation, Houston Methodist



About Houston Methodist

Houston Methodist comprises a leading academic medical center in the Texas Medical Center and seven community hospitals serving the Greater Houston area.



All Locations	(150)
Hospitals	(7) ▶
Long-term Acute Care Hospital	(1) ▶
Emergency Care Centers	(8) ▶
Comprehensive Care Center	(2) ▶
Specialty Physician Group	(104) ▶
Primary Care Group	(28) ▶

\$3.9B (FY17) Total Revenue	2,264 Operating Beds
22,247 Employees	> 6,700 Physicians
107,228 Admissions (2017)	1.2 mil Outpatient Visits (2017)
289 Residents & Fellows	\$51.2M Extramural Funding
50 GME Programs	414 Clinical Trials HM Research Institute

INTERNATIONAL LOCATIONS >	(13)
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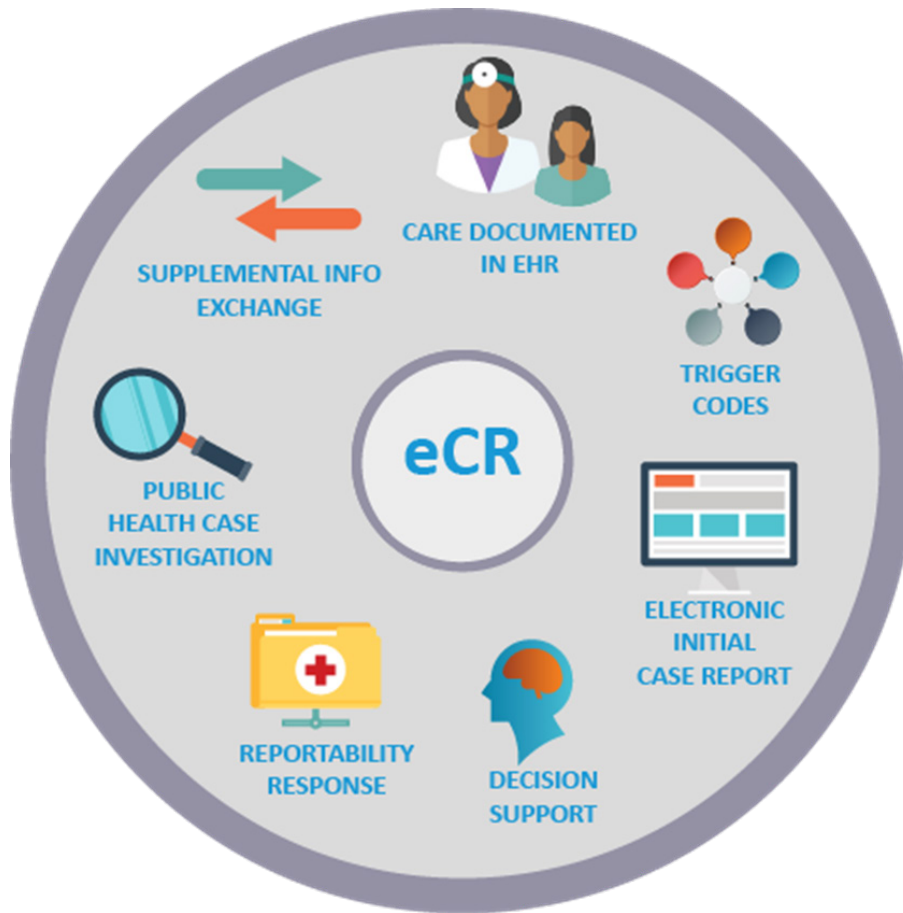
■ Hospital
 ■ Long-Term Acute Care Hospital
 ■ Emergency Care
 ■ Comprehensive Care Center
■ Specialty Physician Group & Primary Care Group

Source: HoustonMethodist.org

10-21-2018



What is 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

Goal and Benefits of eCR



- eCR seeks to reduce the reporting burden for providers while improving the timeliness and accuracy of surveillance data at the local, state, and national levels
- Because the EHR is the data source for case reports, eCR will improve the completeness of patient contact, clinical, and epidemiologic information to jump start case investigations

How Houston Methodist Got Involved



- The MU Stage 3 Final Rule was published in the Federal Register on October 16, 2015, adding eCR as a new public health measure
- The Houston Health Department (HHD) contacted Houston Methodist (HM) and Epic, our common EHR vendor, in August 2016 seeking a partnership to develop eCR functionality to move case reporting from paper to a rule-based automated process
- The Houston project joined the national Digital Bridge eCR pilot project in March 2017
- Through the partnership with HHD, Epic, Digital Bridge, and Surescripts, the HM Center for Innovation successfully transmitted a test case in September 2018 and moved eCR to production in November 14th 2018

