

Informatics 101

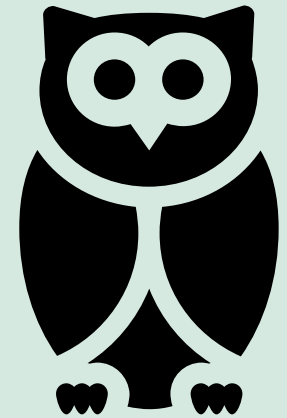
An intro to public health informatics in Oregon



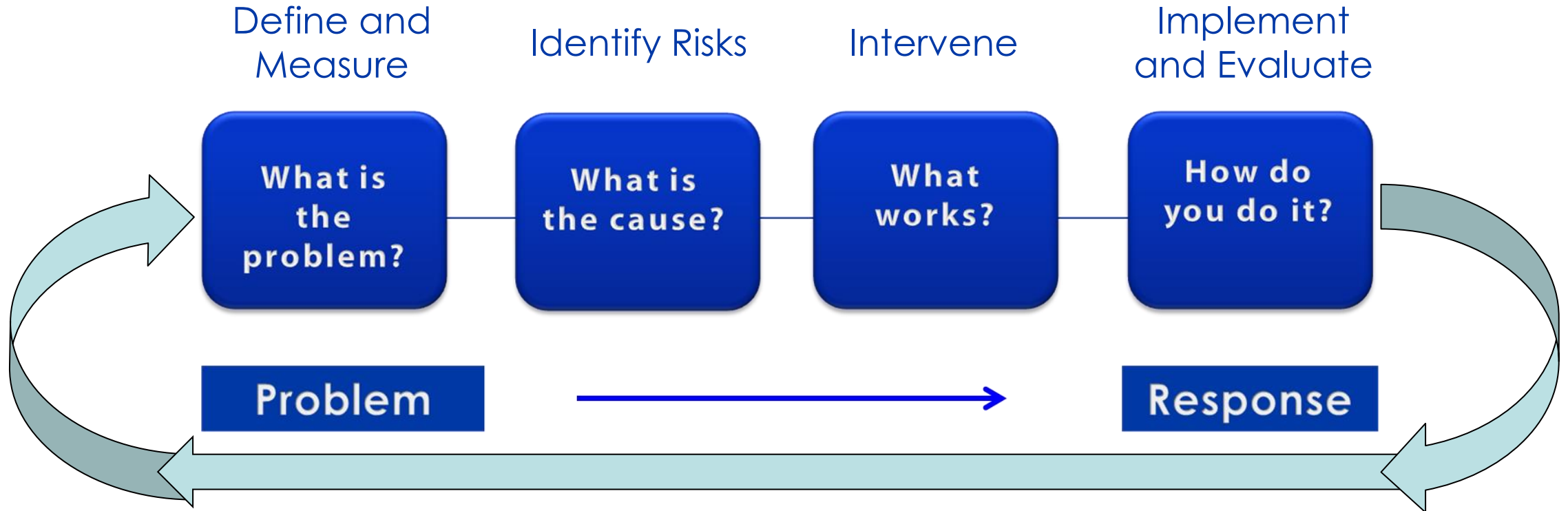
ACUTE & COMMUNICABLE DISEASE PREVENTION
Public Health Division



Setting the Stage



The Public Health Approach



Infor-WHAT-ics??

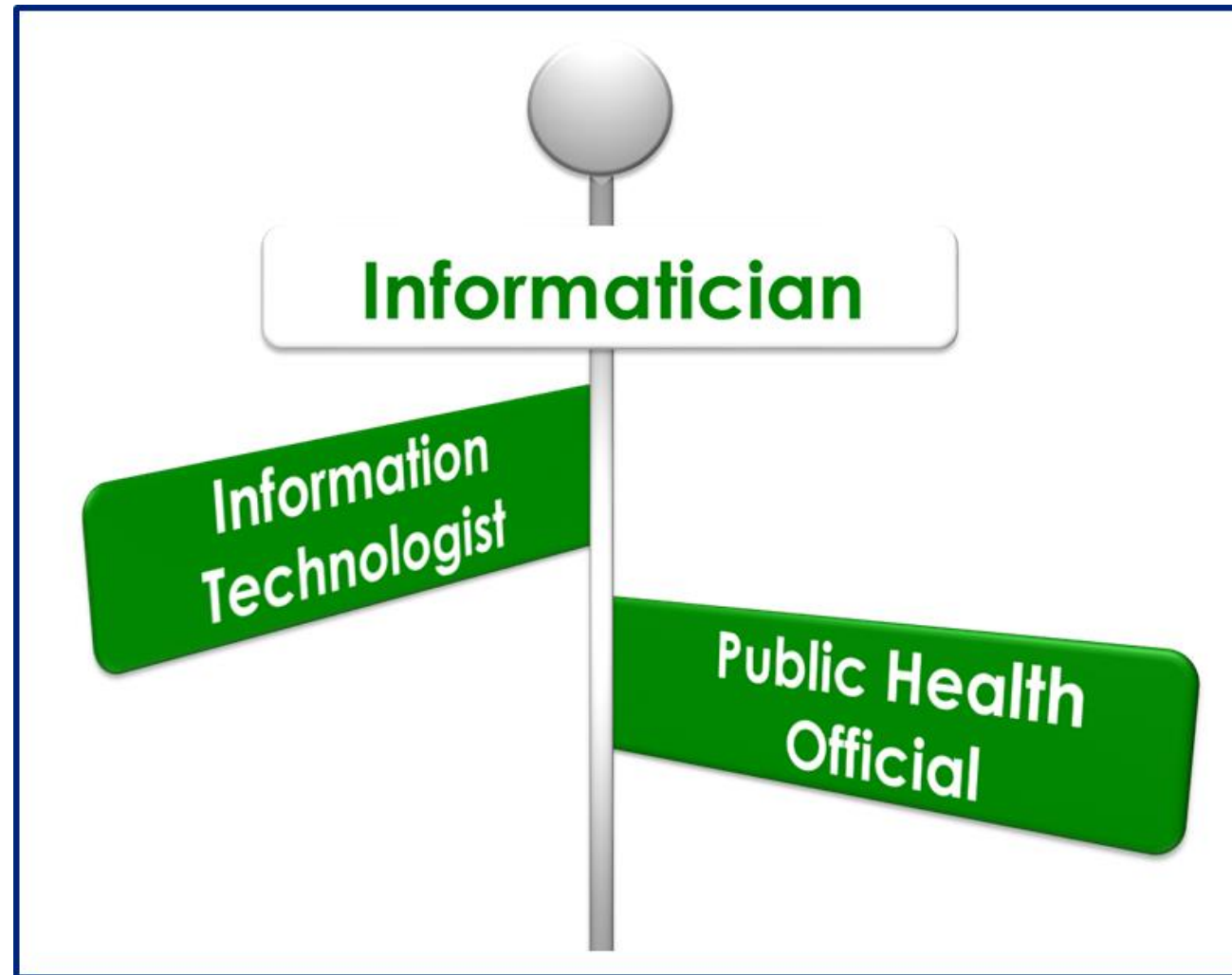


“Public health informatics is the systematic application of information, computer science, and technology to public health practice, research, and learning.”

Yasnoff WA, O'Carroll PW, Koo D, Linkins RW, Kilbourne EM. Public health informatics: improving and transforming public health in the information age. *J Public Health Manag Pract* 2000;6:67–75.

Riegelman R, ed. *Public health 101: healthy people—healthy populations*. Sudbury, MA: Jones & Bartlett Learning; 2010: 40.

Informaticians:





Collect



Parse



Prepare



Provision



Analyze, Interpret, and Explain

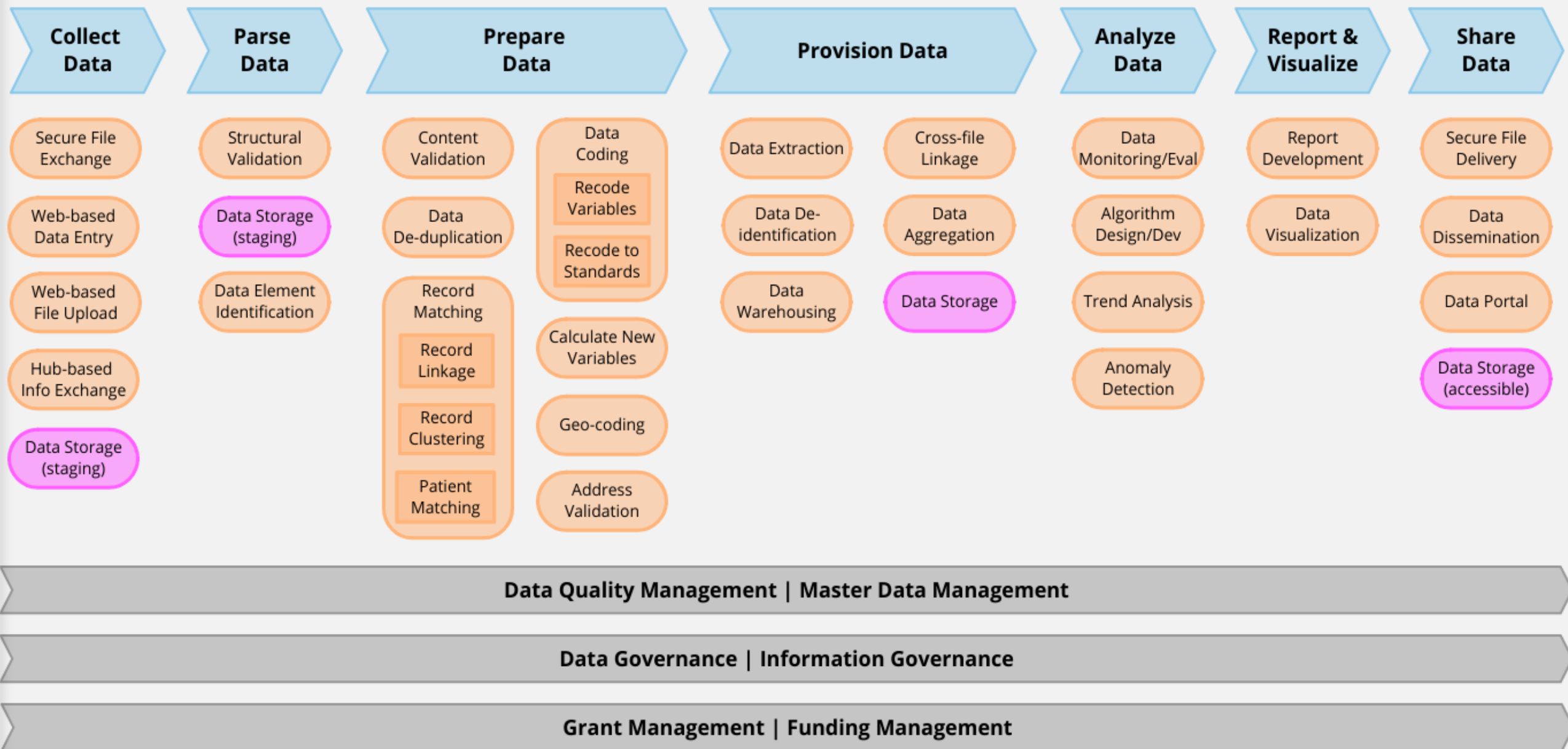


Share and Make Use



ACUTE & COMMUNICABLE DISEASE PREVENTION
Public Health Division

Public Health Surveillance Capabilities



Public Health...

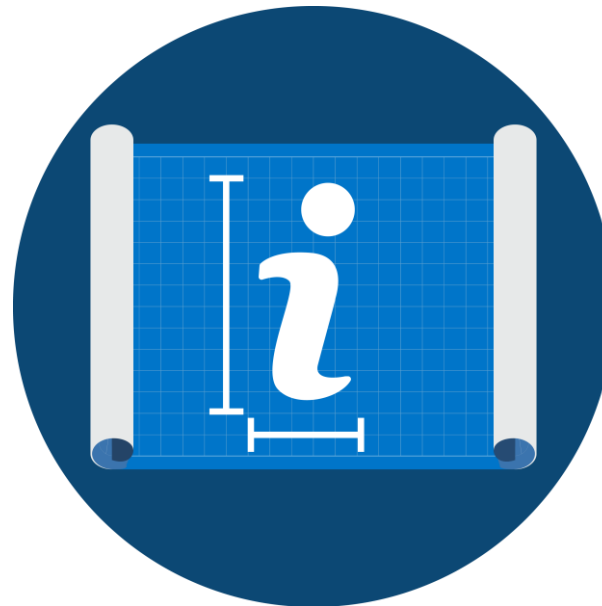


- **Informatics** is the effective use of information and technology to improve population health outcomes.
- **Informaticians** are people with knowledge, skills, and expertise of both public health practice and information technology.
- **Informatics Savvy Organizations** are those that have a competent and skilled informatics workforce, a vision and strategy for how to use information and technology to improve population health, and effectively uses well-designed systems to achieve their mission.

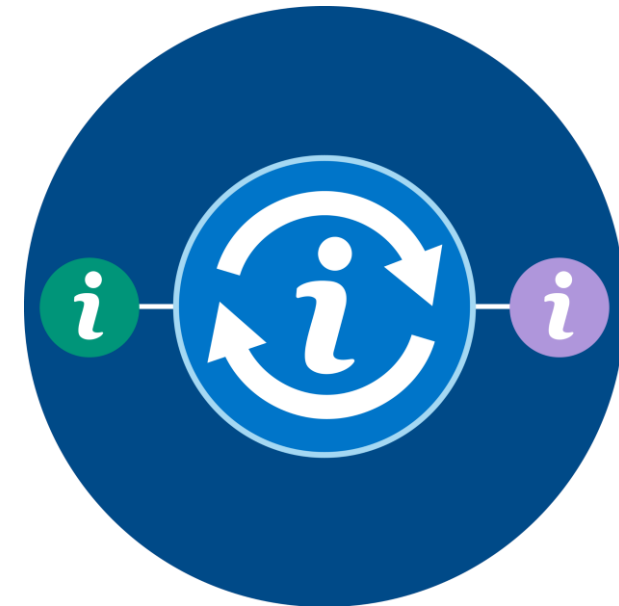
Public Health Informatics Metaphors



Public Health
Data Logistics



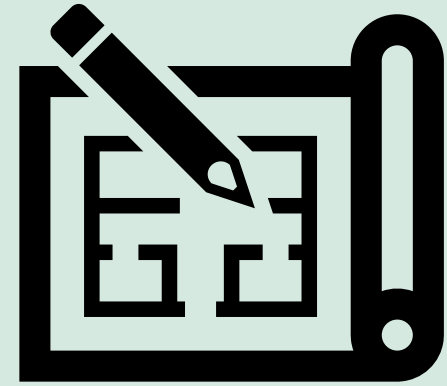
Public Health
Knowledge
Architects



Public Health
Information
Translation

2

Data Inputs



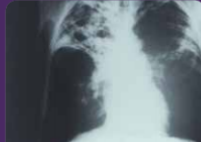
What is reportable?



