

Electronic Case Reporting (eCR) in FHIR:
Addressing public health needs with a
common FHIR EHR reporting design pattern

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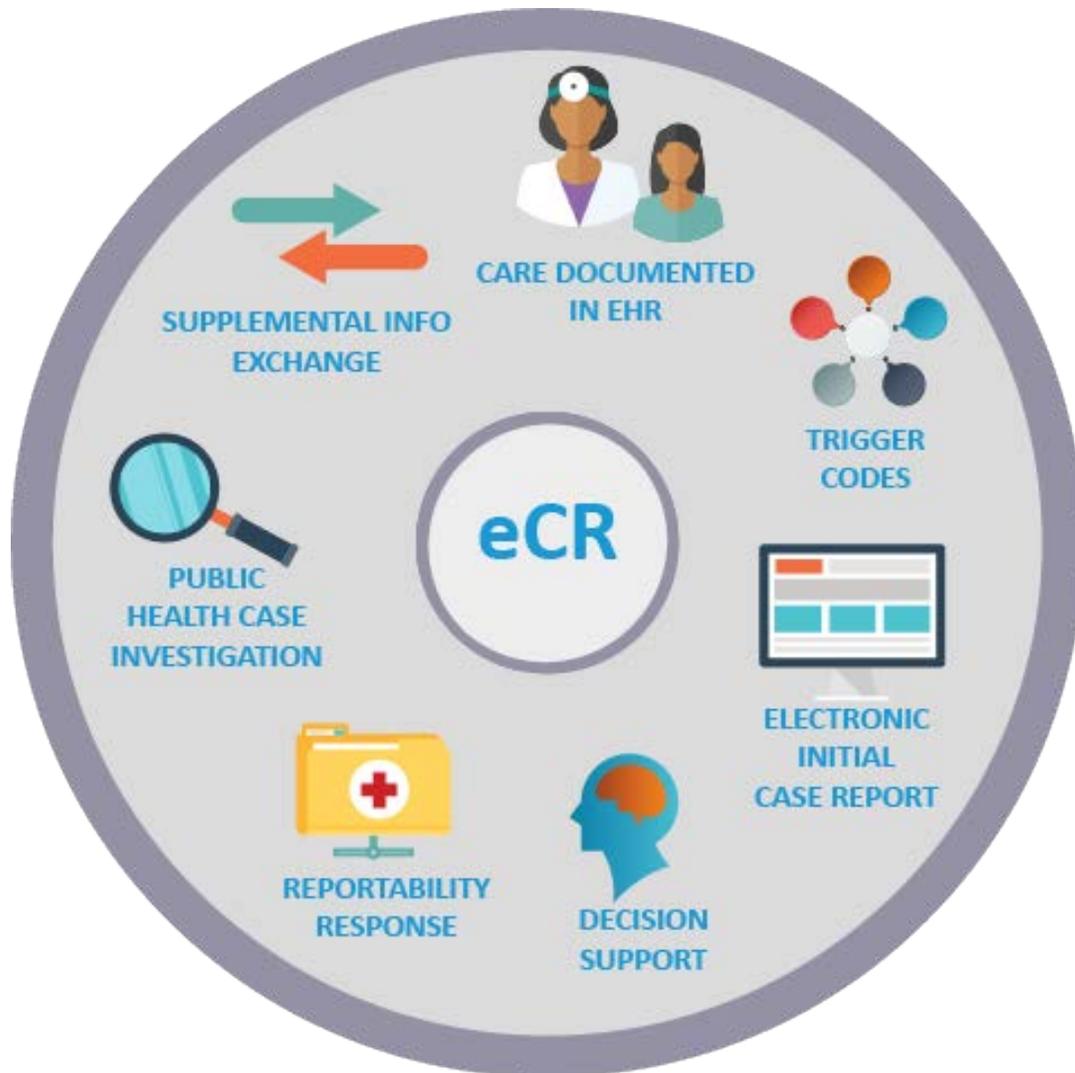
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CMIO CGI Federal, Consultant to APHL, CDC

Agenda

- Existing Electronic Case Reporting (eCR) Standards
- Context for FHIR eCR
- Striving for reduced burden through a common reporting design pattern
- Q & A

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.