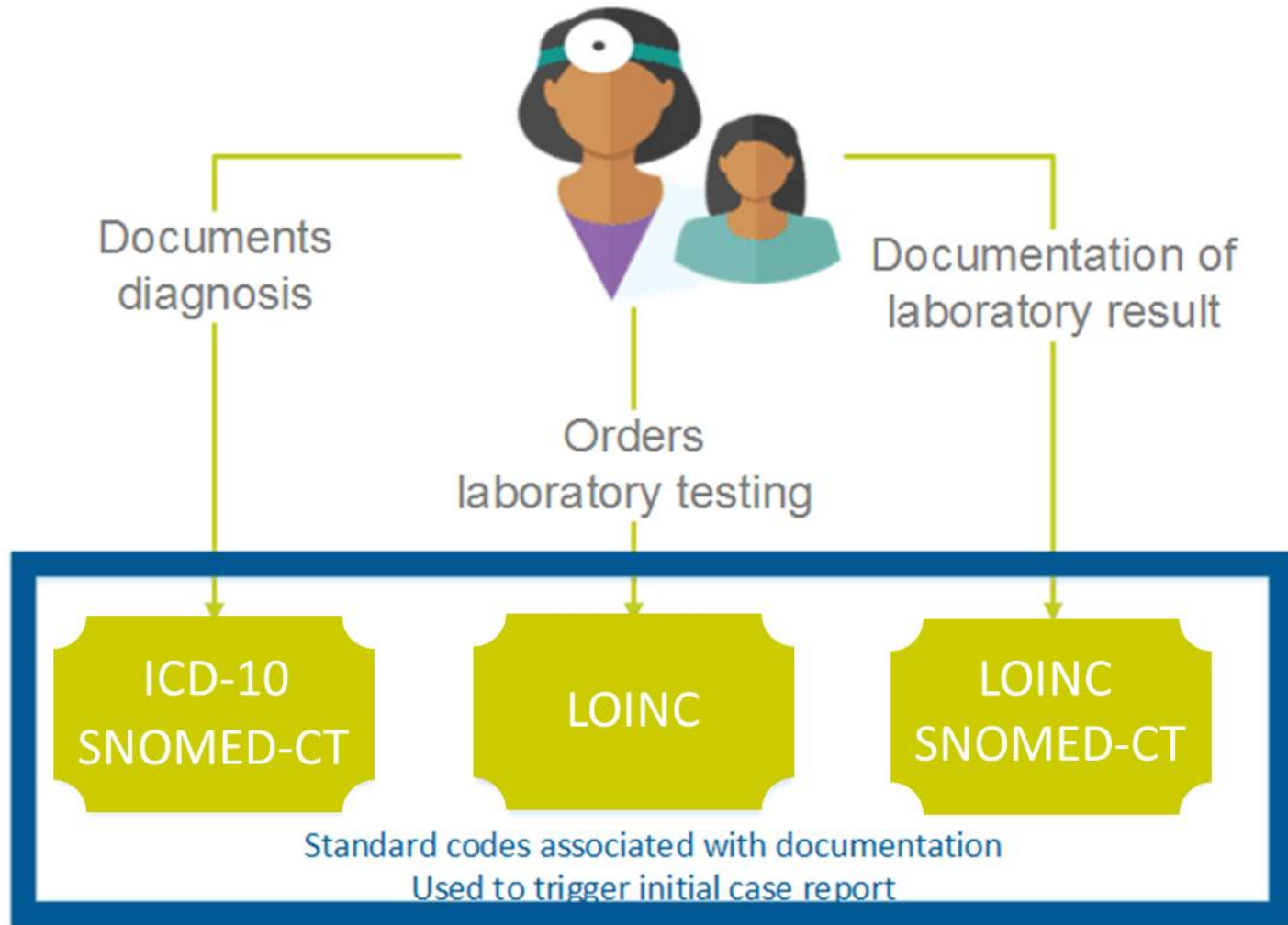


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How does eCR at Houston Methodist work?



It Begins with Care Documented in an EHR



Identifying Reportable Conditions through Trigger Codes & Partnership



The Reportable Conditions Trigger Codes (RCTC) list is consumed by EHRs for matching to initiate a case report.

- The intent behind the RCTC list is sensitivity, not specificity
 - **Sensitivity:** Designed to capture all potentially reportable conditions documented in EHRs, using codes that meet all public health jurisdictions' specifications
 - **Specificity:** Achieved using decision support for adjudication of reportability using jurisdiction-specific reporting requirements

Reportable Condition Trigger Codes (RCTC)