Local health department information

For a list of local health department phone numbers go to www.healthoregon.org/lhddirectory.

TB: Still infectious



ETEC: Not just for travelers



Infection Control: The basics



OREGON PUBLIC HEALTH DIVISION REPORTING FOR CLINICIANS

By law,¹ Oregon clinicians must report diagnoses of the specified infections, diseases and conditions listed on this poster. Both lab-confirmed and clinically suspect cases are reportable. The parallel system of lab reporting does not obviate the clinician's obligation to report. Some conditions (e.g., uncommon illness of public health significance, animal bites, hemolytic uremic syndrome (HUS), pesticide poisoning, disease outbreaks) are rarely, if ever, identified by labs. We depend on clinicians to report.

Reports should be made to the patient's local health department² of residence and include at least the patient's name, home address, phone number, date of birth, sex, diagnosis and date of symptom onset. Most reports should be made within one working day of the diagnosis, but there are several important exceptions — please refer to the list on this poster.

Disease reporting enables appropriate public health follow-up for your patients, helps identify outbreaks, provides a better understanding of morbidity patterns, and may even save lives. Remember that HIPAA does not prohibit you from reporting protected health information to public health authorities for the purpose of preventing or controlling diseases, including public health surveillance and investigations.³

CIVIL PENALTIES FOR VIOLATIONS OF OREGON REPORTING LAW

A civil penalty may be imposed against a person or entity for a violation of any provision in OAR Chapter 333, Division 18 or 19.⁴ These regulations include the requirements to report the diseases listed on this poster, along with related data; and to cooperate with local and state public health authorities in their investigation and control of reportable diseases. Civil penalties shall be imposed as follows:

New reportables are highlighted.

IMMEDIATELY

Anthrax (*Bacillus anthracis*)

Bacillus cereus biovar anthracis

Botulism (*Clostridium botulinum*)

Brucellosis (*Brucella*)

Cholera (*Vibrio cholerae* O1, O139, or toxigenic)

Diphtheria (*Corynebacterium diphtheriae*)

Eastern equine encephalitis

Glanders (*Burkholderia mallei*)

Hemorrhagic fever caused by viruses of the filovirus (e.g., Ebola, Marburg) or arenavirus (e.g., Lassa, Machupo) families

Influenza (novel)⁵

Marine intoxication (intoxication caused by marine microorganisms or their byproducts (e.g., paralytic shellfish poisoning, domoic acid intoxication, ciguatera, scombroid)

Measles (rubella)

Melioidosis (*Burkholderia pseudomallei*)

Plague (*Yersinia pestis*)

WITHIN ONE LOCAL HEALTH AUTHORITY WORKING DAY

Amebic infections⁶ (central nervous system only)

Anaplasmosis (*Anaplasma*)

Animal bites (of humans)

Arthropod vector-borne disease (e.g., California encephalitis, Colorado tick fever, dengue, Heartland virus infection, Kyasanur Forest disease, St. Louis encephalitis, Western equine encephalitis, etc.)

Babesiosis (*Babesia*)

Campylobacteriosis (*Campylobacter*)

Chancroid (*Haemophilus ducreyi*)

Chlamydia (*Chlamydia trachomatis*; lymphogranuloma venereum)

Coccidioidomycosis (*Coccidioides*)

Creutzfeldt-Jakob disease (CJD) and other transmissible spongiform encephalopathies

Cryptococcosis (*Cryptococcus*)

Cryptosporidiosis (*Cryptosporidium*)

Cyclosporiasis (*Cyclospora cayatanensis*)

Ehrlichiosis (*Ehrlichia*)

Enterobacteriaceae family isolates that are resistant to any

Hepatitis D (delta)

Hepatitis E

HIV infection (does not apply to anonymous testing) and AIDS

Influenza (laboratory-confirmed) death of a person <18 years of age

Lead poisoning⁸

Legionellosis (*Legionella*)

Leptospirosis (*Leptospira*)

Listeriosis (*Listeria monocytogenes*)

Lyme disease (*Borrelia burgdorferi*)

Malaria (*Plasmodium*)

Mumps

Non-tuberculous mycobacterial infection (non-respiratory)⁹

Pertussis (*Bordetella pertussis*)

Psittacosis (*Chlamydia psittaci*)

Relapsing fever (*Borrelia*)

Rocky Mountain spotted fever and other *Rickettsia* (except louse-borne typhus, which is immediately reportable)

Salmonellosis (*Salmonella*, including typhoid)

Shigellosis (*Shigella*)

Local health department information

For a list of local health department phone numbers go to www.healthoregon.org/lhddirectory.

M. tuberculosis



ETEC: Detectable by multiplex PCR



Carbapenem-resistant Enterobacteriaceae (CRE)



OREGON PUBLIC HEALTH DIVISION REPORTING FOR LABORATORIES

By law,¹ Oregon laboratories must report all human test results "indicative of and specific for" the following diseases, infections, microorganisms and conditions listed in the accompanying table. These results include microbiological culture, isolation or identification; assays for specific antibodies; and identification of specific antigens, toxins or nucleic acid sequences.

In general, reports must be made to the patient's local public health department of residence within one working day of the initial test report.²

Laboratories should also familiarize themselves with select biological agents and toxins that have potential to pose severe threats.³ Reports must include the patient's name, date of birth, county of residence, specimen type and specimen source site, collection date, lab test, result, and contact information for the ordering clinician and the lab.⁴

If possible, patient sex and street address should also be submitted.

The laboratory reporting the result to the clinician is responsible for reporting to public health, regardless of which lab actually performs the test. Reports on out-of-state results should be made directly to that state's health department, or to the Public Health Division of the Oregon Health Authority. Document these reports in a log.

Oregon law requires laboratories that report an average of >30 records per month to submit the data electronically according to the standards in the Oregon Health Authority's Manual for Mandatory Electronic Laboratory Reporting (ELR).⁵

- Please contact us at 971-673-1111 for ELR initiation, assistance and approval.
- Laboratories required to report via ELR shall have a state-approved continuity of operations plan to maintain reporting in emergency situations. At least two alternate methods should be incorporated.

CIVIL PENALTIES FOR VIOLATIONS OF OREGON REPORTING LAW

A civil penalty may be imposed against a qualifying laboratory that fails to seek or obtain ELR approval, or against a clinical laboratory for failing to report a reportable disease according to Oregon Administrative Rules.⁶

Civil penalties shall be imposed as follows:

- First violation \$100, second violation \$200, third or subsequent violation \$500;
- Each day out of compliance will be considered a new violation.

- 📞 Report by phone immediately, day or night. **New reportables are highlighted.**
- 🕒 Report within 24 hours.

NOTE: Those items below without a symbol next to them require reporting within one local public health authority working day.

- 🏠 Forward isolate to the Oregon State Public Health Laboratory (OSPHL).
- 🧫 **Forward isolate if cultured; otherwise, send the test-positive specimen to OSPHL.**

Oregon State Public Health Laboratory: 503-693-4100

BACTERIA

Anaplasma

Bacillus anthracis³ 📞 🧫

Bacillus cereus

biovar anthracis³ 📞 🧫

Bordetella pertussis

Borrelia

Brucella³ 📞 🧫

Burkholderia mallei³ 📞 🧫

Burkholderia pseudomallei³ 📞 🧫

Campylobacter

Chlamydia trachomatis

Chlamydia psittaci

Clostridium botulinum³ 📞

Clostridium tetani

Corynebacterium diphtheriae 📞 🧫

Coxiella burnetii³ 📞 🧫

Ehrlichia

Mycobacterium, other

(non-respiratory only)

Neisseria gonorrhoeae

Neisseria meningitidis 📞 🧫

Rickettsia prowazekii³ 📞 🧫

Rickettsia, non-provazekii

Salmonella 📞

Shigella 📞

Treponema pallidum

Vibrio cholerae 📞 🧫

Vibrio, non-cholerae 📞

Yersinia pestis³ 📞 🧫

Yersinia, non-pestis 📞

FUNGI

Coccidioides 📞

Cryptococcus 📞

PARASITES

Arenaviruses^{3,11} 📞 🧫

Filoviruses^{3,11} 📞 🧫

Hantavirus

Hepatitis A

Hepatitis B

Hepatitis C

Hepatitis D (delta)

Hepatitis E

Hemorrhagic fever viruses^{3,11} 📞

HIV infection and AIDS

Influenza, novel strain¹² 📞 🧫

Measles (rubella) 📞 🧫

Mumps

Polio 📞 🧫

Rabies 📞 🧫

Rubella 📞 🧫

SARS-coronavirus³ 📞

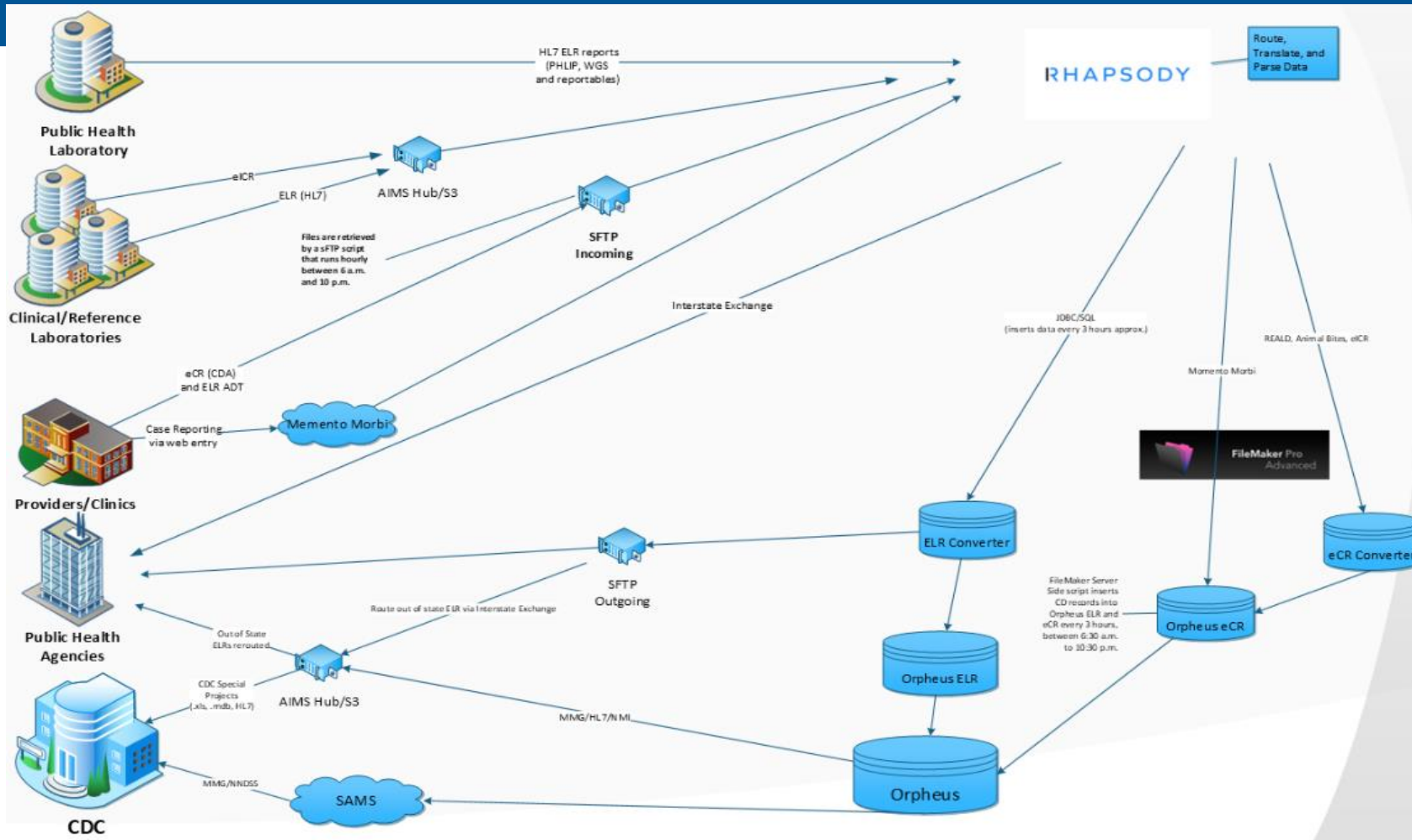
Varicella major (smallpox) 📞 🧫

Data are created somewhere



- Labs, hospitals, clinics generate data from patient interactions
- Data are packaged and sent to ACDP
- {mild freak out about what to do with all this data}
- {in steps Informatics team}
- Here's how we think about the incoming data

Electronic Reporting Data Flow



Electronic Laboratory Reporting (ELR)



```

MSH|^~\&|EPIC|GOOD SAMARITAN HOSPITAL LAB^38D0626046^CLIA|OR ELR|OPHD|20190312090405|LABBACKGROUND|ORU^R01^ORU_R01|
7EC84_28_0_FE3C|T|2.5.1|||||USA|||||PHLabReport-NoAck
SFT|Epic Systems Corporation^L^ANSI^1.2.840^ISO^XX^1.2.840.114350|February 2019|Bridges|8.7.0.0||20190205174326
PID|1||10140280^EpicMRN^1.2.840.114350.1.1.1^ISO^EpicMRN||Harrington^Steve^Test||20000425|M|||||USA^P|||||24162734|||||N|||20171214162901|
1^1.2.840.114350.1.13.341.3.7.2.696570^ISO
ORC|RE|63977128^Epic|19G-063M0001^Beaker|19G-063M0001^Beaker^1.2.840.114350.1.13.341.3.7.3.798268.320^ISO|||||76879601^FAMILY
MEDICINE^PHYSICIAN^~76879601^FAMILY MEDICINE^PHYSICIAN^||^PRN^555^5555555|20190304134712||||SHS SERVICE AREA^D^SAMARITAN HEALTH
SERVICES|100 NW SAMARITAN DRIVE^CORVALLIS^OR^97330^B||123 ANYWHERE STREET^MADISON^WI^53711^C^DANE
OBR|1|63977128^Epic|19G-063M0001^Beaker|72828-7^CT+NG DNA Pnl XXX^LN^GONCHL^CHLAMYDIA / GONORRHOEAE PCR^SHSPROC^2.54||
20190304134700|||||76879601^FAMILY MEDICINE^PHYSICIAN^||^PRN^555^5555555|||||20190304135500||F||||Y93.21^Activity, ice skating^I10^Scientist^Lab^
TQ1|1|||||20190304134712||R
OBX|1|ST|24111-7^N gonorrhoea DNA XXX QI PCR^LN^GON^GC BY PCR^SHSCOMP^2.54||DETECTED||Not Detected|A||F|||20190304134700|||||20190304135504||||
GOOD SAMARITAN HOSPITAL LAB^D^CLIA^ISO^CLIA^38D0626046|3600 NW SAMARITAN DRIVE^CORVALLIS^OR^97330^B
NTE|1|L|Neisseria gonorrhoeae DETECTED by PCR
OBX|2|ST|21613-5^C trach DNA XXX QI PCR^LN^CHLPCR^CHLAMYDIA BY PCR^SHSCOMP^2.54||DETECTED||Not Detected|A||F|||20190304134700|||||
20190304135504||||GOOD SAMARITAN HOSPITAL LAB^D^CLIA^ISO^CLIA^38D0626046|3600 NW SAMARITAN DRIVE^CORVALLIS^OR^97330^B
NTE|1|L|Chlamydia DETECTED by PCR
SPM|1|^19G-063M0001^Beaker||Genital^Genital^||||Urine^Urine^|||||20190304134700|20190304135348
    
```