Currently involves two standards:

- Electronic Initial Case Report (eICR)
- Reportability Response (RR)

Also involves a spreadsheet:

- Reportable Condition Trigger Codes (RCTC)

And:

- The Reportable Condition Knowledge Management System (RCKMS) on the APHL AIMS Platform

Electronic Initial Case Report (eICR)



- HL7 CDA-based document that includes the CSTE identified data elements for “all condition, all jurisdiction” report necessary for public health to initiate a case investigation.
- Release 1.1 STU Implementation Guide was published January 2017. Added:
 - travel history
 - Important in many outbreaks like Zika, Ebola etc.
 - initiating trigger code(s) and RCTC version
 - Identified in certification
- Can also be manually initiated by provider – always reach public health agency
- Pregnancy status data, more structured occupational data, and inclusion of vital signs coming
- Implemented by multiple EHRs

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

Reportability Response (RR)



- HL7 CDA-based document provides information from public health back to clinical care about each eICR received.
 - Confirms eICR receipt and processing
 - Communicates the reportability of condition(s) in an electronic Initial Case Report (eICR) and data needed if “may be reportable”
 - Indicates what Public Health Agency(ies) has been sent a report
 - Links to any additional reporting needs
 - Identifies necessary clinical follow-up activities
 - Provides clinical support information for identified reportable conditions
- Release 1.0 STU Implementation Guide published in Jan 2018.
http://www.hl7.org/implement/standards/product_brief.cfm?product_id=470

RCTC Codes

Value Set Authority Center U.S. National Library of Medicine	
1	
2	Value Set Name Diagnosis_Problem Triggers for Public Health Reporting
3	OID 2.16.840.1.113762.1.4.1146.627
4	Type Grouping
5	Definition Version 20170321
6	Steward CSTE Steward
7	Author CSTE Author
8	Purpose: Clinical Focus This set of values contains diagnoses or problems that represent that the patient may have a potentially reportable condition regardless of the clinical presentation of the condition
9	Purpose: Data Element Scope Diagnoses or problems documented in a clinical record.
10	Purpose: Inclusion Criteria See individual value sets
11	Purpose: Exclusion Criteria See individual value sets
12	Note Includes de-duplicated set of codes from selected value sets used in the Reportable Condition Knowledge Management System (RCKMS) reporting logic. RCKMS value sets in VSAC are for informational use only. When implementing trigger codes for electronic case reporting, use the Reportable
13	Code System ICD10CM,SNOMEDCT
14	

61	A02.23	Salmonella arthritis	ICD10CM	2017
62	A02.24	Salmonella osteomyelitis	ICD10CM	2017
63	A02.25	Salmonella pyelonephritis	ICD10CM	2017
64	A02.29	Salmonella with other localized infection	ICD10CM	2017
65	A02.8	Other specified salmonella infections	ICD10CM	2017
66	A02.9	Salmonella infection, unspecified	ICD10CM	2017
67	A37	Whooping cough	ICD10CM	2017
68	A37.0	Whooping cough due to Bordetella pertussis	ICD10CM	2017
69	A37.00	Whooping cough due to Bordetella pertussis without pneumonia	ICD10CM	2017
70	A37.01	Whooping cough due to Bordetella pertussis with pneumonia	ICD10CM	2017
71	A37.9	Whooping cough, unspecified species	ICD10CM	2017
72	A37.90	Whooping cough, unspecified species without pneumonia	ICD10CM	2017
73	A37.91	Whooping cough, unspecified species with pneumonia	ICD10CM	2017
74	A54	Gonococcal infection	ICD10CM	2017
75	A54.0	Gonococcal infection of lower genitourinary tract without periurethral or accessory gland abscess	ICD10CM	2017
76	A54.00	Gonococcal infection of lower genitourinary tract, unspecified	ICD10CM	2017



Trigger codes are for diagnoses, lab result, lab orders, and lab observation test names. They are available at: <https://phinvads.cdc.gov/vads/SearchVocab.action>

eCR and FHIR?