7					
8	RCTC Worksheets				
9	Name	OID	Code System(s)	Updated Date	Status
10	Trigger code for organism or subst	2.16.840.1.113762.1.4.1146.68	SNOMEDCT	2016-05-12	Approved
11	Trigger code for laboratory test na	2.16.840.1.113762.1.4.1146.42	LOINC	2016-05-12	Approved
12	Trigger code for laboratory test or	2.16.840.1.113762.1.4.1146.166	LOINC	2016-05-12	Approved
13	Trigger code for condition name	2.16.840.1.113762.1.4.1146.28	ICD10CM,SNOMEDCT	2016-05-12	Approved
14					
15					
16		In Following List: Green indicates code systems included in the RCTC file			
17	Code Systems				
18	Code System	Code System Version	Code System OID		
19	CDT	2016	2.16.840.1.113883.6.13		
20	CPT	2016	2.16.840.1.113883.6.12		
21	CVX	2016	2.16.840.1.113883.12.292		
22	SOP	5.0	2.16.840.1.113883.3.221.5		
23	UMLS	2015AB	2.16.840.1.113883.6.86		
24	HCPCS	2016	2.16.840.1.113883.6.14,2.16.840.1.113883.6.285		
25	HSLOC	2010	2.16.840.1.113883.6.259		
26	LOINC	2.54	2.16.840.1.113883.6.1		
27	CDCREC	1.0	2.16.840.1.113883.6.238		
28	ICD9CM	2013	2.16.840.1.113883.6.103,2.16.840.1.113883.6.104		
29	RXNORM	2016-04	2.16.840.1.113883.6.88		
30	ActMood	HL7V3.0_2014-08	2.16.840.1.113883.5.1001		
31	ICD10CM	2016	2.16.840.1.113883.6.90		
32	ICD10PCS	2016	2.16.840.1.113883.6.4		
33	RoleCode	HL7V3.0_2014-08	2.16.840.1.113883.5.111		
34	SNOMEDCT	2016-03	2.16.840.1.113883.6.96		
35	ActReason	HL7V3.0_2014-08	2.16.840.1.113883.5.8		
36	ActStatus	HL7V3.0_2014-08	2.16.840.1.113883.5.14		
37	RoleClass	HL7V3.0_2014-08	2.16.840.1.113883.5.110		
38	AddressUse	HL7V3.0_2014-08	2.16.840.1.113883.5.1119		
39	NullFlavor	HL7V3.0_2014-08	2.16.840.1.113883.5.1008		
Read Me Value Sets Organisms Lab Test Names Lab Orders Diagnoses					

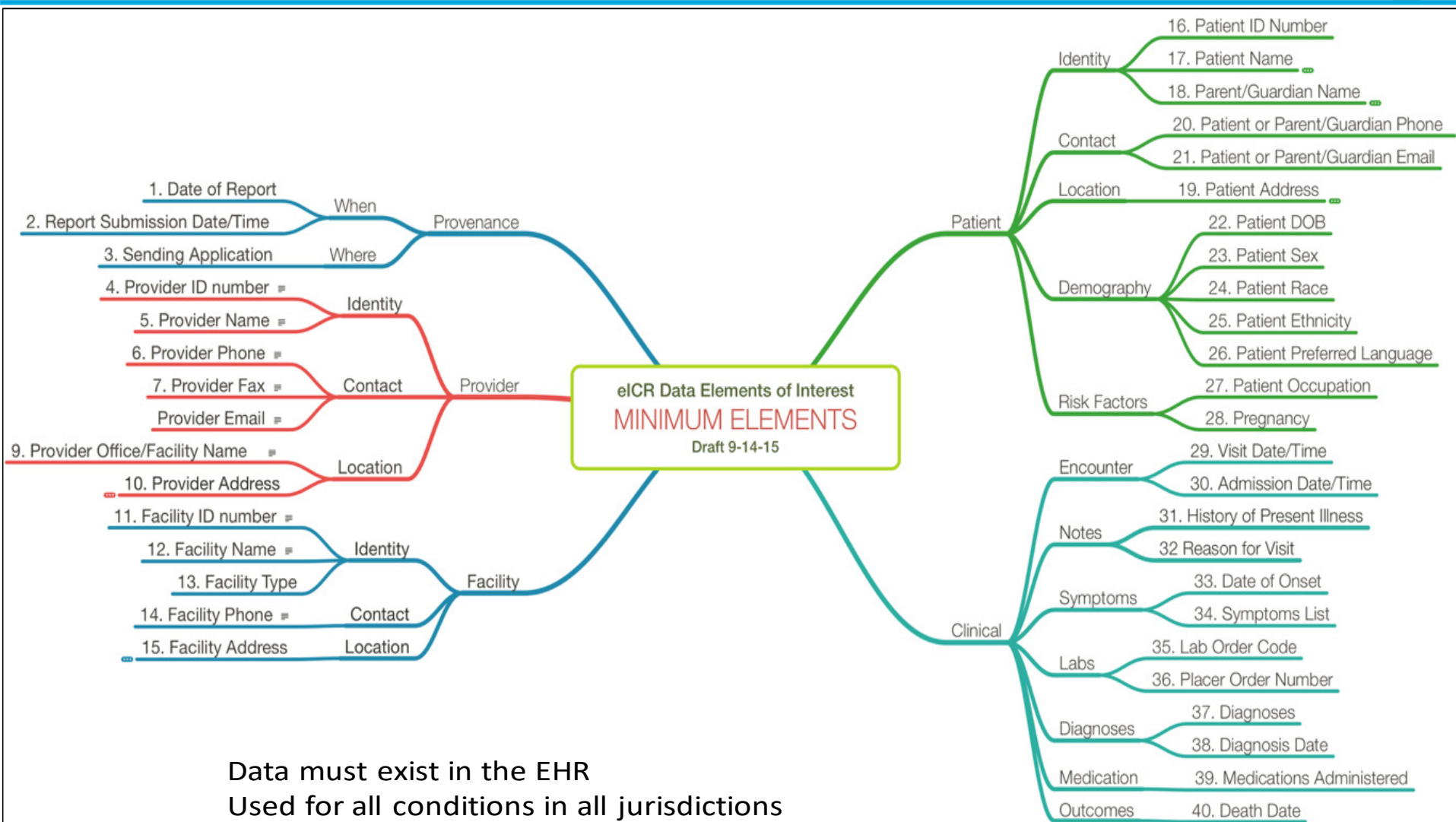
Electronic Initial Case Report (eICR)