Fields and Component can be repeated

Field	Component
MSH	Message Header
PID	Patient
ORC	Order
OBR	Observation
OBX	Observation
SPM	Specimen

Non-standardized ELR (.csv)



```
1 Facility, Facility ID, Facility St Address, Facility City, Facility State, Facility Zip, Facility Phone, Date, Patient Identifier, PatientFirst, Patient Last Name, Patient Date of Birth, Patient Sex, Patient St Address, Patient City, Patient Sta
2 Sample Pediatrics, 38D2084414, 1100 NW 12th St, Anytown, OR, 97232, 123-123-1234, 20240122, 16017, JESSIE, Morales, 20220111, F, 1 FIRST AVE, Vale, OR, 97914, Malheur, Mary, James, 208-452-6556, 83655, 20240116, 1048003^CapBld^SCT, 10368-9^CapBLD^LN, <3.3
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27 Sample Pediatrics, 38D2084414, 1118 NW 12th St, Anytown, OR, 97232, 123-123-1234, 20240122, 17712, DEF, walen, 20240123, F, "1904 - NORTHEAST 37TH AVENUE", Ontario, OR, 97914, Malheur, Michelle, DeVoe, 208-452-6574, 83680, 20240116, 1048003^CapBld^SCT, 10
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```



SampleLeadELR.csv

Electronic Case Reporting (eCR/eICR)



```
5  |-->
6  <ClinicalDocument xmlns="urn:hl7-org:v3" xmlns:voc="urn:hl7-org:v3/voc" xmlns:xsi="http://www.w3.org/2001/XMLSchema-ins:
   CDA.xsd">
7  <!--
8  *****
9  CDA Header
10 *****
11 |-->
12 <typeId root="2.16.840.1.113883.1.3" extension="POCD_HD000040"/>
13 <templateId root="2.16.840.1.113883.3.27.1776"/>
14 <id extension="c266" root="2.16.840.1.113883.19.4"/>
15 <code code="11488-4" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC" displayName="Consultation note"/>
16 <title>Good Health Clinic Consultation Note</title>
17 <effectiveTime value="20000407"/>
18 <confidentialityCode code="N" codeSystem="2.16.840.1.113883.5.25"/>
19 <languageCode code="en-US"/>
20 <setId extension="BB35" root="2.16.840.1.113883.19.7"/>
21 <versionNumber value="2"/>
22 <recordTarget>
23 <patientRole>
24 <id extension="12345" root="2.16.840.1.113883.19.5"/>
25 <patient>
26 <name>
27 <given>Henry</given>
28 <family>Levin</family>
29 <suffix>the 7th</suffix>
30 </name>
31 <administrativeGenderCode code="M" codeSystem="2.16.840.1.113883.5.1"/>
32 <birthTime value="19320924"/>
33 </patient>
34 <providerOrganization>
35 <id root="2.16.840.1.113883.19.5"/>
36 </providerOrganization>
37 </patientRole>
38 </recordTarget>
39 <author>
40 <time value="2000040714"/>
41 <assignedAuthor>
42 <id extension="KP00017" root="2.16.840.1.113883.19.5"/>
43 <assignedPerson>
44 <name>
45 <given>Robert</given>
```

Tensible Markup Language file

length : 46557 lines : 1099



eiCR_EpicSample



```
"resourceType" : "Patient",
"id" : "example",
"text" : {
  "status" : "generated",
  "div" : "<div xmlns=\\"http://www.w3.org/1999/xhtml\\"><p style=\\"border: 1px #661aff solid;
},
"identifier" : [{
  "use" : "usual",
  "type" : {
    "coding" : [{
      "system" : "http://terminology.hl7.org/CodeSystem/v2-0203",
      "code" : "MR"
    }]
  }
},
"system" : "urn:oid:1.2.36.146.595.217.0.1",
"value" : "12345",
"period" : {
  "start" : "2001-05-06"
},
"assigner" : {
  "display" : "Acme Healthcare"
}
}],
"active" : true,
"name" : [{
  "use" : "official",
  "family" : "Chalmers",
  "given" : ["Peter",
    "James"]
},
{
  "use" : "usual",
  "given" : ["Jim"]
},
{
  "use" : "maiden",
  "family" : "Windsor",
  "given" : ["Peter",
    "James"],
  "period" : {
    "end" : "2002"
  }
}
}],
"telecom" : [{
```

Online Reporting



https://epiweb.oha.state.or.us/fmi/webd/Memento%20Morbi?homeurl=http://

Oregon Health Authority Confidential Oregon Morbidity Report

i Intentionally reporting false or misleading information to OHA may result in civil penalties. Make sure all information in this submission is truthful and accurate before submitting.

About The Patient

Patient Name * First Last

Parent/Guardian First Last

Sex * M F

Language English

MRN

Date of Birth * MM/DD/YYYY unknown

Street Street Address

City State ZIP City OR Zip *

Phone ###-###-####

Oregon clinicians are required by law to report confirmed or suspect diagnoses of many specified diseases and conditions.* This secure, electronic report will either be automatically routed to the local health department associated with the patient's county of residence, or to the Oregon Health Authority if the patient is not an Oregon resident, or if the patient's county of residence cannot be determined. You are welcome to call 971-673-1111 and discuss a report, or you can simply use this form.

The padlock icon in your browser indicates secure transmission. Do NOT submit information unless you see the padlock icon. No information can be retrieved through this interface; it can only be submitted.

Direct Entry

Home List Prev Next Print

Pertussis Case Entry

Summary	447274 Kitty A Koffer Disease: Pertussis Species: Status: Confirmed Onset: 10/2/2022 Deceased: No	CLINICAL																												
Labs 1		Ask about exposures from Monday, 12 September through Sunday, 25 September 2022 Onset Indeterminate <input type="checkbox"/> Earliest cough: 10/02/2022 Diagnosis Date: 10/4/2022 Symptomatic? <input checked="" type="radio"/> Yes <input type="radio"/> Refused <input type="radio"/> No <input type="radio"/> Unknown																												
eCR 0																														
⚠ Clinical																														
Treatment	DOB: 5/7/2022 Age: 4 months SOGI: Sex: F Gender:	CLINICAL QUESTIONS <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Symptom</th> <th>Answer</th> </tr> </thead> <tbody> <tr><td>Any cough</td><td>Yes</td></tr> <tr><td>Paroxysmal/spasmodic cough</td><td></td></tr> <tr><td>Whoop</td><td></td></tr> <tr><td>Apnea</td><td></td></tr> <tr><td>Cyanosis</td><td></td></tr> <tr><td>Cold-like symptoms</td><td></td></tr> <tr><td>Post-tussive vomiting</td><td></td></tr> <tr><td>Cough at last interview</td><td></td></tr> <tr><td>Cough Duration (#days) at Final Interview</td><td></td></tr> <tr><td>CXR for pneumonia</td><td></td></tr> <tr><td>Seizures</td><td></td></tr> <tr><td>Acute encephalopathy</td><td></td></tr> </tbody> </table>	Symptom	Answer	Any cough	Yes	Paroxysmal/spasmodic cough		Whoop		Apnea		Cyanosis		Cold-like symptoms		Post-tussive vomiting		Cough at last interview		Cough Duration (#days) at Final Interview		CXR for pneumonia		Seizures		Acute encephalopathy			
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CXR for pneumonia																														
Seizures																														
Acute encephalopathy																														
Risks																														
Followup	REALD: Complete Race: Other White																													
Epilinks	Born: Canada Worksite: Occupation: Attends daycare Industry: Housing: Past yr: Stably Housed																													
Contacts 3																														
Vaccines 1																														
Docs 1	1234 Main St White City OR 97503 JACKSON																													
Letters 0																														
Log	541-555-5555																													
MAPS	Provider: [none added] Keep Active <input checked="" type="checkbox"/>	Hospitalized? <input type="radio"/> Yes <input checked="" type="radio"/> No <input type="radio"/> Unknown <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Hospital</th> <th>Chart #</th> <th>Admit Date</th> <th>ICU</th> <th>Status</th> <th>Disch Date</th> <th>Duration</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </tbody> </table>	Hospital	Chart #	Admit Date	ICU	Status	Disch Date	Duration																					
Hospital	Chart #	Admit Date	ICU	Status	Disch Date	Duration																								
Notes 2	Local Epi: Juventila Liko Received by LHD: 10/6/22 LHD Completion Date: State Completion Date:																													



HL7 Immunization Query (ALERT IIS)



General Vaccines Duplicates Other This person is a twin [Login to ALERT](#)

IMMUNIZATION HISTORY [Query ALERT](#) + Vaccine

VACCINATIONS

Date	Age	CVX	Record Source	Lot Number / Mfg
01/03/19	18	115	+ Source of Record	C5429AA
Tdap			ALERT	UNK
01/22/19	18	01	+ Source of Record	lot #...
DTP			ALERT	UNK
01/22/19	18	163	+ Source of Record	lot #...
Meningococcal B, OMV			ALERT	UNK
01/22/19	18	133	+ Source of Record	lot #...
PCV13			ALERT	UNK
01/23/19	18	43	+ Source of Record	lot #...
HepB-Adult			ALERT	UNK
08/26/19	19	94	+ Source of Record	MMRVTESTLOT
MMRV			ALERT	MSD

Vaccine Forecast

Vaccine	Recommended Date	Earliest Date
Td/Tdap	11/13/20	11/13/20
Flu trivalent nasal	07/01/23	07/01/23
COVID-19	07/01/50	01/15/23
Zoster subunit, recombinant, adjuvanted	07/01/50	07/01/50

Alert Requests

Req Date	Status	Query Result	Creator
10/5/23 10:17 AM	Match	Immunization history updated from ALERT	Heather

Look up vaccine history for this person in Alert IIS and populate it below

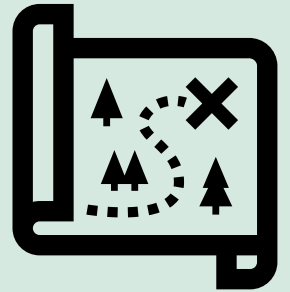
X-12 Medicaid (MMIS) Query



```
ISA*00*.....*00*.....*ZZ*ORDHS.....*ZZ*MB000778.....
*230831*1021*!*00501*090741954*0*P*::~~GS*HB*ORDHS*MB000778*20230831*1021*1*X*005010X279A1~ST*271*0001*005010X279A1~BHT*0022*11**20230831*1021~HL*1*
*20*1~NM1*PR*2*OR~MMIS*****FI*930592162~HL*2*1*21*1~NM1*2B*2*OREGON HEALTH AUTHORITY, PUBLIC HEALTH
FINANCIAL*****XX*1750408159~HL*3*2*22*0~TRN*2*51851642-92077639495367445124*9305921620*MB000778~TRN*1*2324300006*1930592162~NM1*IL*1*MENDOZA*MARIB
EL*F***MI*OH901R8L~N3*380·GWEE·SHUT·RD·APT·A~N4*SILETZ*OR*973800000~DMG*D8*20220620*F~INS*Y*18*001*25~DTP*291*D8*20230808~EB*1*IND*30*MC*BMH·-·
OHP·Plus*****Y~REF*N6*MG~DTP*291*RD8*20230808-20230808~EB*I*IND*30*MC*BMH·-·OHP·
Plus*****N~REF*N6*MG~DTP*291*RD8*20230808-20230808~EB*1*IND*30*MC*CRN·-·Contract·
Nursing*****Y~REF*N6*MG~DTP*291*RD8*20230808-20230808~EB*I*IND*30*MC*CRN·-·Contract·
Nursing*****N~REF*N6*MG~DTP*291*RD8*20230808-20230808~EB*1*IND*30*MC*SMHS·-·State·Medicaid·Mental·Health·
Services*****Y~REF*N6*MG~DTP*291*RD8*20230808-20230808~EB*I*IND*30*MC*SMHS·-·State·Medicaid·Mental·Health·
Services*****N~REF*N6*MG~DTP*291*RD8*20230808-20230808~EB*D*IND*30*MC*BMH·-·OHP·Plus~REF*N6*MG~DTP*291*RD8*20230808-20230808~EB*D*IND*30*MC*CRN·
-·Contract·Nursing~REF*N6*MG~DTP*291*RD8*20230808-20230808~EB*D*IND*30*MC*SMHS·-·State·Medicaid·Mental·Health·
Services~REF*N6*MG~DTP*291*RD8*20230808-20230808~EB*1*IND*1!33!35!4!47!48!5!50!69!71!80!81!86!88!98!99!A0!AD!AF!AI!AL!DM!MH!PT!UC*MC~DTP*292*RD8*2
0230808-20230808~EB*B*IND*33!4!47!48!5!50!69!71!80!81!86!98!99!A0!AD!AF!AI!DM!PT!UC*MC***0*****Y~DTP*292*RD8*20230808-20230808~EB*C*IND*30***29*0*
***Y~EB*C*IND*30***25*0*****Y~EB*A*IND*30*****0*****Y~SE*50*0001~GE*1*1~IEA*1*090741954~
```

3

Ingestion and Integration



Manual Transport Methods



- Phone, Fax, Secure email
 - Pros:
 - Quick
 - Detailed
 - Cons:
 - Requires manual intervention
 - Doesn't scale well
 - Very prone to data-entry errors
 - Requires data-entry interface that's easy to navigate
 - Doesn't have discrete fields that can map

Secure and Managed File Transfer



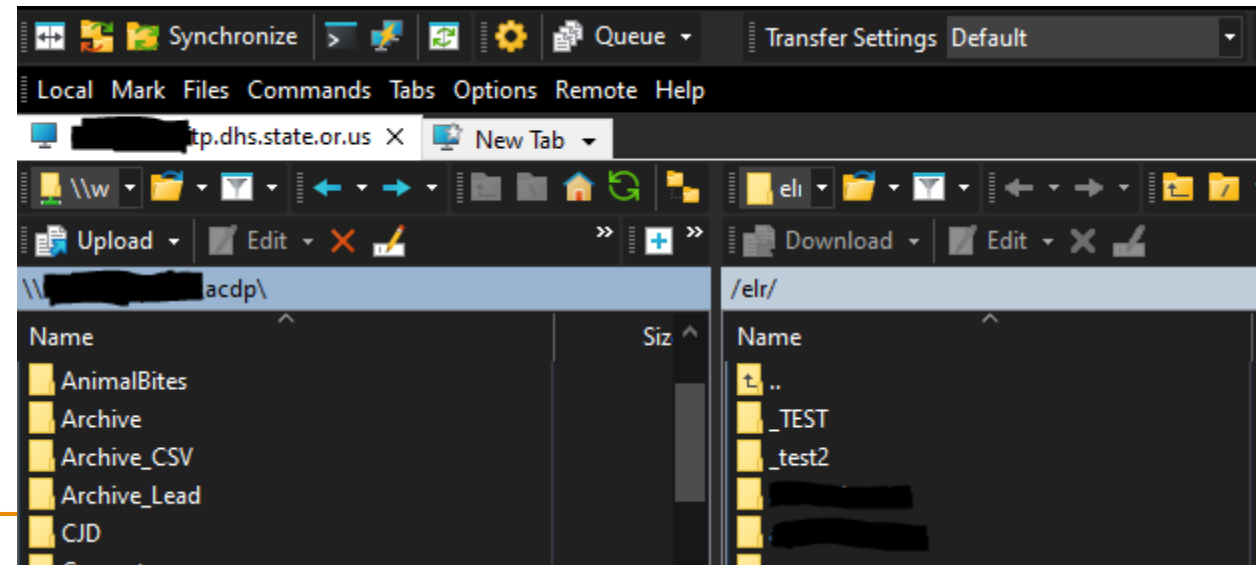
- Secure File Transport Protocol (SFTP)

- Pros:

- Secure
 - Many formats supported
 - Universal
 - Can be automated
 - Could use SSH keys
 - Integrates well

- Cons:

- Requires set-up
 - Requires maintenance if policies require periodic update of pw



Data Transfer



- Data API (Application Programming Interface)

- Pros:

- Readily available
 - Multiple formats supported
 - Can be automated
 - Integrates well
 - Can be secured

- Cons:

- Requires set-up
 - Requires maintenance if host changes API connection info