- A lot of FHIR energy, opportunity, and talk
 - Health industry momentum is in this direction
 - Offers possibilities for solving some long-standing challenges
 - Some EHR vendors say they are waiting for FHIR to do eCR

And...

- Other EHR vendors have implemented eCR in CDA
 - Quite possible to replicate previous interoperability problems in FHIR
 - FHIR will probably take longer than people hope
- Need to do both CDA and FHIR for indefinite future
 - Respect the commitment of those who have implemented in CDA
 - Ease the transition period for all

eCR and FHIR

- HL7 eCR “For Comment” ballot and 126 comments and suggestions in January of 2018
- HL7 Standard for Trial Use (STU) ballot now - encourage you to make comments: <http://hl7.org/fhir/us/ecr/2018Sep/index.html>
- Will be testing at the HL7 Connectathon in Baltimore

And some learnings...

- Have developed transforms that can be used at multiple points in the information supply chain to convert between CDA and FHIR versions of the eICR and the RR
- Striving to keep the CDA and FHIR eICR and RR data in alignment

FHIR

- The addition of FHIR API, RESTful Query, and Apps concepts is very helpful for some existing and new health use cases

And...

- The FHIR API also includes “push”!
- Most public health and clinical use cases use “push” for specific workflow, policy, and legal disclosure reasons
- Push is particularly critical for exchange between organizations with differing data authorities – like healthcare and public health – so as to only disclose the specific data needed

Public health and other government program challenges

- Many government programs have siloed “asks” of healthcare – don’t share much with each other and add burden
- History of case reporting includes individual systems for each condition (a typical Public Health Agency gets reports on over 200 conditions)
- A FHIR app for every disease condition would be no better and would be manual

And....

- FHIR offers Easier segmentation and specification to purpose – should be easier for EHR vendors to create specific documents and messages
- In addition to FHIR being an API, the implementation guides are electronic and can be “consumed” by a FHIR sever to help develop, validate, and test an interface
- We are working to develop a common “reporting” design pattern in FHIR that many programs could use

Healthcare Organizations

Public Health Organizations

Knowledge Distribution

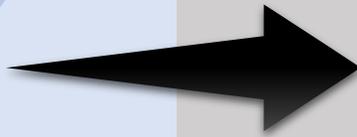
Subscription Service

Surveillance System / Registry

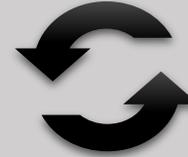
Triggering



Local Rules

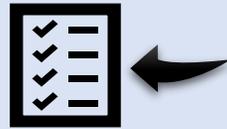


Push Messaging



Remote Rules

EHRs



Feedback to Clinical Care



Supplemental Investigation Data

Common Reporting Design Pattern

- Synergize with other programs to minimize burden
 - May include: public health registries, clinical registries, other reporting...
- Reporting rules are needed somewhere to enable specific disclosures

Healthcare Organizations

Public Health Organizations

Knowledge Distribution

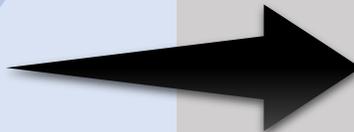
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Surveillance System / Registry

Triggering



Local Rules

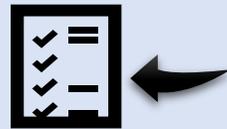


Push Messaging

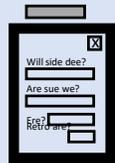


Remote Rules

EHRs



Feedback to Clinical Care



Supplemental Investigation Data

Remote Rules (current eCR state)