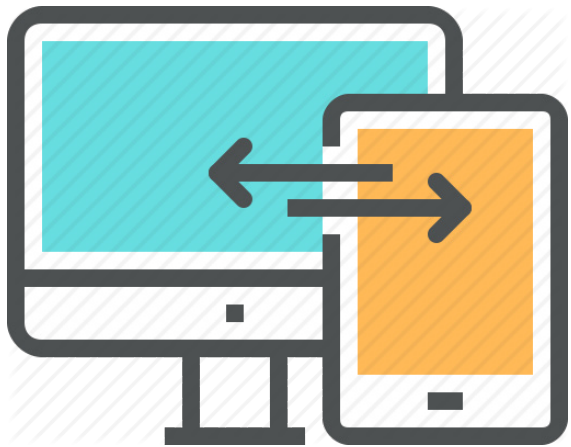
- The eICR is a CDA-based document that includes the CSTE identified data elements necessary for public health to initiate a case investigation
- The eICR R1.1 Implementation Guide was published January 2017

http://www.hl7.org/implement/standards/product_brief.cfm?product_id=436

eICR Minimum Data Elements of Interest

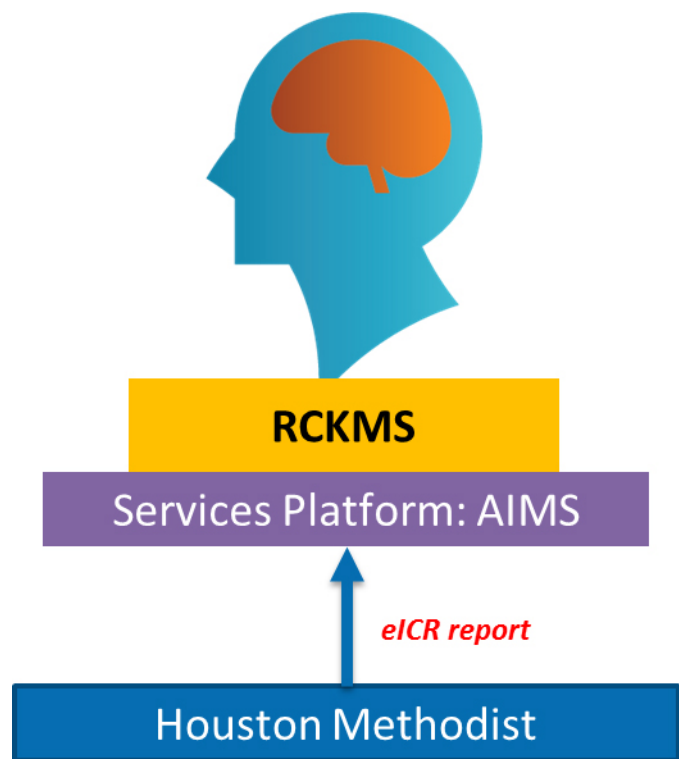


*CSTE Initial Case Report Task Force



- Houston Methodist does a tremendous amount of data exchange across the country, so we worked to leverage our HIE Architects and Surescripts partnership to build a connection
- Additional growth beyond the pilot would allow for the exchange and updates to case reports
- Direct address remains unique, secure, and is inherent to most major EHR vendors