```
{
  "spatialReference": {
    "wkid": 4326,
    "latestWkid": 4326
  },
  "candidates": [
    {
      "address": "800 Northeast Oregon Street, Portland, OR, 97232",
      "location": {
        "x": -122.65812450000142,
        "y": 45.5282190000000597
      },
      "score": 100
    }
  ]
}
```

Other Transport Protocols

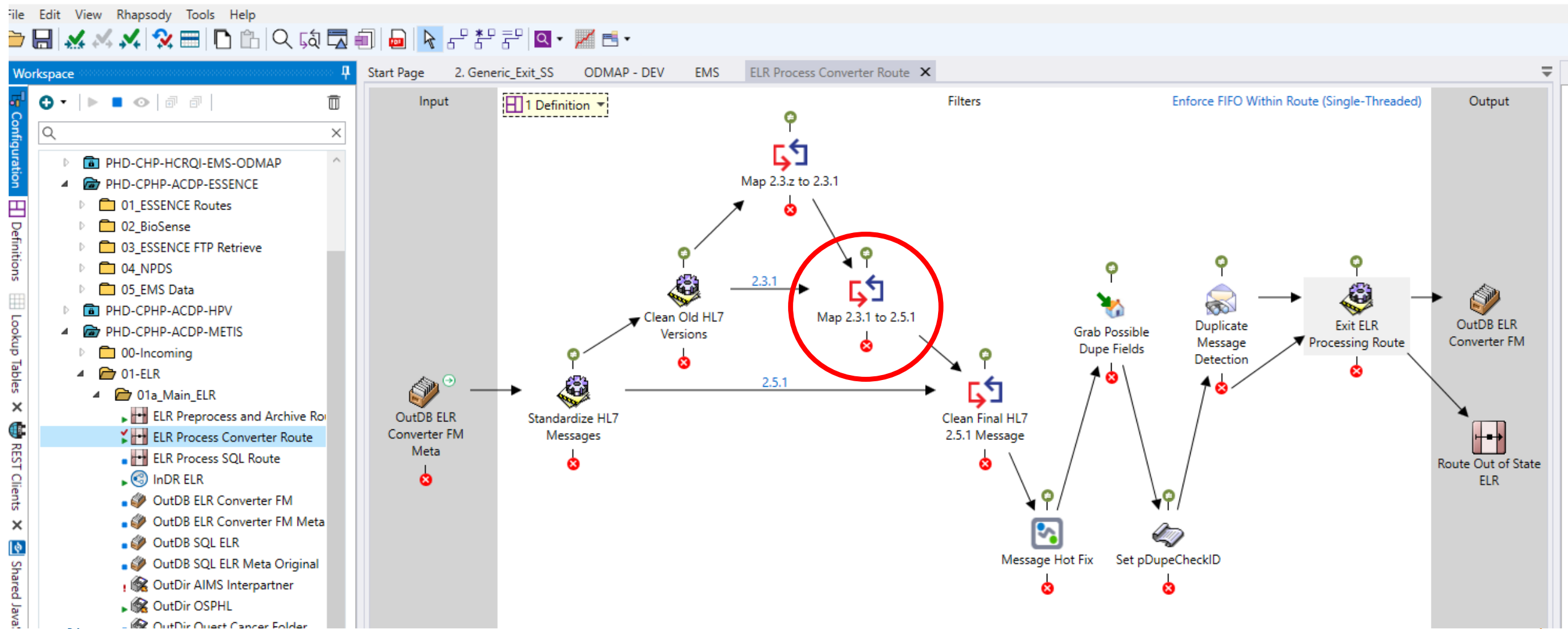


- Other protocols: REST, SOAP
 - Pros:
 - Readily available
 - Multiple formats supported
 - Can be automated
 - Integrates well
 - Can be secured
 - Cons:
 - Requires set-up
 - Requires maintenance if host changes connection info
 - May require pw periodic changes

Data Integration



OPHD - Rhapsody Dev (Development) - Rhapsody v7.0.2 - OR0194167



Mapping and Translation



File Edit View Insert Toolkit Window Help

Workspace

Default

- DG1
- EVN
- IN1
- MSA
- MSH
- OBX
- PID
- PR1
- PV1
- PV2

Segment: PID

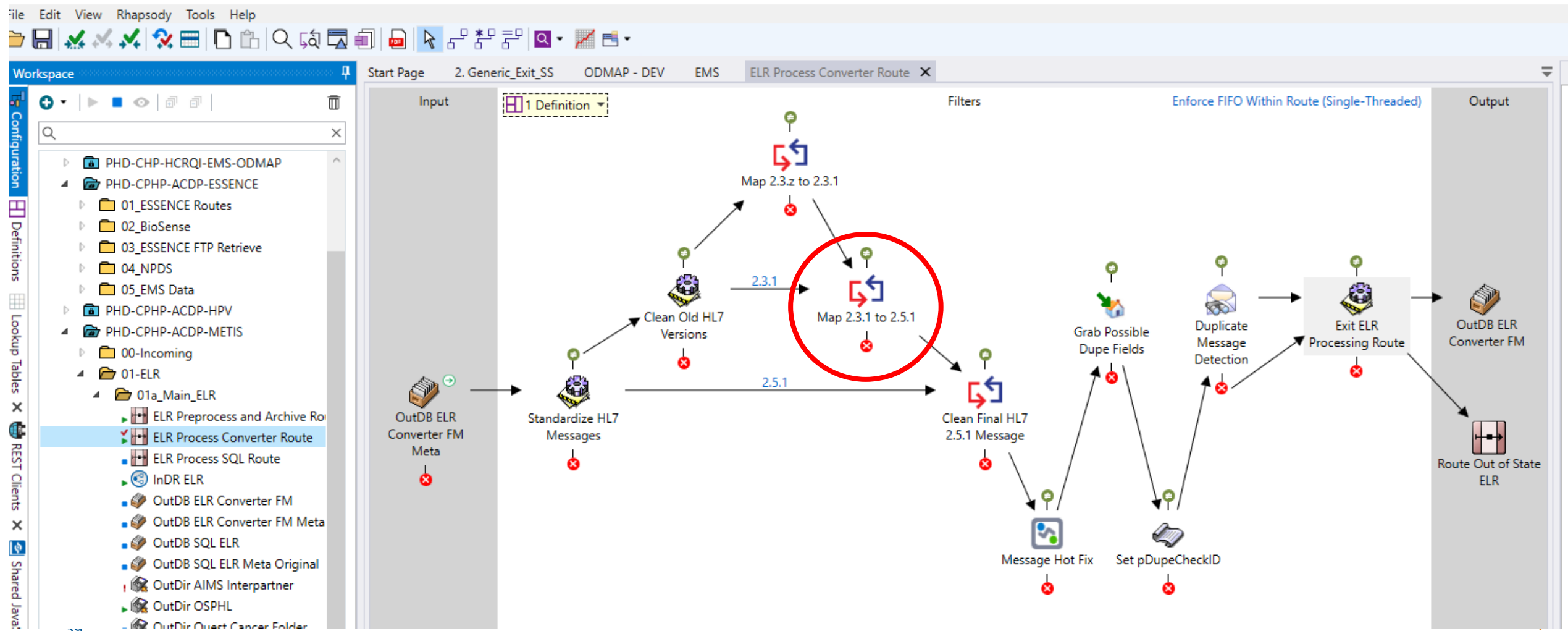
Structure Properties Advanced

	Field Name	H	Datatype	Alignment	R	Min	Max	Min Rpt	Max Rpt	Default	
1	SetID	<input type="checkbox"/>	SI	Left	<input checked="" type="checkbox"/>	0	4	1	1		
2	PatientID *	<input type="checkbox"/>	CX	Left	<input type="checkbox"/>	0	20	0	1		
3	PatientIdentifierList *	<input type="checkbox"/>	CX	Left	<input checked="" type="checkbox"/>	0	478	1	1		
4	AlternatePatientID	<input type="checkbox"/>	CX	Left	<input type="checkbox"/>	0	20	0	No Max		
5	PatientName										
		Field Name	H	Datatype	Alignment	R	Min	Max	Default	Validation	
	1	FamilyName	<input type="checkbox"/>	FN		<input type="checkbox"/>	0	194			
	2	GivenName	<input type="checkbox"/>	ST		<input type="checkbox"/>	0	30			
	3	MiddleInitialOrName	<input type="checkbox"/>	ST		<input type="checkbox"/>	0	30			
	4	Suffix	<input type="checkbox"/>	ST		<input type="checkbox"/>	0	20			
	5	Prefix	<input type="checkbox"/>	ST		<input type="checkbox"/>	0	20			
	6	Degree_DEPRECATED	<input type="checkbox"/>	IS		<input type="checkbox"/>	0	6			
	7	NameTypeCode	<input type="checkbox"/>	ID		<input type="checkbox"/>	0	1			
	8	NameRepresentationCode	<input type="checkbox"/>	ID		<input type="checkbox"/>	0	1			
	9	NameContext	<input type="checkbox"/>	CE		<input type="checkbox"/>	0	483			
	10	NameValidityRange_DEPRE...	<input type="checkbox"/>	DR		<input type="checkbox"/>	0	53			
	11	NameAssemblyOrder	<input type="checkbox"/>	ID		<input type="checkbox"/>	0	1			
	12	EffectiveDate	<input type="checkbox"/>	TS		<input type="checkbox"/>	0	26			
13	ExpirationDate	<input type="checkbox"/>	TS		<input type="checkbox"/>	0	26				
14	ProfessionalSuffix	<input type="checkbox"/>	ST		<input type="checkbox"/>	0	199				
6	MothersMaidenName	<input type="checkbox"/>	XP	Left	<input type="checkbox"/>	0	250	0	No Max		
7	DateTimeOfBirth										
		Field Name	H	Datatype	Alignment	R	Min	Max	Default	Validation	
	1	Time	<input type="checkbox"/>	DTM		<input checked="" type="checkbox"/>	0	24			
2	Precision_DEPRECATED	<input checked="" type="checkbox"/>	ST		<input type="checkbox"/>	0	1				
8	AdministrativeSex	<input type="checkbox"/>	IS	Left	<input type="checkbox"/>	0	1	0	1		

Message Mapping



OPHD - Rhapsody Dev (Development) - Rhapsody v7.0.2 - OR0194167



Field Mapping



Workspace

- mainORUR01([in] ORUR01 in, [out] ORUR01 out)
- MapAltCEToCE([in] CE in, [out] CE out)
- MapCEToCE([in] CE in, [out] CE out)
- MapCEToCWE([in] CE in, [out] CWE out)
- MapCNToCNN([in] CN in, [out] CNN out)
- MapCQToCQ([in] CQ in, [out] CQ out)
- MapCTItoCTI([in] CTI in, [out] CTI out)
- MapCXToCX([in] CX in, [out] CX out)
- MapDLDToDLD([in] DLD in, [out] DLD out)
- MapDLNtoDLN([in] DLN in, [out] DLN out)
- MapDSCToDSC([in] DSC in, [out] DSC out)
- MapDTTMDtoDTM([in] DTTM in, [out] DTM out)
- MapDTtoDT([in] DT in, [out] DT out)
- MapEIPtoEIP([in] EIP in, [out] EIP out)
- MapEIToEI([in] EI in, [out] EI out)
- MapFCToFC([in] FC in, [out] FC out)
- MapHDTtoHD([in] HD in, [out] HD out)
- MapJCCtoJCC([in] JCC in, [out] JCC out)
- MapMOCToMOC([in] MOC in, [out] MOC out)
- MapMOTOmo([in] MO in, [out] MO out)
- MapMSGtoMSG([in] MSG in, [out] MSG out)
- MapMSHToMSH([in] MSH in, [out] MSH out)
- MapNDLtoNDL([in] NDL in, [out] NDL out)
- MapNK1toNK1([in] NK1 in, [out] NK1 out)
- MapNTEtoNTE([in] NTE in, [out] NTE out)
- MapOBRTtoOBR([in] OBR in, [out] OBR out)

MapPIDToPID([in] PID in, [out] PID out)

Input Field	Output Field
4. AssigningAuthority	8. ExpirationDate
5. IdentifierTypeCode	9. AssigningJurisdiction
6. AssigningFacility	10. AssigningAgencyorDepartment
3. PatientIdentifierList []	3. PatientIdentifierList []
4. AlternatePatientID []	4. AlternatePatientID []
5. PatientName []	5. PatientName []
6. MothersMaidenName []	6. MothersMaidenName []
7. DateTimeOfBirth	7. DateTimeOfBirth
1. Time	1. Time
2. Precision	2. Precision_DEPRECATED
8. Sex	8. AdministrativeSex
9. PatientAlias []	9. PatientAlias []
10. Race []	10. Race []
11. PatientAddress []	11. PatientAddress []

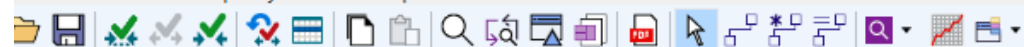
```
76 // Mapping in.DateTimeOfBirth to out.DateTimeOfBirth
77 if (isnull(in.DateTimeOfBirth))
78 {
79     setNull(out.DateTimeOfBirth);
80 }
81 else
82 {
83     MapTSToTS(in.DateTimeOfBirth, out.DateTimeOfBirth);
84 }
85
```


Data Provisioning



OPHD - Rhapsody Dev (Development) - Rhapsody v7.0.2 - OR0194167

File Edit View Rhapsody Tools Help

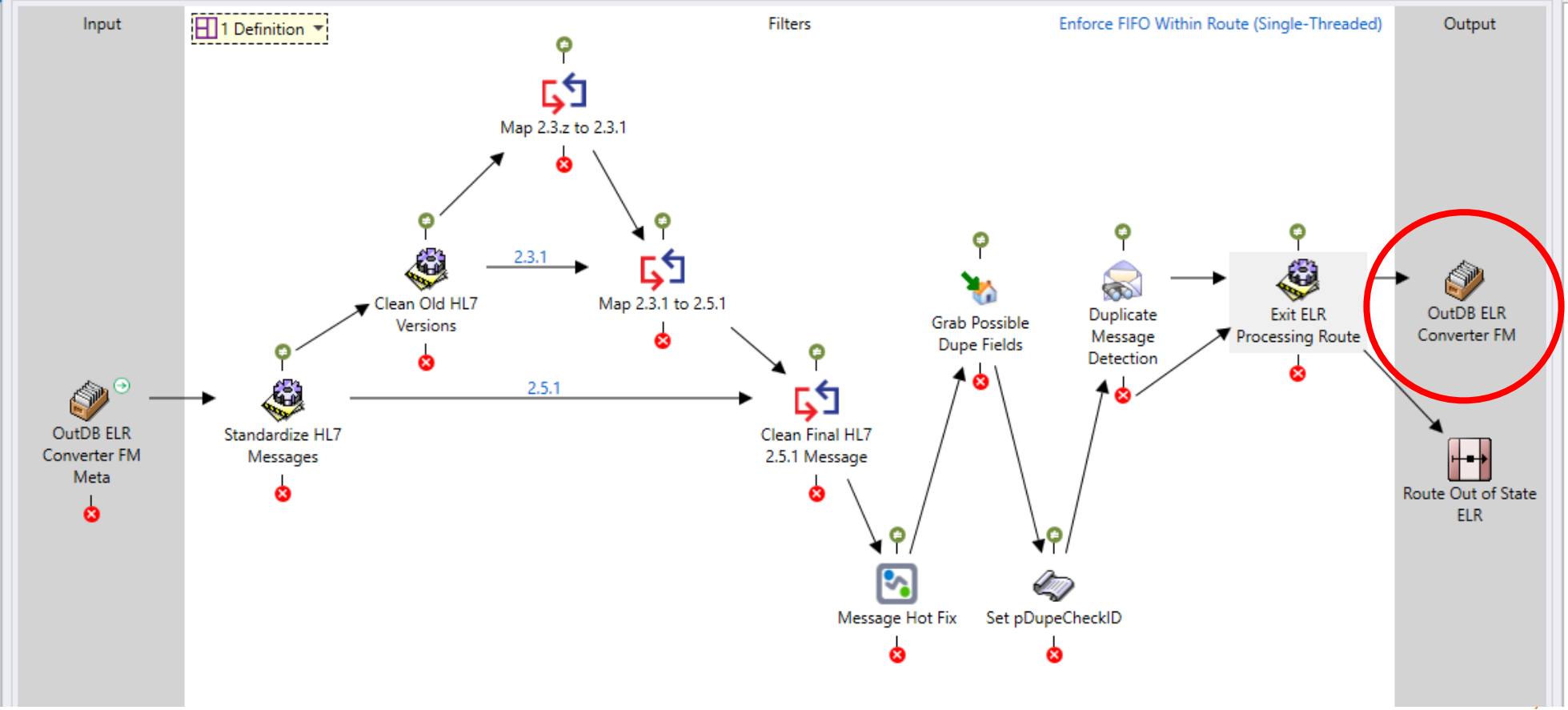


Workspace Start Page 2. Generic_Exit_SS ODMAP - DEV EMS ELR Process Converter Route X

Configuration

Search

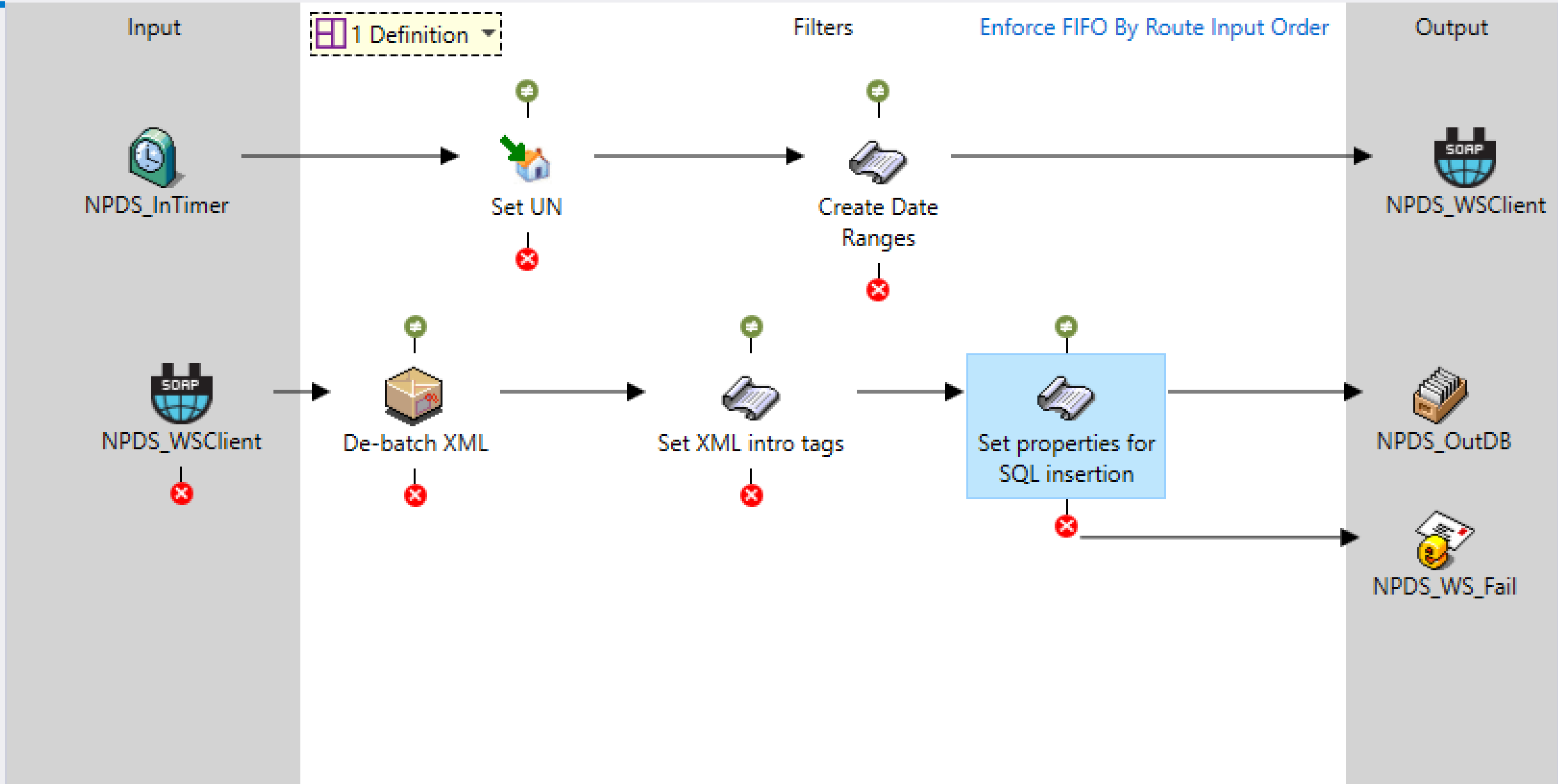
- PHD-CHP-HCROJ-EMS-ODMAP
- PHD-CPHP-ACDP-ESSENCE
 - 01_ESSENCE Routes
 - 02_BioSense
 - 03_ESSENCE FTP Retrieve
 - 04_NPDS
 - 05_EMS Data
- PHD-CPHP-ACDP-HPV
- PHD-CPHP-ACDP-METIS
 - 00-Incoming
 - 01-ELR
 - 01a_Main_ELR
 - ELR Preprocess and Archive Ro
 - ELR Process Converter Route**
 - ELR Process SQL Route
 - InDR ELR
 - OutDB ELR Converter FM
 - OutDB ELR Converter FM Meta
 - OutDB SQL ELR
 - OutDB SQL ELR Meta Original
 - OutDir AIMS Interpartner
 - OutDir OSPHL
 - OutDir Quest Cancer Folder



Database Insertion