- EHRs can not presently implement rules distributed to them
- RCKMS on APHL AIMS platform
- Implement varied jurisdictional reporting rules to comply with state laws
- Operating under healthcare Business Associate (BA) authorities
- Requires shared BA agreement

Healthcare Organizations

Public Health Organizations

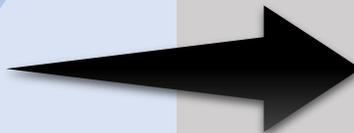
Knowledge Distribution

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Local Rules



Push Messaging



Remote Rules

Surveillance System / Registry

EHRs



Feedback to Clinical Care



Supplemental Investigation Data

Local rules

- FHIR can potentially enable distributed rules
 - FHIR decision support
 - API connected rules engine
- Desirable to distribute to healthcare
 - Access to full EHR data, but under healthcare authorities
 - More sensitive and specific reporting
- A lot of development still needed

Healthcare Organizations

Public Health Organizations

Knowledge Distribution

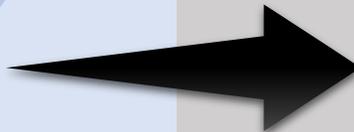
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Local Rules



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Remote Rules

EHRs



Feedback to Clinical Care



Supplemental Investigation Data

Triggering needed to automate reporting

- Reduce provider burden from manual reporting
- Increase reporting compliance and yield
- Can trigger on data changes, workflow, time
- Many EHR vendors have implemented some kind of triggering already for eCR or otherwise
- FHIR eventually adds possibilities to use FHIR subscription or CDS Hooks to trigger

Healthcare Organizations

Public Health Organizations

Knowledge Distribution

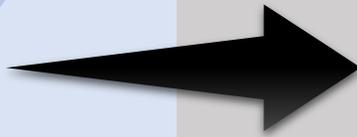
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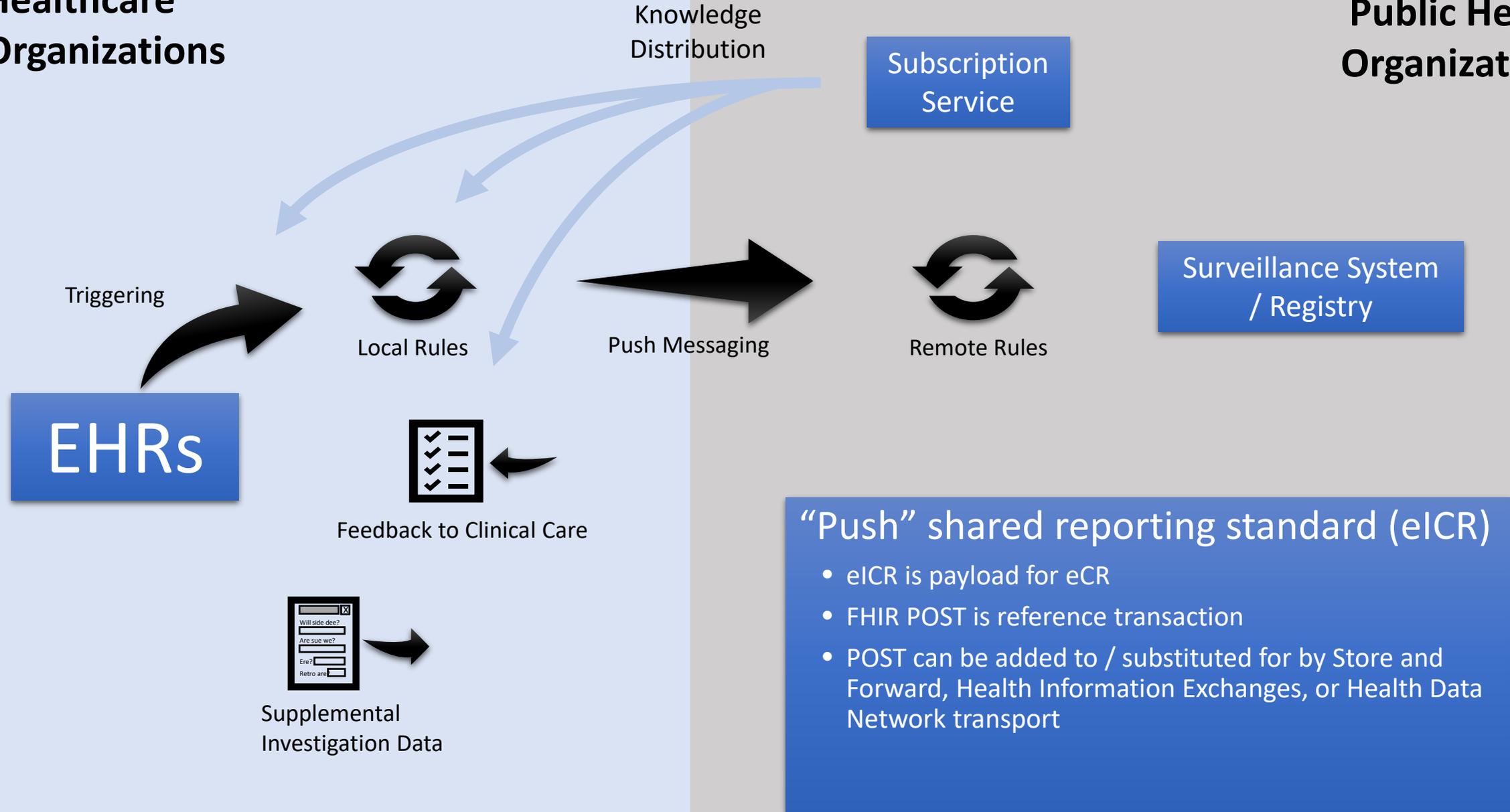
Supplemental Investigation Data