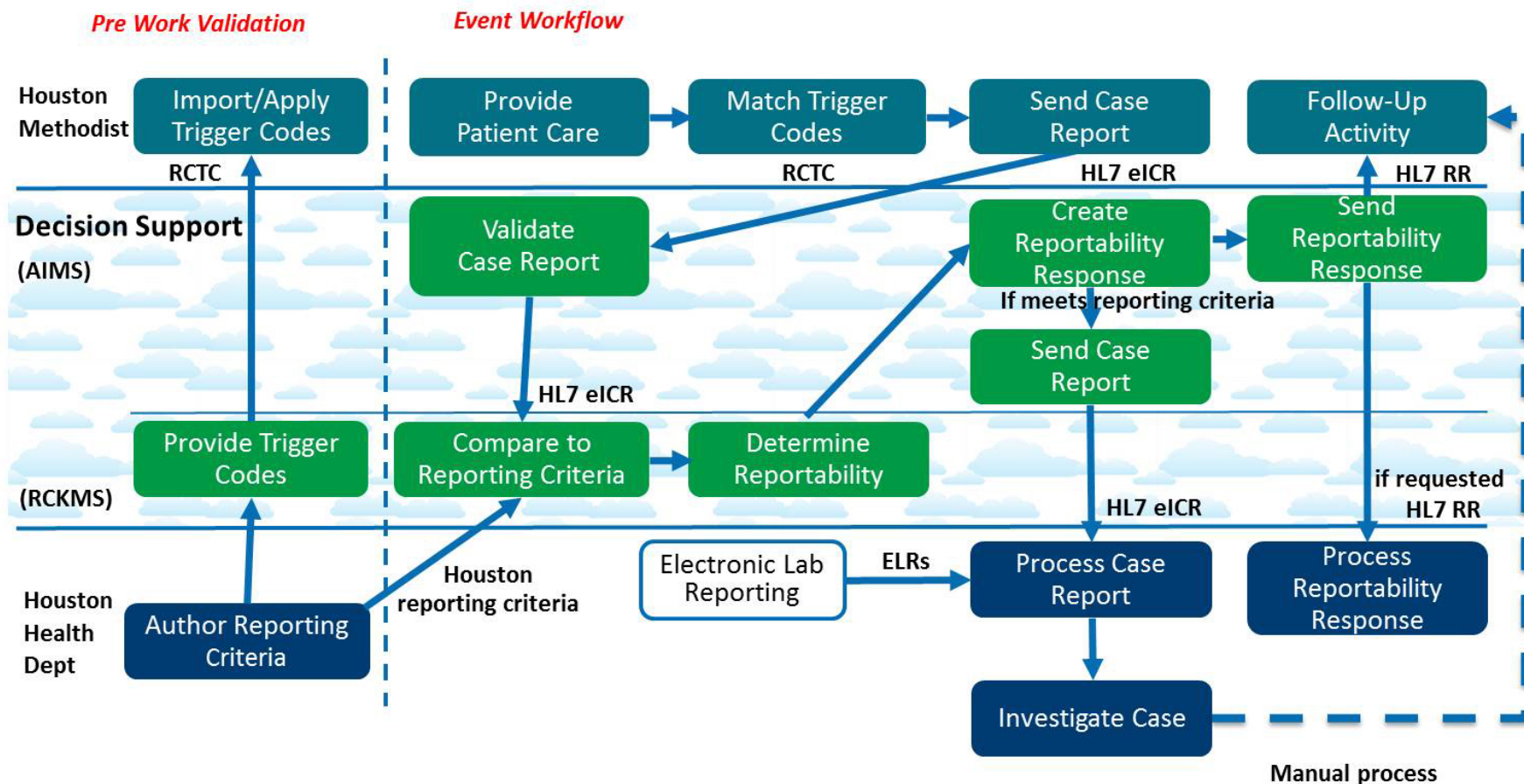
Decision Support: Reportable Conditions Knowledge Management System (RCKMS)



- RCKMS consists of 3 parts:
 - Authoring interface
 - Knowledge repository
 - Decision support service
- The Reportable Conditions Knowledge Management System (RCKMS) decision support service sits on an intermediary services platform (AIMS). Direct address points to AIMS.
- Public health agencies enter their local reporting requirements and RCKMS adjudicates each electronic initial case report against the appropriate jurisdictional requirements to determine reportability

eCR Process

RCTC = Reportable Conditions Trigger Codes
 HL7 eICR = HL7 Electronic Initial Case Report
 HL7 RR = HL7 Reportability Response
 AIMS = APHL Informatics Messaging Services Platform
 RCKMS = Reportable Conditions Knowledge Management System
 ELRs = Electronic Lab Reports



What did we Learn from the Pilot and What's Next?

- Outcomes (Nov 14th -27th)

- » 39 of 965 eICRs sent to RCKMS were deemed Reportable to the Houston Health Department
- » Technology Innovation
 - Seamless Integration Driving Towards Provider Efficiencies
- » Workflow Improvement Still to Come
 - Comfort Level
 - Active Crosswalk Comparisons of Paper and eCR
 - Ongoing Interface efforts with LabCorp and Quest

- Vision

- » Expand Reportable Conditions Code Sets
- » Expand to more Houston Area Counties
- » Response and Updates to eCR Managed Within EHR Workflow



Questions?

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Syndromic Surveillance

Wayne Loschen, Johns Hopkins University Applied Physics Laboratory

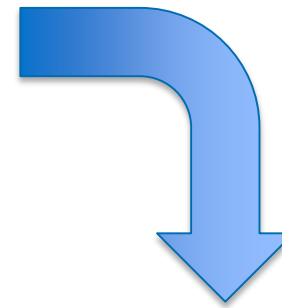


Syndromic Surveillance

How do you detect an outbreak or medical event to have an effective response?

What do you when you are sick?

- stay home from school
- buy medication from drug store
- go to the emergency room