```
Insert Field  Insert Prior Result  Options
1  INSERT INTO MSH (
2      RhapsodyCounter, MSH0301_SendingAppName, MSH0302_SendingAppID, MSH0303_SendingAppAuth,
3      MSH0401_SendingFacName, MSH0402_SendingFacID, MSH0403_SendingAppAuth, MSH05_ReceivingApp,
4      MSH06_ReceivingFac, MSH07_MsgDateTime, MSH0901_MsgCode, MSH0902_MsgTrigger,
5      MSH0903_MsgStructure, MSH10_MsgControlID, MSH11_ProcessingID, MSH12_HL7version,
6      MSH17_CountryCode, MSH2101_MsgProfile, MSH2103_MsgProfileID, MSH2104_MsgProfileAuth
7
8  )
9  VALUES (
10     $pELRcounter, @MSH.SendingApplication.NamespaceID, @MSH.SendingApplication.UniversalID,
11     @MSH.SendingApplication.UniversalIDType, @MSH.SendingFacility.NamespaceID,
12     @MSH.SendingFacility.UniversalID, @MSH.SendingFacility.UniversalIDType,
13     @MSH.ReceivingApplication, @MSH.ReceivingFacility, @MSH.DateTimeOfMessage,
14     @MSH.MessageType.MessageCode, @MSH.MessageType.TriggerEvent, @MSH.MessageType.MessageStructure,
15     @MSH.MessageControlID, @MSH.ProcessingID, @MSH.VersionID, @MSH.CountryCode,
16     @MSH.MessageProfileIdentifier[0].EntityIdentifier, @MSH.MessageProfileIdentifier[0].UniversalID,
17     @MSH.MessageProfileIdentifier[0].UniversalIDType
18 )
```



4

Making Meaning



Parsing Data



```
OBR|1|07908656JFVNs^QUEST^2.16.840.1.113883.3.165.5^ISO|OW515884Y6JFVNs_%653RXE
^QUEST^2.16.840.1.113883.3.165.4^ISO|^|^%653^TREPONEMA PALLIDUM AB^ PARTICLE
AGGLUTINATION^L^v
unknown|||202403121505-0800|||||1548986318^K^K^^^^^NPI&2.16.840.1.113883.4
.6&ISO^L^NPI^^^^^^|^|^|^|20240321203648-0800|||F|||||E11.9^T2 DM W/O
COMPLICATION^I10C^^^^2024~Z11.3^ENC SCREEN INF WITH PRE S^I10C^^^^2024
```

```
OBX|1|CE|^24312-1^T PALLIDUM AB SER QL AGGL^LN^86001191^TREPONEMA PALLIDUM AB^
PARTICLE AGGLUTINATION^L^v unknown|1|11214006^Reactive (qualifier
value)^SCT^^REACTIVE^|||A^Abnormal (applies to non-numeric
results)^HL70078^^^^2.7|||F|||202403121505-0800|05D0643352|||20240321203355-08
00|||LAB^L^^^^CLIA&2.16.840.1.113883.4.7&ISO^XX^^^05D0643352|1 M
HWY^^SAN^CA^92675-2042^^L|^M^M^^^^^^^^^^^^^^^^^^MD, PHD, MBA
```

```
SPM|1|07908656JFVNs&QUEST&2.16.840.1.113883.3.165.5&ISO^OW515884Y6JFVNs&QUEST&2
.16.840.1.113883.3.165.4&ISO||119364003^Serum specimen
(specimen)^SCT^SER^Serum^HL70487^2.5.1^V UNKNOWN^Based on assigned Test Code
LOINC value|||||202403121505-0800|20240313124900-0800
```

Identifying Codesets



```
OBR|1|07908656JFVNs^QUEST^2.16.840.1.113883.3.165.5^ISO|OW515884Y6JFVNs_%653RXE
^QUEST^2.16.840.1.113883.3.165.4^ISO|^|^%653^TREPONEMA PALLIDUM AB, PARTICLE
AGGLUTINATION^L^v
unknown|||202403121505-0800|||||1548986318^K^K^^^^^NPI&2.16.840.1.113883.4
.6&ISO^L^^^NPI^^^^^^|^|^|^|20240321203648-0800|||F|||||E11.9^T2 DM W/O
COMPLICATION^I10C^^^2024~Z11.3^ENC SCREEN INF WITH PRE S^I10C^^^2024
```

```
OBX|1|CE|24312-1^T PALLIDUM AB SER QL AGGL^LN^86001191^TREPONEMA PALLIDUM AB,
PARTICLE AGGLUTINATION^L^v unknown|1|11214006^Reactive (qualifier
value)^SCT^^REACTIVE^|||A^Abnormal (applies to non-numeric
results)^HL70078^^^2.7|||F|||202403121505-0800|05D0643352|||20240321203355-08
00|||LAB^L^^^CLIA&2.16.840.1.113883.4.7&ISO^XX^^^05D0643352|1 M
HWY^^SAN^CA^92675-2042^^L|^M^M^^^^^^^^^^^^^^^^^^MD, PHD, MBA
```

```
SPM|1|07908656JFVNs&QUEST&2.16.840.1.113883.3.165.5&ISO^OW515884Y6JFVNs&QUEST&2
.16.840.1.113883.3.165.4&ISO|^|^119364003^Serum specimen
(specimen)^SCT^SER^Serum^HL70487^2.5.1^V UNKNOWN^Based on assigned Test Code
LOINC value|||||||||202403121505-0800|20240313124900-0800
```

Code Translation



LOINC Codes

LOINC_NUM 24312-1

Clean

OrpheusDiseaseID 700 **Syphilis**

Code Info

Names

More

COMPONENT Treponema pallidum Ab

PROPERTY PrThr

OrpheusDiseaseID	LOINC_NUM	COMPONENT	SHORTNAME
700	22594-6	Treponema pallidum Ab.IgM	T pallidum IgM Ser-aCnc
700	24110-9	Treponema pallidum Ab	T pallidum Ab Ser QI IA
700	24312-1	Treponema pallidum Ab	T pallidum Ab Ser QI Aggl
700	26009-1	Treponema pallidum Ab	T pallidum Ab Titr Ser HA
700	29310-0	Treponema pallidum	T pallidum XXX QI IF
700	31146-4	Reagin Ab	VDRL CSF-Titr
700	31147-2	Reagin Ab	RPR Ser-Titr
700	34147-9	Treponema pallidum Ab.IgG+IgM	T pallidum IgG+IgM Ser QI
700	34382-2	Treponema pallidum Ab	T pallidum Ab Titr Ser IF
700	34954-8	Treponema pallidum Ab.IgG & IgM panel	T pallidum IgG+IgM Pnl Ser
700	39015-3	Treponema pallidum Ab	T pallidum Ab Fid HA-aCnc
700	39231-6	Syphilis screen test status	
700	40679-3	Treponema pallidum Ab.IgG	T pallidum IgG Ser QI IB
700	40680-1	Treponema pallidum Ab.IgM	T pallidum IgM Ser QI IB
700	41122-3	Treponema pallidum Ab	T pallidum Ab XXX-aCnc
700	41163-7	Treponema pallidum DNA	T pallidum DNA XXX QI NAA+prot
700	43238-5	Treponema pallidum Ab	T pallidum Ab Ser Donr QI IF
700	47063-3	Treponema pallidum Ab.IgM	T pallidum IgM CSF IF-aCnc
700	46206-9	Treponema pallidum Ab	T pallidum Ab Ser Donr QI
700	47051-8	Treponema pallidum Ab.IgG	T pallidum IgG CSF IF-aCnc
700	47236-5	Treponema pallidum Ab.IgG+IgM	T pallidum IgG+IgM Ser QI IA
700	47237-3	Treponema pallidum Ab.IgM	T pallidum IgM Ser QI IA
700	47238-1	Treponema pallidum Ab.IgG	T pallidum IgG Ser QI IA
700	47361-1	Treponema pallidum Ab.IgG	T pallidum IgG Ser Donr QI IA
700	47511-1	Treponema pallidum Ab	T pallidum Ab Fid-aCnc
700	47512-9	Treponema pallidum Ab.IgG	T pallidum IgG CSF-aCnc
700	47513-7	Treponema pallidum Ab.IgG	T pallidum IgG Ser Donr QI
700	47514-5	Treponema pallidum Ab.IgM	T pallidum IgM CSF-aCnc
700	49799-0	Treponema pallidum DNA	T pallidum DNA CSF QI NAA+prot
700	49800-6	Treponema pallidum Ab	T pallidum Ab CSF HA-aCnc

“Local” Codes