Knowledge Distribution

- Working with EHR vendors on more processable trigger code distribution
- XML, JSON (is FHIR-based) instead of RCTC spreadsheet, but EHR does not have to use FHIR
- Also convey guidance and parameters for triggering
- Knowledge Distribution subscription service
- Establish path for distributable rules (CQL)

Healthcare Organizations

Public Health Organizations



"Push" shared reporting standard (eICR)

- eICR is payload for eCR
- FHIR POST is reference transaction
- POST can be added to / substituted for by Store and Forward, Health Information Exchanges, or Health Data Network transport

Healthcare Organizations

Public Health Organizations

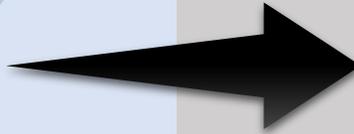
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Feedback to Clinical Care



Supplemental Investigation Data

Feedback to clinical care (RR)

- Now Reportability Response (HL7 CDA)
- Bidirectional communications (notification of reportability, succinct guidance, regional status, connects supplemental forms)
- Healthcare workflow sensitive (work queues, attach to patient chart for “reportable” and “may be reportable” conditions)

Healthcare Organizations

Public Health Organizations

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Remote Rules

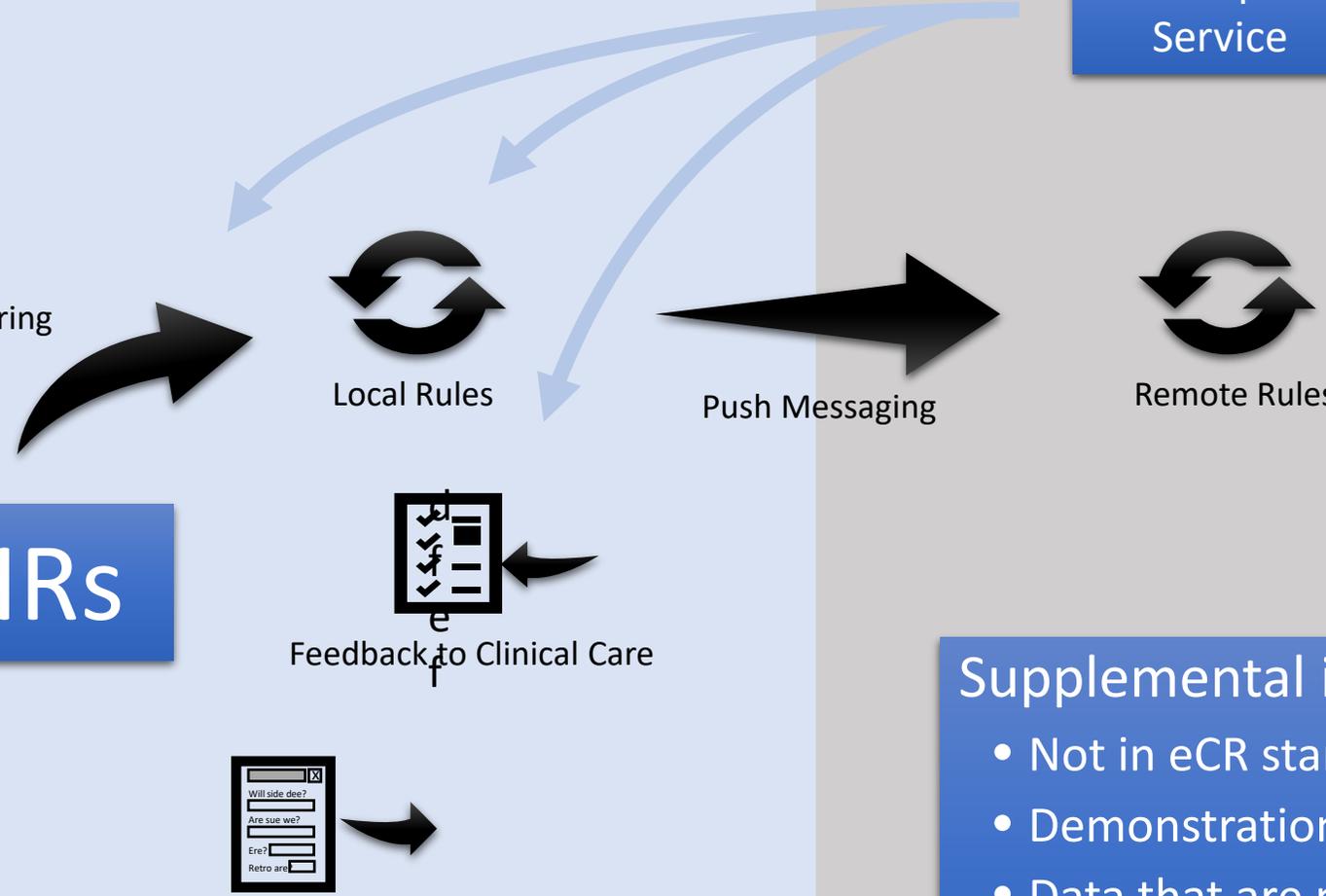
EHRs

Feedback to Clinical Care

Supplemental Investigation Data

Supplemental investigation information

- Not in eCR standards
- Demonstration uses IHE RFD – URL standard
- Data that are not recorded as part of care and those that are not structured in EHRs
- Complements eICR and needs RR



Questions and Comments?

The following have contributed significantly to this work:

- Sarah Gaunt, Rick Geimer, and K.P. Sethi of Lantana Consulting Group
- The co-chairs and participants of the HL7 Public Health Work Group
- EPIC and the Public Health Agencies who have collaborated in multiple Connectathons and Showcases to implement and demonstrate full eCR functionality