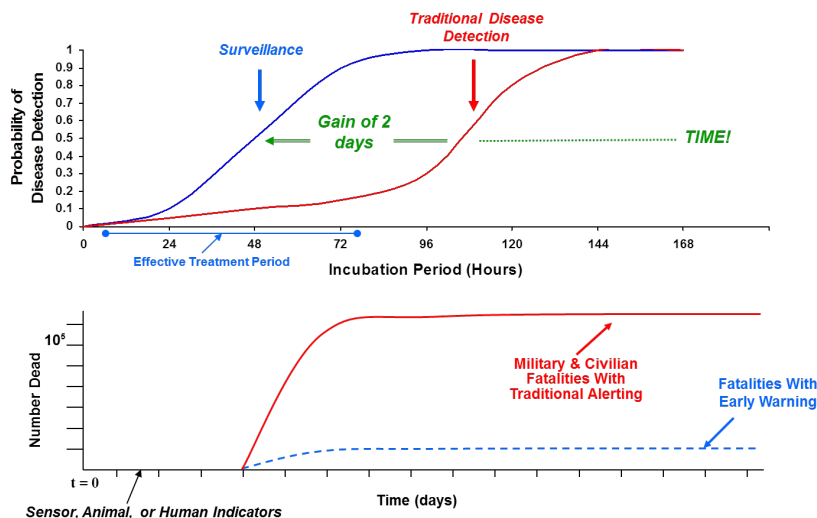
Understand the behaviors

Collect the data

Analyze & Visualize

Early Event Detection

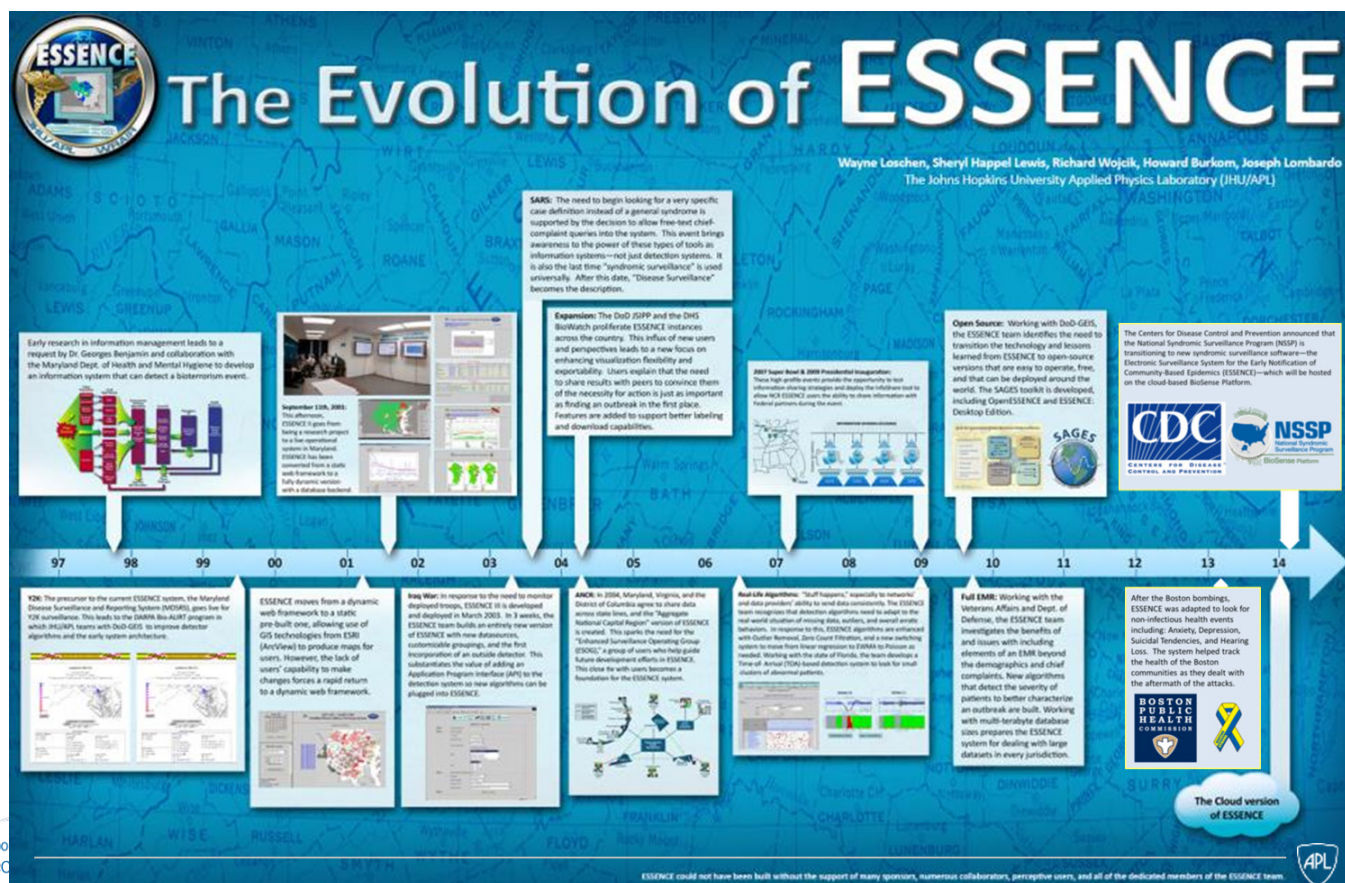
Provide Situational Awareness



History of Syndromic Surveillance

• ESSENCE History

- » Started in 1997, Y2K Surveillance with ER, Claims, Schools, Weather, OTC
- » Some other sites used faxes of ER logs with manual syndromic binning