```
OBR|1|07908656JFVNs^QUEST^2.16.840.1.113883.3.165.5^ISO|OW515884Y6JFVNs_%653RXE
^QUEST^2.16.840.1.113883.3.165.4^ISO|^%653^TREPONEMA PALLIDUM AB, PARTICLE
AGGLUTINATION^L^v
unknown|||202403121505-0800|||||1548986318^K^K^^^^^NPI&2.16.840.1.113883.4
.6&ISO^L^^^NPI^^^^^^^|^^^^^|20240321203648-0800|||F|||||E11.9^T2 DM W/O
COMPLICATION^I10C^^^^2024~Z11.3^ENC SCREEN INF WITH PRE S^I10C^^^^2024
```

```
OBX|1|CE|24312-1^T PALLIDUM AB SER QL AGGL^LN^86001191^TREPONEMA PALLIDUM AB,
PARTICLE AGGLUTINATION^L^v unknown|1|11214006^Reactive (qualifier
value)^SCT^^REACTIVE^|||A^Abnormal (applies to non-numeric
results)^HL70078^^^^2.7|||F|||202403121505-0800|05D0643352|||20240321203355-08
00|||LAB^L^^^CLIA&2.16.840.1.113883.4.7&ISO^XX^^^05D0643352|1 M
HWY^^SAN^CA^92675-2042^^L|^M^M^^^^^^^^^^^^^^^^^^MD, PHD, MBA
```

```
SPM|1|07908656JFVNs&QUEST&2.16.840.1.113883.3.165.5&ISO^OW515884Y6JFVNs&QUEST&2
.16.840.1.113883.3.165.4&ISO||119364003^Serum specimen
(specimen)^SCT^SER^Serum^HL70487^2.5.1^V UNKNOWN^Based on assigned Test Code
LOINC value|||||202403121505-0800|20240313124900-0800
```


Mapping Coded Values



SNOMEDID	FULLYSPECIFIEDNAME	OrpheusDis...
106439011	Reactive perforating collagenosis	
13039017	Reactive attachment disorder of infancy	
13158011	Reactive cytologic changes	
136922019	Reactive immunoproliferative disease, NOS	
139728012	Reactive fibromatosis	
144929012	Reactive depression (situational)	
170645012	Cold reactive autoagglutinin	
178717014	Reactive attachment disorder of infancy OR early childhood, disinhibited type	
17929013	Reactive mastocytosis	
180674011	Antigen with cold reactive autoagglutinins	
181150016	Weakly-reactive	
192438018	Post-streptococcal reactive arthritis	
193412010	C-reactive protein reaction	
194052012	Reactive fibrosis	
19428017	Reactive	
198437015	Reactive cellular changes associated with radiation	
201890016	Reactive cellular changes associated with atrophy	
201891017	Reactive cellular changes associated with intrauterine contraceptive device	
201893019	Atypical endocervical cells of undetermined significance, favor reactive process	
201896010	Atypical endometrial cells of undetermined significance, favor reactive process	
205160019	Reactive cytologic changes	
205161015	Reactive cytologic changes associated with inflammation	
210917016	Non-Reactive	
31943018	Acute reactive otitis externa	
48320011	Reactive attachment disorder of infancy or early childhood	
4980015	Reactive attachment disorder of infancy or early childhood, inhibited type	
506010	Reactive follicular hyperplasia in the elderly	
64236011	Reactive blood vessel hyperplasia	
64637011	Reactive monocytosis	
66604012	Skin reactive factor	
69270014	Reactive attachment disorder, NOS	
73585011	Reactive attachment disorder of early childhood	
91832012	C-reactive protein measurement	
+		

Choosing the “Best” Code