Syndromic Surveillance Today

Absenteeism



Radiology



Diagnostic Labs



Poison Control



Prescriptions



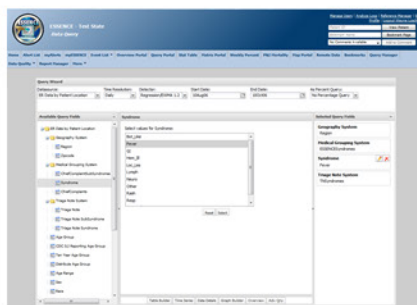
ED Chief Complaints



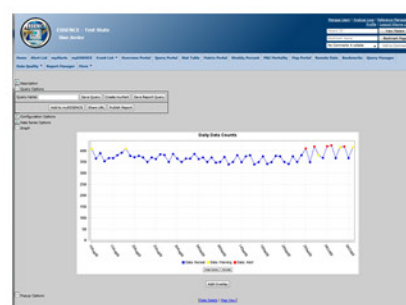
Nurse Call Center



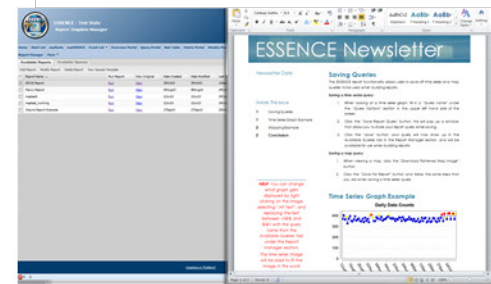
Over the Counter Sales



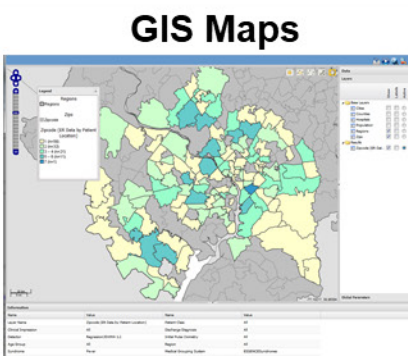
Query Interface



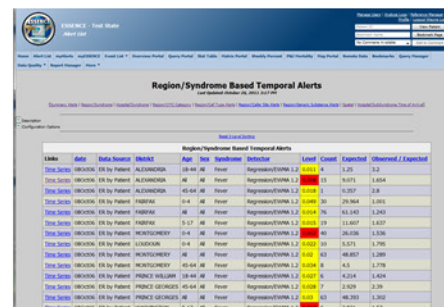
Time Series



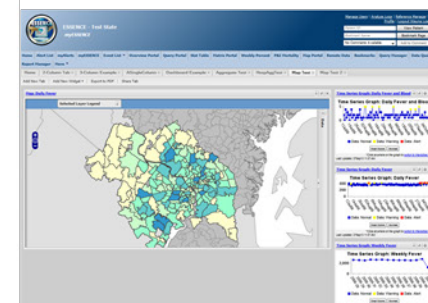
Customizable Reports & Dashboards



GIS Maps



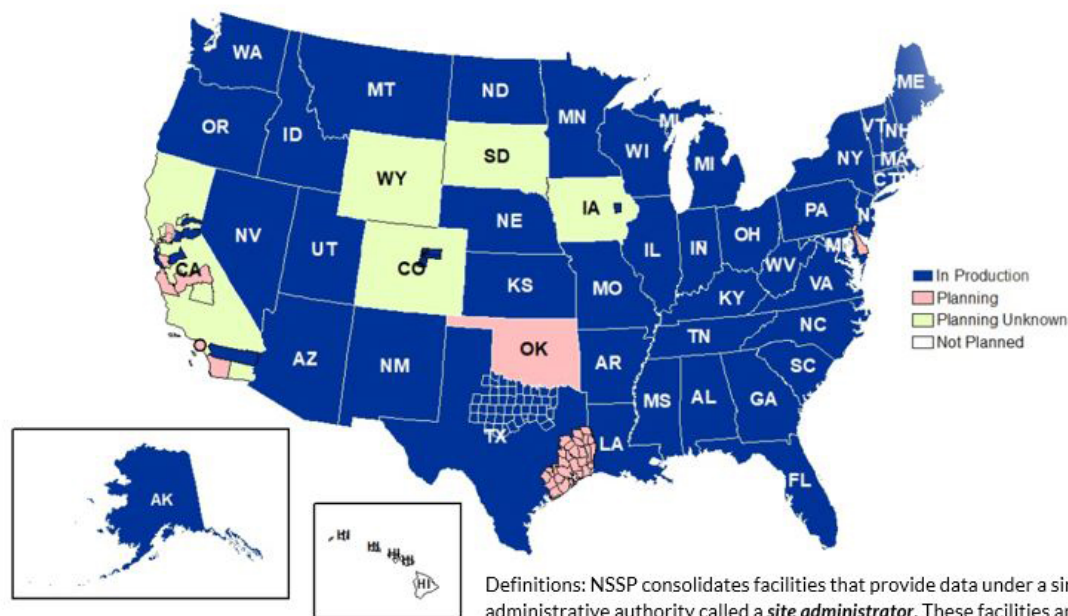
Detector Results



- Plus many additional data sources: Weather, Air Quality, EMS Run, Death Records, Reportable Diseases, ASPR DMAT, Animal, Water Quality, Social Media, etc.