```
elrConverter (WPOHAFMSL12 | EPIEDI Production | epiedi.oha.state.or.us)
Script Workspace (elrConverter (WPOHAFMSL12 | EPIEDI Production | epiedi.oha.state.or.us))
File Edit View Window Help
+ Run Debug
Scripts
01 - Process ELRs
Process Records - Each Record - 2020...
-- Process Each OBX
-- Process Each OBR
02
28 Set Variable [$dx_id; Value: GetValue ( Substitute ( $lookup ; "|" ; ¶ ) ; 1 )]
29 Set Variable [$disease_infoList; Value: List ( $disease_infoList ; $lookup )]
30 Set Variable [$OBXsuccess; Value: 1]
31 End If
32 # Second - look at OBX-5 for a LOINC or LN code (almost never happens)
33 If [( not IsEmpty ( $code3 ) and $code3Type = "LN" ) or ( not IsEmpty ( $code4 ) and $code4Type = "LN" ) or ( not IsEmpty (
34 Set Variable [$lookup;
35 Value: GetValue ( ExecuteSQL ( " SELECT OrpheusDiseaseID, Ignore, IsHIV_Genotype, IsSerology, IsInfo, SHORTNAME, IsSequ
36 Set Variable [$dx_id; Value: GetValue ( Substitute ( $lookup ; "|" ; ¶ ) ; 1 )]
37 Set Variable [$disease_infoList; Value: List ( $disease_infoList ; $lookup )]
38 Set Variable [$OBXsuccess; Value: List ( $OBXsuccess ; 2 )]
39 End If
40 # Third - Look at OBX-3.1/OBX-3.4 for LOINC codes
41 If [((not IsEmpty ( $code1 ) and $code1Type = "LN") or (not IsEmpty ( $code2 ) and $code2Type = "LN" ) or ( not IsEmpty ( $co
42 Set Variable [$lookup;
43 Value: GetValue ( ExecuteSQL ( " SELECT OrpheusDiseaseID, Ignore, IsHIV_Genotype, IsSerology, IsInfo, SHORTNAME, IsSeq
44 Set Variable [$dx_id; Value: GetValue ( Substitute ( $lookup ; "|" ; ¶ ) ; 1 )]
45 Set Variable [$disease_infoList; Value: List ( $disease_infoList ; $lookup )]
46 Set Variable [$OBXsuccess; Value: List ( $OBXsuccess ; 3 )]
47 End If
48 # Fourth - Look up local codes in OBX-5.1 one at a time because using wildcards in the SQL
49 If [ ( not IsEmpty ( $code3 ) and not IsEmpty ( $code3Type ) and $code3Type ≠ "LN" and $code3Type ≠ "SCT" ) and IsEm
50 Set Variable [$lookup;
51 Value: GetValue ( ExecuteSQL ( " SELECT OrpheusDiseaseID, Ignore, IsHIV_Genotype, IsSerology, IsInfo, LocalValue, IsSe
52 Set Variable [$dx_id; Value: GetValue ( Substitute ( $lookup ; "|" ; ¶ ) ; 1 )]
53 Set Variable [$disease_infoList; Value: List ( $disease_infoList ; $lookup )]
54 Set Variable [$OBXsuccess; Value: List ( $OBXsuccess ; 4 )]
55 End If
56 # Fifth - Same as 4th, but looking in OBX-5.4 (where it's expected)
```

Presenting Usable Data (ELR)



Home List Prev Next Print **ELR Patient Detail** [Search]

Person, Random N M DOB: 6/18/2001 Washington Syphilis Msg: 2/7/2023

Search & Link Lab Report More Search for Patient Flagged for Review Note

ELR Person Info

Last Person
First Random N
DOB 6/18/2001
Sex M
Race UNK
Hispanic
Phone 503-123-4567
Addr Random st

Orpheus Person Info

F M X O U R
 White Asian AI/AN Refused
 Black Pacific Is. Unknown Other
Hisp Yes No Unknown

Person ID [] No Match [Person Icon]
[Unlinked] 3/22/2024 2:42:44 PM
Case Created

Final Result

ELR Lab Results [Link]
Specimen Date: 01/30/2023 Lag: 17 days
Specimen Type/Site: Serum
Order: TREPONEMAL AB IgG
Test: T pallidum Ab Ser QI IA

Set these fields before confirming link

Specimen Type/Site: Serum << Update
Test Type: Treponema pallidum Ab << Update
Result: REACTIVE (H) << Update

If unable to confirm link:

Create New Case
Ignore

Existing Case Records for

Disease	County	Onset	LHD Report	Created	Status
---------	--------	-------	------------	---------	--------

Adding Meaning and Context



Home List Prev Next Print

Syphilis Case Entry

518147

Random N Person

Labs 1

Disease: Syphilis

Stage:

Status: Confirmed

Deceased: [Not Answered]

DOB: 6/18/2001 Age: 22

SOGI: incomplete
Sex: M Gender:

REALD: Incomplete
Race: [unspecified]

Housing Type:
Housing at Dx:
Housing Past Year:

Random St
Portland OR 97232
WASHINGTON

503-123-4567

Provider:
[none added]

LABS [view as list](#) ELR

Related Lab Tests

View: All ELR non-ELR

+ Specimen

Show	Laboratory	Date	Specimen	Test Type	Result	Msg Date
<input checked="" type="checkbox"/>	Interpath Laboratory	3/12/24	Serum	Treponema pallidum Ab	REACTIVE (H)	

Laboratory: Interpath Laboratory Inc. (Pendleton) Show ELR

Collection Date: 3/12/2024

Report Date: Lab Result Date...

Specimen Type: Serum

Test Type: Treponema pallidum Ab

Result: REACTIVE (H)

List of Results

Specimen Date: 01/30/2023 Lag: 17 days
Specimen Type/Site: Serum

Order: TREPONEMAL AB IgG

Test: T pallidum Ab Ser QI IA

Adding More Context and Meaning!



Person Entry

Helena Tester

DOB: 7/1/2000

Age: 23

Deceased: [No]

Sex: F

REALD: Language: Don't want to answer
Race: Declined

Birth Country: WASHINGTON

Current Phone: [Add Phone Info...]

Current Address: WASHINGTON

Person Entry

Helena Tester

DOB: 7/1/2000

Age: 23

Deceased: [Not Answered]

Sex: F

REALD: Language: Don't want to answer
Race: Declined

Birth Country: WASHINGTON

Current Phone: [Add Phone Info...]

Current Address: WASHINGTON

Animal

General | Vaccines | Duplicates | Other

This person is a twin

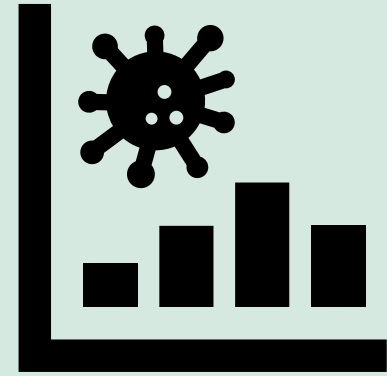
IMMUNIZATION HISTORY

VACCINATIONS

Date	Age	CVX	Record Source	Lot Number / Mfg	Dose
01/03/19	18	115	+ Source of Record	C5429AA	
Tdap			ALERT	UNK	
01/22/19	18	01	+ Source of Record	lot #...	
DTP			ALERT	UNK	
01/22/19	18	163	+ Source of Record	lot #...	
Meningococcal B, OMV			ALERT	UNK	
01/22/19	18	133	+ Source of Record	lot #...	
PCV13			ALERT	UNK	
01/22/19	18	12	+ Source of Record	lot #	

5

Reporting



Data Out: Analyze, Summarize, Report

- Canned reports within Orpheus
 - Case Counts (by county, disease, age, sex...)
 - Risks/Exposures (by disease)
 - Line lists (“report-like” for better case management)
 - Triennial review and data cleaning
- Ad-hoc exports
 - For analyzing data in an outside tool
- Scripted exports
 - CDC (MMWR reporting)
 - Special CDC Projects (MAPS, ABCs, MDRO)
 - Multnomah County Datamart (Tableau project)

Canned Reports and Line Lists



General Disease-specific Risks

CIN HIV Peri HepB Pertussis VPD TB Syphilis

Perinatal Hepatitis B

birth cohort from Start
to End

Baby Data

Mom/Baby Pairs 2nd Dose Needed
Pregnant Cases 3rd Dose Needed
Serology CDC Case List [Export CDC List](#)

Disease
County
Leave blank for all counties

Closed between Start
and End

Home Export [Back to Reports](#) **Perinatal Hepatitis Mom/Contacts** [CDC List](#) [Contacts](#) [Vaccinations](#) [Prophy](#) [Serologies](#) [Save to Excel](#)

Record 1 of 6

CaseID	Case County	Name	DOB	Baby (#): Name	DOB	Trimester	Closed	Insurance: Mom / Child	Follow-up County	HE
514858	Columbia	Madison, Billy	8/7/92	4 Madison, Penguin	7/25/16				Baker	
514858	Columbia	Madison, Billy	8/7/92	1 Madison, Baby6	1/5/16		3426		Curry	1.
447086	Multnomah	Star, Shining	5/4/82	3 Star, Lucky	6/1/16		3000		Curry	6.
447086	Multnomah	Star, Shining	5/4/82	Star, Newborn Baby	9/1/16					
447086	Multnomah	Star, Shining	5/4/82	Star, Newborn Baby	1/1/18					1.
515612	Washington	Test, Person	1/1/80	1 Test, Newborn Baby	9/5/18	3rd				

[Total Pair(s) 6]

Canned Charts and Graphs



Orpheus Reports

Home Settings

General Disease-specific Risks

Search:

Custom Title:

Disease Botulism

County Lake

Date

- Onset
- Report
- Diagnosis
- Date of Record

from **Start**

to **End**

Age by Sex

Age Group by Sex

Age Group by Sex

Age Group by Year

Case Count by Age

Case Count by Age Group

Case Count by County

Case Count by Disease

Case Count by Epi Link (pie)

Case Count by Language

Case Count by Month

Case Count by Race (pie)

Case Count by Sex (pie)

Case Count by Subtype

Case Count by Year

Case Count by Zip Code

Case Line List

Case Line List by disease/county

Case Line List with Treatment & Provider

CD ELR by County

County by Disease by Month

County by Disease by Sex by Age

Disease by County/Month

Disease by County/Year

Case Count by Month EXAMPLE of how report might look

Report - Case Count by Month Graph
County: Clatsop; Onset dates from 1/1/2018 to 10/7/2018

Month	Case Count
Jan	15
Feb	5
Mar	20
Apr	28
May	25
Jun	38
Jul	28
Aug	35
Sep	22
Oct	18
Nov	12
Dec	2

Date as of Thu, 7 October 2010, 12:34 AM

Confidential Report: Shred after Use

Triennial Review Reports



County	CaseID	Disease	Report Date	Interviewed	Interview Date	Intvw Status	Date Sent	Complete	EpiLocal	Disease Group	Intv. Req.	1st Call Try
Deschutes	514759	Cryptococcus	4/1/2016	<input type="radio"/> Yes <input type="radio"/> No			04/01/16		Michelle Barber	Misc CD	<input type="checkbox"/>	
Deschutes	514948	Salmonella	11/4/2016	<input type="radio"/> Yes <input type="radio"/> No			11/04/16		Michelle Barber	Enteric	<input checked="" type="checkbox"/>	
Deschutes											<input type="checkbox"/>	
Deschutes											<input checked="" type="checkbox"/>	01/07/2019

Country Review Menu

Agency

From Jan. 2016 To Jan. 2017

Run a Report...

Completeness

Outbreaks

Timeliness

All Cases - except Animal Bites

	Cases	Intrvwd	
Deschutes CHD	457	155	33.9%
Other Agencies	10174	2797	27.5%

Age/DOB	Race	Ethnicity
155/155 100.0%	148/155 95.5%	135/155 87.1%
2798/2797 100.0%	2651/2797 94.8%	2487/2797 88.9%

Address	Sex
155/155 100.0%	155/155 100.0%
2793/2797 99.9%	2797/2797 100.0%

...excluding chronic Hepatitis C

Occup	Hosp Stat	Outcome
93/216 43.1%	200/216 92.6%	200/216 92.6%
1862/3976 46.8%	3757/3976 94.5%	3744/3976 94.2%

Occupation/Grade - Restrictable Diseases

	Diphtheria	Measles	S. Typhi	Shigella
Deschutes CHD	/	/	/	3/3 100.0%
Other Agencies	/	/	2/2 100.0%	75/75 100.0%

	E. coli	Hep A	Pertussis	Rubella
Deschutes CHD	11/11 100.0%	1/1 100.0%	3/3 100.0%	/
Other Agencies	173/174 99.4%	15/15 100.0%	198/202 98.0%	/

Cases Requiring Interview - excluding Animal Bites

	Cases requiring intv.	Intrvwd	
Deschutes CHD	112	81	72.3%
Other Agencies	2459	1910	77.7%

Age/DOB	Race	Ethnicity
81/81 100.0%	78/81 96.3%	76/81 93.8%
1909/1910 99.9%	1793/1910 93.9%	1702/1910 89.1%

Address	Sex
81/81 100.0%	81/81 100.0%
1907/1910 99.8%	1910/1910 100.0%

Occup	Hosp Stat	Outcome
68/81 81.5%	81/81 100.0%	81/81 100.0%
1356/1910 71.0%	1902/1910 99.6%	1905/1910 99.7%

Outcome - Selected Diseases

	H. flu	Mening	Hep A
2/2 100.0%	/	1/1 100.0%	
32/32 100.0%	21/21 100.0%	15/15 100.0%	

	Hep B acute	Hep C acute	Inf. Pertussis
/	/	/	
17/17 100.0%	11/11 100.0%	19/19 100.0%	

External Reporting



Use the right tool

- Repeated and consistent output
- Language-based read/write data science for reproducibility and transparency (SQL, Python, R)
- Click-based read-only reporting interfaces (Tableau, PowerBI)
- Considerations for compliance and sharing with partners

Visualizations

Oregon Health Authority INTERNAL DASHBOARD - FOR ORPHEUS USERS Submit Feedback

Oregon's Weekly Communicable Disease Report

A weekly report presenting preliminary data on case counts and trends for selected reportable diseases in Oregon. Data current as of March 11, 2024

[Weekly Report Charts](#) | [Disease Data Tables](#)

Data for the Week of: Statewide March 3, 2024

Select a disease to view	Weekly Total Case Count	Year to Date Case Count	Prior 4 Weeks Case Count
Campylobacteriosis	7	159	62

Select a county to view: Multnomah

Campylobacteriosis Cases by Report Week^{**}

Orange bars represent case counts for each report week over the past two months. The light blue line shows the five-year average case count for that week. Bars are marked with a † if the case count is more than two standard deviations above the five-year average.

Report Week	Cases
3/1/2024	20
3/5/2024	29
3/12/2024	10
3/19/2024	21
3/26/2024	15
4/2/2024	16
4/9/2024	7

Cumulative Campylobacteriosis Cases by Year

The light blue bars show the year-to-date case count (week 1 - week 10) for each of the past five years.

Year	Cumulative Cases
2024	159
2023	144
2022	141
2021	164
2020	150

Campylobacteriosis Cases by Report Week^{**}

The light blue bars show the case count for each report week of the current year.

All data in this weekly report are preliminary and are subject to change.

* Report weeks are from Sunday through Saturday. Each year consists of 52 or 53 report weeks, although most years consist of 52 weeks. Week 1 is the first week of the year that has at least four days in the calendar year. For most diseases, cases are assigned to a report week based on their onset date. Cases of diphtheria, hepatitis, Lyme disease, and measles/mumps/rubella are assigned to a week based on the date the case was reported to public health. Cases of HIV and tuberculosis are assigned to a week based on the date of diagnosis and notification of medical status, respectively.

† Due to the fact that most reporting years do not contain a week 10, there may be no historical data for comparison and high case count weeks will often appear for data in week 10.

‡ Data from 2020 and forward are current as of this date. Data prior to 2020 are current as of May 2023.

§ Early syphilis case counts include cases with primary, secondary and early tertiary syphilis. These data do not include cases of congenital syphilis or cases of unknown/late duration.

¶ These numbers are subject to change due to delays in reporting.

National Reporting Requirements



Layout: CaseExportSilo | <https://mvpsnboard.cdc.gov>

Orpheus Dev case export silo

MVPS DASHBOARD | Data Source: Production (P) | Reports | Exp

Case ID

- 515889
- 517151
- 517173
- 517704
- 517382
- 517474
- 517940
- 517454
- 517917
- 517777
- 514236
- 517661
- 515968
- 515238
- 515247
- 515251
- 515252
- 515253
- 517937