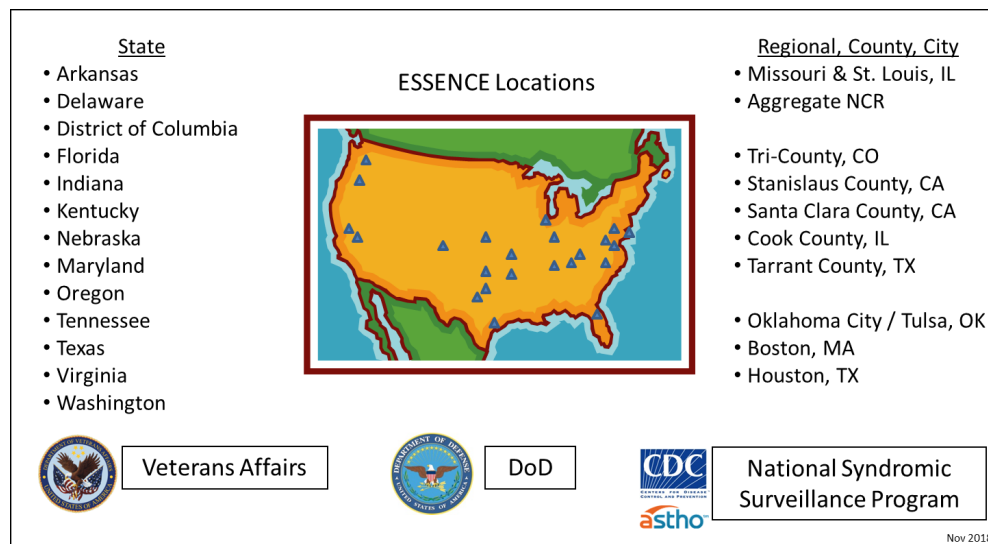
Syndromic Surveillance Today

- CDC National Syndromic Surveillance Program (NSSP)
- NSSP receives data from more than 4,000 facilities. Of these, about 2,567 are emergency departments (EDs) that actively submit data, which means that about 60% of all ED visits in the country are being represented (based on American Hospital Association data). At least 55 sites in 45 states, including the District of Columbia, participate in NSSP. Although NSSP is pleased with participation to date, sites with data in production do not always translate into sites with broad ED coverage.



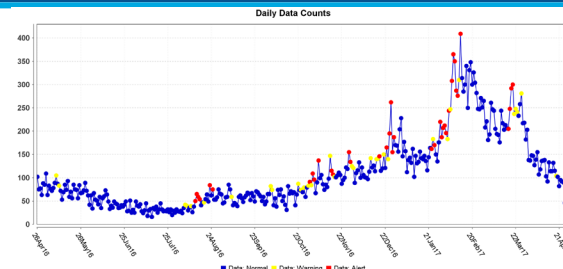
Syndromic Surveillance Today

- In addition to NSSP, many local jurisdictions have their own systems.
- This includes New York City's homegrown system, NC-Detect in North Carolina, ESSENCE locations (map below) and others.
- These systems have moved beyond purely syndromic and now commonly deal with pre-diagnostic, diagnostic, and ancillary data.
- Community has formed around International Society for Disease Surveillance (ISDS).



Syndromic Surveillance: What is it used for

- **Zika / Ebola / Opioids:** Detection and Monitoring
- **Influenza:** Detect start of seasonal outbreak
- **Boston Bombing:** New syndromes (Anxiety, Depression, Suicidal Tendencies, Hearing Loss)
- **Reportable Disease:** ESSENCE discovered 78 unreported cases in Florida from May 1 – Aug 31, 2013 that were required by law to be reported to the public health department.
- **Mass Gathering Surveillance:** Presidential Inaugurations, Republican National Conventions, NATO Summit, Super Bowls
- **Emergencies:** Wildfires, Earthquakes, Hurricanes, Train Derailments, Chemical Exposures



Syndromic Surveillance: Trends

- Domain Trends (when was this topic the most popular in the community)

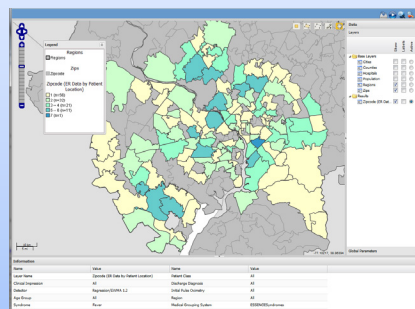
» Initial Concept

» Data Source Selection

» Analytics

» Visualizations

» Data Quality



Past

» Sharing

» Case Definition Development

» Expanding Users & Uses



Present

» One Health



Future

» Prediction

VDH All Drug Overdose v1:

[illegible]

Syndromic Surveillance: ISDS Conference

- For more Syndromic Surveillance Discussion:

<https://www.healthsurveillance.org>

- Groups
- Calendars
- Forums

<https://www.surveillancerepository.org>

- Past Webinars
- Past Abstracts / Conference Materials
- Use Cases
- Syndrome Definitions
- Success Stories
- Training





Thanks

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Questions/Answers

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