- 518022

64

Messages Received
Last 24 hrs. **16**

Messages Completed
Last 24 hrs. **16**

Messages Errored
Last 24 hrs. **0**

Total Messages Received

3 Days

Errors & Warnings

3 Days

Message Heat

3 Days

Message Transaction Table

Start Date: 03 / 27 / 2024 | End Date: 03 / 29 / 2024

Category	Received	Completed	Errored
VACCINE PREVENTABLE DISEASES	32	16	16

System Performance



Due to the demands of all the inputs, processes, and outputs, the electronic system must be monitored. Key performance indicators are used to assess overall system behavior regarding specific goals defined and adapted over time to improve the system functionality.

System Monitoring



Claris FileMaker Server Friday, March 29, 2024 at

- Dashboard
- Databases
- Backups
- Configuration
- Connectors
- Administration
- Logs

System Overview

28

Total Connections

30 / 30

Hosted Databases

FileMaker Pro 28 Connections ⓘ FileMaker Go 0 Connections FileMaker WebDirect 0 Connections Additional 0 Connections ⓘ

Server Name

██████████ Orpheus Production | ██████████

Server IP Addresses

██████████

Server Version

19.4.2.204

FileMaker Server License Expiration

None

SSL Certificate

Expires on 2025-04-23 18:49:12 UTC

[Details](#)

Last Backup

03/29/2024, 01:15

FileMaker Data API Annual Limit

1.2 GB / 43200 GB

ODBC and JDBC Connections

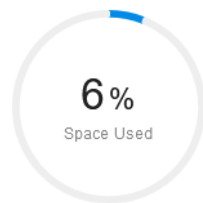
2 / Unrestricted

FileMaker Script Engine Connections

0



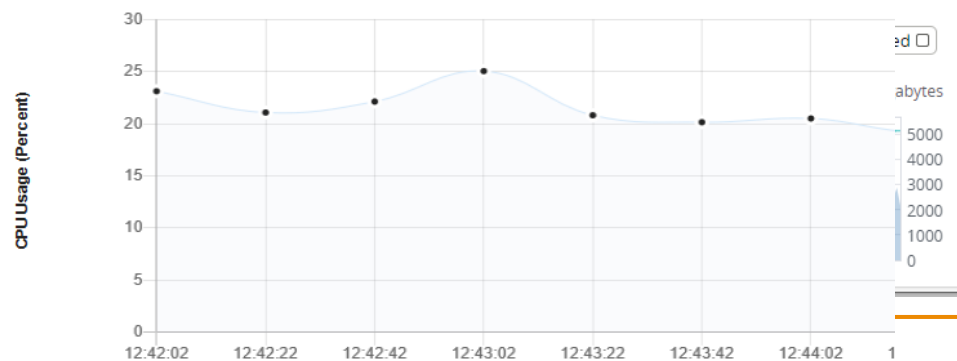
Volume Status



Total Space 249.9 GB

Space Used 15.2 GB

System Statistics

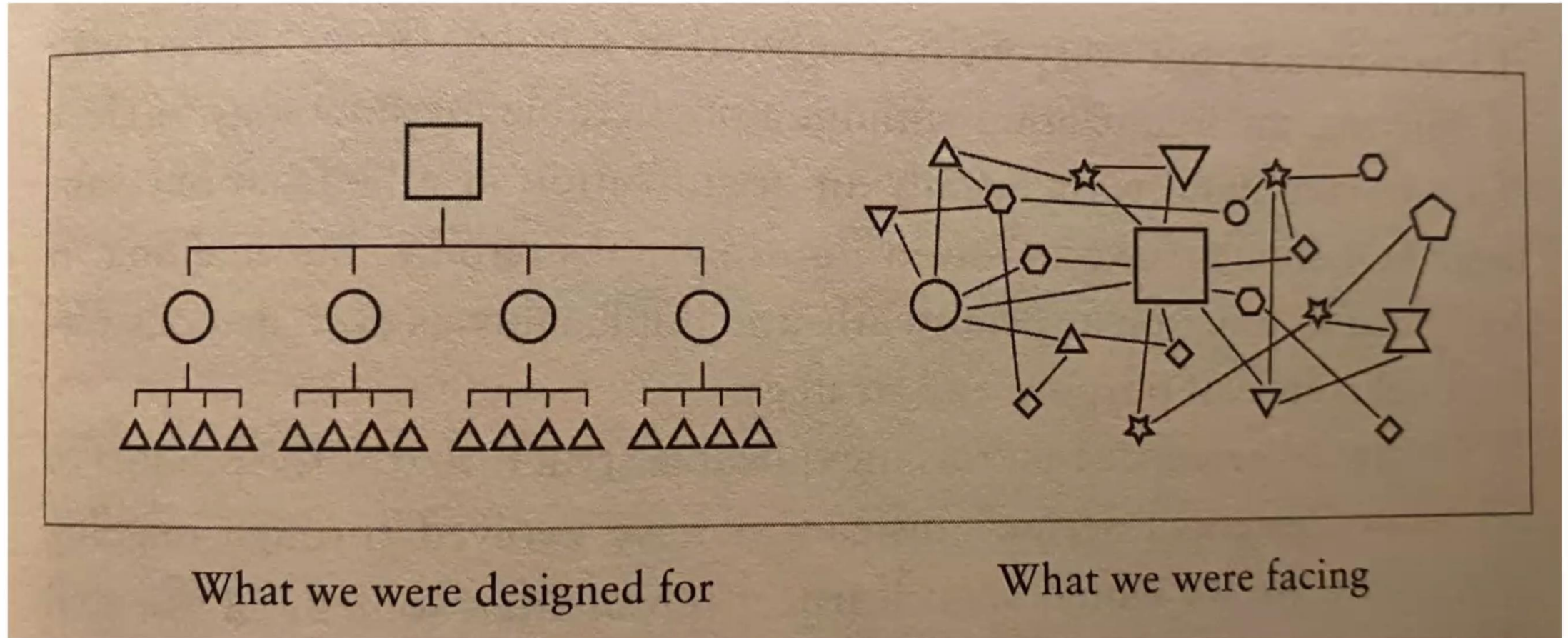




State and Federal Drivers



Now what?



To adapt to the changing landscape...



Public Health Information Systems must be...

Scalable...to receive, process, and send unpredictable volumes of data

Agile...to respond to rapid changes in data, workflows, users, and user needs

Standardized and Interoperable...to easily exchange data with other systems

Sustainable...be maintained, enhanced, and operated with reliable funds

Reusable or Modular...for both routine and emerging events

Easy to Use...by appropriate new staff with minimal training



Shared Priorities to Help Advance Public Health

USCDI & USCDI+

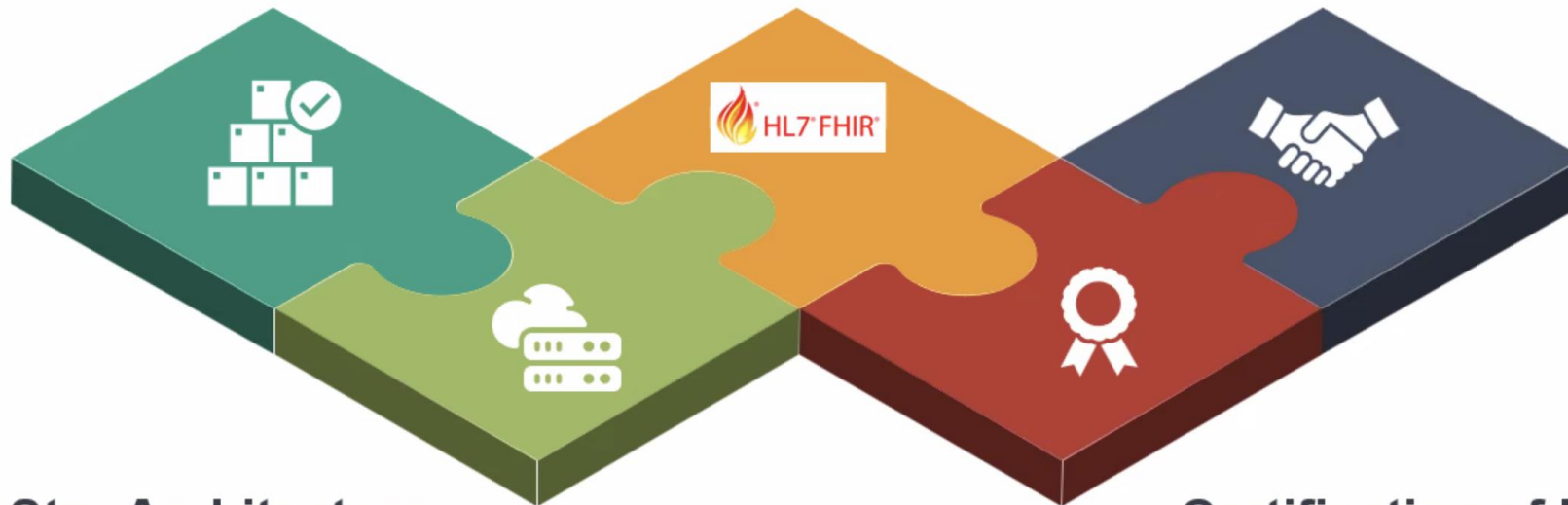
Prioritize and harmonize data most crucial to the needs of public health and beyond

FHIR Advancement and Strategy

Adopt standards that can be more easily extended and reused as conditions change

TEFCA

Develop common, pre-negotiated agreements to simplify data exchange nationwide



North Star Architecture

Help public health jurisdictions share and analyze data with each other and CDC

Certification of IT & Data Systems

Ensure IT & data systems used by public health are sustainable and meet baseline requirements for security and functionality

Guidance



CDC DMI STRATEGIC PRIORITIES

TOP PRIORITIES FOR STLTS



Build the right foundation to increase scalability, flexibility, reusability, sustainability, and interoperability of public health applications and data sources

- Migrate to secure cloud-based services
- Upgrade or replace siloed systems
- Use modern data processing and analytics tools
- Outsource burdensome point-to-point connections to trusted intermediaries



Accelerate data into action by leveraging modern data standards, shared services, and reusable processing approaches that make it easier to link data and more intuitive to troubleshoot issues

- Invest in record linkage capabilities to increase secure data linkages and data completeness
- Identify opportunities and barriers to the usage of shared services and cloud



Develop a state-of-the-art workforce equipped with data science and engineering skillsets to be able to leverage modern tools

- Deploy funds to accredited and competency-based trainings to strengthen skills of the existing workforce



Support and extend partnerships to accelerate the exchange and use of data across the public health ecosystem and the identification, development, and use of shared services

- Increase the use of standardized data use agreements
- Participate in ongoing engagement, feedback gathering and peer-to-peer learning opportunities



Manage change and governance by implementing modern best practices and guardrails for data and IT procurement, development, and governance

- Leverage shared procurement resources and promote human-centered design
- Establish data and IT governance frameworks that empower teams and leaders

Get Involved with HL7



HL7

Pages

SPACE SHORTCUTS

- HL7 Essentials
- HL7.org
- HL7 Work Groups & Projects
- HL7 Documentation & Help
- Project Scope Statements
- Project Proposals
- Zoom
- WGM Agendas

PAGE TREE

- HL7 Acceptable Use Policy

Pages

Welcome to the Confluence Pages of Health Level 7 (HL7) International

Created by Anonymous, last modified by Joshua Prociou on Mar 07, 2024

Welcome to HL7's community workspace for creating health data standards that advance global interoperability.

Here in Confluence you'll find the documentation of how we create HL7 standards, the decision making records and notes across all of our sub-groups, and a trove of resources about the HL7 community, its processes, and events.

This site is a community space. Please [mind your manners](#). We welcome your help in keeping it vibrant and up to date by contributing edits, comments, and questions.

A great place to start your HL7 adventure is with the [HL7 Essentials](#) page. You can also find tips and documentation for [using Confluence and Jira in your HL7 work](#). If you're new here, you'll need to [request a free account](#) before participating.

[Join the HL7 community discussion at chat.f](#)

[Request an Account](#)



Upcoming Events



April 17, 2024 - April 18, 2024

[HL7 C-CDA Implementation-A-Thon](#)



May 18, 2024 - May 24, 2024

[May 2024 Working Group Meeting and HL7 FHIR Connectathon](#)



June 10, 2024 - June 13, 2024

[HL7 FHIR DevDays 2024](#)



July 16, 2024 - July 18, 2024

[CMS HL7 FHIR Connectathon](#)



August 7, 2024 - August 8, 2024

[HL7 C-CDA Implementation-A-Thon](#)

[All Upcoming Events >](#)

Upcoming Training



March 28, 2024 - April 25, 2024

[HL7 FHIR Fundamentals](#)



April 2, 2024 - April 2, 2024

[Everything is Connected: One Health and HL7 FHIR \(free\)](#)



April 9, 2024 - April 11, 2024

[HAPI FHIR](#)



April 23, 2024 - April 25, 2024

[HL7 FHIR Terminology](#)



May 2, 2024 - June 6, 2024

[HL7 V2 to FHIR Mapping](#)

[All Upcoming Training >](#)

OID Registry

Obtain or register an OID and find OID resources.

[OID Registry >](#)

About HL7 International

Founded in 1987, Health Level Seven International (HL7) is a not-for-profit, ANSI-accredited standards developing organization dedicated to providing a comprehensive framework and related standards for the exchange, integration, sharing and retrieval of electronic health information that supports clinical practice and the management, delivery and evaluation of health services.

[Read More >](#)

News & Announcements

[2024 May Announcement of Formation of HL7 Consensus Groups](#)

Registration is open for the HL7 FHIR Connectathon & WGM, May 18-24 (Dallas, TX)!

Registration is open for HL7 FHIR DevDays, June 10-13! Grab a ticket and save with early bird rates.

[Press Release March 22 2024: HL7® International Named Customer Experience Spoke in ARPANET-H, a Nationwide Health Innovation Network](#)

Professional Organizations



COVID-19 ▾

Members ▾

Resources ▾

Committees ▾

Fellowships & Training ▾

Policy ▾

About ▾

Data: Elemental to Health



Data

Da



DMI Stories from
the Field



Data
Modernization
Background



Congressional
Testimony



Communications



About The Program

Increasing the data science capacity of the public health workforce is a key component of the [Data Modernization initiative \(DMI\)](#). The Data Science Team Training program is a team-based, on-the job training program to promote data science upskilling at STLT (state, territory, local, tribal) public health agencies. Learners in the 12-month Data Science Team Training (DSTT) program work collaboratively on a project that addresses a current agency need related to DMI.



APHIF

APPLIED
PUBLIC HEALTH
INFORMATICS
FELLOWSHIP



Program Description

The Applied Public Health Informatics Fellowship (APHIF) is an opportunity to build informatics, data science, and laboratory capacity at state and local health departments while training recent masters or doctoral graduates in applied public health practice. The goals of the 2-year fellowship program are to provide a high-quality training experience and for fellows to explore career opportunities at state and local health departments.



The role of an **Informatics Director** is focused on implementing the technical aspects of DMI and/or Informatics work

The **DMI Director/Lead/Manager** develops, implements, and operationalizes the strategy and visions for the agency's DMI work

Overview

ASTHO is developing a **Data Modernization Roadmap** for state and territorial health agencies, consisting of two parts:

- 1. S/THO Guide** for state health officials and leadership teams
 - Primer for State/Territorial Health Officials (S/THOs) on “What is DMI” and components needed to further DMI progress
 - Audience: S/THOs
- 2. Tactical Guide** for DMI Directors and Informatics Leads
 - More detailed guidance document targeted to agency leaders (e.g., DMI Leads) on strategy and tactics for implementing DMI
 - Audience: Informatics Leaders, Senior Deputies, other agency leaders



General Approach

- S/THO and Tactical Guides are complementary
 - Propose using a similar outline, different level of detail
 - Audience-specific resources to be provided
- As appropriate / possible, point to existing resources
- Align activities with broader STLT priorities
 - CDC DMI Implementation Guidance
 - CSTE DMI Priorities Report
 - ELC / PHIG Guidance

Continuing Education



WHO WE ARE ▾ WHAT WE DO HOW WE DO IT PODCAST MEDIA ROOM ▾ **RESOURCES CENTER** CONTACT

Featured Resources

Summary of Laws Related to Child and Adolescent Mental Health

[READ MORE](#)

Informatics-Savvy Health Department Toolkit

[READ MORE](#)

Reframing Public Health Informatics: A Communications Toolkit

[READ MORE](#)

Resource Categories

TOOLKITS

Toolkits are curated tools that walk users through specialized informatics topics. They are often organized into steps for addressing an issue or implementing a new process.

GUIDANCE

Resources in this collection provide actionable approaches and recommendations for streamlining the work of public health informatics. They include informational models, templates and educational guides.

TECHNICAL ANALYSIS

Process improvement requires analyzing gaps to create new efficiencies. These documents deep-dive into analysis of current work processes using a standardized technical format to inform new workflow decisions.

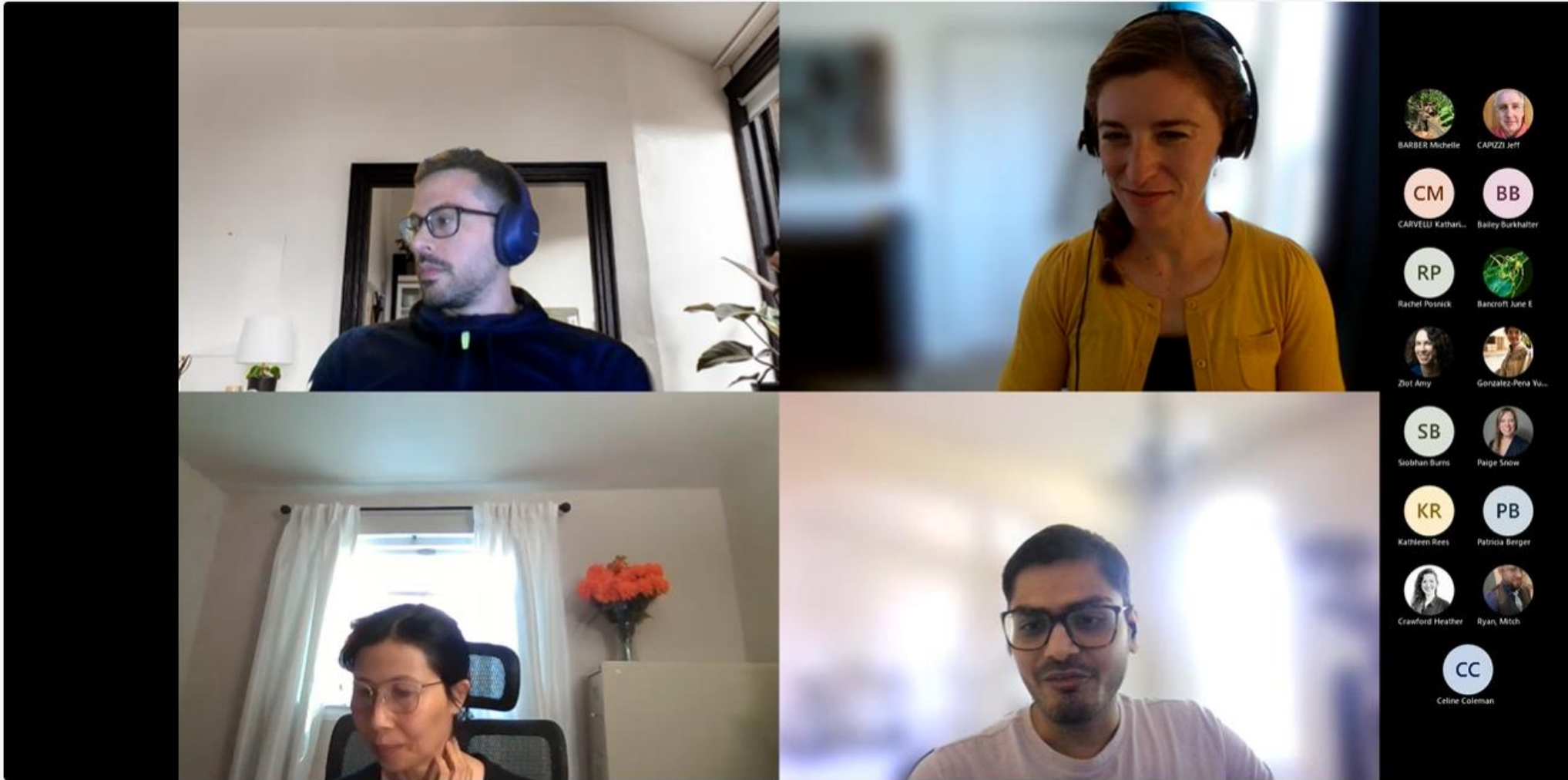


Reframing Informatics Webinar

Hear from a panel of state and local public health professionals as they share plans to incorporate informatics into their work. Recording is now available.

[Learn more](#)

Collaborate



Orpheus|Opera Data Advisory Group

Oregon initiatives



- REALD / SOGI
- Cloud First / Cloud Migration
- Minimum Core Data and Common Data Use Agreement for CDC
- Interjurisdictional Data Exchange
- Data Warehousing / Data mart
 - Improving Data Security and Access
- Workgroups – Data Advisory, Governance
 - Tribal Data Sovereignty
- Informatics Job Classification/Series

Let's connect!

ACDP.Informatics@odhsoha.oregon.gov



- **Michelle Barber**, Informatics Manager
- **Rob Laing**, Communicable Disease Interoperability Director
- **Heather Crawford**, Data Exchange Informaticist

Additional Reference Slides



Links: Training



- Public Health Informatics Institute's [Designing and Managing Public Health Information Systems: 8 Steps to Success](#)
- [Public Health Data Learning Center](#) from Washington State Department of Health and Northwest Center for Public Health Practice
 - CDC's [Public Health 101 Series – Introduction to Public Health Informatics](#)

Links: Resources



- [Reframing Public Health Informatics](#): A FrameWorks Communications Toolkit
- **Public Health Informatics Institute**
 - [Self-Assessment Tools](#)
 - [Communications Toolkit](#), cross-posted from FrameWorks
- https://journals.lww.com/jphmp/Fulltext/2016/07000/What_Is_Informatics_.15.aspx
- <https://www.infectioncontroltoday.com/view/surveillance-informatics-and-epidemiology-triangle>

Links: Rule Makers, Standards



- [The Office of the National Coordinator for Health Information Technology \(ONC\)](#)
 - [United States Core Data for Interoperability \(USCDI\)](#)
 - [Trusted Exchange Framework and Common Agreement \(TEFCA\)](#)
- [HL7](#)
 - [HL7 FHIR ACCELERATOR™ Program](#)
 - [Helios FHIR Accelerator for Public Health](#)
 - [MedMorph](#)

Links: CDC, Professional Organizations



- **CDC**

- [Data Modernization Initiative \(DMI\)](#)
 - [North Star Architecture](#)
- [Public Health Data Strategy](#)

- **CSTE**

- [Data Modernization Initiative – Stories from the Field](#)
- [Data Science Team Training](#)
- [Applied Public Health Informatics Fellowship](#)

- [NACCHO](#)
- [ASTHO](#)
- [APHL](#)